ISSN 1975-7042

Financial Stability Report

2020. 6

BANK OF KOREA

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This Financial Stability Report is published in accordance with the provisions of Article 96 of the Bank of Korea Act, and upon the resolution of the Monetary Policy Board.

June 2020

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Bank of Korea

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Financial stability refers to a condition in which the financial system works smoothly with all of its key components satisfactorily performing their roles: financial institutions carrying out their financial intermediary functions, market participants maintaining a high level of confidence in their financial market, and the financial infrastructure being well developed.

Financial stability is regarded as one of the policy goals that must be achieved, together with price stability and economic growth, for the realization of sustainable economic development. Policy authorities around the world thus devote great efforts to achieving financial stability.

As part of its conduct of macroprudential policies, the Bank of Korea has been publishing the Financial Stability Report on a biannual basis since 2003, analyzing and assessing the potential risks inherent in the Korean financial system and suggesting related policy challenges.

Notably, under the revised Bank of Korea Act of 2011 (Article 96), the Bank of Korea is obliged to draw up a Financial Stability Report and submit and report it to the Korean National Assembly at least two times each year.

The Bank of Korea is devoting its best efforts to qualitative improvement of the Financial Stability Report. This report takes the potential risks to financial stability highlighted until May 2020 as the objects of its analysis.

It is hoped that this Financial Stability Report will help financial market participants, regulators and policymakers to recognize the risk factors inherent in the financial system at an early stage, and deal with them appropriately.

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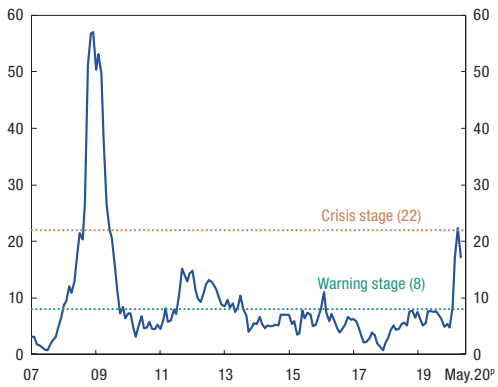
Overview

With the global economy severely affected by the COVID-19 pandemic since March, Korea's financial system has shown a degree of instability as well, such as greater volatility in financial and foreign exchange markets and higher market vigilance. Thanks to the government and the Bank of Korea's active policy responses including market stabilization measures, financial market anxiety has eased on the whole. However, there are concerns that financial unrest could recur, depending on developments of the COVID-19 pandemic. The Financial Stability Index (FSI), showing overall financial system conditions, has rapidly risen since February and reached the crisis stage in April (22.3). The index has fallen since then but remains at 18.0, far above the warning stage threshold (8.0).

Financial stability index (FSI)[1)2)]



Notes: 1) A composite index (0-100) calculated by standardizing 20 monthly real and financial sector indicators related to financial stability. The warning and crisis stage thresholds are set at 8 and 22 respectively, using the "noise-to-signal ratio" method.
2) Preliminary figures for April and May 2020.
Source: Bank of Korea.

A look at financial stability conditions by sector shows, first, that in the credit markets private credit has surged, owing to continuously increasing household loan demand and corporate efforts to secure financial resources in view of worsening business conditions. In addition, the private credit-to-nominal GDP ratio has risen greatly due to a fall in the nominal GDP growth rate. Amid a rise in household credit, led by home mortgage loans, households' debt repayment burden has also increased with the growth rate of household disposable income diminishing due to the economic slowdown. The household loan delinquency rate still remains low, but it has been rising somewhat for loans from non-bank financial institutions. Meanwhile, as demand soars for funds in line with worsening business conditions stemming from the COVID-19 pandemic, corporate credit has seen its growth accelerate thanks to financial institutions' active supply of credit. If the economic recovery is delayed, despite improvement in funding conditions in the corporate sector, credit and liquidity risks could expand, especially in vulnerable industries.

In the asset markets, bonds and stocks have shown high volatility out of concerns about the economic downturn due to the spread of COVID-19. Long-term market interest rates have fluctuated, affected by the possible global economic recession, financial market anxiety, and domestic and overseas market stabilization measures. Corporate bond credit spreads have widened greatly since mid-March due to mounting concerns about deteriorating corporate performance and credit rating downgrades. Domestic stock prices had plummeted along with those in major economies owing to the worldwide spread of the COVID-19 but have rebounded quickly since late March thanks to policy actions taken at home and abroad. The pace of rise in housing sales prices slowed due

to tougher government regulations and worsening real economic conditions, but upward price pressures appear to have been growing lately.

With regard to financial institutions, commercial banks' financial soundness remains solid in general, but their profitability has decreased owing to the decline in their net interest margin caused by falling interest rates. The asset soundness of non-bank financial institutions has been generally favorable amid sustained growth in assets, but their profitability has declined in most sectors. While the negative impacts from the COVID-19 outbreak are not fully reflected in the business performances of financial institutions, if the economic recession is prolonged going forward, profitability could further deteriorate and the potential risks of loans that have grown in the process of the coronavirus response could be realized, especially for vulnerable borrowers.

Foreigners' domestic portfolio investment recorded net outflows of 4.9 billion dollars between January and May due to large-scale outflows of stock investment in line with worsening sentiment stemming from the spread of COVID-19, despite net inflows of bond investment. Going forward as well, capital flow volatility could expand as global investor sentiment deteriorates affected by the possibility of a second wave of the COVID-19 pandemic and worries over the escalation of US-China disputes.

The financial system's resilience, i.e. its capacity to withstand domestic and external shocks, has remained favorable. Although financial institutions' capital adequacy and liquidity ratios have somewhat decreased in response to the outbreak of the coronavirus, they have still greatly exceeded regulatory standards. However, it must be kept in mind that if the economic fallout from COVID-19 lingers longer than expected, credit and market losses could grow and in turn undermine the resilience of domestic financial institutions. As for the nation's external payment capacity, it has remained generally favorable despite foreign portfolio investment outflows, with only a slight decline in official foreign reserves.

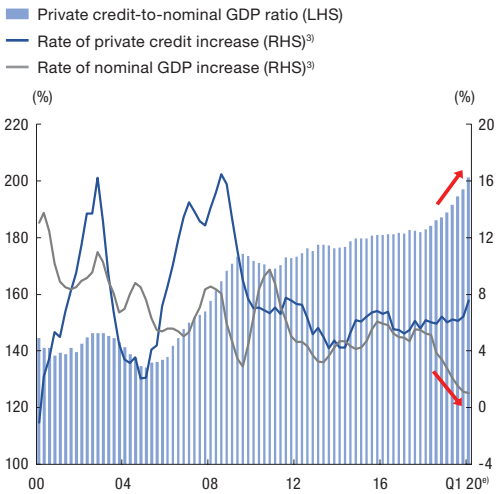
The Korean financial system has shown some degree of instability due to the unprecedented financial and real sector shocks from the spread of COVID-19. However, as active policy responses by Korean and other major country governments and central banks start to pay off, the domestic financial system has gradually recovered. Nevertheless, since there are still potential destabilizing factors at home and abroad, such as a possible second wave of the virus, uncertain domestic and global economic outlooks, and mounting tensions between the US and China, a high level of alertness must be maintained. In coping with the COVID-19 pandemic, the active supply of credit to the private sector has been especially helpful for overcoming crises in the household and corporate sectors. However, it should be noted that if the economic recession is prolonged, these increased loans could weigh on the financial system. The Bank of Korea will strive to maintain the financial system's stability over the medium- and long-term horizon in close cooperation with the government, while actively responding in the event of market destabilizing factors such as heightened market vigilance or a deepening liquidity crunch.

Financial Stability Situation by Sector

I. Credit Markets

1 The private credit-to-nominal GDP ratio, an indicator of the level of private sector leverage, stood at 201.1% (estimated) at the end of the first quarter of 2020, showing a significant rise of 12.3%p from the same period of last year. This was attributable to accelerated growth of private credit driven by corporate funding efforts and increased household loan demand, amid a considerable decline in nominal GDP growth.

Private credit[1]-to-nominal GDP[2] ratio



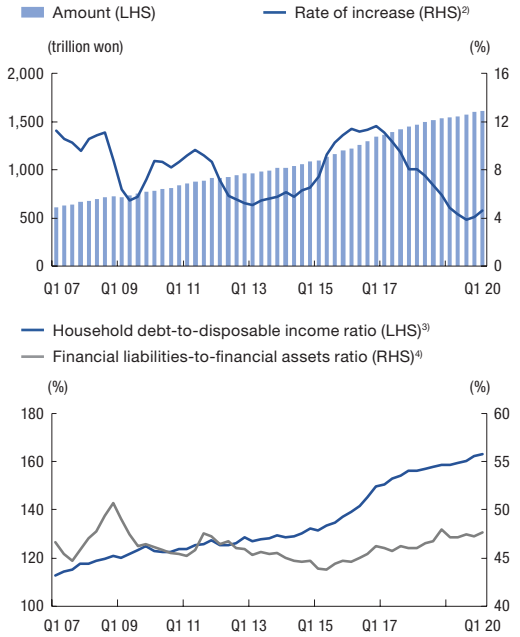
Notes: 1) Estimated figures for Q1 2020.
2) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters.
3) Year-on-year basis.
Source: Bank of Korea.

2 The pace of increase in household credit has slightly accelerated since the fourth quarter of last year, but remained slower than that of the normal year average. Household debt (household credit statistics basis) rose by 4.6% year on year to reach 1,611.3 trillion won at the end of the first quarter of 2020.

As debt increased at a faster rate than that of income, households' debt service burdens grew. The household debt-to-disposable income ratio stood at 163.1% (estimated) at the end of the first quarter of 2020, an increase of 4.5%p from the same period of last year (158.6%). The financial liabilities-to-financial assets ratio (flow of funds statistics basis) stood at 47.7% (estimated) at the end of the first quarter of 2020, up 0.5%p from a year earlier (47.2%). Although the household debt delinquency rate is lower than in the past, it has been rising somewhat for loans from non-bank financial institutions (NBFIs).

Household debt service capacity could further deteriorate going forward as the economy slows and employment conditions worsen due to the spread of COVID-19.

Household credit[1]



Notes: 1) Household credit statistics basis.
2) Year-on-year basis.
3) Disposable income of the first quarter of 2020 is estimated using the average of the household disposable income-to-gross national income ratios for the immediately preceding three years.
4) Based on the flow of funds statistics; estimated figure for Q1 2020.

Source: Bank of Korea.

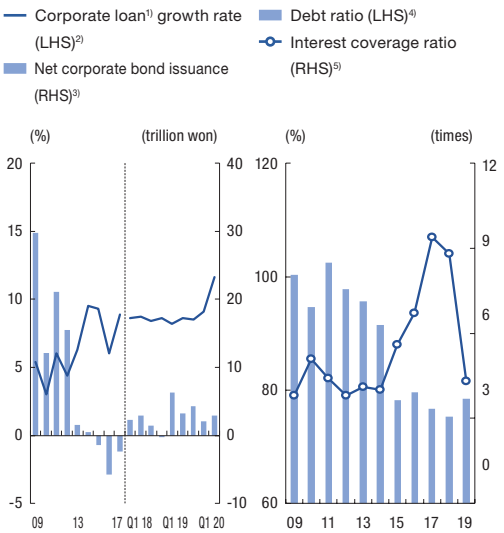
3 Corporate credit has increased considerably as enterprises respond to the spread of COVID-19. Corporate loans recorded a year-on-year increase of 11.6% to reach 1,229.2 trillion won at the end of the first quarter of 2020, driven by loans from both deposit-taking banks and NBFIs. By company size, loans to large enterprises and small and medium-sized enterprises (SMEs) both increased. In the case of the direct financial market, conditions for corporate bond and CP issuance deteriorated somewhat due to heightened market vigilance against credit risks, but then improved steadily thanks to market stabilization measures by the government and the Bank of Korea, resulting in net issuance of corporate bonds and CP.

Corporate financial soundness has been worsening due to a deterioration in corporate performances since last year. The overall corporate debt ratio (debt / equity) at the end of 2019 stood at 78.5%, rising slightly from the end of last year (75.3%). The interest coverage ratio (operating income / interest expenses) declined drastically (8.8 in 2018 → 4.3 in 2019) due to reduced profitability.

As business activity continues to contract considerably this year affected by COVID-19, the financial soundness and funding conditions of the corporate sector are highly likely to further deteriorate.

Corporate credit

Corporate financial soundness



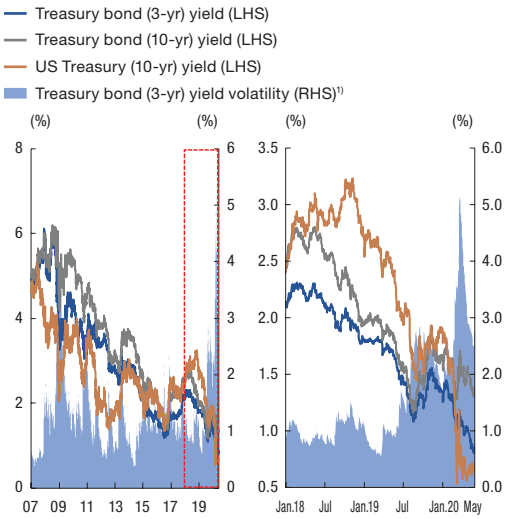
Notes: 1) Based on deposit-taking banks and non-bank financial institutions (mutual credit cooperatives, mutual savings banks, insurance companies and credit-specialized financial companies) (corporate loans extended by NBFIs for certain sectors and periods include loans to financial or insurance businesses due to limited data).
2) Year-on-year basis.
3) During the quarter (since 2018).
4) Debt / Equity, end-period basis.
5) Operating income / Interest expenses.

Sources: Bank of Korea, Korea Securities Depository, KIS-Value, financial institutions' business reports.

II. Asset Markets

1 Treasury bond yields declined on the back of concerns over a global economic recession following the spread of COVID-19, as well as due to market stabilization measures and policy rate cuts in major countries. Interest rate volatility expanded significantly around mid-March but diminished rapidly afterwards.

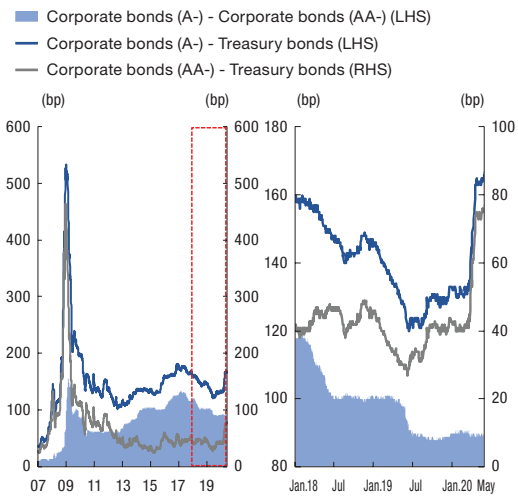
Korean and US Treasury bond yields



Note: 1) Daily volatility calculated using exponential weighted moving average (EWMA) method.
Sources: Korea Financial Investment Association, Bloomberg.

Corporate bond credit spreads widened greatly due to rising concerns about deteriorating corporate performances and corporate credit downgrades resulting from the effects of COVID-19.

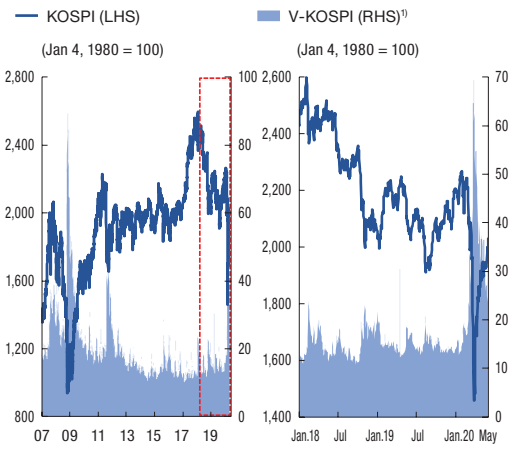
Corporate bond credit spreads,1) and spread across credit ratings



Note: 1) 3-year maturity basis.
Source: Korea Financial Investment Association.

2 Stock prices dropped greatly, influenced by COVID-19 but rebounded sharply after late March thanks to the proactive policy responses taken by Korea and other major countries. Stock price volatility fluctuated widely, affected by the developments in the spread of the COVID-19 at home and abroad, and by subsequent changes in international financial market conditions.

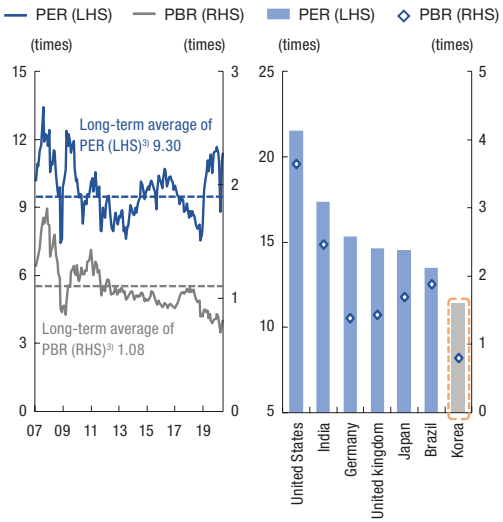
Stock price and stock price volatility indices



Note: 1) Volatility index calculated based on prices for options on KOSPI200 index.
Source: KOSCOM.

The price-earnings ratio (PER), showing the level of a firm's stock price relative to its profit, remained above its long-term average (9.30 since 2001), standing at 11.38 as of the end of May. The price-to-book value ratio (PBR), showing a firm's stock price level relative to its liquidation value, stood at 0.80, below the long-term average (1.08). The PER and PBR of listed stocks in Korea are lower than the corresponding ratios in other major economies.

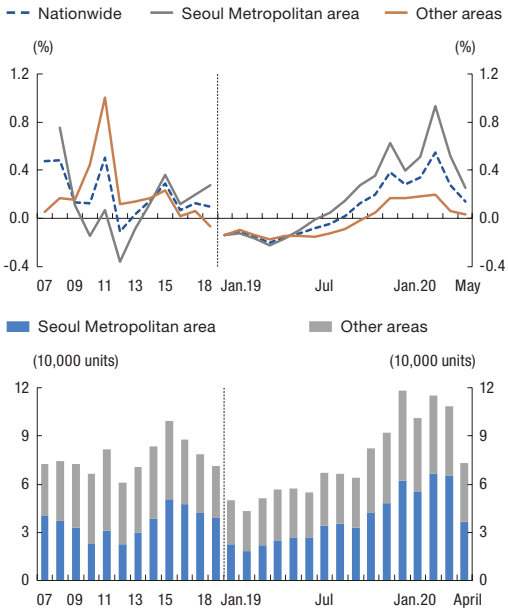
PER[1] and PBR[2]



Notes: 1) MSCI basis (12-month forward).
2) KOSPI basis.
3) Long-term average in the January 2001-May 2020 period.
Sources: Bloomberg, Thomson Reuters.

3 Housing sales prices have been accelerating slightly recently, after having decelerated due to the government's tightened regulations and the worsening real economic conditions. While prices in Seoul showed a slowdown, those of the surrounding areas of Seoul continued their upward trend owing to factors including development projects. The pace of increase in leasehold deposit *(jeonse)* and monthly rental prices has also been accelerating since late May, led by the Seoul Metropolitan area. In the meantime, the volume of housing sales transactions declined drastically entering April as buying sentiment contracted.

Rates of increase in housing sales prices[1] and housing sales transaction volumes[2]



Notes: 1) For 2018 and earlier, annual average of monthly growth; for 2019 onward, month-on-month increase.
2) For 2018 and earlier, monthly average.
Sources: Korea Appraisal Board; Ministry of Land, Infrastructure and Transport.

III. Financial Institutions

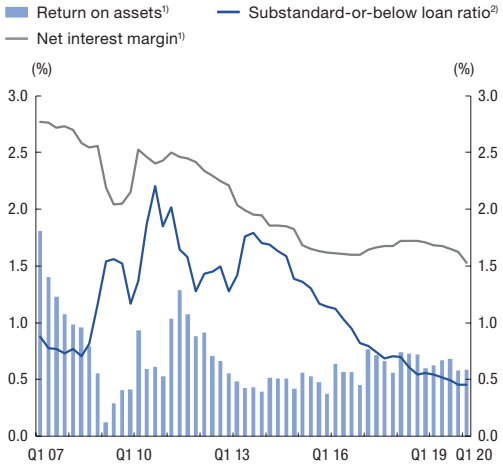
1 The financial soundness of commercial banks remains satisfactory overall.

Commercial banks' assets totaled 1,842 trillion won at the end of the first quarter of 2020, up by 10.2% year on year, the fastest growth since the first quarter of 2009 (14.8%). This has been driven by increased demand for corporate loans following the spread of COVID-19. Commercial banks' asset soundness has remained favorable, with their substandard-or-below loan ratio standing at a low level of 0.46%.

Commercial banks' profitability has declined slightly compared to the same period of last year due to the narrowing of the net interest margin stemming from declines in interest rates. During the first quarter of 2020, commercial banks' return on assets (ROA) was 0.58% (annualized), down by 0.04%p from that in the same period of last year (0.62%).

Entering the second quarter of this year, loans have been increasing rapidly, led by corporate loans. Thus, asset soundness could worsen if the real economic slump continues.

Commercial bank asset soundness and profitability



Notes: 1) Accumulated quarterly incomes annualized.
2) End-period basis.
Sources: Commercial banks' business reports.

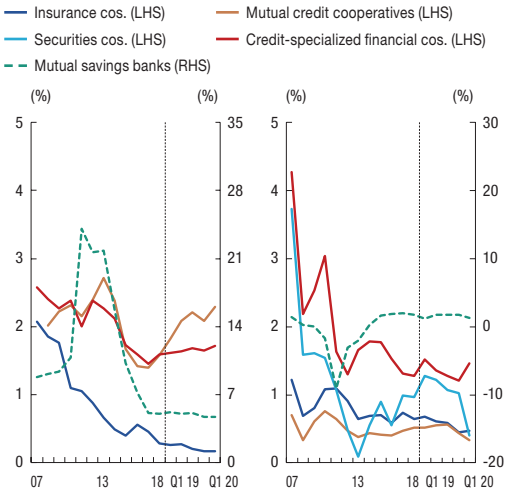
2 The financial soundness of NBFIs has generally been favorable as well. Amid continuous asset growth, asset soundness has remained satisfactory overall, but the profitability of most NBFI sectors has dropped.

NBFIs' assets increased by 9.8% year on year to total 2,942 trillion won at the end of the first quarter of 2020. The asset soundness of savings banks, insurance companies and credit-specialized financial companies has improved overall with declines in their delinquency rates but both the delinquency rate and the substandard-or-below loan ratio of mutual credit cooperatives have increased.

The profitability of most NBFI sectors has dropped. In particular, the ROA of securities companies has declined by the largest margin among NBFI sectors due to losses related to derivatives-linked securities like ELS. If an economic recovery is delayed, the profitability of NBFIs with relatively higher proportions of

vulnerable borrowers could worsen by a larger extent. Therefore, close monitoring of the trend is needed.

NBFI substandard-or-below loan ratios[1)2)]



NBFI returns on assets (ROAs)[2)3)]

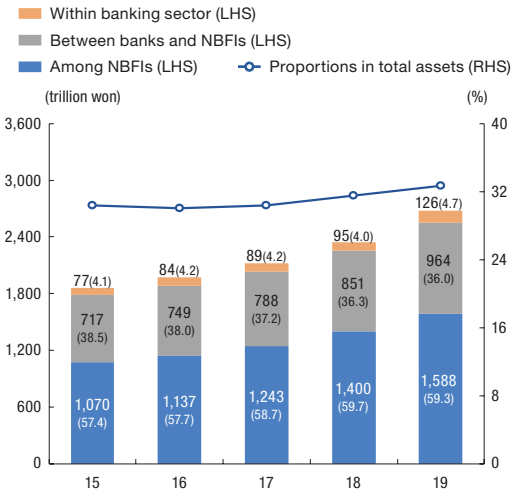
Notes: 1) End-period basis, excluding securities companies.
2) The area on the left of the dotted line is on an annual basis, and that on the right is on a quarterly basis.
3) Accumulated quarterly incomes annualized.
Sources: Financial institutions' business reports.

3 Financial institutions' interconnectedness through their funding and operations has strengthened. Mutual transactions among financial institutions amounted to 2,678 trillion won at the end of 2019, representing a year-on-year increase of 14.1%. The share of mutual transactions in the total assets of the overall financial sector rose to 32.7%, up by 1.2%p from the end of the previous year.

Looking at the proportions across financial sectors, the share of mutual transactions within the banking sector rose by 0.7%p year on year to stand at 4.7%. However, the share of mutual transactions among NBFIs recorded 59.3%, and that of mutual transactions between banks and NBFIs came to 36.0%, falling by 0.4%p and 0.3%p, respectively, from a year earlier. This is because banks increased their investment in securities such as specialized bank debentures in the process of rebalancing their portfolios.

Analyzing mutual transactions among financial institutions, the contagion risk across financial sectors declined slightly compared to the end of last year, while that within the banking sector ticked up. In the meantime, concentration risk increased slightly especially within the banking sector.

Mutual transactions among financial institutions and across sectors[1)2)]



Notes: 1) Mutual transaction amounts are on an end-period basis (flow of funds statistics).
2) Figures within parentheses are the proportion of the total amount of mutual transactions.
Source: Bank of Korea.

IV. Capital Flows

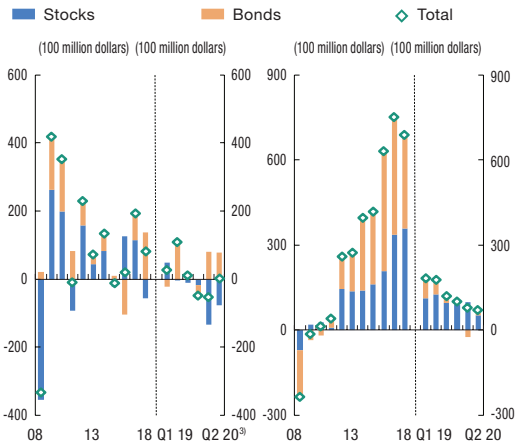
From January to May 2020, foreigners' portfolio investment recorded a net outflow of 4.9 billion dollars (stocks -20.9 billion dollars, bonds 16.0 billion dollars) due to the worsening of investor sentiment with the spread of COVID-19. Volatility appears to have eased overall since April, as funds for bond investment continued to flow in, and the extent of stock investment outflows narrowed thanks to swift policy responses in major economies and the containment of COVID-19 in Korea.

There is a possibility that capital flow volatility could expand again as there are external risk factors remaining such as the possibility of a second wave of COVID-19, an escalation of conflicts between the US and China, and the deepening of recessions in major countries.

The increase in residents' overseas portfolio investment has shrunk, centering around stocks, due to the worsening of global investor sentiment. From January to April 2020, residents' overseas portfolio investment recorded 15.0 billion dollars (stocks 15.5 billion dollars, bonds -0.5 billion dollars), down by 9.2 billion dollars compared to the same period of last year (24.2 billion dollars).

Changes in foreigners' domestic portfolio investment[1)]

Changes in residents' overseas portfolio investment[2)]



Notes: 1) A "+" means net inflow and a "-" net outflow.
2) A "+" means net investment and a "-" net withdrawal.
3) Changes in foreigners' domestic portfolio investment for Q2 2020 based on April-May; changes in residents' overseas portfolio investment based on April.

Source: Bank of Korea.

Resilience of Financial System

I. Financial Institutions

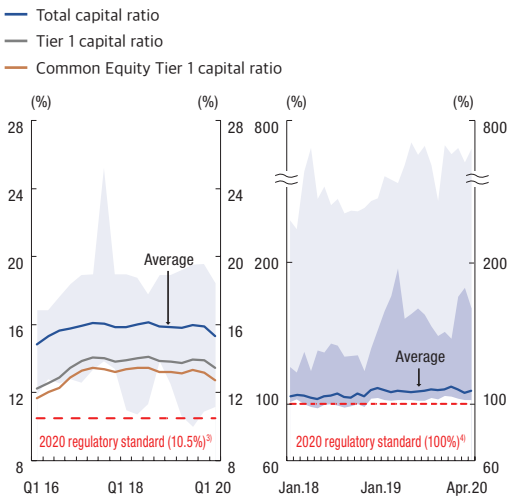
1 Commercial banks' resilience has remained sound overall. Their capital adequacy and liquidity ratios declined, but far exceeded the regulatory standards for all banks.

Commercial banks' total capital ratio under Basel III, indicative of banks' loss absorption capacities, stood at 15.33% at the end of the first quarter of 2020, down by 0.55%p compared to the end of last year. Their Tier 1 capital ratio also showed a decrease of 0.42%p compared to the year-end to stand at 12.74%. Commercial banks' liquidity coverage ratio (LCR), measuring the ability to respond to sudden net outflows of funds, stood at 109.4% at the end of April 2020, down by 1.0%p from the end of last year.

Commercial banks' capital adequacy could decline somewhat as the impacts of COVID-19 are more fully reflected in business performances, but the loss absorption capacities of the banking sector are projected to remain favorable.

Commercial bank total capital ratios[1)]

Commercial bank liquidity coverage ratios (LCRs)[1)2)]



Notes: 1) Shaded area indicates distribution of individual banks and deep shaded area indicates distributions with Internet-only banks excluded.
2) High-quality liquid assets / Total net cash outflows over next 30 calendar days.
3) 8.625% for Internet-only banks in 2020.
4) Temporarily lowered to 85% between April and September 2020.

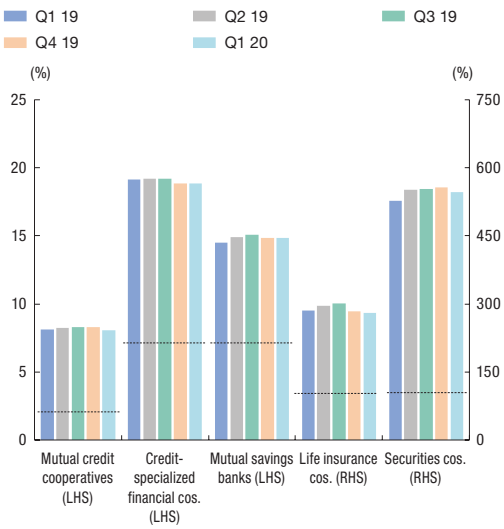
Sources: Commercial banks' business reports.

2 The resilience of NBFIs has been maintained at a satisfactory level, with their capital adequacy ratios largely exceeding the supervisory standards for most sectors.

The net capital ratio of mutual credit cooperatives declined slightly by 0.2%p from the end of last year to stand at 8.1% at the end of the first quarter of 2020. The net capital ratio of securities companies and the risk-based capital ratio of life insurance companies fell by 9.4%p and 3.4%p from the end of last year to stand at 546.5% and 281.2%, respectively. In the meantime, the adjusted capital ratio of credit-specialized financial companies and the BIS capital ratio of mutual savings banks recorded 18.8% and 14.8%, respectively, virtually unchanged from the end of last year.

There is a need to prepare for the possibility of a weakening of NBFIs' resilience, as loan delinquencies and defaults have been increasing, centering around vulnerable industries and borrowers, affected by the spread of COVID-19, along with deteriorating profitability in most sectors.

NBFI capital adequacy ratios[1)2)]



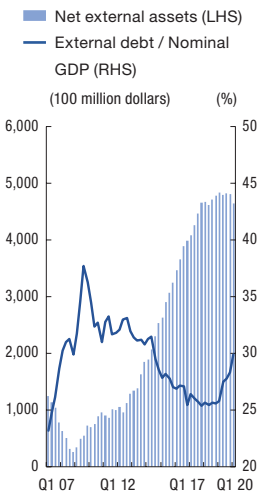
Notes: 1) Mutual credit cooperatives' net capital ratio (supervisory standard 2%; 4% for MG community credit cooperatives and 5% for NongHyup), credit-specialized financial companies' adjusted capital ratio (7%; 8% for credit card companies), mutual savings banks' BIS capital ratio (7%; 8% for banks with total assets of 1 trillion won or more), insurance companies' risk-based capital ratio (100%), securities companies' net capital ratio (100%).
2) The dotted lines show the supervisory standards.
Sources: Financial institutions' business reports.

II. External Payment Capacity

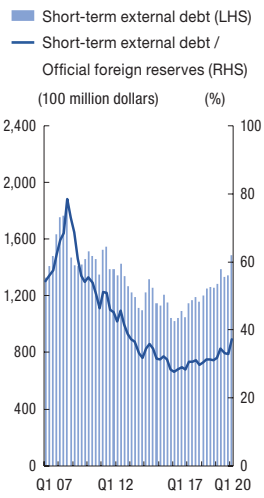
Korea's external payment capacity has remained satisfactory, even though the official foreign reserves declined as the FX authorities carried out policy responses such as market stabilization measures.

Net external assets declined and the ratio of external debt relative to nominal GDP increased slightly. The official foreign reserves fell by a large extent (-9.0 billion dollars) due to the FX authorities' market stabilization measures in response to market strains associated with the COVID-19 spread. However, they increased again in April as the Bank of Korea conducted competitive US dollar loan facility auctions using the proceeds of swap transactions with the US Federal Reserve, and as funding conditions improved in international FX markets. The ratio of short-term external debt relative to official foreign reserves increased by 5.4%p year on year to stand at 37.1% at the end of the first quarter of 2020, but it is significantly low compared to the ratios recorded during past crises.

External debt-to-nominal GDP ratio[1)]



Short-term external debt-to-official foreign reserves ratio[1)]



Note: 1) End-quarter basis.
Source: Bank of Korea.

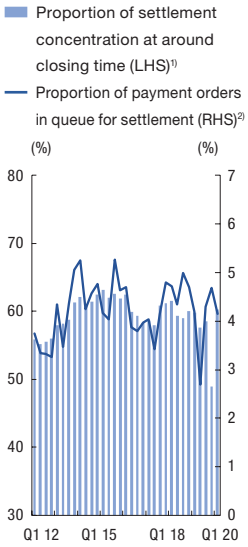
III. Financial Market Infrastructures

The major payment and settlement systems including BOK-Wire+ have been operated smoothly amid a steady increase in the amount of settlement, driven mainly by securities settlements by financial institutions and electronic funds transfers by general customers and companies. Settlement risks have been managed stably despite increased volatility in the financial markets.

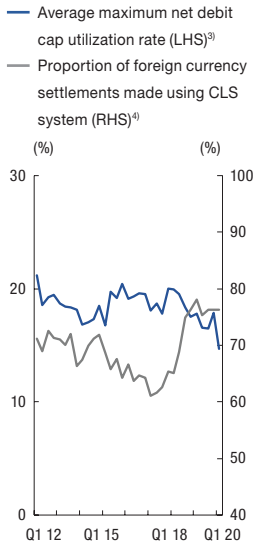
The rate of maximum intraday overdraft cap utilization and the proportion of payment orders in queue for settlement, both of which are monitored as indicators of the settlement liquidity of BOK-Wire+ participants in the nation's large-value payment system, were generally at stable levels of 24.6% and 4.2%, respectively, during the first quarter of 2020. The net debit cap utilization rates, showing settlement risks related to the retail payment systems operated by Korea Financial Telecommunications & Clearing Institute, declined. The share of those handled by the CLS payment-versus-payment system, which reduces settlement risk effectively through the settlement of foreign exchange transactions without any time lag, maintained a high level at 76.3% in the first quarter of 2020.

The Bank of Korea has strengthened its cooperative framework with operating institutions in response to the spread of COVID-19, while frequently examining the settlement risks of participating institutions. In addition, the Bank of Korea has eased the burden of collateral of participating institutions and promoted financial market stability, by lowering the ratio of collateral for guaranteeing net settlements and expanding the range of eligible collateral.

Large-value payment system



Retail payment and foreign exchange settlement systems



Notes: 1) Amount of settlement processed after 16:00 / Total settlement amount.
2) Payment orders in queue for settlement / Total settlement amount (excluding payment orders in queue for liquidity savings).
3) Average of daily maximum net debit cap utilization rates of participants during the period.
4) Proportions in total CLS eligible FX transactions of those settled through CLS system.

Source: Bank of Korea.

Financial Stability Situation by Sector

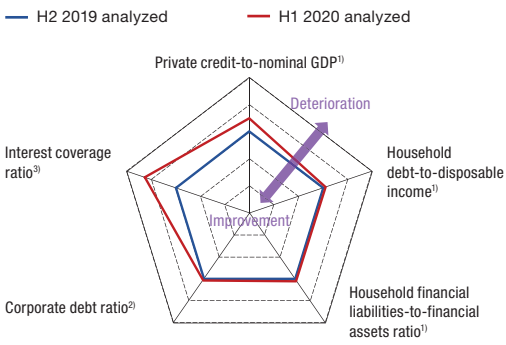
I. Credit Markets

The private credit-to-nominal GDP ratio,[1] an indicator of the level of private sector leverage, surged sharply on a massive increase in private credit due to rising loan demand from households and efforts to secure funding by corporations, amid a drop in nominal GDP growth.

Household credit increased, centering on home mortgage loans, but the rate of increase remained below previous years' levels. However, as debt growth outpaced income growth, households' debt service burden rose further.

Corporate credit growth accelerated due to increased funding demand amid the COVID-19 pandemic, resulting in a sharp rise in loans, with corporate bonds and CP recording net issuance. This situation took a toll on the financial soundness of corporations, whose debt ratios edged up while their profitability and interest payment capacity weakened (Figure Ⅰ-1).

Figure Ⅰ-1. Map of changes in credit market conditions



Notes: 1) Extents of change as of end-Q1 2020 compared to end-Q3 2019 indexed.
2) Extents of change as of end-2019 compared to end-June 2019 indexed.
3) Extents of change as of 2019 compared to July 2018-June 2019 period indexed.
Source: Bank of Korea.

1. Credit Leverage

Continuous rise in private credit-to-nominal GDP ratio

At the end of the first quarter of 2020, the private credit[2]-to-nominal GDP ratio stood at 201.1% (estimated),[3] up by 12.3%p on a year-on-year basis. This is due to accelerated growth in private credit fueled by increased demand for funding from households and corporations

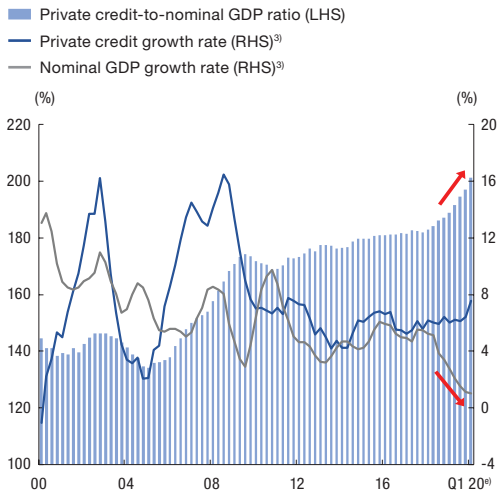
1) The level of private sector leverage is estimated using a variety of financial and real economic indicators such as the rate of increase in private credit by sector, the debt service burdens of households and corporations, housing prices, and bank leverage. In this report, the discussion is based mainly on the private credit-to-nominal GDP ratio, a primary indicator recommended by the Basel Committee on Banking Supervision ("BCBS" hereafter, 2010) as the common reference guide.

2) BCBS (2010) broadly defines "private credit" as "all types of debt funds provided to households and non-financial corporations." Based on this definition, in this report, the sum of household debt (loans, government loans) and corporate debt (loans, bonds, government loans) as reported in the flow of funds statistics was used as the indicator of private credit.

3) Household credit and corporate credit based on the first quarter of 2020 flow of funds statistics were estimated through a linear regression model, using the rate of household credit growth (household credit statistics basis) and the rate of corporate sector credit growth by deposit-taking institution, respectively, as the explanatory variables.

alike, at a time when the slowing economy is causing continued deceleration of nominal GDP[4] growth. In the first quarter of 2020, while the rate of private credit growth (year-on-year basis) reached 7.6%, up by 1.2%p from the end of the previous year (6.4%), the rate of nominal GDP growth (year-on-year basis) declined to 1.0%, down by 0.1%p from the end of the previous year (1.1%) (Figure Ⅰ-2).

Figure Ⅰ-2. Private credit[1]-to-nominal GDP[2] ratio



Notes: 1) Estimated figures for Q1 2020.
2) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters.
3) Year-on-year basis.
Source: Bank of Korea.

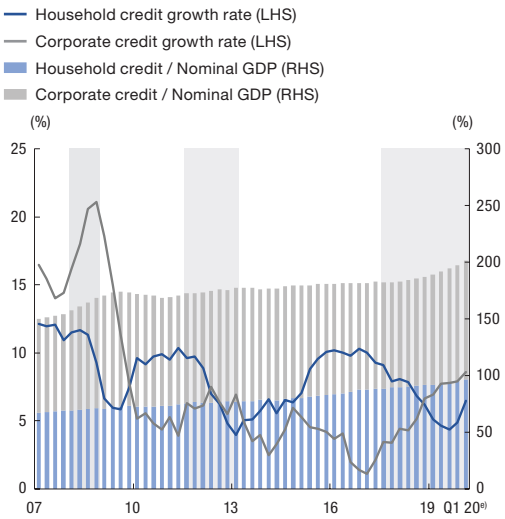
Corporate credit growth outpaces household credit growth

By sector, both household credit growth and corporate credit growth accelerated. The household credit-to-nominal GDP ratio rose to 96.8% at the end of the first quarter of 2020, up by 1.6%p from the end of the previous year (95.2%), and the corporate credit-to-nominal GDP ratio rose to 104.3%, up by 2.5%p from the end of the previous year (101.8%).

The rate of household credit growth (year-on-year basis) at the end of the first quarter of 2020, which had rebounded starting in the fourth quarter of 2019, increased to 6.5% due to greater demand for funding related to home purchase transactions or leasehold deposits. The rate of corporate credit growth also accelerated to 8.6% as corporations moved to secure liquidity in response to the economic slowdown (Figure Ⅰ-3).

4) The sum of nominal GDP in the quarter concerned and the nominal GDP in the immediately preceding three quarters, which is distinct from quarterly nominal GDP in the context of national income statistics.

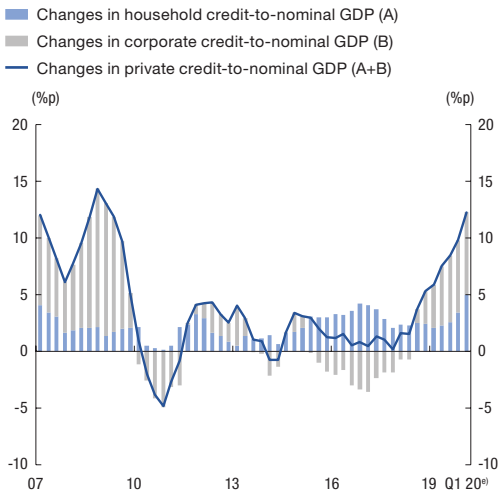
Figure Ⅰ-3. Credit growth rates and credit-to-nominal GDP ratios,[1)2)] by sector



Notes: 1) Estimated figures for Q1 2020; growth rate is year-on-year basis.
2) Shaded area indicates contraction period of Composite Index of Business Indicators.

Source: Bank of Korea.

Figure Ⅰ-4. Contributions[1)] to changes in private credit[2)]-to-nominal GDP[3)] ratios



Notes: 1) Year-on-year changes.
2) Estimated figures for Q1 2020.
3) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters.

Source: Bank of Korea.

The breakdown of the relative contributions of household and corporate credit to the private credit-to-nominal GDP ratio[5)] shows that the increase in private sector leverage is led by corporate credit, which has been quickly rising since the second quarter of 2018.[6)] Of the 12.3%p increase (year-on-year basis) in the private credit-to-nominal GDP ratio registered at the end of the first quarter of 2020, household credit and corporate credit contributed 5.0%p and 7.3%p, respectively (Figure Ⅰ-4).

Amid the significant slowdown in nominal GDP growth from the economic downturn caused by the COVID-19 pandemic, private credit is expanding at a robust pace, driven by corporate credit, and thus the private credit-to-nominal GDP ratio is likely to continue its upward trend for the foreseeable future.

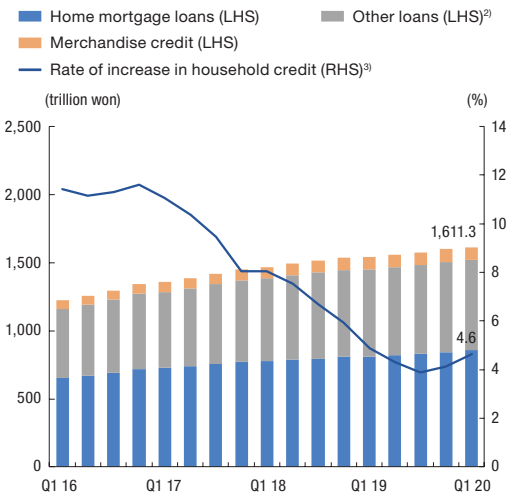
5) The respective contributions of household and corporate credit to the private credit-to-nominal GDP ratio were calculated in consideration only of private credit, the numerator of the ratio, and without taking account of the change in nominal GDP, the denominator.

6) The rate of corporate credit growth (year on year) has continuously increased from 4.3% in the second quarter of 2018 to 8.6% in the first quarter of 2020. During the same period, the private credit-to-nominal GDP ratio jumped by 17.0%p, from 184.1% to 201.1%, of which 10.5%p was accounted for by corporate credit.

2. Household Credit

The growth in household debt has accelerated somewhat since the fourth quarter of 2019, but the rate of growth is still below previous years' levels. However, as debt growth continuously outpaces income growth, households' debt service burden appears to have further increased. The delinquency rate on household loans, although still quite low overall, has shown an uptick among some non-bank financial institutions. Attention must be paid to the possibility of an additional rise in delinquency rates going forward, as the debt service burden of small self-employed businesses and temporary workers particularly heavily impacted by the economic slowdown triggered by the COVID-19 pandemic, may increase.

Figure Ⅰ-5. Household credit[1)]



Notes: 1) Household credit statistics basis.
2) Secured loans not collateralized by housing, unsecured loans, guaranteed loans, etc.
3) Year-on-year basis.
Source: Bank of Korea.

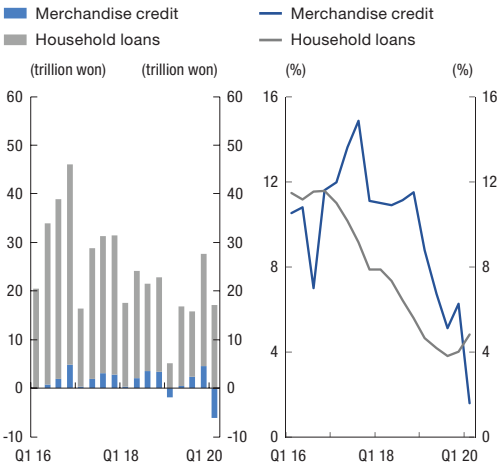
Slight Acceleration in the Rate of Household Credit Growth

At the end of the first quarter of 2020, total household debt (household credit statistics basis) stood at 1,611.3 trillion won, reflecting growth of 4.6%, a slightly higher rate of year-on-year increase than in previous periods. However, this rate is still significantly below the corresponding rates in previous years (7.7% on average in 2010-2019) (Figure Ⅰ-5).

By type of household credit, during the first quarter of 2020, household loans rose by 4.8% on a year-on-year basis,[7)] while merchandise credit rose only by 1.6%. The increase in merchandise credit slowed sharply (6.3% in the fourth quarter of 2019 → 1.6% in the first quarter of 2020), which appears to be mainly due to a drop in private consumption amid the COVID-19 pandemic (Figure Ⅰ-6).

7) According to monthly estimates of household loans (published in June 2020 by the Financial Supervisory Service, distinct from household credit statistics in standards and scope), household loans increased in April and May by 3.0 trillion and 3.6 trillion won, respectively, growing much more slowly than in March (+9.1 trillion won compared to the previous month).

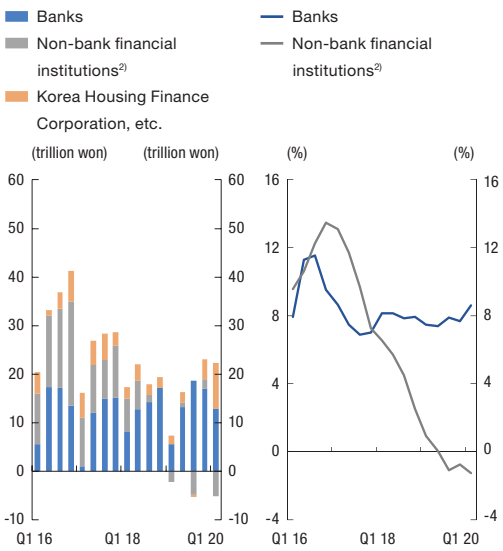
Figure Ⅰ-6. Household credit,[1] by category



Note: 1) Household credit statistics basis.
Source: Bank of Korea.

By type of financial institution, banks' household loan balance reached 780.6 trillion won at the end of the first quarter of 2020, recording a higher year-on-year increase of 8.6%.[8] This is mainly explained by greater demand for funding related to housing purchases and leasehold deposits transactions. On the other hand, non-bank financial institutions' household loan balance dropped 1.3% year on year to 572.5 trillion won, continuing the downward trend begun in the third quarter of 2019 (-1.1%). This is primarily due to the refinancing[9] of some non-bank home mortgage loans into fixed rate government loans for low- to moderate-income borrowers, amid sustained efforts to strengthen risk management on household loans, particularly on the part of mutual credit cooperatives (Figure Ⅰ-7).

Figure Ⅰ-7. Household loans,[1] by financial sector



Notes: 1) Household credit statistics basis.
2) Non-bank deposit-taking institutions and others (excluding Korea Housing Finance Corporation, etc.).
Source: Bank of Korea.

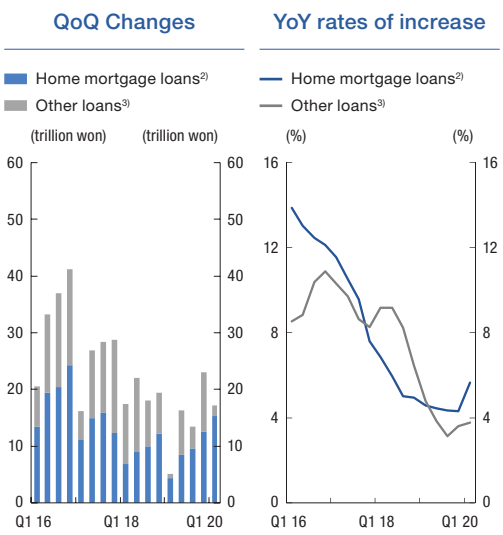
By type of loan, the rate of increase accelerated for home mortgage loans, which stood at 858.2 trillion won at the end of the first quarter of 2020, up 5.7% on a year-on-year basis. This is due to the spike in the volume of housing purchases and leasehold deposits transactions seen since the fourth quarter of 2020,[10] centered on the Seoul Metropolitan

8) However, the rate of increase in household loans appears to have slowed from April onward. According to monthly estimates of household loans (published in June 2020 by the Financial Supervisory Service, distinct from household credit statistics in standards and scope), banks' household loans (including government-subsidized mortgage loans) increased in April and May by 4.9 trillion and 5.0 trillion won from the previous month, respectively, well below the corresponding amount in March (+9.6 trillion won).

9) Using this government-subsidized mortgage loan product for refinancing floating-rate home mortgage loans (including semi-fixed rate loans) into fixed rate loans, approximately 3.2 trillion worth of non-bank financial institution loans were converted into bank loans (including Korea Housing Finance Corporation loans) during the first quarter of 2020 (source: Financial Supervisory Service).

area, which resulted in increased loan demand. Other loans amounted to 663.5 trillion won, up 3.8% year on year, continuing the comparatively low upward trend within the range of 3% begun in the second quarter of 2019 (Figure Ⅰ-8).

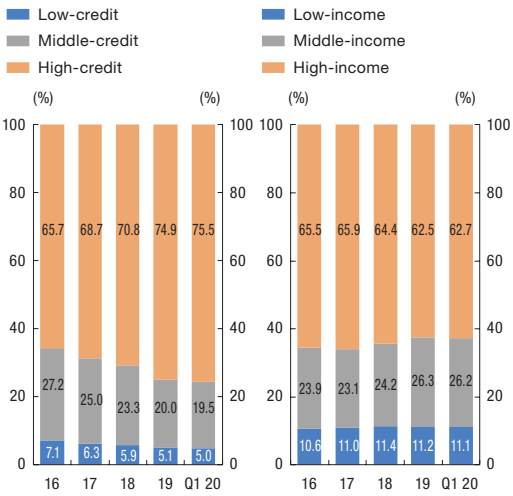
Figure Ⅰ-8. Household loans,[1] by loan type



Notes: 1) Household credit statistics basis.
2) Home mortgage loans (of depository institutions, insurance companies and credit-specialized financial companies), loans extended by Korea Housing Finance Corporation and National Housing and Urban Fund, etc.
3) Secured loans not collateralized by housing, unsecured loans, guaranteed loans, etc.
Source: Bank of Korea

By type of borrower, loans to high-income or high-credit rating borrowers accounted for over 60-70% of all loans. At the end of the first quarter of 2020, the share of high-credit borrowers stood at 75.5%, up 0.6%p from the end of the previous year, and the share of high-income borrowers at 62.7%, up 0.2%p from the end of the previous year (Figure Ⅰ-9).

Figure Ⅰ-9. Shares[1] in household loans, by borrowers' credit rating and income level



Notes: 1) Loan amount basis.
2) High-credit (grades 1-3), middle-credit (grades 4-6), low-credit (grades 7-10).
3) High-income (top 30%), middle-income (30-70%), low-income (bottom 30%).
Source: Bank of Korea (Consumer Credit Panel).

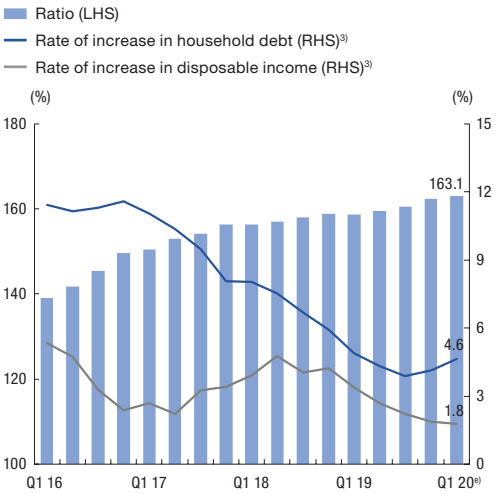
Increase in household debt service burdens

At the end of the first quarter of 2020, the household debt-to-disposable income ratio (household credit statistics basis) amounted to 163.1% (estimated), which represents a 4.5%p increase over the same period of the previous year (158.6%), suggesting that households' debt service burden has increased. This is because although household debt grew moderately, income growth continued to slow (Figure Ⅰ-10). Meanwhile, the ratio of financial liabilities-to-financial assets (flow of funds statistics basis) stood at 47.7% (estimated) at the end of the first quarter of 2020, representing a year-

10) According to the Ministry of Land, Infrastructure and Transport, the volume of housing sales transactions in the Seoul Metropolitan area between the fourth quarter of 2019 and the first quarter of 2020 amounted to 340,000 units, representing a 63.8% increase over the average sales volume (208,000 units) in the past two years.

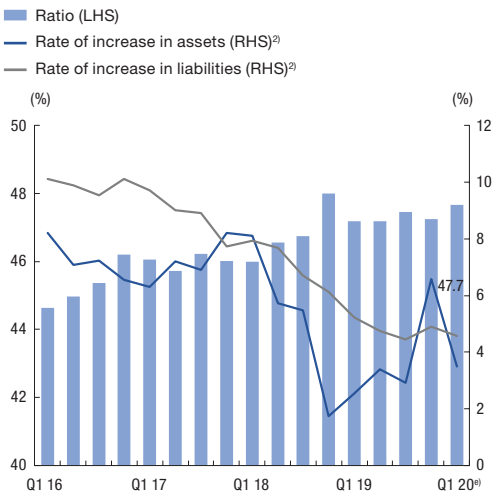
on-year increase of 0.5%p (Figure Ⅰ-11).

Figure Ⅰ-10. Household debt[1]-to-disposable income[2] ratio



Notes: 1) Household credit statistics basis.
2) Disposable income for Q1 2020 is estimated using the average of the household disposable income-to-gross national income ratios for the immediately preceding three years.
3) Year-on-year basis.
Source: Bank of Korea.

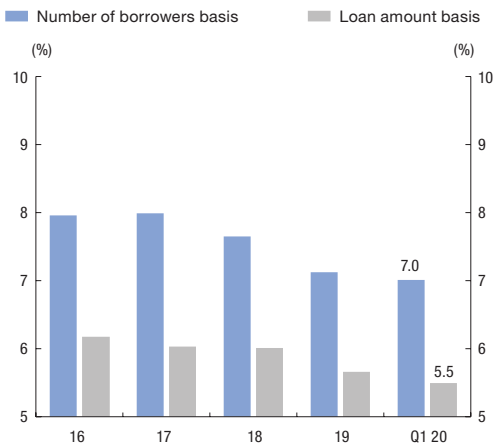
Figure Ⅰ-11. Financial liabilities-to-financial assets ratio[1]



Notes: 1) Flow of funds statistics basis (estimated figures for Q1 2020).
2) Year-on-year basis.
Source: Bank of Korea.

The share of borrowers with a comparatively low debt repayment capacity fell. At the end of the first quarter of 2020, the share of vulnerable borrowers with low income (bottom 30%) or low credit ratings (grades 7-10), who furthermore have multiple household loans, dropped to 7.0% from 7.1% at the end of the previous year, continuing the downward trend from earlier periods. Their share of the total amount of household loans also dropped from the end of the previous year (5.7%, 85.2 trillion won) to 5.5% (83.7 trillion won). The steady decline in the share of vulnerable borrowers seems to have been influenced by the assistance the government and the financial authorities provided to borrowers with low repayment capacity, amid continued risk management efforts by financial institutions.[11] (Figure Ⅰ-12).

Figure Ⅰ-12. Proportions of vulnerable borrowers

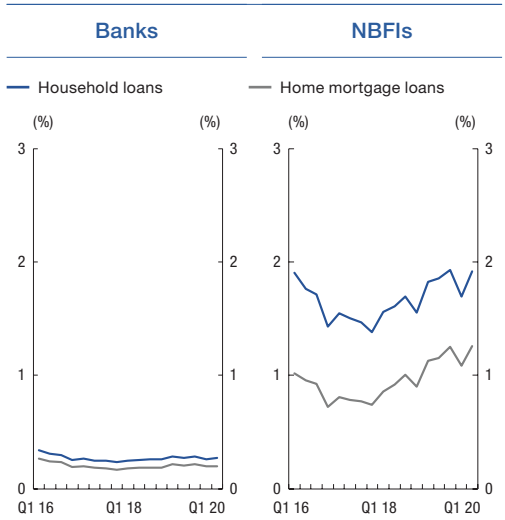


Source: Bank of Korea (Consumer Credit Panel).

Household loan delinquency rates, still mostly low, showed an uptick in some non-bank financial institutions. The delinquency rate on banks' household loans remained at a low level, standing at 0.27% at the end of the first

quarter of 2020, down 0.02%p from a year earlier. The delinquency rate on household loans by non-bank financial institutions ("NBFIs" hereafter) stood at 1.92%, which, although below its long-term average (2.71% on average in 2010-2019), represents a year-on-year increase of 0.09%p, continuing the slow upward trend begun in 2018 (Figure Ⅰ-13). Despite various efforts by the government aimed at easing the debt burden of individual borrowers,[12] it is likely that households' debt repayment capacity will deteriorate should the deterioration in employment conditions and business conditions for the self-employed, triggered by the COVID-19 pandemic, continue for a prolonged period of time.[13]

Figure Ⅰ-13. Delinquency rates[1] of household loans extended by banks and NBFIs[2][3]



Notes: 1) Based on delinquencies of one month and longer (one day and longer for mutual credit cooperatives and mutual savings banks).
2) Mutual savings banks, mutual credit cooperatives, insurance companies, credit-specialized financial companies, etc.
3) Excluding insurance contract loans for insurance companies, and including card (excluding merchandise credit), installment and lease assets for credit-specialized financial companies.

Sources: Financial institutions' business reports.

11) Including the 「Best Practice Guidelines for the Promotion of the Household Loan Free Workout Program」 (February 2018) by the banking industry and 「Measures for Improving the Credit Counseling System for Individual Debtors」 (February 2019) by the Credit Counseling and Recovery Service.

12) The government unveiled the following: (i) 「COVID-19 Measures for Increasing Support for the Credit Rehabilitation of Vulnerable Individual Borrowers」 (April 8, 2020), whose highlights include a grace period on principal repayment (6-12 months) and debt adjustments for borrowers with multiple loans, and (ii) 「Measures for Job Creation and Business Stabilization to Overcome the Unemployment Crisis」 (April 22, 2020), consisting of job protection measures for those that are in employment and financial assistance for workers not covered by unemployment insurance.

13) For further details, refer to <Analysis of Financial Stability Issues> 「III. Assessment of Household Default Risk under Economic Shock」 (page 134).

3. Corporate Credit

The increase in corporate credit accelerated as corporations coped with a deteriorating business environment amid the COVID-19 pandemic, resulting in a massive surge in corporate loans, with corporate bonds and CP recording net issuance. Corporate financial soundness also worsen due to declining earnings. If the current economic downturn continues in Korea and globally for a prolonged period of time, this could lead to liquidity shortages or a rise in credit risk centering on vulnerable industries.

Corporate credit growth accelerates

Corporate loans by financial institutions increased at an accelerated pace to increase by 11.6% year on year to 1,229.2 trillion won at the end of the first quarter of 2020. Amid corporations ongoing efforts for fundraising, corporate loans are likely to continue to increase for the foreseeable future.[14)]

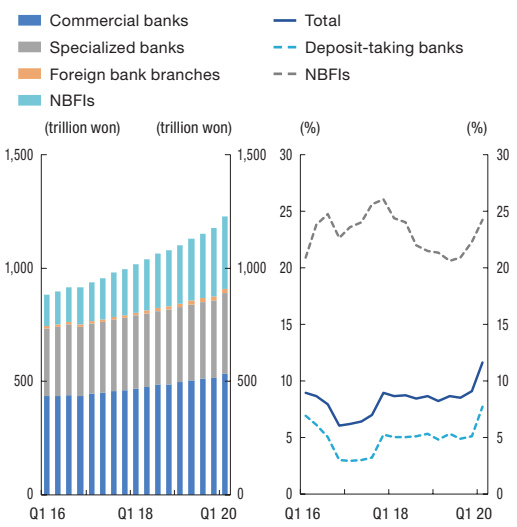
By financial sector, there was an upsurge in corporate loans both by deposit-taking banks and non-bank financial institutions ("NBFIs" hereafter). Corporate loans by deposit-taking banks increased 7.7% year on year (commercial banks 7.2%, specialized banks 7.8%) to 907.5 trillion won (commercial banks 532.5 trillion won, specialized banks 356.6 trillion won) at the end of the first quarter of 2020. Corporate loans by NBFIs[15)] registered a whopping year-on-year increase of 24.2% to reach 321.7 trillion won,[16)] much of which was centered on mutual credit cooperatives (Figure Ⅰ-14).

14) Banks' corporate loans (advance estimate basis) continued to exhibit a high rate of growth (11.2% year on year as of the end of May), increasing 27.9 trillion dollars in April and 16.0 trillion won in May.

15) The NBFI data are based on mutual savings banks, mutual credit cooperatives (Nonghyup, Suhyup, forestry cooperatives, Sinhyup and MG community credit cooperatives), insurance companies (life insurance companies and general insurance companies), and credit-specialized financial companies (credit card companies and installment finance companies). However, due to limited data, the analysis of some of the sectors included financial insurance companies.

16) By sector, corporate loans by NBFIs broke down to 163.6 trillion won by mutual credit cooperatives (50.9% of all corporate loans by NBFIs), 79.9 trillion won by insurance companies (24.8%), 45.6 trillion won by credit-specialized financial companies (14.2%) and 32.6 trillion won by mutual savings banks (10.1%). Corporate loans by mutual credit cooperatives recorded a massive year-on-year increase of 45.0% as amid the rising loan demand from the corporate sector, these institutions tried to compensate for the restrictive effects of stricter household loan regulations by increasing lending to corporations. This is a potentially worrisome trend, especially since the corporate loan delinquency rate among mutual credit cooperatives has recently spiked (2.5% at the end of the first quarter of 2019 → 3.2% at the end of the first quarter of 2020).

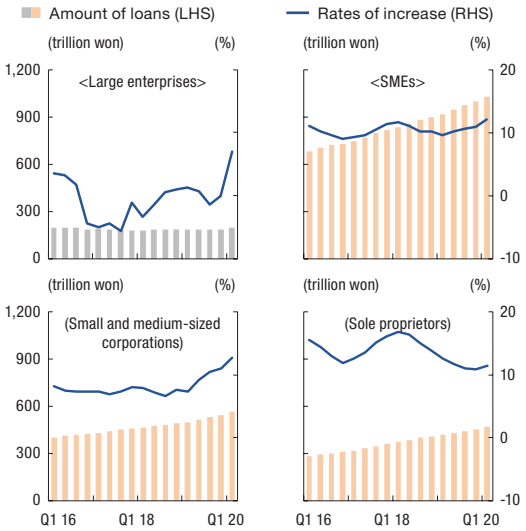
Figure Ⅰ-14. Corporate loans of financial institutions[1)]



Notes: 1) Deposit-taking banks include commercial banks, specialized banks and foreign bank branches; NBFIs include mutual savings banks, mutual credit cooperatives, insurance companies, and credit-specialized financial companies.
2) End-period basis; excluding financial and insurance companies.
3) Year-on-year basis.
Sources: Financial institutions' business reports.

By company size,[17)] corporate loans showed an increase for both large enterprises and small and medium-sized enterprises ("SMEs" hereafter). Loans to large enterprises (195.6 trillion won, 7.0% year-on-year increase), after dropping during the second half of 2019, re-embarked on an upward path in the first quarter of this year, as corporations tried to boost their liquidity position in anticipation of a tightening of credit conditions. In the case of SME loans (1,031.9 trillion won, 12.2%), loans to SMEs (565.4 trillion won, 12.8%) surged, lifted by increased demand for working capital. Loans to sole proprietors (466.5 trillion won, 11.4%) also continued a rather sharp upward trend (Figure Ⅰ-15).

Figure Ⅰ-15. Corporate loans,[1)2)] by company size

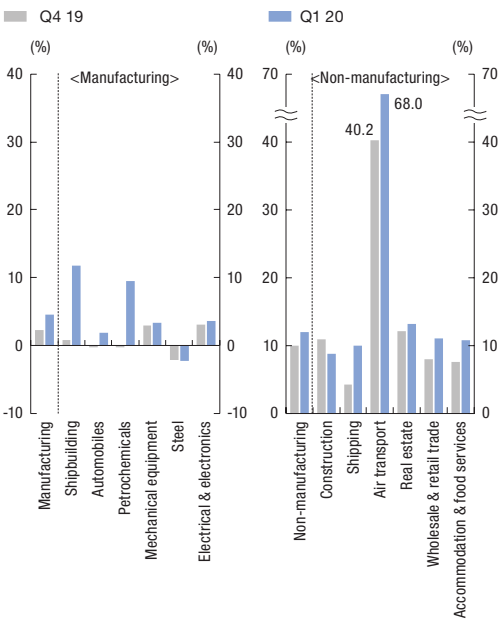


Notes: 1) Based on sum of banks and NBFIs.
2) End-period basis (excluding financial and insurance companies); rates of increase are year-on-year basis.
Sources: Financial institutions' business reports.

By industry,[18)] while loans increased in most sectors, particularly large increases were recorded in shipbuilding, air transport, and petrochemicals, among others. The heightened loan demand from these industries appears to be due to a liquidity shortage either as a result of a prolonged slump or a sharp drop in sales amid the COVID-19 pandemic (Figure Ⅰ-16).

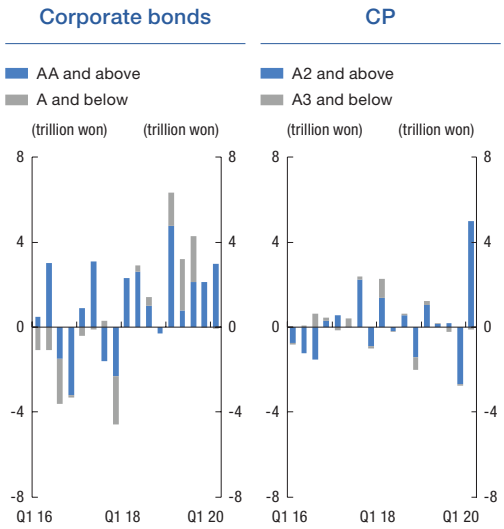
17) Due to data limitations, the analysis of corporate loans by company size excluded insurance policy loans by insurance companies that could not be classified by company size.
18) The analysis excluded corporate loans by some types of institutions (mutual savings banks, credit-specialized financial companies) as the data were not classified by industry.

Figure Ⅰ-16. Growth rates[1] of financial institutions' corporate loans, by industry



Note: 1) Year-on-year basis.
Sources: Financial institutions' business reports.

Figure Ⅰ-17. Corporate bonds and commercial paper (CP) issuance[1]



Note: 1) Excluding issuance by financial holding companies and special purpose companies (SPCs); net-issuance basis.
Sources: Bank of Korea, Korea Securities Depository, Korea Credit Information Services.

Corporate bond and CP recorded net issuance due to corporations' efforts to enhance their liquidity positions. However, growing credit vigilance caused funding rates to rise,[19] and subprime bonds recorded net redemption due to the difficulty of refunding maturing bonds (Figure Ⅰ-17).

Rising corporate debt ratios

Corporate[20] debt ratios (debt / equity capital), which had steadily declined since 2017, freshly embarked on an upward trend, with the overall debt ratio rising by 3.2%p to 78.5% at the end of 2019 from the end of the previous year (75.3%).[21] By company size, while the debt ratio of SMEs dropped (56.2% in 2018 → 54.6% in 2019), that of large enterprises registered an uptick (76.3% → 79.8%). The share of firms with a debt ratio above 200% (excessively indebted firms) also rose to 12.6% from the

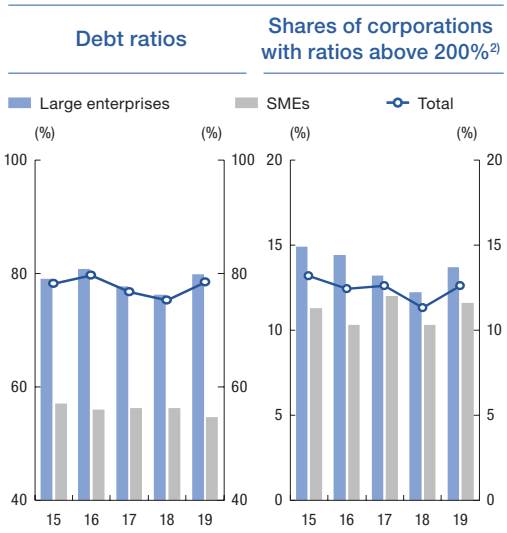
19) After the outbreak of COVID-19, credit spreads (based on 3-yr Corporate bond (A-) yield - 3-yr Treasury bond yield) widened in the corporate bond market, from 133bp at the end of January 2020 to 153bp (+20bp) at the end of March 2020. In the money market, the CP rate rose from 1.69% to 2.20% (+0.51%p).

20) Hereafter based on 2,185 firms, including listed companies required to file a business report pursuant to the Financial Investment Services and Capital Markets Act and some unlisted companies (excluding financial and insurance industries). Note that the analytical sample is different from the sample of companies used in the Financial Statement Analysis, resulting in differences in debt ratios and other financial soundness indicators.

21) The change to lease accounting standards introduced in 2019, whereby operation of funds is recognized as assets and debt, was also a contributing factor to the rise of corporate debt ratios.

end of the previous year (11.3%). By company size, the share of excessively indebted firms increased for both large enterprises (12.2% → 13.7%) and SMEs (10.3% → 11.6%), compared to the end of the previous year (Figure Ⅰ-18).

Figure Ⅰ-18. Corporate debt ratios,[1] by company size

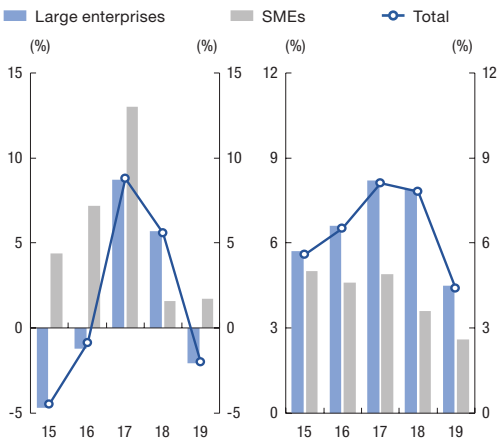


Notes: 1) Debt / Equity; end-period basis.
2) Including corporations with negative net worths.
Source: KIS-Value.

Stagnant growth and declining profitability

In 2019, corporate growth and profitability were negatively affected by the slowing growth in major countries and persistent trade uncertainties. In 2020, this situation is expected to only worsen as the COVID-19 pandemic upends the global economy. In 2019, sales growth (year-on-year), a measure of corporations' growth, moved into negative territory to record -2.0% (5.6% in 2018), as major export industries were hit by a drop in overseas demand.[22] By company size, sales growth showed a slight acceleration among SMEs compared to the previous year (1.6% in 2018 → 1.7% in 2019) but sharply slowed among large enterprises (5.7% → -2.1%). The operating income-to-sales ratio (operating income / sales), an indicator of profitability, plunged to 4.4% in 2019 from 7.8% a year earlier. By company size, the drop in the operating income-to-sales ratio was much more significant among large enterprises (7.9% in 2018 → 4.5% in 2019) than among SMEs (3.6% → 2.6%) (Figure Ⅰ-19).

Figure Ⅰ-19. Sales growth rates[1] and operating income-to-sales ratios,[2] by company size



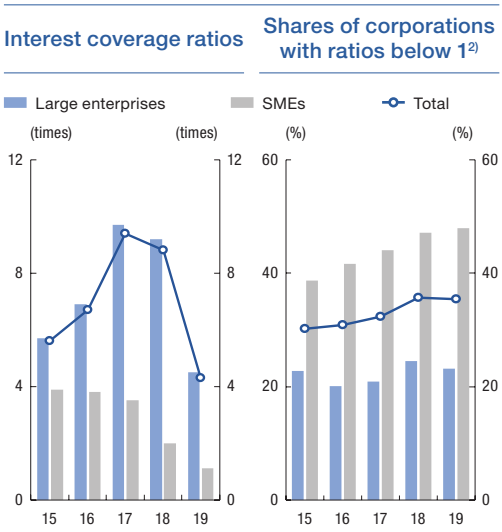
Notes: 1) Year-on-year basis.
2) Operating income / Sales.
Source: KIS-Value.

22) When the overall rate of decrease in sales (-2.0%) is broken down by industry, the contributions of major export industries, electrical & electronics (-1.9%p) and petrochemicals (-1.0%), were the highest. During 2019, Korea's total exports recorded a year-on-year decrease of 10.4%. Exports in electrical & electronics and petrochemicals fell by 18.5% and 10.1% due to the slump in semiconductors and falling unit prices, respectively.

Weakened interest payment capacity

The interest coverage ratio (operating income / interest expenses), measuring a company's interest payment capacity, took a dive from the previous year's level (8.8 in 2018 → 4.3 in 2019). By company size, the ratio was halved for both large enterprises (9.2 → 4.5) and SMEs (2.0 → 1.1). In 2019, the share of firms with an interest coverage ratio below 1 was 35.4%, mostly unchanged from the previous year (35.7%) (Figure Ⅰ-20).

Figure Ⅰ-20. Corporate interest coverage ratios,[1] by company size



Notes: 1) Operating income / Interest expenses.
2) Including corporations recording operating losses.
Source: KIS-Value.

The rapid deterioration in corporate performance caused by the COVID-19 pandemic that started early this year is likely to take a major toll on corporations' financial soundness. Although the massive increase in corporate loans suggests that funding conditions in the corporate sector remain favorable, if the economic fallout of the COVID-19 pandemic continues for an extended period of time, this could lead to liquidity problems in vulnerable industries and companies.[23]

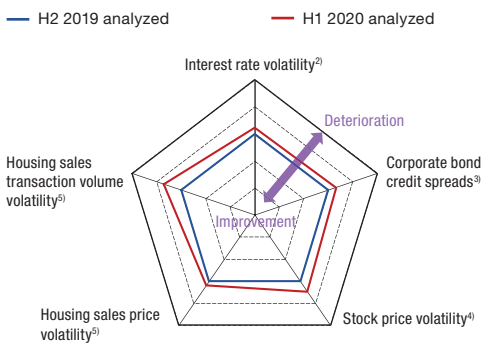
23) For further details, refer to <Analysis of Financial Stability Issues> 「II. The Effect of the Covid-19 Shock on Corporate Financial Soundness」 (page 124).

II. Asset Markets

Concerns about a global economic slowdown triggered by the worldwide spread of COVID-19 caused Treasury bond yields to sharply decline. Credit spreads on corporate bonds widened substantially in mid-March, but further widening was contained thanks in large part to the financial market stabilization measures by the government and the Bank of Korea.[1] The surge of COVID-19 cases worldwide pushed stocks sharply lower between February and mid-March. Prices quickly recovered, however, helped by aggressive policy responses in Korea and other major countries, and on expectations of the normalization of global economic activity.

While the growth in housing sales prices has slowed, affected by the influence of tightened government regulations and deteriorating real economic conditions, upward pressure on prices appears to be building again more recently. While prices in Seoul showed slowdown, those of the surrounding areas of Seoul continued their upward trend (Figure Ⅱ-1).

Figure Ⅱ-1. Map of changes in asset market conditions[1]



Notes: 1) Extents of change in December 2019-May 2020 period (December 2019-April 2020 period for housing sales volume) compared to June-November 2019 period indexed.
2) Daily volatility of Treasury bond yield (3-yr) calculated using exponential weighted moving average (EWMA) method.
3) Corporate bond yield (A-) - Treasury bond yield (3-yr), with its extent of change as of end-May 2020 compared to end-November 2019 indexed.
4) V-KOSPI 200 basis.
5) Indexed monthly volatility of housing sales price index and housing sales transaction volume.

Source: Bank of Korea.

1. Bond Markets

Decline in long-term market interest rates

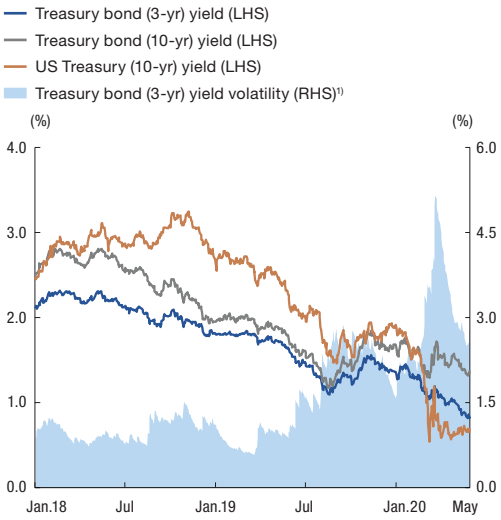
Treasury bond yields had fluctuated within a narrow range since December last year but then sharply declined starting in February on worries about a surge in COVID-19 cases. In March, as moves to secure liquidity became more pronounced in the international financial markets, Treasury bond yields quickly

1) Following the outbreak of the COVID-19 pandemic, the Bank of Korea extended the range of eligible collateral securities for lending to banks (March 12), conducted outright purchases of Treasury bonds (March 20, April 10) and introduced an RP purchase facility under which an unlimited amount of liquidity is provided (March 26), while also broadening the range of securities and institutions eligible for open market operations (April 1). The government eased call market regulations (March 24, the same hereafter) and introduced a bond market stabilization fund and COVID-19 P-CBO.

climbed with anxiety spiking in the money maret. Starting in late March, as market anxiety gradually dissipated in reaction to various measures to stabilize financial markets undertaken by the government and the Bank of Korea, Treasury yields dipped again on concerns about domestic and global economic slowdowns[2] and the resurfacing of US-China conflicts. With the additional cut in the Base Rate in May, Treasury (3-year) yields hit a new historic low at the end of the month.

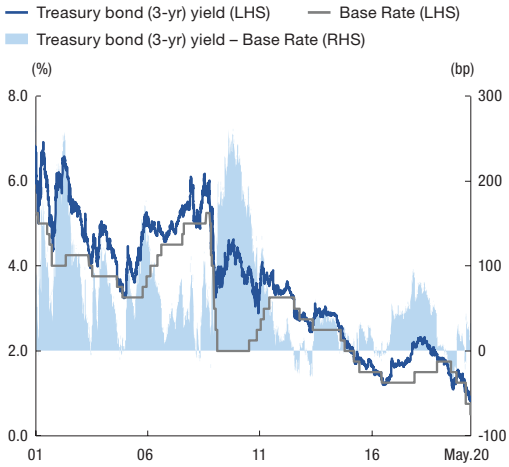
The anxiety sweeping across domestic and international financial markets also caused interest rate volatility to increase sharply in mid-March; however, it quickly decreased afterward under the influence of market stabilization measures (Figure Ⅱ-2, Figure Ⅱ-3).

Figure Ⅱ-2. Korean and US Treasury bond yields



Note: 1) Daily volatility calculated using exponential weighted moving average (EWMA) method.
Sources: Korea Financial Investment Association, Bloomberg.

Figure Ⅱ-3. Base Rate and Treasury bond yield



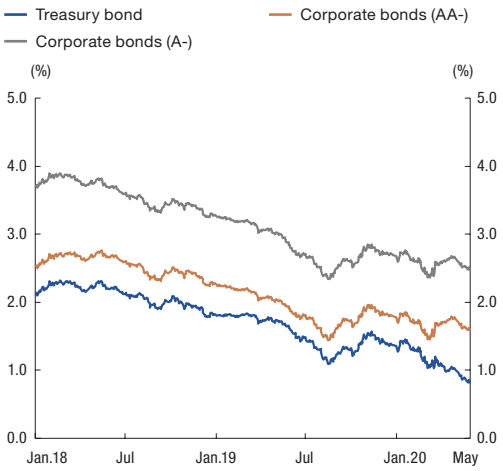
Sources: Bank of Korea, Korea Financial Investment Association.

Rapid widening of credit spreads on corporate bonds

Corporate bond yields had moved in a similar trajectory to Treasury bond yields until they were pushed higher in mid-March by deteriorating earnings caused by the spread of COVID-19 and worries about potential credit downgrades (Figure Ⅱ-4).

2) The Bank of Korea has forecast (May 28) that the Korean economy will record negative growth in 2020 (-0.2%; February forecast: 2.1%) as COVID-19 takes a toll.

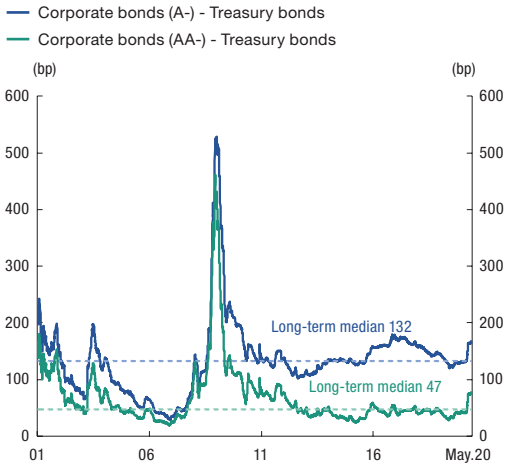
Figure Ⅱ-4. Corporate bond and Treasury bond yields[1)]



Note: 1) 3-year maturity basis.
Source: Korea Financial Investment Association.

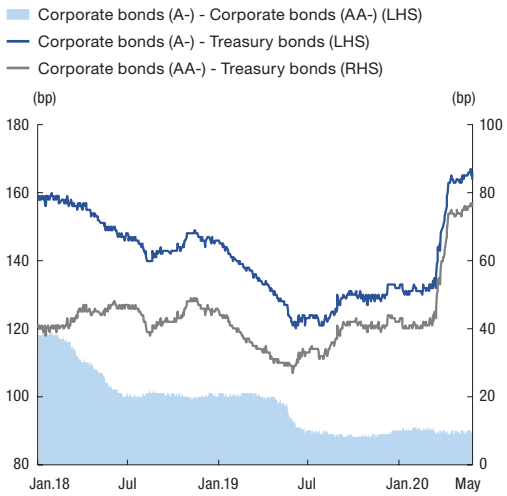
As a result, credit spreads on corporate bonds also widened sharply starting in mid-March. However, since mid-April, with market anxiety quelled by the stabilization measures by the government and the Bank of Korea, credit spreads have remained at the level of 75bp for prime bonds (AA-) and 165bp for subprime bonds (A-). These spreads are however still well above their long-term median values (January 2001-May 2020 basis) (Figure Ⅱ-5). On the other hand, the spread between credit ratings (A- and AA- basis) remains unchanged from the end of last year, even after the outbreak of COVID-19 (Figure Ⅱ-6).

Figure Ⅱ-5. Corporate bond credit spreads[1)2)]



Notes: 1) 3-year maturity basis.
2) Long-term median in January 2001-May 2020 period.
Source: Korea Financial Investment Association.

Figure Ⅱ-6. Corporate bond credit spreads,[1)] and spread across credit ratings

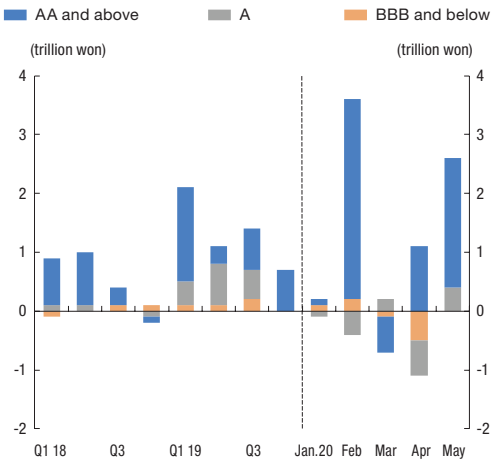


Note: 1) 3-year maturity basis.
Source: Korea Financial Investment Association.

Conditions in the corporate bond primary market had been continuously favorable since the fourth quarter of 2019 until March 2020 when a spike in market vigilance against credit risks caused the book-building participation rate to drop[3)] and the value of issuance to

sharply decrease, centered on subprime rated bonds (A and below). In May, the market's vigilance against credit risks was eased somewhat thanks to the various measures undertaken to stabilize corporate bonds,[4] leading to net issuance mainly in prime bonds (Figure Ⅱ-7).

Figure Ⅱ-7. Net corporate bond[1] issuances[2]



Notes: 1) Public offer basis; excluding issuance by financial companies.
2) Monthly average basis.
Sources: Bank of Korea, Korea Securities Depository.

3) Between March and May 2020, the book-building participation rate amounted to 257%, sharply lower than during the same period of the previous year (535% between March and May 2019).

4) The government unveiled a series of COVID-19-related financial market stabilization measures (March 24), including the Bond Market Stabilization Fund (20 trillion won), COVID-19 Impact Response Corporate Bond Issuance Support (P-CBO, etc.) and support for the speedy purchases and refunding of corporate bonds through the Korea Development Bank. Meanwhile, the Bank of Korea announced the introduction of a Special Financial Stabilization Loan Program (April 16).

Box 1.

Trends of the Credit Bond Market amid the Spread of COVID-19

The COVID-19 pandemic exacerbated[1] the instability in international financial markets after mid-March, with the domestic credit bond market appearing to contract as market vigilance against credit risks jumped dramatically over a short span of time. In response, the Bank of Korea and the government swiftly implemented various market stabilization measures in a bid to relieve the uneasiness in markets and reduce businesses' difficulty in securing funding.

Here, we examine corporate bonds offered publicly by companies ("corporate bonds" hereafter) and bonds issued by credit-specialized financial companies to identify the trends of the credit bond market in the wake of the COVID-19 outbreak and derive implications.

Major credit bond market stabilization measures

(trillion won)

Measures	Announcement date	Effective date	Amount[1)]
Bond Market Stabilization Fund operation	March 24	April 1	20.0
Support for direct purchases of conversion issue of corporate bonds by the Korea Development Bank	March 24	Late March	1.9
Support for the issuance of corporate bonds through primary collateralized bond obligations (P-CBOs) in response to COVID-19	March 24	May 29[2)]	11.7
Quick bond takeover program	March 24	May 28[3)]	2.2
Corporate Bond-Backed Lending Facility by Bank of Korea	April 16	May 4	10.0
Purchase of lower-rated corporate bonds	April 22	TBD	10.0

Notes: 1) Ceiling basis.
2) Issuing date basis.
3) Basis of selection date for initially supported companies.
Sources: Bank of Korea, Financial Services Commission.

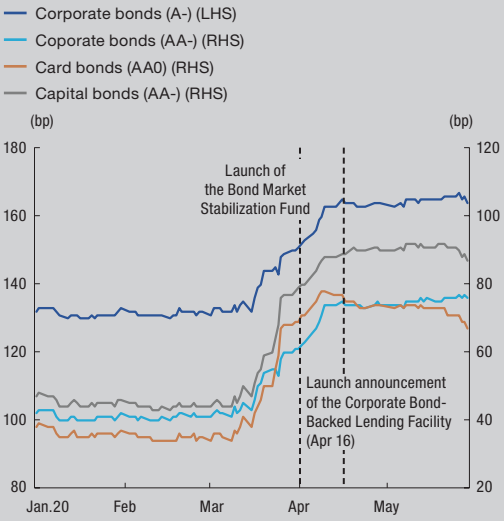
Credit spread

After mid-March, the credit spread of corporate bonds relative to 3-year Treasury bonds widened significantly, driven by concern over the deterioration of the real economy and depressed investment sentiment associated with COVID-19. Both prime bonds (AA and above) and subprime bonds (A and below) saw their credit spreads widen by a large margin in a short span of time. For instance, the credit spreads of AA- and A- rated corporate bonds widened by 31bp, respectively, from March 17 to April 10. Regard-

1) The volatility of global interest rates and stock prices jumped significantly as a result of a combination of factors: the declaration of the COVID-19 pandemic by the WHO on March 12, 2020; the failure of OPEC+ to reach an agreement on production cuts; the sharp decline of the international oil price on March 13; and the reduction of the benchmark interest rate by the US Federal Reserve (-100bp) in an emergency move on March 15.

ing debentures issued by financial institutions, the credit spreads of bank debentures rose by a small margin (AAA, +12bp), while bonds issued by credit-specialized financial companies (card bonds and capital company bonds that tend to be sensitive to economic variables such as private consumption) saw their credit spreads widen more than those of corporate bonds with comparable ratings (card bonds: AA0 +40bp, capital company bonds: AA- +41bp)

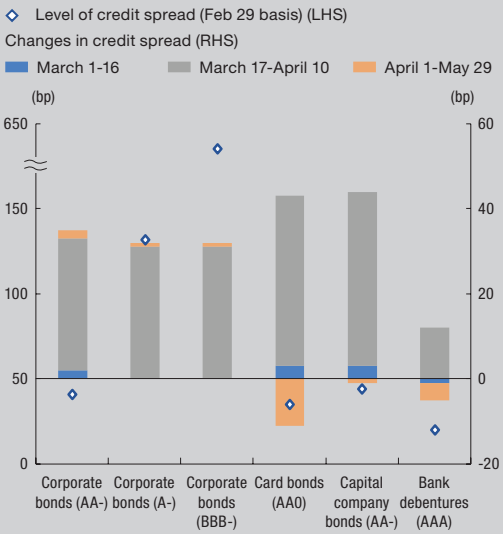
Credit spreads[1)]



Note: 1) 3-year maturity basis. Difference in the yields of credit bonds and Treasury bonds.
Source: Korea Financial Investment Association.

However, as market stabilization measures, including the launch of the Bond Market Stabilization Fund, were implemented on April 1, the widening trend of corporate bond credit spreads moderated significantly after the middle of the month (from April 11 to May 29, AA- +2bp, A- +1bp). Among bonds issued by credit-specialized financial companies, the credit spreads of card bonds, which carry relatively higher credit ratings (AA0, -11bp), narrowed greatly. In this process, the introduction of an RP purchase facility according to which an unlimited amount of liquidity is supplied and the Corporate Bond-Backed Lending Facility (CBBLF)[2)] by the Bank of Korea are believed to have helped relieve market vigilance against credit risks by providing liquidity support to institutions contributing to the Bond Market Stabilization Fund and improving sentiment toward corporate bond investment, respectively.

Credit spread level and changes[1)] by bond type



Note: 1) 3-year maturity basis. Difference in the yields of credit bonds and Treasury bonds.
Source: Korea Financial Investment Association.

Although the widening of credit spreads of corporate bonds has slowed recently, the current level is still above the long-term average for prime and sub-prime bonds. As for the credit spreads of bonds issued by credit-specialized

2) The Bank of Korea lends directly to banks, securities companies, and insurers by taking prime corporate bonds (ratings of AA- and above) as collateral. To financial institutions that provide eligible corporate bonds as collateral, the Bank of Korea can lend funds up to the assessed value of such collateral.

financial companies, the credit spreads of card bonds with relatively higher credit ratings are slightly below the long-term average, while the credit spreads of bonds issued by capital companies are above the long-term average.

Comparison of credit spreads between corporate bonds and bonds issued by credit-specialized companies

(bp)

	Long-term average[1]	By business cycle phase[1)2)]		Current level[3]
		Expansion phase	Contraction phase	
Corporate bonds (AA-)	63	55	78	76
Corporate bonds (A-)	137	127	153	164
Card bonds (AA0)	70	62	85	67
Capital company bonds (AA-)	81	73	95	87

Notes: 1) January 2005-May 2020
2) Business cycle reference dates by Statistics Korea basis.
3) Based on end-May 2020.
Source: Korea Financial Investment Association.

Primary market

In the primary market for corporate bonds, due to seasonal factors in March coupled with the depressed investment demand[3] amid the COVID-19 pandemic, new issues fell sharply compared to the previous month, shifting to net redemption. Net issues of bonds issued by credit-specialized financial companies, driven by bonds issued by capital companies carrying relatively lower credit ratings, dropped significantly.

In April, thanks to the increased demand associated with investment by the Bond Market Stabilization Fund, new issues of corporate bonds and bonds issued by credit-specialized financial companies increased, driven by prime bonds. However, corporate bonds with sub-prime ratings (A and below), which are not eligible for investment by the Bond Market Stabilization Fund,[4] saw new issues falling to 0.2 trillion won in April and 0.9 trillion won in May, continuing their sluggish trend. The yields of newly issued corporate bonds exceeded those of existing bonds issued by the same issuers or issuers with the same credit ratings in the secondary market (based on average market yields of four bond rating companies) for both prime bonds and sub-prime bonds, and the size of such yield spread continues to rise, driven mainly by sub-prime bonds.[5] In terms of maturity at issuance, the share of new issues with maturity of three years or less rose dramatically after April, reflecting the trend of new issues with shorter maturities.[6]

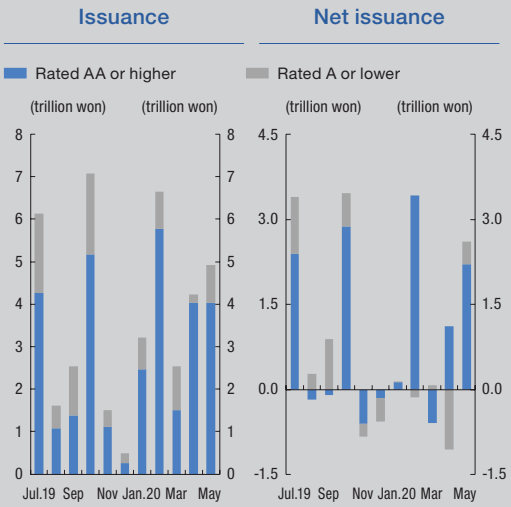
3) Participation in book building for corporate bonds (participation in book building / expected corporate bond issuance amount ×100) fell significantly: 409% (January and February 2020) → 258% (first week of March) → 80% (third week of March). However, in April and May, when the market stabilization measures were implemented, it rose to 243%.

4) The Bond Market Stabilization Fund can invest only in corporate bonds and bonds issued by credit-specialized financial companies with credit ratings of AA- and above and CP with an A1 rating. However, from May 19, it will be able to purchase corporate bonds that had been rated AA- and above (as of April 1) and fell to A+, and bonds issued by credit-specialized financial companies with an A+ rating from June 1.

5) Yield spreads of corporate bonds (AA and above) at issuance (actual yields at issuance - yields of relevant company (or relevant credit rating) estimated by bond rating companies) widened to -6bp (January 2020) → -3bp (February) → +10bp (March) → +32bp (April) → +27bp (May). Those for bonds (A and below) widened to +1bp (January 2020) → -1bp (February) → +29bp (March) → +47bp (April) → +69bp (May).

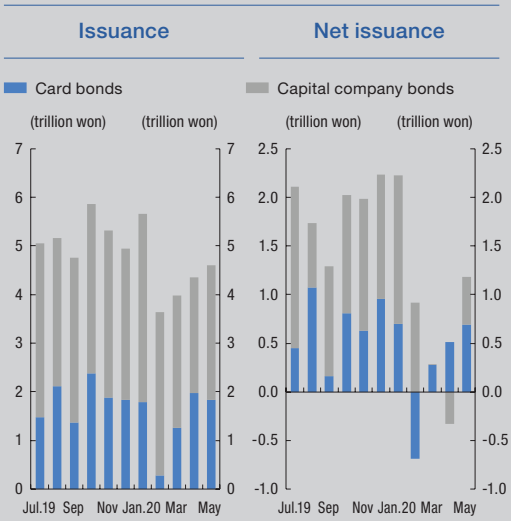
6) The share of corporate bonds issued with maturity of three years or less rose from 39.9% during January through March to 73.0% during April and May.

Corporate bond issuance and net issuance[1)]



Note: 1) Public subscription, non-financial corporations basis.
Source: Korea Securities Depository.

Issuance and net issuance of bonds by credit-specialized financial companies[1)]



Note: 1) Public & private subscription basis.
Source: Korea Securities Depository.

Assessment

In the credit bond market, which had contracted after the occurrence of the COVID-19 pandemic, the trend of widening credit spreads was mitigated and the scale of new issues climbed following the implementation of market stabilization measures in April, boosting market conditions. However, as market vigilance against credit risks, especially for sub-prime bonds, persists, funding conditions for businesses with lower credit ratings in vulnerable industries remain sluggish. To address this, the Bank of Korea and the government plan to eliminate factors causing market instability by establishing a special-purpose vehicle (SPV) to manage purchases of lower-rated corporate bonds and commercial paper.

However, if the real economy deteriorates significantly due to the resurgence of the COVID-19 pandemic and growing conflict between the United States and China, instability will return to the credit bond market, and the funding conditions for businesses with lower credit ratings in vulnerable industries will continue deteriorating. Therefore, continued close monitoring of the credit bond market is needed.

Box 2.

Money Market Trends and Assessment

As uncertainty in international financial markets rose due to the spread of COVID-19 in March 2020, the volatility of domestic financial markets increased significantly as well. In the money market, amid growing market vigilance against credit risks due to the worsening liquidity of security companies and concern over the sluggish economy, the yields of CP and short-term bonds rose sharply. Since April, the money market has stabilized somewhat, but CP yields remain high and market vigilance against credit risks may surge again, depending on COVID-19 developments and changes in international financial markets.

This section examines the trends of the money market in the first half of 2020 with a focus on CP, short-term bond, MMF, call, and RP markets, and measures potential risks.

Market trends

The CP and short-term bond markets were volatile, with yields rising sharply after mid-March. Securities companies sold security holdings such as CP or issued CP and short-term bonds to raise funds in response to margin calls related to ELS[1] as a result of the plunge in global stock prices in March. During this process, concern over the liquidity of securities companies rose, amid demand for funds at the end of the first quarter[2] and worries about a decline of corporate earnings due to COVID-19. As a result, the outstanding balance of CP and short-term bonds decreased, and yields shot up. The outstanding balance of CP and short-term bonds fell from 258.5 trillion won as of March 18 to 244.7 trillion won at the end of March, and continued falling in April. CP yields (A1, 91-day, final quotation yield) climbed for 12 consecutive business days, from 1.36% on March 17 to 2.24% on April 2. Consequently, the yield spread relative to CDs (AAA, 91-day, final quotation yield) widened to 114bp, the highest since the global financial crisis.[3]

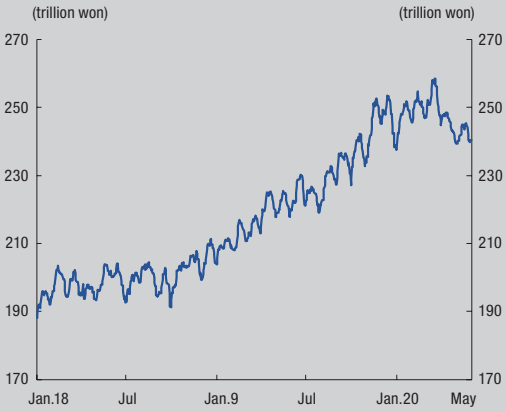
---

1) Securities companies buy or sell stock index-related derivatives (options, etc.) to hedge their positions related to ELS. In the event stock indices tumble, they are required to deposit additional margins with stock exchanges. As of the end of 2019, the outstanding balance of ELS amounted to 71.0 trillion won. Underlying assets included Euro Stoxx 50 (41.4 trillion won), S&P 500 (39.8 trillion won), H-shares (30.3 trillion won), and KOSPI 200 (19.9 trillion won) assets (for ELS with two or more underlying assets, their respective assets were double-counted) (Financial Supervisory Service press release, 「The issue and operation of derivatives by securities companies in 2019」, April 24, 2020).

2) At the end of a quarter, businesses and banks decrease their investments in MMFs to improve their financial ratios and BIS ratios, respectively. Funding for tax payments and dividend payments is another driver that lifts demand for funds at the end of a quarter.

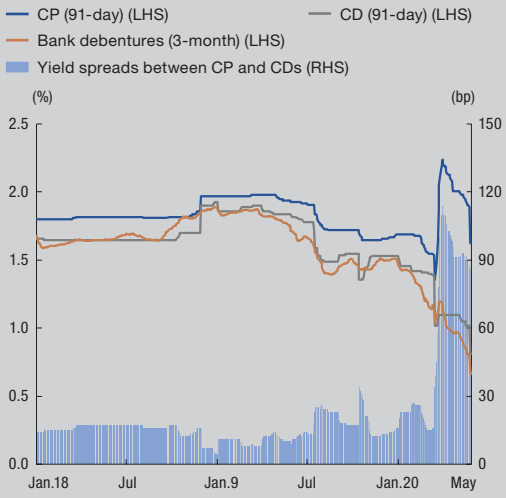
3) The yield spread between CP (91-day) and CDs (91-day) expanded to 292bp on January 8, 2009, during the global financial crisis. The yield spread of 114bp recorded on April 2, 2020, is the highest since the 117bp recorded on January 28, 2009.

Balance of CP and short-term bonds



Source: Yonhap Infomax.

Yields of CP,[1] CDs,[2] and bank debentures[3]



Notes: 1) Final quotation yield (A1, 91-day).
2) Final quotation yield (AAA, 91-day).
3) Average of four agencies (AAA, three-month).

Sources: Yonhap Infomax, Korea Financial Investment Association.

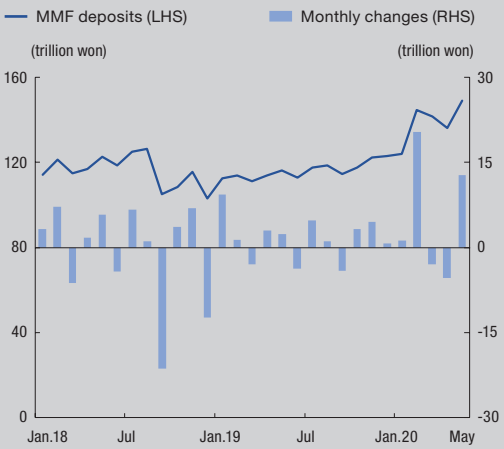
To address this, the Bank of Korea and the government promptly implemented market stabilization measures to calm the money market. The Bank actively supplied liquidity to securities companies by expanding the types of eligible securities and institutions for loans and RPs[4] and adopting an RP purchase facility according to which an unlimited amount of liquidity is supplied.[5] The government also supplied liquidity to the money market by increasing loans from the Korea Securities Finance Corp., relaxing regulations on call money transactions,[6] and purchasing CP through the Bond Market Stabilization Fund and state-owned financial institutions (Korea Development Bank and Industrial Bank of Korea). Consequently, vigilance against credit risks in the money market subsided, and demand for CP and short-term bonds recovered moderately, while CP yields began to decline. However, considering the fact that yields of CP (91-day) remain well above those of other short-term instruments, such as CDs (91-day) and bank debentures (3-month), it appears that sentiment in the money market has not yet made a full recovery.

As the major source of funds in the money market, MMF deposits fell dramatically in March. MMF deposits increased to 146.3 trillion won by March 18 due to the inflow of the government's surplus funds[7] and an increase in standby money associated with the stock market decline. Thereafter, however, they declined for 10 consecutive business days, falling to 119.6 trillion won by April 1[8]. This is attributed to the concen-

4) KDB bonds, IBK bonds, KEXIM bonds, debentures issued by the National Agricultural Cooperative Federation and Nonghyup Bank, debentures issued by the National Federation of Fisheries Cooperatives and Suhyup Bank, commercial bank bonds, bonds issued by eight public institutions, and deposit insurance corporation bonds were all added to the list of eligible securities for RPs in the Bank of Korea's open market operations. Moreover, KDB bonds, IBK bonds, KEXIM bonds, and MBSs issued by the Korea Housing Finance Corporation were newly included to the list of eligible securities for outright sales and purchases in open market operations. Furthermore, 11 securities companies were added as eligible institutions for RP transactions, and the Corporate Bond-Backed Lending Facility (CBBLF) was created to lend to banks, securities companies, and insurers with corporate bonds as collateral.

tration of demand for redemption, such as the usual demand for redemption at the end of a quarter; the possible non-performance of CP,[9] one of the major assets of MMFs; and concern over valuation losses[10] associated with the rise of CP yields. Meanwhile, with the disappearance of the end-of-quarter factor in April and implementation of market stabilization measures by the Bank of Korea and the government, the money market began to regain stability, and thus MMF deposits transitioned to a positive trend, reaching 134.0 trillion won by April 29. As funds continued to flow in, the balance of MMF deposits climbed to 156.7 trillion won as of May 27.

Amount of MMF deposits[1] and monthly changes



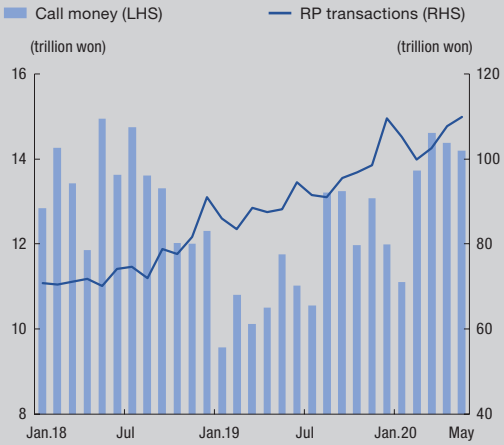
Note: 1) Average monthly balance.
Source: Korea Financial Investment Association.

Meanwhile, the call and RP markets[11], which have extra-short maturities, have been stable overall, unlike the CP and short-term bond markets. The daily average of call transactions in March 2020 was 14.6 trillion won, up by 0.9 trillion won from the preceding month, and 14.4 trillion won in April. In March, the daily balance of

5) As of May 31, 2020, a total of 12.6 trillion won had been supplied since the introduction of the measure.
6) On March 24, the Financial Services Commission temporarily raised the call money borrowing limit for securities companies (15% of equity → 30%) as well as the call loan limit for asset management firms (2% of total collective investment assets → 4%). With the liquidity conditions of securities companies having improved moderately, these limits were again curtailed by a small margin from May.
7) During January and February of 2020, the issuance of government and public bonds increased significantly (net issuance of +35.2 trillion won), and the majority of proceeds from the issuance seemed to have been placed with MMFs.
8) At the end of the first quarter of 2020 (last five business days of March), MMF deposits decreased by 16.8 trillion won (12.3%), falling more steeply than the decline of 11.2 trillion won (10.2%) recorded at the end of the first quarter of 2019.
9) As of the end of April 2020, bills such as CP accounted for 36.2%, the largest share of MMF assets, followed by financial bonds (11.4%), government and public bonds (10.7%), deposits (9.8%), and corporate bonds (8.2%).
10) According to the regulations on MMFs, investors requesting redemption are repaid at book value, which does not reflect losses, when the difference between the market price and book value is less than 0.5%. However, if the difference exceeds 0.5%, investors are repaid at market price, suffering losses. Hence, investors who request redemption before the difference rises above 0.5% can avoid losses (called “first mover advantage”).
11) In the call market, financial institutions borrow or lend funds with a very short maturity period to deal with temporary surpluses or deficits of funds. The RP market allows financial institutions to buy or sell back those same securities at an agreed upon price at a specific date in the future or at a time notified by one party of a transaction to the other party.

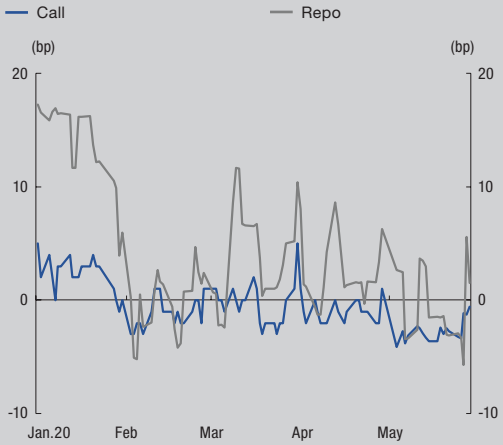
RPs was 102.5 trillion won, up by 2.7 trillion won from February, and it continued rising in April. The monthly average yield spread of call transactions (relative to the base rate) was -0.3bp in March and -1.0bp in April, showing little variation. The yield spreads of RPs rose moderately to 3.9bp in March due to the increase in RP sales, but narrowed to 2.4bp in April, staying at the average level of recent years. This is attributable to the favorable liquidity conditions of banks, the main suppliers of funds, thanks to the Bank of Korea's active supply of liquidity through its full-allotment RP purchase facility as well as its managing reserves at a sufficient level.

Daily average balance of call money and RP transactions



Sources: Bank of Korea, Korea Securities Depository.

Yield spreads[1] between call and RP



Note: 1) Relative to the base rate.

Sources: Bank of Korea, Korea Securities Depository.

Assessment

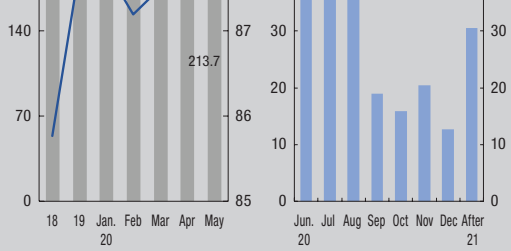
In the domestic money market, vigilance against credit risks soared significantly in March amid the coronavirus pandemic, especially in the CP and short-term bond markets. However, with the implementation of various market stabilization measures by the Bank of Korea and the government, and the partial easing of anxiety in international financial markets following the rebound of global equity prices,[12] the domestic money market stabilized gradually. Yields of CP and short-term bonds continued to slide in April and shifted to a net issue in May, showing a trend of overall stability. Given the purchase demand in the market, high proportion of top credit ratings (A1), and establishment of a special-purpose vehicle for purchasing corporate bonds and CP,[13]

12) Euro Stoxx 50, which is often used as an underlying asset for ELS, rebounded from 2,385.8 on March 18, 2020, to 3,050.2 on May 29, 2020. As a result, part of the additional margin related to ELS that was deposited in March appears to have been repaid.

13) On May 20, 2020, the government and the Bank of Korea announced the establishment of a special-purpose vehicle for purchasing corporate bonds, CP, and short-term bonds, including low-credit rating bonds, for a limited period. The special-purpose vehicle will be funded by senior loans from the Bank of Korea and investment and subordinated loans from the Korea Development Bank.

rollovers of bonds approaching maturity are unlikely to be hampered.

CP and short-term bonds' balances by credit rating and time to maturity[1)]



Note: 1) May 31, 2020 basis.
Sources: Yonhap Infomax, Korea Financial Investment Association.

However, depending on the progress of the COVID-19 pandemic, there remains the possibility that market vigilance against credit risks, largely in vulnerable sectors of the money market, may resurge.

If global stock prices tumble again, the burden of depositing additional ELS-related margin by securities companies may emerge again. In addition, continued sluggishness of the real economy and real estate market would likely increase vigilance in the CP and short-term bond markets due to concern over the rollover of CP, short-term bonds, and PF-ABCP issued by businesses in vulnerable sectors.

If the CP and short-term bond markets become unstable again, other money markets may be affected via the MMF and RP markets. As the balance of MMF deposits has risen significantly recently and MMF assets that carry higher yields, like CP, have increased, if demand for redemption emerges, MMFs will sell their CP holdings, thus raising CP yields. Moreover, a reduction of RP purchases by MMFs to secure liquidity would serve as a factor raising RP yields. In particular, securities companies that are principal borrowers in the RP market have built up significant assets by borrowing in the RP market over the last few years. Considering the high share of overnight (O/N) borrowing[14)] in RP transactions, the contraction of the RP market could translate into an elevation of rollover risks.

Potential risks of money market

CP and short-term bonds	•Decline in global stock prices due to the COVID-19 pandemic → Increase in burden of ELS margin calls on securities companies
	•Sluggishness of real economy → Refinancing trouble with CP and short-term bonds issued by vulnerable industries
	•Slowdown in the real estate market → Refinancing trouble with PF-ABCP
⇩	
MMF	•Increase in redemption requests → Sales of CP holdings, rise in CP yields, reduction in RP purchases
⇩	
Repos	•Reduction in RP purchases → Rise in RP yields, worsening liquidity conditions of securities cos.

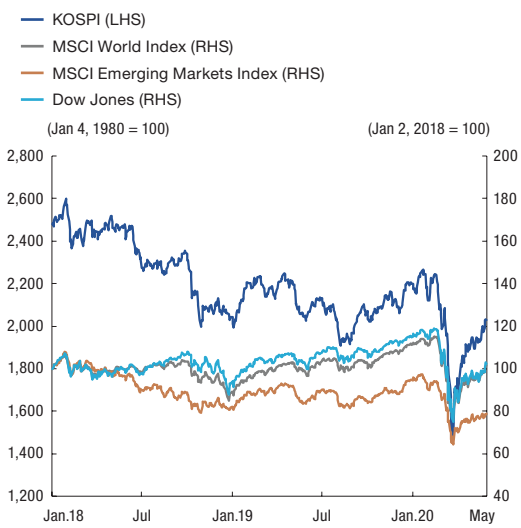
14) In the RP market in 2019 (RP sales), the share of securities companies was 59.1%, and the share of overnight borrowing out of all RP transactions was 94.0%.

2. Stock Markets

After a short-term plunge, stocks rebound significantly

After a steady upswing since December last year, stocks trended lower from February this year amid COVID-19 fears. In March, the worldwide spread of COVID-19, rising concerns about a global recession and the plunge in international oil prices caused stock prices in both Korea and other major countries to plunge. However, starting in late March, stocks quickly rebounded, lifted by aggressive policy responses in Korea and other major countries. Stock prices continued on an uptrend in May despite concerns about an escalation of the US-China disputes, driven by global movements to reopen economies and expectations of COVID-19 vaccine development (Figure Ⅱ-8).

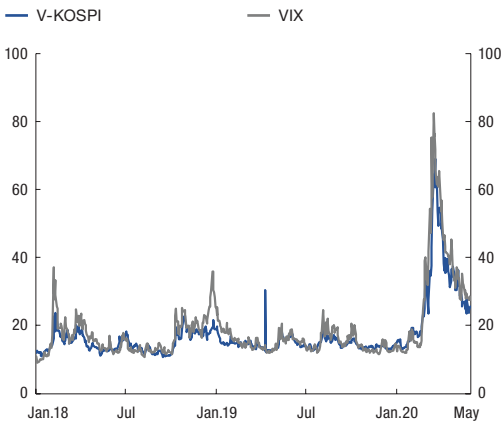
Figure Ⅱ-8. KOSPI and global stock prices



Sources: KOSCOM, Bloomberg.

The KOSPI200 volatility index (V-KOSPI), which had remained mostly low between December last year and mid-February this year, sharply spiked from March on heightened uncertainties in the international financial markets.[5] Since April, as stability gradually returned to stock markets in Korea and worldwide, the V-KOSPI has continued on a downward path, but remains quite elevated compared to pre-COVID-19 levels (Figure Ⅱ-9).

Figure Ⅱ-9. Stock price volatility indices[1]



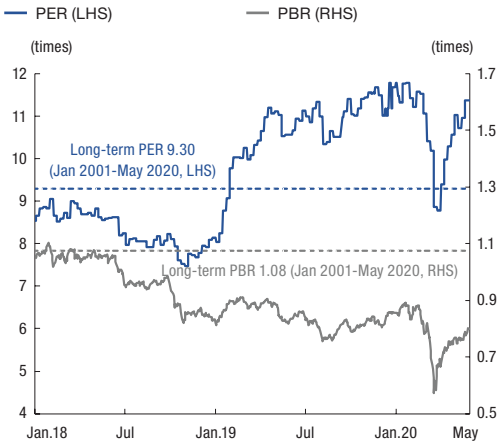
Note: 1) Volatility indices calculated using prices for options on KOSPI200 and S&P500 indices.
Sources: KOSCOM, Bloomberg.

5) As the VIX surged to an all-time high of 83 on March 16, the V-KOSPI climbed to 69 on March 19, the highest level since the global financial crisis of 2008 (all-time high of 89 reached on October 29, 2018).

PER and PBR edge back up after a steep drop

At the end of March, the price-to-earnings ratio (PER),[6] which had hovered around 11.5 until late February, dipped to 8.80, a level below its long-term average (9.30, January 2001-May 2020), as stock prices tumbled. Later, as stocks rapidly recovered, the PER sharply increased to rise above its long-term average to 11.38 at the end of May. The price-to-book ratio (PBR), comparing the current market price of a stock to its liquidation value, plunged starting in late February to as low as 0.57, but climbed back to 0.80 at the end of May (Figure Ⅱ-10).

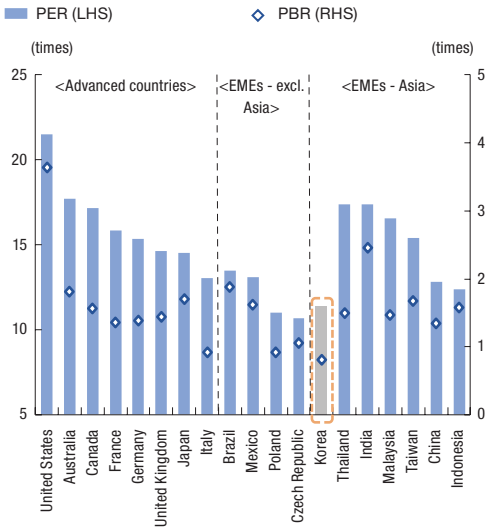
Figure Ⅱ-10. PER[1] and PBR[2]



Notes: 1) MSCI basis (12-month forward).
2) KOSPI basis.
Sources: Bloomberg, Thomson Reuters.

The PER and PBR remain low in Korea compared to advanced countries as well as other major emerging market countries (Figure Ⅱ-11).

Figure Ⅱ-11. PERs[1)2)] and PBRs[1)] of major countries



Notes: 1) End-May 2020 basis.
2) MSCI basis (12-month forward).
Sources: Bloomberg, Thomson Reuters.

6) Based on the 12-month forward MSCI PER, calculated by dividing the sum of the stock market capitalizations of companies tracked by the MSCI index by the sum of their expected net profits (values forecasted by Korean and foreign securities companies) during the next one-year period.

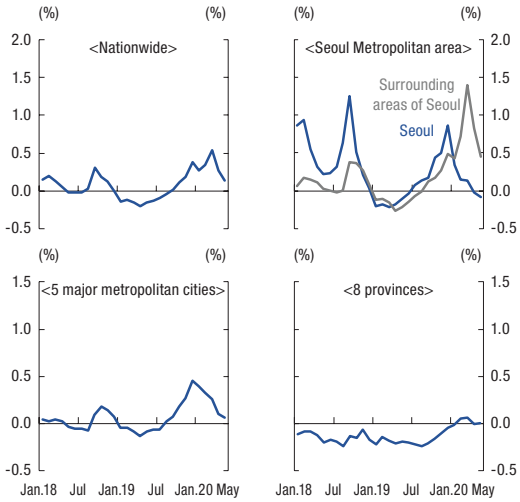
3. Real Estate Markets

Although the growth in housing sales prices has decelerated due to tightened government regulations and deteriorating real economic conditions, the upward pressure on prices appears to be building again more recently. While prices in Seoul showed a slowdown, those of the surrounding areas of Seoul continued their upward trend. As for other parts of the country, the rate of increase in housing sales prices has sharply decreased in the five regional metropolitan cities but remains mostly stable in the provinces. Meanwhile, the rates of increase in leasehold deposit *(jeonse)* and monthly rental prices have somewhat accelerated recently after a period of gradual slowdown.

Gradual acceleration in housing sales price growth

The rate of increase in housing sales prices, which had slowed under the influence of stricter government regulations (such as the December 16 Measures) and the real economic downturn triggered by the COVID-19 pandemic, has more recently started to show signs of acceleration.[7] By region, in the Seoul Metropolitan area, price growth has slowed in Seoul since the regulatory tightening at the end of last year. On the other hand, in the surrounding areas of Seoul, the upward trend is continuing unabated on expectations of future appreciation from development news or due to regulatory disparities. In other parts of the country, the rate of price increase has slowed in metropolitan cities on concerns about local economic downturns amid the COVID-19 pandemic. In the eight provinces, housing sales prices temporarily increased between February and March this year, but mostly flattened out thereafter (Figure Ⅱ-12). However, more recently, the extent of increase has been expanding somewhat in these places.

Figure Ⅱ-12. Rates of increase[1] in housing sales prices

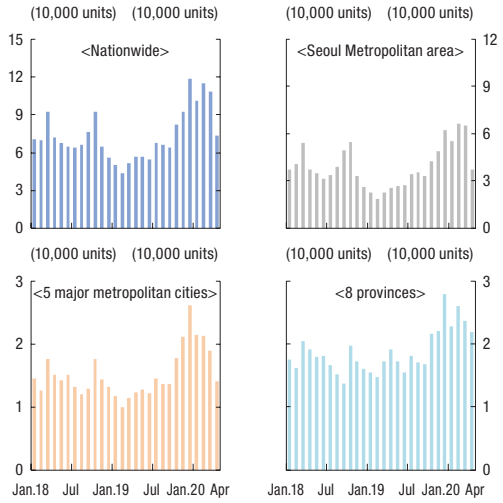


Note: 1) Compared to previous months.
Source: Korea Appraisal Board.

The volume of housing sales transactions recorded a high level in January to March 2020, but fell sharply in April as purchase sentiment weakened[8][9] (Figure Ⅱ-13).

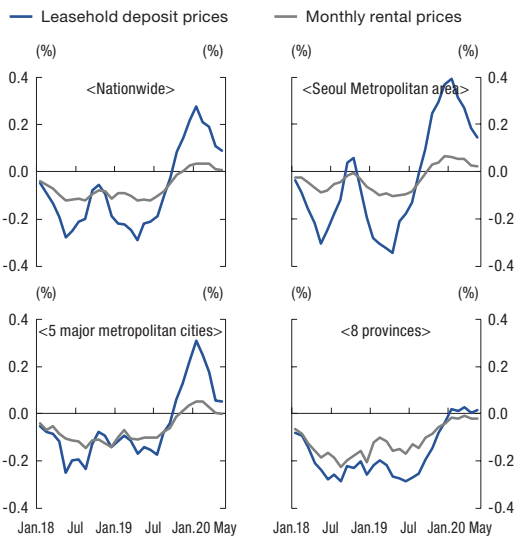
7) The rate of increase in the weekly apartment sales price index accelerated slightly from the beginning of May (0.04% on May 11 → 0.08% on May 25 → 0.12% on June 8).
8) The Buyer Superiority Index (KB Real Estate), which had been on the rise recently, slipped in April (74.3 in March 2020 → 58.3 in April 2020).
9) The average monthly volume of housing sales transactions fell from 108,000 in January to March to 74,000 in April 2020.

Figure Ⅱ-13. Housing sales transaction volumes



Source: Ministry of Land, Infrastructure and Transport.

Figure Ⅱ-14. Rates of increase[1)] in leasehold deposit and monthly rental prices



Note: 1) Compared to previous months.
Source: Korea Appraisal Board.

Slight acceleration in the increase of leasehold deposit and monthly rental prices

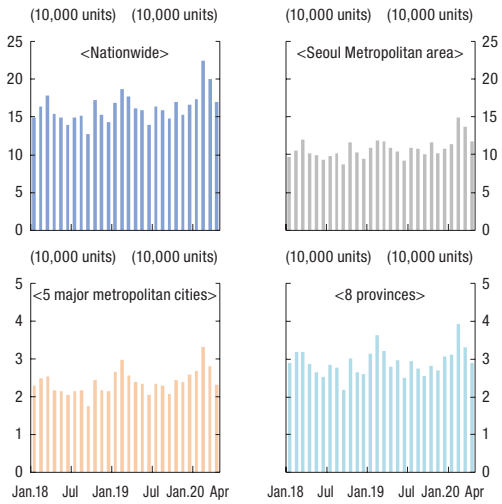
After a brief period of slowing price increases in the housing rental market starting in February this year, both leasehold deposit *(jeonse)* and monthly rental prices are gaining some degree of upward momentum in the Seoul Metropolitan area and five regional metropolitan cities.[10)] Prices in the eight provinces have fluctuated within a narrow range (Figure Ⅱ-14).

The volume of leasehold deposit and monthly rental transactions[11)] amounted to 768,000 units in January to April 2020, up by 10.5% on a year-on-year basis. By region, the volume of transactions in the Seoul Metropolitan area amounted to 517,000 units during the same period, corresponding to a year-on-year increase of 13.8%. The volume of transactions stood at 111,000 and 132,000 units in the five regional metropolitan cities and eight provinces, respectively, up by 4.9% and 3.6% on a year-on-year basis (Figure Ⅱ-15).

10) The weekly apartment leasehold deposit price index shows that weekly price growth has been accelerating slightly since late May (0.05% on May 11 → 0.07% on May 25 → 0.09% on June 8).

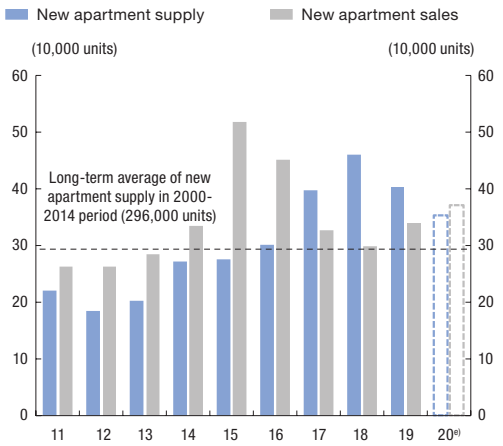
11) This total, based only on contracts with fixed dates, may be different from the total volume of rental transactions.

Figure Ⅱ-15. House leasehold deposit and monthly rental transaction volumes[1)]



Note: 1) Based on fixed date.
Source: Ministry of Land, Infrastructure and Transport.

Figure Ⅱ-16. New apartment supply and new apartment sales[1)]



Note: 1) June 1, 2020 basis; based on sum of monthly planned amount for 2020.
Source: Real Estate 114.

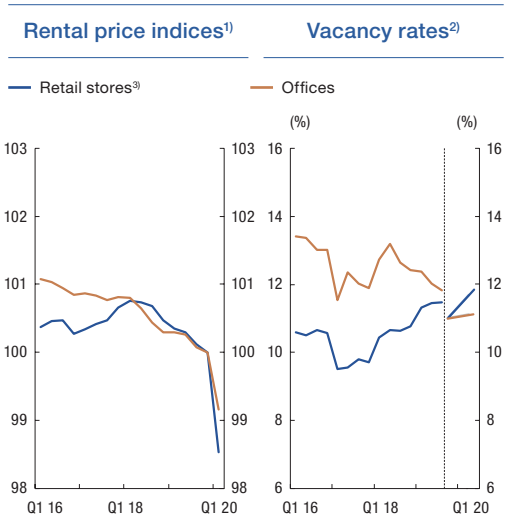
The projected supply of new apartments in 2020 amounts to 353,000 units, less than during the previous year (403,000 units), but still above the average of previous years (2000-2014: annual average of 296,000 units). The number of new apartment sales[12)] projected for this year is 370,000 units, which represents an increase over last year (339,000 units) (Figure Ⅱ-16). Meanwhile, the inventory of unsold new housing decreased by 23.4% from the end of last year to 37,000 units (4,000 in the Seoul Metropolitan area, 33,000 in other parts of the country) at the end of April 2020, with much of the decrease centering on Gangwon, Gyeonggi and Gyeongnam provinces.

Decline in commercial real estate rental prices

Rental prices of commercial real estate continued to trend lower as business uncertainty was heightened by a contraction in domestic demand.[13)] By property type, rental prices of retail stores and offices, after falling by 0.5% and 0.3% in 2019, declined sharply during the first quarter of this year due to the COVID-19 pandemic, recording decreases of 1.5% and 0.8%, respectively, centering on the Daegu area.[14)] The vacancy rate[15)] rose slightly from the perious quarter for retail stores to 11.7% in the first quarter of 2020. However, the vacancy rate for offices (11.1%) was mostly unchanged from the previous quarter (11.0%) (Figure Ⅱ-17).

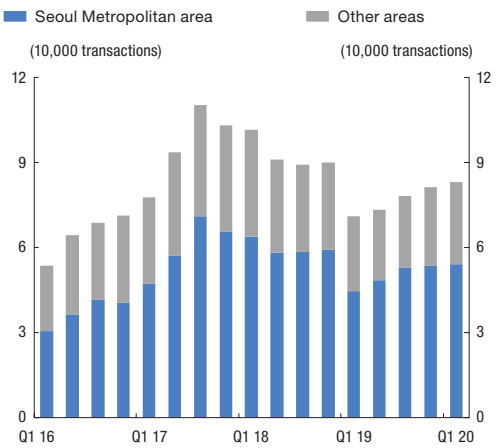
12) In 2020, the volume of new sales is expected to sharply increase in the Seoul Metropolitan area (174,000 → 214,000) but is likely to decrease moderately in other parts of the country (165,000 → 156,000).
13) For details on the commercial real estate market, refer to <Box 3> 「Status and Assessment of the Commercial Real Estate Market」 (page 50).
14) In the case of retail stores, the drop in foot traffic in offline stores due to the COVID-19 pandemic appears to have been a contributing factor.
15) Due to the expansion and replacement of sample at the time of the first quarter of 2020 rental survey, the time series was interrupted from the fourth quarter of 2019.

Figure Ⅱ-17. Commercial real estate rental price indices and vacancy rates



Notes: 1) Q4 2019 = 100.
2) Interrupted due to redesign of the samples of the commercial real estate market rent survey in Q1 2020.
3) Based on medium-sized to large retail stores.
Source: Korea Appraisal Board.

Figure Ⅱ-18. Commercial real estate[1] transaction volumes[2]



Notes: 1) Based on buildings used for commercial including *officetels* (dual-purpose buildings used for commercial and residential purposes).
2) Including transactions other than sales, such as allotment of new apartments, gifts, and exchanges.
Source: Ministry of Land, Infrastructure and Transport.

The volume of commercial real estate transactions increased 16.9% year on year to 83,000 units in the first quarter of 2020. By region, the volume of transactions increased by 21.1% and 10.0% in the Seoul Metropolitan area and other parts of the country to 54,000 and 29,000, respectively (Figure Ⅱ-18).

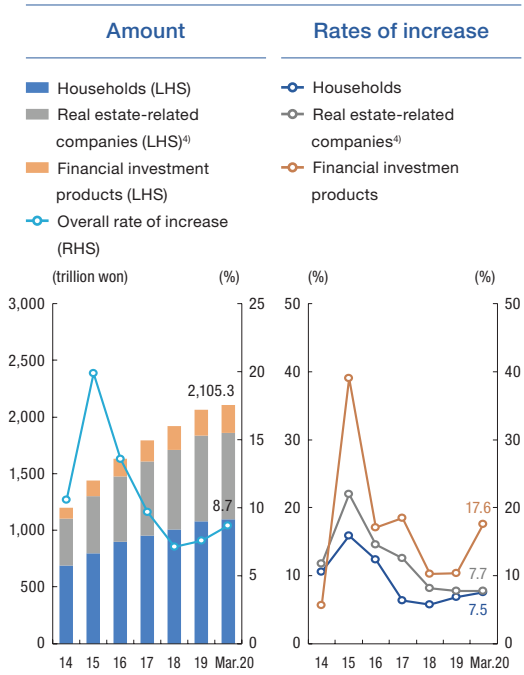
Increase in real estate finance exposures

As of the end of March 2020, real estate finance exposures[16] amounted to 2,105.3 trillion won, representing a year-on-year increase of 8.7%. By type, household credit stood at 1,095.1 trillion won, corresponding to 52.0% of total exposures and recording a year-on-year increase of 7.5% as housing-related loans, such as loans for leasehold deposits, continuously rose. Real estate-related corporate loans represented a year-on-year increase of 7.7% to 765.0 trillion won (36.3% of total exposure) due to a higher volume of loans and PF loans. Meanwhile, financial investment products recorded a massive year-on-year increase of

16) Real estate finance exposures are defined as the sum of real estate-related loans to households and corporations by financial institutions and credit guarantee institutions, and real estate-related financial investment products. For more information about real estate exposures, refer to the June 2017 Financial Stability Report, <Box 3> 「Current Status of Real Estate Finance Exposures」 (page 44).

17.6% to 245.2 trillion won (11.7% of total exposures), lifted by the recent sharp increase in MBS issuance[17] (Figure Ⅱ-19).

Figure Ⅱ-19. Amount[1] and rates of increase[2] of real estate finance exposures[3]



Notes: 1) End-period basis.
2) Year-on-year basis.
3) The sum of real estate-related household loans, corporate loans issued by financial institutions and credit guarantee institutions, and real estate-related financial investment products.
4) Defined as companies directly related to real estate market conditions (such as real estate rental and supply businesses and related service businesses) and construction firms.

Source: Bank of Korea.

17) This appears to be due to the increase in the offloading of home mortgage loans by banks in response to the launch of “Relief Loans” and the change in loan-to-deposit ratio rules.

Box 3 .

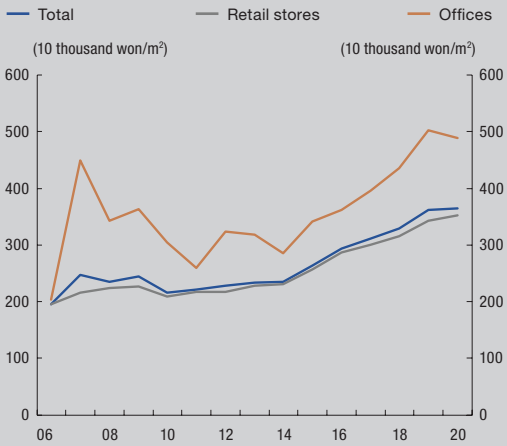
Status and Assessment of the Commercial Real Estate Market

The commercial real estate market[1] has grown due to the increasing trend of investors' search for yield driven by persistent low interest rates in the wake of the global financial crisis ("GFC" hereafter), leading to an expanded transaction volume[2] and increased exposure of the financial system to commercial real estate. As the conditions of the real economy have deteriorated due to the COVID-19 pandemic, we need to examine the impact of a possible decline in commercial real estate prices on the financial system. In what follows, we look at the current status of the commercial real estate market and potential risks posed by a depressed real estate market through major spillover channels.

Trends of the commercial real estate market

The average transaction price per unit area (m^2) estimated based on actual transactions of commercial real estate had risen steeply by an annual average rate of 9% from 2015, but had slowed significantly by 2020. From January to April of 2020, the average transaction price per unit area was 3.652 million won, up by only 2.8% from the same period of the previous year. By type of property, prices of offices dropped sharply for two years after the GFC and began rebound thereafter, whereas prices of retail stores have climbed slowly and with smaller fluctuations than those of offices.

Average transaction price[1] per unit area (m^2) of commercial real estate



Note: 1) Total transaction amount / Total floor space during the period for each type of use. 2020 figures are based on averages between January-April.

Source: Ministry of Land, Infrastructure and Transport.

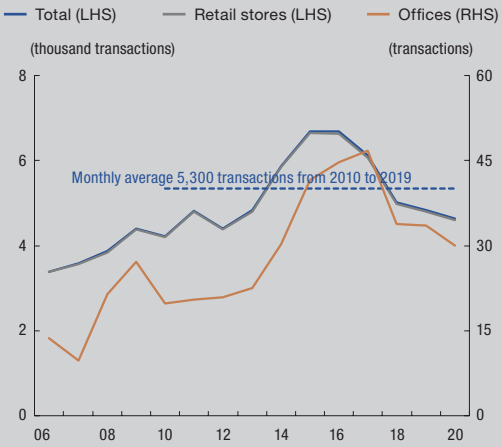
The monthly average volume of commercial real estate transactions had climbed steadily until 2016, but declined thereafter. From January to April 2020, an average of 4,600 transactions were executed per month, similar to that for the same period of the previous year but less than the long-term average after the GFC (5,300 transactions per month from 2010 to 2019). By type of property, transactions for retail stores far outnumbered those for offices, and transactions for offices were relatively infrequent, as the average value per transaction for offices tends to

1) Commercial real estate includes property for commercial use (retail stores and offices), property for industrial use (factories and warehouses), accommodation and leisure facilities, and others. This article focuses on retail stores and offices.

2) The value of commercial real estate transactions rose from 24.4 trillion won in 2011 to 50.7 trillion won in 2019, growing at an annual average rate of 9.6%.

be very large[3] (16.2 billion won, from January to April 2020).

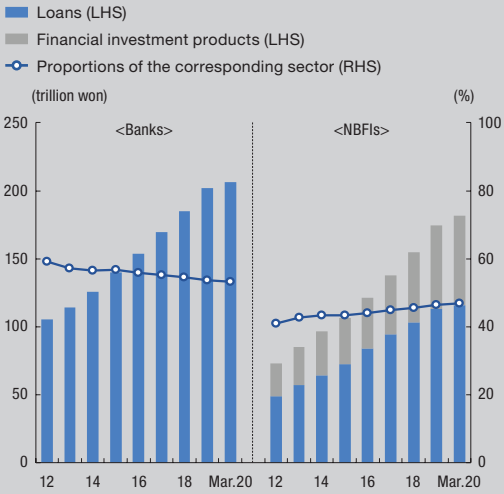
Commercial real estate sales transaction volumes[1)2)]



Notes: 1) Monthly average basis. 2020 figures are based on averages between January-April.
2) Excluding transactions other than sales, including allotments of new apartments, gifts, and exchanges.
Source: Ministry of Land, Infrastructure and Transport.

Exposure to commercial real estate is estimated to be 382.4 trillion won as of the end of March 2020. Loans by financial institutions—amounting to 322.4 trillion won,[4] or 84.3%—accounted for most of this, followed by commercial real estate funds (42.0 trillion won) and retail store and office REITs (17.9 trillion won). By type of financial institution, loans by banks and NBFIs stood at 206.5 trillion won and 115.9 trillion won, respectively.

Commercial real estate finance exposures



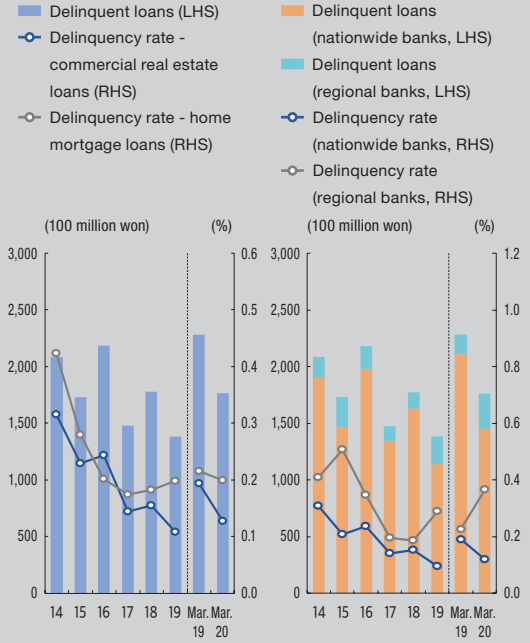
Source: Bank of Korea.

The delinquency rate of commercial real estate loans is currently classified as favorable, based on data from eight commercial banks. As of the end of March 2020, the delinquency rate stood at 0.13%, lower than the average of normal years (0.20% from 2014 to 2019) and even lower than that of mortgage loans of domestic banks (0.20%), which tends to be low. By banking sector, the delinquency rate for nationwide commercial banks has maintained a downward trend, while that of regional banks has recently transitioned to an upward trend.

3) From January to April 2020, a monthly average of 30 transactions were completed for offices, accounting for only 0.6% of all commercial real estate transactions. During the same period, the monthly average transaction value for offices (0.5 trillion won) accounted for 12.3% of the aggregate value of all commercial real estate transactions.
4) This figure was estimated by applying the share of office and retail store loans of the non-housing collateralized loans of eight commercial banks (40.3%) to all non-housing collateralized loans, except for PF loans extended by financial institutions (banks and NBFIs) (799.9 trillion won).

Delinquent loans[1] and delinquency rates of commercial real estate loans

By banking sector[2]

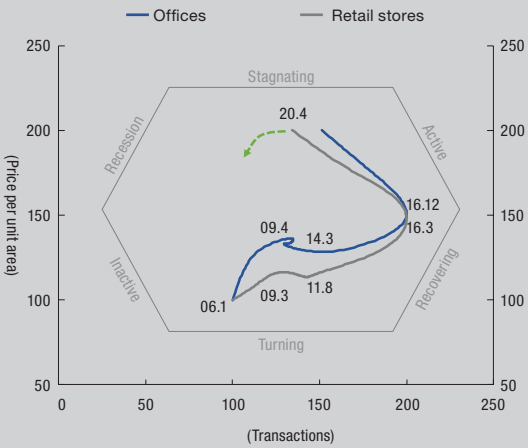


Notes: 1) Based on loans delinquent for one month and longer.
2) Nationwide banks include Nonghyup Bank.
Sources: Eight domestic banks.

To identify the phase and future projections of the commercial real estate market, we extracted trend and cyclical components from data on the number of transactions and prices per unit area, and applied them to the Honeycomb Cycle Model.[5] The analysis results showed that offices and retail stores saw increasing prices and decreasing numbers of transactions for 41 months and 50 months, respectively, similar to the end of the active phase or stagnating phase.

Furthermore, as the volume of transactions for commercial real estate has fallen significantly since 2017, the expansion of supply carried out so far[6] could serve as a factor that depresses prices. Moreover, if the COVID-19 pandemic persists for an extended period, wholesale and retail businesses will contract dramatically,[7] which may lead the commercial real estate market to enter a recession more rapidly.[8]

Business cycle phase[1] of commercial real estate by use



Note: 1) Trend cycles of the number of transactions and prices per unit area in offices and retail stores during the period are extracted by HP filtering and standardized by 100 to 200, respectively.
Sources: Bank of Korea, Ministry of Land, Infrastructure and Transport.

Analysis of impact on the financial system

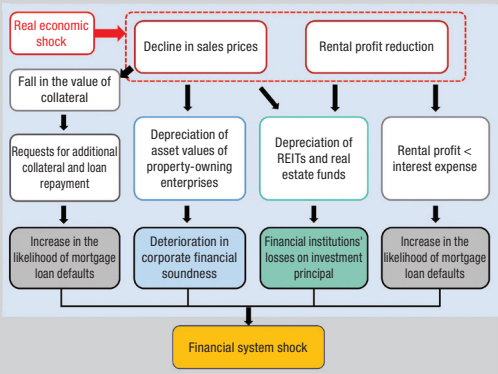
Rapid deterioration of the commercial real estate market could exert a negative influence on the financial system via various spillover channels.

5) Janssen (1994) argued that the number of housing transactions and prices move counterclockwise in a honeycomb cycle (recovering → active → stagnating → recession → inactive → turning), depending on the business cycle.
6) From 2015 to 2019, the annual average area of commercial real estate construction starts rose significantly to 36.4 million m^2 from 25.7 million m^2 in the period from 2011 to 2014.
7) In its Financial Stability Report released in May 2020, the US Federal Reserve pointed to a possible decline of commercial real estate prices due to the contraction of the wholesale and retail sectors caused by the COVID-19 pandemic.
8) BIS (2020) found that the growth rate of Korea's commercial real estate prices is positively related to the real GDP growth rate.

Above all, a decline of commercial real estate prices or a reduction of rental income could adversely affect related loans. Moreover, with the value of real estate investment products declining, financial institutions may suffer losses on investment. Meanwhile, corporations may see their financial soundness negatively affected as the decline of commercial real estate prices is reflected in their financial statements. However, as most corporations evaluate assets at book value, with the book value usually being well below the current value, the impact is likely to be rather limited.

Given the prospect that the current financial and economic conditions could deteriorate significantly, this report hereafter examines the impacts on the financial system under a scenario where commercial real estate prices drop[9] by 20% within a year and major variables, such as substandard-or-below ratios and return on rental income, deteriorate nearly twice as much as they did during the GFC.

Effects of the sluggish commercial real estate market on the financial system



First, if the LTV ratio of an existing commercial real estate loan rises above a certain percentage[10] (70%) of the collateral value due to a decline in prices, the financial institution may request that the borrower put up additional collateral or repay a certain portion of the loan. In this process, rollover risk may arise. Under the scenario where commercial real estate prices decline by 20% over the next year, loans that become due within a year[11] and have an LTV ratio of over 56%[12] carry rollover risks. Based on this, commercial real estate loans with rollover risks are estimated at about 97.9 trillion won (30.4% of all commercial real estate loans).

Financial institutions must provide for additional loan loss provisions in the event that commercial real estate prices drop sharply and rollover risks become a reality. If the extent of deterioration of

9) A scenario was assumed where commercial real estate prices drop by 20%, about double the decline during the GFC (-11.5%).

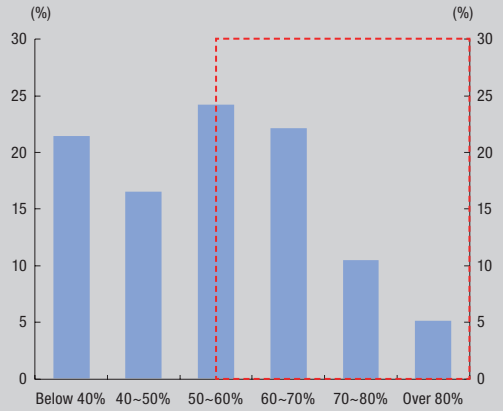
10) Mutual credit cooperatives are regulated so that the LTV ratio of non-mortgage loans does not exceed 70%. Banks were found to manage the LTV ratio within a range of 60% to 70%. This paper assumed that additional collateral is required at an LTV ratio of 70%.

11) The share of commercial real estate loans that become due in one year (63.9%) was calculated based on the Consumer Credit Panel.

12) It was assumed that commercial real estate prices have not changed since the loans were made, and the threshold for rollover risk (70% × (1 - 20%) = 56%) was calculated by applying an LTV ratio of 70% and a 20% decline of collateralized asset prices.

asset quality[13] associated with the fall of commercial real estate prices is twice as much as that during the GFC, the burden of financial institutions to put up additional provisions for mitigating rollover risks is estimated at 1.6 trillion won.

Distributions[1] of commercial real estate[2] loans, by LTV range



Notes: 1) End-March 2020 basis.
2) Retail stores and offices.
Sources: Five domestic banks.

Landlords of commercial real estate may face a situation (cash flow risks) where they cannot pay the interest on their loans as rental income falls due to declining rentals and increasing vacancy rates. To assess the cash flow risk of landlords, we assumed that return on income (rental income / asset value), which determines rental profit, falls at a rate equal to the recent downward trend (2019, -0.26%p) plus double the decline recorded during the GFC (-0.60%p[14]). Under these assumptions, to identify landlords of commercial real estate loans whose rental profit falls short of interest expenses, we calculated the threshold LTV.[15] As a result, it was found that rental profit fails to cover interest expenses only in the case of an LTV ratio exceeding 75%. Considering the distribution of current commercial real estate loans by LTV level, loans with cash flow risks are estimated at about 33.6 trillion won (10.4% of all commercial real estate loans) and the burden of providing for additional loan loss provisions at 1.0 trillion won.

Rate of income return on commercial real estate[1]

Note: 1) Net operating income (income such as rent - operating costs) / underlying asset value x100.
Source: Korea Appraisal Board.

13) As there were no data on the asset quality of commercial real estate loans before and after the GFC, we referred to the fact that, with regard to changes in the classification of corporate loans by asset quality for one year, the share of corporate loans classified as normal fell by 2.4%p, and loans classified as precautionary, substandard, doubtful, and estimated loss rose by 1.5%p, 0.7%p, 0.2%p, and 0.1%p, respectively.

14) During the GFC, the return on income of commercial real estate fell by 0.30%p on average.

15) Cash flow risk occurs if rental profit is less than interest expenses. Rental profit is equal to: asset price × (1 - price drop rate) × return on income ≒ loan amount / LTV × (1 - 20%) × return on income. If we seek the LTV ratio that meets the condition (loan amount / LTV × 80% × return on income < loan amount × loan interest rate), LTV > 80% × return on income / loan interest rate = 80% × (current return on income - drop of return on income) / loan interest rate = 80% × (4.05% - 0.86%) / 3.43% ≒ 75%. Hence, it can be presumed that if LTV exceeds 75%, borrowers will face cash flow risk.

Meanwhile, financial institutions may suffer losses on investment through financial products such as real estate funds. Although it is difficult to distinguish financial institutions' exposure to commercial real estate funds and office and retail store REITs, by referring to the Korea Financial Investment Association's data on the share[16] of financial institutions' investment in real estate funds, it was estimated that financial institutions' exposure was about 15.5 trillion won[17] as of the end of March 2020. If the decline in commercial real estate prices (20%) leads to a decrease in rate of return, some funds may incur net losses even if the rate of accumulated net return[18] is considered. As a result, based on the rate of accumulated net return, including the price decline, the expected losses of commercial real estate investment funds are estimated to be 0.5 trillion won.

As for office and retail store REITs (17.9 trillion won), based on the share of financial institutions out of listed REITs and large non-listed REITs with total assets, the exposure of financial institutions is estimated[19] at 4.2 trillion won. As is the case for real estate funds, if commercial real estate prices fall by 20%, based on the rate of accumulated net return, the expected losses of REITs[20] are estimated to be 0.1 trillion won.

Implications

In the case of a decline of commercial real estate prices due to a depression of the real economy and decline in rents, considering financial institutions' estimated burden of setting aside loan-loss provisions and their expected losses (rollover risk: 1.6 trillion won, cash flow risk: 1.0 trillion won, losses on investment products: 0.6 trillion won), our analysis shows that the negative impact on the financial system may not be serious.

However, in the case of commercial real estate loans turning sour, the recoverable amount[21] may be far less than mortgage loans, meaning that risk management needs to be strengthened. In particular, considering the fact that commercial real estate loans grew significantly by an annual average rate of 11% from 2012 to 2019, more stringent risk management is required.

Furthermore, it should be noted that a second wave or prolongation of the COVID-19 pandemic would result in overall changes in social and economic activities, such as social distancing and a decrease in face-to-face transactions. In this case, the demand for commercial real estate would contract more than expected, and the extent of price adjustment could be larger.

16) Applied the share of real estate funds held by financial institutions to total funds issued at the end of March 2020 (49.1%).

17) Considering that the share of real estate out of total real estate fund assets ranges from 50 to 100%, we used 75%, the median, as the share of real estate in real estate funds.

18) The weighted average rate of return since the date of fund establishment for publicly offered real estate funds was about 7% as of June 1, 2020.

19) The total assets of office and retail store REITs (17.9 trillion won) consisted of listed REITs (2.9 trillion won) and non-listed REITs (15.0 trillion won). The exposure of financial institutions to listed REITs was estimated based on their investment in each listed REIT (0.2 trillion won). Exposure to non-listed REITs was estimated by using the share (26.8%) of financial institutions in 14 non-listed REITs, with the total assets of each REIT being at least 300 billion won.

20) Considering the weighted average rate of return since the listing of the REITs (7%), as of the end of May 2020.

21) From January to April 2020, the ratio of sales price to appraised value of commercial real estate on auction was 67.9%, far below that of residential property (82.2%). This ratio fell to 46% during the GFC.

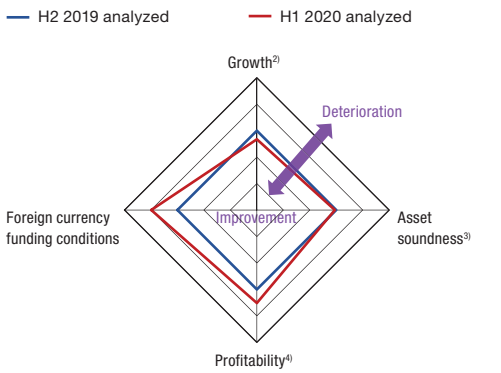
III. Financial Institutions

1. Banks

The financial soundness of commercial banks[1] has been generally satisfactory. Total assets increased sharply in the process of responding to the COVID-19 pandemic. Banks' asset soundness has continued to be adequate thanks to their sustained efforts to strengthen risk management. Profitability declined slightly year on year due to shrinking net interest margins.

As corporate loans are again increasing at an accelerated rate in the second quarter, the possibility of a deterioration in asset soundness cannot be ruled out should the real economic downturn continue for a prolonged period of time and the potential risk from the massive loan growth in recent months become actualized[2] (Figure Ⅲ-1).

Figure Ⅲ-1. Map of changes in commercial bank financial soundness conditions[1]



Notes: 1) Extent of change in Q4 2019-Q1 2020 compared to Q2-Q3 2019 indexed (Foreign currency funding conditions; extent of change of daily volatility of CDS premia in December 2019-May 2020 compared to June-November 2019 indexed.).
2) Rate of increase in total assets.
3) Substandard-or-below loan ratio.
4) Return on assets (ROA).

Sources: Bank of Korea, commercial banks' business reports.

Sharp surge in assets

At the end of the first quarter of 2020, commercial banks' total assets (banking account basis) jumped 10.2% year on year, the highest rate of increase since the first quarter of 2009 (14.8%), to 1,842 trillion won. This appears to be due to the heightened loan demand amid the COVID-19 outbreak, coupled with the accelerated increase in corporate loans since

1) The banking sector analysis of this report considers only commercial banks (nationwide and regional banks). Specialized banks (Korea Development Bank, Industrial Bank of Korea, Korea Eximbank, Nonghyup Bank and Suhyup Bank), whose business models differ from those of commercial banks, are excluded. Internet-only banks (K-Bank and Kakao Bank) are included among nationwide banks.

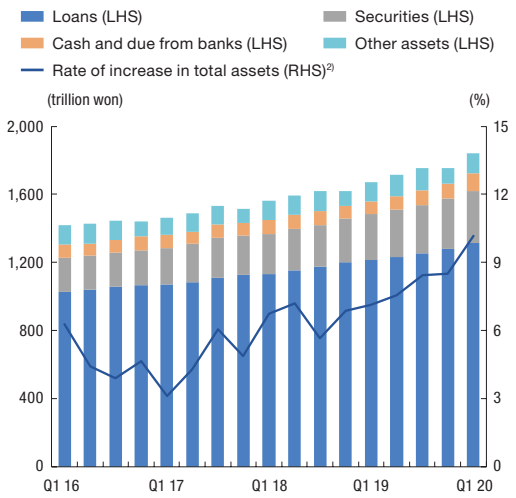
2) To assist SMEs, small merchants and other vulnerable borrowers faced with short-term liquidity shortages, the government announced the 「Guidelines on the Extension of Loan Maturity Dates and Interest Payment Deferral (April 1)」 and the 「COVID-19 Measures for Increasing Support for the Credit Rehabilitation of Vulnerable Individual Borrowers」 (April 29). When extensions and grace periods granted under these measures expire, it could result in a further increase in principal repayment burdens.

3) The government and the Bank of Korea are providing funding to small merchants, SMEs and middle market enterprises experiencing liquidity shortages amid the COVID-19 pandemic through a variety of measures and programs, such as the Financial Sector Responses to COVID-19 (February 7), Household Economic Stability-Financial Stabilization Package Program (March 24), Corporate Stabilization Measures (April 22), increased credit ceilings for the Bank Intermediated Lending Support Facility (February 27, May 13), and interest rate cuts (March 16, May 28).

February 2020. The policy trend toward active financial support[3] appears to have been another contributing factor. Banks' total assets sharply expanded in April as well (10.9% year-on-year), continuing the steep upward trend into the second quarter, centered on loans.

By asset type, loans increased by 8.4% on a year-on-year basis. Securities, which are held to secure liquidity and improve interest yields, increased 13.2%, and cash and deposits 39.9% (Figure Ⅲ-2).

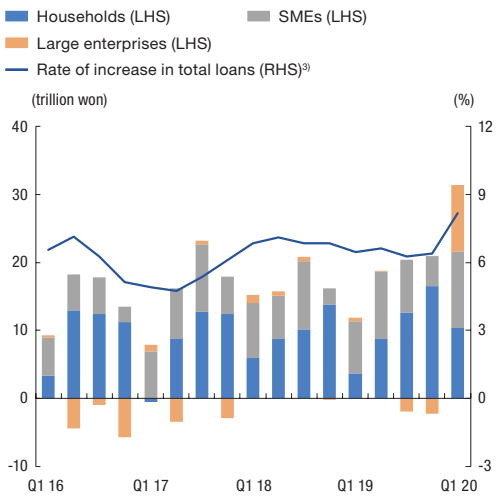
Figure Ⅲ-2. Commercial bank total assets[1]



Notes: 1) End-period banking account balance basis.
2) Year-on-year basis.
Sources: Commercial banks' business reports.

By borrower type, the rate of loan growth (won-denominated loan basis) has accelerated for both household and corporate loans. During the first quarter of 2020, banks' household loans increased by 10.4 trillion won, centered on home mortgage and unsecured loans, far exceeding the level during the same period of the previous year (+3.7 trillion won). Corporate loans increased by a much greater amount for both SMEs and large enterprises (+11.2 trillion won, +9.8 trillion won) than during the same period last year (+7.7 trillion won, +0.5 trillion won), due to rising demand for working capital, as well as the financial support policy in the case of the former and the heightening of liquidity demand by the slump in the direct financial markets and unfavorable domestic and global business conditions in the case of the latter (Figure Ⅲ-3). The increase in corporate loans (+13.2 trillion won) continued to significantly surpass the level during the same period of the previous year (+4.8 trillion won) into April. The rate of increase in household loans (+3.8 trillion won) also picked up considerably[4] (+2.5 trillion won in April 2019).

Figure Ⅲ-3. Changes[1] in commercial bank loans[2]



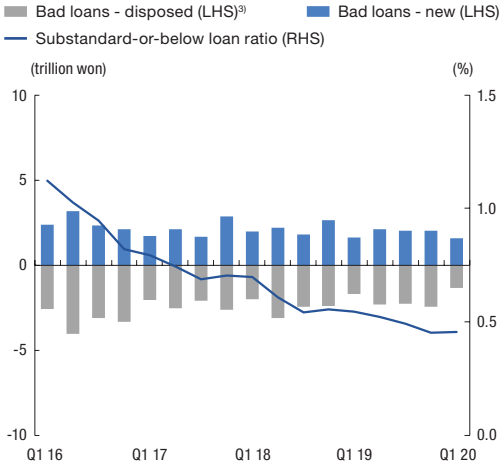
Notes: 1) Compared to previous quarters.
2) Banking account won-denominated loan basis.
3) Year-on-year basis.
Sources: Commercial banks' business reports.

4) In May (advance estimate basis), corporate loans maintained a solid pace of growth (+6.9 trillion won) as the increase in SME loans (+6.8 trillion won) largely surpassed that in the same period of 2019 (+2.8 trillion won). However, the increase in household loans (+2.3 trillion won) showed a slight deceleration compared to the same period of 2019 (+3.1 trillion won).

Generally satisfactory level of asset soundness

Commercial banks' asset soundness has remained satisfactory, with the substandard-or-below loan ratio dropping 0.09%p year on year to 0.46% at the end of the first quarter of 2020, continuing the downward trend from previous periods (Figure Ⅲ-4). Nonetheless, the substandard-or-below loan ratio was comparatively higher among regional banks at 0.84%.[5)]

Figure Ⅲ-4. Commercial bank bad loans[1)] and substandard-or-below loan ratio[2)]

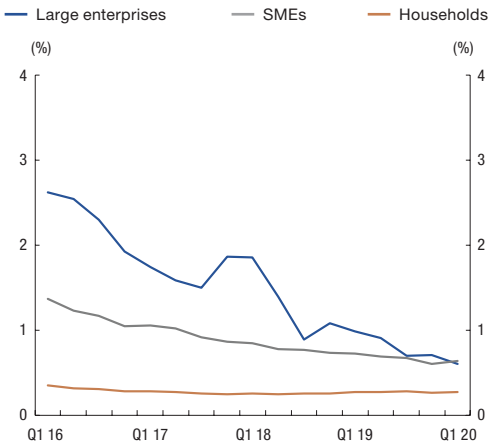


Notes: 1) During the period basis.
2) End-period basis.
3) Including those through loan withdrawals, loan loss write-offs, loan sales, soundness reclassifications, debt restructurings, etc.

Sources: Commercial banks' business reports.

By borrower type, the substandard-or-below loan ratio of household loans has remained low, standing at 0.27% at the end of the first quarter of 2020. The substandard-or-below loan ratio on corporate loans dropped 0.38%p year on year to 0.60% for large enterprises and 0.09%p to 0.63% for SMEs (Figure Ⅲ-5).

Figure Ⅲ-5. Commercial bank substandard-or-below loan ratios, by borrower type

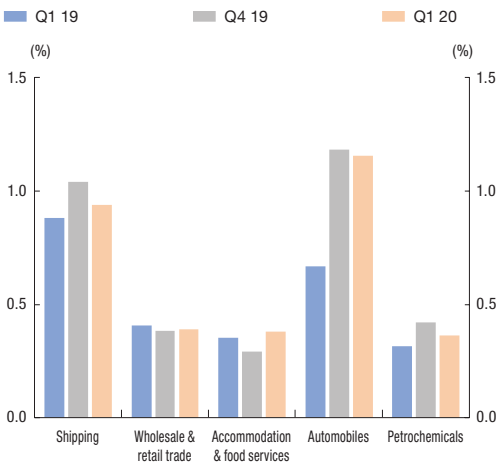


Sources: Commercial banks' business reports.

By industry, in manufacturing, the substandard-or-below loan ratio on loans to the automobile (0.67% in the first quarter of 2019 → 1.15% in the first quarter of 2020) and petrochemical industries (0.32% → 0.36%) showed upticks from the same period of the previous year, reflecting the export slowdown. In non-manufacturing, the substandard-or-below loan ratio also registered an increase for the transportation (0.88% → 0.94%) and accommodation & food service industries (0.35% → 0.38%), again reflecting the business slowdown. Going forward, attention must be paid to the possibility of a delayed rise in the substandard-or-below loan ratio,[6)] centered on vulnerable industries that are more acutely impacted by the COVID-19 pandemic (Figure Ⅲ-6).

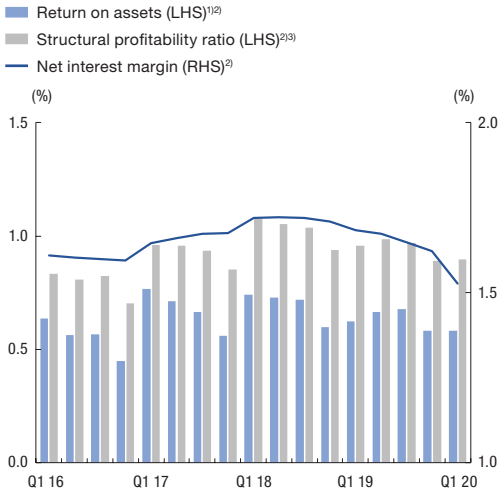
5) This triggered the review of some regional banks by international credit rating agencies for a possible downgrade (March 24). International credit rating agencies, moreover, downgraded the outlook for the Korean banking system (April 2) and the credit rating outlook for some Korean banks (April 23). Therefore, the possibility of downgrades to domestic banks' credit ratings going forward cannot be ruled out.

Figure Ⅲ-6. Commercial bank substandard-or-below loan ratios in major industries



Sources: Commercial banks' business reports.

Figure Ⅲ-7. Commercial bank profitability



Notes: 1) Loan loss reserves excluded.
2) Accumulated quarterly incomes annualized.
3) (Interest income + Fee income + Trust account income – Operating expenses) / Total assets.

Sources: Commercial banks' business reports.

Slight drop in profitability

Commercial banks' profitability dropped slightly compared to the same period of last year.

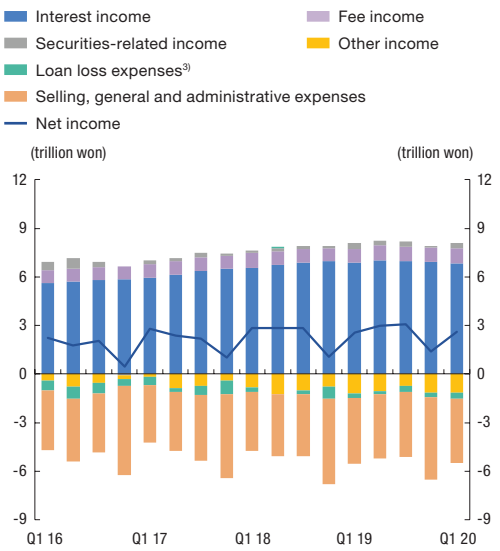
In the first quarter of 2020, banks' return on assets (ROA) fell 0.04%p to 0.58% (annualized basis). The structural profitability ratio, measuring banks' capacity to generate profits in a sustainable manner, also declined by 0.06%p on a year-on-year basis to 0.90% in the same period (annualized basis) (Figure Ⅲ-7).

Commercial banks' net income increased slightly (+0.1 trillion won) to 2.6 trillion won during the first quarter of 2020. Of the factors contributing to the change in net income, although declining interest rates pushed the net interest margin down to the lowest level ever recorded, interest income was maintained roughly at the same level as last year (6.9 trillion won) thanks to the increase in interest-earning assets.[7] Meanwhile, loan loss expenses, amounting to 0.4 trillion won, showed a small year-on-year increase (+0.1 trillion won) (Figure Ⅲ-8).

6) According to the current criteria for the classification of asset soundness (「Banking Business Supervision Regulations」 <Appendix Table 3>), a loan is classified as "substandard" only when the length of delinquency exceeds three months. Given the loan payment deferral program and other financial support measures implemented in response to the COVID-19 pandemic, it is likely to take some time before insolvencies among vulnerable households and companies become actualized.

7) As a result of the Bank of Korea's Base Rate cut (March 16, 1.25% → 0.75%), commercial banks' net interest margin fell from 1.68% in the first quarter of 2019 to 1.53% in the first quarter of 2020. Meanwhile, banks' won-denominated interest-earning assets (average balance basis) recorded a year-on-year increase of 8.4% at the end of the first quarter of 2020 on the solid growth in loan assets.

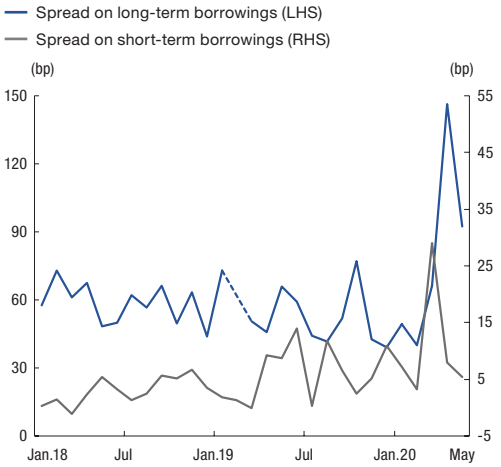
Figure Ⅲ-8. Commercial bank net income composition[1)2)]



Notes: 1) Loan loss reserves excluded.
2) During the period basis.
3) Including bad debt expenses, net provisions transferred, and profits and losses from loan sales and purchases.

Sources: Commercial banks' business reports.

Figure Ⅲ-9. Commercial bank short- and long-term foreign currency borrowing spreads[1)2)3)]



Notes: 1) Borrowing spreads based on LIBOR (average of the spreads borne by Kookmin, Shinhan, Woori and Hana Banks weighted by the amounts of their US dollar borrowings).
2) Excluding borrowings between domestic financial institutions, inter-office borrowings (between head office and foreign branches) and overnight (O/N) borrowings.
3) The dotted line indicates the period when data (spread on long-term borrowings in February 2019) was unavailable due to the lack of borrowing records.

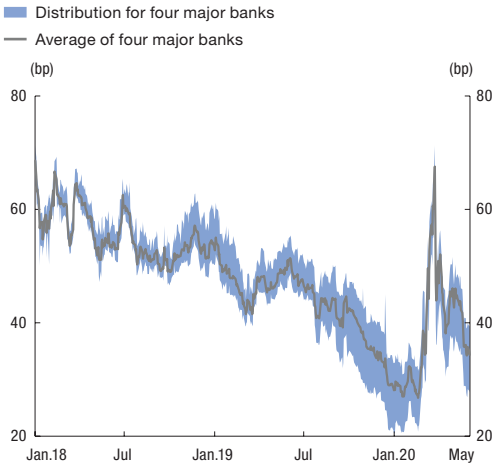
Source: Bank of Korea.

Brief deterioration of overseas foreign currency funding conditions

At the onset of the COVID-19 outbreak in late February, commercial banks' overseas foreign currency funding conditions quickly deteriorated, after which they gradually stabilized, starting with short-term funding. In March, short-term foreign currency borrowing spreads sharply increased for a brief period of time, but dropped to the previous level as the Korea-US currency swap arrangement helped improve foreign currency liquidity conditions. Long-term foreign currency borrowing spreads also widened substantially during April on the decreased demand for medium- and long-term bonds, but narrowed significantly in May (Figure Ⅲ-9).

Commercial bank's CDS premia began a steep upward climb from late February as global investor sentiment was dampened by the COVID-19 outbreak. However, thanks to aggressive policy responses in major countries and a slowdown in the spread of the COVID-19, CDS premia were brought down in May to the level seen in the fourth quarter of last year (Figure Ⅲ-10).

Figure Ⅲ-10. Commercial bank[1] CDS premia[2]



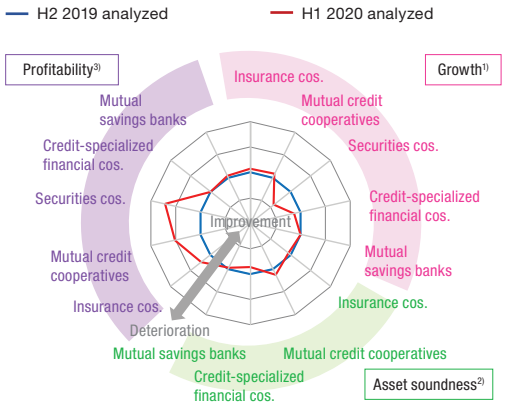
Notes: 1) Based on Kookmin, Shinhan, Woori and Hana Banks.
2) 5-year maturity basis.
Source: Markit.

2. Non-Bank Financial Institutions

The financial soundness of non-bank financial institutions ("NBFIs" hereafter) has remained mostly satisfactory. Amid continuous asset growth, the asset soundness of NBFIs was also generally adequate, but profitability showed a deterioration in most sectors.

Going forward, related developments should be carefully monitored, as a delay in economic recovery could lead to a further deterioration in the profitability of NBFIs, which have a high share of vulnerable borrowers (Figure Ⅲ-11).

Figure Ⅲ-11. Map of changes in NBFI financial soundness conditions

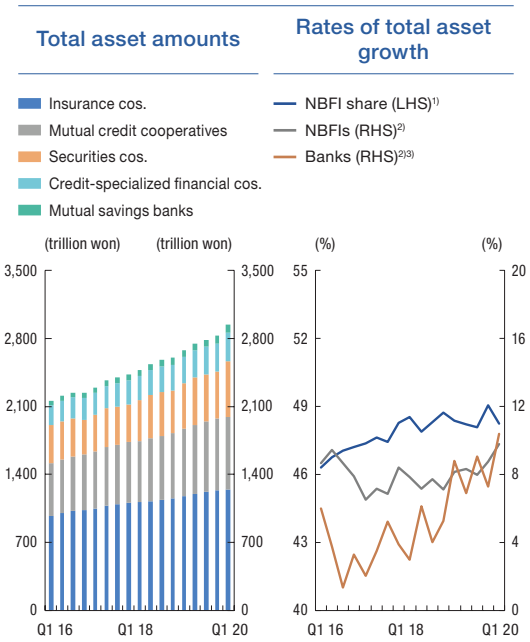


Notes:1) Rate of increase in total assets; extent of change in Q4 2019-Q1 2020 compared to Q2-Q3 2019 indexed.
2) Delinquency rate; extent of change at end-Q1 2020 compared to end-Q3 2019 indexed.
3) Return on assets (ROA); extent of change in Q4 2019-Q1 2020 compared to Q2-Q3 2019 indexed.
Sources: Financial institutions' business reports.

Continuous asset growth

NBFIs' assets grew by 9.8% year on year to 2,942 trillion won at the end of the first quarter of 2020, continuing the upward trend from previous periods. However, as banks' assets (10.4%) grew faster than those of NBFIs during this period, their share in the total assets of the financial sector as a whole[8] (6,100 trillion won) dropped slightly from the same period of the previous year (48.4%) to 48.2% at the end of the first quarter of 2020 (Figure Ⅲ-12).

Figure Ⅲ-12. NBFI total assets

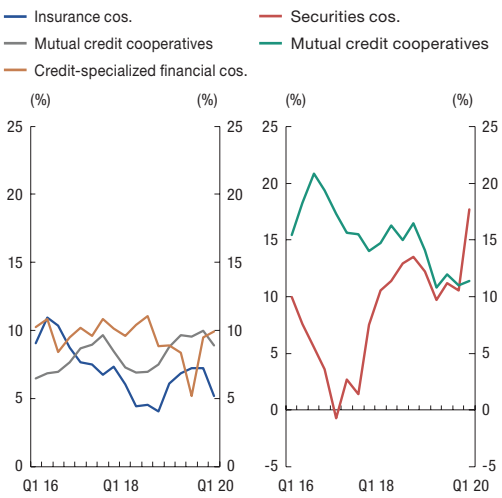


Notes: 1) Total assets of NBFIs / (Total assets of banks + Total assets of NBFIs).
2) Year-on-year basis.
3) Including commercial banks, specialized banks and foreign bank branches.
Sources: Financial institutions' business reports.

By sector, securities companies' assets recorded a particularly massive year-on-year increase of 17.7% at the end of the first quarter of 2020. This was mainly due to the increase in individual investors' deposits and additional margin deposits on equity-linked securities (ELS) after the start of the COVID-19 outbreak,[9] rather than to an increase in investment by securities companies. Mutual savings banks' assets surged to year-on-year growth of 11.4% on a continuous increase in SME loans. The assets of credit-specialized financial companies expanded by 9.4%, driven by card loans. The assets of mutual credit cooperatives grew by 8.9%, boosted by increased corporate loans. Insurance companies' assets expanded by only 5.2% due to a decline in the number of new policyholders and an increase in policy cancellations[10] (Figure Ⅲ-13).

8) Encompassing banks and NBFIs, with commercial banks, specialized banks and domestic branches of foreign banks included among banks.
9) After the COVID-19 outbreak, massive amounts of undeployed funds entered the stock market, causing investors' deposits to jump by 53.1% year on year. Meanwhile, as plunging stock markets in major countries led to ELS-related margin calls, increasing margin requirements on overseas derivatives by 246.7%, investors' deposits rose by 51.1%.
10) In January to February this year, life insurance companies' new policy sales fell by 2.7% year on year on a value basis, while the refunds of surrenders increased by 2.1%.

Figure Ⅲ-13. NBFI rates of total asset growth,[1] by sector[2]



Notes: 1) Year-on-year basis.
2) Excluding accounts receivable for securities companies.
Sources: Financial institutions' business reports.

Meanwhile, the assets of mutual credit cooperatives (excluding MG community credit cooperatives) recorded a year-on-year increase of 7.3% at the end of April this year, the same rate as in the previous month. Mutual savings banks' assets expanded 14.5%, a slightly faster rate than in March, driven in part by corporate loans.

Satisfactory level of asset soundness

The asset soundness of NBFIs has maintained at a generally satisfactory level, with the delinquency rate and substandard-or-below loan ratio dropping for most sectors. However, the asset soundness of mutual credit cooperatives suffered as both the delinquency rate and substandard-or-below loan ratio edged up.

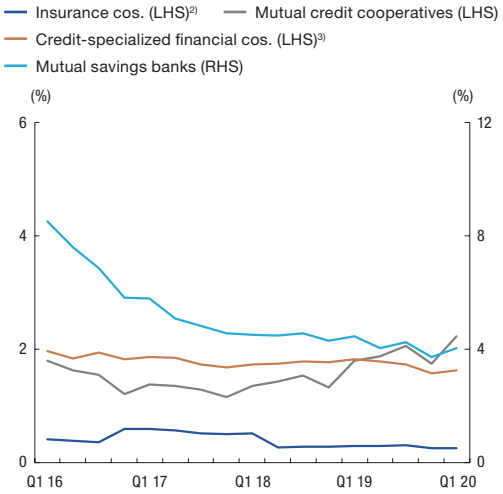
At the end of the first quarter of 2020, the delinquency rate and substandard-or-below loan ratio of mutual savings banks stood at 4.04% and 4.71%, respectively, down by 0.43%p and 0.50%p, over the same period last year. The delinquency rate and substandard-or-below loan ratio of insurance companies also dropped by 0.04%p and 0.09%p to 0.26% and 0.17%, respectively, year on year. In the case of credit-specialized financial companies, while the substandard-or-below loan ratio rose by 0.10%p to 1.71%, the delinquency rate dropped by 0.21%p to 1.62%.

On the other hand, both the delinquency rate and the substandard-or-below loan ratio of mutual credit cooperatives increased, by 0.43%p and 0.47%p to 2.23% and 2.29%, respectively, at the end of the first quarter of 2020, with corporate loans accounting for much of this change.[11] The continuous rise in the delinquency rate on corporate loans, in particular, warrants attention. By industry, the delinquency rate rose more sharply on loans to construction and real estate-related sectors[12] (Figure Ⅲ-14, Figure Ⅲ-15, Figure Ⅲ-16).

11) At the end of the first quarter of 2020, mutual credit cooperatives' delinquency rate on household loans and corporate loans recorded an uptick of 0.21%p (1.59% → 1.80%) and 0.69%p (2.50% → 3.19%), respectively, from the same period of the previous year. By borrower type, the delinquency rate of corporate loans edged up by 0.50%p (3.33% → 3.83%) for corporations and 0.61%p (1.95% → 2.56%) for sole proprietors.

12) By industry, mutual credit cooperatives' delinquency rate rose by 1.28%p (3.13% → 4.41%) for construction loans, 0.78%p (2.09% → 2.87%) for real estate loans, and 0.36%p (2.62% → 2.98%) for wholesale & retail trade loans, while it dropped by 0.25%p (4.37% → 4.12%) for manufacturing loans and 0.06%p (2.59% → 2.53%) for accommodation & food service loans.

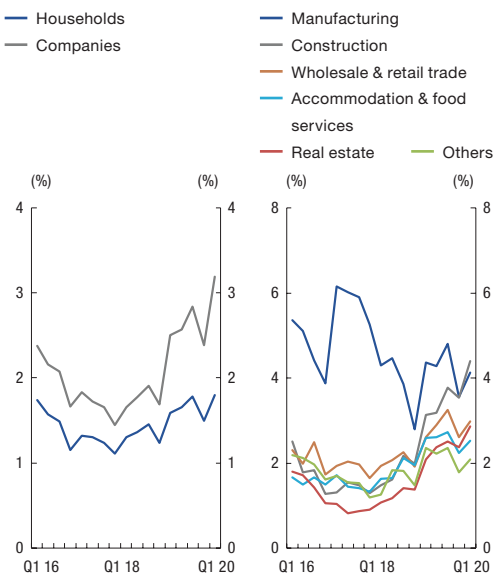
Figure Ⅲ-14. NBFI delinquency rates,[1] by sector



Notes: 1) Based on delinquencies of one month and longer (for mutual credit cooperatives and mutual savings banks, principal delinquencies of one day and longer or interest delinquencies of one month and longer).
2) Excluding insurance contract loans.
3) Including card (excluding merchandise credit), installment and lease assets.
Sources: Financial institutions' business reports.

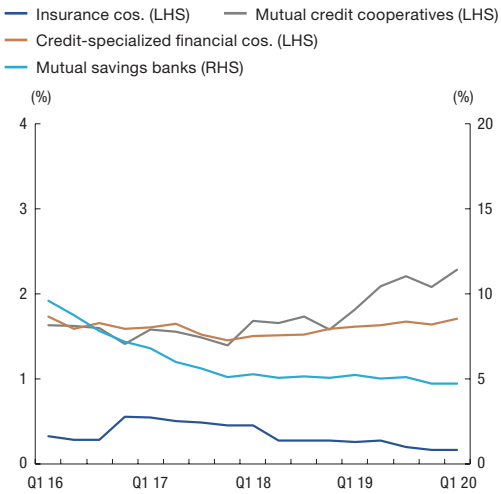
Meanwhile, the delinquency rate of mutual credit cooperatives (excluding MG community credit cooperatives) was unchanged from the end of March to stand at 2.09% at the end of April, while that of mutual savings banks rose by 0.19%p to 4.23% among mutual savings banks over the same period.[13]

Figure Ⅲ-15. Mutual credit cooperative delinquency rates of loans



Note: 1) Based on corporate loans.
Sources: Financial institutions' business reports.

Figure Ⅲ-16. NBFI substandard-or-below loan ratios, by sector



Sources: Financial institutions' business reports.

13) Compared to mutual credit cooperatives and other NBFIs, mutual savings banks have a higher share of borrowers with low credit ratings and a lower share of borrowers with high credit ratings.

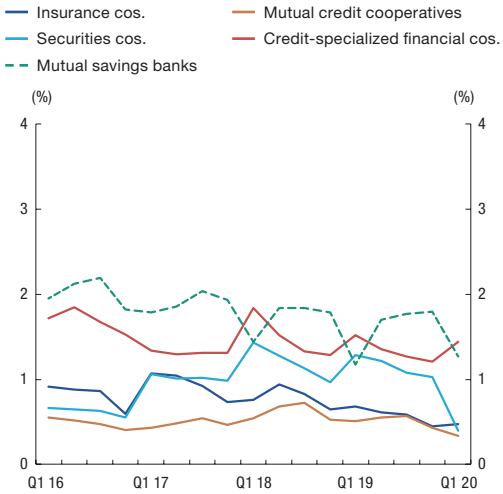
Decline in profitability

The profitability of NBFIs appears to have slipped somewhat with the exception of mutual savings banks.

In the first quarter of 2020, securities companies' return on assets (ROA) recorded the sharpest year-on-year decrease (-0.88%p) of all NBFIs to stand at 0.40%. This was mainly due to a significant increase in losses[14] related to derivatives-linked securities like ELS caused by a sharp fall in the global stock indexes. Insurance companies' ROA fell by 0.21%p year on year to 0.47% on the increase in claim payments[15] among other factors. The ROA of mutual credit cooperatives decreased by 0.18%p to 0.33%. The ROA of credit-specialized financial companies (1.46%) dropped by 0.05%p year on year as a result of decreased revenue from credit sales.

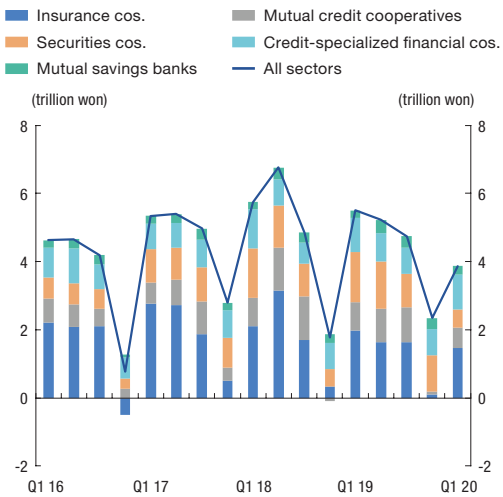
On the other hand, the ROA of mutual savings banks rose by 0.10%p on a year-on- year basis to 1.27% during the first quarter of 2020, boosted by an increase in interest income (Figure Ⅲ-17, Figure Ⅲ-18).

Figure Ⅲ-17. NBFI ROAs[1]



Note: 1) Accumulated quarterly incomes annualized.
Sources: Financial institutions' business reports.

Figure Ⅲ-18. NBFI net incomes[1]



Note: 1) During the quarter basis.
Sources: Financial institutions' business reports.

14) In the first quarter of 2020, securities companies' operating income related to derivatives-linked securities decreased by nearly 0.9 trillion won from 0.2 trillion won in the first quarter of 2019 to stand at negative 0.7 trillion won.
15) In the first quarter of 2020, insurance companies' total claim payments increased by 11.1% year on year, outpacing the rate of increase in premium income (5.4%).

Box 4.

Examination of Key Risk Factors of Non-Bank Financial Institutions

The extent of the shock of the COVID-19 pandemic on the financial sector and the economy is, to a large degree, dependent on the future development of the pandemic, but its impact is expected to exert an influence on the financial system for a considerable period of time. In particular, as non-bank financial institutions ("NBFIs" hereafter) are more vulnerable[1] than banks, they are likely to be more affected by the pandemic.

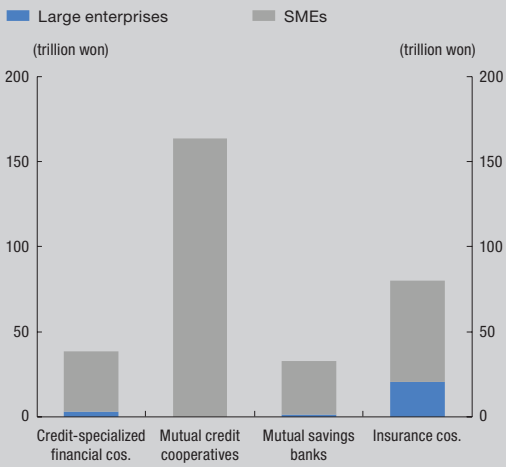
In what follows, we analyze NBFIs' exposure to major risks (credit, market and liquidity risks) and factors that affect their vulnerability to these risks.

Credit risk: expansion of the share of corporate loans to vulnerable sectors, such as small and medium-sized enterprises and sole proprietors.

Although the financial market instability observed in the early phase of the COVID-19 pandemic has subsided, credit risks,[2] such as non-performing loans caused by the reduction of household income and sluggish corporate revenue amid deepening economic recessions at home and abroad, are likely to emerge as major risk factors facing NBFIs going forward.

As of the end of March 2020, the balance of corporate loans[3] extended by NBFIs amounted to 321.7 trillion won, of which loans to small and medium-sized enterprises ("SMEs" hereafter, 169.3 trillion won) and sole proprietors (120.5 trillion won), which are relatively vulnerable to economic downturns, accounted for the majority (90.1%). When the extension of the maturity periods of existing loans and deferment of interest payments that were offered to SMEs and small merchants in response to COVID-19 expire, non-performing loans, mainly to vulnerable borrowers, may increase.

Corporate loans, by borrower type[1]

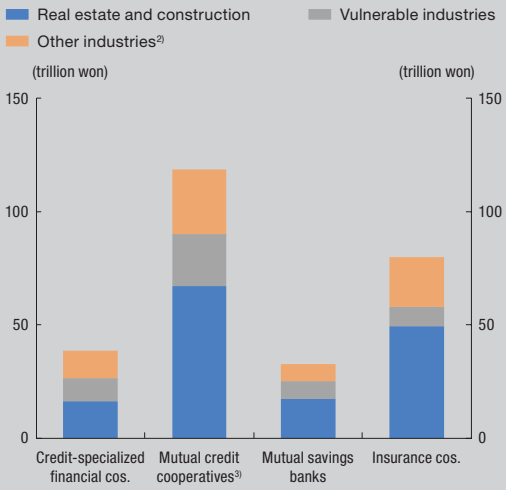


Note: 1) End-March 2020 basis.
Sources: Financial institutions' business reports, Bank of Korea staff calculations.

1) NBFIs are considered to have less loss absorption capacity than banks, in part due to their smaller capital.
2) Major components of credit risk exposure include exposure to loans and exposure to financial products and alternative investments. This section analyzes exposure to loans. Exposures to financial products and alternative investment are analyzed in the market risk section, as they are closely related to market risk.
3) This is the sum of loans extended by mutual credit cooperatives, insurance companies, mutual savings banks, and credit-specialized financial companies. Loans extended by securities companies (46.2 trillion won) were not included as they are relatively small and cannot be divided by type of borrower.

By industry, loans to vulnerable industries[4] that are more prone to the effects of the pandemic accounted for 18.4% of total corporate loans, which is not a large proportion, but loans to the real estate and construction industries occupied 55.6%, raising the possibility that these loans may rapidly turn sour if the deterioration of economic conditions leads to a price adjustment of commercial real estate.[5] Moreover, NBFIs have increased[6] their share of loans to companies with lower credit ratings, thus introducing greater vulnerability to the credit ratings of businesses.

Corporate loans, by industry[1]



Notes: 1) End-March 2020 basis.
2) Excluding loans to financial and insurance companies.
3) Excluding MG commodity credit cooperatives.
Sources: Financial institutions' business reports.

Meanwhile, household loans by NBFIs (households credit statistics basis) amounted to 572.5 trillion won as of the end of March 2020. Due to the higher share[7] of loans to borrowers with lower credit standings, NBFIs are vulnerable to household credit risks. By type of financial institution, the shares of mutual savings banks and credit-specialized financial companies were more prominent, at 23.7% and 13.2%, respectively.

Proportions of household loans by NBFIs, by credit rating (end-April 2020)

(%)

	Mutual savings banks	Credit -specialized financial cos.	Mutual credit cooperatives	Insurance cos.	Total
High credit ratings (grades 1-3)	11.4	41.8	65.0	68.9	58.4
Middle credit ratings (grades 4-6)	64.8	45.1	27.8	25.5	32.7
Low credit ratings (grades 7-10)	23.7	13.2	7.2	5.6	9.0

Source: NICE Investors Service.

Market risk: rising risks of overseas investment and alternative investments

The market risk of NBFIs has moderated as financial markets have recently regained stability, but it may surge again as the volatility of financial markets moves in tandem with the develop-

4) The scope of vulnerable industries was limited to the wholesale & retail trade, accommodation & food services, arts, sports & recreation related services, and transportation & storage industries due to the insufficiency of industry type classifications for corporate loans in NBFIs' business reports.
5) As of the end of March 2020, of corporate loans extended by NBFIs (excluding mutual savings banks and MG commodity credit cooperatives), loans secured through collateral other than housing, such as retail store loans, stood at 135.3 trillion won, or 55.4% of all corporate loans.
6) The share of NBFIs' loans to corporations that publicly disclose their annual financial statements, are subject to external audit, and have lower credit ratings (NICE credit rating level 7 and below) grew from 42.3% at the end of 2015 to 49.6% at the end of 2018. Meanwhile, the share of bank loans to businesses with lower credit ratings declined from 48.3% to 41.3% during the same period.
7) The share of household loans extended by NBFIs to borrowers with lower credit ratings (credit rating grade 7 and below) was 9.0% at the end of April 2020, higher than the 2.2% for banks.

ment of the pandemic. The market exposure[8] of NBFIs stood at 1,266.4 trillion won as of the end of March 2020, comprising investment in financial products (1,045.4 trillion won) and alternative investments[9] (221.0 trillion won). Of investment in financial products, investment in overseas securities including bonds,[10] driven by insurance companies, is growing rapidly, thereby raising the possibility of market risk contagion from overseas financial markets as well as foreign currency funding risks.[11] As for alternative investments, the share of domestic and overseas real estate investment[12] is significant, intensifying the impact of real estate business conditions on market risk.

Amount of NBFIs' investment in financial products (end-March 2020)

(trillion won)

		Insurance cos.	Securities cos.	Credit-specialized financial cos.	Mutual credit cooperatives[1]	Mutual saving banks	Total
Bonds	Government and public bonds	248.6	55.3	0.1	0.4	0.3	304.8
	Special bonds	132.2	63.8	0.6	1.5	0.2	357.4
	Corporate bonds and financial bonds	68.6	90.5				
Stocks		34.7	12.9	2.1	0.03	0.3	50.0
Other securities[2]		98.5	46.9	10.5	4.8	1.2	162.0
Overseas securities		146.3	24.7	0.1	-	0.0	171.1
Total		728.9	294.2	13.4	6.8	2.0	1,045.4

Notes: 1) Excluding MG commodity credit cooperatives.
2) Beneficiary certificates, CP, etc.
Sources: Financial institutions' business reports.

Among NBFIs, insurance companies have a larger share of securities out of total assets, and securities companies[13] have a smaller share of government and public bonds, which are highly liquid safe assets, and a larger share of investment in stocks and credit bonds, such

8) Market risk exposure is largely divided into investment in traditional financial instruments, such as stocks and bonds, and alternative investments in real estate, etc.

9) This figure is the sum of the alternative investments of securities companies as of the end of September 2019 and those of insurance companies as of the end of June 2019.

10) Investment in overseas securities soared by 236.6%, jumping from 50.8 trillion won at the end of 2014 to 171.1 trillion won at the end of March 2020, and its share of total investment in financial products rose from 7.4% to 16.4% during the same period.

11) For insurance companies, which dominate overseas bond investment, the share of short-term foreign currency borrowing using FX swaps is estimated to have been around 30 to 40% of total foreign currency funding as of the end of June 2019.

12) Investment in domestic and foreign real estate amounted to 89.2 trillion won (domestic: 67.1 trillion won, foreign: 22.1 trillion won), or 40.3% of total alternative investments.

13) As of the end of March 2020, the share of government and public bonds out of total investment in financial products was 18.8% for securities companies and 34.1% for insurance companies. The share of investment in credit bonds, stocks, and beneficiary certificates was 51.1% for securities companies and 27.7% for insurance companies.

as corporate bonds. Thus, the market risks of insurance companies and securities companies are deemed to be relatively greater. In particular, as securities companies funded investment in financial products using short-term leverage such as RPs to increase their rate of return, their risk of market losses soared. Moreover, of their alternative investments, securities companies have a higher share of debt guarantees (credit provision[14]) for real-estate PF-ABCP, which carries relatively greater risk than other types of alternative investments, and risks related to their investment in overseas real estate are growing as a result of the deterioration of property markets overseas.

Alternative investment by securities companies and insurance companies

(trillion won)

	Securities cos.[1]	Insurance cos.[2]	Total
Domestic investment (real estate)	40.4 (38.1)	130.8 (29.0)	171.2 (67.1)
Overseas investment (real estate)	16.5 (11.1)	33.2 (11.0)	49.8 (22.1)
Total	57.0 (49.2)	164.0 (40.0)	221.0 (89.2)

Notes: 1) End-September 2019 basis.
2) End-June 2019 basis.
Sources: Financial Supervisory Service, financial institutions' business reports.

Liquidity risk: persistent wholesale funding risk of securities companies and credit-specialized financial companies

NBFIs' wholesale funding, which constitutes one of their main liquidity risks,[15] stood at 276.2 trillion won, dominated by credit-specialized financial companies (65.1% of total wholesale funding of NBFIs) and securities companies (32.3%).[16] Meanwhile, mutual credit cooperatives, mutual savings banks, and insurance companies, institutions that raise most of their funds through deposits and insurance premiums, which are stable means of funding, are deemed to have less liquidity risk.

Credit-specialized financial companies raise funds mainly through bonds (card bonds and capital company bonds). Notably, capital companies face growing vulnerability in terms of funding structure, as the share of funding in the money market is rising[17] as a result of the contraction of the market for capital company bonds with longer maturities due to the COVID-19 pandemic. In the second half of 2020, rollover risks related to maturing wholesale funds, such as bonds issued by credit-specialized financial companies and CP, are expected to reach 30.9 trillion won as of the end of April 2020.

14) At the end of September 2019, securities companies' debt guarantees for real estate PF-ABCP amounted to 22.7 trillion won, accounting for 56.2% of their domestic alternative investments, and 85.5% of such debt guarantees was extended through credit provision. Debt guarantors that provide credit must underwrite PF-ABCP in the case of a downgrade of the credit ratings of underlying assets to guarantee the redemption of debts, thus bearing significant risks.

15) Liquidity risk arises mostly from a mismatch of maturities of borrowing and operation of funds. This section focuses on the liquidity risk associated with wholesale funding, which is a less secure means of funding.

16) At the end of March 2020, the share of wholesale funding out of total liabilities was 75.0% for credit-specialized financial companies and 19.8% for securities companies (excluding investors' deposits with securities companies), exceeding the share of other NBFIs (around 1%).

17) The share of funding through capital company bonds, CP, and short-term bonds with maturities of less than one year remained at around 30 to 40% from January 2019 to March 2020, but it soared to 64.3% in April 2020.

Securities companies are even more vulnerable to liquidity risk, due to the growing maturity mismatch between assets and liabilities associated with higher reliance on money markets (RP, CP, short-term bonds, and call money) for funding. The expected rollover risks of securities companies in the second half of 2020, excluding extra-short RPs and call money, totaled 10.7 trillion won as of the end of April 2020.

Wholesale funding of securities companies and credit-specialized financial companies (end-March 2020)[1]

(trillion won, %)

	Wholesale funding	Bonds	Short-term funds	RP sales	CP	Short-term corporate bonds	Call money
Securities cos.	89.3 (100.0)	17.3 (19.4)	71.9 (80.6)	40.6[2] (45.4)	16.1 (18.0)	9.3 (10.4)	6.0 (6.7)
Credit-specialized financial cos.	179.9 (100.0)	162.2 (90.2)	17.6 (9.8)	0.01 (0.01)	16.9 (9.4)	0.8 (0.4)	-

Notes: 1) ( ) indicates share within wholesale funding.
2) Excluding RP selling related to customer asset management such as CMA.
Sources: Financial institutions' business reports, KOSCOM.

Securities companies have a smaller share of cash and cash equivalents[18] (20.7 trillion won) out of their total assets, and a higher share of less liquid assets such as credit bonds. In addition, contingent liabilities such as real estate PF-ABCP and overseas real estate that were not sold down are also emerging as factors increasing liquidity risk.[19] Furthermore, securities companies experienced serious liquidity deterioration due to the sharp increase in margin[20] related to ELS amid the fall of overseas stock prices in the early phase of the COVID-19 pandemic, and have since continued to issue ELS.[21] Should overseas stock prices tumble again, the liquidity risk of securities companies may reemerge.

Assessment

NBFIs need to monitor credit risks associated with the economic downturn, as corporate loans to vulnerable sectors have increased dramatically. In particular, the escalating credit risk is making financial markets more volatile and may work as a factor rekindling market and liquidity risks.

Moreover, as NBFIs sought higher yields amid the protracted low-yield environment, they quickly increased overseas bonds investment and alternative investment in domestic and overseas real estate. Hence, overseas financial markets and real estate markets at home and abroad have emerged as factors elevating market risks.

18) Cash and cash equivalents excluded margins for derivatives transactions. As of the end of March 2020, the ratio of cash and cash equivalents to short-term wholesale funding was 28.8%.
19) Securities companies' investment in PF-ABCP and overseas real estate are sold down to institutional investors, in which case securities companies do not bear a large funding burden. However, under adverse market conditions, securities companies must fund the entire amount of their investments, raising the funding amount.
20) This is the case of securities companies hedging ELS on their own (48.7 trillion won, as of end of March 2020, or 66.2% of the total outstanding balance of ELS issued). The aggregate balance of their margin accounts soared from 6.5 trillion won at the end of February 2020 to 12.9 trillion won at the end of March 2020, as a result of meeting margin calls after the sharp plunge of overseas stock prices in March.
21) From March to April of 2020, securities companies issued ELS worth 9.7 trillion won with higher coupons of 7 to 10%.

After steady growth,[22] NBFIs could serve as a channel for the spread of systemic financial risks amid the COVID-19 pandemic. In particular, securities companies, which rely on money market funding,[23] are key entities in the interconnectedness among financial institutions and could thus act as a channel for the transmisison of major risks. Accordingly, policy authorities need to prepare appropriate policy responses while keeping an eye on the major risk factors for NBFIs.

Risk assessment by NBFI sector

	Liquidity risk	Credit risk	Market risk
Securities cos.	High	Medium	High
Credit-specialized financial cos.	High	High	Low
Insurance cos.	Low	Medium	High
Mutual credit cooperatives	Low	High	Low
Mutual savings banks	Low	High	Low

22) The ratio of a narrow measure of non-bank financial intermediation to nominal GDP rose from 34.4% at the end of 2011 to 52.6% at the end of 2018.

23) Securities companies' borrowings from financial institutions (based on the flow of funds statistics) amounted to 287.6 trillion won at the end of 2019, or 12.4% of the total borrowings of institutions. In particular, securities companies are major borrowers in the money market, accounting for 53.9% of institutional RP transactions and 58.4% of call money at the end of March 2020.

3. Interconnectedness

Financial institutions' interconnectedness through their raising and operation of funds expanded in 2019. The expanded volume of mutual transactions[16] caused the proportion of total mutual transactions relative to total financial sector assets to rise from the end of the previous year. Although the default contagion risk among financial sectors declined slightly from the end of the previous year, the risk among banks showed a moderate increase. Concentration risk also increased slightly, centered on the banking sector.

Accelerated growth in mutual transactions

The volume of mutual transactions among financial institutions has grown at an accelerated pace, jumping 14.1% year on year to 2,678 trillion won at the end of 2019.[17] The share of mutual transactions in the total assets (8,191 trillion won, flow of funds statistics basis) of the overall financial sector also increased 1.2%p from the end of the previous year (31.5%) to 32.7%.

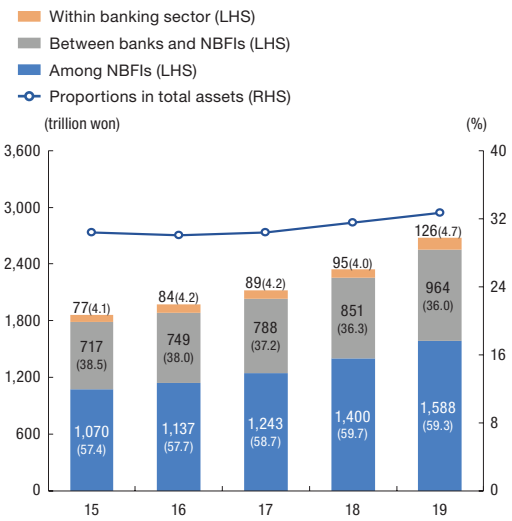
Among the sub-categories of mutual transactions in the financial sector—those among banks, those between banks and NBFIs, and those among NBFIs—the volume of transactions among banks grew at the fastest rate from the end of the previous year, recording growth of 32.4%.[18] Mutual transactions among NBFIs grew by 13.4% and transactions between banks and NBFIs by 13.3%. As a result, the share of transactions among banks in total mutual transactions climbed from 4.0% at the end of 2018 to 4.7% at the end of 2019. On the other hand, the share of transactions among NBFIs fell from 59.7% to 59.3%, and that of transactions between banks and NBFIs from 36.3% to 36.0% over the same period (Figure Ⅲ-19).

16) Estimated based on data from key survey questionnaires used for the compilation of the flow of funds statistics—financial assets and liabilities tables, cash and deposit statements, borrowings statements and securities holdings statements, etc.—by classifying products into 48 categories, including deposits, loans and derivatives, and institutions into 19 individual banks, 34 types of financial institutions, and 9 other sectors. For details, refer to the Financial Stability Report (December 2016), <Analysis of Financial Stability Issues> 「III. Analysis of Banking System Interconnectedness, and Measurement of Cross-sectional Systemic Risk」 (page 122).

17) The year-on-year increase of mutual transactions between financial institutions has been accelerating, from 5.8% at the end of 2016 → 7.6% at the end of 2017 → 10.7% at the end of 2018 → 14.1% at the end of 2019.

18) This rate of increase, far surpassing that in 2018 (7.2%), is mainly explained by the increase in bond transactions between banks (62.5 trillion won in 2018 → 78.4 trillion won in 2019), centered on commercial banks' investment in special banks' bonds.

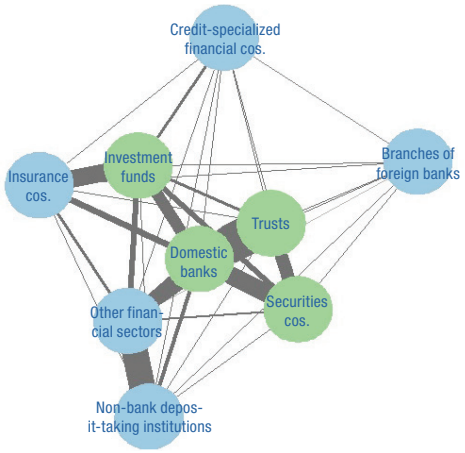
Figure Ⅲ-19. Mutual transactions among financial institutions and across sectors[1)2)]



Notes: 1) Mutual transaction amounts are on an end-period basis (flow of funds statistics).
2) Figures within parentheses are the proportion of the total amount of mutual transactions.

Source: Bank of Korea.

Figure Ⅲ-20. Financial sector interconnectedness map[1)2)3)4)]



Notes: 1) ● indicate the four highest-ranked financial sectors in terms of their mutual transaction volumes.
2) Interconnectedness map using network visualization analysis, with centrality, concentrations and line thicknesses all proportional to the mutual transaction volumes.
3) "Trusts" refers to trust accounts of banks, securities and insurance companies; "Non-bank deposit-taking institutions" to MG community credit cooperatives, credit unions, mutual savings banks, etc.; and "Other financial sectors" to public financial institutions, holding companies, the national federations of each non-bank deposit-taking institution, etc.
4) End-2019 basis.

Source: Bank of Korea.

By financial institution type, domestic banks, trusts, securities companies and investment funds appeared to play a key role in mutual transactions. At the end of 2019, the amount of mutual transactions between domestic banks and trusts was the highest at 244.1 trillion won, followed by, in decreasing order, that between domestic banks and securities companies (173.2 trillion won), between insurance companies and investment funds (168.1 trillion won) and between securities companies and trusts (141.9 trillion won)[19] (Figure Ⅲ-20).

Looking at the mutual transactions across financial sectors based on the products involved, mutual transactions were carried out mainly in deposits, bonds and stocks. As of the end of 2019, the shares of deposits and stocks in total transactions between financial institutions rose by 0.3%p from a year earlier to 24.1% and 20.3%, respectively. On the other hand, the share of bond in total mutual transactions fell by 0.8%p to 22.5%. The shares of loans, RPs and derivatives maintained generally low levels (Table Ⅲ-1).

19) As of the end of 2019, the highest increase in mutual transactions from the end of the previous year was recorded between domestic banks and trusts at 37.8 trillion won, followed by, in decreasing order, that within the banking sector (30.8 trillion won), between insurance companies and investment funds (27.3 trillion won), between domestics banks and investment funds (17.5 trillion won) and between securities companies and investment funds (17.3 trillion won).

Table Ⅲ-1. Volumes of mutual transactions among financial sectors, by product

(trillion won, %, %p)

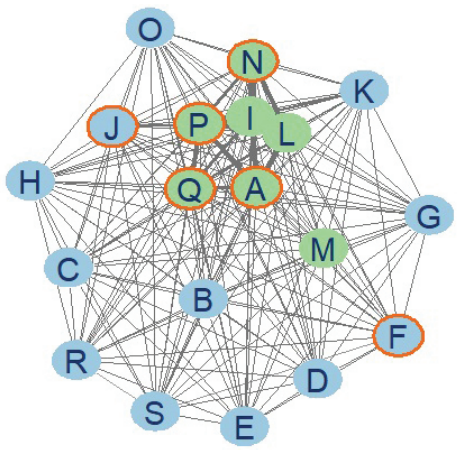
Product	End-2018		End-2019		B-A
	Amount	Share (A)	Amount	Share (B)	
Deposits	558.0	23.8	645.2	24.1	0.3
Bonds	545.9	23.3	602.3	22.5	-0.8
Stocks[1)]	469.2	20.0	544.3	20.3	0.3
Loans	123.4	5.3	136.3	5.1	-0.2
Repos	114.8	4.9	141.9	5.3	0.4
Derivatives	53.6	2.3	61.1	2.3	0.0

Note: 1) Including investment fund shares, equity-linked securities (ELS), etc.

Source: Bank of Korea.

Meanwhile, the structure of interconnectedness among domestic banks showed a high volume of transactions among some nationwide banks and specialized banks (Figure Ⅲ-21).

Figure Ⅲ-21. Domestic banking sector interconnectedness map[1)2)3)]



Notes: 1) Interconnectedness map using network visualization analysis, with centrality, concentrations and line thicknesses all proportional to the mutual transaction volumes.
2) ○ indicate D-SIBs, and ● the seven highest-ranked banks in terms of their mutual transaction volumes.
3) End-2019 basis.

Source: Bank of Korea.

By type of financial product, the share of bonds in total mutual transactions between domestic banks was the highest at 62.3% and also increased at the highest rate (4.7%p) from the end of the previous year. On the other hand, the share of loans dropped 1.9%p to 19.0% (Table Ⅲ-2).

Table Ⅲ-2. Volumes of mutual transactions among domestic banks, by product

(trillion won, %, %p)

Product	End-2018		End-2019		B-A
	Amount	Share (A)	Amount	Share (B)	
Bonds	62.5	57.6	78.4	62.3	4.7
Loans	22.7	20.9	23.9	19.0	-1.9
Derivatives	4.2	3.8	5.5	4.4	0.6
Deposits	5.1	4.7	3.9	3.1	-1.6
Stocks	4.0	3.7	3.9	3.1	-0.6

Source: Bank of Korea.

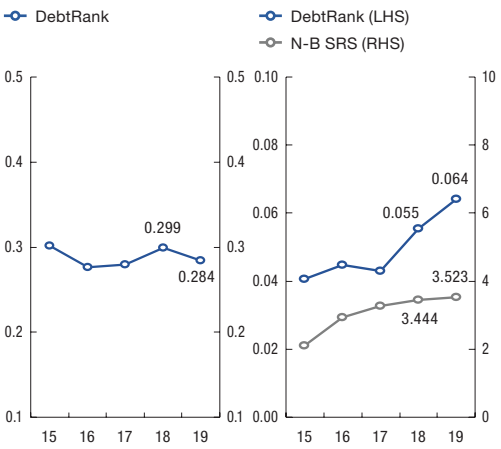
Slight rise in interbank default contagion risks

The results of an analysis based on the structure of mutual transactions in the financial sector suggest that default contagion risk across financial sectors declined slightly from the level at the end of 2018, while that within the banking sector increased slightly. Concentration risk also showed a moderate increase, much of which was centered on the banking sector.

At the end of 2019, the Network-Based SRS (N-B SRS)[20] and DebtRank,[21] two default contagion risk indicators, recorded slight downticks from the end of the previous year for inter-financial sector risks, but a moderate upswing for inter-banking sector risks (Figure Ⅲ-22).

Figure Ⅲ-22. Default contagion risks[1]

Across financial sectors | Within banking sector

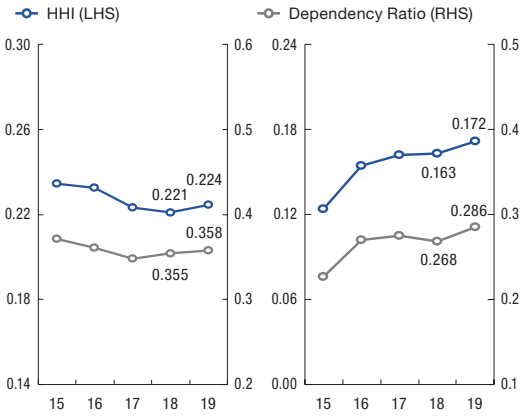


Note: 1) End-period basis.
Source: Bank of Korea.

Measures of concentration risk, the Herfindahl-Hirschman Index (HHI)[22] and the dependency ratio,[23] increased centered on the banking sector (Figure Ⅲ-23).

Figure Ⅲ-23. Concentration risk[1]

Across financial sectors | Within banking sector



Note: 1) End-period basis.
Source: Bank of Korea.

20) Network-Based SRS is the aggregate amount of the banking sector's risk, appearing when the probability of default of a specific bank expands through its exposures to mutual transactions with other banks, is defined as the square root of the bank's probability (%) of default multiplied by the amount (trillion won) of its mutual transactions with its transaction counterparties (Das, Sanjiv Ranjan. "Matrix Metrics: Network-Based Systemic Risk Scoring," 2015).

21) As the simple average of the ratio of the aggregate losses appearing when a shock from the insolvency of an individual sector (bank) spreads to its transaction counterparties through their mutual exposures, relative to total financial (banking) sector assets under management, a DebtRank of 0.05 means that losses following the insolvency of an individual sector (bank) will on average give rise to a loss of 5% of total financial (banking) sector assets under management (Battiston, Stefano, et al. "DebtRank: Too Central to Fail? Financial Networks, the Fed and Systemic Risk," 2012).

22) The HHI is the weighted average value of the summed squares of the individual sectors' (banks') proportions of their transactions with other sectors (banks), and indicates the level of dependence on a small number of transaction counterparties. The shares of transactions and the weight were calculated based on fund management transactions.

23) The Dependency Ratio is the weighted average value of the individual sectors' (banks') proportions of their transactions with the single sectors (banks) with which they have the largest amounts of transactions, and signifies the level of dependence on single transaction counterparty. The shares of transactions and the weight were calculated based on fund management transactions.

Ⅳ. Capital Flows

From January to May 2020, foreigners' domestic portfolio investment showed an outflow in stocks and an inflow in bonds. In March, as investor sentiment was dampened by the COVID-19 outbreak, there was a massive outflow of stock funds, but the size of outflows was reduced starting in April in reaction to policy actions taken by major countries. Inflows of bond funds continued at a solid pace, driven by public investment. Going forward, as external uncertainties, including US-China conflicts and the possibility of a second wave of COVID-19 cases, remain unabated, attention should be paid to the possible resurgence of volatility in foreign portfolio investment flows in the domestic securities markets.

The increase in overseas portfolio investment by residents slowed compared to the same period of 2019, due in part to reduced investment incentives, and shifted to net withdrawal in March, with much of this shift centered on bonds.

Net outflow of foreigners' domestic portfolio investment

From January to May 2020, foreigners' domestic portfolio investment[1] recorded a net outflow of 4.9 billion dollars (-20.9 billion dollars in stocks, 16 billion dollars in bonds). In February to May, the rapid deterioration of global investor sentiment,[2] hit by recession concerns amid the surge of COVID-19 cases worldwide, led to a massive outflow. In March, in particular, the outflow of stock investment reached 11.04 billion dollars, surpassing the intra-month record[3] set in August 2007 (-9.99 billion dollars). However, from April onward, the size of outflows started to shrink thanks to rapid policy actions taken by major countries.

Meanwhile, foreigners' domestic bond investment maintained a steady inflow in January to May. The inflow of bond investment, although reduced in February when massive amounts of bonds were redeemed at maturity,[4] increased at an accelerated pace in April, boosted by the continuously solid inflow of public investment funds and expanded arbitrage incentives. In May, the inflow of bond investment decreased in spite of a continuous inflow of public investment funds, as it was more than offset by an outflow of private investment (Figure Ⅳ-1).

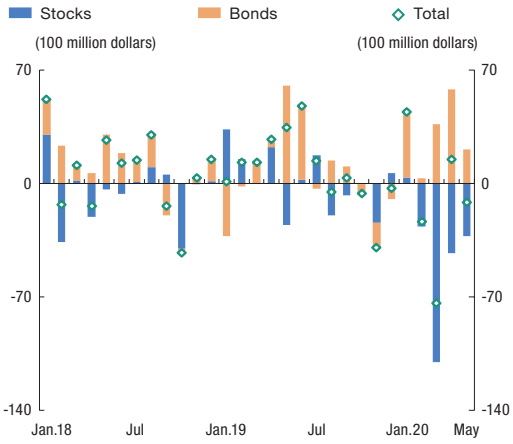
1) The stock investment considered includes exchange-traded and OTC transactions in KOSPI- and KOSDAQ-listed stocks, as well as initial public offerings (IPOs) (but excludes ETFs, ELWs, ETNs, etc.), while bond investment is based on exchange-traded and OTC transactions in listed bonds (reflecting repo transactions and the amounts reaching maturity).

2) The VIX, a proxy indicator of global investor sentiment (a rise means a worsening in investor sentiment, daily average of the corresponding month) sharply surged from 19.3 in February 2020 to 57.7 in March 2020 before it dropped to 41.5 in April and then 30.8 in May.

3) This outflow was the largest since statistics were first recorded in 2007.

4) In February 2020, 2.28 billion dollars worth of Monetary Stabilization Bonds were redeemed at maturity.

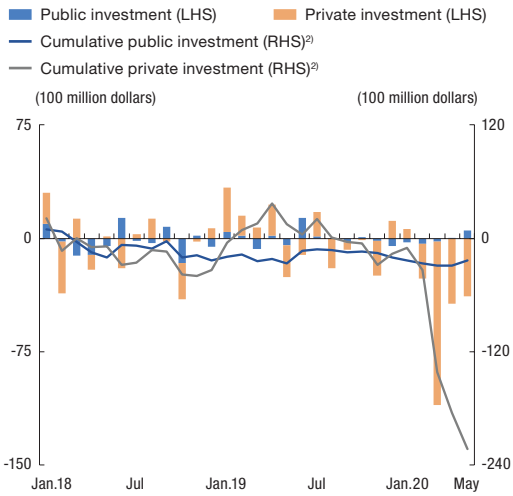
Figure Ⅳ-1. Changes in foreigners' domestic portfolio investment[1)]



Note: 1) A "+" means net inflow and a "-" net outflow.
Source: Bank of Korea.

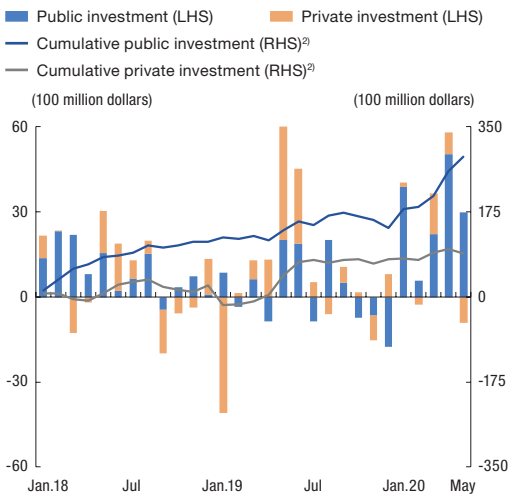
By investor type, the outflow of stock investment was led by private investment including global funds, and much of the inflow of bond investment was accounted for by public investment including sovereign wealth funds (Figure Ⅳ-2, Figure Ⅳ-3).

Figure Ⅳ-2. Net foreigners' stock investment inflows,[1)] by investor type



Notes: 1) A "+" means net inflow and a "-" net outflow.
2) Cumulative sums of monthly net inflows since January 2018.
Source: Bank of Korea.

Figure Ⅳ-3. Net foreigners' bond investment inflows,[1)] by investor type



Notes: 1) A "+" means net inflow and a "-" net outflow.
2) Cumulative sums of monthly net inflows since January 2018.
Source: Bank of Korea

As of the end of April 2020, the balance of foreigners' stock investment stood at 505 trillion won, representing 31.5% of stock market capitalization,[5)] a decrease of 1.8%p from the end of the previous year (33.3%). The balance of foreigners' bond investment amounted to 140.5 trillion won, corresponding to 7.3% of the total balance of listed bonds, an increase of 0.5%p from the end of the previous year (6.8%).

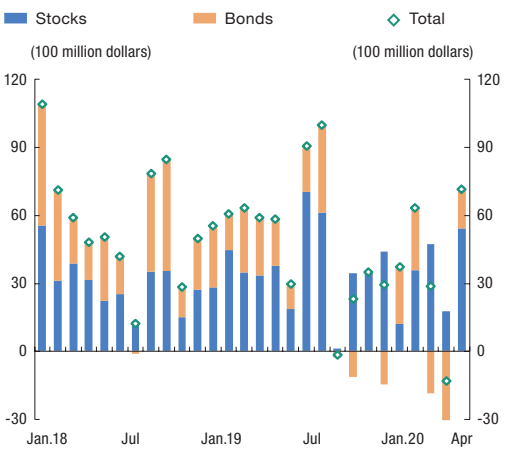
Although since April the volatility in capital flows has decreased from its peak in March on the continuous inflow of bond investment and reduced outflow of stock investment, external uncertainties, such as the possibility of a second wave of COVID-19, an escalation of conflicts between the US and China and the deepening of recessions in major countries, remain high and warrant attention.

5) The sum of the total market capitalizations of the KOSPI and KOSDAQ markets.

Slowing overseas portfolio investment by residents

From January to April 2020, overseas portfolio investment by residents increased by 15.0 billion dollars (15.5 billion dollars in stocks, -0.5 billion dollars in bonds), significantly less than the corresponding amount during the same period of the previous year (24.2 billion dollars). In March, in particular, residents' overseas portfolio investment recorded a net withdrawal (-1.3 billion dollars) as investment demand dropped in the wake of COVID-19 (Figure Ⅳ-4). As of the end of March 2020, residents' overseas portfolio investment balance stood at 530.5 billion dollars, of which 305.2 billion dollars is accounted for by stocks and 225.3 billion dollars by bonds.

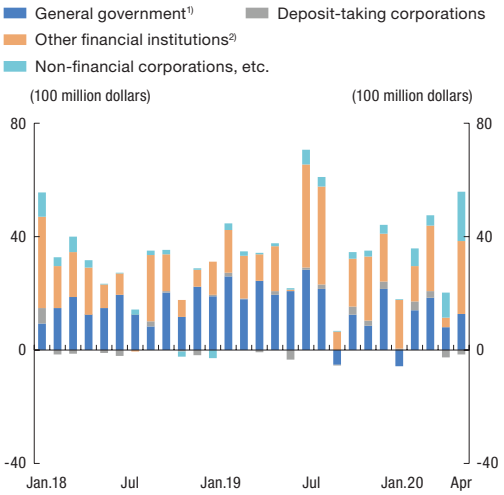
Figure Ⅳ-4. Changes in residents' overseas portfolio investment[1)]



Note: 1) A "+" means net investment, and a "-" net withdrawal.
Source: Bank of Korea.

By investor type, the increase in stock investment was driven by general government and other financial corporations, such as insurance companies and asset management companies (Figure Ⅳ-5).

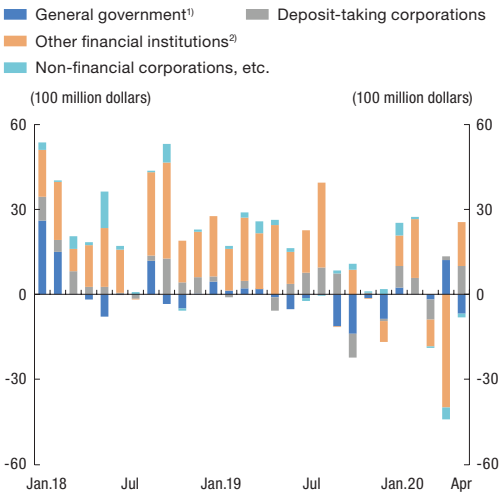
Figure Ⅳ-5. Net residents' overseas stock investment outflows, by investor type



Notes: 1) National Pension Service (NPS), Korea Investment Corporation (KIC), etc.
2) Insurance companies, asset management companies, etc.
Source: Bank of Korea.

On the other hand, other financial corporations including insurance companies were mainly responsible for the decrease in bond investment. In March, the rising cost of hedging against foreign exchange risk and the shrinking demand for overseas bonds resulted in a large net withdrawal (-3.1 billion dollars) (Figure Ⅳ-6).

Figure Ⅳ-6. Net residents' overseas bond investment outflows, by investor type



Notes: 1) National Pension Service (NPS), Korea Investment Corporation (KIC), etc.
2) Insurance companies, asset management companies, etc.

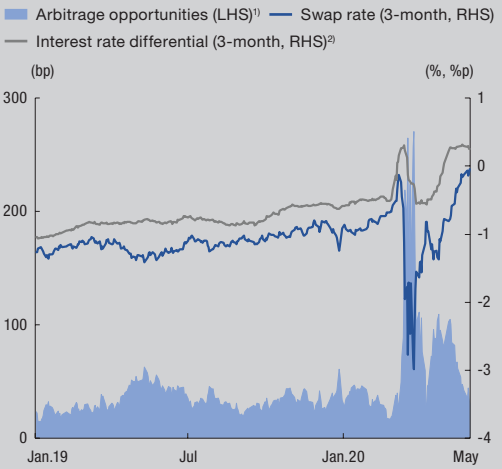
Source: Bank of Korea.

Box 5.

Swap Rate: Recent Trends and Assessment

The 3-month swap rate[1] fell abruptly after March 9, 2020, due to concern over an economic recession amid the COVID-19 pandemic and increased risk aversion in global markets. On March 24 it fell to -2.98%, the lowest level recorded since the global financial crisis (-3.38% on December 24, 2008). After this drop, the swap rate began to increase, driven by the policy responses of major economies and resulting stock price rebounds, the Bank of Korea's competitive US dollar loan facility auctions,[2] and the return of the interest rate differential to a positive value. Hereafter, we examine the background of the sharp decline of the swap rate and assess recent developments in the swap market.

Swap rate and arbitrage opportunities



Notes: 1) Interest rate differential - swap rate.
2) Monetary stabilization bonds (3-month) - LIBOR (3-month).
Sources: Bank of Korea, Korea Financial Investment Association.

Background of sudden plunge in swap rate

The dramatic decline of swap rate that occurred in March this year can be attributed, first of all, to the deterioration of dollar funding conditions in the money markets as risk aversion soared amid the spread of COVID-19 in major economies such as the United States and Europe. In March, the USD LIBOR-OIS spread[3] widened signifi-

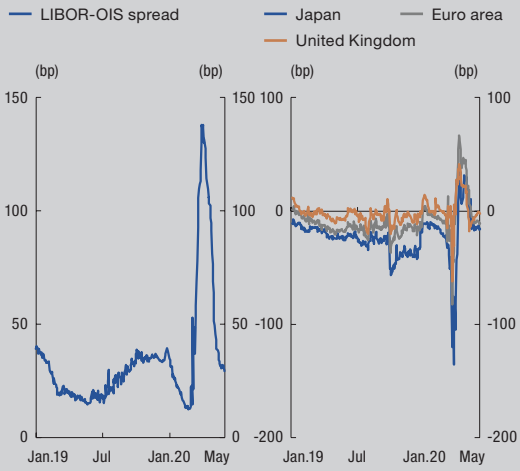
1) The swap rate is the annualized difference between the forward exchange rate and spot exchange rate divided by the spot exchange rate [(forward exchange rate - spot exchange rate) / spot exchange rate]. According to the theory of interest rate parity (IRP), the swap rate is equal to the interest rate differential between two currencies. The swap rate is used as a proxy indicator of financial institutions' funding conditions. For example, a swap rate that is higher than the interest rate differential indicates an improvement of funding conditions for US dollars, whereas a swap rate that is below the interest rate differential shows a deterioration of funding conditions for US dollars. If banks enter into swap transactions where they buy at the spot exchange rate and sell at the forward exchange rate ("buy & sell" hereafter) to raise US dollars, the swap rate falls. Conversely, when banks sell at the spot rate and buy at the forward rate ("sell & buy" hereafter) to invest in US dollars, the swap rate rises.

2) The Bank of Korea has supplied foreign currency loans through competitive US dollar loan facility auctions to foreign exchange banks on six occasions since March 31, using the proceeds of a currency swap arrangement with the US Federal Reserve. The total amount supplied through these auctions amounts to 19.872 billion dollars. As foreign currency liquidity had since become favorable, given the rising swap rates and foreign currency deposits, the Bank suspended bidding on May 6 for the time being.

3) Refers to the difference between the LIBOR and OIS (overnight indexed swap) rate, which is a fixed interest rate that is exchanged for the overnight floating rate for a fixed period. While LIBOR reflects the liquidity and credit risks of the counterparties of interbank loans, the OIS rate is a fixed-rate leg in interest rate swaps that carries very limited credit risk. Hence, the spread between the LIBOR and OIS rates reflects the liquidity and credit risks of banks.

cantly, and the swap basis[4] of major currencies, including the euro and Japanese yen, declined dramatically.

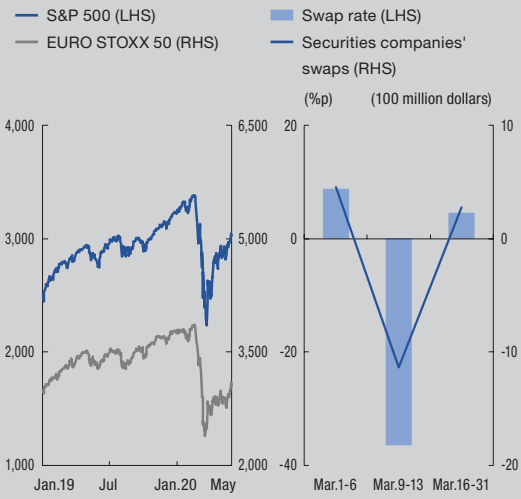
LIBOR-OIS spread[1] and swap basis of major currencies



Note: 1) 3-month basis.
Source: Bloomberg.

Stock price indices of major countries

Swap transactions[1][2] of securities companies and swap rate[2] in March



Notes: 1) "+"" means net operations through the swap market and "-" means net funding.
2) Daily average.
Sources: Bank of Korea, Bloomberg.

Second, the sharp increase in securities companies' demand for foreign currency (buy & sell) also contributed to the decline of the swap rate. Such demand for foreign currency arose because, with the plunge of stock prices in major countries such as the United States and Europe in March, the burden of securities companies to provide additional margin[5] for futures contracts overseas rose as they issued equity-linked securities (ELS) with underlying assets such as the S&P 500 and EURO STOXX 50.

Moreover, amid the increase in non-deliverable forwards (NDFs) sold by non-residents, branches of foreign banks[6] in Korea that had purchased the NDFs needed foreign currency funds (buy & sell) to clear this position, which is another reason for the fall in the swap rate. After March, in order to hedge[7] their NDF long positions that arose from the non-residents' unwinding of existing NDF long positions (NDF sell) in the process of the massive liquidation of domestic stocks, as well as NDF sell transactions for profit-taking amid the significant depreciation of the Korean won against the US dollar, foreign

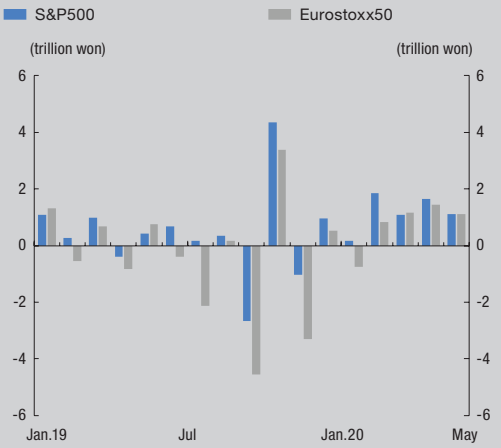
4) "Swap basis" refers to interest rates added to the interest rate of a certain currency in a swap transaction between that currency and US dollars (for a swap between euros and USD, counterparties exchange USD LIBOR for the sum of EUR LIBOR and swap basis). A decline of the swap basis means a shortage of US dollars (excess demand for USD), while an increase in the swap basis indicates sufficient liquidity of US dollars (excess supply of USD).
5) Securities companies bought futures contracts related to overseas stock indices such as the S&P 500 and EURO STOXX 50 in order to hedge their positions (long position of put option). Because of the dramatic fall of stock prices in global markets, securities companies had to meet a considerable amount of margin calls as a result of such futures contracts suffering losses.
6) Foreign bank branches supplied foreign currency funds mostly by using sell & buy transactions in the swap market.
7) In buy & sell swap transactions, spot buy transactions are liquidated by spot sell transactions in the spot exchange market, and forward sell transactions are cleared by NDF buy transactions purchased from non-residents, leading to the positions of both spot and forward exchange transactions being neutralized.

bank branches entered into buy & sell swaps and sold spot. As a result, the buy & sell swap transactions of foreign bank branches grew.

Assessment

At the end of May, the swap rate rebounded to -0.05%, similar to the level seen prior to the sudden drop, and volatility declined[8] significantly relative to March. In addition, considering the fact that arbitrage opportunities related to the interest rate differential [9] has waned significantly, the foreign currency swap market is deemed to have regained much of its stability. Nevertheless, the balance of ELS, derivatives that are linked to overseas stock indices, has risen steadily, while ELS caused a sharp increase in buy & sell swap transactions by securities companies in March. Thus, it should be noted that, should global stock prices tumble, the sharp increase in demand for foreign currency would likely cause a significant decline in the swap rate.

Changes in securities companies' balance of ELS[1] linked to major overseas stock price indices



Note: 1) Based on the outstanding balance of ELS issued after 2010.
Source: Korea Securities Depository.

8) Change of swap rate from the previous day (average during each period, bp): February: 2 → March: 41 → April: 12 → May: 6

9) Arbitrage opportunities (interest rate differential - swap rate, bp): end of February: 23 → March 24: 270 → end of March: 87 → end of April: 83 → end of May: 30
Incentive for arbitrage in the swap market may come from counterparty and credit risks, more stringent regulations, and mismatch between demand and supply. The domestic swap market tends to be more significantly driven by demand for foreign currency in relation to foreign exchange hedging for overseas securities investment by institutional investors ("What Do Deviations from Covered Interest Parity and Higher FX Hedging Costs Mean For Asia," IMF, 2019).

Resilience of Financial System

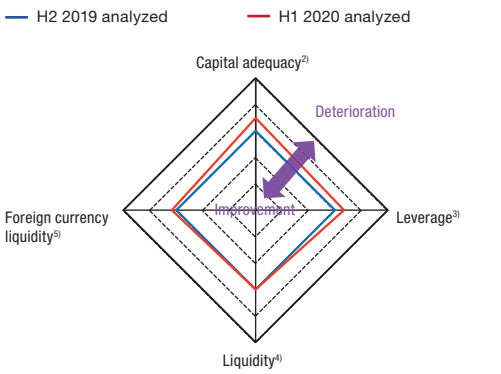
Ⅰ. Financial Institutions

1. Banks

In the first quarter of 2020, commercial banks' resilience has remained at a sound level. The capital adequacy ratio, an indicator of banks' loss absorption capacities, and the liquidity ratio, measuring their capacities to respond to sudden outflows of funds, dropped, but were still in excess of the respective regulatory minimum for all banks.[1)]

Going forward, if the real economic downturn persists due to COVID-19, the resulting increase in credit risk and deterioration in profitability could impair banks' shock absorption capacity. Therefore, it is important for banks to maintain a stable level of resilience by continuing their efforts to expand capital (Figure Ⅰ-1).

Figure Ⅰ-1. Map of changes in commercial bank resilience[1)]



Notes: 1) Extent of change in Q4 2019-Q1 2020 compared to Q2-Q3 2019 indexed.
2) Total capital ratio under Basel Ⅲ.
3) Leverage ratio.
4) Liquidity coverage ratio (LCR).
5) Foreign currency LCR.

Source: Bank of Korea.

Sound loss absorption capacity

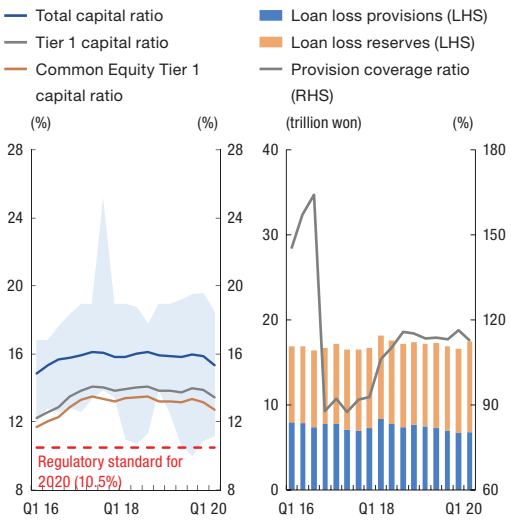
At the end of the first quarter of 2020, commercial banks' capital adequacy ratio (BIS total capital ratio) stood at 15.33%, down by 0.55%p from the end of the previous year (15.89%). Banks' Common Equity Tier 1 capital ratio dropped by 0.42%p from the end of 2019 to 12.74%. The total capital ratio significantly exceeded the 2020 regulatory minimum (10.5%, 11.5% for D-SIBs,[2)] 8.625% for Internet-only banks) for all banks. The provision coverage ratio (loan loss provisions / substandard-or-below loans), an indicator of

1) To facilitate credit supply by banks amid the COVID-19 pandemic, the financial authorities eased regulatory burdens related to capital and liquidity requirements, for example by adopting the Basel Ⅲ reforms on credit-risk calculation earlier than previously planned.

2) The domestic systemically important banks (D-SIBs) are Shinhan/Jeju Bank (Shinhan Financial Group), KEB Hana Bank (Hana Financial Group), KB Kookmin Bank (KB Financial Group), Nonghyup Bank (NH Financial Group) and Woori Bank (Woori Financial Group). As a way of introducing a temporary easing of regulations in response to COVID-19, the financial authorities are planning to waive the additional capital requirement (+1%p) for small regional banks affiliated with a bank holding company (the Regulations on the Supervision of Banking Business and its sub-regulations amended in June 2020).

banks' capacity to absorb expected losses, fell by 3.4%p from the end of the previous year (116.2%)[3] to 112.8%, owing to an increase in substandard-or-below loans (Figure Ⅰ-2).

Figure Ⅰ-2. Commercial bank Basel Ⅲ-basis capital ratios[1)2)3)4)] and provision coverage ratio[1)2)]



Notes: 1) End-period basis.
2) Provision coverage ratio = Loan loss provisions / Substandard-or-below loans. Loan loss reserves had been included in loan loss provisions until Q3 2016, and have been included in common equity Tier 1 capital since then.
3) Regulatory standards for 2020: Common Equity Tier 1 capital ratio 7%, Tier 1 capital ratio 8.5%, and Total capital ratio 10.5% (8%, 9.5% and 11.5% for D-SIBs, respectively).
4) Shaded area indicates distribution of individual banks' total capital ratios.
Sources: Commercial banks' business reports.

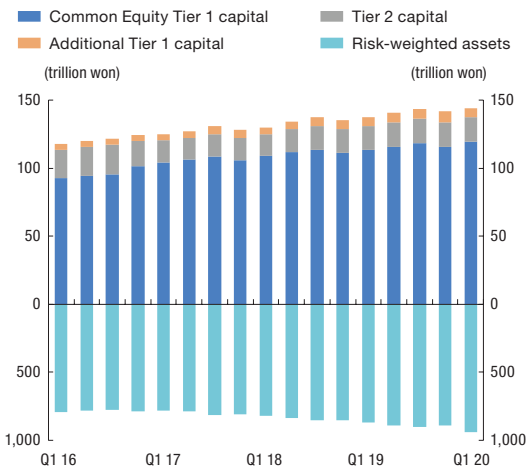
The decline in commercial banks' capital ratios was mainly due to the increase in lending as part of financial support to shore up the economy amid the COVID-19 pandemic, which resulted in a sharp expansion in household and corporate loans (Figure Ⅰ-3). However, this expanded supply of credit, coupled with financial and foreign exchange market stabilization measures by the policy authorities, prevents households and corporations experiencing temporary liquidity shortages from becoming delinquent or defaulting on their loans, and thus is likely to have the effect of helping banks avoid a larger drop in their capital ratios.[4] Given the current capital ratios substantially in excess of regulatory minimums and the continuing efforts to recapitalize via the issuance of contingent convertible bonds, among other methods, commercial banks appear to have sufficient capacity to handle losses.[5]

3) Although the provision coverage ratio decreased during the first quarter of 2020 from the end of 2019 due to increases in loan loss provisions and substandard-or-below loans of 0.1 trillion and 0.3 trillion won, respectively, banks' ability to respond to a rise in non-performing loans does not appear to have been affected, given that loan loss reserves (loan loss provisions for supervisory purposes - loan loss provisions for accounting purposes) increased by 0.8 trillion won.

4) For details, refer to <Box 6> 「Examination of the Effects of Policy Responses to COVID-19 on Financial Institutions' Capital Adequacy」 (page 90).

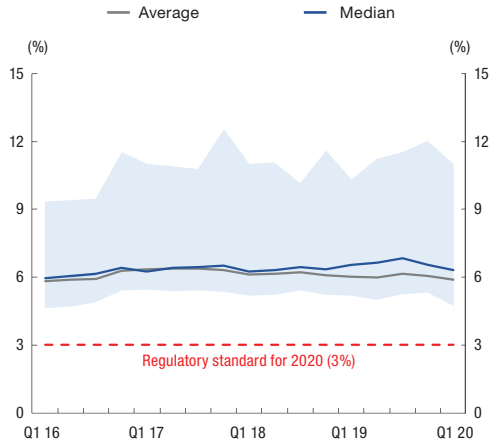
5) The financial authorities decided to adopt the Basel III reforms, whose highlights include downward adjustments to the loss given defaults (LGD) value on corporate loans and the risk weight for loans to SMEs without a credit rating, in the second quarter of 2020, 1.5 years earlier than the initially planned date of 2022, to alleviate capital-related regulatory burdens on banks from increased corporate loans.

Figure Ⅰ-3. Commercial bank capital ratio decomposition[1)2)]



Notes: 1) End-period basis.
2) From Q4 2016, Common Equity Tier 1 capital includes loan loss reserves.
Sources: Commercial banks' business reports.

Figure Ⅰ-4. Commercial bank leverage ratios[1)2)3)]



Notes: 1) Tier 1 capital (Common Equity Tier 1 capital + Additional Tier 1 capital) / Total exposure; end-period basis.
2) Auxiliary indicator until 2017, implemented as regulatory standard from 2018.
3) Shaded area indicates distribution of individual banks' leverage ratios.
Sources: Commercial banks' business reports.

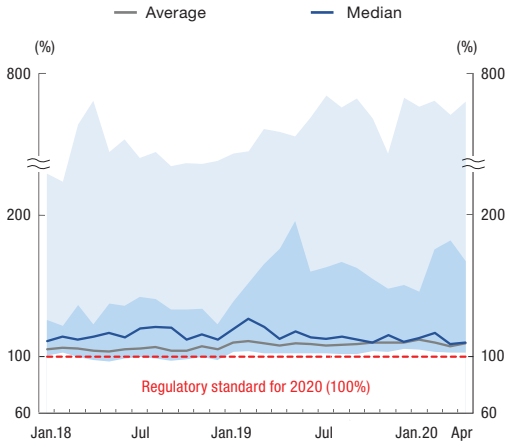
At the end of March 2020, commercial banks' leverage ratio[6)] fell by 0.16%p from the end of the previous year (6.05%) to 5.89%. This drop was primarily due to the expansion in household and corporate loans, resulting in an increase in total exposures. However, the leverage ratio has remained well above the regulatory minimum requirement (3%) for all banks (Figure Ⅰ-4).

Generally satisfactory liquidity response capacity

At the end of April 2020, banks' liquidity coverage ratio (LCR) fell by 1.0%p from the end of the previous year (110.4%) to 109.4%. This is mainly explained by a decrease in high-quality liquid assets such as government bonds, coupled with an increase in net outflow of cash, centered on corporate deposits and other non-operational deposits. The LCR is currently in excess of the regulatory minimum (100%, but temporarily lowered to 85% for April to September 2020) for all banks (Figure Ⅰ-5).

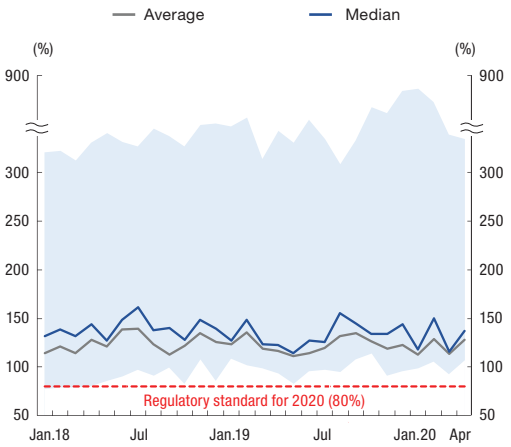
6) The leverage ratio means the simple Tier 1 capital ratio based on the 「Banking Business Supervision Regulations」. The ratio was introduced to limit excessive leverage in the banking sector to prevent abrupt deleveraging in times of crisis and the resulting amplification of shocks to the financial system. This ratio, calculated based on total exposure, plays a supplementary role to minimum capital adequacy requirements. In Korea, it was selected as a supplementary indicator from the first quarter of 2015 and then officially adopted as a regulatory measure in 2018. The leverage ratio also started to be applied to Internet-only banks in January 2020.

Figure Ⅰ-5. Commercial bank LCRs[1)2)]



Notes: 1) High-quality liquid assets / Total net cash outflows over next 30 calendar days; monthly average balance basis.
2) Shaded area indicates distribution of individual banks' LCRs, and deep shaded area indicates distribution with Internet-only banks excluded.
Sources: Commercial banks' business reports.

Figure Ⅰ-6. Commercial bank foreign currency LCRs[1)2)]



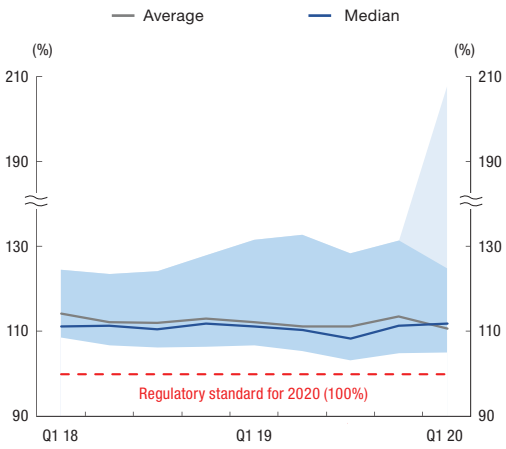
Notes: 1) High-quality liquid foreign currency assets / Total net cash outflows in foreign currency over next 30 calendar days; monthly average balance basis.
2) Shaded area indicates distribution of individual banks' foreign currency LCRs.
Sources: Commercial banks' business reports.

At the end of April 2020, the foreign currency LCR[7)] rose by 5.1%p to 127.8% from the end of 2019 (122.7%). This was mainly due to improving foreign currency liquidity conditions, resulting in an increase in foreign currency deposits. The foreign currency LCR was above the regulatory minimum (80%, but temporarily lower to 70% for April to September 2020) for all banks (Figure Ⅰ-6).

7) Although the foreign currency LCR is not a part of the Basel III requirements, it became an official requirement in Korea, effective as of January 2017, to ensure the steady supply of foreign currencies to the real sector even under a stress situation. The foreign currency LCR is a requirement for most domestic banks with the exception of Korea Eximbank, Internet-only banks and some regional banks with only a small amount of foreign currency liabilities (Kwangju and Jeju Banks). The regulatory minimum was raised incrementally starting in 2017 until 2019 when the fully phased-in level (80% for commercial banks) became effective. Meanwhile, to allow banks to sufficiently use their high-quality liquidity assets in response to the economic fallout of COVID-19, the supervisory authorities temporarily lowered the foreign currency LCR by 10%p.

Banks' net stable funding ratio (NSFR),[8] measuring the long-term stability of the funding profile, stood at 110.7% at the end of the first quarter of 2020, with all banks satisfying the regulatory minimum (100%) (Figure Ⅰ-7).

Figure Ⅰ-7. Commercial bank net stable funding ratios (NSFRs)[1)2)]



Notes: 1) Available stable funding / Required stable funding; end-period basis.
2) Shaded area indicates distribution of individual banks' NSFRs, and deep shaded area indicates distribution with Internet-only banks excluded.
Sources: Commercial banks' business reports.

8) The NSFR limits banks' overreliance on short-term wholesale funding by requiring them to fund some of their long-term assets under management with stable debt and capital. The NSFR was introduced to domestic banks in January 2018 (2020 in the case of Internet-only banks).

Box 6.

Examination of the Effects of Policy Responses to COVID-19 on Financial Institutions' Capital Adequacy

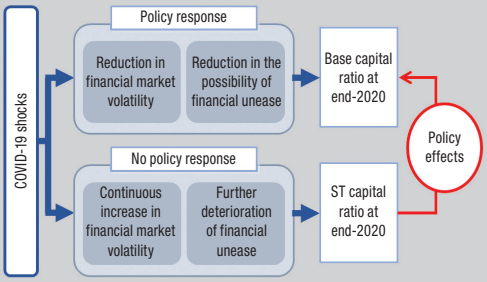
The policies implemented by the Bank of Korea and the government in response to COVID-19[1] are considered to have contributed to the improvement of investment sentiment and the stability of the financial markets. However, there is concern that the increased supply of credit in the course of providing financial support to households and corporations could undermine the capital adequacy of financial institutions.

In the following, we examine the effect of COVID-19-related policies on the capital adequacy of financial institutions.

Methods of review

The policy effect was calculated by deducting (i) the counterfactual capital ratios based on the results of a stress test in the absence of policy responses from (ii) the baseline capital ratios for the end of 2020 that would be expected if the current financial market stability persists.

Structure of reviewing COVID-19 policy effects



The scenarios used to review the policy effect were set as follows. The baseline scenario supposed that, as economic activity[2] recovered slowly, the stability of the financial markets and the stable supply of credit following the implementation of the policies would continue. The counterfactual scenario[3] assumed that, due to the absence of appropriate policy responses, the financial market instability that occurred in the early phase of the coronavirus outbreak would persist, leading to the growing volatility of price variables in financial markets and a decreasing supply of credit in line with the business cycle.

Results of review

The capital buffers of financial institutions in 2020 are predicted to remain in a favorable position relative to the counterfactual absence of policy responses.

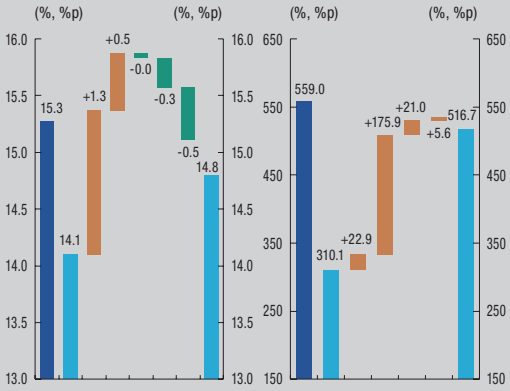
1) This includes cuts of the base rate by the Bank of Korea (0.50%p on March 16 and 0.25%p on May 28), signing of a Korea-US currency swap (March 19, USD 60 billion), launch of bond and stock market stabilization funds, provision of support for the issuance of corporate bonds, and provision of financial support for small and medium enterprises and small merchants.

2) Based on the forecast of the Bank of Korea in May 2020, it is assumed that the growth rate of the Korean economy would retreat to -0.5% in the first half of 2020 and rebound to 0.1% in the second half, resulting in a growth rate of -0.2% for the entire year of 2020.

3) The counterfactual scenario assumed a domestic economic growth rate of -0.2%, as in the baseline scenario, and the KOSPI being 518 points lower and the credit spread of corporate bonds (AA-) relative to 3-year Treasury bonds being 244bp higher (as an average during the second half of 2020) than in the baseline scenario. Moreover, the counterfactual scenario also assumed, during the second half of 2020, a 4.4% year-on-year decline of the credit supply.

Under the baseline scenario, which assumed the presence of policy responses, the BIS total capital ratio of banks as of the end of 2020 was 14.8%, which is 0.7%p higher than the 14.1% recorded under the counterfactual scenario. This is mainly attributable to a decrease in credit losses as the active supply of credit by banks reduced the number of bankruptcies and delinquent loans caused by a temporary liquidity crunch. As a result, the capital ratio rose by 1.3%p. However, the expansion of risk-weighted assets associated with the increase in loans pared down the ratio moderately by 0.5%p. Under the baseline scenario, the net operating capital ratio (NCR) of securities companies at the end of 2020 was projected to be 516.7%, which is 206.6%p higher than the 310.1% under the counterfactual scenario. This positive result seems to be driven mainly by reduced market losses thanks to the restored stability of financial markets and soaring stock trading volume.[4)]

Commercial bank Basel III capital ratios[1)] **Securities company NCR[2)]**



Notes: 1) X-axis names, from left to right: end-2019, counterfactual, credit losses, market profits and losses, business profits and losses, contagion losses, RWA change, baseline.
2) X-axis names, from left to right: end-2019, counterfactual, credit losses, market profits and losses, business profits and losses, contagion losses, baseline.

Source: Bank of Korea.

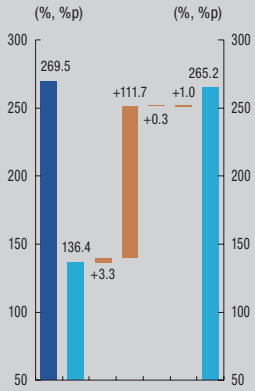
The risk-based capital (RBC) ratio of insurance companies was estimated at 265.2% under the baseline scenario, which is 128.8%p higher than the 136.4% projected under the counterfactual scenario. This is because market losses on securities assets were recovered with the restoration of the stability of financial markets as a result of the policy responses. As for credit card companies, the effect of the policy responses on the Adjusted Capital Ratio was found to be 3.8%p (counterfactual 16.4% → baseline 20.2%), which is attributable to the active supply of credit by the financial sector mitigating the risk of borrower defaults, and to lower funding costs caused by falling interest rates. Mutual savings banks and mutual credit cooperatives showed positive policy effects[5)] as a result of the control of borrowers' default risk through the provision

4) With the rebound of the equity market, the daily average trading volume of the KOSPI soared from 0.47 billion shares in 2019 to over 0.7 billion shares after March 2020 (March: 0.78 billion shares → April: 1.05 billion shares → May: 0.85 billion shares).

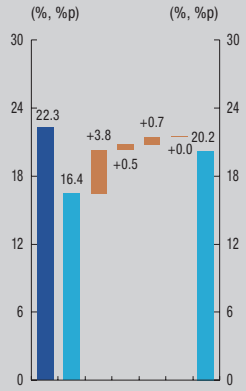
5) The policy effect on the capital ratios of mutual savings banks and mutual credit cooperatives is estimated at 0.5%p (counterfactual 14.2% → baseline 14.7%) and 0.2%p (counterfactual 7.7% → baseline 7.9%), respectively.

of a grace period for the payment of principal and interest and an extension of the maturity period for loans.

Insurance company RBC ratio[1)]



Credit card company adjusted capital ratio[1)]



Note: 1) X-axis names, from left to right: end-2019, counterfactual, credit losses, market profits and losses, business profits and losses, contagion losses, baseline.
Source: Bank of Korea.

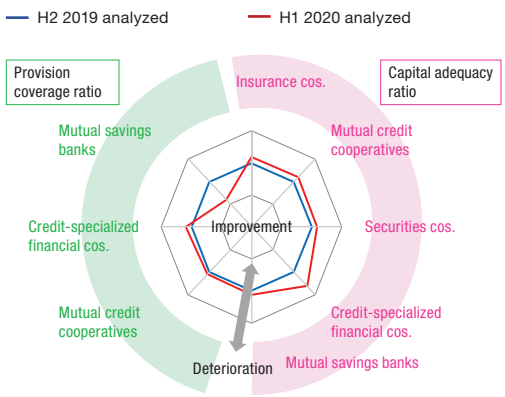
Assessment

The policies rolled out by the Bank of Korea and the government in response to the COVID-19 pandemic are believed to have contributed to the maintenance of the capital buffers of financial institutions. However, this policy effect is based on the assumption that the impact of COVID-19 is only temporary. It should be noted that if the impact persists over the long term, the possibilities of a considerable portion of the credit supplied so far turning sour and the resilience of financial institutions being impaired cannot be ruled out.

2. Non-Bank Financial Institutions

The resilience of non-bank financial institutions ("NBFIs" hereafter) has been maintained at a satisfactory level, with capital adequacy ratios far exceeding the supervisory standards for all sectors (Figure Ⅰ-8). It should be however noted that as NBFIs are more susceptible to credit, market and liquidity risks than banks, an unexpected shock could lead to a rapid deterioration in their resilience.[9)]

Figure Ⅰ-8. Map of changes in NBFI resilience[1)]

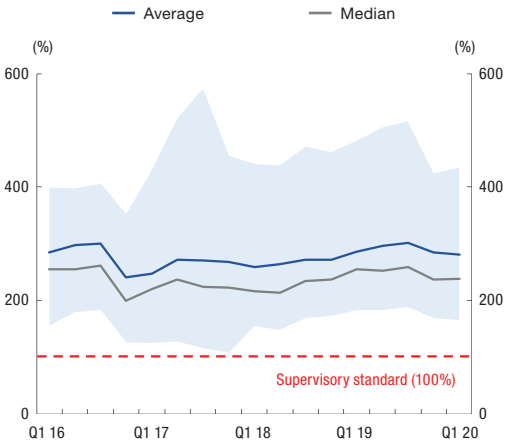


Note: 1) Extents of change as of end-Q1 2020 compared to end-Q3 2019 indexed.
Sources: Financial institutions' business reports.

Generally satisfactory level of resilience

At the end of the first quarter of 2020, life insurance companies' risk-based capital (RBC) ratio,[10)] an indicator of loss absorption capacities, stood at 281.2%,[11)] down by 3.4%p from the end of 2019 (284.6%) (Figure Ⅰ-9).

Figure Ⅰ-9. Life insurance company risk-based capital (RBC) ratios[1)]



Note: 1) Amount of available capital / Amount of required capital; shaded area indicates distribution of individual life insurance companies' RBC ratios.
Sources: Financial institutions' business reports.

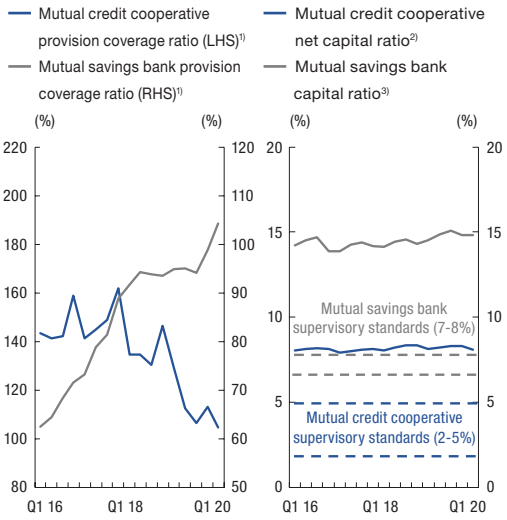
In the case of mutual credit cooperatives, the net capital ratio fell by 0.2%p from the end of 2019 (8.3%) to stand at 8.1% at the end of the first quarter of 2020, due to the increase in substandard-or-below loans resulting in additional loan loss provisions. The provision coverage ratio dropped by 8.6%p from the end of the previous year (113.1%) to stand at 104.5%.

At the end of the first quarter of 2020, the BIS capital ratio of mutual savings banks was unchanged from the end of the previous year at 14.8%, while the provision coverage ratio (104.3%) rose by 5.4%p from the end of

9) For details, refer to <Box 4> 「Examination of Key Risk Factors of Non-Bank Financial Institutions」 (page 66).
10) The RBC ratio is the amount of available capital divided by required capital. Required capital, the denominator, is calculated by measuring the total amount of insurance risk, interest risk, credit risk, market risk, and operational risk.
11) At the end of the first quarter of 2020, general insurance companies' RBC ratio stood at 243.9%, representing a 2.8%p increase from the end of 2019.

the previous year (98.9%) due in part to the strengthening of loan loss provision requirements[12] (Figure Ⅰ-10).

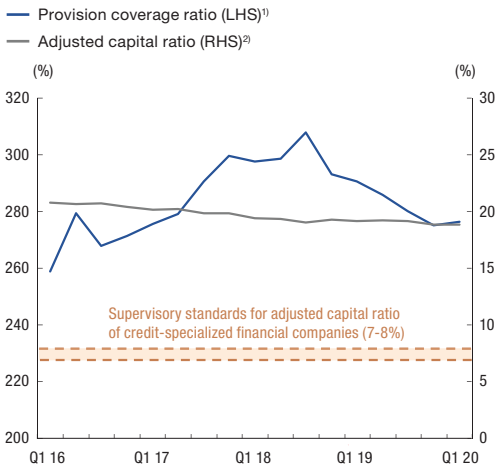
Figure Ⅰ-10. Mutual credit cooperative and mutual savings bank resilience indicators



Notes: 1) Loan loss provisions / Substandard-or-below loans.
2) Supervisory standard 2% (4% for MG community credit cooperatives, 5% for Nonghyup).
3) Capital / Risk-weighted assets; supervisory standard 7% (8% for institutions with assets of more than 1 trillion won).
Sources: Financial institutions' business reports.

At the end of the first quarter of 2020, the adjusted capital ratio of credit-specialized financial companies was unchanged from the end of 2019 at 18.8%. The provision coverage ratio stood at 276.3%, up by 1.1%p from the end of the previous year (275.2%) (Figure Ⅰ-11).

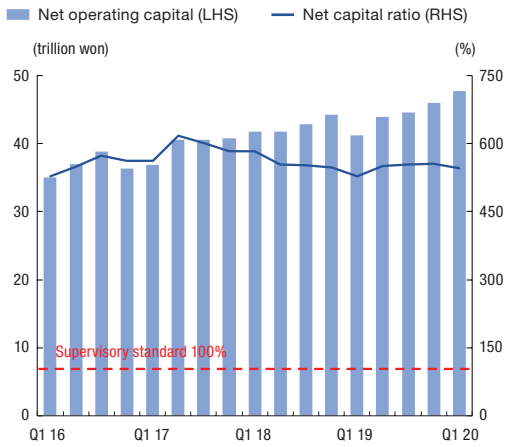
Figure Ⅰ-11. Credit-specialized financial company resilience indicators



Notes: 1) Loan loss provisions / Substandard-or-below loans.
2) Adjusted capital / Adjusted total assets; supervisory standard 7% (credit card companies 8%).
Sources: Financial institutions' business reports.

Securities companies' net capital ratio[13] stood at 546.5% at the end of the first quarter of 2020, down by 9.4%p from the end of 2019 (555.9%) (Figure Ⅰ-12).

Figure Ⅰ-12. Securities company resilience indicators



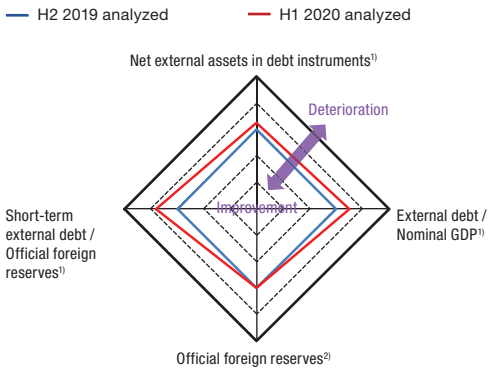
Sources: Financial institutions' business reports.

13) Securities companies' net capital ratio was calculated by dividing net capital (net operating capital minus total risk) by required maintenance equity.

Ⅱ. External Payment Capacity

Korea's external payment capacity has mostly remained satisfactory despite a slight weakening due to rising demand for foreign currency liquidity from financial institutions amid heightened volatility in the international financial markets and a decrease in the official foreign reserves, caused by the market stabilization measures by the foreign exchange authorities. Amid a drop in net external assets since the fourth quarter of 2019, the external debt-to-nominal GDP ratio drifted higher. At the end of May 2020, the official foreign reserves stood at 407.3 billion dollars, representing a decrease of 1.5 billion dollars from the end of 2019. The ratio of short-term external debt relative to official foreign reserves showed a slight uptick (Figure Ⅱ-1).

Figure Ⅱ-1. Map of changes in external payment capacity indicators



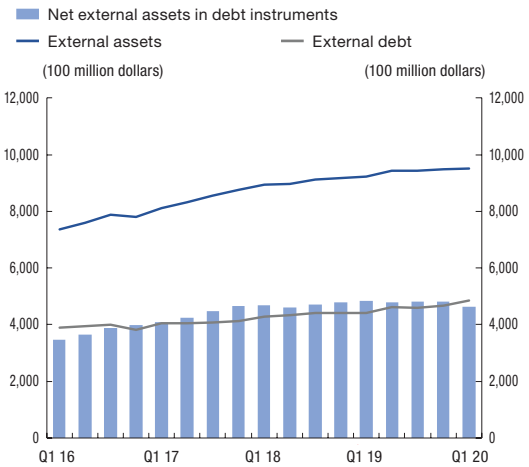
Notes: 1) Extent of change as of end-Q1 2020 compared to end-Q3 2019 indexed.
2) Extent of change as of end-May 2020 compared to end-November 2019 indexed.

Source: Bank of Korea.

Moderate drop in net external assets

At the end of the first quarter of 2020, Korea' net external assets (external assets - external debt) amounted to 464.2 billion dollars, representing a year-on-year decrease of 3.9% (-18.6 billion dollars) (Figure Ⅱ-2).

Figure Ⅱ-2. Net external assets in debt instruments1)



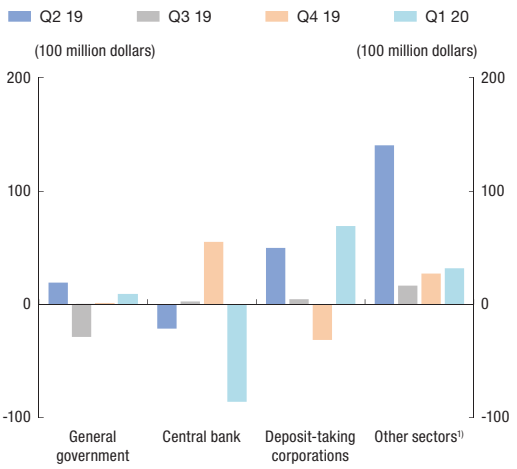
Note: 1) End-quarter balance basis.

Source: Bank of Korea.

External assets rose 2.8% (+26.2 billion dollars) year on year to 950.0 billion dollars at the end of the first quarter of 2020.

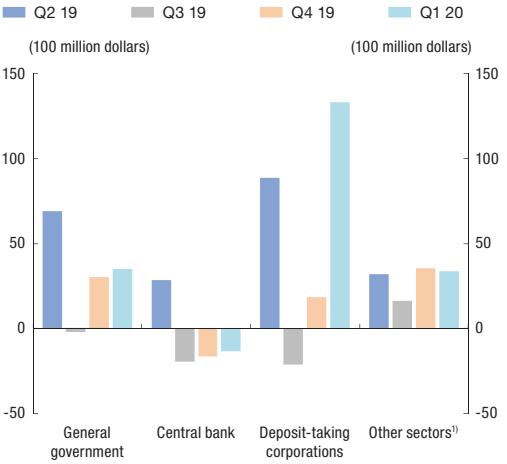
The quarterly change in external assets during the first quarter of this year (+2.5 billion dollars) breaks down by sector to an increase of 0.9 billion dollars for general government and 3.2 billion dollars for other sectors. Deposit-taking corporations' external assets also expanded by 7.0 billion dollars on the increase in due from banks in foreign currency. Meanwhile, the central bank's external assets fell by 8.6 billion dollars due to the drop in the official foreign reserves (Figure Ⅱ-3).

Figure Ⅱ-3. Changes in external assets in debt instruments, by sector



Note: 1) Including other financial corporations (securities companies, asset management companies, insurance companies, etc.) and non-financial corporations.
Source: Bank of Korea.

Figure Ⅱ-4. Changes in external debt, by sector



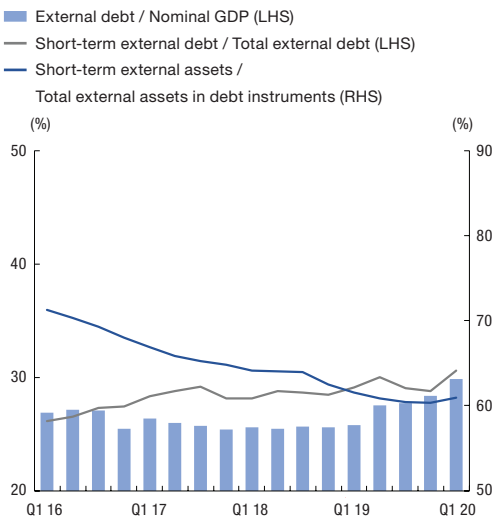
Note: 1) Including other financial corporations (securities companies, asset management companies, insurance companies, etc.) and non-financial corporations.
Source: Bank of Korea.

At the end of the first quarter of 2020, external debt stood at 485.8 billion dollars, representing a year-on-year increase of 10.2% (+44.8 billion dollars).

The change in external debt during the first quarter of this year (+18.8 billion dollars) breaks down to a decrease of 1.3 billion dollars for the central bank and an increase of 3.5 billion and 3.4 billion dollars for general government and other sectors, respectively. Deposit-taking corporations' external debt also increased by 13.3 billion dollars due to domestic banks' efforts to secure foreign currency funding in anticipation of a liquidity squeeze (Figure Ⅱ-4).

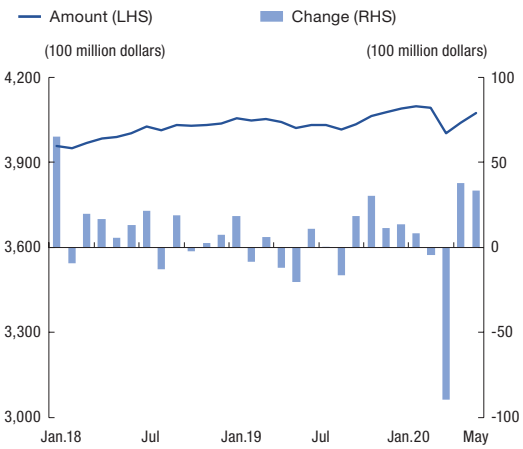
At the end of the first quarter of 2020, the external debt-to-nominal GDP ratio climbed to 29.9% from the same period of the previous year (25.8%), with the share of short-term external debt in total external debt also increasing slightly to 30.6% from the same period of the previous year (29.1%). Meanwhile, the share of short-term assets in total external assets declined moderately to 60.9% from the same period of the previous year (61.5%) (Figure Ⅱ-5).

Figure Ⅱ-5. Proportions[1] of short-term external debt and assets in debt instruments



Note: 1) End-quarter basis.
Source: Bank of Korea.

Figure Ⅱ-6. Balance of and changes in official foreign reserves[1]



Note: 1) Amounts at the month-ends, changes during the months.
Source: Bank of Korea.

Official foreign reserves recover after a brief dip

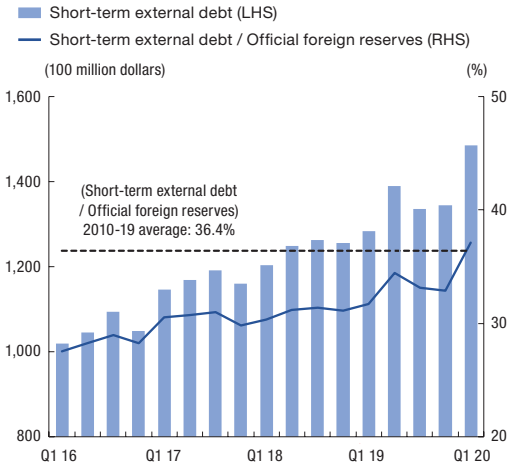
At the end of May 2020, Korea's official foreign reserves recorded 407.3 billion dollars, a decrease of 1.5 billion dollars from the end of 2019. This result in spite of a steady increase in investment income from foreign currency assets is mainly explained by the market stabilization measures by the foreign exchange authorities and the recent strength of the US dollar which lowered the conversion value of assets denominated in other currencies such as the euro and the Japanese yen (Figure Ⅱ-6)

After reaching an all-time high of 409.7 billion dollars in late January 2020, the official foreign reserves dropped sharply (-9.0 billion dollars) in March when the foreign exchange authorities expanded the supply of foreign-currency liquidity as the outbreak of COVID-19 caused volatility to spike in the international financial markets and domestic foreign-currency liquidity conditions to deteriorate. However, since April, the foreign reserves swung back to an upward trend as the Bank of Korea conducted competitive US dollar loan facility auctions using the proceeds of swap transactions with the US Federal Reserve, and as funding conditions improved in international financial markets.

At the end of the first quarter of 2020, the short-term external debt-to-foreign reserve ratio edged up by 5.4%p from the same period of the previous year (31.7%) to stand at 37.1% (Figure Ⅱ-7). Although slightly above the average of normal years (36.4% between 2010-2019), this is not a concerning level since it is

well below the corresponding ratio during the global financial crisis (78.4%).

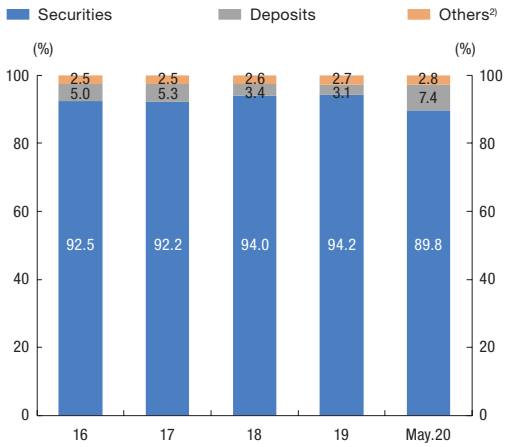
Figure Ⅱ-7. Short-term external debt-to-official foreign reserves ratio[1)]



Note: 1) End-quarter basis.
Source: Bank of Korea.

Looking at the composition of the official foreign reserves as of end-May 2020, the majority was accounted for by securities (89.8%) and deposits (7.4%). Securities, which account for an overwhelming share of total foreign reserves, consist mostly of highly-liquid safe assets such as government bonds, government agency bonds and asset-backed securities (Figure Ⅱ-8).

Figure Ⅱ-8. Composition[1)] of official foreign reserves



Notes: 1) End-period basis.
2) Gold, SDRs, etc.
Source: Bank of Korea.

Ⅲ. Financial Market Infrastructures

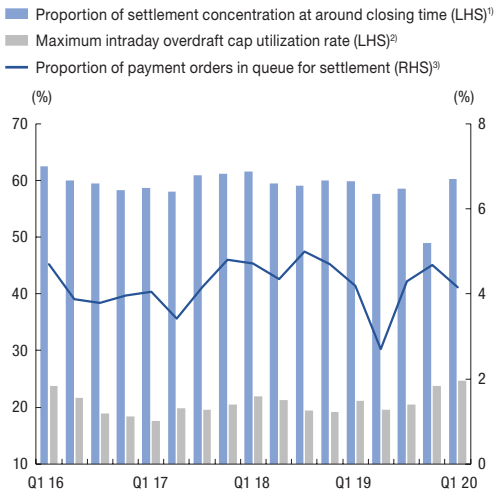
The major payment and settlement systems including BOK-Wire+ have been operated smoothly, with settlement risks managed stably amid a steady increase in the amount of settlement, driven by securities settlements by financial institutions and electronic funds transfers by individuals and companies. To ensure the smooth operation of the payment and settlement systems amid the COVID-19 pandemic, the Bank of Korea has strengthened its cooperation system with system operators and has been closely monitoring the status of settlement risks among participants. Going forward, continuing efforts to ensure the stability of the payment and settlement systems will be neccesary.

BOK-Wire+

During the first quarter of 2020, the daily average amount of settlement through BOK-Wire+, which provides final settlement of mutual obligations among financial institutions, reached 406.9 trillion won, continuing the upward trend from the previous year (369.9 trillion won), while the related settlement risks were managed stably.

The rate of maximum intraday overdraft cap utilization and the proportions of payment orders in queue for settlement, both of which are monitored as indicators of the settlement liquidity of BOK-Wire+ participants, were generally at stable levels of 24.6% and 4.2%, respectively, during this period. Among the total settlement amount, the portion settled near the closing time (16:00-17:30) was 60.3% during this period, mostly unchanged from the same period of 2019 (59.8%) (Figure Ⅲ-1).

Figure Ⅲ-1. Risk indicators related to BOK-Wire+

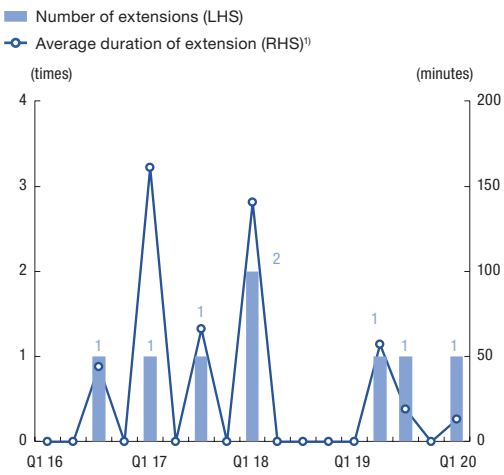


Notes: 1) Amount of settlement processed after 16:00 / Total settlement amount during the period.
2) Daily average rate of maximum utilization of participants' intraday overdraft caps.
3) Average ratio of the amount of participants' payment orders in queue for settlement / Total settlement amount (excluding payment orders in queue for liquidity savings).

Source: Bank of Korea.

Meanwhile, in the first quarter of 2020, BOK-Wire+'s operating hours were extended once. This was a result of delays in the processing of repo transactions due to an error in the Korea Securities Depository's external network (Figure Ⅲ-2).

Figure Ⅲ-2. Extension of BOK-Wire+ operating hours



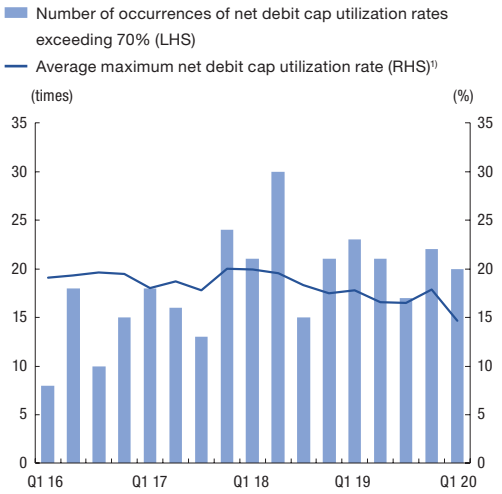
Note: 1) Total duration of extension / Number of extensions during the quarter.
Source: Bank of Korea.

Retail payment systems

In the first quarter of 2020, the daily average amount of settlement through the retail payment systems, operated by Korea Financial Telecommunications and Clearings Institute, recorded 76.2 trillion won. As the upward trend continued from last year (69.4 trillion won), lifted by electronic funds transfers by general customers and companies, related settlement risks were managed smoothly overall.

Among retail payment system-related risk indicators, the average maximum net debit cap[1] utilization rate of institutions participating in net settlements stood at 14.7% in this period, lower than in the same period of the previous year (17.8%). During the first quarter, the net debit cap utilization rate exceeded the cautionary level (70%) 20 times, 2 times less than during the fourth quarter of the previous year (22 times) (Figure Ⅲ-3).

Figure Ⅲ-3. Net debit cap utilization rate



Note: 1) Average of daily maximum net debit cap utilization rates of participants during the period.
Source: Bank of Korea.

Securities settlement systems

Settlement risks have also been managed stably in the securities settlement systems operated by by Korea Exchange and Korea Securities Depository, amid a steady increase in the amount of settlement. During the first quarter of 2020, the daily average amount of settlements reached 208.8 trillion won, a noticeable increase over the previous year (186.4 trillion won), with inter-institutional repo transactions being responsible for much of this rise.

1) In the retail payment systems, including the CD Network System, the Interbank Remittance System and the Electronic Banking System, the transaction payees are paid immediately but the subsequent credits and debits among financial institutions are settled on the following business day at the designated time (11:00) through BOK-Wire+, which results in the provision of credit between financial institutions. To control these net settlement-related risks in the retail payment systems, the Bank of Korea requires participants to independently establish ceilings (net debit caps) on their own unsettled net debit positions.

During the first quarter of 2020, settlements on transactions in both exchange-traded stocks and exchange-traded government bonds were completed by their respective deadlines (16:00 and 17:00, respectively). However, during the fourth quarter of 2019, some over-the-counter (OTC) stock transactions by institutional investors were settled after the deadline (16:50), due to the shortages of settlement liquidity of participants (Table Ⅲ-1).

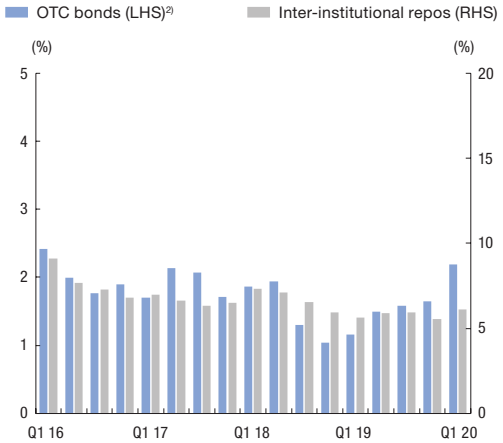
Table Ⅲ-1. Proportions of securities settlement completed after the deadline

	Penalty deadline[1]	Proportions of payments (%)				
		2019				2020
		Q1	Q2	Q3	Q4	Q1
Exchange-traded stocks	16:00	-	-	-	-	-
Exchange-traded government bonds	17:00	-	-	-	-	-
Institutional investors for OTC stocks	16:50	-	0.0905	-	0.0002	-

Note: 1) Deadlines after which settlement delay penalties imposed.
Source: Bank of Korea.

Among OTC bonds and inter-institutional repo transactions, the proportions settled on a free-of-payment (FOP) basis rather than through the securities delivery-versus-payment (DvP) systems during the first qurter of this year maintained stable levels of 2.2% and 6.1%, respectively (Figure Ⅲ-4).

Figure Ⅲ-4. Shares[1] of FOP settlement



Notes: 1) Proportion in total settlement amount (of OTC bonds and inter-institutional repos) of settlements not processed through DvP (delivery-versus-payment) system.
2) Based on final settlement after deduction of linked settlements.
Source: Korea Securities Depository.

Foreign exchange settlement systems[2]

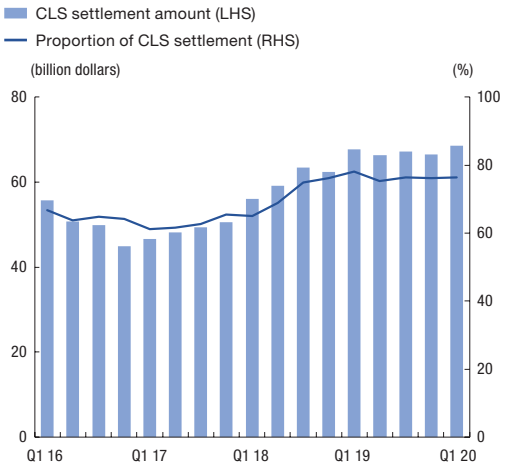
The daily average amount of settlement through the foreign exchange PvP system operated by CLS Bank (the CLS system)[3] continuously increased after the fourth quarter of 2016 to amount to 68.49 billion dollars in the first quarter of 2020.

2) Foreign exchange settlements are conducted through the interbank correspondent network, the PvP settlement system operated by CLS Bank, and the domestic foreign currency funds transfer systems. In this report we focus on foreign exchange PvP settlements routed through the CLS System, in which the settlement amounts can be accurately determined.

3) To address time differences between countries, which are a fundamental cause of foreign exchange settlement risk, CLS (Continuous Linked Settlement) Bank settles most transactions during a designated settlement period (07:00-12:00 CET). In continuous linked settlement the actual funds transfers (payments) are linked and processed within this settlement period between the accounts of settlement member banks and CLS Bank held with the central banks issuing the currencies concerned. At present the CLS PvP system is connected to the large-value payment systems (including BOK-Wire+) run by the central banks issuing the 18 CLS settlement currencies.

The share in total foreign exchange settlement of that carried out on a PvP basis via the CLS system accounted for 76.3% of total settlement in this quarter, little changed from last year (76.4%). Settlement risks related to foreign exchange transactions, appear to have stayed at a stable level (Figure Ⅲ-5).

Figure Ⅲ-5. Settlement amount[1] and proportion[2] made through the CLS system



Notes: 1) Daily average during the quarter.
2) Proportion in total CLS eligible FX transactions of those settled through the CLS system.

Source: Bank of Korea.

Box 7.

Recent Measures Implemented by the Bank of Korea to Support the Stability of the Payment and Settlement Systems

With the dramatic rise of volatility in domestic and overseas financial markets amid the COVID-19 pandemic and the detection of cases of COVID-19 infection within financial institutions as well, the need to ensure financial stability through the stable operation of the payment and settlement systems has been heightened. Thus, the Bank of Korea has made efforts to stabilize the payment and settlement systems by strengthening the monitoring of settlement risks of system operators and participants and reducing the burden of participants to provide collateral to guarantee settlement.

Strengthening monitoring of operators and participants of the payment and settlement systems

By establishing a regular communication system with major operators of payment and settlement systems, such as the Korea Exchange, Korea Securities Depository, and Korea Financial Telecommunications & Clearings Institute, the Bank of Korea monitored the readiness of these operators and examined the possibility of settlement risks of participants such as banks and securities companies.

The Bank inspected, among others, the risk management of system operators with regard to business continuity in the event of participant defaults or emergency situations, and the status of participants' establishment of settlement liquidity and response systems. In particular, as liquidity risk emerged in securities companies and instability heightened in money markets amid the tumble of global stock markets, the Bank examined the securities companies participating in the retail payment system for any sign of possible liquidity risks, such as ELS-related margin trends, the burden of underwriting ABCP in accordance with purchase agreements, and funding conditions.

Stronger monitoring of the payment and settlement systems

Target	Principal area of monitoring
System operators[1)]	- Credit and liquidity risk management related to participant's default - Operational risk management in case of emergency (distribution of manpower, remote work arrangements, etc)
Participants	- Risk management status of large-value payment, retail payment, and securities settlement systems - Liquidity management of securities companies - Crisis response system for BOK-Wire+ (installation of backup centers and disaster recovery terminals, distribution of manpower, etc)

Note: 1) Korea Exchange, Korea Securities Depository, Korea Financial Telecommunications & Clearing Institute.
Source: Bank of Korea.

The inspection found that system operators had secured sufficient financial resources to respond in the event of participant defaults and had properly established emergency fundraising plans, and that the risks of virus infections at business sites and business closures had been promptly addressed through the distribution of manpower and implementation of remote work arrangements.

As for participants, stability was shown in various indicators of settlement liquidity conditions, such as the proportion of fast payment orders in queue for settlement, intraday overdrafts, and maximum net debit cap utilization rate. The liquidity risk of securities companies participating in the retail payment system was managed properly overall thanks to the market stabilization measures taken by the government and the Bank of Korea.

Settlement risks of participants in the payment and settlement systems

(%, billion won)

Division	Risk management indicators	Before COVID-19 outbreak		After COVID-19 outbreak		
		Jan	Feb[1]	Mar[2]	Apr	May[3]
Large-value payment system (BOK-Wire+)	Proportion of settlements carried out after 16:00 (near the closing time)[4]	59.4	56.5	59.1	54.8	54.5
	Proportion of fast payment orders in queue for settlement[5]	23.1	22.4	26.3	23.2	21.4
	Amount of net intraday overdraft	574	417	626	907	542
Retail payment systems	Average maximum net debit cap utilization rate[6]	15.1	13.7	14.9	15.1	15.9
Securities settlement systems	Proportion of FOP settlement in the OTC market					
	Inter-institutional repos	6.3	7.4	5.3	5.8	6.8
	OTC bonds	2.3	3.2	1.6	1.6	1.4

Notes: 1) From February 1 to 22, 2020.
2) From February 23 to March 31, 2020.
3) From May 1 to 22, 2020.
4) Daily average basis.
5) Fast payment orders in queue for settlement / Total settlement amount.
6) Daily unsettled net debit caps among participants.
Source: Bank of Korea.

Meanwhile, in February 2020, the Bank of Korea prepared guidance in response to the detection of coronavirus infections at business sites and business closures for BOK Wire+ participants, aiming to ensure the stable operation of BOK Wire+ during emergencies. The Bank also inspected the status of participants' establishment of response systems (installation of backup centers and disaster recovery terminals, distribution of manpower, etc.) in accordance with the guidance and instructed some participants to address deficiencies.

Reducing the burden of participants to provide securities as collateral for guaranteeing settlements

In response to the COVID-19 pandemic, the Bank of Korea reduced the ratio of collateral for guaranteeing net settlements by 20%p (from 70% to 50%) from April 2020 in order to support the collateral buffers of retail payment system participants, and adjusted its schedule for raising the ratio.[1] After the measure was introduced, the amount of collateral securities financial institutions must provide to the Bank of Korea to guarantee net settlements dropped from 35.5 trillion won on March 30, 2020 to 25.4 trillion won. This is expected to increase liquidity supply to financial markets by the same amount as well as boost the collateral buffers of financial institutions.

1) In December 2018, the Bank of Korea decided to raise the collateral-to-net debit cap ratio for guaranteeing net settlements by 10%p each year until August 2022, in order to comply with the 「Principles for Financial Market Infrastructures (PFMI)」, an international standard for payments and settlements.

Changed schedule for raising ratio of collateral for guaranteeing net settlements

(%)

Division	Apr.20	Aug	2021	2022	2023	2024
Before	70	80	90	100	100	100
After	50	50	70	80	90	100

Note: 1) Ratio changed every August starting in 2021.
Source: Bank of Korea.

In addition, the Bank of Korea lessened financial institutions' collateral burden by temporarily broadening eligible collateral for guaranteeing net settlements to newly include bonds issued by public organizations and general bank debentures in addition to the existing government bonds and Monetary Stabilization Bonds.

Broadening of eligible collateral for net settlements

Before	After[1]
Government bonds, Monetary Stabilization Bonds, government-guaranteed bonds, KDB bonds, IBK bonds, KEXIM bonds, KHF MBS	(same as on the left)
-	Banking institutions established by the Bank Act; debentures issued by the National Agricultural Cooperative Federation and Nonghyup Bank, the National Federation of Fisheries Cooperatives and Suhyup Bank; bonds issued by nine public institutions[2]

Notes: 1) Temporary adjustment in place from May 25, 2020, through March 31, 2021.
2) KEPCO, Korea Expressway Corporation, Korea Gas Corporation, Korea and & Housing Corporation, Korail, Korea Rail Network Authority, K-Water, Korea SMEs & Startups Agency, and Korea Deposit Insurance Corporation.
Source: Bank of Korea.

Participation in international discussions and efforts to strengthen cooperation

As a member of the BIS' Committee on Payment and Market Infrastructures (CPMI), a body that sets international standards for payments and settlements and a forum for discussing agendas for global cooperation, the Bank of Korea participated in international discussions[2] on responses to the COVID-19 pandemic and actively cooperated with central banks of major economies.

On the conference calls, the Bank of Korea was informed about the responses of operators of major payment and settlement systems of other countries amid the COVID-19 pandemic, cases of failures, and payment and settlement trends. Meanwhile, the Bank analyzed the impact of the growing volatility of global financial markets and changes in payment types on the stability of domestic payment and settlement systems.

2) The Bank of Korea participated in conference calls hosted by the BIS on four occasions (April 1, April 8, April 30, and May 26) to check the status of and share information on the responses of central banks amid the spread of COVID-19.

Box 8.

Results of Systemic Risk Survey

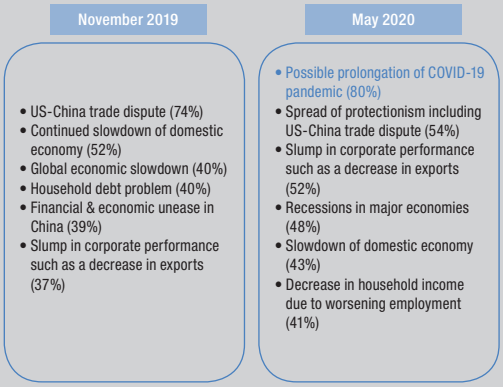
The Bank of Korea conducts the Systemic Risk Survey as a means of identifying major risk factors to the financial system and assessing financial system stability.[1] The following presents the results of the Systemic Risk Survey conducted from May 14 to 25, 2020, on employees of domestic and overseas financial institutions and financial specialists.

Major risk factors

The major risk factors for the Korean financial system that were cited[2] included a possible prolongation and second wave of the COVID-19 pandemic (80%), the spread of protectionism (including the US-China trade dispute) (54%), and a slump in corporate performance due to a decrease in exports (52%). In addition, recessions in major economies and a slowdown of the domestic economy also gained relatively large percentages of answers (48% and 43%, respectively[3]).

Compared with the last survey conducted in November 2019, possible prolongation of COVID-19 pandemic was added as the greatest risk factor for the Korean financial system, if it were to materialize, and concerns over sluggish corporate earnings and economic downturn in major countries were cited more frequently.

Changes in major risk factors[1]

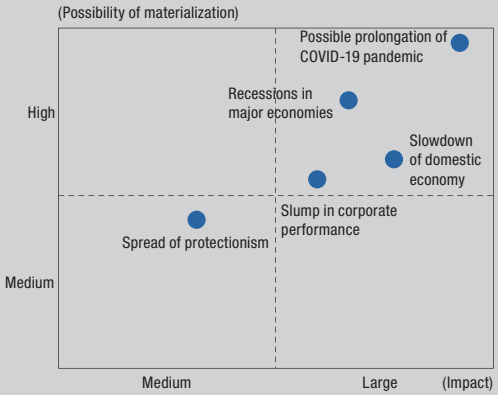


Note: 1) The six highest-ranked risk factors in terms of frequencies of response.
Source: Bank of Korea.

Among the major risk factors, a possible prolongation of the COVID-19 pandemic, economic recessions in major countries and Korea, and sluggish corporate earnings were cited as sources of risk that would be relatively highly likely to materialize and would have significant impacts on the Korean financial system. The spread of protectionism was ranked as a medium-scale risk factor.

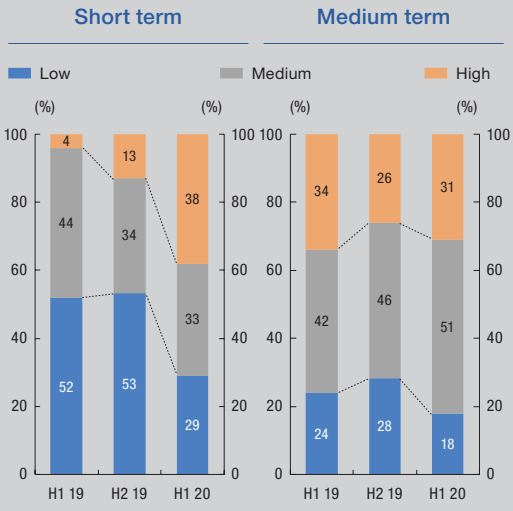
1) The central banks of about 10 countries, including the United States, United Kingdom, Sweden, and Canada, also conduct similar surveys.
2) Respondents were asked to list five risk factors (multiple answers). The 80% indicated here means that 80% of respondents cited a specific risk at least once in their top five risk factors.
3) In terms of the top risks cited by respondents, a possible prolongation of the COVID-19 pandemic was the most frequently cited (60%), followed by a slump in corporate performance, recessions in major economies, and a slowdown of the domestic economy, each of which was cited at a rate of 7%. Other risks were also cited at a rate of 7%, including concern over the deterioration of the soundness of financial institutions due to the COVID-19 pandemic and an expansion of credit risks of businesses and individuals.

Possibility of materialization by risk factor and impact on financial system



Source: Bank of Korea.

Possibilities of financial system risks[1)]



Note: 1) "High" and "low" include "very high" and "very low" respectively in the survey item.

Source: Bank of Korea.

Probability of realization of financial systemic risk

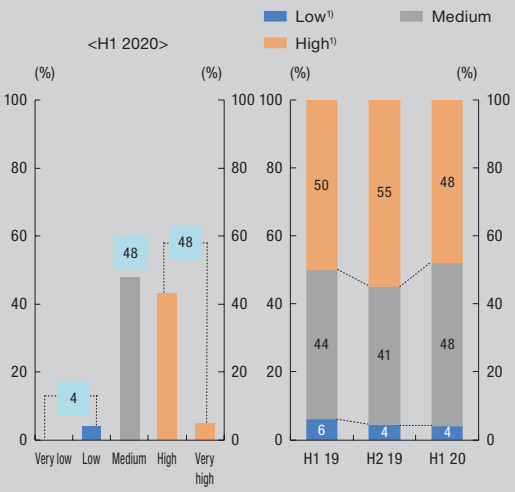
The probability of systemic risk materializing increased both in the short term (within a year) and medium term (more than a year and less than three years). The percentage of respondents that said there is a "high" probability of systemic risk materializing in the Korean financial system in the short term was 38%, significantly higher than in the last survey (13%).

However, the percentage of respondents that said there is a "high" probability of systemic risk materializing over the medium term rose by a small margin (26% → 31%), likely due to the expectation that public-health and economic measures will be put in place even if COVID-19 persists for a protracted period or resurges.

Assessment of level of confidence in financial system stability

Confidence in the stability of the Korean financial system remained robust. Despite the COVID-19 pandemic, 96% of respondents said that their confidence in the stability of the financial system over the next three years is "high" or "neutral", similar to the findings of the last survey.

Confidence in financial system stability



Note: 1) "High" and "low" include "very high" and "very low" respectively in the survey item.
Source: Bank of Korea.

Although the probability of financial system risk materializing in the short term rose significantly, confidence in the financial system has not declined much. Respondents said that Korea has dealt effectively with both the COVID-19 pandemic in its early phase and the instability in the foreign exchange market, and that the stability of the financial system would not be greatly undermined thanks to the well-established safety mechanisms centered on banks and others.

According to the survey, the most urgent thing to enhance the stability of Korea's financial system at this point would be flexible and swift responses to COVID-19 developments. On the other hand, some said that it is necessary to strengthen cyber security and enhance the stability of IT systems, as various security incidents could occur frequently due to increased non-face-to-face financial consumption. Furthermore, some mentioned the need to cope with any negative consequences of expansionary monetary and fiscal policies and the measures taken to relax financial regulations amid the coronavirus pandemic once the pandemic begins to subside and things start to return to normal.

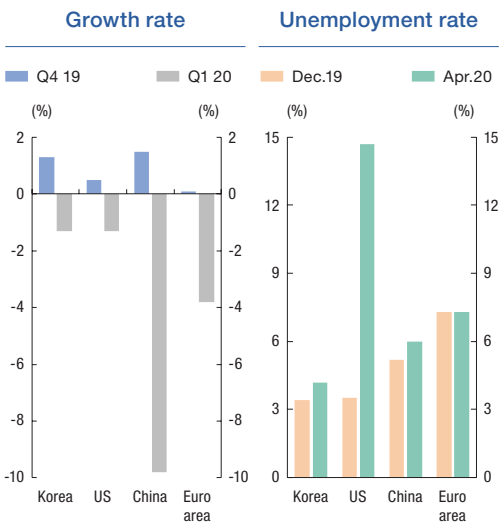
Analysis of Financial Stability Issues

Ⅰ. Financial Stability Outlook and Major Risk Factors

1. Background

With the accelerated spread of COVID-19 across the world since March this year, the global economy contracted sharply as lock-downs and global supply chain disruptions caused industrial production to decline and unemployment to surge (Figure Ⅰ-1). The COVID-19 pandemic also triggered a real economic shock in Korea, both on the supply and demand sides, negatively affecting household consumption and production by businesses, with its repercussions rapidly being felt in the corporate sector and financial markets.

Figure Ⅰ-1. Growth[1] and unemployment rates of major countries



Note: 1) Quarter-on-quarter basis.

Sources: Each country's respective central bank and national statistics.

However, the broad and swift measures undertaken by the policy authorities to prevent the resulting risks from propagating across the economy have helped restore some measure of calm in the financial markets. The asset quality of financial institutions also appear to remain at a sound level (Figure Ⅰ-2).

Notwithstanding, even if the spread of COVID-19 slows in Korea during the first half, the economic fallout of the pandemic is expected to persist for some time as the global recovery is likely to be prolonged.[1)]

This article forecasts financial stability conditions by sector going forward and examines major risks likely to affect the financial system.

2. Financial Stability Forecast

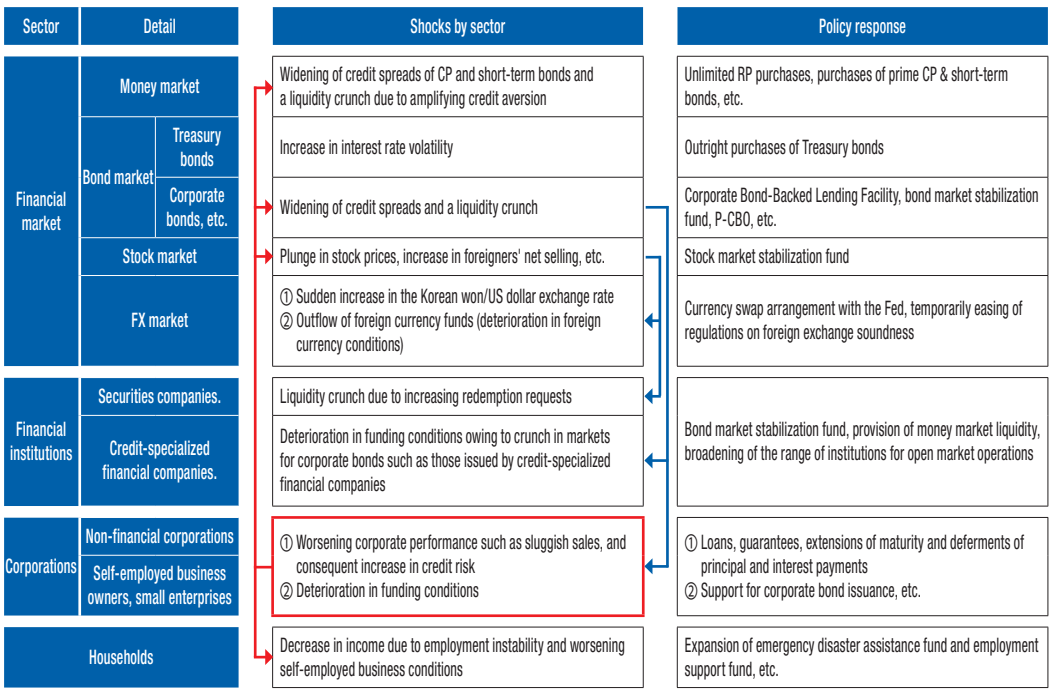
(1) Baseline scenario

Under the baseline scenario for the forecast of financial stability conditions, it is assumed that the spread of COVID-19 comes to a halt in Korea during the second quarter, and economic activity gradually resumes during the second half. The assumptions used in this forecast, including the rate of economic growth, are taken from the Bank of Korea's May 2020 Economic Outlook.

① Financial and real estate markets

The volatility of price variables in the financial and foreign exchange markets is projected to decrease gradually thanks to the policy authorities' stabilization measures and a gradual economic recovery. In the case of credit bonds, while credit spreads are expected to decrease slowly on CP and other short-term instruments, there is a possibility that the decrease in credit spreads on corporate bonds will be

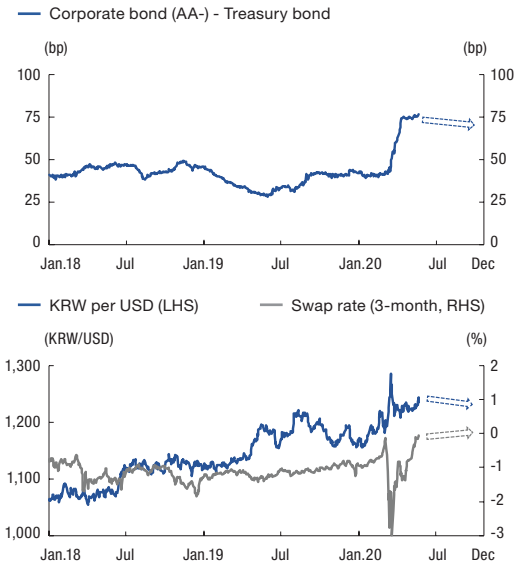
Figure Ⅰ-2. Shocks and policy responses by sector due to the spread of COVID-19



1) The IMF (April 14), World Bank (June 8) and the OECD (June 10) forecast the global economy to contract by 3.0%, 5.2% and 6.0%, respectively, in 2020.

limited due to lingering market vigilance against credit risks amid a decline in earnings. In the stock market, although stocks rebounded starting in April, strongly affected by the price movement in the global market, in the second half, prices are likely to fluctuate within a limited range. In the foreign exchange market, even though volatility will persist in the Korean won/US dollar exchange rate and swap rate, stability is expected to return as the economy slowly recovers and foreigners' investment swings to net inflows (Figure Ⅰ-3).

Figure Ⅰ-3. Corporate credit spread[1] and exchange rate



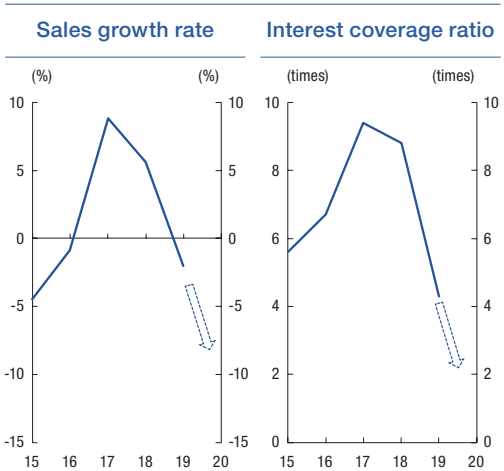
Note: 1) 3-year maturity basis.
Sources: Korea Financial Investment Association, Korea Money Brokerage Corp., Tullet Prebon, Bank of Korea staff calculations.

In the real estate market, although downside risks on house prices persist due to the strengthening of government regulations and the COVID-19 pandemic, a large-scale price adjustment is unlikely given the abundant liquidity in the market and strong investor appetite for properties in the Seoul Metropolitan area.

② Corporations and households

As earnings drop in some of the industries that are more heavily impacted by COVID-19 despite aggressive relief measures by the policy authorities, and as employment conditions consequently deteriorate, the debt repayment capacities of both households and corporations are likely to weaken. Revenues will decline especially sharply in the travel, air transport, shipping and petrochemical industries, with the effects of COVID-19 on corporate revenue varying by industry (Figure Ⅰ-4).

Figure Ⅰ-4. Corporate sales growth rate[1] and interest coverage ratio



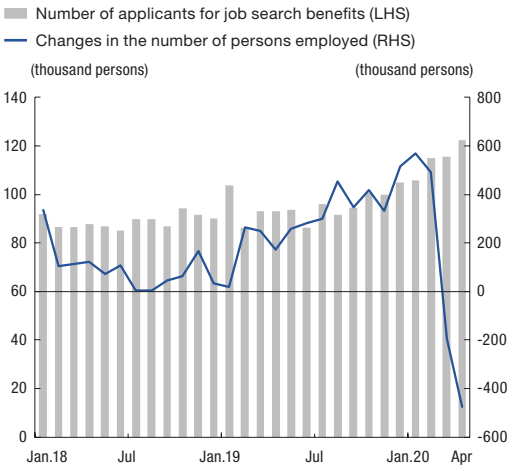
Note: 1) Year-on-year basis.
Sources: KIS-Value, Bank of Korea staff calculations.

Despite the government's various economic relief programs and job protection measures to minimize the negative employment shock to households,[2] a worsening of households'

2) The government has announced a package of employment stabilization measures worth 10.1 trillion won, including employment retention, emergency employment stabilization funding, and creation of public-sector jobs and youth employment (April 22).

income conditions appears inevitable due to the sales decline in the self-employed sector and unemployment surge (Figure Ⅰ-5). The delinquency rate on household loans is likely to show a slight increase from the end of 2019 (0.81%), but still remains below its long-term average (1.37% in 2010-2019).

Figure Ⅰ-5. Number[1] of applicants for job search benefits and changes[2] in the number of persons employed

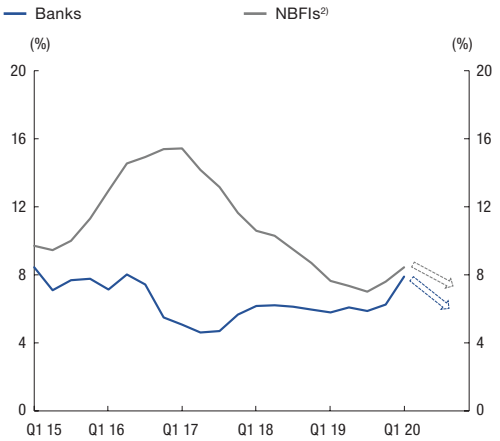


Notes: 1) Seasonally adjusted series.
2) Year-on-year basis.
Sources: Ministry of Employment and Labor, Korea Statistics, Bank of Korea staff calculations.

③ Financial institutions

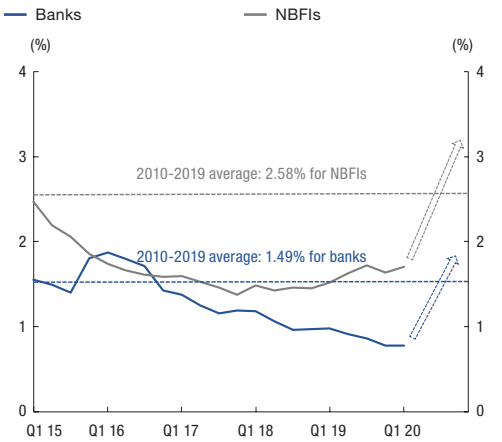
The growth in bank loans, which accelerated sharply during the first half as a result of the government's financial relief policy and due to the rising demand for corporate loans, is expected to slow during the second half as banks step up the monitoring of their asset quality (Figure Ⅰ-6). Banks' profitability is likely to slip below last year's level, brought down by narrowing loan-deposit spread amid declining interest rates, increased loan loss expenses and decreased non-interest income. Other asset quality indicators like the substandard-or-below loan ratio are likely to worsen from the second half, centered on loans to vulnerable households and corporations. Amid a slight slowdown in loans by non-bank financial institutions ("NBFIs" hereafter), there could be an uptick in the credit risk of credit card companies and mutual savings banks with comparatively high shares of loans to low-income or self-employed borrowers. In the case of insurance companies, they may see a further deterioration in profitability due to an increase in negative margins as a result of declining interest rates (Figure Ⅰ-7).

Figure Ⅰ-6. Rate of increase in loans by financial institutions[1]



Notes: 1) Year-on-year basis.
2) Excluding insurance contract loans.
Sources: Financial institutions' business reports, Bank of Korea staff calculations.

Figure Ⅰ-7. Financial institutions substandard-or-below loan ratios



Sources: Financial institutions' business reports, Bank of Korea staff calculations.

④ Resilience of financial system

When financial institutions' expected losses and resilience were estimated based on the current baseline forecast path, using the Bank of Korea's Systemic Risk Assessment Model for Macroprudential Policy (SAMP), the results suggested that some credit losses are likely, but loss absorption capacities are sufficient to handle these losses. The total expected credit losses of all financial institutions caused by a rise in loan delinquency rates are estimated at 22.2 trillion won at the end of 2020, 12.9 trillion won more than the amount without the COVID-19 shock (9.3 trillion won). Meanwhile, their market income (10.9 trillion won) is estimated to be slightly less (0.9 trillion won) than the amount without the COVID-19 shock (11.8 trillion won), which takes into account the widening of credit spreads and so on (Table Ⅰ-1).

Table Ⅰ-1. Expected amounts[1] of credit losses and market income under the current baseline scenario

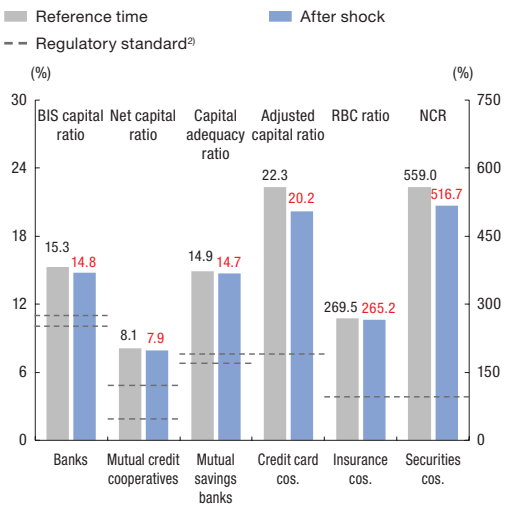
(trillion won, %)

Sector	Credit losses[2]				Market income[2]		
	Amount (A)		Available capital (B)	A/B ×100	Amount (C)		C/B ×100
Total	-22.2	(-9.3)	517.7	-4.3	10.9	(11.8)	2.1
Banks	-11.6	(-4.3)	236.6	-4.9	5.7	(5.5)	2.4
Mutual savings banks	-0.6	(-0.3)	9.5	-6.4	0.0	(0.0)	0.0
Mutual credit cooperatives[3]	-2.7	(-1.7)	62.1	-4.4	0.1	(0.1)	0.2
Credit card cos.	-4.7	(-2.5)	27.4	-17.1	-0.1	(0.0)	-0.4
Insurance cos.	-0.8	(-0.2)	156.4	-0.5	4.1	(4.3)	2.6
Securites cos.	-1.8	(-0.3)	25.9	-6.9	1.1	(1.9)	4.4

Notes: 1) ( ) indicates the amount of expected profit and loss under a scenario without the COVID-19 shock.
2) A "+" means profits, and a "-" means losses.
3) Based on the sum of Nonghyup, Suhyup, NFCF and credit unions.

The average capital ratios of financial institutions, although brought down slightly by increased credit losses and decreased market income, are likely to remain above the regulatory standards across all sectors. The only exception is a few small insurance companies whose capital ratios are expected to fall below the regulatory standards (Figure Ⅰ-8).

Figure Ⅰ-8. Changes in capital ratios[1] by sector under the current baseline scenario



Notes: 1) Banks, mutual credit cooperatives, mutual saving banks, and credit card companies are on the left side; insurance companies and securities companies are on the right side.
2) Regulatory standards: 10.5% for banks (11.5% for D-SIBs), 2-5% for mutual credit cooperatives, 7% for mutual savings banks (8% for institutions with assets of more than 1 trillion won), 8% for credit card companies, and 100% for insurance companies and securities companies.

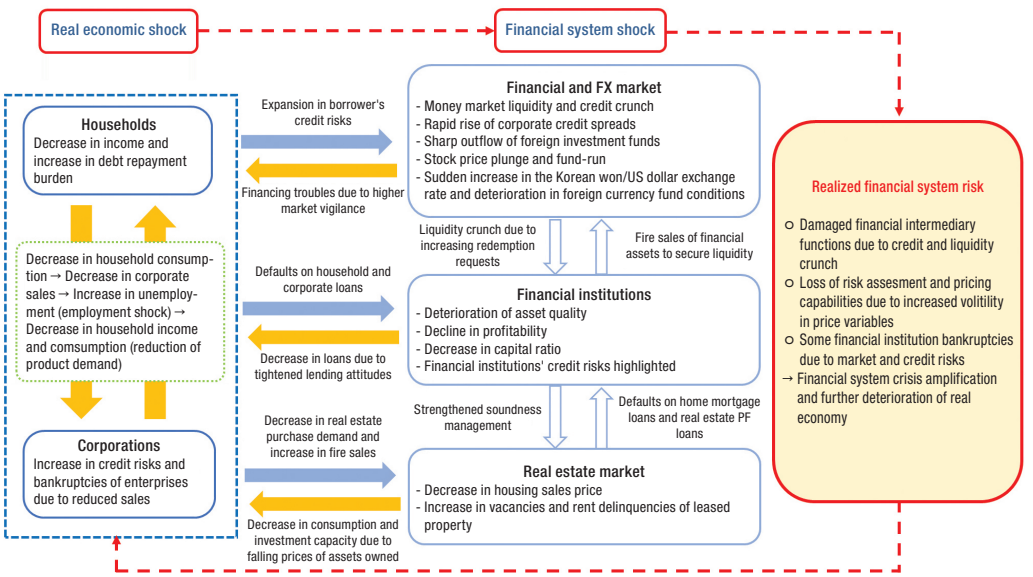
(2) Major risk factors under a severe scenario

Should there be an additional unexpected shock going forward in the form of a second wave of COVID-19, bankruptcies of large enterprises, or an escalation of US-China conflicts, the real economic shock in the corporate and household sectors could become amplified through interconnections between the financial, foreign exchange markets and financial institutions to become a systemic risk. Below is a sector-by-sector examination of vulnerabilities that may manifest themselves in the financial system under this severe scenario (Figure Ⅰ-9).

① Further intensification of credit crunch and increased market risk

The credit crunch for companies and financial institutions may intensify should there be a second major wave of COVID-19 pandemic as this will lead to further economic down-

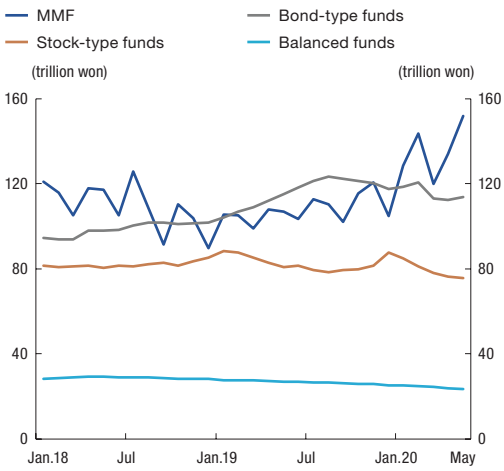
Figure Ⅰ-9. Possible risks in the financial system and spillover channels



turns in Korea and worldwide, a sharp drop in household income and a surge in corporate bankruptcies, driving up credit risk. Credit incidents such as an onslaught of corporate credit downgrades in vulnerable industries or upsurge in financial institutions' non-performing assets could sharply widen credit spreads or put a de facto halt to the issuance of corporate bonds altogether. Funding would also become difficult in money markets, through CP or short-term bonds alike. Among financial institutions, securities companies and credit-specialized financial companies ("credit-specialized companies" hereafter) with high reliance on wholesale funding[3] are likely to see their rollover risk spike. If this happens, securities companies may become pressured to dump their holdings of bonds and other securities, and credit-specialized companies to reduce credit supply to households and SMEs.

In the financial markets, the volatility of price variables, such as interest rates and stock prices, could significantly increase as investors' risk aversion grows, leading to a second surge in market risk. Increased investment losses by money market funds, which invest heavily in credit instruments, and by financial products, such as corporate bonds or stock funds, could result in fund runs, forcing asset management companies into fire sales of assets to raise enough cash to meet the redemption demand on funds (Figure Ⅰ-10). Moreover, incentives to dump assets could grow stronger among financial institutions, and more particularly, among securities companies with high market risk exposures.[4] Meanwhile, the possibility of a stock market plunge causing spiraling losses for individual investors who massively increased their stock investment during the first COVID-19 shock cannot be ruled out (Figure Ⅰ-11).

Figure Ⅰ-10. Balances of funds by type

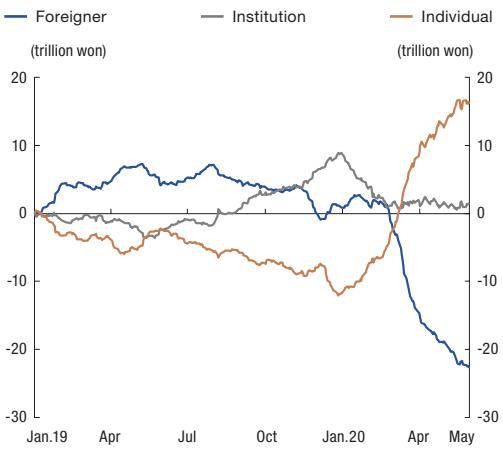


Source: Korea Financial Investment Association.

3) RP sales, CP and other short-term debt account for 80.6% of total wholesale funding by securities companies. As for credit-specialized companies, credit-specialized financial company bonds (90.2%) account for the bulk of their wholesale funding (as of the end of March 2020).

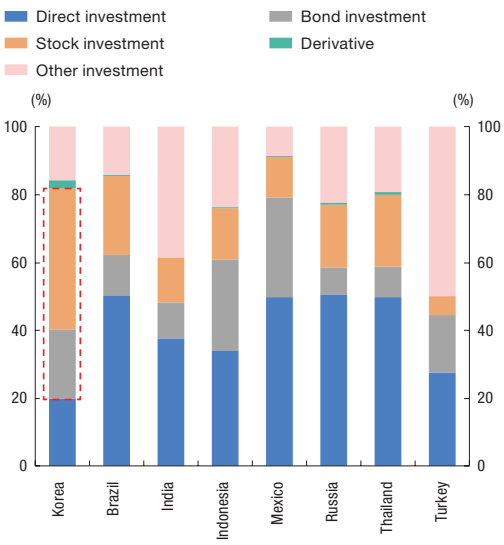
4) Securities companies, which hold large amounts of bonds (154.4 trillion won as of the end of March 2020) to leverage investment using proprietary capital and hedge ELS, have incentives to rapidly dump them when market risk increases.

Figure Ⅰ-11. Stock investment[1] by investor type



Note: 1) Daily cumulative net purchase.
Source: Yonhap Infomax.

Figure Ⅰ-12. Proportions[1] of external financial liabilities by country



Note: 1) End-2019 basis.
Source: IMF.

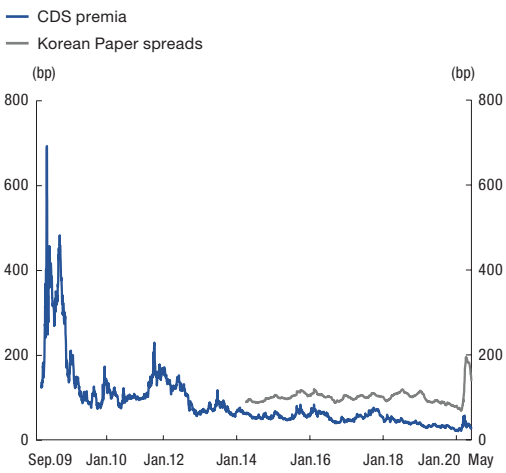
② Deterioration in foreign currency conditions

As confidence wanes in the fundamentals of the domestic economy, and the appetite for safe global assets grows, the demand for dollars could spike, and the sudden outflow of foreigners' domestic portfolio investment could send the Korean won/US dollar exchange rate sharply higher, leading to an acute shortage of foreign currency funds.[5] Given the high share of foreign holdings in domestic stocks and bonds and the substantial portion of marketable investments (stocks and bonds) in Korea's external financial liabilities,[6] the possibility of a sudden outflow of foreigners' investment cannot be ruled out should domestic and global conditions worsen (Figure Ⅰ-12).

Moreover, an increase in the credit risk of large enterprises or financial institutions amid a rapid increase in foreign currency borrowing spreads and CDS premia on Foreign Exchange Equalization Bonds could have an adverse impact on Korea's sovereign credit rating[7] (Figure Ⅰ-13).

5) During the global financial crisis, the Korean won/US dollar exchange rate jumped from 938.2 won (December 2007 average) to as much as 1,570.3 won (the highest level recorded on March 2, 2009), with the swap rate (3-month) sharply dropping from -242bp (December 2007 average) to -879bp (the lowest level, recorded on October 10, 2008).
6) Foreign investors account for 31.5% and 7.3% of the domestic stock and bond market, respectively (as of the end of April 2020), and external financial liabilities (1.2 trillion dollars at the end of 2019) are made up of marketable investments such as stocks (41.5%) and bonds (20.3%).
7) S&P basis: A (July 2005) → A+ (September 2012) → AA- (September 2015) → AA (August 2016).

Figure Ⅰ-13. CDS premia[1] on foreign exchange equalization bonds and KP[2] spreads[3]

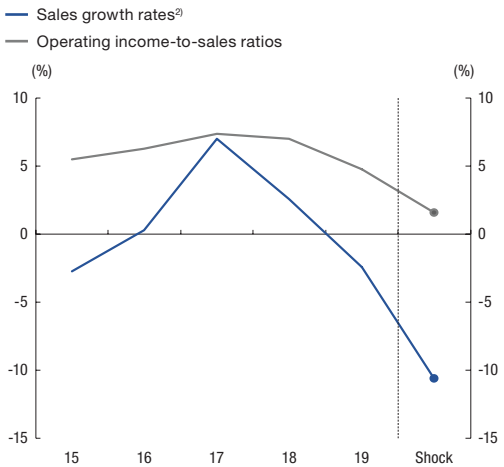


Notes: 1) 5-year maturity basis.
2) USD-denominated corporate bonds and quasi-government bonds basis.
3) Spreads relative to US Treasury bond yields.
Sources: Bloomberg, Barclays.

③ Increased bankruptcy probability for some companies[8]

A further deterioration in the economic downturn could lead to a dramatic decline in sales and a liquidity squeeze, which could in turn cause the corporate loan delinquency rate to surge and increase the probability of corporate bankruptcies. If sales decrease to the degree seen in the immediate aftermath of the COVID-19 outbreak (about -10.6%), this is estimated to result in a drop in the operating income-to-sales ratio (externally-audited corporation (20,693 firms) basis, the same hereafter) to 1.6%. If the earnings drop is compounded by a financial shock in which firms are unable to refinance some of their marketable borrowings, as many as 10.8% of all externally-audited companies could face a liquidity shortage, with their combined total liquidity shortfall reaching 54.4 trillion won. If companies respond to the deteriorating earnings performance and the financial shock by laying off employees, this could also have a negative impact on employment conditions (Figure Ⅰ-14).

Figure Ⅰ-14. Growth[1] and profitability[2] of corporations in event of sales shock



Notes: 1) ● indicates the outlook under the sale shock scenario.
2) Year-on-year basis.
Sources: KIS-Value, Bank of Korea staff calculations.

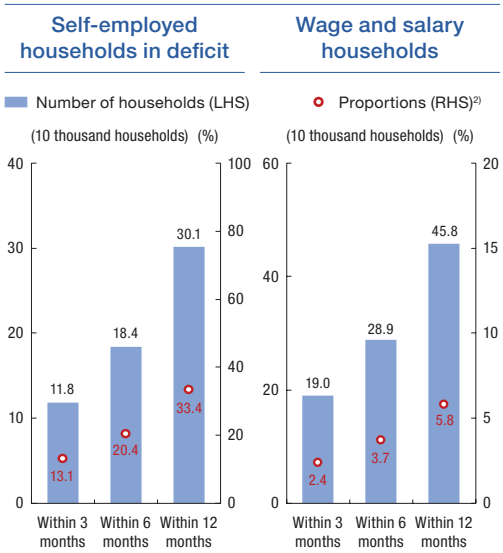
8) As it is difficult to estimate the decrease in corporate sales under a macro-variable scenario, such as the one used in this article, additional variables including "sales shock" were used for this purpose. For further details, refer to <Analysis of Financial Stability Issues> 「II. The Effect of the COVID-19 Shock on Corporate Financial Soundness」 (page 124).

④ Rise in defaults on self-employed and household loans[9)]

There is a possibility that a sharp drop in sales of self-employed businesses and the resulting decline in their debt repayment capacity would lead to a massive increase in defaults on loans to this group of borrowers. Should a severe sales shock similar to the one experienced during the initial throes of COVID-19 between mid-February and April persist, as many as 20.4% of total self-employed households that are currently in deficit would be able to meet their expenses for less than six months, even with additional cash from liquidating their financial assets.

Under an employment shock scenario using the increase in the unemployment rate during the Asian currency crisis, as many as 289,000 households, corresponding to 3.7% of all wage and salary households with financial liabilities, were estimated to be able to meet their consumption expenses and service their debt for less than six months (Figure Ⅰ-15).

Figure Ⅰ-15. Number of households and proportions by time to liquidity shortage after sales and unemployment shocks[1)]



Notes: 1) Financially indebted households basis.
2) Proportions in the total number of self-employed households in deficit and in the total number of wage and salary households, respectively.

Sources: Bank of Korea and Statistics Korea (2019 Survey of Household Finances and Living Conditions), staff calculations.

⑤ Significant drop in financial institution's capital ratios, but sound level of resilience for financial system

Increased market and liquidity risks amid rising defaults on corporate and household loan and heightened volatility in the financial markets could lead to a drastic deterioration in the asset soundness and profitability of financial institutions. When financial institutions'

9) In the case of households, to circumvent the difficulty of estimating the increase in the unemployment rate and decrease in self-employed sales under the macro-variable scenario used in this article, additional variables were used, including "employment shock" and "sales shock." For details, refer to <Analysis of Financial Stability Issues> 「III. Assessment of Household Default Risk under Economic Shock」 (page 134).

10) To reflect a tremendous shock to financial and economic conditions, the 1st percentile of the distribution of forecast GDP growth conditional on current financial conditions (GaR 1%, -3.2%) was assumed. Assuming an extremely low rate of economic growth is a practice that is also adopted by central banks in other major countries for stress testing. For details on GaR, refer to the June 2019 Financial Stability Report, <Box 1> 「Assessments of Financial Vulnerability of Korea using Growth-at-Risk Approach」 (page 15).

expected losses were estimated using SAMP, under a scenario in which Korea's economic growth shrinks to an extremely low level,[10] the results suggest that a significant number of financial institutions are likely to record massive net losses, hit by a dramatic increase in credit (-44.5 trillion won) and market (-48.6 trillion won) losses due to heightened volatility in domestic and global markets amid a sharp rise in delinquency rates caused by an expanding volume of non-performing loans (Table Ⅰ-2). NBFIs' loan portfolios appear more susceptible to credit risk and worsening conditions in the real estate market than banks'.[11] Insurance companies, which have a high share of bond holdings, were found to experience the largest market losses of all sectors (-42.9 trillion won), and given the recent massive increase in their overseas securities investment,[12] the possibility of risk contagion from overseas cannot be ruled out.

Table Ⅰ-2. Expected amounts[1] of credit losses and market income under the severe scenario

(trillion won, %)

Sector	Credit losses[2]				Market income[2]		
	Amount (A)		Available capital (B)	A/B ×100	Amount (C)		C/B ×100
Total	-44.5	(-22.2)	517.7	-8.6	-48.6	(10.9)	-9.4
Banks	-22.6	(-11.6)	236.6	-9.6	-0.9	(5.7)	-0.4
Mutual savings banks	-1.3	(-0.6)	9.5	-14.1	0.0	(0.0)	0.0
Mutual credit cooperatives[3]	-7.0	(-2.7)	62.1	-11.3	0.0	(0.1)	0.0
Credit card cos.	-8.1	(-4.7)	27.4	-29.4	-0.7	(-0.1)	-2.4
Insurance cos.	-2.7	(-0.8)	156.4	-1.8	-42.9	(4.1)	-27.4
Securites cos.	-2.5	(-1.8)	25.9	-10.7	-4.1	(1.1)	-15.9

Notes: 1) ( ) indicates the amount of expected profit and loss for 2020 under the baseline scenario.
2) A "+" means profits, and a "-" means losses.
3) Based on the sum of Nonghyup, Suhyup, NFCF and credit unions.

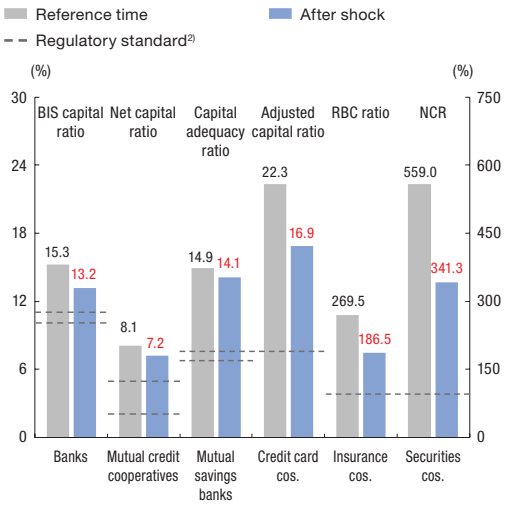
This situation notwithstanding, the resilience of the overall financial system is expected to be maintained at a sound level, with average capital ratios by sector as well as the capital ratios of most financial institutions remaining in excess of the regulatory standards. However, financial institutions' capital ratios are expected to decrease significantly due to rising market and credit losses, with a greater number of them seeing their capital ratios fall below the regulatory standards than under the baseline forecast path (Figure Ⅰ-16). As NBFIs' capital ratios are expected to drop more significantly than banks' due to the smaller size of capital, this could worsen funding conditions for

11) Compared to banks, NBFIs have significantly higher shares of borrowers with medium (32.7%) and low (9.1%) credit ratings, with small and medium-sized enterprises and sole proprietors accounting for 91.8% of total corporate loans. By industry, loans to the construction (39.1 trillion won) and real estate (110.3 trillion won) industries made up 54.0% of total corporate loans by NBFIs (as of the end of March 2020).

12) The share of overseas securities in total investment in financial products by insurance companies increased to 20.1% at the end of March 2020 from 9.1% at the end of 2014.

them. Amid growing market vigilance against credit risks, a decline in financial institutions' capital ratios could undermine their financial intermediation function since it would adversely affect their credit supply capacity, especially for financial institutions with lower capital strength.

Figure Ⅰ-16. Changes in capital ratios[1] by sector under the severe scenario



Notes: 1) Banks, mutual credit cooperatives, mutual saving banks, and credit card companies are on the left side; insurance companies and securities companies are on the right side.
2) Regulatory standards: 10.5% for banks (11.5% for D-SIBs), 2-5% for mutual credit cooperatives, 7% for mutual savings banks (8% for institutions with assets of more than 1 trillion won), 8% for credit card companies, and 100% for insurance companies and securities companies.

3. Implications

Although the COVID-19 outbreak has caused economic activity to sharply shrink and volatility to spike in the financial markets, the broad spectrum of measures undertaken by the policy authorities has helped temper market instability to some degree. The Bank of Korea has also prepared a series of phased responses to prevent COVID-19's economic fallout from becoming a risk to the financial system; some of these measures have already been implemented.[13]

Under the baseline scenario assumed earlier, although some weakening in the debt repayment capacity of the household and corporate sectors may be inevitable to some extent, when the effects of policy actions already undertaken and the level of financial institutions' resilience are considered, the financial system is expected to remain stable for the most part. Moreover, even under the severe scenario in which an additional unexpected shock causes further aggravation in financial and economic conditions, the resilience of the financial system is projected to be maintained at a stable level.

However, if mounting economic uncertainties lead to a sharp reduction in the debt repayment capacity of economic agents and massive losses for financial institutions, this could se-

13) After the COVID-19 outbreak, the Bank of Korea undertook a series of economic and financial stabilization measures, including cutting the Base Rate (1.25% → 0.50%), extending the range of eligible collateral securities and institutions for open market operations, establishing an RP purchase facility according to which an unlimited amount of liquidity is supplied, launching the Corporate Bond-Backed Lending Facility (CBBLF), providing support for purchases of corporate bonds with low credit ratings and CP, increasing the total ceiling and lowering the interest rates on the Bank Intermediated Lending Support Facility, and entering into a currency swap arrangement with the US Federal Reserve.

riously undermine their function as financial intermediaries, with a vicious cycle between the financial sector and the real sector becoming actualized. Therefore, it is important for the policy authorities to put into place a proactive response system to prevent the major risk factors discussed earlier from becoming system risks. Attention should be paid to risk management by examining the level of risk tolerance among different economic agents, including financial institutions, corporations and households, and refraining from investment involving excessive leverage or in high-risk products.

The Bank of Korea will strengthen its routine monitoring of internal and external risk factors and closely examine paths of risk propagation. Moreover, should a sharp increase in non-performing corporate and household loans or a widening in financial institutions' losses intensify the credit crunch, the Bank of Korea will more actively fulfill its role as the lender of last resort to stabilize the financial system.

Ⅱ. The Effect of the COVID-19 Shock on Corporate Financial Soundness

1. Background

The COVID-19 pandemic that has recently unfolded across the globe has sharply contracted economic activities in Korea and worldwide, causing a severe decline in corporate[1] performance.[2] This has resulted in an increased possibility of a deterioration in corporate financial soundness and liquidity conditions, especially in vulnerable industries which are more heavily impacted by COVID-19.[3]

Although the delinquency rate[4] of corporate loans still maintains its low trend, vigilance against corporate credit risk is spreading as the probability of default shows an upsurge,[5] with credit ratings downgraded.[6] In particular, some companies are encountering liquidity shortages, having difficulties in refinancing their maturing bonds.[7]

This article looks at the change in corporate financial soundness and estimates the liquidity shortfalls of corporations under stress scenarios in which the COVID-19 pandemic leads to a drop in corporate sales and anxiety in the financial markets. Based on the results of this analysis, the effectiveness of policy responses by the government and other authorities is evaluated, and future policy responses are explored (Figure Ⅱ-1).

1) 20,693 companies that are externally audited and publish an annual report pursuant to the 「Act on External Audit of Stock Companies, Etc.」 (excluding financial, insurance and other non-relevant industries) were analyzed. In 2019, the sales of these companies (2,594.6 trillion won) accounted for a 62.5% share of the total 2018 sales of companies tracked in the annual 「Financial Statement Analysis」 (4,151.6 trillion won).

2) During the first quarter of 2020, the operating income of major corporations (592 KOSPI-listed companies) decreased by 31.2% on a year-on-year basis (Source: Korea Exchange).

3) In this article, nine industries, including general retail, accommodation & food services, leisure services, petrochemicals, automobiles and air transport, that are likely to have been more heavily impacted than others during the COVID-19 pandemic by decreased domestic and overseas demands due to social distancing and travel restrictions, and by damaged global value chains, were selected as vulnerable industries.

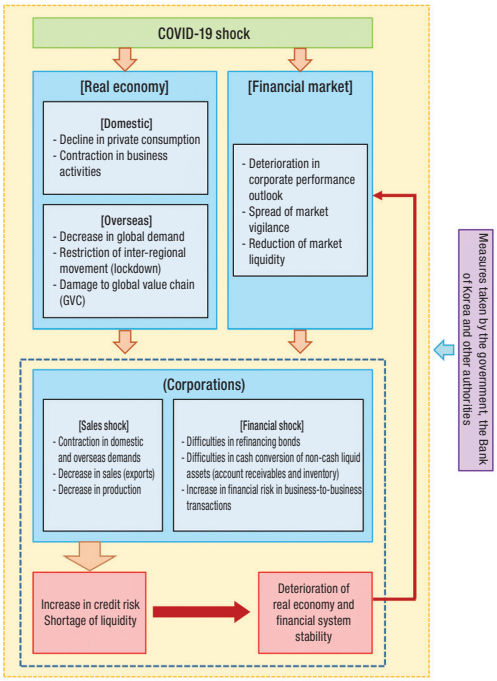
4) As of the end of March 2020, the delinquency rate on banks' corporate loans stood at 0.50%, below its long-term average (0.77% in 2013-2019, simple average of values at the end of March of each year).

5) The probability of default of listed companies (average basis), which was maintained around the 1.5% range between September 2019 and February 2020, sharply rose to 2.5% in March this year. Companies with a probability of default in excess of 2.5% may be regarded as speculative grade (source: Korea Risk Management).

6) Between January and May 2020, the credit rating up-down ratio (upgraded companies / downgraded companies, notch changes basis) stood at 0.2, continuing on the downgrade trend from last year (0.6).

7) As of the end of May 2020, 66.4% (157.3 trillion won) of the total CP and short-term bonds (237.0 trillion won) was set to reach maturity during the second to third quarters in 2020 (54.3 trillion won in the second quarter, 103.0 trillion won in the third quarter).

Figure Ⅱ-1. Expected spillover channels of the COVID-19 shock



2. Stress Test Scenario

To gauge the effect of the COVID-19 pandemic on the financial soundness and liquidity conditions of companies, stress scenarios of a sales shock and a financial shock were assumed.

For the sales shock,[8] sales figures and outlooks in industries since the COVID-19 outbreak and sales in past times of crisis were comprehensively considered. Adjustments in operating expenses were also assumed to accompany the sales shock. Moreover, given the sharp downward revisions to global economic forecasts in recent months,[9] both the strength and length of the shock were set rather conservatively.

For the financial shock, the scenarios assumed a situation in which, amid a significant drop in the proportion of current liabilities that are refinanced ("refinancing rate" hereafter) caused by growing wariness about corporate credit risk, companies are unable to quickly convert their non-cash assets, such as account receivables and inventory, into cash.[10]

8) The sales shock scenario for vulnerable industries (annual sales basis, %).

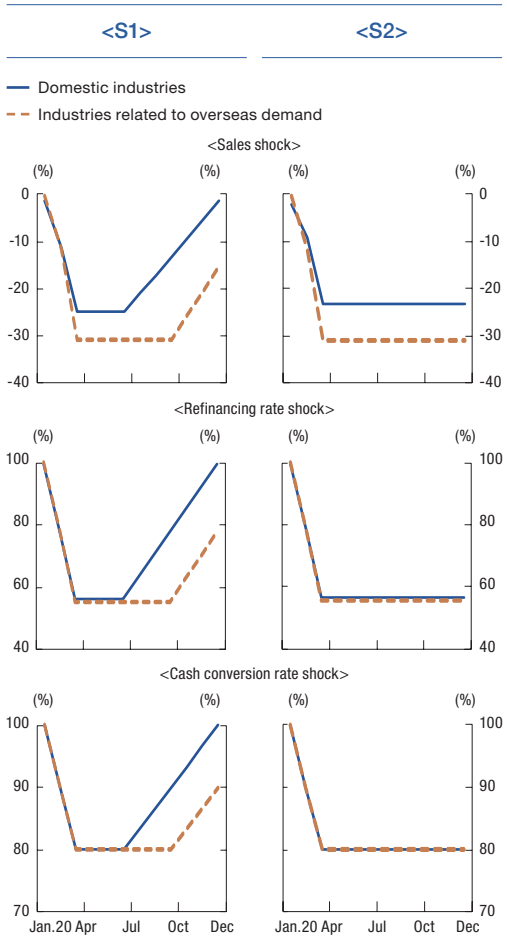
	Domestic industries				Industries related to overseas demand				
	General retail	Accommodation & food services	Leisure services	Film & entertainment	Petrochemicals	Automobiles	Air transport	Travel	Shipping
S1	-7.2	-22.2	-22.7	-52.4	-27.2	-24.8	-61.7	-66.7	-28.0
S2	-9.6	-33.3	-35.9	-75.6	-30.2	-27.3	-68.4	-71.5	-31.0
Basis of shock	Weakened consumer sentiment, decline in private consumption due to social-distancing measures				Drop in oil prices and demand contraction	Temporary production stoppages in Korea and abroad and decrease in overseas sales	Reduction of air passengers due to lockdown measures		Reduction of global trade volume

9) In the World Economic Outlook (April 2020), the IMF predicted negative annual growth of 3.0% for the global economy in 2020, while the Bank of Korea predicted a similar growth rate of -3.4% in its Economic Outlook (May 2020). These growth forecasts are substantially below the rate of growth during the global financial crisis (-0.1%).

10) It was assumed that under the financial shock, of the current liabilities, all loans are rolled over, while all marketable debt (CP, corporate bonds) is repaid. Moreover, it was also taken into consideration that the amount of account receivables and inventory converted into cash in past times of crisis was only about 80-90% of that in normal times. Based on these assumptions, a debt refinancing rate of 71.3% was used for S1 and 61.7% for S2, with 87.6% and 82.5% (annual rate basis) applied as the rate of cash conversion of non-cash assets for S1 and S2, respectively.

Two different scenarios were set up in consideration of the fact that the magnitude of the impact on the real economy and financial markets could vary depending on the length of COVID-19. The baseline scenario (S1) was assumed under a situation in which the sales shock and the financial shock continue into the second quarter of 2020 for domestic industries and the third quarter of 2020 for industries related to overseas demand. In addition to the S1 scenario, a severe scenario (S2) was set up in which these shocks continue unabated throughout the year. Finally, it was assumed that even after the dissipation of the shocks, it would take about six months for companies to recover, with the after-effects of the shocks persisting through to the second quarter of 2021 in the worst case scenario (Figure Ⅱ-2).

Figure Ⅱ-2. Sales and financial shocks due to COVID-19



Source: Staff calculations.

3. Change in Financial Soundness and Liquidity Shortfall

A. Change in financial soundness

Under the sales shock triggered by COVID-19, the financial soundness of companies appears to sharply deteriorate.

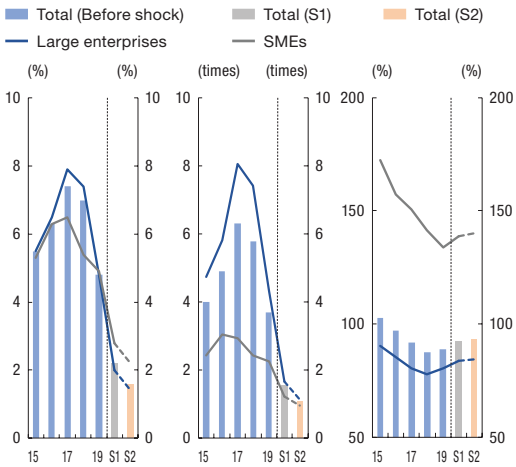
The operating income-to-sales ratio (operating income / sales), measuring corporate

profitability, is projected to fall to 2.2% under S1 and 1.6% under S2 from 4.8% in 2019. By company size, the drop in sales appears to be more significant for large enterprises (4.8% in 2019 → S1 2.0%, S2 1.4%) than for SMEs (4.9% in 2019 → S1 2.8%, S2 2.2%).

The interest coverage ratio (operating income / interest expenses), an indicator of debt repayment capacity, is projected to dip to 1.5 under S1 and 1.1 under S2 from 3.7 in 2019. The interest coverage ratio of large enterprises, standing at 4.3 in 2019, substantially higher than that of SMEs (2.3), is expected to fall to a level similar (1.7 under S1, 1.1 under S2) to the latter's (1.2 under S1, 0.9 under S2) after the sales shock.

The debt ratio (debt / equity) is projected to rise to 92.3% under S1 and 93.1% under S2, reflecting the decrease in equity due to the worsening business performance, from 88.8% at the end of 2019. The debt ratio is expected to climb from 80.4% at the end of 2019 to 83.4% under S1 and 84.3% under S2 for large enterprises, and from 133.9% to 138.8% (S1) and 140.2% (S2) for SMEs (Figure Ⅱ-3).

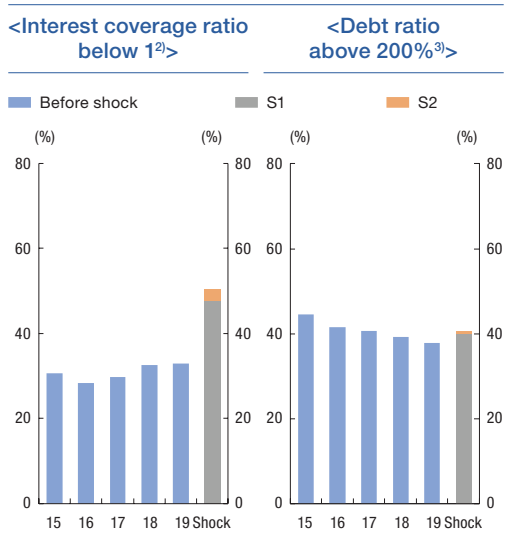
Figure Ⅱ-3. Changes in major indicators of corporate financial soundness



Sources: KIS-Value, Bank of Korea staff calculations.

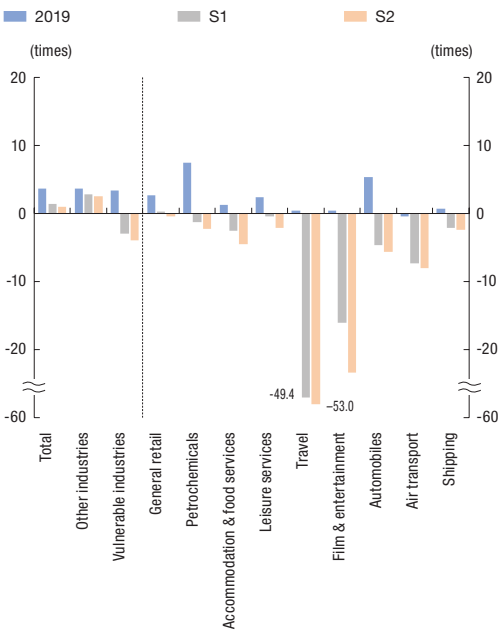
Amid the deteriorating business performance, the share of companies with an interest coverage ratio below 1 is expected to surge to 47.7% under S1 and 50.5% under S2 from 32.9% in 2019, with that of companies with a debt ratio above 200% rising to 39.9% under S1 and 40.5% under S2, from 37.9% at the end of 2019 (Figure Ⅱ-4).

Figure Ⅱ-4. Changes in proportions[1] of corporations with weak financial soundness



Notes: 1) Proportions of corporations subject to analysis.
2) Including corporations recording operating losses.
3) Including corporations with negative net worths.
Sources: KIS-Value, Bank of Korea staff calculations.

Figure Ⅱ-5. Post-shock changes in interest coverage ratios, by industry

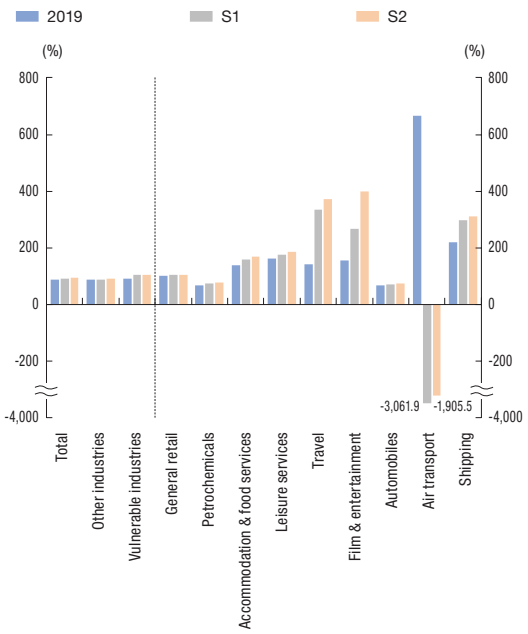


Sources: KIS-Value, Bank of Korea staff calculations.

By industry, the deterioration in debt repayment capacity appears more marked in nine vulnerable industries that are particularly heavily impacted by COVID-19. The interest coverage ratio dipped below 1 for all nine vulnerable industries. The accommodation & food service, travel, film & entertainment, shipping, petrochemical, automobile and leisure service industries are projected to go into deficit under S1 and the general retail industry under S2, pushing their interest coverage ratios into negative territory. The debt repayment capacity of the air transport industry, which was already in deficit prior to the shock, is projected to become seriously impaired (-0.4 in 2019 → -7.2 under S1, -8.0 under S2) (Figure Ⅱ-5).

The debt ratio is expected to remain mostly unchanged for other industries at about 100%, but is likely to deteriorate for the air transport industry and other vulnerable industries. The debt ratio of the travel industry is expected to jump to 336.1% under S1 and 372.6% under S2 from 142.2% at the end of 2019, and that of the film & entertainment industry to 268.1% under S1 and 397.9% under S2 from 154.3% in 2019. The air transport industry, whose earnings were seriously impacted, is expected to face a negative net worth (Figure Ⅱ-6).

Figure Ⅱ-6. Post-shock changes in debt ratios, by industry



Sources: KIS-Value, Bank of Korea staff calculations.

B. Liquidity shortfall

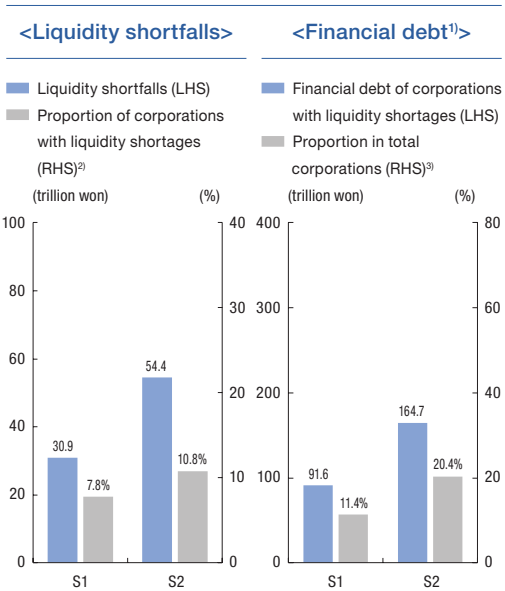
The liquidity shortfall ($SL_{S1,\ S2}$) among externally audited firms under the sales and financial shocks was estimated based on companies whose total current assets, including operating income, are less than their total current liabilities that need to be settled within the year, as follows:

$$SL_{S1,S2} = \Sigma_i \,|\, \text{Cash equivalent assets}_{i,S1,S2} + (\text{Inventory} + \text{Account receivables})_i \times \text{Cash conversion rate}_{S1,S2} + \text{Operating losses} - \text{Current liabilities}_i \times (1 - \text{Refinancing rate}_{S1,S2}) \,|$$

* i,S1(i,S2) is companies with "total current assets < debt to be settled within the year under S1(S2).

The liquidity shortfall thus estimated amounted to 30.9 trillion won under S1 and 54.4 trillion won under S2,[11] with the share of companies facing shortages among all externally audited firms standing at 7.8%, and 10.8%, respectively. Moreover, the financial debt of companies encountering liquidity shortages was estimated at 91.6 trillion won (11.4% of all externally audited firms) under S1 and 164.7 trillion won (20.4%) under S2 (Figure Ⅱ-7).

Figure Ⅱ-7. Liquidity shortfalls of corporations and their financial debt



Notes: 1) Financial debt includes borrowings and corporate bonds.
2) Proportion of corporations with liquidity shortages to corporations subject to analysis.
3) Proportion of financial debt of corporations with liquidity shortages to financial debt of corporations subject to analysis.

Sources: KIS-Value, Bank of Korea staff calculations.

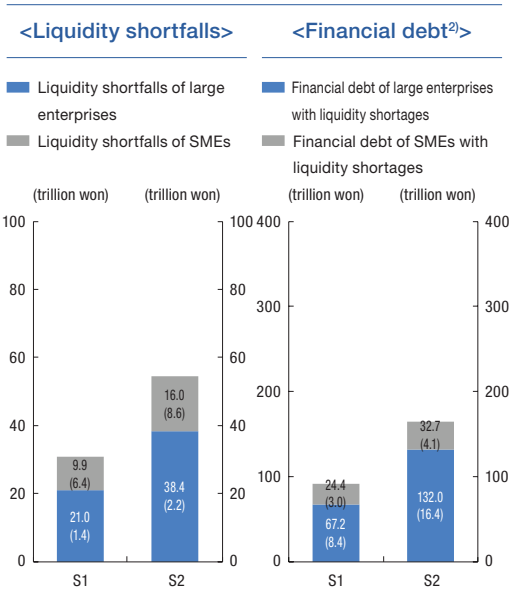
Meanwhile, considering the fact that companies may not be able to completely recover

11) Under S1 in which companies are assumed to gradually recover from the sales and financial shocks during the second half of 2020, the liquidity shortfall appeared to sharply decrease in the second half (7.3 trillion won) from the first half (23.6 trillion won). On the other hand, under S2 in which the shock continues into the second half, the liquidity shortfall is estimated to increase significantly in the second half to 30.8 trillion won from 23.6 trillion in the first half.

from the sales and financial shocks triggered by COVID-19 by the end of the year, their liquidity shortfall in the first half of 2021 was also estimated. The results indicated that while the liquidity shortfall was almost non-existent under S1, totaling only 0.8 trillion won, the amount was significantly larger at 5.1 trillion won under S2, suggesting that some aftershocks could persist.

By company size, the liquidity shortfall in 2020 is projected to be substantially greater for large enterprises than SMEs, amounting to 21.0 trillion won and 38.4 trillion won for the former under S1 and S2, respectively, and 9.9 trillion won and 16.0 trillion won for the latter. The share of companies experiencing liquidity shortages is projected to be 1.4% and 2.2% for large enterprises under S1 and S2, respectively, and 6.4% and 8.6% for SMEs, suggesting that more SMEs could struggle with liquidity problems than large enterprises (Figure Ⅱ-8).

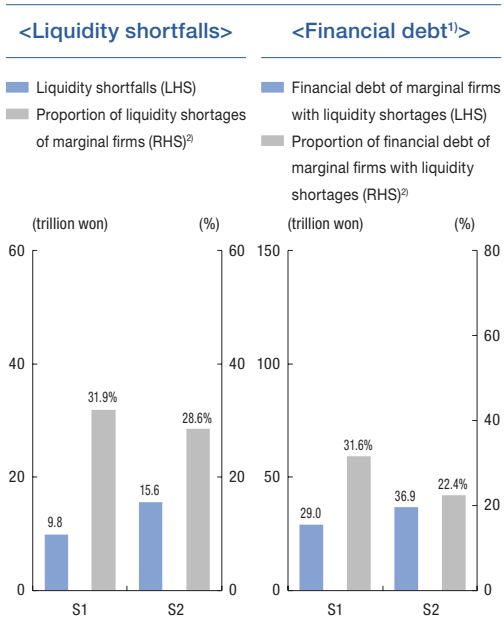
Figure Ⅱ-8. Corporate liquidity shortfalls and financial debt[1], by company size



Notes: 1) ( ) indicates the proportion of the number of corporations to the total number (financial debt) of corporations.
2) Financial debt includes borrowings and corporate bonds.
Sources: KIS-Value, Bank of Korea staff calculations.

Meanwhile, the liquidity shortfall of marginal firms whose interest coverage ratio has been below 1 for the past three years, in other words, from prior to the shocks, is estimated to amount to 9.8 trillion won under S1 and 15.6 trillion won under S2, representing 31.9% and 28.6% of the total liquidity shortfall, respectively. As for the financial debt of marginal firms, they are projected to amount to 29.0 trillion won under S1 (31.6% of the total financial debt of all firms facing liquidity shortages) and 36.9 trillion won (22.4%) under S2 (Figure Ⅱ-9).

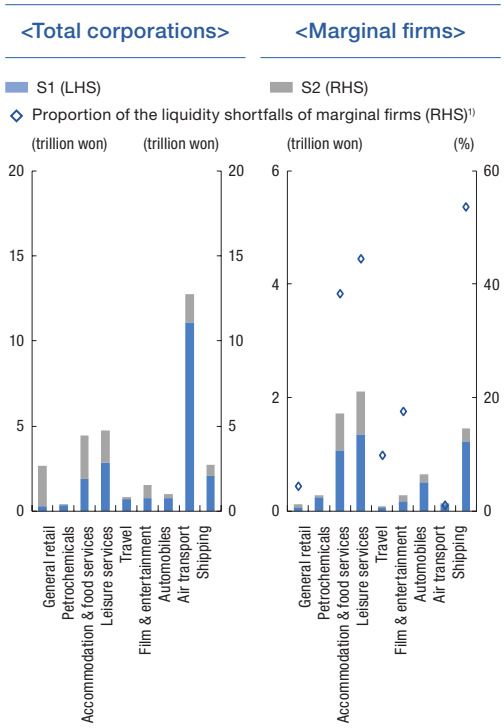
Figure Ⅱ-9. Liquidity shortfalls and financial debt of marginal firms



Notes: 1) Financial debt includes borrowings and corporate bonds.
2) Proportion of liquidity shortages (financial debt) of marginal firms with liquidity shortages to that held by corporations with liquidity shortages.
Sources: KIS-Value, Bank of Korea staff calculations.

The liquidity shortfall of vulnerable industries is estimated to amount to 20.8 trillion won and 31.1 trillion won under S1 and S2, respectively, accounting for a high share of the total liquidity shortfall of the overall corporate sector (67.3% under S1, 57.2% under S2). By industry, the liquidity shortfall was the largest in the air transport industry (11.1 trillion under S1, 12.7 trillion won S2) and was also rather sizeable in leisure services (2.9 trillion won, 4.7 trillion won), accommodation & food services (1.9 trillion won, 4.5 trillion won), and shipping (2.1 trillion won, 2.7 trillion won). In particular, marginal firms appear to account for an important share of the total liquidity shortfall in shipping (53.6%), leisure services (44.4%) and accommodation & food services (38.3%), suggesting a higher risk of insolvency in these industries (Figure Ⅱ-10).

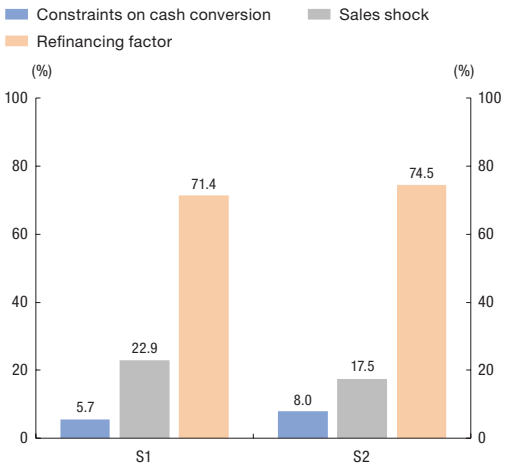
Figure Ⅱ-10. Liquidity shortfalls of corporations, by major industry



Note: 1) Proportion of liquidity shortfalls marginal firms to that of corporations by industry under the S2 scenario.
Sources: KIS-Value, Bank of Korea staff calculations.

When the liquidity shortfall is broken down by shock factor, under S1, the contribution of the drop in the refinancing rate appears to be the greatest at 71.4%, followed by the decline in sales (22.9%) and constraints on the cash conversion of non-cash assets (5.7%). While the results under S2 are similar for the most part, the contribution of the drop in the refinancing rate was slightly higher (74.5%), reflecting the prolongation of the shocks (Figure Ⅱ-11).

Figure Ⅱ-11. Contribution rate of liquidity factors[1)]



Note: 1) Results of liquidity impact factor analysis of liquidity shortfalls under the S1 (S2) scenario.
Sources: KIS-Value, Bank of Korea staff calculations.

Based on the above results, the total provision of liquidity required to address the COVID-19-induced corporate liquidity shortages is estimated at 30.9 trillion won under S1 and 54.4 trillion won under S2. When excluding companies with a low probability of long-term viability that were already marginal even prior to the shocks,[12)] the required amount of liquidity provision decreased to 21.1 trillion won under S1 and 38.8 trillion won under S2 (Table Ⅱ-1).

Table Ⅱ-1. Provision of liquidity required

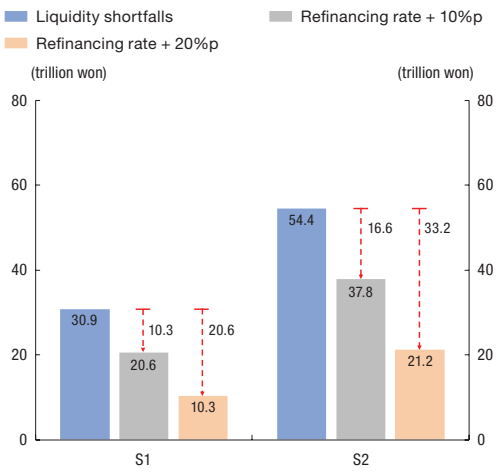
	Excluding marginal firms	Total
S1	21.1 trillion won	30.9 trillion won
S2	38.8 trillion won	54.4 trillion won

Source: Staff calculations.

To assess the effectiveness of the policy authorities' financial and economic stabilization efforts, the liquidity shortfall was recalculated by increasing the refinancing rate by 10%p and 20%p from the rates assumed under the initial stress scenario. The results showed that the liquidity shortfall was substantially reduced after the implementation of the stabilization measures, to 20.6 trillion won (+10%p increase in refinancing rate) and 10.3 trillion won (+20%p increase in refinancing rate) from the initial 30.9 trillion won under S1 and 37.8 trillion won and 21.2 trillion won from the initial 54.4 trillion won under S2.

This means that even with a shock to corporate sales and constraints on the cash conversion of non-cash assets, liquidity problems can be resolved to a large extent if sufficient funding is available through the refinancing of current liabilities or new loans (Figure Ⅱ-12).

Figure Ⅱ-12. Liquidity shortfalls in case of refinancing rate relief



Source: Staff calculations.

12) Key financial indicators of 173 listed companies that went out of business in 2008-2019 reveal that their debt repayment capacity had deteriorated over a significant period of time before they ultimately filed for bankruptcy.

4. Overall Assessment

The COVID-19 pandemic has taken a heavy toll on the growth and profitability of companies, with their financial soundness changing for the worse. Liquidity conditions have deteriorated and debt repayment capacities weakened, particularly in more vulnerable industries. Even under the baseline scenario (S1) in which stability is assumed to return by the end of the year, the corporate liquidity shortage is expected to be substantial (30.9 trillion won) as the sales and financial shocks take hold.

Given that this liquidity shortage is not structural, but temporary, caused by the COVID-19 shock,[13] providing timely funding assistance is essential to prevent a large number of companies from becoming bankrupt and a massive amount of corporate liabilities from becoming non-performing debt. The monitoring of corporate liquidity conditions, particularly in vulnerable industries, should be strengthened, and efforts should be made to stabilize the CP and corporate bond markets to facilitate the supply of marketable borrowings. In tandem, solutions should be explored to provide active funding assistance to firms facing a temporary liquidity squeeze.

Considering the support measures underway by the policy authorities and active efforts to supply credit by financial institutions,[14] the likelihood of liquidity problems in the corporate sector becoming actualized at a massive scale does not appear high, at least for the foreseeable future. However, attention should be paid to the possibility that an expiration of relief measures such as deferral of loan principal and interest payments, amid continuously deteriorating corporate earnings and little possibility of any quick improvement in their debt repayment capacity, could result in a new surge in credit-wariness[15] and a significant number of firms facing liquidity shortages. Accordingly, it is important to closely monitor any changes in corporate performance and liquidity conditions, with appropriate response measures prepared in advance.

In the medium and long term, the COVID-19 pandemic is expected to bring about profound changes in the pattern of economic activity as well as in the global production and trade structure. As support is provided to the corporate sector to prevent a temporary worsening of business conditions from causing permanent damage to the production base, this should be accompanied by efforts to structurally improve companies and strengthen their competitiveness amid changing economic conditions by, for instance, initiating the restructuring of marginal firms with a low probability of long-term viability.

13) Without the COVID-19 shock, the liquidity shortfall of externally-audited firms would have amounted to an estimated 1.5 trillion won in 2020, which, in normal circumstances, would be met through loans or new issues of corporate bonds.

14) In January to May 2020, financial institutions' corporate loans increased by 93.7 trillion won, growing at a significantly faster rate than last year. Note however that for the loan increase from April onward, only data on bank loans (advance estimate basis, +27.9 trillion won in April, +16.0 trillion won in May) were considered due to the difficulty of obtaining non-bank financial data for this period.

15) After the global financial crisis, the gradual phaseout of financial relief measures for companies led to an increase in corporate credit risk, with the substandard-or-below loan ratio on corporate loans showing an uptick (2.9% at the end of June 2010, +1.2%p compared to the end of the previous year).

Ⅲ. Assessment of Household[1] Default Risk under Economic Shock

1. Background

The recent real economic downturn set off by the COVID-19 pandemic is placing increasing strains on both wage and salary workers and self-employed business owners. Since February when COVID-19 started to gain momentum, applications for unemployment benefits have surged, with sales decreasing sharply for self-employed businesses, particularly in the service sector.[2]

If unemployment of wage and salary workers and sales decline for self-employed businesses continue for a prolonged period of time, this could weaken the debt repayment capacity of households. In this article, the default probability on household debt under COVID-19-induced employment and sales shocks is analyzed by estimating the length of time wage and salary households and self-employed households that are currently in deficit can continue to meet their essential consumption expenses and debt obligations using their financial assets. The amounts of their financial liabilities and liquidity shortage are also estimated.

2. Current Status of Wage and Salary Households and Self-employed Households

A. Proportions of number of households and financial liabilities by status of worker

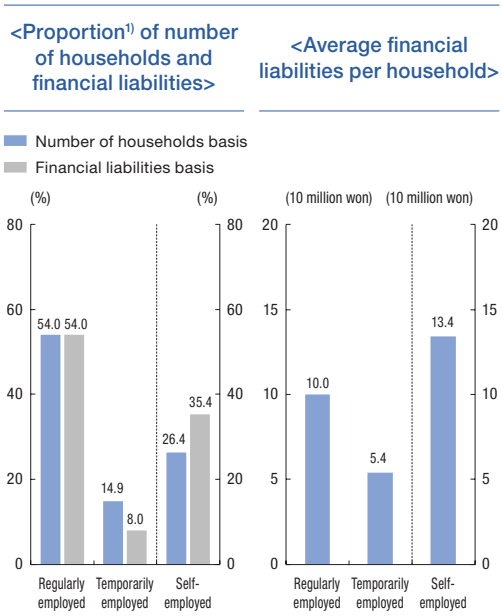
As of 2019, wage and salary households made up 68.9% (households with regular employment 54.0%, households with temporary employment 14.9%) of all households (11.45 million), with their total financial liabilities representing a slightly lower share of 62.0% (54.0%, 8.0%). On the other hand, self-employed households' share in total financial liabilities (35.4%) significantly exceeded their share in total households (26.4%). This is explained by the higher average financial

1) The analysis was based on households with financial liabilities (11.45 million households) among total households (19.92 million households) included in the Survey of Household Finances and Living Conditions in 2019. Households were classified by status of worker (head of household basis) into three large categories: wage and salary households (regularly or temporarily employed), self-employed households (including unpaid family workers) and unemployed households. Unemployed households (540,000 households) were excluded from the assessment of default risk as they were deemed not to be impacted by the employment and sales shocks (some unemployed households that have one or more members with employee income were included in wage and salary households).

2) During the period in which the COVID-19 shock rapidly gained momentum (February 17-April 30), credit card sales decreased sharply in sectors with a high share of self-employed business owners such as arts, sports & recreation-related services ("leisure services" hereafter) (-37.2% year-on-year), accommodation & food services (-36.2%) and real estate (-23.9%).

liabilities per household among self-employed households (134 million won) than that among wage and salary households with regular employment (100 million won) and households with temporary employment (54 million won) (Figure Ⅲ-1).

Figure Ⅲ-1. Proportions and average financial liabilities per household, by status of worker

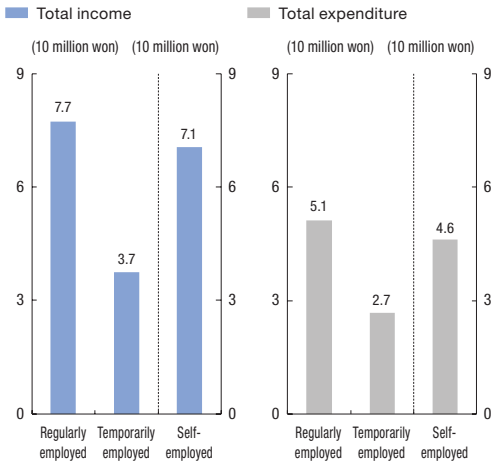


Note: 1) Proportions in the total number of financially indebted households and total financial liabilities.
Source: 2019 Survey of Household Finances and Living Conditions.

B. Financial characteristics

In terms of income and expenditure, the average annual income of wage and salary households with regular employment and households with temporary employment amounted to 77 million won and 37 million won, respectively, with their average annual expenditure amounting to 51 million won and 27 million won. For self-employed households, the average annual income and expenditure stood at 71 million won and 46 million won, respectively (Figure Ⅲ-2).

Figure Ⅲ-2. Average income and expenditure per household[1]

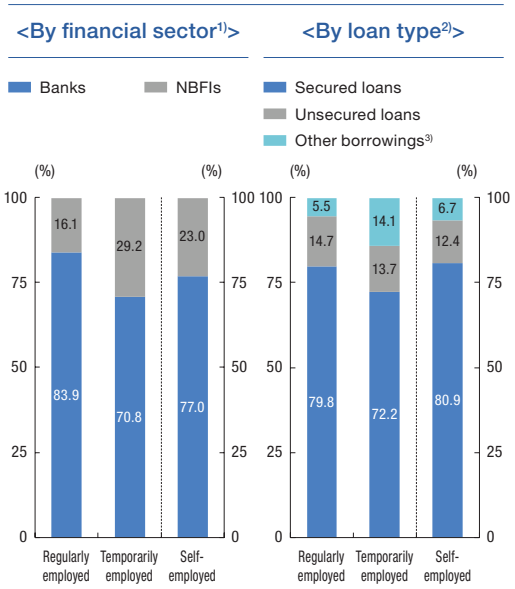


Note: 1) Based on financially indebted households.
Source: 2019 Survey of Household Finances and Living Conditions.

In terms of composition of financial liabilities, while bank loans and secured loans accounted for close to 80% of total liabilities for households with regular employment and self-employed households, the liabilities of households with temporary employment showed a larger share of relatively high-interest-rate loans from non-bank financial institutions (NBFIs) (29.2%) and other borrowings[3] (loans other than secured or unsecured loans, 14.1%) (Figure Ⅲ-3).

3) Includes owing on credit cards (card loans, cash advances, etc.), installment balance and personal loans from private individuals. NBFI loans and other borrowings made up 16.1% and 5.5%, respectively, of total liabilities of wage and salary households with regular employment, and 23.0% and 6.7% of total liabilities of self-employed households.

Figure Ⅲ-3. Composition of financial liabilities



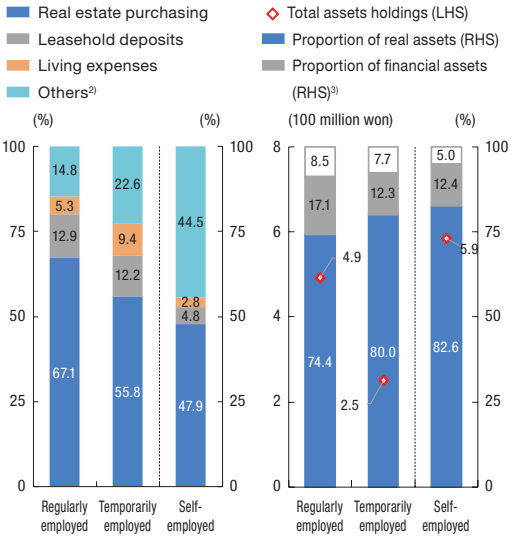
Notes: 1) Proportions in the sum of secured loans and unsecured loans by status of worker.
2) Proportions in the total amount of financial liabilities by status of worker.
3) Owing on credit cards, installment balance, etc.

Source: 2019 Survey of Household Finances and Living Conditions.

By usage, housing-related loans[4] claimed the highest share of wage and salary households' loans (79.9% for households with regular employment, 68.0% for households with temporary employment). In the case of self-employed households, while housing-related loans represented the largest share (52.7%), loans for other purposes including running businesses also accounted for a substantial share (44.5%) of total loans.

In terms of asset composition, the ratio of financial assets to total assets was the highest for wage and salary households with regular employment (25.6%), followed by wage and salary households with temporary employment (20.0%) and self-employed households (17.4%), in this order. The average total assets of self-employed households amounted to 590 million won, higher than the corresponding amount among wage and salary households both with regular employment (490 million won) and temporary employment (250 million won) (Figure Ⅲ-4).

Figure Ⅲ-4. Proportions of loans by usage and composition of financial assets



Notes: 1) Proportions in the sum of secured loans and unsecured loans by status of worker.
2) Including preparing funds for business and repaying financial liabilities, etc.
3) White area in financial assets means rental deposit (houses, retail stores, etc.).

Source: 2019 Survey of Household Finances and Living Conditions.

4) Loans from financial institutions for use toward home purchases or leasehold deposits.

3. Default Risk Assessment Criteria and Scenario

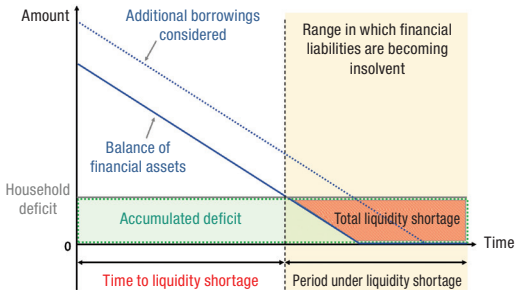
A. Criteria for the assessment of default risk

To evaluate the impact of the real economic downturn and the resulting rise in unemployment and decline in sales on wage and salary households and self-employed households, "deficit households" were identified. "Deficit households" means households whose income is below their expenditure due to unemployment or decreased sales.

Deficit households were assumed to cope with their deficit by drawing on sources such as financial assets, including savings, fund investment and insurance policies,[5] and other income (property income, transfer income, etc.[6]). Under this assumption, the "time to liquidity shortage", which is the length of time before the accumulated household deficit[7] exceeds available funding from sources such as financial assets, was estimated. The time to liquidity shortage was also estimated for cases in which deficit households resort to new borrowings such as home mortgage loans[8] ("home mortgages" hereafter), in addition to their financial assets.

Moreover, to estimate the size of default risk under employment and sales shocks, the amounts of financial liabilities and liquidity shortage were calculated for households whose time to liquidity shortage is less than certain lengths of time (six months, one year, etc.) (Figure Ⅲ-5).

Figure Ⅲ-5. Deficit households' time to liquidity shortage and the shortage amount



B. Scenario

For the size of the employment shock to wage and salary households, an amount of increase in unemployed households similar to that during the Asian financial crisis ("AFC" hereafter) was used. Concretely, additional unemployment of 3.7% and 12.3% was assumed for households with regular employment and households with temporary employment, respectively.[9]

5) For insurance policies, a premium refund rate of 70% was applied.
6) The self-employment income, if any, of wage and salary households and the employee income of self-employed households were included in other income.
7) Essential consumption expenditure (food, housing, medical care, etc.) and debt service expenses in excess of other income.
8) For additional loans, including home mortgages, taken out by deficit households, a regulatory loan-to-value (LTV) ratio of 50% was assumed.
9) The amount of unemployment for regular and temporary workers during the AFC were calculated using the micro-data of the 1997-1998 economically active population survey.

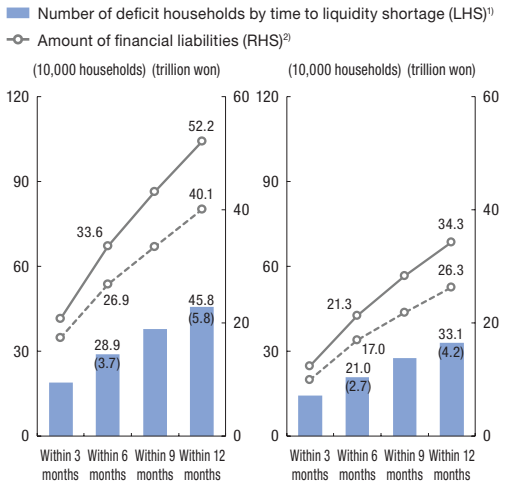
Finally, for self-employed households, their self-employed income was assumed to decline by the same rate as the drop in credit card sales following the COVID-19 outbreak,[10] and income other than self-employed income was assumed to be unchanged.

4. Test Results

A. Wage and salary households

Under an employment shock similar to the level during the AFC, if only financial assets are used to cope with the deficit, as many as 289,000 deficit households had a time to liquidity shortage of less than six months, with their financial liabilities estimated at close to 33.6 trillion won (+6.7 trillion won compared to before the shock) (number and financial liabilities of households with a time to liquidity shortage of less than a year amounting to 458,000 and 52.2 trillion won, respectively). When households were assumed to increase their cash flow through home mortgages or other types of additional loans, the number of households with a time to liquidity shortage of less than six months was reduced to 210,000 and their financial liabilities to 21.3 trillion won (+4.3 trillion won) (Figure Ⅲ-6).

Figure Ⅲ-6. Number of deficit households and their financial liabilities after the employment shock, by time to liquidity shortage



Notes: 1) Figures in ( ) refer to proportions in total financially indebted wage and salary households.
2) The solid and dotted lines show before and after the shock, respectively.
Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

The total amount of liquidity shortage among households with a time to liquidity shortage of less than six months was an estimated 1.8 trillion won (1.2 trillion won if home mortgages or other types of additional loans are considered). For households with a time to liquidity shortage of less than a year, this amount was in the range of 5.6 trillion won (4.2 trillion

10) The year-on-year rate of change in credit card sales by industry during the period when the COVID-19 shock gained momentum (February 17-April 30).

Rate of change in credit card sales induced by COVID-19,[1] by industry

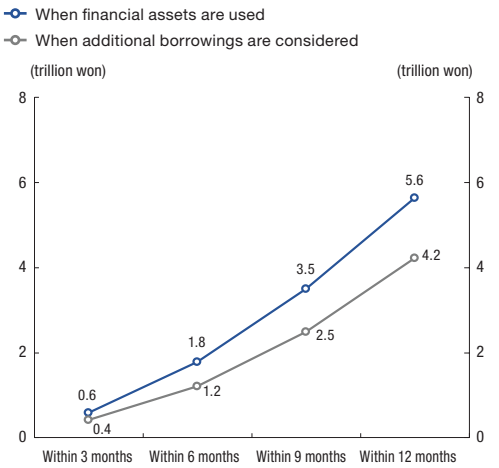
(%)

	Wholesale & retail trade	Transportation	Accommodations & food servicies	Real estate	Education	Human health & social works	Leisure services	Other services	Others
Rate of change	-6.2	-8.4	-36.2	-23.9	-14.4	-12.7	-37.2	-8.4	-4.0

Note: 1) Year-on-year basis.
Source: Credit Finance Association.

won if home mortgages or other types of additional loans are considered) (Figure Ⅲ-7).

Figure Ⅲ-7. Amount of liquidity shortage[1] after the employment shock, by period



Note: 1) The amount which is required not to fall in liquidity shortage within the period.

Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

The analysis found that by status of worker, households with temporary employment with comparatively low financial asset holdings are likely to run into liquidity shortage faster than households with regular employment. Households with temporary employment made up 59.2% of all households with a time to liquidity shortage of less than three months, significantly larger than the share of households with regular employment (40.8%). However, the share of households with regular employment showed a gradual increase as the time to liquidity shortage became longer (Table Ⅲ-1).

Table Ⅲ-1. Number of deficit households after the employment shock, by time to liquidity shortage and status of worker[1]

(10,000 households, %)

Time to liquidity shortage		Within 3 months	Within 6 months	Within 9 months	Within 12 months
When financial assets are used	Regularly employed	7.8	12.7	18.4	23.7
		(40.8)	(44.1)	(48.3)	(51.6)
	Temporarily employed	11.3	16.2	19.7	22.2
		(59.2)	(55.9)	(51.7)	(48.4)
When additional borrowings are considered	Regularly employed	5.5	8.9	12.9	16.0
		(38.1)	(42.5)	(46.9)	(48.3)
	Temporarily employed	9.0	12.0	14.6	17.1
		(61.9)	(57.5)	(53.1)	(51.7)

Note: 1) Figures in ( ) refer to proportions in total financially indebted and deficit wage and salary households whose time to liquidity shortage is shorter than the corresponding period.

Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

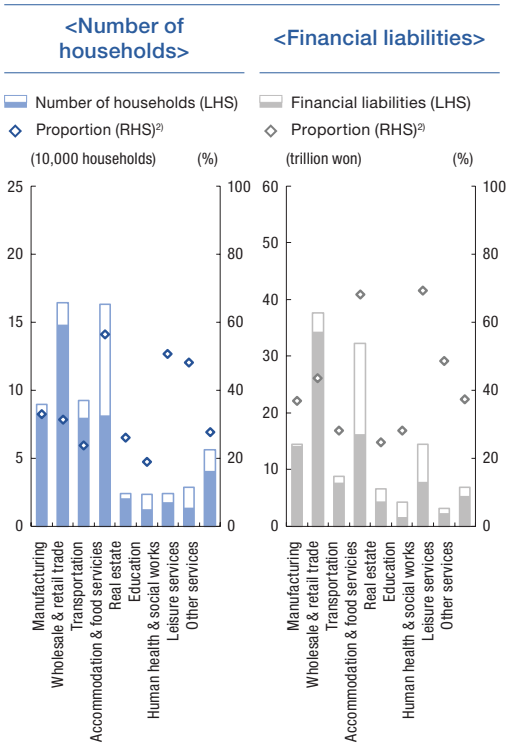
B. Self-employed households

During the period of the sales shock, while 2.119 million self-employed households or 70.1% of all self-employed households continued to be profitable, the remaining 902,000 households (29.9%) either slid further into deficit (23.8%) or moved into deficit (6.1%). The total financial liabilities of deficit households are estimated at as much as 162.9 trillion won.

By industry, the number of deficit households was 164,000 in wholesale & retail trade (31.3% of all self-employed households in the sector), 163,000 (56.5%) in accommodation & food services, and 92,000 (23.7%) in transportation, from highest to lowest. The financial liabilities held by deficit households were 37.7 trillion won in wholesale & retail trade (43.5% of all self-employed households' financial liabilities in the sector), 32.3 trillion won (68.1%) in accommodation & food services, and 14.5

trillion won in manufacturing (36.8%), from highest to lowest. The accommodation & food service industry (+82,000 households, +16.0 trillion won) appears to be particularly hard hit by the sales shock (Figure Ⅲ-8).

Figure Ⅲ-8. Deficit self-employed households,[1] by industry



Notes: 1) Dark-colored bars represent the number (financial liabilities) of self-employed households slid further into deficit, and white area represents the number (financial liabilities) of self-employed households moved into deficit.
2) Proportions of number (financial liabilities) of deficit self-employed households in total number (financial liabilities) of self-employed households by industry.
Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

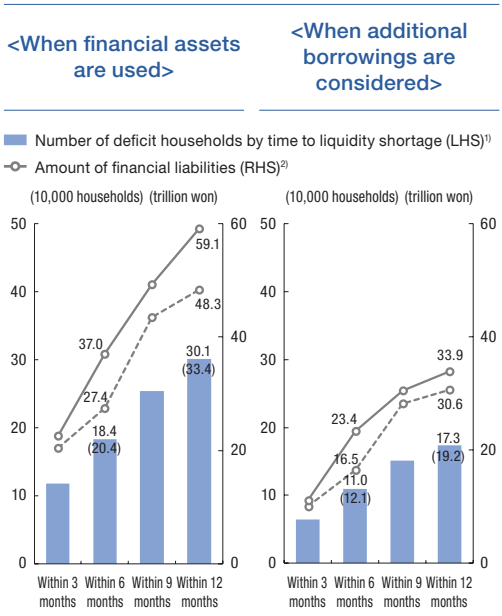
Meanwhile, if only financial assets are used to cope with the deficit, the time to liquidity shortage was less than six months for 184,000 self-employed households (20.4% of all self-employed households in deficit), with their financial liabilities estimated at 37.0 trillion won (+9.6 trillion won compared to before the shock).[11] If the time to liquidity shortage is extended to less than a year, the number of households and the total financial liabilities increase to 301,000 households and 59.1 trillion won (+10.8 trillion won), respectively.

When deficit households were assumed to resort to additional borrowings to cope with the worsening deficit, the number of households with a time to liquidity shortage of less than six months and their financial liabilities amounted to 110,000 and 23.4 trillion won (+6.9 trillion won compared to before the shock), respectively.[12] If the time to liquidity shortage is extended to less than a year, the number of households and the total financial liabilities increase to 173,000 and 33.9 trillion won (+3.3 trillion won) (Figure Ⅲ-9).

11) If the government's loan deferment program (deferral of loan maturity dates and grace periods on interest payments) is taken into consideration, the number and financial liabilities of self-employed households with a time to liquidity shortage of less than six months decrease to 83,000 and 13.4 trillion won, respectively.

12) If the government's loan deferment program is taken into consideration, the number and financial liabilities of self-employed households with a time to liquidity shortage of less than six months decrease to 48,000 and 7.5 trillion won, respectively.

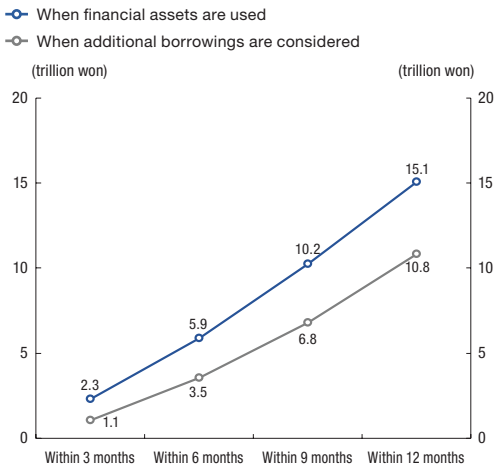
Figure Ⅲ-9. Number of deficit self-employed households and their financial liabilities, by time to liquidity shortage



Notes: 1) Figures in ( ) refer to proportions in total financially indebted and deficit self-employed households.
2) The solid and dotted lines show before and after the shock, respectively.
Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

The total liquidity shortage for households with a time to liquidity shortage of less than six months was estimated at 5.9 trillion won (3.5 trillion won if additional borrowings such as home mortgages are used), with the amount increasing to 15.1 trillion won (10.8 trillion won if additional borrowings such as home mortgages are used) for households with a time to liquidity shortage of less than a year (Figure Ⅲ-10).

Figure Ⅲ-10. Amount of liquidity shortage1) of self-employed households, by period

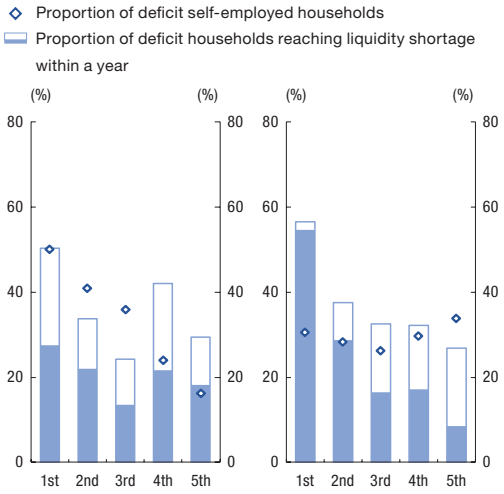


Note: 1) The amount which is required not to fall in liquidity shortage within the period.
Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

By income and asset quintiles, the share of deficit households in total self-employed households, although decreasing as income increased, remained mostly within the 30% range regardless of the level of assets. The share of households with a time to liquidity shortage of less than a year, estimated under the assumption that self-employed households use both financial assets and additional borrowings such as home mortgages, showed that the lower the income and the real asset holdings, the lower their ability to withstand the sales shock. Among deficit self-employed households in the 1st asset quintile, in particular, the share of households with a time to liquidity shortage of less than a year (56.5%) was substantially higher than among those in other asset quintiles (26.9-37.6%). This figure further increased when home mortgages or other types of additional borrowings were taken into consideration (Figure Ⅲ-11).

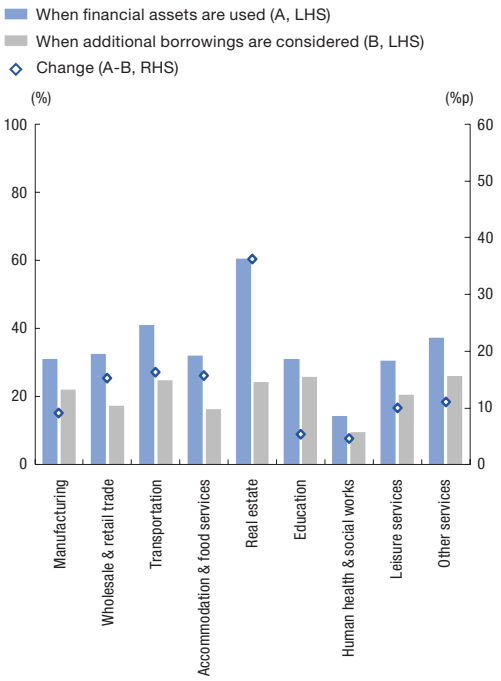
Figure Ⅲ-11. Proportions of deficit self-employed households[1] and deficit households reaching liquidity shortage within a year[2], by income and asset quintile

<By income quintile> <By asset quintile>



Notes: 1) Proportions of number of deficit self-employed households in total self-employed households by quintile.
2) Bars represent proportions when financial assets are used, and dark-colored bars represent proportions under the consideration of additional borrowings.
Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

Figure Ⅲ-12. Proportions of deficit households reaching liquidity shortage within a year, by industry



Source: 2019 Survey of Household Finances and Living Conditions (staff calculations).

When examined by industry, the share of deficit households with a time to liquidity shortage of less than a year was the highest in real estate (60.5%), followed by transportation (41.1%) and other services (37.2%), in this order. When home mortgages or other types of additional borrowings were taken into consideration, this share decreased noticeably, with the exception of human health & social work activities (-4.6%p) and education (-5.3%p) where the improvement was only modest (Figure Ⅲ-12).

5. Overall Assessment

The analysis found that if the COVID-19 pandemic leads to employment conditions that are worse than during the AFC, this will likely have an adverse impact on the debt repayment capacity of wage and salary households, resulting in a massive rise in loan defaults. The default risk appeared to increase faster among households with temporary employment, which have low financial assets, than households with regular employment.

In the case of self-employed households, if the sales shock due to the COVID-19 pandemic persists for a prolonged period of time, the

number of deficit households is expected to rise, centered on the accommodation & food service industry, substantially increasing the default risk. The time to liquidity shortage appeared particularly short among self-employed households in the 1st asset quintile, with low asset holdings.

These results suggest the importance of timely and consistent implementation of COVID-19 relief measures by the government to stabilize employment.[13] The support program for temporary workers that are more vulnerable to an employment shock and are at a greater risk in the short term of defaulting on loans needs to be fine-tuned in a sustained effort to minimize the number of those falling through the cracks of policy response measures.

For self-employed households, a variety of support measures need to be planned in consideration of their lower ability to withstand a shock due to their high leverage compared to wage and salary households. While current financial relief measures such as deferral of loan principal and interest payments are likely to help improve the liquidity conditions of self-employed households up to a point, given the high degree of uncertainty in the business outlook, these measures may have to be extended as well as expanded as necessary, based on the progress in sales recovery. Finally, the default risk among low-income self-employed households with a sharply lower capacity to cope with deficit should be continuously monitored.

13) On April 22, the government unveiled 「Measures for Job Creation and Business Stabilization to Overcome the Unemployment Crisis」 consisting of job protection measures for those that are employed and financial assistance for workers that are not covered by unemployment insurance.

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Financial Stability Report

Publisher	Lee, Juyeol
Editor	Min, Jwa Hong
Published by	Bank of Korea
	67, Sejong-daero, Jung-Gu, Seoul, 04514, Korea
	www.bok.or.kr
Published on	September 15, 2020
Printed by	Jeil Printech Co., Ltd.

This material is posted on the website of Bank of Korea (http://www.bok.or.kr/eng > Financial Stability > Financial Stability Report)

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This is a translation of the original version in Korean, which is the sole authoritative text

ISSN 1975-7042


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