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Financial Stability Report

2020. 12

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.

December 2020

Lee, Juyeol
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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 November 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.

Contents

Contents

List of Boxes

[Financial Stability Situation by Sector]

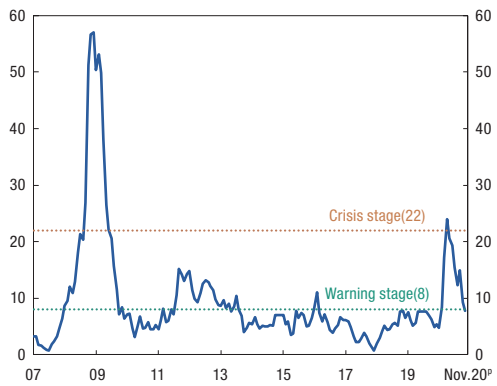
[Resilience of Financial System]

Executive Summary

Overview

Korea's financial system has remained generally stable, affected by market stabilization measures taken by the policy authorities, amid a moderate easing of the economic slump from COVID-19. Despite the resurgence of the virus at home and abroad since October, the Korean financial and foreign exchange markets have remained calm, with the financial intermediary function working well. The Financial Stability Index (FSI), showing overall financial system conditions, which had reached the crisis stage temporarily in April, fell continually thereafter to stand at 7.7 (preliminary) in November, slightly below 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 October and November 2020.
Source: Bank of Korea.

A look at financial stability conditions by sector shows that in the credit markets private credit grew at a faster pace, as both households and firms increased borrowing. In addition, the private credit-to-nominal GDP ratio has risen greatly as the nominal GDP growth rate fell due to the prolonged pandemic. Households' debt repayment burden has also grown, as household credit rose, led by home mortgage loans and unsecured loans, while the growth rate of household disposable income diminished. Household debt still remains sound, but the default risk could grow for vulnerable households if the improvement in income conditions is insufficient due to a delay in economic recovery. Meanwhile, corporate credit continued to grow, as demand for funds increased amid the prolonged pandemic. As corporates' financial soundness is deteriorating with their performance still weak, liquidity and credit risks could be realized going forward, especially in vulnerable industries.

In the asset markets, bonds and stocks have shown less volatility, but the housing market has seen high upward price pressures. Long-term market interest rates have risen as in other major economies, driven by concerns about an excess Treasury bond supply following the supplementary budget compilation and improvements in domestic and overseas economic indicators. Corporate bond credit spreads have narrowed as risk aversion eased as a result of market stabilization measures taken by the policy authorities.

Domestic stock prices continued to rise, driven by the easing of uncertainties related to the US presidential election and the expectations of COVID-19 vaccine development. The pace of rise in housing sales prices slowed temporarily due to the government's series of housing market stabilization measures, but picked up again in November, mainly in the Seoul Metropolitan area and five major metropolitan cities. As funds have continued to flow into the asset markets,

there are growing concerns about the disconnect between financial markets and the real economy.

With regard to financial institutions, commercial banks' financial soundness remains solid in general, but their profitability has fallen slightly owing to an increase in their loan loss expenses. The asset soundness of non-bank financial institutions (NBFIs) has generally improved amid sustained growth in assets, and their profitability remained at similar levels year on year. However, it should be noted that the soundness indicators may not properly reflect the actual risk, due to for instance financial support from the government.

As for foreigners' portfolio investment, stock investment has recorded a net outflow this year, while bond investment has posted a net inflow. Stock investment, which had shown large-scale net outflows amid the COVID-19 pandemic, turned to a net inflow from October, driven by the nation's relatively strong economic indicators. Going forward, capital flow volatility could expand again, should a delay in economic recovery following the resurgence of COVID-19 at home and abroad lead to stronger risk aversion.

The financial system's resilience, i.e. its capacity to withstand domestic and external shocks, has remained favorable, with financial institutions' capital adequacy ratios still far exceeding regulatory standards. Banks' capital adequacy ratios increased after their earlier-than-scheduled adoption of the Basel III reforms, while that of NBFIs also rose in general. The nation's external payment capacity has remained stable as official foreign reserves sustained growth since April.

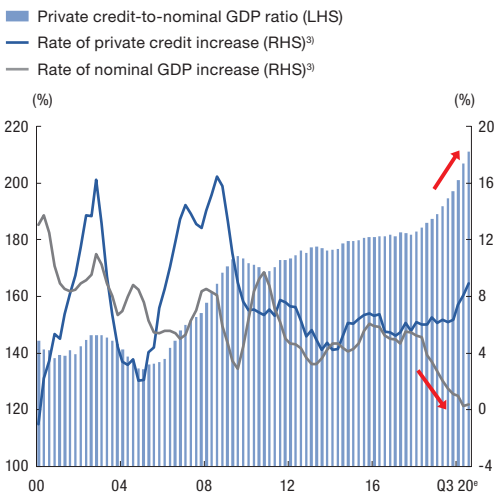
An overview of financial and economic conditions shows that the Korean financial system has shown stability despite the prolonged pandemic, with the financial market back on the recovery track, financial institutions performing the financial intermediary function smoothly, and financial system resilience remaining sound. However, there still remain potential destabilizing factors at home and abroad, such as a rapid resurgence of the virus and a weakening of the global economic recovery. Continued vigilance is needed with respect to the increasing mid- and long-term financial stability risk as financial imbalances intensify, with household and corporate debt soaring and pressures on asset prices rising amid the response to COVID-19.

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 211.2% (estimated) at the end of the third quarter of 2020, showing a sharp rise of 16.6%p from the same period of last year. This was attributable to an accelerated growth of private credit demand driven by increased household loan demand related to living expenses and housing, and by corporate funding efforts in response to economic uncertainties, while GDP growth slowed considerably due to the prolonged pandemic.

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



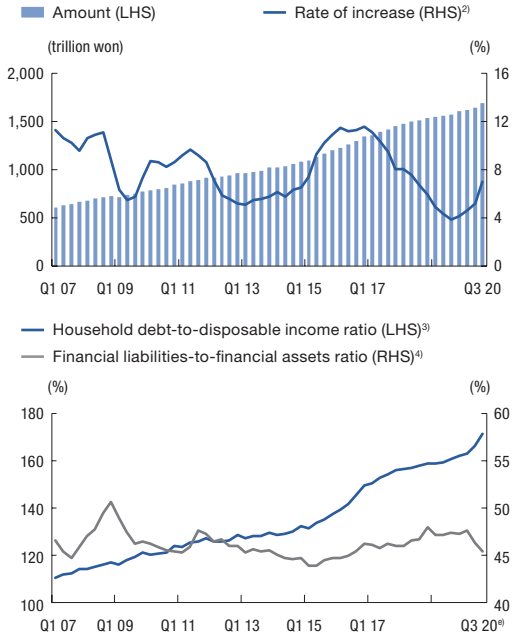
Notes: 1) Estimated figures for Q3 2020.
2) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters.
3) Year-on-year basis.
Source: Bank of Korea.

2 Household credit increased by 7.0% year-on-year to record 1,682.1 trillion won at the end of the third quarter of 2020. Its pace of growth has accelerated gradually since the fourth quarter of 2019.

The household debt-to-disposable income ratio (household credit statistics basis) stood at 171.3% (estimated) at the end of the third quarter of 2020, an increase of 10.7%p from the same period of last year (160.5%), indicating that households face greater debt servicing burdens. The financial liabilities-to-financial assets ratio (flow of funds statistics basis), however, dropped by 2.0%p to 45.4% (estimated) at the end of the third quarter of 2020 from a year earlier (47.4%), owing to the increased valuation of assets such as stocks. The household debt delinquency rate declined slightly for both banks and NBFIs.

Although household loan soundness remains solid, with the share of high-rated and high-income borrowers increasing and the delinquency rate falling, attention should be given to the possibility of the default risk increasing for vulnerable households, should the improvement in income conditions weaken due to a delay in economic recovery.

Household credit[1]



Notes: 1) Household credit statistics basis.
2) Year-on-year basis.
3) Disposable income for Q3 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 Q3 2020.

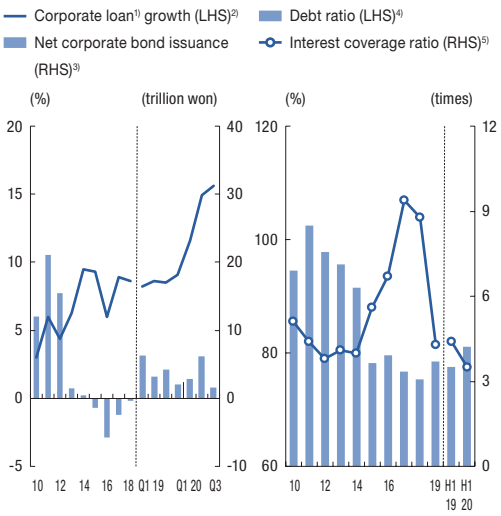
Source: Bank of Korea.

3 Corporate credit has increased sharply as enterprises respond to the prolonged COVID-19 pandemic. Corporate loans recorded a year-on-year increase of 15.5% to reach 1,332.2 trillion won at the end of the third quarter of 2020. By company size, loans to large enterprises and small and medium-sized enterprises (SMEs) both increased. In the direct financial market, the market stabilization measures by the Bank of Korea and the government, and the increase in corporate demand for funds, resulted in net issuance of corporate bonds. Corporate financial soundness has worsened due to a further deterioration in corporate performances affected by COVID-19. The overall corporate debt ratio at the end of the first half in 2020 stood at 81.1%, rising slightly from the end of last year (78.5%). The interest coverage ratio declined considerably (4.4 in 2019 → 3.5 in 2020, first-half basis) due to reduced profitability.

Given the high uncertainties over the corporate business environment, including concerns about a possible weakening of the global economic recovery, preparations need to be made against a worsening of liquidity conditions or a rise in credit risk resulting from a delayed recovery in corporate performances.

Corporate credit

Corporate financial soundness



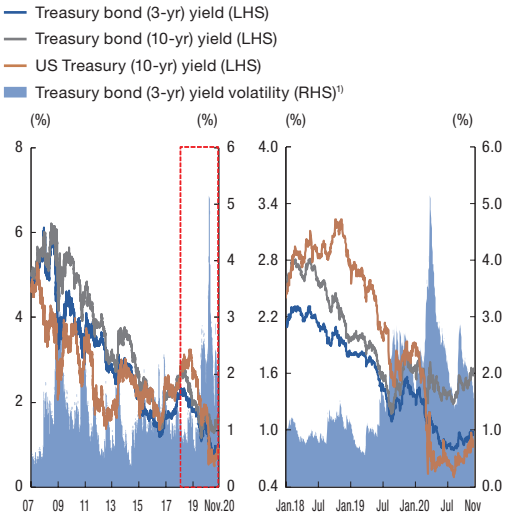
Notes: 1) Based on deposit-taking banks and non-bank financial institutions (mutual credit cooperatives, mutual savings banks, insurance companies and credit-specialized financial companies); including financial and insurance companies for certain periods or sectors, due to the limited availability of data.
2) Year-on-year basis.
3) During the quarter (since 2019).
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 rose considerably as in other major economies, driven by concerns about an excess Treasury bond supply following the supplementary budget compilation and the improvement in domestic and overseas economic indicators. Interest rate volatility narrowed.

Korean and US Treasury bond yields

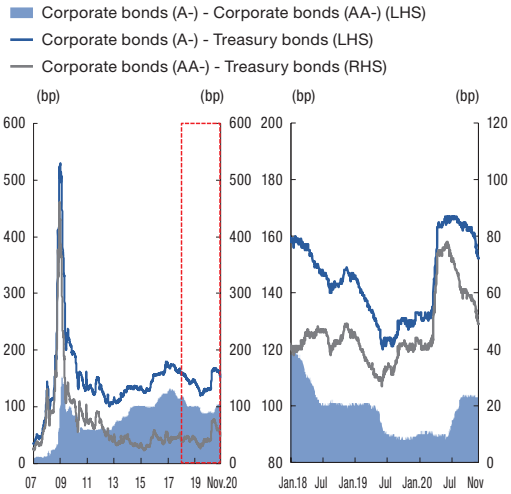


Note: 1) Daily volatility calculated using exponential weighted moving average (EWMA) method.

Sources: Korea Financial Investment Association, Bloomberg.

Corporate bond credit spreads have narrowed significantly, mainly for prime-rated bonds, on the back of support measures taken by the government and the Bank of Korea.

Corporate bond credit spreads,[1] and spread across credit ratings

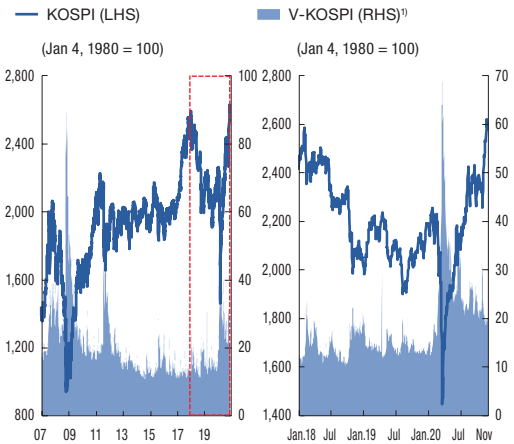


Note: 1) 3-year maturity basis.

Source: Korea Financial Investment Association.

2 Domestic stock prices continued to rise, driven by the accommodative policy stances maintained in major economies, the easing of uncertainties regarding the US presidential election and the expectations of COVID-19 vaccine development.

Stock price and stock price volatility indices

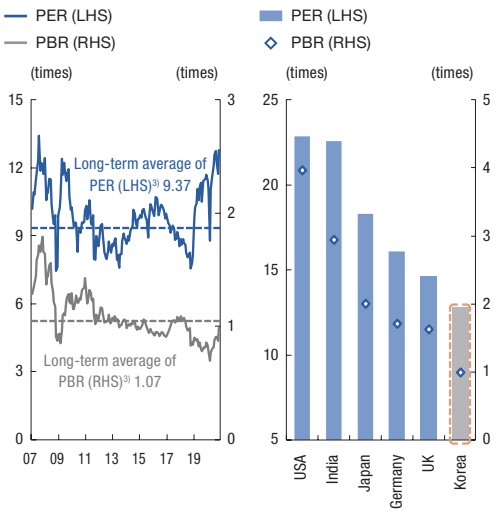


Note: 1) Volatility index calculated based on prices for options on KOSPI200 index.

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 (9.37 since 2001), standing at 12.79 as of end-November. The price-to-book value ratio (PBR), showing a firm's stock price level relative to its liquidation value, mostly continued to rise, recording 0.99 at the end of November.

PER[1] and PBR[2]



Notes: 1) MSCI basis (12-month forward).
2) KOSPI basis.
3) Long-term average in the January 2001-November 2020 period.

Sources: Bloomberg, Thomson Reuters.

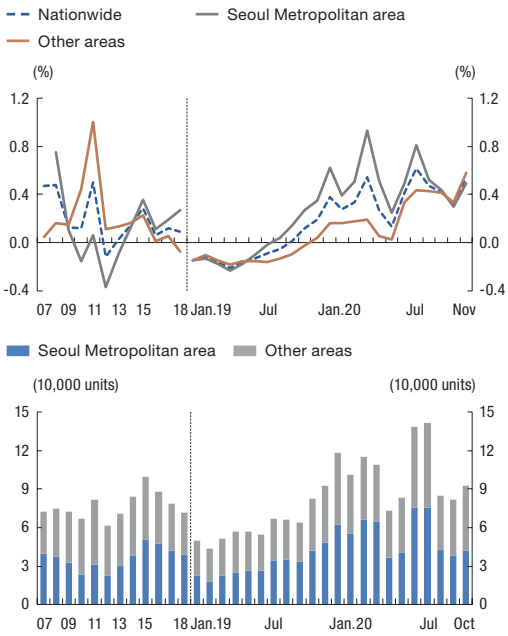
3 Housing sales prices increased at a faster pace entering November, after having decelerated after August due to the government's series of housing market stabilization measures. This is mainly attributable to continued expectations of price increases owing to concerns about a housing shortage, the low-interest-rate environment, and regulatory disparities.

Leasehold deposit (*jeonse*) and monthly rental prices have also risen at a faster pace, as the new housing supply continued to decline and concerns were raised about a mismatch between housing supply and demand resulting from the implementation of the Housing Lease Protection Act.

The volume of housing sales transactions grew by 72.0% year on year between January and October 2020. In June and July, it soared on rising expectations of house price increases. Although it decreased from August, as buying sentiment contracted after regulatory tightening, it still remained above the volume seen in the same period of 2019.

With the real economic slump continuing amid the COVID-19 resurgence, it should be noted that a concentration of funds into the real estate market and a rapid rise in house prices could act as factors expanding financial imbalances.

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 Real Estate Board, Ministry of Land, Infrastructure and Transport.

Ⅲ. Financial Institutions

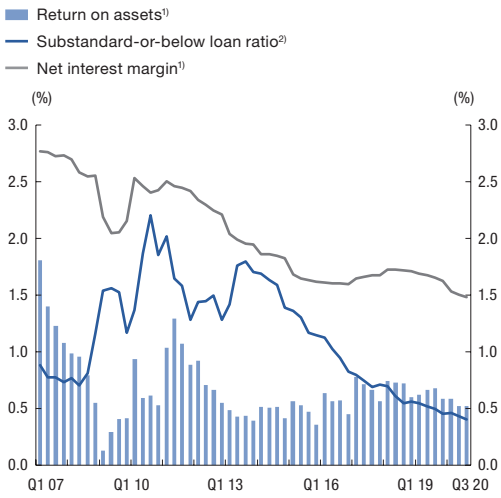
1 The profitability of commercial banks fell slightly, but their financial soundness remained satisfactory overall with improvement in their asset soundness.

Commercial banks' assets rose by 7 rate of total asset growth compared to the same period of last year (8.4%). Despite the economic sluggishness following the COVID-19 outbreak, commercial banks' asset soundness continued to improve as the substandard-or-below loan ratio dropped to 0.40%, thanks to the rise in new loans and to financial support measures such as the deferral of principal and interest repayment.

Commercial banks' profitability declined due to increased loan loss expenses as they set aside loan loss provisions preemptively. Their return on assets (ROA) from the first to third quarters of 2020 was 0.52% (annualized), down by 0.16%p from the same period of last year (0.68%).

Caution is needed as to the possibility of a rise in defaults if the financial support measures end amid a delayed economic recovery in the future.

Commercial bank asset soundness and profitability



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

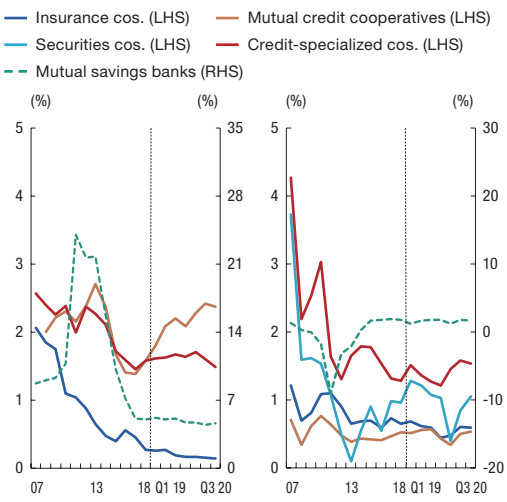
2 The financial soundness of NBFIs was generally stable as well. Their asset soundness improved in most NBFI sectors and profitability remained mostly unchanged from the same period of last year.

NBFIs' assets stood at 3,068 trillion won at the end of the third quarter of 2020, up by 10.0% year on year. The asset soundness of mutual savings banks, insurance companies and credit-specialized financial companies improved with the year-on-year declines in both the delinquency rates and substandard-or-below loan rates. However, mutual credit cooperatives' asset soundness fell slightly with increases in both the delinquency rate and substandard-or-below loan ratio.

The profitability of most NBFI sectors except for credit-specialized financial companies remained unchanged. Credit-specialized financial companies saw their profitability improving thanks to

declines in card business-related costs and in loan loss provision expenses in line with a drop in the delinquency rate.

NBFI substandard-or-below loan ratios[1)2)] **NBFI returns on assets (ROAs)[2)3)]**



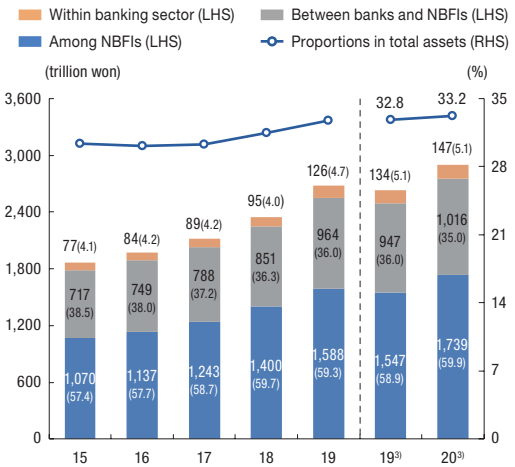
Notes: 1) End-period basis, excluding securities companies.
2) For 2018 and earlier, annual basis; for 2019 onward, quarterly basis.
3) Accumulated quarterly incomes annualized.
Sources: Financial institutions' business reports.

3 Financial institutions' interconnectedness through their funding and operations has strengthened. Mutual transactions among financial institutions amounted to 2,902 trillion won at the end of the second quarter of 2020, representing a year-on-year increase of 10.4%. Mutual transactions accounted for 33.2% of the total assets of the overall financial sector, up by 0.4%p from the same period of last year.

Looking at mutual transactions across financial sectors, those among NBFIs grew by 12.4% year on year, owing to the rise in securities companies' transactions related to customer deposits. As a result, mutual transactions among NBFIs accounted for 59.9% in the total amount, recording a year-on-year increase of 1.0%p. However, mutual transactions between banks and NBFIs dropped by 1.0%p year on year to stand at 35.0%. The proportion of mutual transactions within the banking sector remained unchanged from a year earlier at 5.1%.

Analyzing the default contagion and concentration risks based on the structure of mutual transactions across financial sectors, the contagion risk increased while the concentration risk maintained a similar level.

Current status of mutual transactions among financial institutions and across sectors[1)2)]



Notes: 1) End-period basis (flow of funds statistics).
2) ( ) indicates proportions in total amount of mutual transactions.
3) Based on end-Q2 for each year.
Source: Bank of Korea.

Ⅳ. Capital Flows

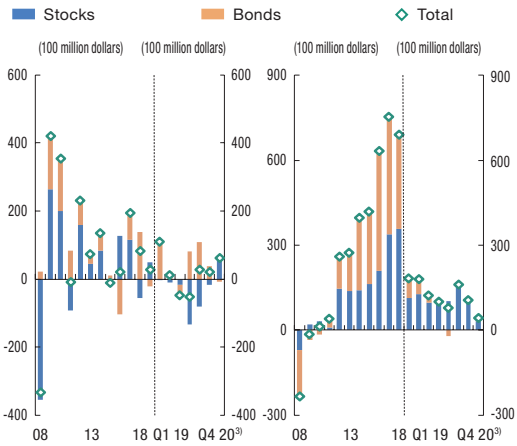
From January to November 2020, foreigners' domestic portfolio investment showed a net outflow in stocks and a net inflow in bonds. Foreigners' stock investment registered a massive outflow from February to April due to the spread of COVID-19, but recorded a net inflow on the back of improvement in investment sentiment since October. Foreigners' bond investment showed a net inflow from January to July due to growing appetite for safe assets, but posted a moderate outflow since September owing to reduced incentives for arbitrage transactions and maturing bonds.

Going forward, foreigners' portfolio investment is expected to record net inflows led by stock investment. However, capital flow volatility could expand again if a delay in economic recovery affected by the resurgence of the pandemic leads to a worsening of investor sentiment.

The increase in residents' overseas portfolio investment shrank considerably year on year (51.9 billion dollars) to reach 38.6 billion dollars (stocks 38.4 billion dollars and bonds 0.2 billion dollars) from January to October 2020. While residents' stock investment continued to grow in line with bullish overseas stock markets, their bond investment decreased.

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 Q4 2020 based on October-November; changes in residents' overseas portfolio investment based on October.

Source: Bank of Korea.

Resilience of Financial System

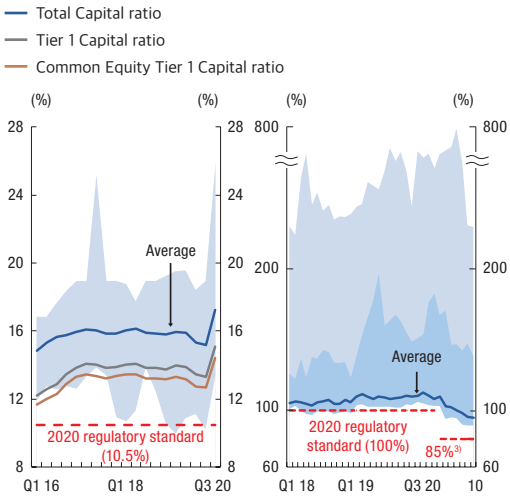
Ⅰ. Financial Institutions

1 Commercial banks' capital adequacy ratio increased, while the liquidity ratio dropped.

Commercial banks' total capital ratio under Basel III, indicative of their loss absorption capacities, stood at 17.24% at the end of the third quarter of 2020, up by 1.35%p compared to the end of last year, in line with the early introduction of the Basel III reforms featuring a downward adjustment to the risk weight of corporate loans. Commercial banks' liquidity coverage ratio (LCR), measuring the ability to respond to sudden net outflows of funds, declined by 15.4%p from the end of last year to reach 95.0% at the end of October 2020. The decrease was attributable to a surge in net cash outflows affected by a hike in corporate transferable deposits.

Commercial banks stayed fairly resilient despite the COVID-19 pandemic, but it should be noted that credit risks amid persistently sluggish corporate performance could weaken their loan loss absorption capacities.

Commercial bank total capital ratios[1)] | **Commercial bank liquidity coverage ratios (LCRs)[1)2)]**



Notes: 1) The shaded area indicates distribution of individual banks, and the 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) Temporarily lowered to 85% between April 2020 and March 2021.

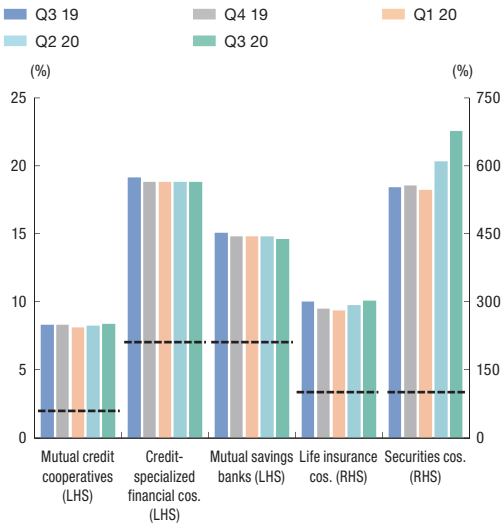
Sources: Commercial banks' business reports.

2 The resilience of NBFIs remained favorable, with their capital adequacy ratios largely exceeding the supervisory standards for most sectors.

The net capital ratio of securities companies and the risk-based capital (RBC) ratio of life insurance companies rose by 121.4%p and 18.9%p from the end of last year to stand at 677.3% and 303.5% respectively at the end of the third quarter of 2020. The net capital ratio of mutual credit cooperatives also increased by 0.1%p from the end of last year to reach 8.4%. In the meantime, mutual savings banks' BIS capital adequacy ratio came to 14.6%, down slightly (0.2%p) from the end of last year. The adjusted capital ratio of credit-specialized financial companies stood at 18.8%, virtually unchanged from the end of the previous year.

NBFIs have a relatively higher share of vulnerable borrowers than banks do, and there are large differences in capital adequacy ratios among financial institutions. Therefore, capital buffers should be expanded, especially those of financial institutions whose loan loss absorption capacities are relatively weak, in preparation for the possible persistence of the economic slowdown.

NBFI capital adequacy ratios[1)]



Note: 1) The dotted lines show the capital adequacy regulatory ratios.
Sources: Financial institutions' business reports.

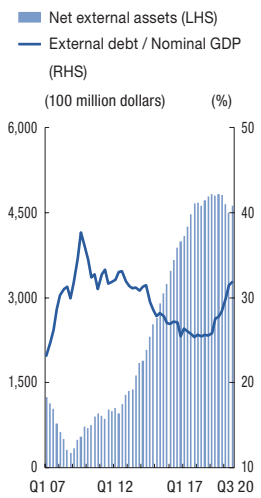
II. External Payment Capacity

Korea's external payment capacity weakened temporarily in the process of dealing with the spread of COVID-19. However, it then stabilized as the official foreign reserves grew significantly.

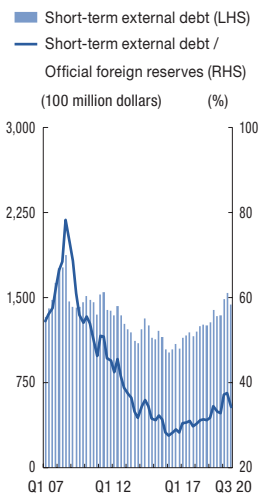
Net external assets turned to a quarter-on-quarter increase in the third quarter of 2020, and official foreign reserves continued to rise in the second half, owing to gains in investment returns and the dollar-conversion value of non-dollar assets, to record 436.38 billion dollars at the end of November 2020.

Meanwhile, the ratio of external liabilities relative to nominal GDP rose due mainly to the growth in foreigners' domestic bond investment. The ratio of short-term external debt to official foreign reserves increased slightly year on year from 33.1% to reach 34.3% at the end of the third quarter of 2020, but stayed below the average of previous years (36.4% from 2010 to 2019).

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.

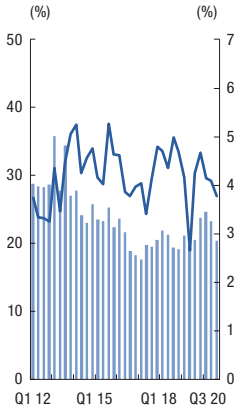
Ⅲ. Financial Market Infrastructures

The major payment and settlement systems including BOK-Wire+ were operated smoothly, with settlement risks managed stably 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. Meanwhile, as the next generation BOK-Wire+ incorporating improved settlement methods and revised settlement accounts began operating on October 12, the stability and efficiency of the settlement systems are expected to be enhanced greatly.

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 settlement system, remained generally stable to stand at 20.4% and 3.8%, respectively, during the third quarter of 2020. The net debit cap utilization rate, showing settlement risks related to the retail payment systems operated by Korea Financial Telecommunications & Clearing Institute, was also favorable at 18.2%. Meanwhile, the share of settlement 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 74.9% in the third quarter of 2020.

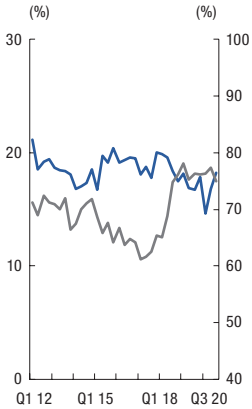
Large-value payment system

Rate of maximum intraday overdraft cap utilization (LHS)[1]
Proportion of payment orders in queue for settlement (RHS)[2]



Retail payment and foreign exchange settlement systems

Average maximum net debit cap utilization rate (LHS)[3]
Proportion of foreign currency settlements made using CLS system (RHS)[4]



Notes: 1) Average of daily maximum intraday overdraft cap utilization rates of participants.
2) Average ratio of the amount of payment orders in queue for settlement / Total settlement amount (excluding payment orders in queue for liquidity savings).
3) Simple average of daily maximum net debit cap utilization rates (unsettled net debits / net debit caps) of participants during the period.
4) Proportions in total CLS eligible FX transactions of those settled through the CLS system.

Source: Bank of Korea.

Financial Stability Situation by Sector

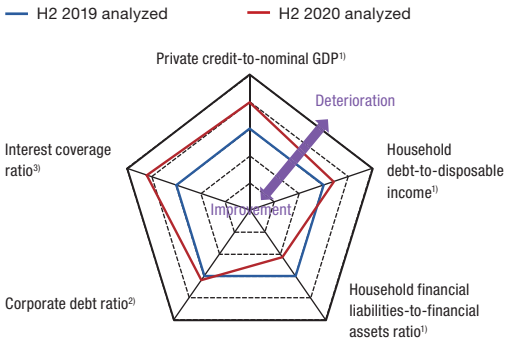
I. Credit Markets

The private credit-to-nominal GDP ratio,[1] an indicator of the level of private sector leverage, maintained a steep upward trend as the COVID-19 pandemic continued unabated, slowing GDP growth considerably and causing a massive increase in private credit.

Amid accelerated growth in household credit, both for home mortgage loans and unsecured loans, growth in disposable income slowed, increasing the debt service burden on households.

Corporate credit continued its upward march as the move by companies to secure funding to weather a prolonged pandemic caused loans to rise sharply and corporate bonds to shift to net issuance. Corporate financial soundness worsened from last year on declining sales, with the operating income-to-sales ratio trending lower (Figure Ⅰ-1).

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



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

1. Credit Leverage

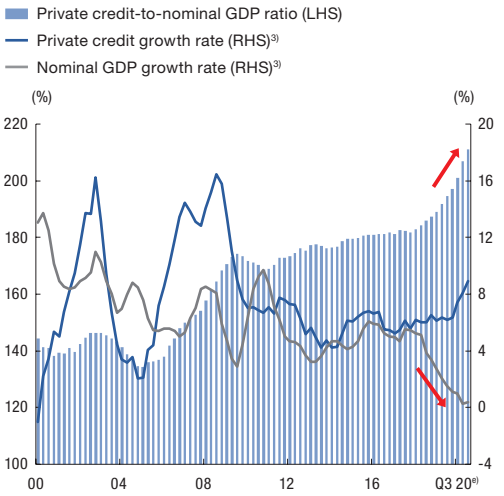
Surge in private credit-to-nominal GDP ratio

The private credit[2]-to-nominal GDP ratio embarked on a steeper upward trajectory, jumping 16.6%p year on year to 211.2% (estimated)[3] at the end of the third quarter of 2020. This is explained by the rapid expansion in household and corporate loans and the resulting increase in private credit at a time when growth in nominal GDP[4] slowed sharply under the

1) The level of private sector leverage is assessed using a variety of financial and real economic indicators, such as the rate of private credit growth by sector, the debt repayment burdens of households and corporations, the level of housing prices, and bank leverage. In this report, the level of private sector leverage is discussed primarily based on the private credit-to-nominal GDP ratio, which is the global common reference guide recommended by the Basel Committee on Banking Supervision ("BCBS" hereafter, 2010) under the Bank for International Settlements (BIS).
2) The BCBS (2010) broadly defines private credit as "all types of debt funds provided to households and non-financial corporations." In accordance with this definition, we used the sum of household debt (private and government loans) and corporate debt (private and government loans, securities other than shares) as reported in the flow of funds statistics.
3) Household and corporate credit based on the third quarter of 2019 flow of funds statistics were estimated through a linear regression model using the rate of household credit growth (based on the household credit statistics) and the rate of corporate credit growth by deposit-taking institutions, respectively, as the explanatory variables.
4) Calculated as the sum of the nominal GDP of the current quarter and that of the three immediately preceding quarters, this amount is not the same as the quarterly nominal GDP reported in the national income statistics.

impact of the COVID-19 pandemic. While the rate of private credit growth (year-on-year) increased from 6.4% at the end of 2019 to 8.9% at the end of the third quarter of 2020, the rate of nominal GDP growth (year-on-year) decreased by 0.7%p from 1.1% in the fourth quarter of 2019 to 0.4% in the third quarter of 2020 (Figure Ⅰ-2).

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



Notes: 1) Estimated figures for Q3 2020.
2) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters.
3) Year-on-year basis.
Source: Bank of Korea.

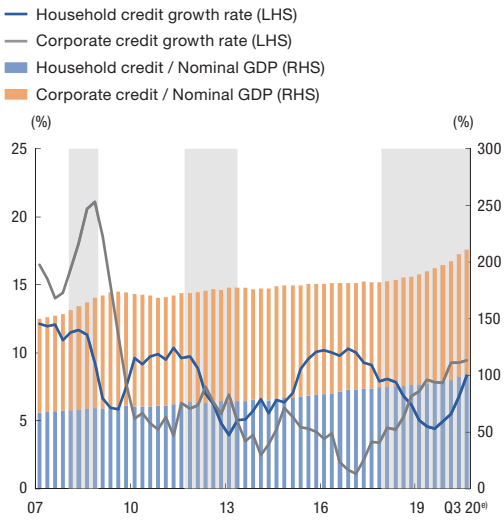
Accelerated credit growth in both the household and corporate sectors

Since early this year, credit growth has picked up pace in both the household and corporate sectors. By sector, the household credit-to-nominal GDP ratio rose 7.4%p year on year to 101.1% at the end of the third quarter of 2020, while the corporate credit-to-nominal GDP ratio jumped 9.2%p to 110.1% during the same period.

Household credit growth has gained speed since the beginning of this year to record a year-on-year increase of 8.3% at the end of the third quarter of 2020, buoyed by an upsurge in housing sales and leasehold deposit-related loans, coupled with increased demand for loans for basic living expenses and stock investment.[5)]

Corporate credit also registered a high year-on-year increase of 9.5% on rising financing needs among companies as they struggled to cope with the economic fallout from the COVID-19 pandemic (Figure Ⅰ-3).

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



Notes: 1) Year-on-year basis; estimated figures for Q3 2020.
2) Shaded area indicates contraction period of Composite Economic Indexes Indicators.
Source: Bank of Korea.

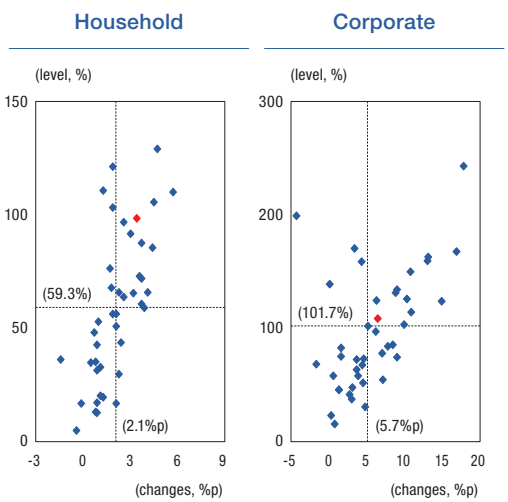
5) Customer deposits by retail investors jumped 125.3% from the end of 2019 to 61.6 trillion won (as of November 30), while securities companies' total credit loans increased 94.3% over the same period, suggesting a large spike in households' demand for stock investment funds.

International comparison of private credit

An increase in private credit is a phenomenon observed worldwide during the process of responding to the COVID-19 pandemic, although this phenomenon has been somewhat more pronounced in Korea. The private credit-to-nominal GDP ratio (BIS statistics basis) in Korea reached 206.9% at the end of the second quarter of 2020, putting it 13th among 43 countries surveyed by BIS. In terms of change from the pre-COVID-19 period (end of 2019), Korea placed 14th (9.9%p), suggesting that both its level of private credit and change in private credit are above the global averages.

By sector, the household credit-to-nominal GDP ratio rose from 95.2% at the end of 2019 to 98.6% (7th) at the end of the second quarter of 2020 by 3.4%p (11th), while the corporate credit-to-nominal GDP ratio increased from 101.8% to 108.3% (17th) by 6.5%p (17th) (Figure Ⅰ-4).

Figure Ⅰ-4. International comparison[1] of the level[2] and changes[3] of private credit-to-nominal GDP



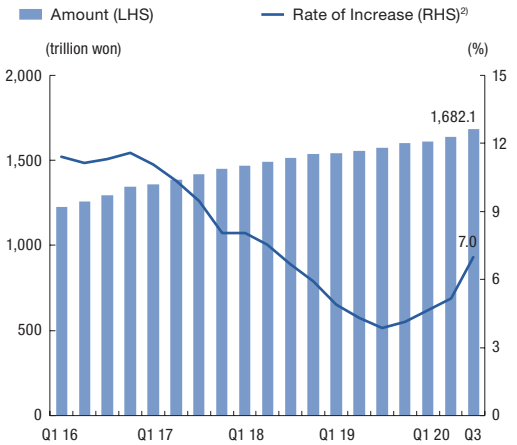
Notes: 1) The dotted lines indicate the average of 43 countries: the red dots indicate Korea.
2) End-Q2 2020 basis.
3) Based on changes from 2019 to end-Q2 2020.
Source: BIS.

2. Household Credit

Household credit growth gains pace

Household debt (household credit statistics basis), which showed a gradually accelerating trend since the fourth quarter of 2019, posted a year-on-year increase of 7.0% to 1,682.1 trillion won at the end of the third quarter of 2020 (Figure Ⅰ-5).

Figure Ⅰ-5. Household credit[1]

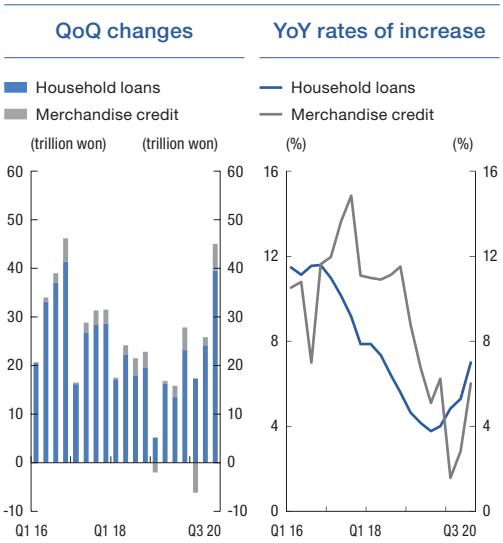


Notes: 1) Household credit statistics basis.
2) Year-on-year basis.
Source: Bank of Korea.

By type of credit, at the end of the third quarter of 2020, household loans amounted to 1,585.5 trillion won, up 7.0% on a year-on-year basis. Merchandise credit, whose growth sharply slowed during the first half due to the onset of the COVID-19 pandemic, closed the third quarter with a year-on-year increase of 6.0%, returning to a level similar to the fourth quarter of 2019 (6.3%), lifted by the expanding volume of online transactions (Figure Ⅰ-6). Household loan growth has continued its unrelenting upward march even after Octo-

ber, for both home mortgage loans and other loans.[6]

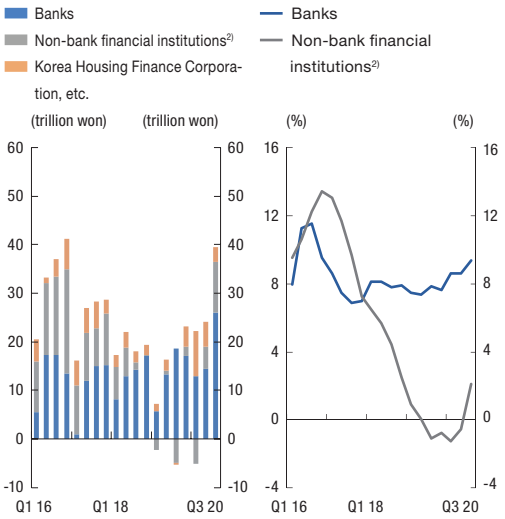
Figure Ⅰ-6. Household credit,[1] by category



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

By type of financial institution, banks' household loan balance reached 821.0 trillion won at the end of the third quarter of 2020, representing a year-on-year increase of 9.4%. NBFIs' household loan balance grew 2.1% to 587.9 trillion won, reversing the downward trend begun in the third quarter of last year (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, home mortgage loans jumped 7.2% year on year to 890.4 trillion won at the end of the third quarter of 2020. This is mainly due to the huge spike in the volume of housing purchase transactions,[7] coupled with the recent increase in housing-related loan demand among young borrowers in the 20-30 age group.[8] Other loans rose by 6.8% year on year to 695.2 trillion won, driven by unsecured loans, stemming from declining interest rates[9] and growing loan demand for basic living expenses (Figure Ⅰ-8).

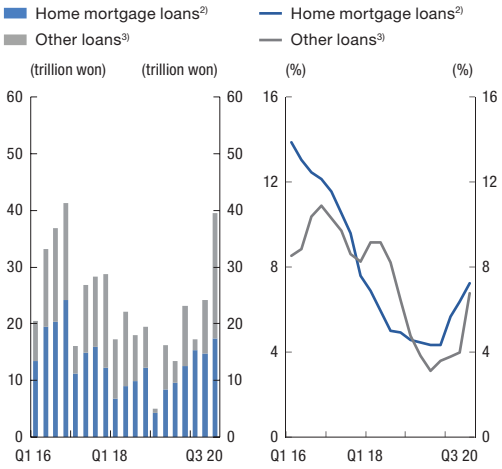
6) In October to November 2020, the overall financial sector (banks, mutual credit cooperatives, insurance companies, mutual savings banks and credit-specialized financial companies) added 31.9 trillion won of new loans, of which 14.1 trillion won is accounted for by home mortgage loans and 17.7 trillion won by other loans. This increase is well above the corresponding amount during the same period last year (15.0 trillion won).

7) In July to September 2020, the number of housing purchase and leasehold deposit rental (*jeonse*) transactions (fixed date basis) amounted to 309,000 and 534,000 respectively, up 55.9% and 13.3% year on year.

8) At the end of the third quarter of this year, housing-related loans to young borrowers increased 10.6% year on year, far surpassing the corresponding figure for other age groups (5.9%). For details, refer to <Box 1> 「Recent Trends in Household Loans to Young Borrowers and Assessment」 (page 25).

9) In September 2020, while the weighted average interest rate on unsecured loans (new loan basis) by deposit-taking banks dropped 0.98%p from the end of last year to 2.89%, the home mortgage loan rate fell by only 0.01%p during the same period.

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

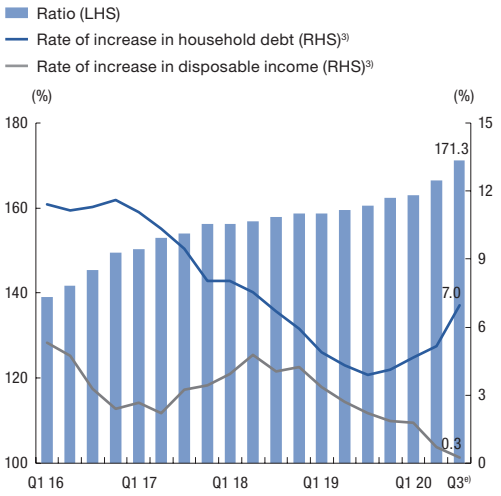


Notes: 1) Household credit statistics basis.
2) Home mortgage loans (of depository institutions, insurance companies and credit-specialized financial companies, extended by Korea Housing Finance Corporation and National Housing and Urban Fund), leasehold deposit fund loans, etc.
3) Secured loans not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

Increase in households' debt service burden

At the end of the third quarter of 2020, the household debt-to-disposable income ratio (household credit statistics basis) jumped 10.7%p from the same period last year (160.5%) to 171.3% (estimated), as household debt increased rapidly while income growth stagnated amid a slowing economy (Figure Ⅰ-9).

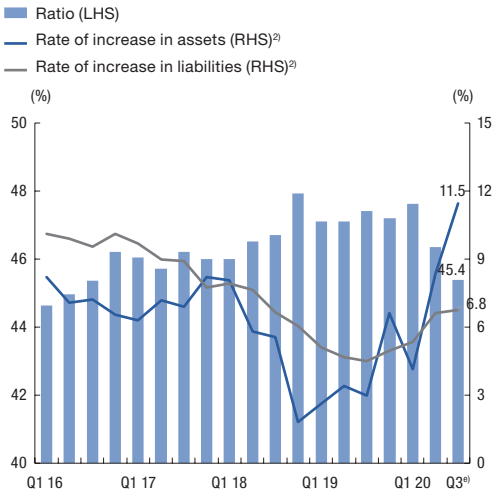
Figure Ⅰ-9. Household debt[1]-to-disposable income[2] ratio



Notes: 1) Household credit statistics basis.
2) Disposable income for Q3 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.

Meanwhile, the financial liabilities-to-financial assets ratio (flow of funds statistics basis) stood at 45.4% (estimated) at the end of the third quarter of 2020, down 2.0%p from the same period last year (47.4%). This is explained by growth in individual financial assets (11.5% year on year) largely outpacing growth in liabilities (6.8%) as a result of the recent stock market boom leading to a sharply higher valuation of equity investments, coupled with a significant increase in cash holdings and deposits driven by a precautionary motive (Figure Ⅰ-10).

Figure Ⅰ-10. Financial liabilities-to-financial assets ratio[1]

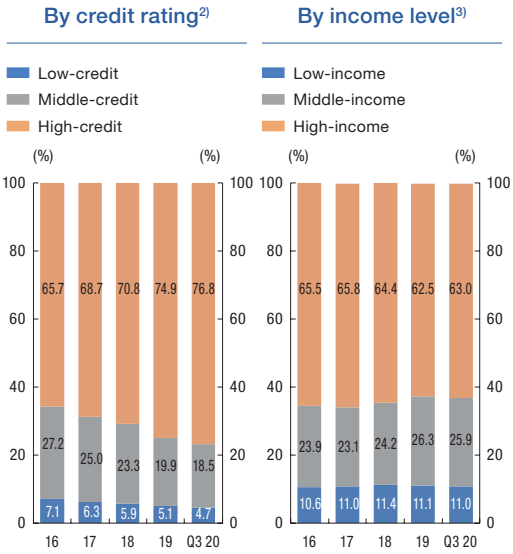


Notes: 1) Flow of funds statistics basis (estimated figures for Q3 2020).
2) Year-on-year basis.
Source: Bank of Korea.

Declining share of vulnerable borrowers

By borrower profile, the share of high-income and high-credit borrowers increased steadily. At the end of the third quarter of 2020, loans to high-credit and high-income borrowers accounted for 76.8% and 63.0% of total loans respectively, up 1.9%p and 0.5%p from the end of the previous year (Figure Ⅰ-11).

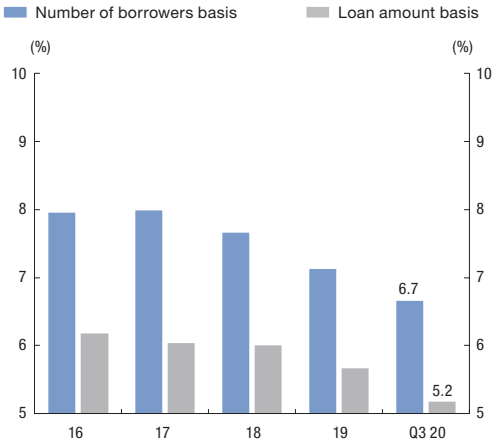
Figure Ⅰ-11. Shares[1] in household loans, by borrower credit rating and income level



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).

Moreover, the share of borrowers with a comparatively lower debt repayment capacity continued to decline. At the end of the third 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, stood at 6.7%, down 0.4%p from the end of last year. The share of vulnerable borrowers also fell in terms of loan value to 5.2% (82.1 trillion won) from 5.7% (85.2 trillion won) at the end of the previous year (Figure Ⅰ-12).

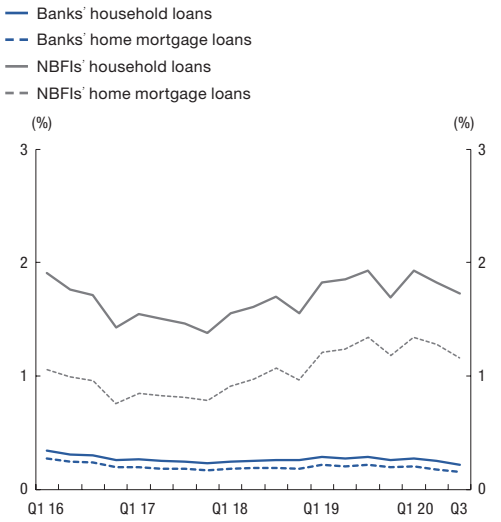
Figure Ⅰ-12. Proportions of vulnerable borrowers



Source: Bank of Korea (Consumer Credit Panel).

The household loan delinquency rate decreased by 0.07%p on a year-on-year basis to 0.22% at the end of the third quarter of 2020 for bank loans and 0.20%p to 1.73% for loans by NBFIs (Figure Ⅰ-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 (for mutual credit cooperatives and mutual savings banks, principal delinquencies of one day and longer or interest delinquencies of one month and longer).
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.

Amid a surge in household debt, the pandemic-induced sales slump in the self-employed sector[10)], including wholesale and retail and accommodation and food services, and the concomitant worsening in overall employment conditions suggest a strong likelihood that households' debt repayment capacity has weakened.[11)] Nevertheless, credit risk arising from this situation has not yet been actualized as it is kept at bay for the moment by low interest rates and a variety of debt relief measures such as the loan forbearance scheme.

10) For details, refer to <Box 2> 「Outlook on the Financial Soundness of Self-employed Business Owners」 (page 32).
11) For details, refer to <Analysis of Financial Stability Issues> 「I. Recent Changes in Household Borrowers' Debt Repayment Capacities」 (page 119).

Accordingly, going forward, attention must be paid to the possibility of a spike in default risk centered on vulnerable households, should income conditions fail to improve meaningfully due to a delay in economic recovery.

Box 1.

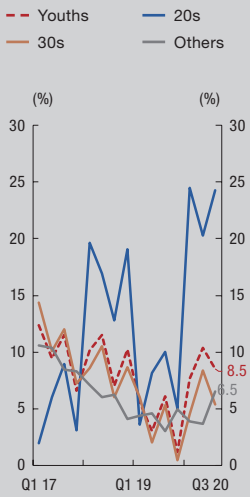
Recent Trends in Household Loans to Young Borrowers and Assessment

With the growth rate of household loans gradually rising this year, household loans of borrowers in their 20s and 30s ("youths" hereafter) are increasing at a higher rate than those of other age groups. Here, the recent status of youths' household loans, the background of such increase, and the debt service capacity of this age group are examined.

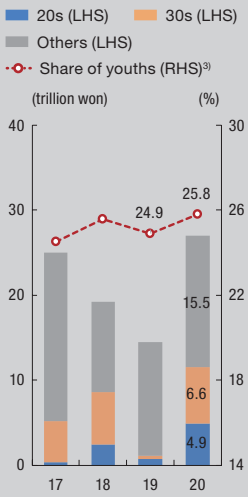
Status

(Size of loans) Household loans extended to youths rose to 409.3 trillion won at the end of the third quarter 2020, up by 8.5% year on year, which exceeds the growth rate of total household loans (+7.0%). In particular, the increase (quarterly average) in household loans for youths this year (+11.5 trillion won) accounted for 42.7% of the total increase in household loans (+27.0 trillion won). As a result, youths' share in the total balance of household loans (1,586 trillion won) edged up from 24.9% (20s: 4.2%, 30s: 20.7%) at the end of 2019 to 25.8% (20s: 4.9%, 30s: 20.9%) at the end of the third quarter of this year.

Growth rate[1] of household loans[2] to youths



Quarterly average increase in loans and share of youths



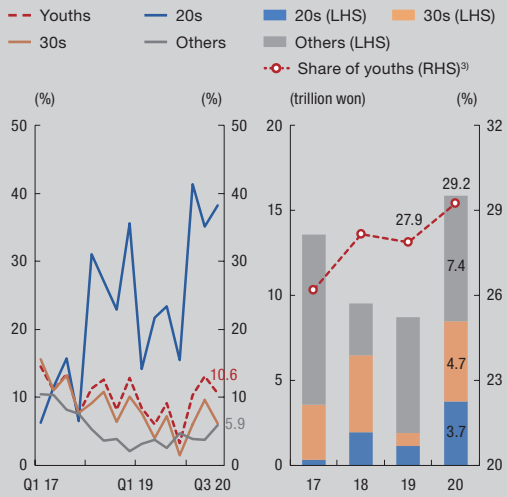
Notes: 1) Year-on-year basis.
2) End-period basis.
3) Youths' share in the total balance of household loans; end-Q3 basis for 2020.

Source: Bank of Korea (Consumer Credit Panel).

(Types of loans) Housing-related loans granted to youths reached 260.2 trillion won at the end of the third quarter of this year, up by 10.6% year on year. Of the average quarterly increase in housing-related loans this year (+15.8 trillion won), youths accounted for 53.4% (+8.5 trillion won), showing a jump from last year (21.4%). As a result, youths' share of the total balance of housing-related loans climbed to 29.2% from the end of 2019 (27.9%). Meanwhile, as for the increase in housing-related loans for youths (+8.5 trillion won), leasehold deposit loans accounted for 85.1%, leading the upward trend of youths' housing-related loans.

Growth rate[1] of housing-related loans[2] to youths

Quarterly average increase in loans and share of youths



Notes: 1) Year-on-year basis.
2) End-period basis.
3) Youths' share in the total balance of housing-related loans; end-Q3 basis for 2020.

Source: Bank of Korea (Consumer Credit Panel).

Increase and balances of housing-related loans to youths[1]

(trillion won, %)

	Youths		Total	
	Quarterly average increase (January-September 2020 period)	Balance (Q3 2020)	Quarterly average increase (January-September 2020 period)	Balance (Q3 2020)
Leasehold deposit fund loans (A)	+7.2 (85.1)	87.6 (33.7)	+10.6 (67.0)	151.1 (17.0)
Home mortgage loans (B)	+1.3 (14.9)	172.6 (66.3)	+5.2 (33.0)	739.3 (83.0)
Housing-related loans (A+B)	+8.5 (100.0)	260.2 (100.0)	+15.8 (100.0)	890.4 (100.0)

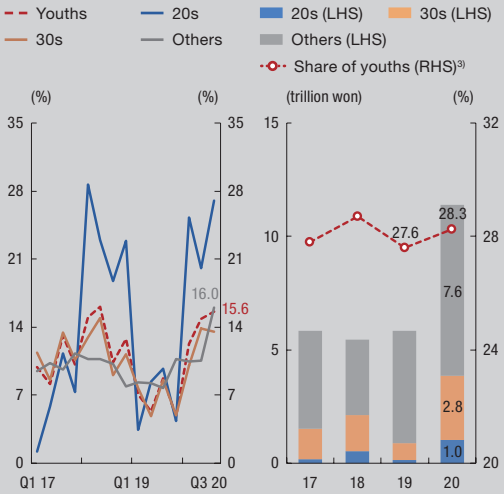
Note: 1) Figures in ( ) refer to shares of leasehold deposit fund loans and home mortgage loans in housing-related loans.

Source: Bank of Korea (Consumer Credit Panel).

Unsecured loans to youths increased to 89.0 trillion won, up by 15.6% year on year. Of the average quarterly increase in unsecured loans this year (+11.4 trillion won), youths accounted for 33.6% (+3.8 trillion won). Hence, youths' share of the total balance of unsecured loans rose from 27.6% at the end of 2019 to 28.3%.

Growth rate[1] of unsecured loans[2] to youths

Quarterly average increase in loans and share of youths



Notes: 1) Year-on-year basis.
2) End-period basis.
3) Youths' share in the total balance of unsecured loans; end-Q3 basis for 2020.

Source: Bank of Korea (Consumer Credit Panel).

Background of increase

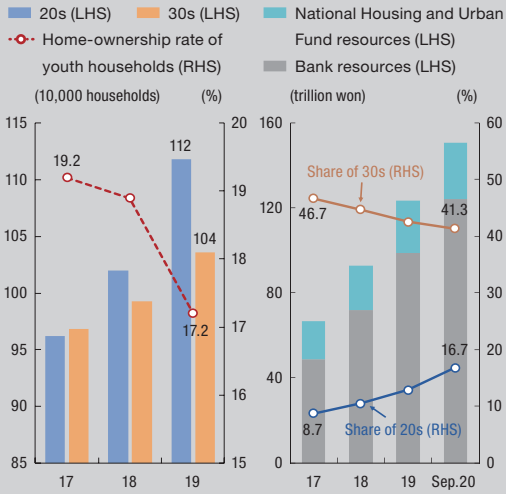
(Increase in loans for leasehold (*jeonse*) deposits and monthly rents)

With the increase in single-person households among youths and the government's strong support for stable housing for youth households (aged 24 to 34), both the supply of and demand for loans for leasehold (*jeonse*) deposits and monthly rents for youths increased. While single-person youth households increased largely among people in their 20s, the home-ownership rate of youth households has fallen steadily (19.2% in 2017 → 17.2% in 2019), prompting an increase in demand for loans for leasehold

(*jeonse*) deposits and monthly rents. Since 2018, the government has introduced various programs to support funding leasehold (*jeonse*) deposits and monthly rents for people in their 20s and early 30s. Loans for leasehold (*jeonse*) deposits and monthly rents programs for youth households developed by the government include the Beotimmok Jeonse Deposit Loan (January 2018), SMEs Young Employee Leasehold Deposit and Monthly Rental Deposit Loan (June 2018), and Youth Leasehold Deposit and Monthly Rental Loan (May 2019). From January to October of 2020, the Beotimmok Jeonse Deposit Loan and SMEs Young Employee Leasehold Deposits and Monthly Rental Deposit Loan amounted to 7.4 trillion won, and from January to September of the same year, the Youth Leasehold Deposit and Monthly Rental Loan stood at 2.1 trillion won. At the end of September this year, borrowers in their 20s accounted for 16.7% of the total balance of leasehold deposit loans, having climbed steeply from the 8.7% recorded at the end of 2017.

Number of single-person youth households and home-ownership rate of youth households

Amount of leasehold deposit fund loans[1] and share[2] of youths



Notes: 1) As leasehold deposit fund loans are usually extended by banks under business agreements with credit guarantee institutions, only a small amount of loans are extended by NBFIs.
2) End-period basis.

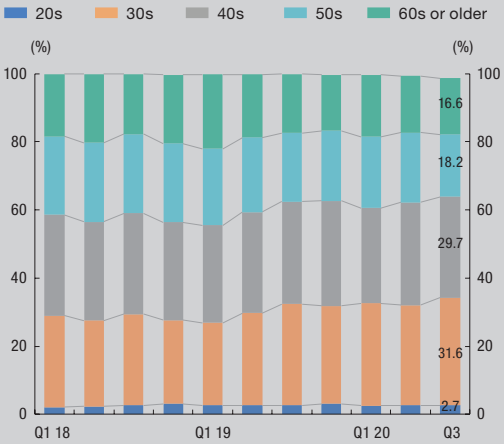
Sources: Bank of Korea (Consumer Credit Panel), Ministry of Land, Infrastructure and Transport, National Housing and Urban Fund, Statistics Korea.

(Expansion of demand for housing purchases by borrowers in their 30s)

This year, while the volume of housing sales transactions surged dramatically, especially in the Seoul Metropolitan area, amid the expectation of rising housing prices, transactions by people in their 30s climbed sharply, representing the largest segment of the increase among all age groups. In addition, the share of youths' borrowings from financial institutions out of total funds raised for home purchases remained higher than that of other age groups.[1]

1) For January to September of this year, financial institution borrowings accounted for 29.1% of the home purchase funds of people in their 30s and 26.1% for people in their 20s, higher than for other age groups (22.0% for people in their 40s, 16.7% for those in their 50s, and 9.2% for those in their 60s or older).

Shares in housing sales transactions[1] in Seoul Metropolitan area, by buyer age[2]



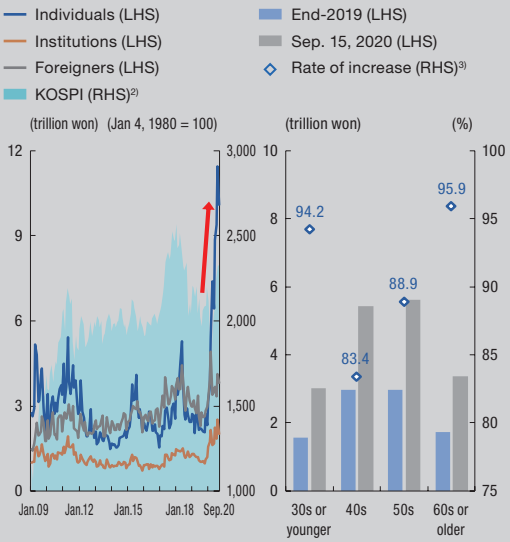
Notes: 1) Based on transactions that require submission of a funding plan for housing purchase.
2) Based on the age of the representative buyer for transactions in which two or more people buy a house together.
Sources: Ministry of Land, Infrastructure and Transport (funding plan for housing purchase).

(Increase in demand for stock investment funds)

After the sharp fall of stock prices amid the COVID-19 pandemic, stock investments by individuals rose significantly, especially among youths who engage in leveraged stock investment. While credit loans[2] from securities companies expanded in all age groups, the rate of increase (94.2%) of such loans to borrowers in their 30s or younger, along with those in their 60s or older (95.9%), was the highest. Meanwhile, due to the higher interest rate,[3] short life, and strict credit line review for margin loans from securities companies, a significant portion of youths' unsecured loans granted by depository banks with more favorable loan terms and conditions are also likely to have flowed into the stock market.

Stock investment,[1] by investor type

Credit loan balance, by age



Notes: 1) KOSPI basis (monthly average).
2) End-period basis.
3) Changes as of September 15, 2020 compared to end-2019.
Sources: KOSCOM, Financial Supervisory Service.

(Expansion of non-face-to-face, unsecured loans)

The intensified competition among financial institutions over non-face-to-face, mobile-based, unsecured loans, amid the launch of Internet-only banks[4] and spread of Fintech innovation, has likely contributed to the increase in lending to digitally savvy youths. Internet-only banks have

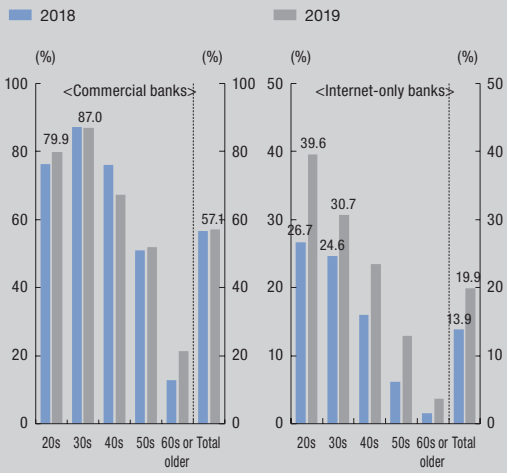
2) Refers to a stock purchase funded by one's own funds and borrowings from securities companies, usually for up to 90 days. In the event the collateral value ratio (stock valuation / loan amount) falls below a certain level, securities companies ask borrowers to deposit additional collateral, and if such additional collateral is not deposited, they dispose of the related collateral.

3) As of the end of September 2020, the interest rate of securities companies' credit loans ranged from 5.75% (1 to 7 days) to 8.75% (over 180 days), and in September 2020, the interest rate of unsecured loans granted by deposit-taking banks (for new loans) was 2.89% (source: Financial Supervisory Service, Bank of Korea).

4) According to the distribution of Internet-only bank customers by age, customers in their 20s and 30s accounted for about 60% (K Bank: 940,000, Kakao Bank: 7,850,000) of total customers.

focused on youths as their main customers and expanded their marketing of unsecured loan products, while nationwide commercial banks experiencing dwindling market share have also concentrated on non-face-to-face products with preferential loan limits and interest rates. As a result, the share of the growth of loans extended through electronic channels out of the growth in total bank loans soared from 28.7% in 2019 to 34.2% for the period from January to September 2020.

Use of mobile banking services of commercial[1] and Internet-only banks, by age[2]



Notes: 1) Nationwide banks excluding Internet-only banks (Kakao Bank, K-Bank), and specialized banks are included.
2) Results of survey of 2,650 people.
Source: Bank of Korea.

Assessment of debt servicing capacity

(Leverage) The loan-to-income (LTI) ratio of youths has steadily increased due to the growth of household debt outpacing that of income, reaching 221.1% as of the end of the third quarter of this year and approaching the level of other age groups (227.6%). The LTI ratio of borrowers in their 30s (254.9%) is the highest among all age groups, with the pace of its rise having accelerated this year.

(DSR) The DSR (debt service ratio) of youths was 35.6%, and has dropped more significantly than those of other age groups since 2017. This is likely attributable to youths' higher share[5] of bank loans with relatively low interest rates and the growth of leasehold deposit loans, which require only interest payments during the life of the loan, as well as factors common to all age groups, such as the decline of loan interest rates and increase in the average maturity of household loans during the period.

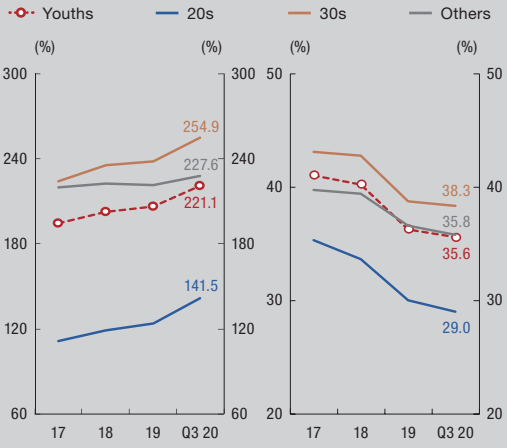
(Vulnerable borrower) The number of vulnerable borrowers[6] among youths declined gradually to 455,000 at the end of the third quarter of this year, causing their share among all youth borrowers (7.2%) to fall continuously. However, the share of vulnerable borrowers still remains higher than that of other age groups (6.4%).

5) The share of bank loans out of youths' total household loans stood at 70.3% at the end of the third quarter of 2020, having steadily risen since the end of 2017 (63.4%). The share of bank loans out of youths' total housing-related loans was 75.3%, and the share of bank loans out of youths' unsecured loans was 81.4%, both higher than those of other age groups (68.5% and 70.3%).

6) "Vulnerable borrowers" refers to borrowers with multiple loans (at least three loans from financial institutions) and either low income (lowest 30%) or low credit ratings (grades 7 to 10).

Leverage (loan-to-income ratio), by age[1)]

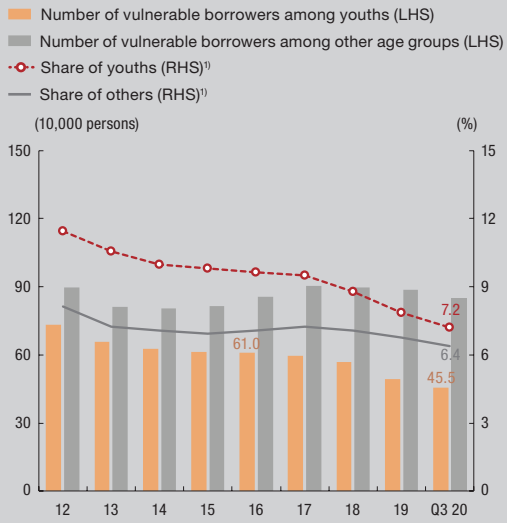
DSR (debt service ratio), by age[1)]



Note: 1) Household loan borrower and end-period basis.
Source: Bank of Korea (Consumer Credit Panel).

(Share of borrowers with low-income or low credit ratings) The share of low-income (lowest 30%) borrowers out of household loans to youths fell steadily to 25.4% by the end of the third quarter of this year. Of borrowers in their 20s, about half (46.8%) were low-income borrowers, but the decline (17.7%p) their share since 2012 was the largest among all age groups. Meanwhile, the share of young borrowers with low credit ratings (grade 7 to 10) is on a downward trend thanks to the overall improvement of credit ratings,[7)] holding at 11.0% (20s: 9.9%, 30s: 11.6%) at the end of the third quarter of this year, which is similar to the levels for other age groups.

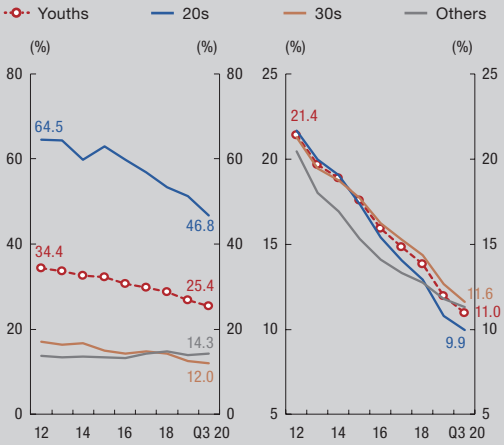
Number of vulnerable borrowers among youths



Note: 1) Proportions of number of vulnerable borrowers in total number of borrowers in each age group.
Source: Bank of Korea (Consumer Credit Panel).

Share[1)] of low-income[2)] borrowers among youths

Share[1)] of low-credit rating[2)] borrowers among youths

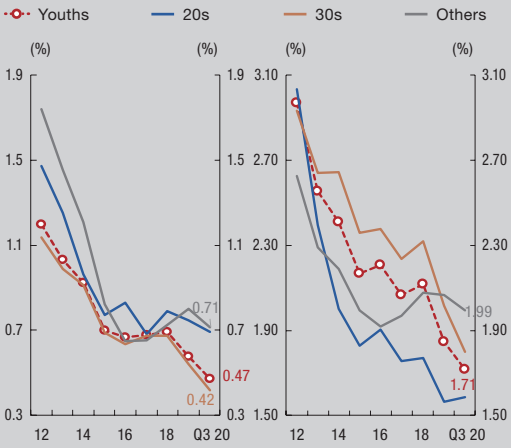


Notes: 1) Number of borrowers at end-period basis.
2) Low-income and low-credit rating refer to bottom 30% and credit grades 7-10 (total of 10 grades), respectively, among borrowers who have credit history in NICE Credit Information Service.
Source: Bank of Korea (Consumer Credit Panel).

7) Thanks to the decline of the delinquency rate of household loans, the government's efforts to support individuals' credit rehabilitation and increased stringent risk management by financial institutions, the credit ratings of individual borrowers have improved overall since 2012.

(Delinquency rate) The delinquency rate of loans to youths was slightly lower than that of other age groups and was on a downward trend overall, standing at 0.47% at the end of the third quarter of this year. The delinquency rate of loans to borrowers in their 30s (0.42%) has declined to the lowest level among all age groups. Meanwhile, the share of borrowers with delinquent loans out of all young borrowers has also continued to decline, falling to 1.71% at the end of the third quarter of this year, lower than that of other age groups (1.99%).

Delinquency rates[1] of youths' household loans



Share of delinquent borrowers[1] among youths

Note: 1) Delinquency amount, duration, and coverage of household loans are different from those obtained from financial institutions' business reports; end-period basis.
Source: Bank of Korea (Consumer Credit Panel).

Implications

The surge of household loans to youths comes as youths' demand for loans for leasehold (*jeonse*) deposits and monthly rents, and home purchases rose and demand for stock investment expanded, from the demand side, and as non-face-to-face, unsecured loans more accessible to youths climbed and the government strengthened the funding support for youths' leasehold (*jeonse*) deposits and monthly rents, on the supply side.

Despite the steep increase in household loans to youths, the debt service burden is not yet deemed to be significant. The growth of household loans to youths has been driven by housing-related bank loans backed by guarantees or collateral, which carry lower interest rates, amid a declining DSR and a steadily low delinquency rate. However, it should be noted that the leverage (LTI ratio) among people in their 30s has been rapidly rising and the share of vulnerable borrowers among youths is higher than that of other age groups.

The rise of household loans to youths is not yet a grave concern, but if the rate of the recent steep rise continues, the debt repayment capacity of youths will likely deteriorate.[8] Accordingly, risk management needs to be strengthened gradually to cope with a possible elevation of credit risks in tandem with the rapid growth of household loans to youths.

8) It should also be noted that the soaring debt of youths, who tend to have a higher propensity to consume, is highly likely to constrain the consumption capacity of the economy overall.

Box 2.

Outlook on the Financial Soundness of Self-employed Business Owners

As non-face-to-face transactions increased amid the protracted COVID-19 pandemic, sales dropped significantly, largely among self-employed business owners ("SEBOs" hereafter),[1] who rely more on person-to-person transactions. Moreover, the consumption activities of economic agents declined drastically due to the strengthened social distancing measures in response to the surging number of COVID-19 cases, while the number of foreign visitors dropped sharply due to the travel restrictions, deepening the business slump.

Here, the impact of the decrease in sales caused by the COVID-19 pandemic on the financial soundness of SEBOs is analyzed using microdata such as the Consumer Credit Panel and the 2019 Survey of Household Finances and Living Conditions, and the effect of the principal and interest payment deferment measure[2] is estimated to derive implications.

Recent status of SEBOs

The rate of contraction of sales for SEBOs has fluctuated in tandem with the spread of COVID-19 and the distribution of the government's emergency disaster support funds.[3] By industry, while sales in some industries rose substantially with the increase in non-face-to-face transactions, the accommodation, leisure service, and food service industries saw their sales decline dramatically.

As of the end of September 2020, the loans of SEBOs amounted to 777.4 trillion won, up 15.9% year on year. By industry, loans to the wholesale & retail trade, food service, and leisure service industries rose significantly, suggesting that the shortfall of working capital due to the decrease in sales was partly funded by loans.

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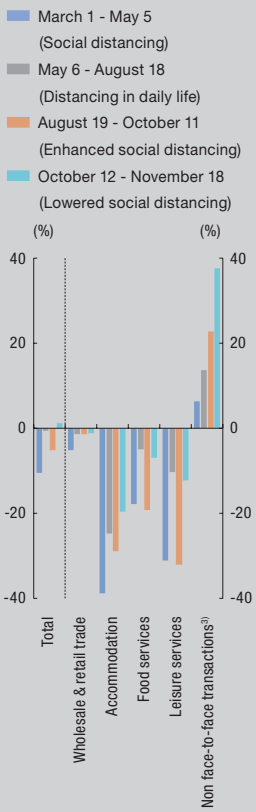
1) Self-employed households encompass households that have a household head with one of the following employment statuses: SEBO with employees, SEBO without employees, SEBO without pay, or other SEBO (self-employed homeschool teachers, etc.).

2) The government and financial institutions have had a loan principal and interest payment deferment measure in place for small businesses since April 2020. This measure is scheduled to end on March 31, 2021 (press release of the Financial Services Commission, March 31, 2020).

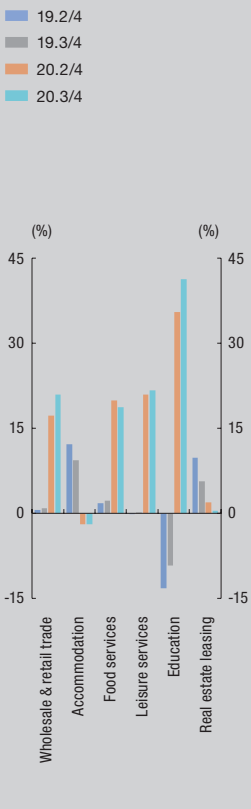
3) The government paid a total of 14.2357 trillion won to 22.16 million households as the first round of emergency disaster support funds. The support funds were spent at marketplaces (food and beverages) (2.5 trillion won, 26.3% of total usage), restaurants (2.3 trillion won, 24.3%), hospitals and pharmacies (1.2 trillion won, 10.6%), and gas stations (0.6 trillion won, 6.1%), in that order.

Trends of sales and loans of self-employed business owners

<Credit card sales[1] by social distancing measure[2]>



<Growth trends of loans by industry[4]>



Notes: 1) Year-on-year increase.
2) Social distancing (March 1 - May 5), transition to distancing in daily life (May 6 - August 18), social distancing level 2 (August 19), raised to level 2.5 in the Seoul Metropolitan area (August 30).
3) Based on Internet commerce and mail orders.
4) Based on loans of self-employed business owners in identifiable industries.

Sources: Bank of Korea (Consumer Credit Panel), The Credit Finance Association.

Prospects for financial soundness

Scenario

For self-employed households in industries that sustained significant sales shocks, the impact of the protracted COVID-19 pandemic on their financial status was examined.[4] Households whose gross income fails to cover essential expenditures[5] due to decreased sales are referred to as "households in deficit," among which households that are unable to cover their deficits using their financial assets[6] are referred to as "liquidity risk households" and households whose net assets are negative, meaning that their assets are less than their liabilities, are classified as "insolvency risk households."

Regarding the future business conditions of SEBOs, two scenarios were set: a scenario where sales increase to pre-pandemic levels from the second quarter of 2021, thanks to the development and deployment of coronavirus vaccines and treatments (base scenario), and a scenario where the sales conditions as of October this year persist until the end of 2021 (adverse scenario).

For each scenario, the effect of the government's principal and interest payment deferment measure (effective from April 1, 2020, to March 31, 2021) is analyzed.[7] The effect of the exten-

4) Based on the 2019 Survey of Household Finances and Living Conditions, an analysis was conducted of self-employed households engaged in business industries that appear to have been seriously impacted by the COVID-19 pandemic (wholesale & retail trade, transportation & storage, accommodation & food services, real estate, education, human health & social work, leisure, and other personal services). Households in these business industries (2.44 million) accounted for 53.8% of all self-employed households (4.53 million).

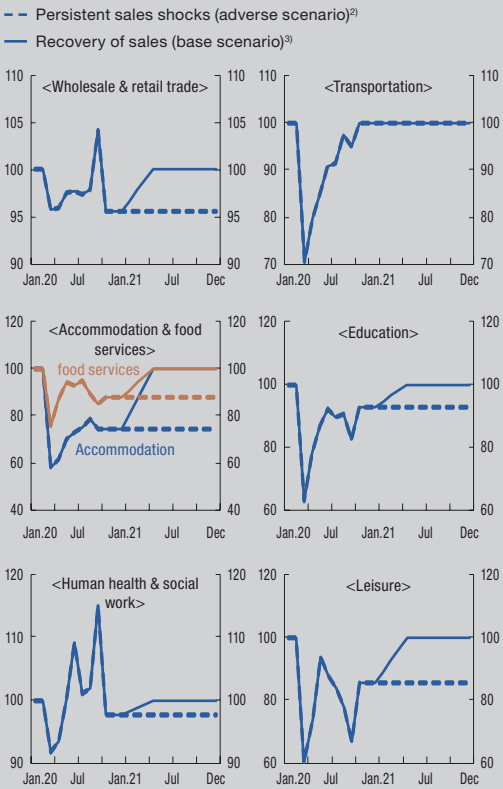
5) Gross income includes self-employment income, employee income, and property income, while essential expenditures as a minimum cost of living include consumption spending, such as medical expenses, telecommunication service, and food, and non-consumption spending, such as taxes and principal and interest payments.

6) Financial assets include savings, investment funds, insurance, and stocks. For insurance, a premium refund rate of 70% was applied.

7) It was assumed that, based on the requirements for applying for principal and interest payment deferment (eligible borrowers, eligible loan types, etc.) and the deferment performances by financial institutions, households with deferred principal and interest payments accounted for 50% of all self-employed households.

sion of the measure after March 2021 is also reviewed.

Changes in sales due to COVID-19[1]



Notes: 1) Pre-shock sales (January - February 2020) are indexed to 100.
2) Sales as of October 2020 persist.
3) Sales as of October 2020 persist until end-2020, and then increase to pre-pandemic levels from the second quarter of 2021.

Sources: The Credit Finance Association, Bank of Korea staff calculations.

Test results

Regarding the change in households' total income and expenditure between February 2020 and December 2021, 79.2% of self-employed households in major business industries were in surplus. On the other hand, 1.5% of households shifted from surplus to deficit, and 18.8% of households remained in deficit. Meanwhile, some SEBOs (0.5%) have even transitioned from deficit to surplus owing to the government's principal and interest payment deferment measure.

Change[1] in total income and expenditure of self-employed households under COVID-19 shock[2]

(10,000 households, %)

	Number of households	Proportions
Total households	243.7	(100.0)
Households in surplus	194.2	(79.7)
Surplus → Surplus	193.1	(79.2)
Deficit → Surplus	1.2	(0.5)
Households in deficit	49.5	(20.3)
Surplus → Deficit	3.7	(1.5)
Deficit → Deficit	45.7	(18.8)

Notes: 1) Based on number of self-employed households in major business industries.
2) Conditions of total income and expenditure as of December 2021 compared to February 2020 under base scenario.

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

(Households in deficit)

It was found that the number of self-employed households in deficit is significantly correlated to the government's implementation of its principal and interest payment deferment measure.

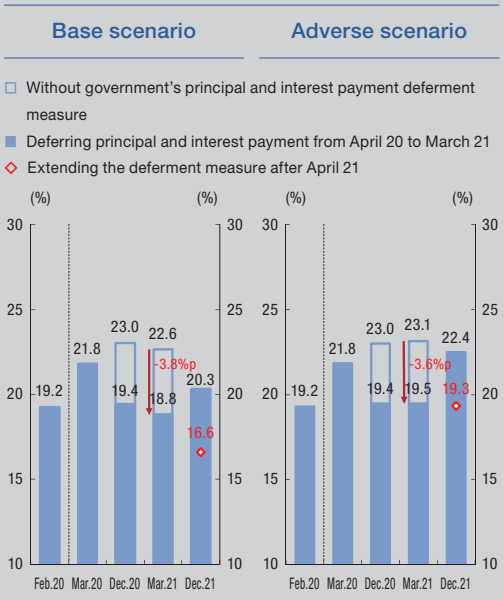
The share of self-employed households in deficit climbed from 19.2% (among self-employed households in major industries, the same hereafter) in February 2020, before the outbreak of COVID-19, to 21.8% in March, right after the pandemic began, but is projected to slip to 18.8% by March 2021 under the base scenario and to 19.5% under the adverse scenario due to the government's principal and interest payment deferment measure.

From April 2021, when the burden of deferred

principal and interest payments emerges upon the termination of the government's measure, the share of self-employed households in deficit is projected to rise to 20.3% by December 2021 under the base scenario and to 22.4% under the adverse scenario. Notably, under the adverse scenario, the share of households in deficit is likely to surpass the share seen in March this year (21.8%), when the sales shock caused by COVID-19 was particularly serious.

Meanwhile, as for the effect of the government's principal and interest payment deferment measure in effect from April this year, the share of households in deficit will be reduced by 3.6-3.8%p by March 2021. Moreover, if the government's measure is extended, by December 2021 the share of households in deficit is likely to remain lower at 16.6% and 19.3%, respectively, under the base and adverse scenarios.

Change in share[1] of self-employed households in deficit[2]



Notes: 1) Compared to the number of self-employed households in major business industries.
2) Based on accumulated household deficit from January 2020 to each period.

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

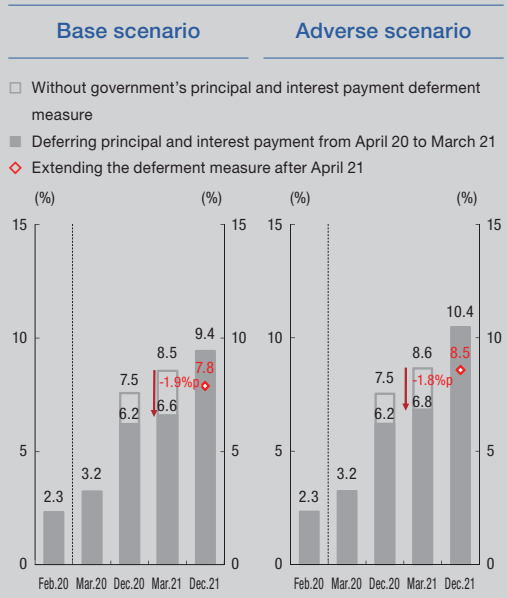
(Liquidity risk households)

Among self-employed households in deficit, liquidity risk households have increased steadily despite the government's support measure. This is largely because, as the deficits of households that were already in deficit before the coronavirus outbreak accumulate, households with depleted financial assets are on the rise.

The share of liquidity risk households among SEBOs rose from 2.3% in February 2020 to 3.2% in March 2020, and is projected to jump to 6.6% by March 2021 under the base scenario and to 6.8% under the adverse scenario, levels twice as high as those seen in March this year. Furthermore, it will likely rise to 9.4% and the 10% range, respectively, by December 2021.

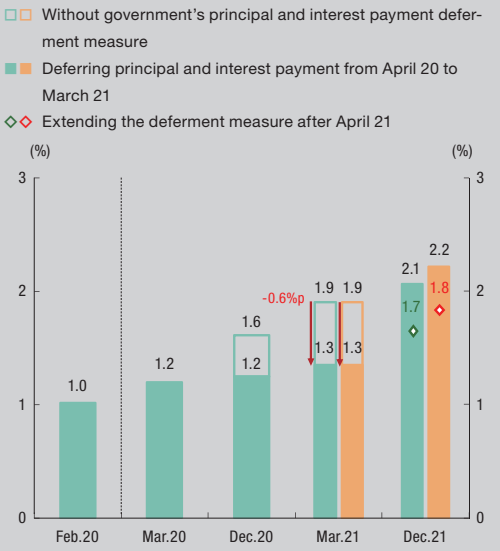
Meanwhile, the government's measure to defer principal and interest payments will reduce the share of liquidity risk households by 1.8-1.9%p by March 2021. If the measure is extended, the share is expected to slide to 7.8% and 8.5%, respectively, by December 2021 under the base and adverse scenarios.

Change in share[1] of self-employed liquidity risk households[2]



Notes: 1) Compared to the number of self-employed households in major business industries.
2) Households whose accumulated deficit from January 2020 to each period exceeds their financial assets.
Sources: 2019 Survey of Household Finances and Living Conditions, Bank of Korea staff calculations.

Change[1] in share[2] of self-employed insolvency risk households[3]



Notes: 1) The green and orange colors show the base and adverse scenario, respectively.
2) Compared to the number of self-employed households in major business industries.
3) Households whose accumulated deficit from January 2020 to each period exceeds their net assets.
Sources: 2019 Survey of Household Finances and Living Conditions, Bank of Korea staff calculations.

(Insolvency risk households)

Among self-employed households in deficit, the share of insolvency risk households, i.e., households with negative net assets, edged up to 1.2% in March 2020 from 1.0% in February 2020, and is expected to tick up to 1.3% by March 2021 under both scenarios. By December 2021, it is projected to climb to 2.1% under the base scenario and to 2.2% under the adverse scenario.

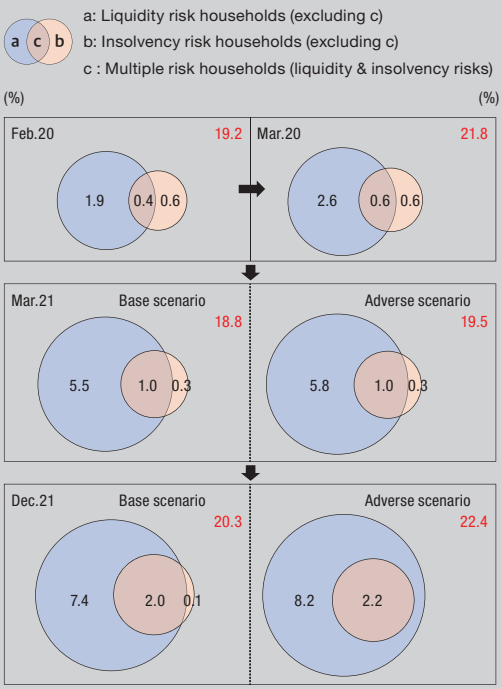
Meanwhile, the government's measure to defer principal and interest payments is estimated to decrease the share of insolvency risk households by 0.6%p by March 2021. If the measure is extended, the share will likely fall to 1.7% and 1.8%, respectively, in December 2021 under the base and adverse scenarios.

(Transmission between liquidity risk and insolvency risk households)

Regarding the changes in risks of self-employed households, the share of households in deficit varies depending on whether the government's measure is implemented, but the share of liquidity risk and insolvency risk households rise steadily regardless of the government's measure. The share of households with both liquidity and insolvency risks at the same time (households with multiple risks) is expected to increase from 0.4% in February 2020 to around 2.0 to 2.2% in December 2021. It should be noted that the financial status of households with multiple risks is less likely to improve even after the impact of the protracted COVID-19 pandemic dissipates.[8]

8) The analysis results of this paper showed that even in the case of sales recovery, households with multiple risks do not improve to the current or previous levels of households with a single risk (either liquidity risk or insolvency risk).

Change of self-employed liquidity risk and insolvency risk households[1)2)]



Notes: 1) Share in the number of self-employed households in major business industries.
2) The numbers in red show the share of households in deficit.
Sources: 2019 Survey of Household Finances and Living Conditions, Bank of Korea staff calculations.

Implications

It was found that the risks of increases in self-employed households in deficit and those with liquidity risk and insolvency risk amid the coronavirus pandemic are largely mitigated by the government's measures, including the principal and interest payment deferment measure. However, considering that the share of households in deficit is expected to rise again after April 2021 upon the termination of the support measure, such temporary financial support appears to be rather limited in its ability to address problems facing SEBOs. In particular, the share of liquidity risk and insolvency risk households is projected to continue increasing even if the principal and interest payment deferment measure is extended. This is attributable largely to the fact that households that were in deficit before the coronavirus outbreak continue to suffer deficits despite the recovery of sales.

Meanwhile, when considering whether to extend the principal and interest payment deferment measure for SEBOs experiencing a lingering sales shock amid the protracted COVID-19 pandemic, the self-employed should be categorized based on financial status, distinguishing between those who are struggling with a temporary liquidity shortage versus those who are facing insolvency.[9)] Hence, support would be more effective if it prioritized SEBOs facing a temporary liquidity crisis, through loan reviews by financial institutions.[10)]

In addition, given that the sales shock that hit SEBOs was concentrated in industries reliant on person-to-person transactions, a measure is necessary to support change in their business industries so that they can better cope with the change in consumption patterns in the long term.

9) Currently, small businesses that suffered direct or indirect losses due to COVID-19 are eligible to apply for principal and interest payment deferment for loans, excluding those in specific business industries (industries related to real estate purchases and rental or speculative businesses) or those with delinquent loans.

10) As information on the business closures of self-employed business owners is insufficient, data on corporations was used. It showed that, while the rate of business closure within one year among firms with a liquidity shortage (liquidity ratio less than 100%) is only 0.8% if their capital was not impaired (net assets were not negative), the rate for firms with capital impairment rises to 8.1%. This suggests that borrowers experiencing both a liquidity shortage and capital impairment carry higher default risk (Bank of Korea estimate, November 2020).

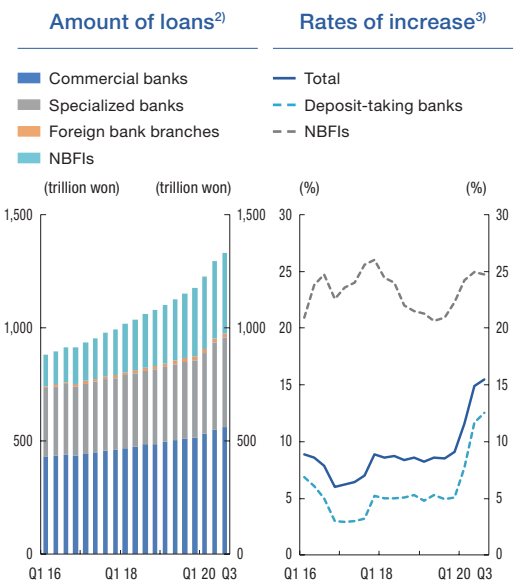
3. Corporate Credit

Persistent growth in corporate credit

Corporate loans by financial institutions have maintained a solid rate of growth to stand at 1,332.2 trillion won at the end of the third quarter of 2020, representing a year-on-year increase of 15.5%. The upward trend in corporate loans is likely to continue for the foreseeable future due to the government's relief measures for SMEs and self-employed businesses.[12)]

By type of financial institution, corporate loans showed a solid pace of growth among both deposit-taking banks and NBFIs. Corporate loans by deposit-taking banks recorded a year-on-year increase of 12.5% (10.0% for commercial banks, 16.1% for specialized banks) to stand at 975.6 trillion won (563.1 trillion won for commercial banks, 394.3 trillion won for specialized banks) at the end of the third quarter of 2020. Corporate loans by NBFIs[13)] jumped a whopping 24.7% year-on-year to 356.6 trillion won,[14)] mainly driven by a sharp rise in loans by mutual credit cooperatives (36.0%) (Figure Ⅰ-14).

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.

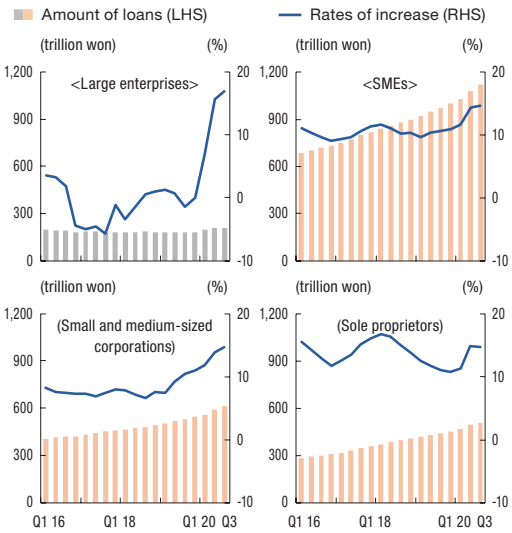
12) On September 23, the government overhauled its small merchant support program for the second time (raising the maximum funding support level per merchant, etc.). Also, in September, Bank of Korea increased the credit ceilings for the Bank Intermediated Lending Support Facility by 8 trillion won to assist small merchants and SMEs faced with funding shortfalls. As a result, corporate loans have maintained a relatively sharp upward trend into the fourth quarter (change in corporate loans by banks: +9.2 trillion won in October → +6.7 trillion won in November).

13) Corporate loans by NBFIs are based on loans by mutual savings banks, mutual credit cooperatives (Nonghyup, Suhyup, forestry cooperatives, Shinhyup 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/leasing companies). However, due to limited data availability, some sectors' data include loans to financial and insurance companies.

14) By type of financial institution, corporate loans break down to 191.5 trillion won by mutual credit cooperatives (53.7% of all corporate loans by NBFIs), 85.9 trillion won by insurance companies (24.1%), 45.5 trillion won by credit-specialized financial companies (12.8%) and 33.7 trillion won by mutual savings banks (9.4%). Corporate loans by mutual credit cooperatives, which increased at a particularly impressive rate of 36.0%, showed a slight uptick in delinquency rate as well (2.83% at the end of the third quarter of 2019 → 2.97% at the end of the third quarter of 2020).

By company size,[15] an upsurge was seen in loans to both large enterprises and SMEs. The sharp increase in loans to large enterprises (211.3 trillion won, 17.0% year-on-year increase) was driven mainly by the move by companies to strengthen their liquidity positions in the face of economic uncertainty, while the strong growth in SME loans was primarily attributable to increased demand for working capital (610.6 trillion won in small and medium-sized corporation loans, 14.7%; 507.5 trillion won in sole proprietor loans, 14.8%) (Figure Ⅰ-15).

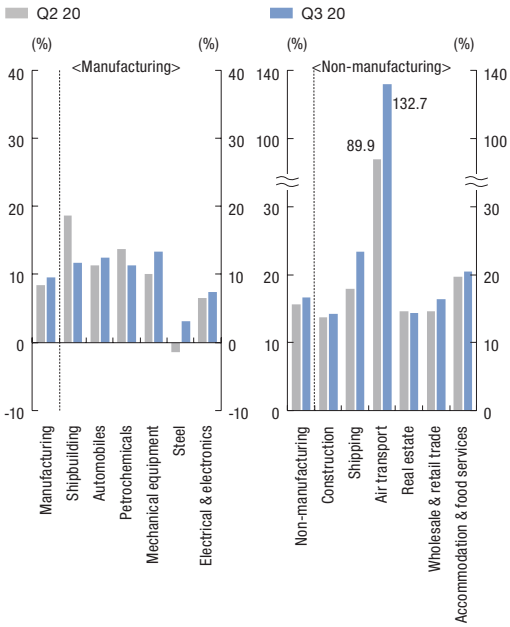
Figure Ⅰ-15. Corporate loans,[1)2)] by company size



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

By industry,[16] while loans increased across most sectors, the rate of increase was particularly high in industries that are heavily hit by the protracted pandemic, such as air transport, shipping, and accommodation & food services (Figure Ⅰ-16).

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

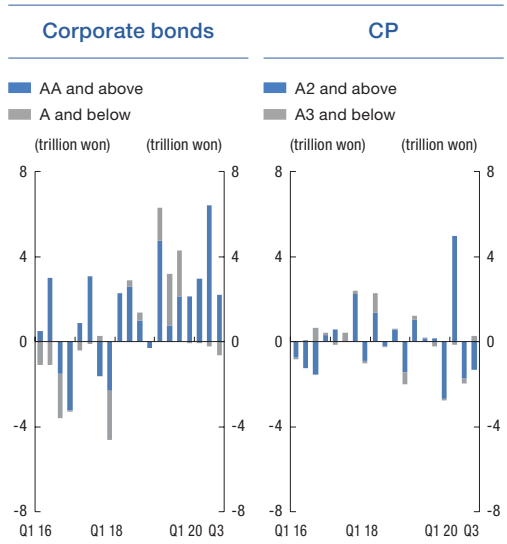


Note: 1) Year-on-year basis.
Sources: Financial institutions' business reports.

In the direct financial market, amid the ongoing move by companies to boost their liquidity positions, corporate bonds recorded net issuance as market stabilization measures by the Bank of Korea and the government caused credit vigilance to soften. However, subprime bonds recorded net redemption due to some difficulties in refunding maturing bonds. Commercial paper also recorded net redemption on increasing preference for corporate bonds by virtue of their longer maturities (Figure Ⅰ-17).

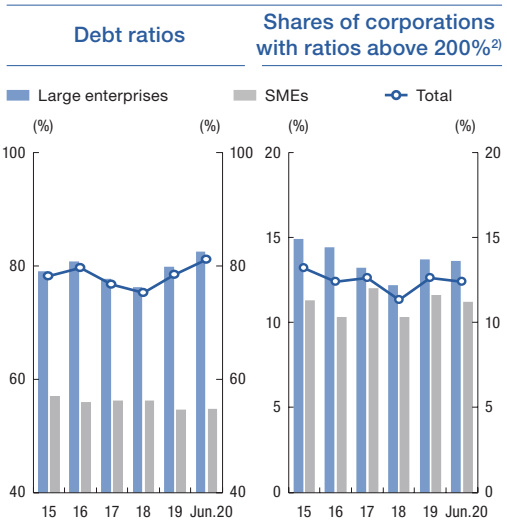
15) Due to limited availability of data, the analysis of corporate loans by company size excluded some NBFI loans (insurance policy loans) that could not be classified by company size.
16) The analysis excluded corporate loans by some types of institutions (mutual savings banks, credit-specialized financial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

Figure Ⅰ-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.

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.

Debt ratios on the rise

The overall corporate[17)] debt ratio (debt / equity) edged up from 78.5% at the end of 2019 to 81.1% at the end of the first half of 2020. Nonetheless, the share of firms with a debt ratio above 200% (excessively indebted firms) dropped slightly to 12.4% from the end of last year (12.6%)[18)] (Figure Ⅰ-18).

Sharply weakened growth and lower profitability

Corporate growth and profitability were severely weakened as the COVID-19 pandemic continued unabated. During the first half of 2020, sales growth (year-on-year) sharply decelerated from the same period of the previous year (-0.8%) to -7.0%. By company size, while SMEs managed small positive growth (1.9%), large enterprises experienced a large decline (-7.3%).[19)]

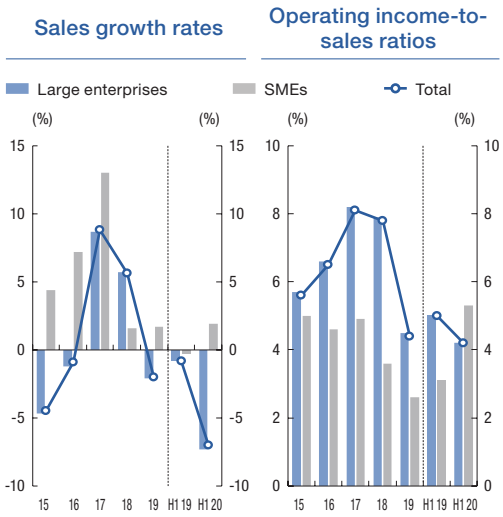
17) Hereafter based on 2,158 firms (1,105 large enterprises, 1,053 SMEs), including listed companies and some unlisted companies required to file a business report pursuant to the Financial Investment Services and Capital Markets Act (excluding financial and insurance industries). Note that the analytical 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.

18) This means that the increase in corporate debt during the first half of this year was driven mainly by firms with a debt ratio below 200%.

19) Unlike SMEs whose sales grew thanks to industries such as machinery & equipment (10.2%), medicinal chemistry (37.1%), and information services (11.4%), which were comparatively little affected by the COVID-19 pandemic, the sales of large enterprises retreated significantly due to a record drop in accommodation & food services (-40.8%), air transport (-38.7%), petrochemicals (-19.9%) and shipbuilding (-18.8%).

The operating income-to-sales ratio (operating income / sales) was also brought down (5.0% in the first half of 2019 → 4.2% in the first half of 2020) by a massive drop in operating income[20] (year-on-year -23.5%) amid the downturn. By company size, the operating income-to-sales ratio rose for SMEs (3.1% → 5.3%) commensurately with sales growth,[21] while that of large enterprises drifted lower (5.0% → 4.2%) (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.

Weakened interest payment capacity

The interest coverage ratio (operating income / interest expenses), measuring a company's interest payment capacity, took a sizeable dip (4.4 in the first half of 2019 → 3.5 in the first half of 2020). By company size, the interest coverage ratio rose for SMEs (1.3 → 2.1) and declined for large enterprises (4.6 → 3.6).

The share of firms with an interest coverage ratio below 1, i.e. those with weak interest payment capacities, increased significantly from 37.3% in the first half of 2019 to 42.4% in the first half of 2020. More than half of SMEs (49.7% → 52.8%) are currently unable to cover interest expenses from operating income. The corresponding share also rose rather substantially among large enterprises (25.3% → 32.4%) (Figure Ⅰ-20)

Meanwhile, the share in total corporate loans accounted for by companies with an interest coverage ratio below 1[22] was 36.1% at the end of the first half of 2020, up 7.8%p from the end of last year (28.3%). This is mainly attributable to an overall worsening in corporate financial soundness caused by the COVID-19 pandemic since early this year.

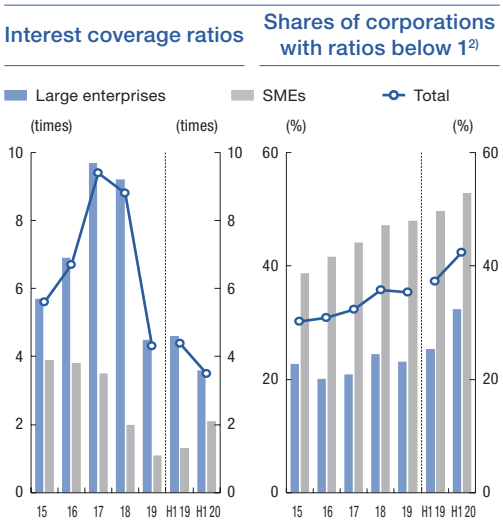
20) In the first half of 2020, operating income slid into negative territory in the petrochemical, shipbuilding, air transport, and accommodation & food service industries, while it sharply shrank in the automobile (-34.8% year on year), wholesale and retail (-30.7%) and transportation (-10.9%) industries.

21) The rise in SMEs' operating income-to-sales ratio and interest coverage ratio is mainly due to the improving profitability in machinery & equipment (4.3% in the first half of 2019 → 6.9% in the first half of 2020), medicinal chemistry (2.9% → 16.0%) and information services (6.0% → 12.2%), which experienced sales upturns during the first half of 2020.

22) The share in total corporate loans accounted for by companies with an interest coverage ratio below 1 (%, end of period basis, sources: KIS-Value, Korea Credit Information Services).

	2015	2016	2017	2018	2019	2020.6
Share	35.6	24.1	20.3	26.6	28.3	36.1

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.

During the process of responding to the COVID-19 pandemic, there has been a steep increase in corporate funding due both to easing measures by the financial authorities and the drive by companies to strengthen their liquidity positions. Although going forward the financial soundness of firms is expected to be progressively restored as the pandemic is brought under control, given the great uncertainties surrounding business conditions, attention must be paid to the possibility that a stalled recovery in corporate performance may lead to liquidity shortage and credit risk.[23]

23) For details, refer to <Analysis of Financial Stability Issues> 「Ⅱ. Impact of the Protracted COVID-19 Pandemic on Corporate Operations」 (page 132).

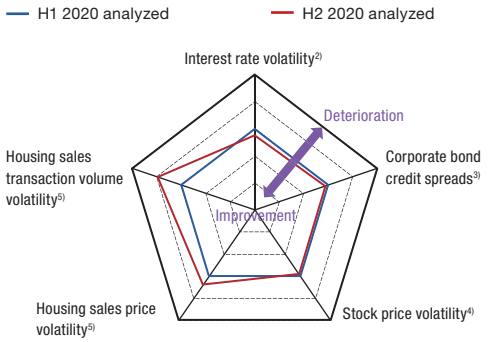
Ⅱ. Asset Markets

Treasury bond yields trended significantly higher on concerns about demand-supply imbalances in the Treasury market and the rise in interest rates in major countries. Credit spreads on corporate bonds narrowed as the government and Bank of Korea stepped in with measures to stabilize the credit securities market,[1] but still remain above pre-pandemic levels.

Stock prices, in spite of a bout of correction with the resurgence of COVID-19 in Korea and across the world, made a significant advance as monetary policy in major countries continued on an easing trend. Improving economic indicators and the expectation of rapid availability of COVID-19 vaccines also contributed to this price gain.

Growth in housing sales prices, which slowed from August onwards affected by the government's successive housing market stabilization measures, re-embarked on an accelerating path starting in November (Figure Ⅱ-1).

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



Notes: 1) Extents of change in June-November 2020 period (June-October 2020 period for housing sales volume) compared to December 2019-May 2020 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-November 2020 compared to end-May 2020 indexed.
4) V-KOSPI basis.
5) Indexed monthly volatility of housing sales price index and housing sales transaction volume.
Source: Bank of Korea.

1. Bond Markets

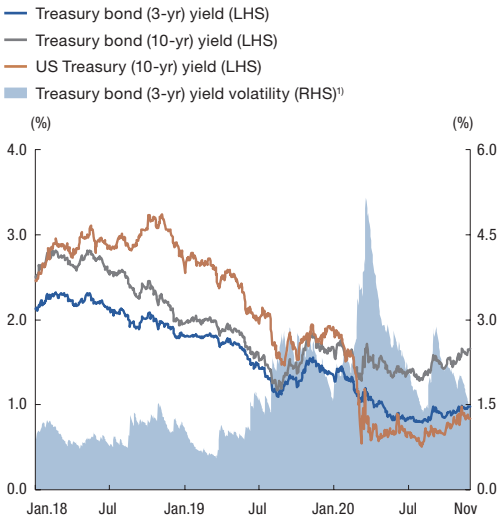
Rise in long-term market interest rates

Treasury bond yields increased substantially until early September under concerns about an excess Treasury bond supply as the government unveiled its 2021 budget and compiled a fourth supplementary budget. Later, with Bank of Korea's announcement to expand its outright purchase of Treasury bonds (September 8) and on the resurgence of COVID-19, Treasury yields drifted down to the lower-0.80% level in late September. From October onwards, Treasury yields showed a steep upward trend, moving

1) In cooperation with the government and Korea Development Bank, Bank of Korea has set up a special purpose vehicle (SPV) to purchase, with an upper limit of 10 trillion won, corporate bonds and CP, including lower-rated instruments. The SPV started operation on July 24.

together with those in major countries,[2] on the likelihood of a new economic stimulus package in the United States and the expectation of rapid availability of COVID-19 vaccines (Figure Ⅱ-2, Figure Ⅱ-3).

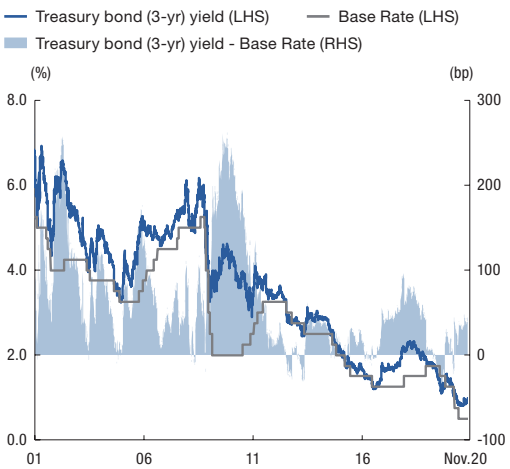
Figure Ⅱ-2. Korean and US Treasury bond yields



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

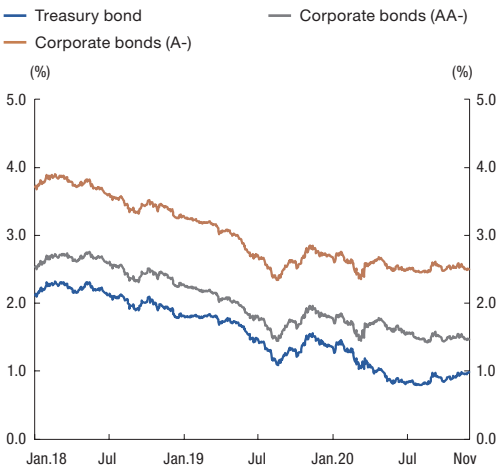


Sources: Bank of Korea, Korea Financial Investment Association.

Moderate narrowing in credit spreads on corporate bonds

Credit spreads on corporate bonds showed a slight tightening as corporate bond yields either decreased moderately or moved sideways, in contrast with Treasury bond yields (Figure Ⅱ-4).

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



Note: 1) 3-year maturity basis.

Source: Korea Financial Investment Association.

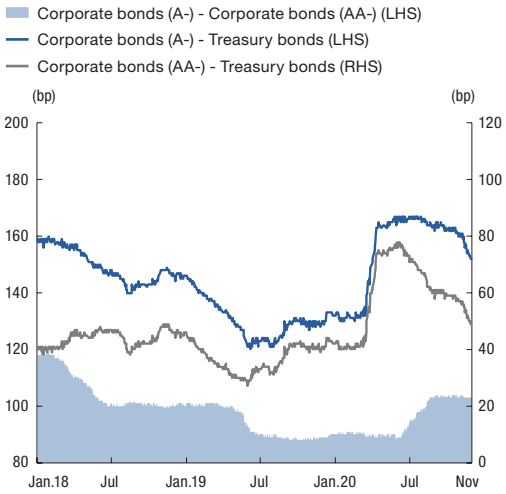
Credit spreads on prime bonds (AA-) decreased from 71bp in early July to 49bp in late November as investor sentiment improved on the actions of the government and Bank of Korea to stabilize the credit securities market. Credit spreads on subprime bonds (A-) also narrowed after the special purpose vehicle (SPV) kicked into operation (July 24), but the extent of narrowing was not as significant for this segment of bonds, which are more vulnerable to the COVID-19 shock than prime bonds (166bp in early July → 152bp in late November). As a result, the spread between credit ratings (A- and AA- basis) widened from

2) Between October 1 and November 3, the US Treasury bond yield (10-year) rose 22bp.

July onwards (Figure Ⅱ-5). Credit spreads on corporate bonds, although brought down substantially in recent months from their peak in the initial aftermath of the COVID-19 outbreak, still remain above pre-pandemic levels (Figure Ⅱ-6).

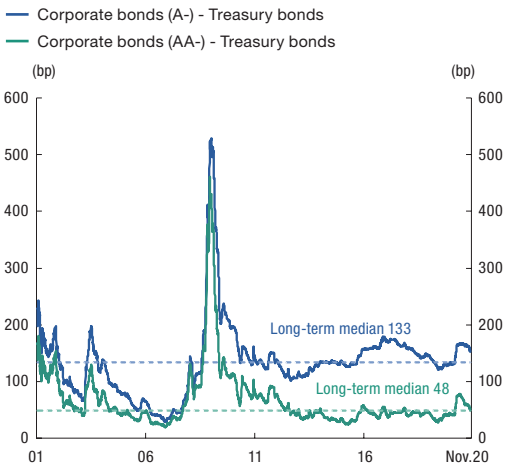
Meanwhile, the corporate primary market recorded a net issuance in the second half as well, driven by prime bond issues. Subprime bonds also swung to net issuance starting in the fourth quarter as purchases by the SPV lifted the volume of new issues (Figure Ⅱ-7).

Figure Ⅱ-5. Corporate bond credit spreads,[1] and spread across credit ratings



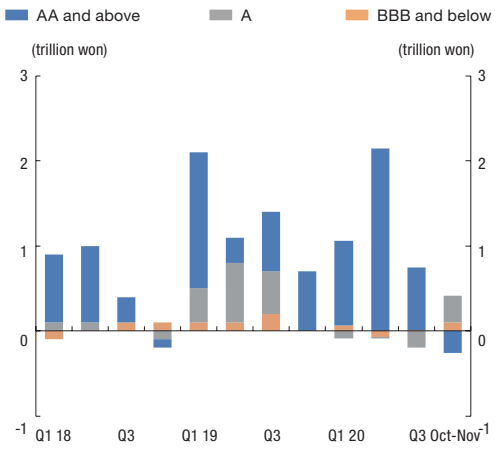
Note: 1) 3-year maturity basis.
Source: Korea Financial Investment Association.

Figure Ⅱ-6. Corporate bond credit spreads[1)2)]



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

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



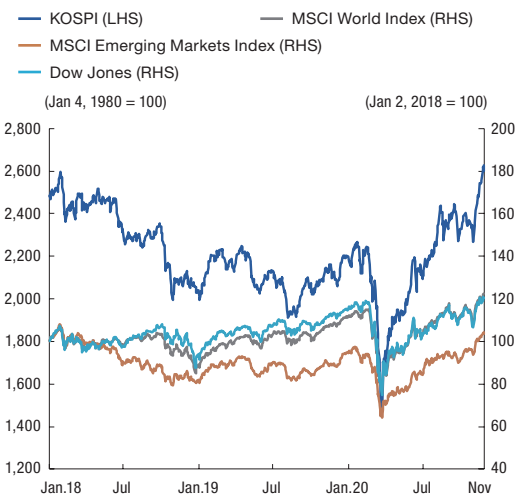
Notes: 1) Public offer basis; excluding issuance by financial companies.
2) Monthly average basis.
Sources: Bank of Korea, Korea Securities Depository.

2. Stock Markets

Continued rise in stock prices

Since July, stock prices continued on an upward trend on the aggressive policy response from governments in major countries and improving economic indicators, returning to pre-pandemic levels. However, in August to October, the stock index fluctuated between 2,250 and 2,450 points as the market reckoned with both positive and negative price factors, such as the expectation of an additional US stimulus package and better-than-expected corporate earnings on the one hand, and the accelerating spread of COVID-19 and the uncertainty surrounding the US presidential election on the other. However, in November, reduced uncertainty in US politics and the anticipation of rapid availability of COVID-19 vaccines sent stock prices to record highs[3] (Figure Ⅱ-8).

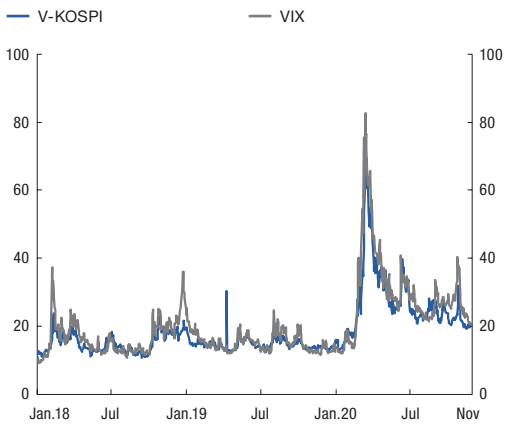
Figure Ⅱ-8. KOSPI and global stock prices



Sources: KOSCOM, Bloomberg.

In June to October, the KOSPI200 volatility index (V-KOSPI) rose briefly and fell again repeatedly on the new surge in COVID-19 cases in home and abroad and the mounting uncertainty in US politics. Although the index stabilized gradually starting in November, it is still quite high compared to pre-pandemic levels (Figure Ⅱ-9).

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



Note: 1) Volatility indices calculated using prices for options on KOSPI 200 and S&P 500 indices.
Sources: KOSCOM, Bloomberg.

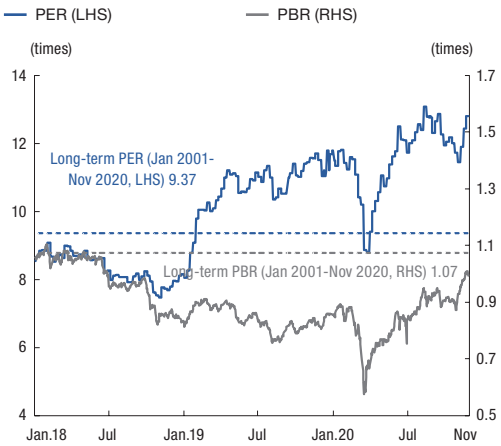
Modest drop in PER, rise in PBR

In mid-August, the price-to-earnings ratio[4] (PER) was lifted to 13.09 by rising stock prices, but fell thereafter as the expectation of improving corporate earnings rapidly became widespread. However, the price-to-earnings ratio resumed an upward trajectory in November on a sharp spike in stock prices to hit 12.79 at the end of November, significantly above the long-term average (9.37 since 2001). The price-to-book value ratio (PBR), comparing the current market price of a stock to its liquidation value, mostly continued on an

3) On November 27, the KOSPI hit 2,633, breaking the previous record high (2,598, January 29, 2018).

upward track to reach 0.99 at the end of November (Figure Ⅱ-10).

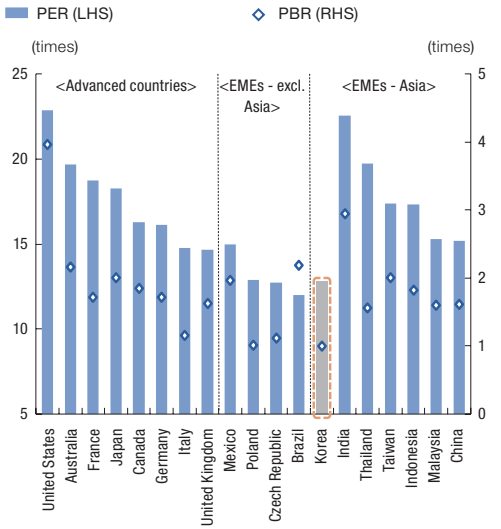
Figure Ⅱ-10. PER[1] and PBR[2]



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

The PER and PBR in Korea continue to remain low 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-November 2020 basis.
2) MSCI basis (12-month forward).
Sources: Bloomberg, Thomson Reuters.

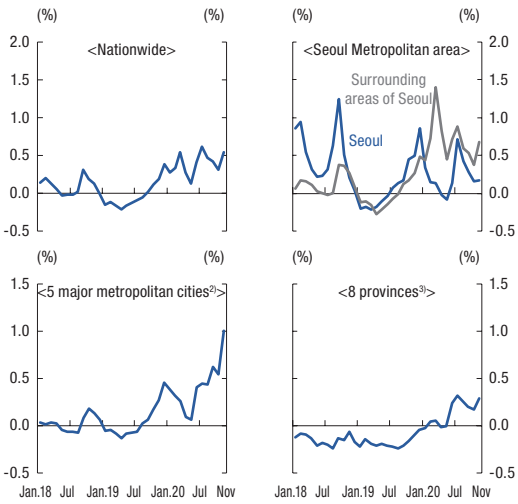
4) Based on the 12-month forward MSCI PER, calculated by dividing the sum of the stock market capitalizations of companies tracked by the MSCI index by the sum of their expected net profits (values forecasted by Korean and foreign securities companies) during the next one-year period

3. Real Estate Markets

Resumption of acceleration in housing sales price growth

The growth in housing sales prices slowed from August onwards, affected by housing market stabilization measures by the government such as the June 17, July 10 and August 4 Measures, but picked up pace in November. This was mainly due to the continued expectation of price appreciation driven by both concerns about a shortage in housing supply, and low interest rates. By region, price growth gained momentum in the areas surrounding Seoul and in the five major metropolitan cities, owing to factors such as development projects and regulatory disparities,[5] with the upward trend continuing also in the eight provinces (Figure Ⅱ-12).

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



Notes: 1) Compared to previous months.
2) Busan, Daegu, Daejeon, Gwangju and Ulsan.
3) Gangwon, Chungbuk, Chungnam, Jeonbuk, Jeonnam, Gyeongbuk, Gyeongnam, and Jeju.

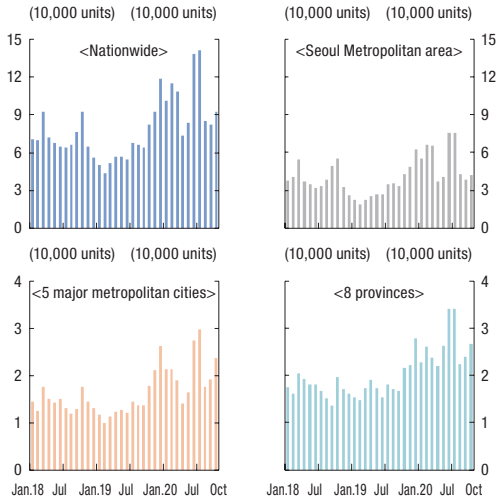
Source: Korea Real Estate Board.

In January to October 2020, the volume of housing sales transactions jumped 72.0% year on year to 1.022 million units. The volume of housing transactions, which massively expanded in June to July on the heightened expectation of price appreciation, shrank again from August onwards as purchase sentiment was hit by regulatory tightening,[6] but continues to remain above the level in the same period a year ago (Figure Ⅱ-13).

5) Since early this year, there has been somewhat of a balloon effect in the housing market, with the price increase accelerating in regions that are outside the scope of the government's market stabilization measures or that are subject to more lenient regulations.

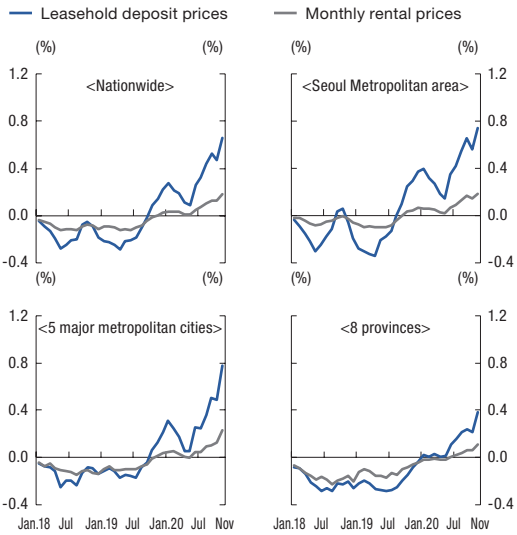
6) The Buyer Superiority Index (KB Real Estate), which embarked on a downward trend following the announcement of the July 10 Measures (92.0 on June 29 → 94.7 on July 6 → 82.6 on July 13), returned to an upward trend in mid-October, centered on areas in other parts of the country (67.5 on October 5 → 74.0 on October 12 → 99.8 on November 30).

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 Real Estate Board.

Accelerating increase of leasehold deposit and monthly rental prices

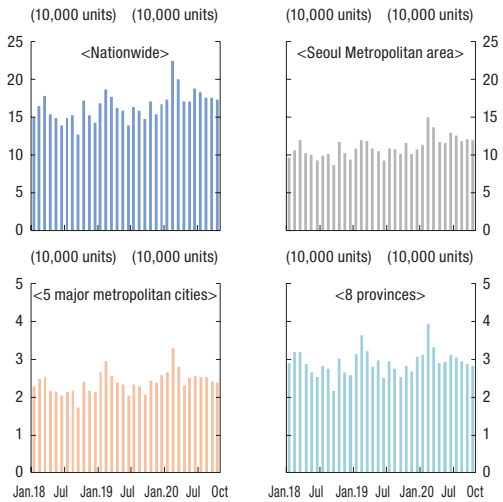
In the housing rental market, leasehold deposit (*jeonse*) and monthly rental prices continued their upward climb, buoyed by a decline in the supply of new apartments and rising sales prices. From August onwards, rental price growth accelerated considerably as the rental housing stock decreased with the entry into force of the Housing Lease Protection Act,[7] raising concerns about a worsening of demand-supply imbalances[8] (Figure Ⅱ-14).

In January to October 2020, the volume of leasehold deposit and monthly rental transactions[9] grew 12.1% on a year-on-year basis to 1.833 million units. By rental type, leasehold deposit and monthly rental transactions increased 12.0% and 12.4% year on year, respectively, to 1.094 million and 0.739 million units. The share of leasehold deposit rental transactions amounted to 59.7%, similar to that for the same period last year (59.8%). By region, the volume of transactions during this period reached 1.246 million units in the Seoul metropolitan area, up 14.9% year on year, and 260,000 units and 310,000 units respectively in the five major metropolitan cities and the

7) The housing stock in the rental market fell following the implementation of a series of new measures by the government, including the lease renewal option and rent control rules (July 31), reduction of tax benefits for housing rental businesses and the actual residence requirement (2 years) for members of apartment redevelopment project unions.
8) The Leasehold Demand and Supply Index (KB Real Estate) continued its upward trend from April, and in October surged to the highest level since July 21, 2003 when it was first included in statistics (152.6 on April 6 → 192.8 on October 26 → 186.6 on November 30).
9) This total, based only on contracts with fixed dates, may be different from the total volume of rental transactions.

eight provinces, up 8.2% and 5.6% year on year (Figure Ⅱ-15).

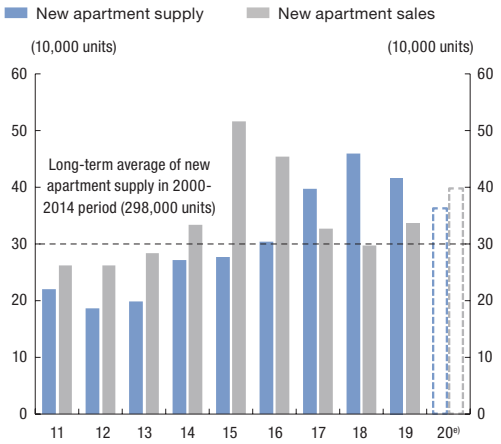
Figure Ⅱ-15. House leasehold deposit and monthly rental transaction volumes[1)]



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

The supply of new apartments in 2020 is projected to decline from a year earlier (416,000 units) to 362,000 units, continuing the downward trend from last year. The projected number of new apartment sales[10)] stands at 398,000 units, which represents an increase over last year (336,000 units) (Figure Ⅱ-16). At the end of October 2020, the inventory of unsold new housing decreased by 44.1% from the end of last year, centered on the Gyeongnam, Gyeongbuk, and Gangwon areas, to 27,000 units (4,000 units in the Seoul metropolitan area, 23,000 outside the Seoul metropolitan area).

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



Note: 1) December 2, 2020 basis; based on sum of monthly planned amount for 2020.
Source: Real Estate 114.

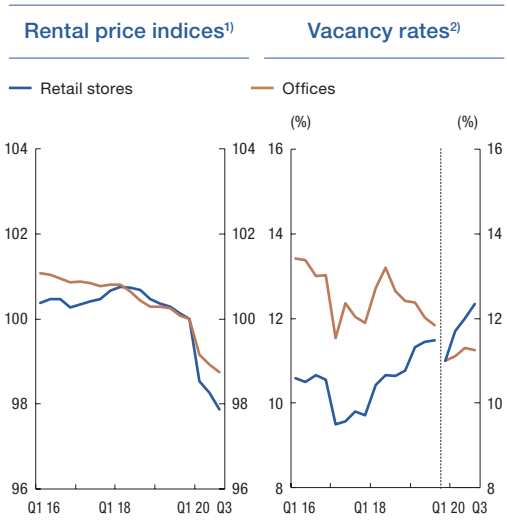
Decline in commercial real estate rental prices

Rental prices of commercial real estate continued on a downward track as the protracted pandemic took a toll on the economy. By property type, in the first to third quarters of 2020, rental prices of retail stores and offices dropped 2.1% and 1.3% respectively from the end of last year. During the third quarter, the vacancy rate[11)] rose to 12.4% from 12.0% in the previous quarter for retail stores, while it was essentially unchanged for offices (11.2%) from the previous quarter (11.3%) (Figure Ⅱ-17).

10) In 2020, new apartment sales are expected to increase substantially from last year in both the Seoul metropolitan area (176,000 units → 219,000 units) and other parts of the country (160,000 units → 179,000 units). However, in January to May, apartment sales dropped 28.5% year on year as transactions were delayed by the COVID-19 outbreak.

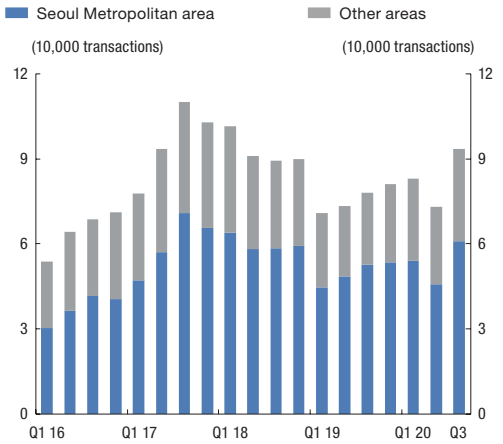
11) Due to the expansion and replacement of sample at the time of the first quarter of 2020 rental survey, the time series was interrupted from the fourth quarter of 2019.

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



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

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



Notes: 1) Based on buildings used for commercial activities 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, which temporarily decreased during the second quarter before resuming growth in the third quarter,[12] amounted to 249,000 units in the first to third quarters of 2020, representing a year-on-year increase of 12.2% (Figure Ⅱ-18).

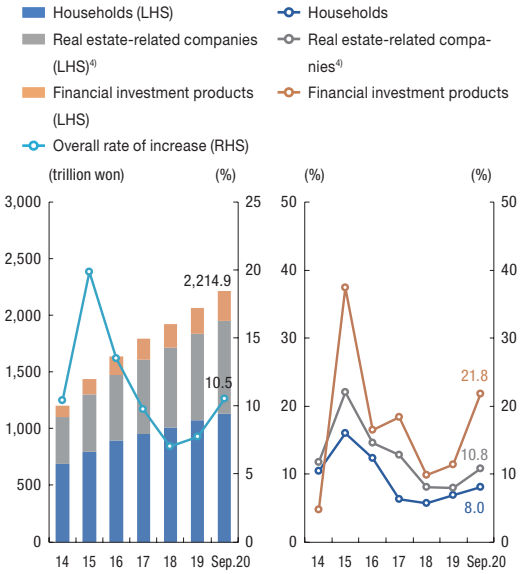
Increase in real estate finance exposures

At the end of September 2020, real estate finance exposures[13] jumped 10.5% year-on-year to 2,214.9 trillion won on rising housing prices. By type, household credit rose 8.0% year-on-year to amount to 1,133.7 trillion won (51.2% of total exposures), driven by a steady increase in home mortgage loans and leasehold deposit loans. Real estate-related corporate loans totaled 816.4 trillion won (36.9%), corresponding to a year-on-year increase of 10.8%. Financial investment products surged sharply year on year by 21.8% to 264.8 trillion

12) The increase in the volume of commercial real estate transactions in the third quarter of this year appears to be due mainly to rising demand caused by the expectation of asset price gains.
13) 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 Exposure」 (page 59).

won (12.0%) on a massive rise[14] in MBS issuance since the fourth quarter of 2019 (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.

14) Since the fourth quarter of 2019, there has been a precipitous increase in MBS issuance (5.3 trillion won in the third quarter of 2019 → 12.5 trillion won in the fourth quarter → 17.9 trillion won in the first quarter of 2020 → 10.8 trillion won in the second quarter → 10.6 trillion won in the third quarter). This increase appears to be due to the increase in the offloading of home mortgage loans by banks in response to the launch of “Relief Loans.”

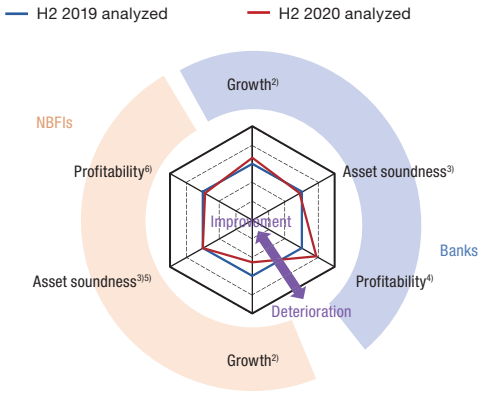
Ⅲ. Financial Institutions

Although the profitability of commercial banks[1] was brought down slightly by an increase in loan loss expenses, their financial soundness remained satisfactory overall with their asset soundness showing improvement as support measures by the financial authorities kicked in.

The management soundness of NBFIs has also remained adequate. Amid continuous growth in assets, asset soundness has improved in most sectors, with profitability maintained at a similar level to that of the same period of the previous year.

Financial institutions' interconnectedness via funding and operations has intensified. Increasing inter-institutional transactions, particularly between NBFIs, have lifted their share in the financial sector's total assets, commensurately amplifying the systemic risk of default contagion (Figure Ⅲ-1).

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



Notes: 1) Extents of change as of end-Q3 2020 compared to end-Q3 2019 indexed.
2) Rate of increase in total assets.
3) Substandard-or-below loan ratio.
4) Return on assets (ROA).
5) Excluding securities companies.
6) Average of each NBFI sector's ROA weighted by the amounts of their total assets.

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

1. Banks

Slowing asset growth

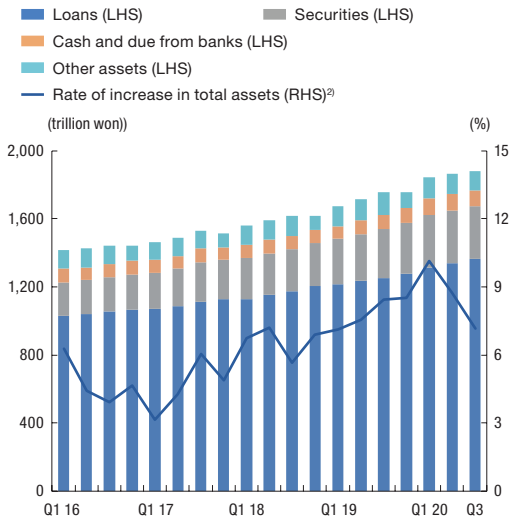
At the end of the third quarter of 2020, commercial banks' total assets (banking account basis) stood at 1,880 trillion won, representing a 7.2% year-on-year increase. In spite of a continuous expansion in loan assets, overall asset growth decelerated from the same period a year ago (8.4%) due to slower growth in non-loan assets.

By asset type, loan assets increased 8.9% year on year, outstripping the pace of growth in the

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.

third quarter of the previous year (6.8%). As firms cope with the fallout of the COVID-19 pandemic, there has been a sharp surge in corporate loans. Household loan growth also gained pace, centered on unsecured loans.[2] As for securities assets, which expanded significantly last year on banks' efforts to increase non-interest income, the rate of growth tapered off to 8.3% at the end of the third quarter of 2020, well below the level in the same period of 2019 (15.2%) (Figure Ⅲ-2).

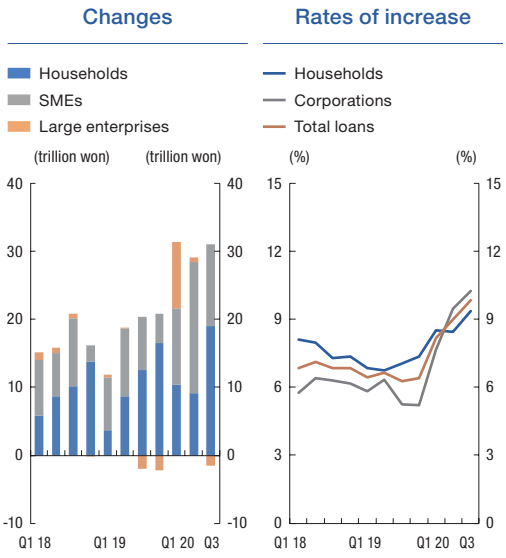
Figure Ⅲ-2. Commercial bank total assets[1]



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

By borrower type, in the first to third quarters of 2020, household loans and corporate loans (won-denominated loan basis) grew by 38.6 trillion won and 51.5 trillion won, respectively, increasing at a much faster rate than during the same period last year (25.0 trillion won, 24.0 trillion won). As a result, total loan growth reached 9.8% at the end of the third quarter of 2020, the highest level recorded since the fourth quarter of 2008 (12.8%). Corporate loan growth outstripped household loan growth starting in the second quarter of 2020, as expanded loan relief measures to mitigate the impact of COVID-19 led to a massive increase in SME loans.[3] Loans to large enterprises, which recorded a sharp surge during the first quarter due to efforts on the part of firms to strengthen their liquidity positions amid uncertainty in the immediate aftermath of the COVID-19 outbreak, slowed thereafter to shift to negative growth in the third quarter (Figure Ⅲ-3).

Figure Ⅲ-3. Changes[1] and rate of increase[2] in commercial bank loans[3]



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

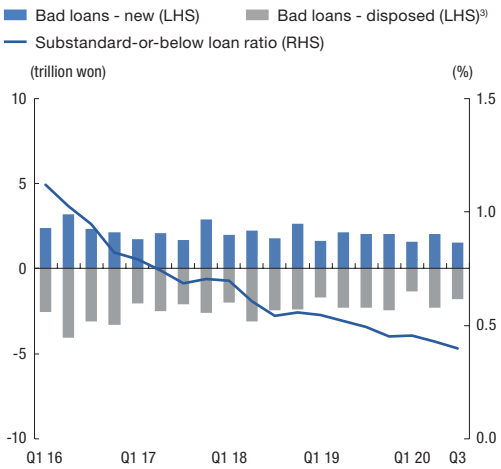
2) Unsecured household loans jumped 19.2% during this quarter, far exceeding the growth rate of home mortgage loans (7.7%).

3) Between the first and third quarters of this year, SME loans increased by the highest rate (42.5 trillion won) since 2004. The quarterly increase during the second quarter (19.3 trillion won) is the largest recorded since the third quarter of 2003.

Satisfactory level of asset soundness

At the end of the third quarter of 2020, the substandard-or-below loan ratio, an indicator of commercial banks' asset soundness, dropped to 0.40% from the same period last year (0.49%) in spite of the economic slowdown triggered by the COVID-19 pandemic, thanks to various debt relief measures such as the deferral of principal and interest payments (Figure Ⅲ-4).

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

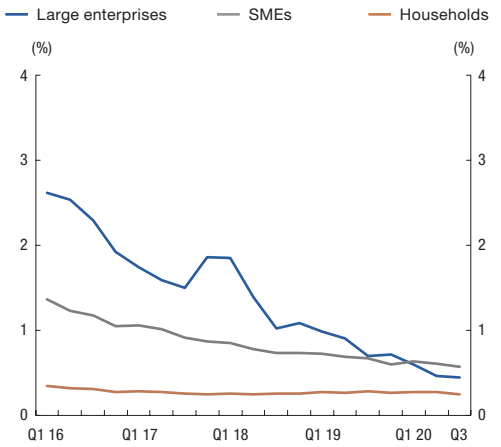


Notes: 1) During the period basis.
2) End-period basis.
3) Including those through loan withdrawals, loan loss write-offs, loan sales, soundness reclassifications, debt restructurings, etc.

Sources: Commercial banks' business reports.

By borrower type, the substandard-or-below loan ratio on household loans remained low at 0.25% as of the end of the third quarter of 2020. The ratio of corporate substandard-or-below loans continued its downward trend to stand at 0.44%, below the level in the same period a year ago (0.69%). The substandard-or-below loan ratio on SME loans dropped 0.10%p to 0.57% (Figure Ⅲ-5).

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



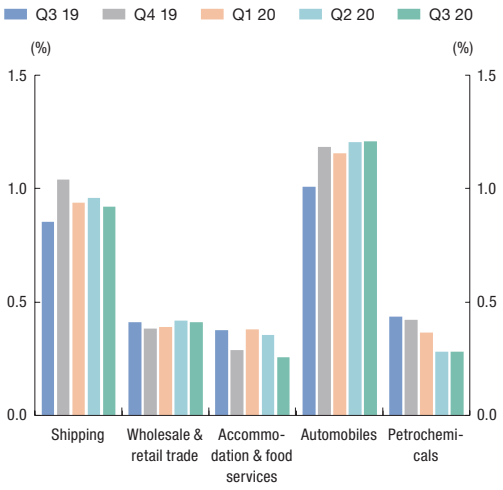
Sources: Commercial banks' business reports.

By industry, the substandard-or-below loan ratio fell or was maintained at a similar level to that of the same period of the previous year in most industries, including petrochemicals (0.44% in the third quarter of 2019 → 0.28% in the third quarter of 2020), accommodation & food services (0.38% → 0.26%) and wholesale & retail industries (0.41% → 0.41%). This ratio, however, inched up slightly in the automobile (1.01% → 1.21%) and transportation & warehousing industries (0.86% → 0.92%). Although the substandard-or-below loan ratio in key industries has remained low, attention must be paid to the possibility of a rise in defaults centered on vulnerable industries when relief measures come to an end,[4] especially if the

4) The loan forbearance program was extended to March 2021. Given that under 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, insolvencies among vulnerable households and companies are likely to become actualized with a lag in time, sometime after the expiration of the forbearance program.

recovery in corporate performance is delayed by a new wave of COVID-19 cases or other events triggering heightened uncertainty (Figure Ⅲ-6).

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



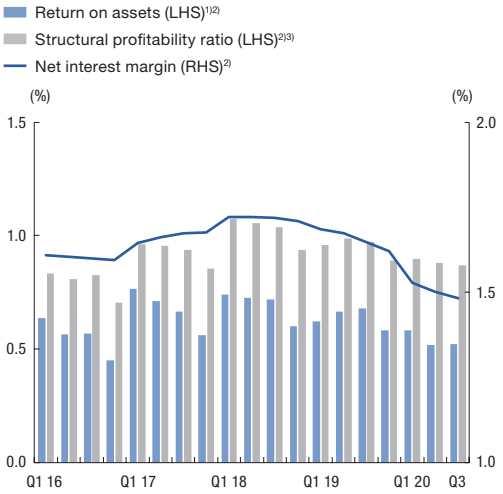
Sources: Commercial banks' business reports.

Slight decline in profitability

Commercial banks' profitability fell modestly from the same period a year ago.

Between the first and third quarters of 2020, return on assets (ROA) was down by 0.16%p year on year to stand at 0.52% (annualized basis), continuing the downward trend begun in 2018. The structural profitability ratio, measuring banks' capacity to generate profits in a sustainable manner, also declined by 0.10%p year on year to 0.87% (annualized basis) during this period (Figure Ⅲ-7).

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.

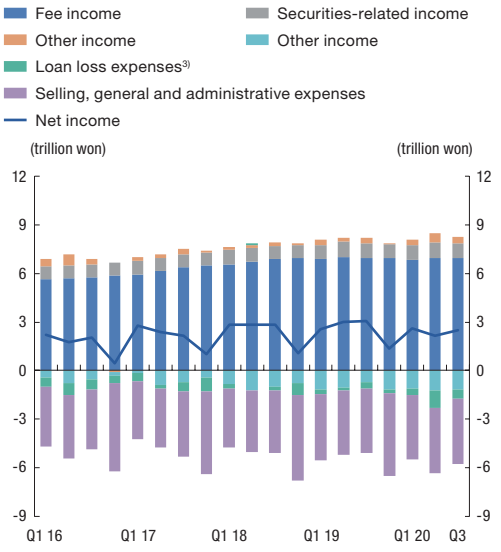
During the first three quarters of 2020, commercial banks' net income decreased by 1.4 trillion won from the same period of the previous year (8.6 trillion won). Among factors contributing to this decline, interest income decreased only marginally (-0.1 trillion won) in spite of the reduced net interest margin under the low interest rate environment,[5] as this was largely offset by sharp growth in loans. However, loan loss expenses, which rose by 1.2 trillion won year-on-year as banks set aside loan loss provisions preemptively in anticipation of credit losses in downturns,[6] acted as the main factor behind the decrease of net income. Going forward, banks' profitability is expected to continue to be heavily influenced by changes in the business environment, such

5) Following two successive base rate cuts effected this year (1.25% → 0.75% in March, 0.75% → 0.50% in May), commercial banks' net interest margin shrank to 1.48% in the third quarter. Meanwhile, their won-denominated interest-earning assets (average balance during the third quarter of 2020) increased by 8.8% year on year.

6) At the end of September 2020, commercial banks' balance of loan loss allowances showed a year-on-year increase of 3.9%, greatly surpassing the corresponding rate at the end of September 2019 (-5.7%).

as a delay in economic recovery and intensifying competition[7] as well as changes in loan loss expenses[8] (Figure Ⅲ-8).

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



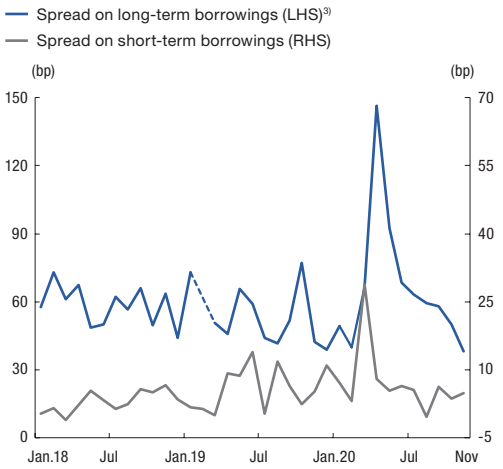
Notes: 1) Loan loss reserves excluded.
2) During the period basis.
3) Including bad debt expenses, net provisions transferred, and profits and losses from loan sales and purchases.

Sources: Commercial banks' business reports.

Improvement in overseas foreign currency funding conditions

Overseas foreign currency funding conditions for commercial banks, which took a negative turn early this year at the onset of the COVID-19 outbreak, stabilized later on to return to pre-pandemic levels. Short-term foreign currency borrowing spreads were brought down by the weakening appetite for safe assets and the easing of US dollar liquidity conditions. Long-term foreign currency borrowing spreads also showed a downward trend on improving investor sentiment and the successful issuance of Foreign Exchange Stabilization Bonds in September[9] (Figure Ⅲ-9).

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



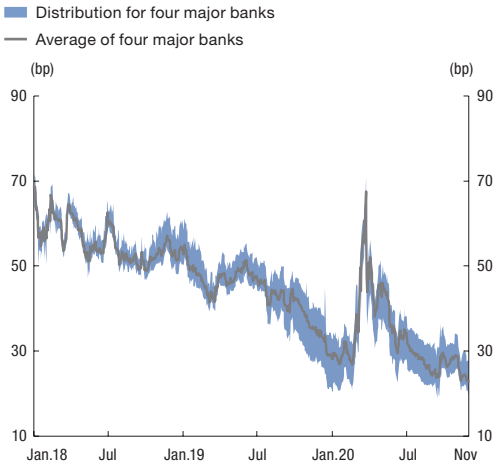
Notes: 1) Borrowing spreads based on LIBOR (average of the spreads borne by Kookmin, Shinhan, Woori and Hana Banks weighted by the amounts of their US dollar borrowings).
2) Excluding borrowings between domestic financial institutions, inter-office borrowings (between head office and foreign branches) 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.

Commercial banks' CDS premia, which steeply rose reflecting heightened uncertainty amid the COVID-19 pandemic, quickly dipped back thereafter to hit an all-time low in November (Figure Ⅲ-10).

7) The massive increase in contactless financial transactions, attributable to both advances in digital finance and the protracted COVID-19 pandemic, is also having a growing impact on the stability of the financial system. For details, refer to <Box 3> 「Current State and Assessment of Non-face-to-face Financial Transactions」 (page 59).
8) Given that the decline in banks' net income in the first to third quarters of 2020 was not as large as anticipated, sufficient provisions should be set aside while more resources are available to cover future credit losses.
9) The 1.45 billion dollars' worth of Foreign Exchange Stabilization Bonds issued on September 10, 2020 had a historic low yield at issuance and yield spread.

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.

Box 3 .

Current State and Assessment of Non-face-to-face Financial Transactions

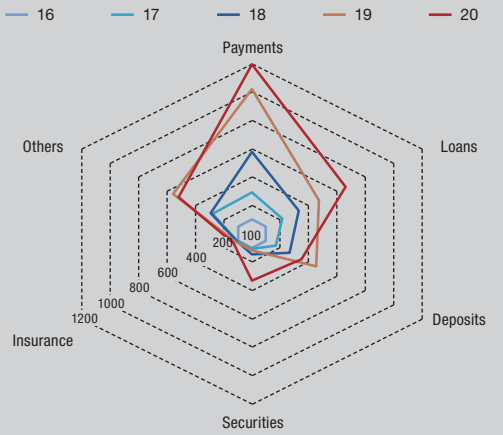
With the development of digital technology since the mid-2010s, fintech companies have grown steadily and significantly in number and influence. Meanwhile, financial institutions have continuously closed branches while increasing their financial services using ICT.[1] This year, amid the COVID-19 pandemic, non-face-to-face transactions such as mobile payments have gained even more ground. Going forward, this trend is expected to continue thanks to the implementation[2] of the government's policy to support digital finance.

Here, we review the current state of transactions made through non-face-to-face channels in the financial sector and analyze the impact and related risks.

Current state of non-face-to-face financial transactions

The yearly growth trend of the volume of non-face-to-face financial transactions[3] since 2016 is reviewed in terms of six sectors: payments (including money transfers), loans, deposits, securities (including asset management), insurance, and others. Over the last four years, the volume of non-face-to-face transactions in these sectors has increased by over fivefold on average, with especially large growth seen in the payment sector (12-fold since 2016). This year, non-face-to-face transactions in the securities (177.4%), loan (39.4%), and payment sectors (16.9%) showed high growth.

Growth trend of non-face-to-face financial transactions, by sector[1)2)]



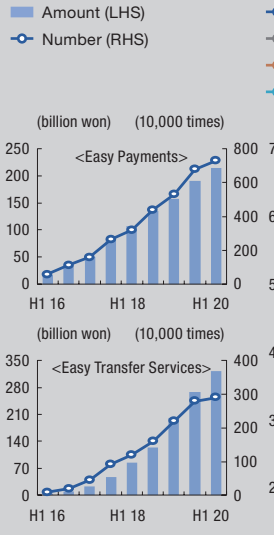
Notes: 1) Extents of changes in each year compared to 2016 are indexed (two or more available statistics used for each sector).
2) For 2020, amounts are annualized based on actual amounts for January to September.
Source: Bank of Korea staff calculations

1) The number of branches of commercial banks decreased from 5,046 at the end of 2013 to 3,930 at the end of September 2020, and the number of fintech companies rose dramatically from 94 at the end of 2013 to 345 at the end of 2019.
2) In July 2020, the government unveiled the "Korean New Deal," designed to implement the Green New Deal (promoting transition toward a low-carbon, eco-friendly economy) and Digital New Deal (promoting transition toward a digital economy) through collaboration among related government ministries.
3) In this paper, "non-face-to-face financial transactions" refer to digital transactions made using Internet and mobile devices as well as payments made via telephone banking and CD/ATMs. However, because it is not possible to include all non-face-to-face financial transactions due to the limited availability of statistics, the analysis focuses on identifying the trend of non-face-to-face transaction volume since 2016 based on available statistics (payment and settlement statistics, financial institutions' business reports, etc.).

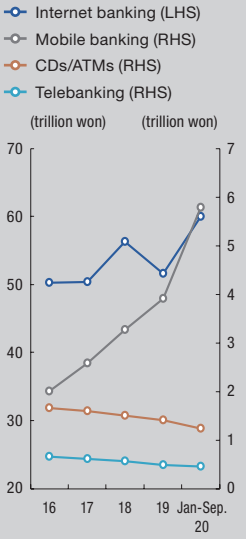
(Payments)

Payments is the most active segment of non-face-to-face financial transactions, and has shown high growth since 2016, driven by Easy Payments and Easy Transfer Services provided by financial institutions and fintech (Big Tech) companies. As e-commerce transactions, such as online shopping,[4] increased significantly amid the COVID-19 pandemic, the share of simplified payments made via credit card companies rose[5] rapidly this year. Fintech companies are also expanding Easy Payments through partnerships with credit card companies or by using e-money. Meanwhile, as for the trend of non-face-to-face transactions at banks, such as remittances and transfers, by channel, while payments made via telephone banking and CD/ATMs have decreased, Internet banking transactions transitioned to a positive growth trend and mobile banking expanded at a higher rate this year.

Easy Payments and Easy Transfer Services[1]



Non-face-to-face transaction volume of banks, by channel[1]



Note: 1) Daily average during the period.
Sources: Bank of Korea, Commercial banks' business reports.

(Lending and deposits)

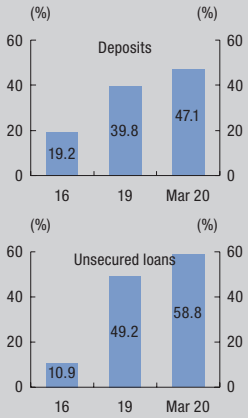
Non-face-to-face deposit and loan transactions at financial institutions have been increasing substantially since 2017, when IT-based Internet-only banks without physical branches were launched. In particular, the amount of non-face-to-face transactions is rising in unsecured household loans by banks. Meanwhile, although the balance of non-face-to-face corporate loans (4.6 trillion won at the end of September 2020, commercial banks) is relatively small compared to that of household loans (56.0 trillion won), it is expected to grow with the recent introduction of new non-face-to-face loan products. Meanwhile, the share of non-face-to-face loans at NBFIs, and especially mutual savings banks, has signifi-

4) During January to September 2020, the share of the value of online shopping transactions out of total retail trade (monthly average, Statistics Korea) was 26.6%, showing a significant rise from the pre-pandemic level (18.8% in 2018 and 21.4% in 2019).

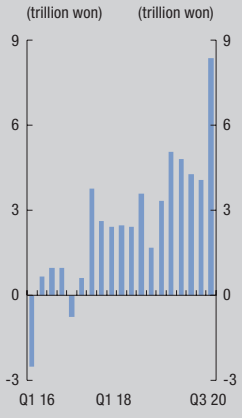
5) The share of easy payments out of the total payment value of credit card companies climbed from 14.0% in January 2020 to 16.8% in September 2020.

cantly expanded since last year.

Share of online transactions[1]



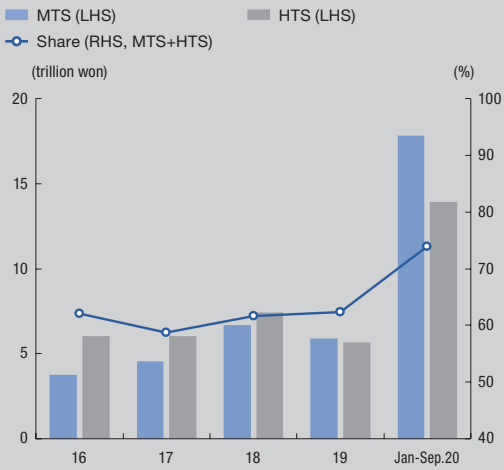
Growth trend[2] of unsecured household loans of banks through non-face-to-face channels[3]



Notes: 1) Based on five commercial banks.
2) During the period.
3) Internet, mobile, etc.

Sources: Financial Services Commission, Commercial banks' business reports.

Amount[1] and share of stock trading, by non-face-to-face channel[2]



Notes: 1) Daily average during the period.
2) Based on MTS and HTS (excluding terminals at offline branches).

Source: Korea Exchange.

(Securities and insurance)

Since the foreign currency crisis in 1997, securities companies have steadily worked to enhance individual investors' access and cost savings by converting offline securities transactions at branch offices[6] into online ones. This year, with the stock market recovering after the COVID-19 outbreak, there has been a significant increase in securities trading using a mobile trading system (MTS) or home trading system (HTS), which are easy to use and charge lower fees than transactions made at counters of branch offices. In terms of asset management, investment fund products sold online have recently increased[7] as well.

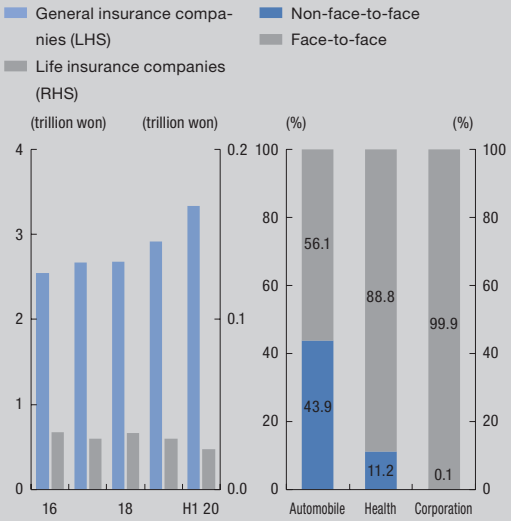
As for the insurance sector, where offline sales have traditionally predominated, online sales of non-life insurance products have soared since last year. In particular, the share of online sales of automobile insurance (43.9% from January to September 2020) was relatively high. On the other hand, online sales of life insurance products, whose structure and terms are more complex than those of non-life insurance products, faced limitations such as stricter consumer protection regulations in addition to the limitations inherent in life insurance products (e.g. special terms of insurance policies and scope of coverage must be explained to policy purchasers).

6) The number of branches of securities companies fell sharply from 1,275 at the end of 2016 to 986 at the end of September 2020, and the share of transactions executed at branch counters has also declined (27.7% (2016) → 24.1% (2018) → 13.4% (January to September 2020)).

7) Newly established online investment funds increased by only 0.1 trillion won in 2016, but grew by 2.0 trillion won in 2019 and by 3.2 trillion won during January to September 2020.

Amount[1)2)] of sales through non-face-to-face channels,[3)] by type of insurance company

Share of non-face-to-face sales of general insurance companies, by product[4)5)]



Notes: 1) Initial premiums for life insurance companies and direct premiums written for general insurance companies.
2) Quarterly average during the period
3) Telemarketing, online marketing, etc.
4) Based on direct premiums written.
5) Jan-Sep. 2020.

Sources: Korea Life Insurance Association, General Insurance Association of Korea, Financial institutions' business reports.

(Others)

Peer-to-peer (P2P) lending and crowdfunding had grown steadily until last year, as fintech companies made inroads into the financial sector. This year, however, the inflow of funds has slowed down with the sharply rising delinquency rate, incidents of illegal and unsound business practices, and postponement of private equity fund redemption in Korea.

P2P lending and crowdfunding

	2017	2018	2019	2020[1)]
P2P lending[2)] (trillion won)	0.3	0.3	0.7	0.6
Crowdfunding[3)] (10 billion won)	0.7	0.8	0.9	0.5

Notes: 1) During Q1-Q3.
2) Quarterly average amount.
3) Quarterly average growth.

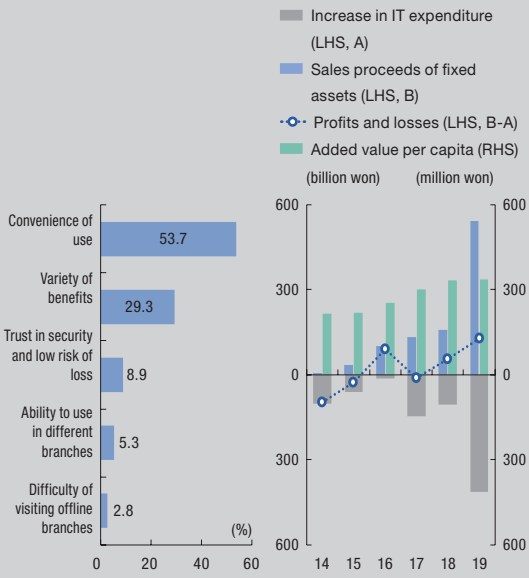
Sources: Korea P2P Finance Association, CrowdNet.

Potential risks associated with the growth of non-face-to-face financial transactions

The impact of non-face-to-face financial transactions on finance is multifaceted. They offer consumers convenience and financial service diversity, reduce the costs of financial institutions, and promote digital innovation across the financial industry. In particular, banks have found that profits from the sale of fixed assets, such as branch offices, exceed the IT expenditure necessary to provide non-face-to-face services.

Preference for mobile financial transactions[1)]

Profits from the sale of fixed assets and IT investment[2)] costs



Notes: 1) Result of survey of commercial bank customers' reasons for using mobile banking services (March 2020).
2) Based on IT budget.

Sources: Bank of Korea, Commercial banks' business reports, Committee on Financial Informatization Promotion.

However, it should be noted that non-face-to-face financial transactions may cause huge changes in the existing structure of the financial industry as their share of payments rises, negatively affecting financial stability as outlined below.

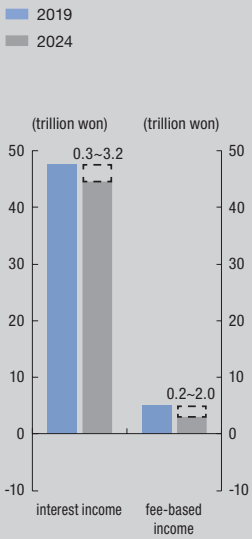
First, non-face-to-face transactions are vulnerable to cyber and operating risks[8] and involve issues of personal information security and financial consumer protection due to their high dependence on IT.

Second, non-face-to-face transactions may boost household debt and defaults, as evidenced by the fact that the delinquency rate of P2P loans processed via non-face-to-face channels is on the rise and Internet-only banks are also experiencing higher delinquency rates than commercial banks. Furthermore, unsecured loans with no collateral offered by some non-bank financial institutions tend to attract multiple-loan or vulnerable borrowers, raising the risk of default in the event of an economic downturn.

Third, as non-face-to-face financial services offered directly by fintech or Big Tech companies have penetrated diverse financial sectors, with their share surging within the financial system, the intensified competition may adversely affect the soundness of financial institutions. In addition to losing market share in fee-based services such money transfers, asset management, and foreign exchange, the business base may be eroded in core businesses such as loans, resulting in a decrease in profits[9] and stronger risk appetite to compensate.

Delinquency rate of P2P loans and loans of Internet-only banks[1]

Estimation[2] of banks' profits under intensified competition



Notes: 1) End-period basis.
2) Commercial banks' profits after five years are estimated in reference to the Monetary Authority of Singapore's Financial Stability Review (2017).
Sources: Commercial banks' business reports, Midrate, Financial Services Commission, Bank of Korea staff calculations.

Fourth, amid the increased interconnectedness within financial systems, the occurrence of a crisis may put pressure on the liquidity conditions of financial institutions. As fintech companies are ineligible for the protection of the financial safety net such as depositor protection and non-performing asset resolution, they may face a massive withdrawal of customer deposits in the event of an exogenous shock and expose other financial institutions to contagion liquidity risks.

8) For details, refer to Box 7 ("Post-COVID-19 Cyber Risk Response in Major Countries and Implications," page 111).
9) It is assumed that banks' business declines to an extent equivalent to the growth of fintech, reducing their profits. That is, depending on the intensity of competition (10% to 100%), banks' profits (sum of interest and fee based income) are expected to fall by 0.5 trillion won to 5.2 trillion won in five years. Meanwhile, the growth rate of fintech companies' interest income was calculated as the difference in loan growth rate between (i) the sum of Internet-only banks and P2P and (ii) commercial banks. The growth rate of fee-based income was calculated as the difference between the recent growth rates of (i) the number of Easy Transfer services offered by electronic financial service companies and (ii) the number of electronic banking transactions executed by commercial banks.

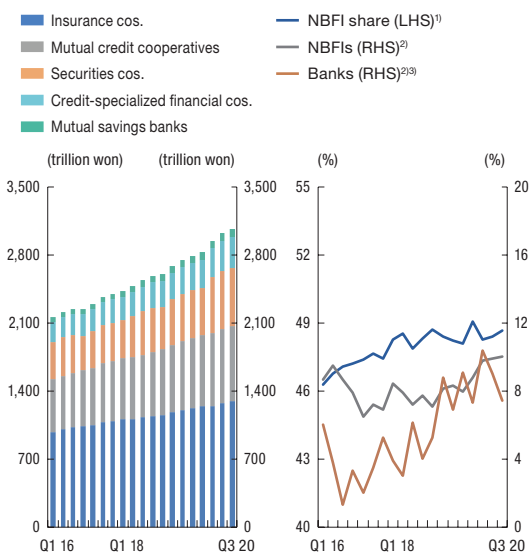
In the post-COVID-19 era, with the ongoing progress of digital finance, non-face-to-face financial transactions are expected to grow. Hence, to maximize the efficiency of non-face-to-face transactions and minimize related risks, continued close monitoring of the changes in the domestic financial industry, trends of international discussions on fintech, and cases of major economies' responses is needed, and related risk management should be strengthened preemptively.

2. Non-Bank Financial Institutions

Continuous asset growth

NBFIs' assets maintained a solid pace of growth to reach 3,068 trillion won at the end of the third quarter of 2020, representing a year-on-year increase of 10.0%. NBFIs' share in the total assets (6,304 trillion won) of the financial sector as a whole[10] also ticked up 0.6%p from the same period of the previous year (48.1%) to 48.7% at the end of the third quarter of 2020 (Figure Ⅲ-11).

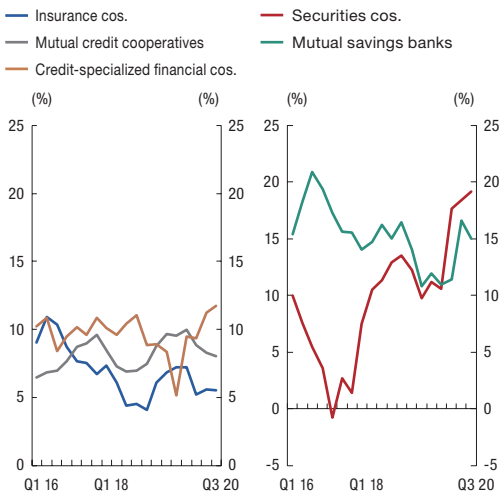
Figure Ⅲ-11. NBFI total assets



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 recorded a particularly massive year-on-year increase of 19.2% at the end of the third quarter of 2020. Following the foreign currency liquidity shortage in March this year caused by margin calls amid the COVID-19 pandemic, securities companies sharply increased their cash and cash equivalent assets, such as foreign currency deposits and margins and stock investment-related investor deposits.[11] Credit-specialized financial companies' assets also increased substantially year on year by 11.7% due to precautionary cash holdings as a response to the COVID-19 crisis and business diversification.[12] Mutual savings banks' assets jumped 15.0% year on year on the accelerated growth in both household and corporate loans.[13] The assets of mutual credit cooperatives increased 8.1% year on year, driven mainly by corporate loans.[14] Insurance companies' assets recorded relatively moderate year-on-year growth of 5.6% (Figure Ⅲ-12).

Figure Ⅲ-12. NBFI rates of total asset growth[1)2)]



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

10) Encompassing banks and NBFIs, with commercial banks, specialized banks and domestic branches of foreign banks included among banks.

Satisfactory level of asset soundness

NBFIs' asset soundness has generally remained at a satisfactory level, with the delinquency rate and the substandard-or-below loan ratio down in most sectors. However, the asset soundness of mutual credit cooperatives took a negative turn as both the delinquency rate and the substandard-or-below loan ratio edged up.

At the end of the third quarter of 2020, the delinquency rate and the substandard-or-below loan ratio of mutual savings banks stood at 3.75% and 4.65% respectively, representing year-on-year declines of 0.49%p and 0.45%p. The delinquency rate and the substandard-or-below loan ratio of credit-specialized financial companies also dropped to 1.38% and 1.49% respectively by 0.35%p and 0.19%p. The delinquency rate and the substandard-or-below loan ratio of insurance companies stood at 0.20% and 0.15% respectively, representing year-on-year decreases of 0.11%p and 0.04%p.

On the other hand, both the delinquency rate and the substandard-or-below loan ratio of mutual credit cooperatives[15] increased, by 0.03%p and 0.16%p to 2.09% and 2.37%, respectively, at the end of the third quarter of 2020, with corporate loans[16] accounting for much of this change. By industry, the delinquency rate rose sharply on loans to construction and real estate-related sectors[17] (Figure Ⅲ-13, Figure Ⅲ-14, Figure Ⅲ-15).

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11) After the outbreak of COVID-19, massive amounts of undeployed capital entered the stock market, causing investor deposits to jump 97.9% year on year as of the end of the third quarter of 2020. Meanwhile, as prices plummeted in major stock markets around the globe, triggering ELS margin calls, overseas derivative-related deposits and margins also jumped by 47.0%.

12) Since the start of the pandemic, there have been changes in securities companies and credit-specialized financial companies' funding and fund management behavior, such as the increase in cash and cash equivalent assets. For details, refer to <Box 5>「Post-COVID-19 Funding and Fund Management Practices among Securities and Credit-specialized Financial Companies and Implications」 (page 75).

13) Mutual savings banks are showing particularly strong growth in unsecured loans among household loans, and in loans to the financial and insurance sectors and PF loans among corporate loans. For details on related trends, refer to <Box 4>「Mutual Savings Banks' Lending Trends and Implications」 (page 69).

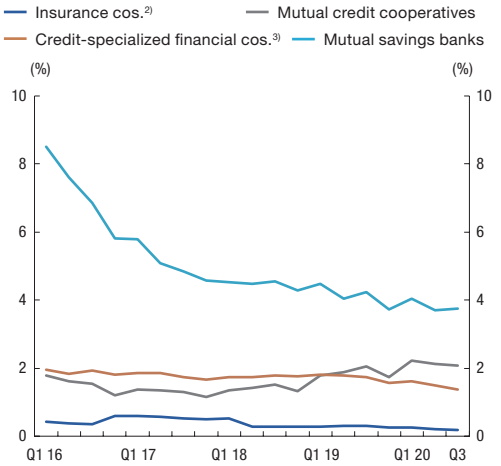
14) Mutual credit cooperatives' corporate loans totaled 194 trillion won at the end of the third quarter of 2020, up 36.5% year on year. Household loans, on the other hand, fell 1.7% during the same period to 319 trillion won.

15) At the end of the third quarter of 2020, the delinquency rate of Nonghyup, Suhyup and forestry cooperatives was at 1.60%, while the corresponding rate was 3.33% for Sinhyup and 2.52% for MG community credit cooperatives.

16) While the delinquency rate of household loans by mutual credit cooperatives fell 0.16%p year on year (1.78% → 1.62%) at the end of the third quarter of 2020, that of corporate loans rose 0.14%p (2.83% → 2.97%). For details on the causes of the recent drop in the soundness of corporate loans, refer to <Box 5>「Soundness of Corporate Loans by Mutual Credit Cooperatives and Assessment」in「Financial Stability Situation」(September 2020, page 31).

17) By industry, the delinquency rate of corporate loans by mutual credit cooperatives (excluding MG community credit cooperative) inched up by 0.41%p (3.78% → 4.19%) for construction, 0.34% (2.52% → 2.86%) for real estate, and down by 1.06%p (4.80% → 3.74%) for manufacturing, 0.77%p (3.25% → 2.48%) for wholesale and retail and 0.47%p (2.73% → 2.26%) for accommodation and food services.

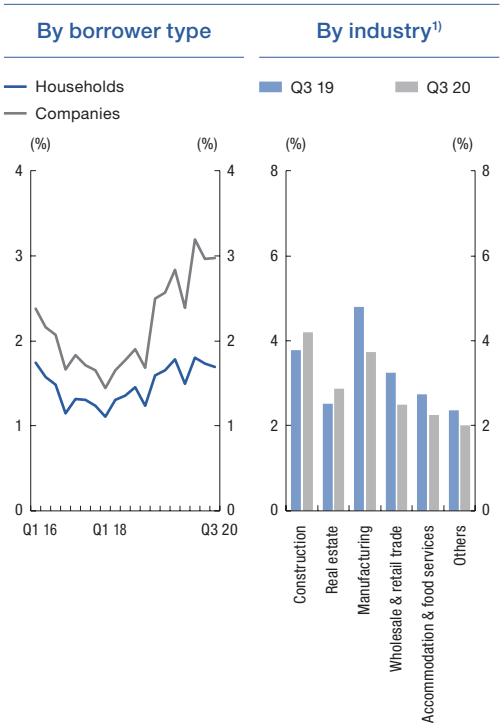
Figure Ⅲ-13. NBFI delinquency rates[1)]



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.

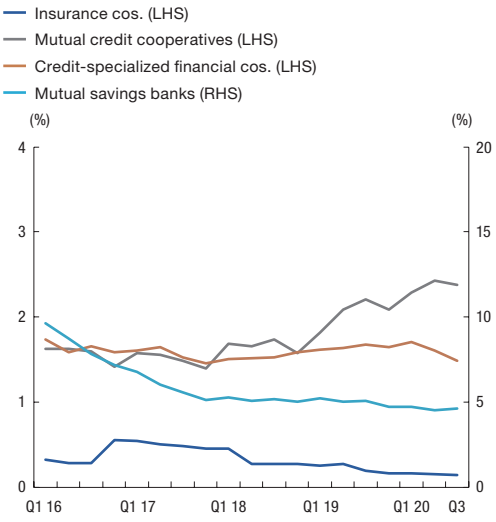
Figure Ⅲ-14. Mutual credit cooperative delinquency rates of loans



Note: 1) Corporate loan basis, excluding MG community credit cooperatives.

Sources: Financial institutions' business reports.

Figure Ⅲ-15. NBFI substandard-or-below loan ratios



Sources: Financial institutions' business reports.

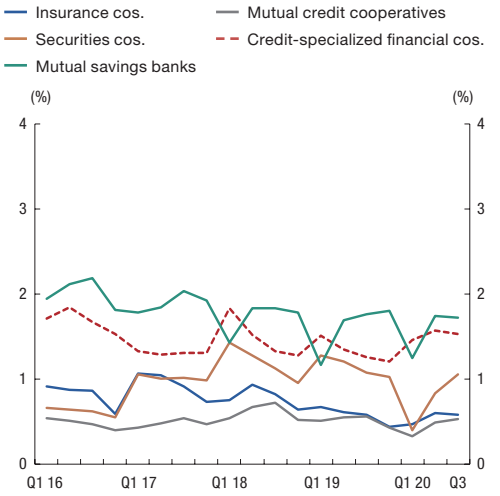
Profitability maintained

NBFIs' profitability appears to have stayed roughly at last year's level, although this varied somewhat from sector to sector.

Insurance companies' return on assets (ROA) for the first three quarters of 2020 stood at 0.59% and that of securities companies at 1.06%,[18)] essentially unchanged from the same period of 2019. Meanwhile, the return on assets of mutual savings banks and mutual credit cooperatives dropped 0.05%p and 0.03%p year-on-year, respectively, to 1.72% and 0.53%.

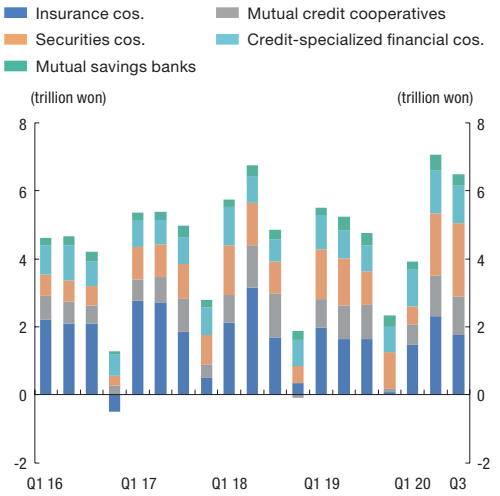
The return on assets of credit-specialized financial companies rose by 0.27%p to 1.53% mainly due to the reduction of card business-related expenses[19)] and the decrease in loan loss expenses as a result of the drop in the delinquency rate (Figure Ⅲ-16, Figure Ⅲ-17).

Figure Ⅲ-16. NBFI ROAs[1)]



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

Figure Ⅲ-17. NBFI net incomes[1)]



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

18) After heavy losses related to equity-linked securities (ELS) and other derivatives-linked securities during the first quarter caused by a sharp fall in global stock indexes, securities companies' net income increased as prices rebounded, boosting their profit from securities and derivatives, and the recovery of trading volume lifted their fee income. However, ROA growth was limited due to a significant increase in low-profit assets such as cash and deposits.

19) The reduced consumption activity amid the COVID-19 pandemic lowered both income from and expenses for the card business. However, as social distancing resulted in a sharp drop in marketing costs and costs related to signing up new customers, expenses fell more significantly (-6.1% year on year in the first to third quarters of 2020) than revenue (-0.2%).

Box 4.

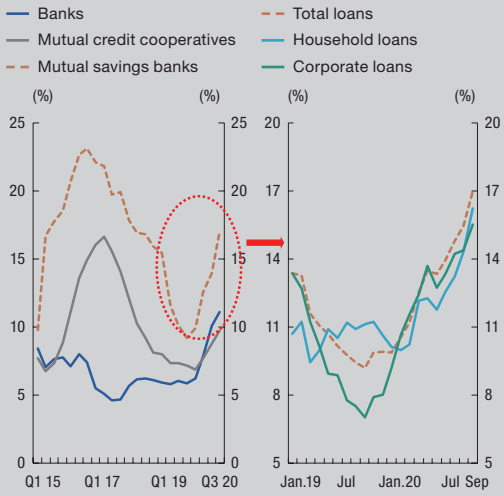
Mutual Savings Banks' Lending Trends and Implications

Mutual savings banks ("savings banks" hereafter) have seen higher loan growth than other financial sectors since 2015, when restructuring[1] was completed (annual loan growth rate of 16.7% from 2015 to 2019; compared to 6.2% for banks and 10.3% for mutual credit cooperatives). The balance of loans extended by savings banks as of the end of September 2020 stood at 73.2 trillion won, recording the highest level in 10 years, since the restructuring (65.5 trillion won, end of May 2010). The rapid increase in loans extended by savings banks was funded by a substantial increase in deposits offering relatively high interest rates.[2] Deposits with savings banks rose by an annual average rate of 15.3% from 2015 to 2019, which is faster than other financial sectors (banks: 6.3%, mutual credit cooperatives: 8.3%).

This year, while loans in all financial sectors increased at a faster rate (6.7% in 2019 → 10.1% from January to September 2020) amid the COVID-19 pandemic, loans of savings banks grew sharply (9.9% → 17.0%). By type of borrower, both household loans and corporate loans grew at a faster rate. Here, the recent status of loans extended by savings banks and their characteristics are reviewed and implications are derived.

Growth rates[1] of loans, by financial sector

Growth rates[1] of household and corporate loans at mutual savings banks



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

Lending to households: rapid growth driven by unsecured medium-interest rate loans

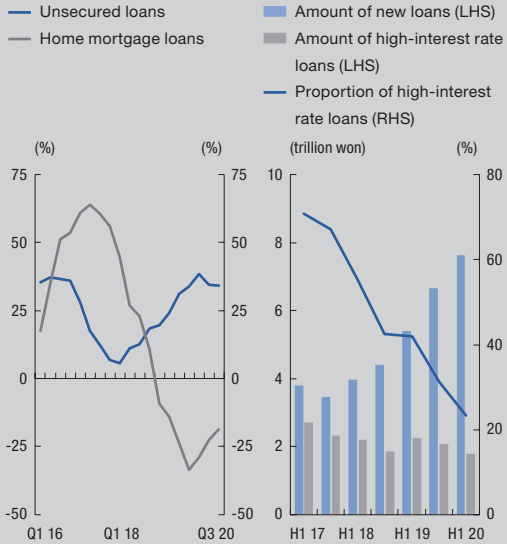
Household loans issued by savings banks amounted to 29.6 trillion won at the end of September 2020, up by 16.2% year on year (banks: 9.4%, mutual credit cooperatives: -1.7%), with growth led particularly by unsecured loans (18.6 trillion won), which rose by 34.1%. This is attributable to the fact that, while the growth of home mortgage loans contracted[3] due to stricter regulations, savings banks focused[4] on their medium-interest rate loan business under

1) The number of savings banks declined from 105 at the end of 2010 to 79 at the end of January 2015, in the course of restructuring, due to massive defaults on project financing (PF) loans, and has hovered around that number ever since.
2) During January 2015 to September 2020, the average interest rate of savings banks' deposits (one-year time deposits) was 2.28%, exceeding that of banks (1.70%) and mutual credit cooperatives (1.85%) by 58bp and 43bp, respectively.
3) Home mortgage loans issued by savings banks continued their decline, falling by 33.6% in 2019 and by 18.7% year on year until the end of September 2020.
4) Some large savings banks upgraded their credit assessment systems through partnerships with machine learning-based data analytics firms and credit rating companies to support their unsecured medium-interest rate loans.

the financial authorities' policy[5] to expand medium-interest rate loans.[6] In recent years, the interest rate of unsecured loans extended by savings banks has fallen rapidly,[7] with the share of high-interest rate loans (over 20%) among new unsecured loans having dropped significantly (first half of 2017: 70.8% → first half of 2020: 23.3%).

The share of borrowers with middle credit ratings among unsecured loans of savings banks expanded significantly (end of 2015: 48.6% → end of September 2020: 75.9%), and the share of savings banks' loans out of all unsecured loans to borrowers with middle credit ratings grew threefold during the same period (8.2% → 25.5%).

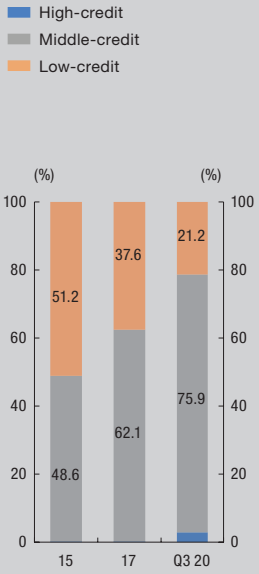
Growth rates[1] of household loans, by collateral



Unsecured high-interest rate household loans[2]

Notes: 1) Year-on-year basis.
2) Loans with interest rates of over 20% among new unsecured loans during the half year.
Sources: Financial institutions' business reports.

Proportion of unsecured household loans[1], by credit ratings



Proportion of middle-credit borrowers' unsecured loans[1], by financial sector

Note: 1) End-period basis.
Source: Bank of Korea (Consumer Credit Panel).

5) Regulatory incentives included the exclusion of medium-interest rate loans from the gross household credit limit (October 2018), implementation of additional 50% loan loss reserves for high-interest rate (over 20%) loans (June 2017), and increase in the weight assigned to medium-interest rate loans to 150% in calculating the mandatory ratio of loans to be extended to specific business areas (September 2016).

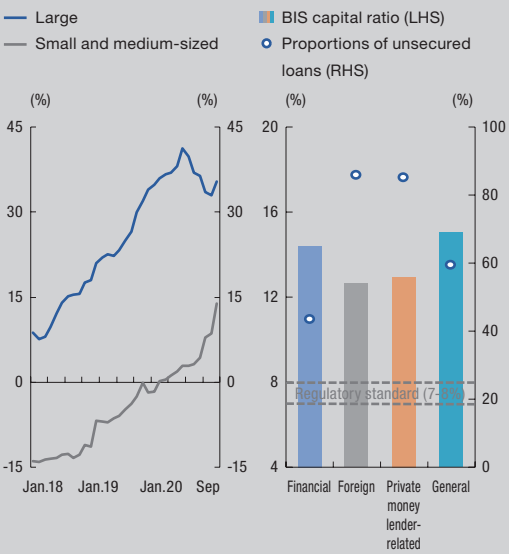
6) The financial authorities set different standards for recognizing medium-interest rate loans for different financial sectors. As for savings banks, loans with a weighted average interest rate of 16% or less (highest interest rate not exceeding 19.5%), of which 70% are extended to borrowers with a credit rating of 4 or lower, were classified as medium-interest rate loans by the authorities.

7) In September 2020, the interest rate of unsecured loans issued by savings banks (based on newly extended loans) was 16.8%, dropping by 8.2%p over the last five years. During the same period, the interest rate of unsecured loans extended by banks, mutual credit cooperatives, and credit card companies fell by 1.5%p, 1.1%p, and 1.6%p, respectively.

By size, large savings banks (with assets of over 1 trillion won) accounted for 94.9% of total unsecured household loans, with private money lender-related savings banks and large foreign savings banks driving[8] the growth of unsecured loans. These private money leader-related savings banks and foreign savings banks hold very high shares of unsecured loans (85.6%) among their total assets and have low BIS capital ratios,[9] suggesting that their loss-absorption capacities are relatively weak.

Growth rates[1] of unsecured household loans, by size

Proportions of unsecured household loans and BIS ratio[2], by ownership structure



Notes: 1) Year-on-year basis; large savings banks are based on institutions with assets of more than 1 trillion won at the end of September 2020.
2) End-September 2020 basis; general savings banks are institutions whose largest shareholders are individuals or non-financial corporations.
Sources: Financial institutions' business reports.

The delinquency rate of household loans at the end of September 2020 stood at 3.50%, down by 0.43%p year on year, and the delinquency rate of unsecured loans was 3.64%, a decrease of 0.65%p during the same period.

Mutual savings banks' delinquency rates[1] of household loans, by collateral

(%)

	2018	2019		2020		
		Q3	Q4	Q1	Q2	Q3
Total household loans	4.65	3.92	3.58	3.83	3.41	3.50
Unsecured loans	6.27	4.29	3.79	4.08	3.42	3.64
Home mortgage loans	1.76	2.92	3.04	3.25	2.86	2.64

Note: 1) End-period basis.
Sources: Financial institutions' business reports.

Lending to businesses: growth of loans extended to financial and insurance industries and real estate PF loans

Corporate loans issued by savings banks reached 41.1 trillion won as of the end of September 2020, up 15.5% year on year. By industry, loans to the financial and insurance industries,[10] including private money lenders, rose dramatically by 57.6% year on year as of the end of September 2020, representing about half (46.7%) of corporate loan growth during the same period (+5.5 trillion won). In particular, savings banks whose largest shareholders are private money lenders saw their loans to the financial and insurance industries jump by 128.1% year on year. Private money lenders originate home mortgage loans, and savings banks extend loans to private money lenders, taking

8) The share of large savings banks among total household loans was 86.2% at the end of September 2020. During January 2016 to September 2020, unsecured loans issued by private money lender-related savings banks and large foreign savings banks climbed by 8.9 trillion won, accounting for 73.2% of the increase in unsecured loans during the same period (12.1 trillion won).

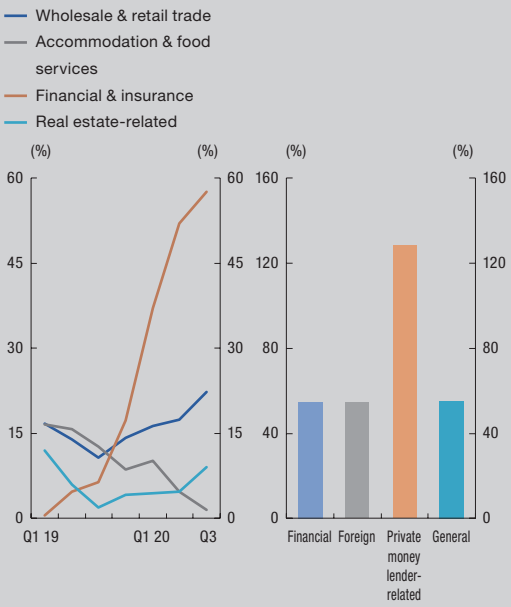
9) The BIS capital ratio of private money lender-related savings banks and large foreign savings banks was 12.8% at the end of September 2020, 1.8%p lower than that of other large savings banks (14.6%) and the average ratio of the sector (14.6%).

10) The balance of corporate loans to the financial and insurance industries at the end of September 2020 amounted to 7.1 trillion won, representing 17.2% of total corporate loans issued by savings banks (41.1 trillion won).

these home mortgage loans as collateral. About 80% of home mortgage loans of private money lenders offered as collateral exceeded the loan-to-value (LTV) limit applicable across the financial sector at the end of February 2020.[11] This implies that savings banks' lending to private money lenders was used as a means of bypassing the regulations on home mortgage loans.

Growth rates[1] of corporate loans, by industry

Growth rate of loans to financial & insurance industries, by ownership structure[1]



Notes: 1) Year-on-year basis; real estate-related industries are based on real estate and construction industries.
2) End-September 2020, year-on-year basis.
Source: Financial institutions' business reports.

Moreover, despite the stronger[12] regulations on real estate PF loans that had been behind the restructuring of savings banks, such loans are growing rapidly. PF loans amounted to 6.8 trillion won as of the end of September 2020, and have increased by an annual average rate of 23.1% since 2015 after having declined[13] substantially from 2011 to 2014, with the share of PF loans out of total loans rising by 9.3%.

Meanwhile, the delinquency rate of corporate loans was 4.07% at the end of September 2020, down by 0.51%p, and the delinquency rate of real estate PF loans was 2.56%, down by 0.87%p during the same period. However, real estate PF loans classified as precautionary amounted to 1.1 trillion won at the end of September 2020, having increased[14] since the end of 2018 (0.4 trillion won), and thus the possibility of defaults needs to be monitored.

11) After detecting cases in which the LTV regulation had been bypassed in the financial sector among savings banks' loans to private money lenders, the financial authorities treated home mortgage loans of private money lenders as loans extended to the original borrower by savings banks. Hence, on September 2, 2020, the financial authorities ordered savings banks to apply the same LTV regulation to these loans.

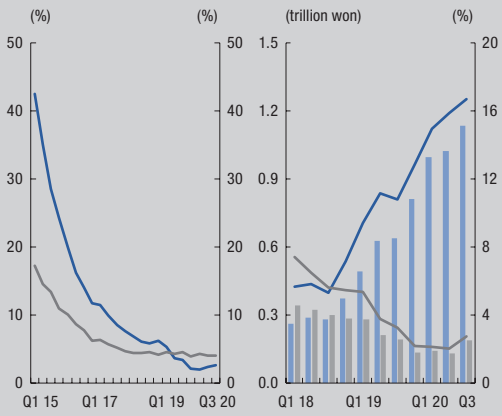
12) After the 2011 mutual savings banks crisis, regulations on real estate PF loans were tightened, including: reduction of PF loans' share in total credit (30% → 20%); mandatory requirement that at least 20% of total funds for a project be met by borrowers' own funds; and incorporation of business feasibility results into asset quality classification standards.

13) PF loans extended by savings banks fell sharply from 12.3 trillion won at the end of 2010 to 2.1 trillion won at the end of 2014.

14) The share of loans classified as precautionary of total real estate PF loans rose from 7.2% to 16.7%, up 9.5%p during the same period, which appears to be attributable to the lowering of the business feasibility grade amid the sluggish sales conditions of some PF projects and decreased debt servicing capacity of borrowers.

Mutual savings banks' delinquency rates[1] of corporate loans

Precautionary loan ratio of real estate PF loans[1]



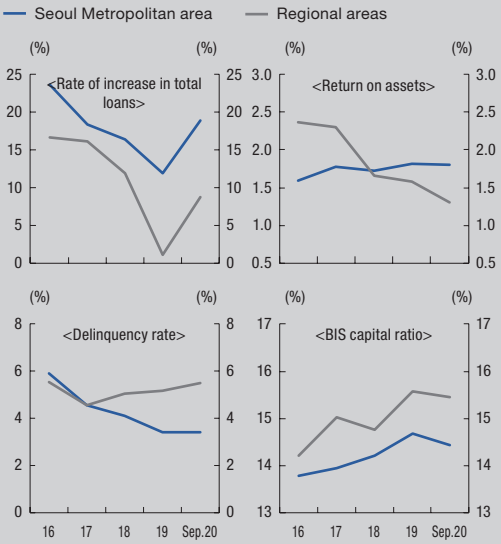
Note: 1) End-period basis.
Sources: Financial institutions' business reports.

Widening gap between savings banks in the Seoul metropolitan area and regional areas

Loans issued by savings banks in regional areas are growing at a slower rate[15] than those extended by savings banks in the Seoul Metropolitan area, and the profitability and soundness of regional savings banks are not favorable. The return on assets (ROA) of regional savings banks has declined in recent years, standing at 1.3% (annualized rate) during January to September 2020, but the delinquency rate has shifted to an upward trend since 2018.

The sluggish business conditions of regional savings banks are largely due to the downturns in regional economies. The delinquency rate of corporate loans has soared since 2018, driven by the real estate sector[16] (4.8% → 6.3%). Also, the BIS capital ratio of regional savings banks has improved thanks to the slower growth of risk-weighted assets (end of 2016: 14.2% → end of September 2020: 15.5%), but there is significant variation across regional savings banks, most of which are small and medium sized and have relatively small capital bases.[17]

Financial soundness conditions[1] of mutual savings banks, by area



Note: 1) Year-on-year basis for rate of increase in total loans, accumulated quarterly income annualized basis for return on assets, and end-period basis for delinquency rate and BIS capital ratio.
Sources: Financial institutions' business reports.

15) While loans of savings banks in the Seoul metropolitan area grew by 18.9% year on year until the end of September 2020, loans issued by regional savings banks increased by only 8.7%, and the share of regional savings banks out of total loans extended by savings banks declined from 20.8% at the end of 2015 to 16.9% at the end of September 2020.

16) The share of loans issued to real estate and construction industries out of total corporate loans issued by savings banks was 45.0% at the end of September 2020, and the share for regional savings banks was 47.1%.

17) At the end of September 2020, the BIS capital ratio of regional savings banks ranged from 9.9% to 44.3%, and the size of equity capital (average: 54.5 billion won) was 26.6% of that of savings banks in the Seoul metropolitan area.

Implications

Loans issued by savings banks, which contracted markedly after restructuring, have recently shown rapid recovery, which is expected to improve access to loans for borrowers with low to middle credit ratings. The asset quality of these loans, as measured by the delinquency rate, remains stable, and the capital ratio is above the regulatory minimum, indicating overall management soundness. In particular, the promotion of unsecured medium-interest rate loans appears to have helped reduce the financial costs of borrowers with saving banks.

However, if the current economic downturn is protracted, the recent rapid loan growth could become a risk factor,[18] and thus internal risk management frameworks need to be strengthened and loss-absorption capacities bolstered. Although the PF-related exposure of savings banks remains lower than during the 2011 mutual savings bank crisis,[19] loans classified as precautionary are rising swiftly, requiring caution against the possibility of default. Furthermore, some large savings banks and regional savings banks that have relatively insufficient loss-absorption capacities are advised to make preemptive efforts to expand their capital. In addition, to ensure that the credit supply of savings banks is not used as a means of bypassing the regulations on household debt, monitoring and supervision should be strengthened as well.

18) The share of vulnerable borrowers (multiple-loan borrowers with low income or low credit ratings) of savings banks' household loans stood at 23.8% at the end of June 2020, significantly higher than for banks (3.4%), mutual credit cooperatives (5.3%), insurance companies (7.1%), and credit-specialized financial companies (13.3%), meaning that savings banks are more exposed to economic cyclical fluctuations than other financial sectors.

19) At the time of the mutual savings bank crisis at the end of the second quarter of 2011, PF-related exposure accounted for 20.3% of total loans.

Box 5.

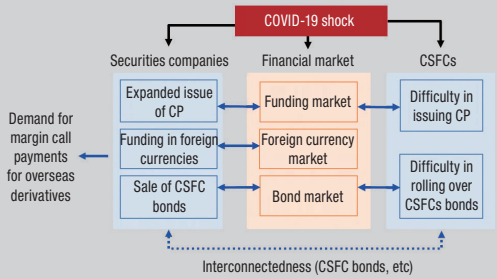
Post-COVID-19 Funding and Fund Management Practices among Securities and Credit-specialized Financial Companies and Implications

Amid the outbreak of COVID-19 this March, securities companies and credit-specialized financial companies (“CSFCs” hereafter) sustained particularly significant shocks compared to other financial institutions. Here, changes in the raising and operation of funds by securities companies and CSFCs before and after the COVID-19 outbreak are reviewed, and policy implications are derived.

Spread of COVID-19 and increased pressure on securities companies and CSFCs

Securities companies and CSFCs are highly dependent[1] on wholesale funding and thus relatively vulnerable to liquidity risk. As financial market conditions had been favorable, they were not adequately prepared for the subsequent deterioration of funding conditions. Under these circumstances, the liquidity risk of securities companies became the principal factor that spread the COVID-19 shock across the financial markets overall. Because USD margin call payments related to equity-linked securities (ELS) rose sharply amid the dramatic plunge of stock prices overseas, securities companies urgently expanded the scale of funding in Korean won and foreign currencies, spreading and amplifying shocks to the funding, foreign exchange, and bond markets.[2] In addition, while securities companies have increased[3] their investment in bonds issued by CSFCs (“CSFC bonds” hereafter), leading to a closer link between securities companies and CSFCs, the sale of CSFC bonds and issue of more CP by securities companies aggravated the liquidity conditions of CSFCs.

Spillover channel of the COVID-19 shock on securities companies and CSFCs



Thanks to the policy response of Bank of Korea and financial authorities, the financial market regained stability, and the liquidity conditions of securities companies and CSFCs improved

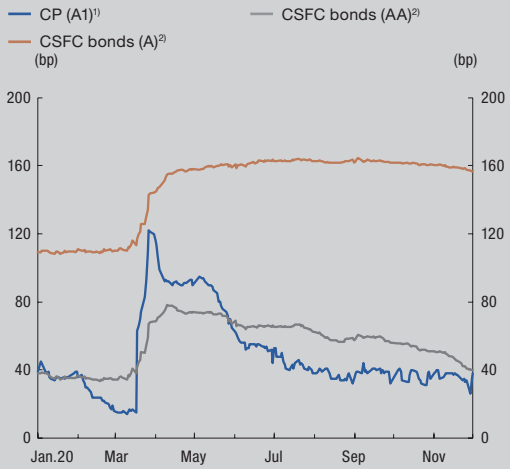
1) At the end of 2019, the share of wholesale funding out of total liabilities was 73.6% for CSFCs and 20.6% for securities companies (excluding deposits placed by investors), both of which are higher than other non-bank financial institutions (about 1%).

2) Markets were also unstable in major economies such as the United States and Europe during the same period, as preference for safe assets and cash increased. Due to the stock price decline and significant widening of credit spreads, investors suddenly reduced their risk assets, leading to a significant increase in requests for redemption of some MMFs and corporate bond investment funds and a major jump in demand for margin call payments for derivatives. The Financial Stability Board (FSB) attributed this market instability largely to the increased impact of non-bank financial institutions (e.g. investment funds) within the financial system, and is discussing responses to it.

3) Securities companies’ exposure to CSFCs climbed from 23.2 trillion won at the end of 2015 to 38.6 trillion won at the end of 2019, up by 66.5%, and CSFCs’ exposure to securities companies at the end of 2019 was relatively low, amounting to 3.3 trillion won.

substantially. Still, some CSFCs with low or medium credit ratings (A or lower) continued to face funding difficulties due to the persistently higher credit spread even after March this year.

Spread between CP and call rates, and credit spread of CSFC bonds, by credit rating



Notes: 1) Relative to the call rate, 91-day maturity basis.
2) Relative to the Treasury bond rate, 3-year maturity basis.
Sources: Bank of Korea, Korea Financial Investment Association

Raising and operation of funds by securities companies and CSFCs

Even after the liquidity shock caused by the COVID-19 pandemic, securities companies and CSFCs showed solid asset growth. In particular, the assets of securities companies grew by 31.5% during January to September 2020 (annualized, the same hereafter), showing far greater growth than other financial sectors.

(Securities companies: reduced investment in risk assets and curtailed reliance on wholesale funding)

In terms of the operation of funds, securities companies increased their cash assets. Due to the payment of USD-denominated margin calls, foreign currency deposits for margin calls rose by 149.7% during January to September 2020, and customer deposits and credit provision surged substantially owing to inflows of stock investment funds amid the favorable stock market conditions at home and abroad. On the other hand, investment in risk assets,[4] such as foreign currency-denominated securities, investment funds, and stocks, which had grown sharply, declined dramatically due to the deteriorated investment conditions and stricter regulations after COVID-19.[5] As for bond investment, investment in low-risk bonds such as government bonds increased.[6]

Recent strengthening of regulation related to securities companies

Sector	Contents
RRP market	○ Mandatory ratio of holding cash assets ○ Application of haircut
Real estate PF	○ Setting up PF liability warranty limit for securities companies ○ Eliminating benefits related to IBs' PF loans
Derivatives-linked securities	○ Improving liquidity ratio with maturity of early redemption ○ Strengthening regulation of leverage ratio related to non-principal protected securities ○ Diversified investment to hedge overseas assets

4) Risk assets are investment products that carry credit and market risks. The data used in this analysis included proprietary transactions and operation of funds raised by issuance of derivatives-linked securities.
5) Investment in risk assets such as foreign currency-denominated securities, investment funds, and stocks increased by annual average rates of 42.4%, 35.9%, and 19.9%, respectively, from 2016 to 2019 but declined by -3.3%, -21.4%, and -12.2%, respectively, from January to September 2020.
6) During January to September 2020, the growth rate of investment in government and municipal bonds, special bonds, and debentures issued by financial institutions (114.1%, 17.1%, and 37.5%, respectively) outpaced the annual average growth rates of investment in those instruments from 2016 to 2019 (7.9%, 1.7%, and 25.4%, respectively), while investment in corporate bonds rose by 18.8%, which is similar to the annual average growth rate of 20.0% recorded from 2016 to 2019.

In terms of fundraising, the issue of subordinated bonds, which provides long-term funding that supplements capital,[7] increased, and the dependence on wholesale funding[8] decreased owing to increasingly stringent regulations. Instead of inter-institutional repos, a major source of wholesale funding, funding from customer repos, which is a relatively stable source of funds, expanded.[9] Meanwhile, while the balance of promissory notes issued continued growing rapidly, the balance of derivatives-linked securities issued reversed to a downward trend with a decrease of 10.4% during January to September 2020 (after increasing by 4.7% annually from 2016 to 2019).

Growth rate of securities companies' major assets & liabilities

(%, trillion won)

Accounts	2016-2019[1]	Jan-Sep 2020[2]	end-Sep 2020
Cash and deposits	4.8	77.3	116.1
(Customer deposits)	5.3	118.5	60.2
(Foreign currency deposits & margin calls)	-9.8	149.7	10.9
Securities	9.0	10.9	342.8
(Bonds)	8.6	23.9	65.0
Loans	16.6	21.0	56.6
(Credit provision)	11.1	34.2	33.7
(Corporate loans)	25.8	4.9	22.9
Total assets	8.8	31.5	597.1
Deposit liabilities	10.1	97.4	82.2
(Customer deposits)	7.9	107.2	77.7
Borrowing liabilities	8.9	14.5	363.7
(Short-term borrowings)[3]	23.6	22.9	27.4
(RP selling)	5.0	27.8	147.1
(Available-for sale DLS)	4.7	-10.4	104.2
(Promissory notes)	46.8	36.6	17.4
Capital	7.7	10.0	66.4
Total liabilities & capital	8.8	31.5	597.1

Notes: 1) Annual average.
2) Annualized basis.
3) Sum of call, CP, short-term bonds.
Sources: Financial Institutions' business reports

(CSFCs: increase in cash assets and slight expansion of short-term funding)

CSFCs have also significantly expanded their operation of surplus funds out of a precautionary motive. Cash and deposits from banks rose by 80.7% in the first nine months of this year, which is much higher than the growth rate of the normal average year (annual average growth of 2.8% from 2016 to 2019), and securities are

7) The balance of subordinated bonds issued rose by 39.5% during January to September 2020, far greater than the annual average rate of increase of 5.9% recorded from 2016 to 2019.
8) Refers to the share of wholesale funding (sum of corporate bonds issued by securities companies, excluding subordinated bonds, inter-institutional repos, call money, CP, and short-term bonds) out of total liabilities. The share declined from 20.6% at the end of 2019 to 18.4% at the end of September 2020.
9) The balance of inter-institutional repos sold rose by 0.5% during January to September 2020, falling well below the annual average growth rate of 49.7% recorded from 2016 to 2019, but the balance of customer repos sold shifted from a downward trend of 2.1% from 2016 to 2019 to an increase of 40.2% during January to September 2020.

surging. Credit card companies increased their stable beneficiary certificates, such as MMFs, and capital companies saw their securities holdings[10] rise rapidly in search of investment profits.

CSFCs had been diversifying their business areas to cope with the changes in the business environment, such as low interest rates and reduced card commissions, and these trends have remained in place even after the COVID-19 outbreak. Credit card companies have reduced their presence in the card business and have instead expanded[11] their investment in installment and lease assets. Meanwhile, capital companies have strengthened[12] their loans and investment finance, which are relatively high-risk, high-return assets. Such portfolio adjustment could stretch the maturity of assets in operation, increasing the maturity mismatch between assets and liabilities.

In terms of fundraising, the issue of long-term bonds by CSFCs, which account for about 60% of borrowings, has grown at a slower pace[13] compared to the normal annual average. While bonds issued by credit card companies maintained growth rates consistent with the average of normal years, the issue of bonds by capital companies was sluggish as capital companies with low and medium credit ratings faced difficulty in fundraising. Hence, capital companies increased their long-term borrowings from financial institutions, and capital companies with credit ratings of A or below strengthened their short-term funding.[14]

Growth rate of CSFCs' major assets & liabilities

(%, trillion won)

Accounts	2016-2019[1]	Jan-Sep 2020[2]	end-Sep 2020		
			Card	Capital	
Cash and deposits	2.8	80.7	125.2	55.3	11.9
Securities	17.5	27.5	47.9	19.6	24.2
Loans	11.3	10.0	37.9	9.0	85.6
Card assets	7.3	3.1	3.1	-	104.6
Installment and lease assets	10.4	9.2	24.6	6.5	75.2
Total assets	9.5	10.5	10.2	10.7	315.1
Borrowing liabilities	11.1	10.1	8.7	11.0	229.0
(Short-term borrowings)	-5.5	3.9	-11.4	6.7	12.7
(Long-term borrowings)	12.4	24.2	6.1	45.7	28.1
(Short-term corporate bonds)	-11.3	45.8	73.3	22.4	3.5
(Long-term corporate bonds)	14.6	7.2	9.7	5.7	138.9
Capital	6.3	7.6	4.7	10.8	55.1
Total liabilities & capital	9.5	10.5	10.2	10.7	315.1

Notes: 1) Annual average.
2) Annualized basis.
Sources: Financial institutions' business reports.

10) With the expansion of investment finance, such as alternative investments, the balance of securities investment by capital companies grew steadily at an annual average rate of 20.1% from 2016 to 2019, and 19.6% during January to September 2020.

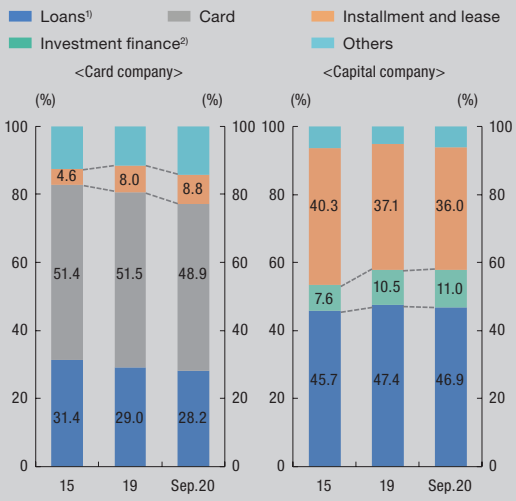
11) Card assets increased by 3.1% during January to September 2020, lower than the annual average growth rate of 7.3% recorded from 2016 to 2019. Installment and lease assets soared by over 20% annually, with their share of total assets doubling from 4.6% at the end of 2015 to 8.8% at the end of September 2020.

12) While the share of installment and lease assets of capital companies declined from 40.3% at the end of 2015 to 36.0% at the end of September 2020, the share of investment finance and loans rose from 53.3% to 57.9% during the same period.

13) The balance of long-term bonds rose by 7.2% during January to September of 2020, falling below the annual growth rate of 14.6% from 2016 to 2019.

14) Capital companies with credit ratings of A+ or below (senior corporate bonds) increased their short-term funding through instruments with maturity not exceeding one year instead of funding through long-term bonds. As a result, the share of short-term funding (short-term borrowings and corporate bonds due within one year / borrowing liabilities) soared to 27.3% by the end of September 2020, up 2.6%p (up 0.9%p for all CSFCs).

Changes in composition of CSFCs' assets



Notes: 1) Including loans, and including card loans and cash advances among card assets.
2) Including securities and new-technology financial assets.
Sources: Financial institutions' business reports.

Implications

Securities companies and CSFCs, which suffered a liquidity shock amid the COVID-19 pandemic, have improved their overall readiness for liquidity risk by expanding their cash assets. Also, the financial authorities are implementing more stringent regulations for sectors that were exposed to risks amid the pandemic-induced shock.[15)]

However, despite these stronger regulations and somewhat improved liquidity risk management, securities companies and CSFCs remain vulnerable to liquidity risk caused by various factors as their business models are, by nature, highly dependent on the financial markets. Despite efforts to improve regulations, in United States, where the financial intermediation of non-bank financial institutions is more advanced compared to that of their Korean counterparts, the COVID-19 pandemic shock resulted in the emergence of potential risks, such as the massive redemption of MMFs and investment funds that invested in corporate bonds and the activation of margin calls, causing a liquidity crunch across the financial markets overall as well as among affected financial institutions.

Hence, to cope with potential risks that could emerge as securities companies and CSFCs grow, the regulatory system needs to be revamped. To do this, regulations need to be supplemented to realize a shift from the current risk management method by sector to the comprehensive management of overall risks associated with the raising and operation of funds. In particular, securities companies are advised to conduct more stringent liquidity risk stress tests for overseas investment, which has grown rapidly in recent years, as well as for real estate PF and derivatives-linked securities whose risks were exposed. Based on the results, an effective emergency funding plans should be established. Furthermore, CSFCs need to strengthen their risk management to address risks associated with maturity mismatch between assets and liabilities associated with business diversification and supplement their emergency funding plans in response to financial market shocks.

Meanwhile, although the wide-ranging market intervention by Bank of Korea and financial authorities during this pandemic shock was inevitable, there is concern over the possible adverse effects of this intervention, such as moral hazard among financial institutions. Therefore,

15) For details, refer to "Financial Policy Direction for Post-Pandemic Era" by the Financial Services Commission (July 2020) and "Plans to Improve Rules on Structured Products" by the Financial Services Commission and related government ministries (July 2020).

to minimize official market interventions, system improvement is necessary to ensure that the financial intermediation of major financial institutions such as banks remains at a proper level during crises.

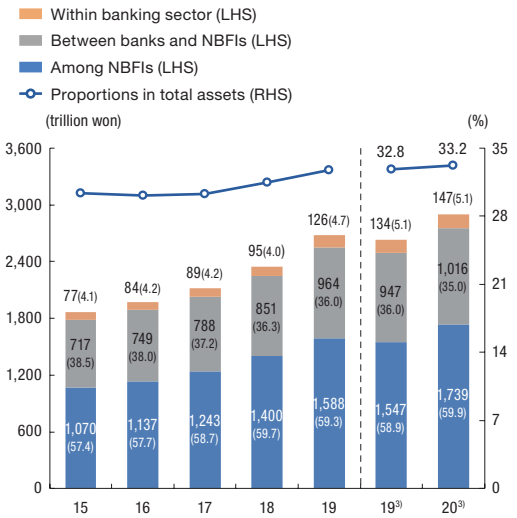
3. Interconnectedness

Continuous upward trend in mutual transactions

At the end of the second quarter of 2020, mutual transactions between financial institutions[20] amounted to 2,902 trillion won, up 10.4% year on year.[21] The share of mutual transactions in the total assets of the overall financial sector (8,736 trillion won, flow of funds statistics basis) also edged up 0.4%p from 32.8% at the end of the second quarter of 2019 to 33.2% at the end of the second quarter of 2020.

Among the sub-categories of mutual transactions in the financial sector—those among banks, those between banks and NBFIs, and those among NBFIs—transactions between NBFIs registered a particularly strong year-on-year increase of 12.4%, centered on customer deposits of securities companies.[22] Inter-bank transactions and transactions between banks and NBFIs increased 9.9% and 7.2% respectively. As a result, the share of transactions between NBFIs in total inter-financial institution transactions was lifted from 58.9% at the end of the second quarter of 2019 to 59.9% of the second quarter of 2020, while the share of transactions between banks and NBFIs fell from 36.0% to 35.0% during the same period. The share of inter-bank transactions was mostly unchanged from last year's level (5.1%) (Figure Ⅲ-18).

Figure Ⅲ-18. 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.
3) Based on end-Q2 of each year.

Source: Bank of Korea.

By financial institution type, domestic banks, securities companies, trusts and investment

20) Estimated based on key flow of funds questionnaire data—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).

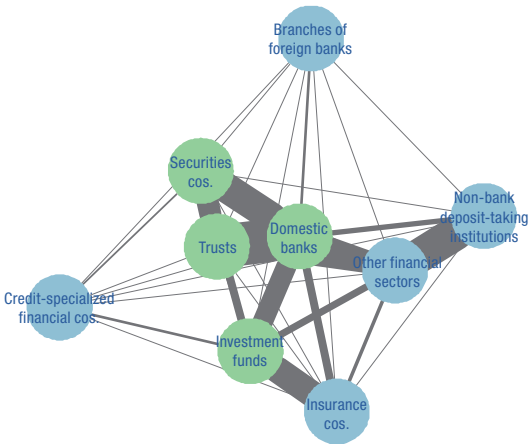
21) The year-on-year increase of mutual transactions between financial institutions changed from 6.5% at the end of the second quarter of 2017 → 8.0% at the end of the second quarter of 2018 → 14.0% at the end of second quarter of 2019 → 10.4% at the end of the second quarter of 2020.

22) Transactions between securities companies were the highest contributor (44.2 trillion won) to the year-on-year increase of mutual transactions between NBFIs (191.8 trillion won). This is mainly explained by the large inflow of money from retail investors for stocks and IPOs, resulting in a sharp rise in customer deposits (24.7 trillion won at the end of the second quarter of 2019 → 46.3 trillion won at the same time of 2020), coupled with an increase in fund management operations.

funds appeared to play a key role in mutual transactions. The value of transactions was the highest between domestic banks and trusts, amounting to 231.8 trillion won at the end of the second quarter of 2020, followed by transactions between domestic banks and securities companies (193.6 trillion won), between insurance companies and investment funds (182.2 trillion won) and between securities companies and trusts (166.4 trillion won), in that order[23] (Figure Ⅲ-19).

Looking at the mutual transactions across financial sectors based on the products involved, mutual transactions were carried out mainly in deposits and bonds. At the end of the second quarter of 2020, deposit and bond trading accounted for 23.4% and 22.2% respectively of total transactions between financial institutions, up 0.6%p and 0.7%p on a year-on-year basis.[24] The share of stock trading, on the other hand, fell 0.5%p to 19.7% (Table Ⅲ-1).

Figure Ⅲ-19. 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-Q2 2020 basis.
Source: Bank of Korea.

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

(trillion won, %, %p)

Product	End-Q2 2019		End-Q2 2020		B-A
	Amount	Share (A)	Amount	Share (B)	
Deposits	599.2	22.8	680.0	23.4	0.6
Bonds	566.3	21.5	643.0	22.2	0.7
Stocks[1)]	529.9	20.2	570.6	19.7	-0.5
Loans	133.2	5.1	147.1	5.1	0.0
Repos	122.9	4.7	140.7	4.8	0.1
Derivatives	68.7	2.6	80.4	2.8	0.2

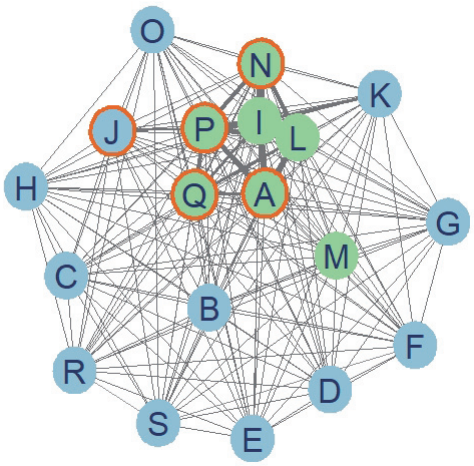
Note: 1) Including investment fund shares, equity-linked securities (ELS), etc.
Source: Bank of Korea.

Meanwhile, looking at the structure of the interconnectedness between domestic banks, particularly strong linkages were found between some nationwide commercial banks and specialized banks (Figure Ⅲ-20).

23) At the end of the second quarter of 2020, the year-on-year increase was the highest for mutual transactions between securities companies at 44.2 trillion won, followed by transactions between domestic banks and securities companies (27.6 trillion won), between insurance companies and investment funds (23.7 trillion won), between domestic banks and investment funds (23.2 trillion won) and between securities companies and trusts (13.7 trillion won), in that order.

24) This is mainly due to the rise in customer deposits at securities companies, resulting in increased deposits and bond purchases.

Figure Ⅲ-20. 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-Q2 2020 basis.
Source: Bank of Korea.

By type of financial product, bonds represented the largest share (60.2%) of mutual transactions between domestic banks, also recording the highest year-on-year increase (6.7%p).[25)] On the other hand, the share of loans dropped 0.8%p year on year to 18.7% (Table Ⅲ-2).

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

(trillion won, %, %p)

Product	End-Q2 2019		End-Q2 2020		B-A
	Amount	Share (A)	Amount	Share (B)	
Bonds	71.7	53.5	88.7	60.2	6.7
Loans	26.2	19.5	27.6	18.7	-0.8
Derivatives	5.9	4.4	6.8	4.6	0.2
Deposits	6.8	5.1	4.7	3.2	-1.9
Stocks	4.4	3.3	4.0	2.7	-0.6

Source: Bank of Korea.

Rise in contagion risk

The analysis of default contagion risk and concentration risk based on the structure of interconnectedness between financial institutions found that while contagion risk has increased, concentration risk has remained roughly the same.

DebtRank,[26)] a default contagion risk indicator, showed a slight uptick from the same time of the previous year for the risk between financial sectors and remained high for the risk within the banking sector. Network-Based Systemic Risk Scoring (N-B SRS),[27)] an indicator of the aggregate amount of the banking sector's contagion risk, has surged since the start of the COVID-19 outbreak, reflecting the

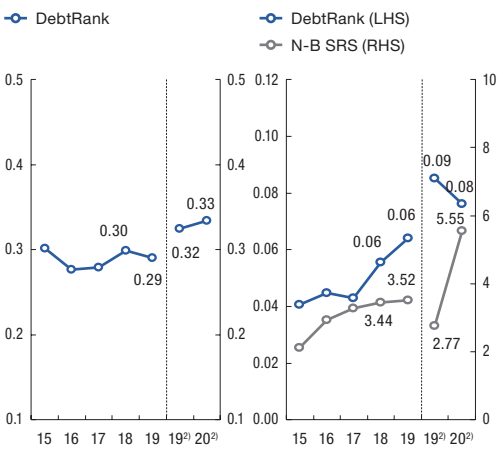
25) Government support to mitigate the impact of COVID-19 has led to a steep increase in bank bond issues, particularly by specialized banks (6.7 trillion won in 2019 → 27.9 trillion won during the first half of 2020, net issuance basis).

26) Calculated as the simple average of the ratio of aggregate losses arising from the spread of a shock from the insolvency of an individual sector (bank) to its transaction counterparties through their mutual exposures, relative to the financial (banking) sector's total 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 the total assets under management of the financial (banking) sector (Battiston, Stefano, et al. "DebtRank: Too Central to Fail? Financial Networks, the Fed and Systemic Risk," 2012).

27) N-B SRS is the aggregate amount of the banking sector's risk resulting from the amplification of the probability of default of a specific bank (estimated based on spreads on bank bonds) through the mutual exposures it has with other banks, defined as the square root of the value calculated by multiplying the default probabilities of two banks with mutual exposures by the total value of transactions between them for all pairs of banks and adding up the results (Das, Sanjiv Ranjan. "Matrix Metrics: Network-Based Systemic Risk Scoring," 2015).

widening of bank bond spreads[28] among other factors (Figure Ⅲ-21).

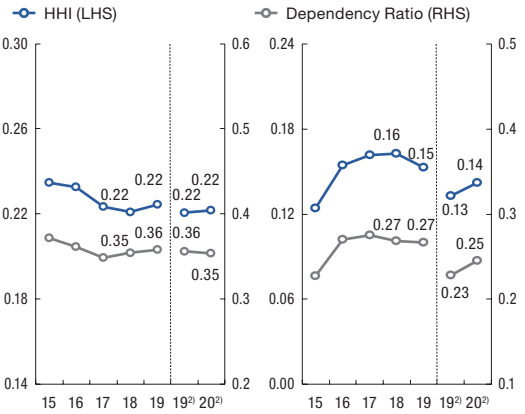
Figure Ⅲ-21. Default contagion risks[1]



Notes: 1) End-period basis.
2) Based on end-Q2 of each year.
Source: Bank of Korea.

Measures of concentration risk, the Herfindahl-Hirschman Index (HHI)[29] and the dependency ratio,[30] registered slight upticks from the same period of last year for the risk within banking sector, while they remained essentially unchanged for the risk between financial sectors (Figure Ⅲ-22).

Figure Ⅲ-22. Concentration risks[1]



Notes: 1) End-period basis.
2) Based on end-Q2 of each year.
Source: Bank of Korea.

28) In the second quarter of 2020, the average spread (relative to 3-year Treasury bonds) on bank bonds (AAA, 3-year) stood at 29.4bp, representing a significant increase from the same period of the previous year (15.4bp).

29) 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.

30) The Dependency Ratio is the weighted average share in individual sectors' (banks') total transactions, accounted for by the single sector (bank) with which they have the largest amount of transactions, indicating the level of dependency on a single transaction counterparty. The share of transactions and the weight were calculated based on fund management transactions.

Ⅳ. Capital Flows

In January to November 2020, foreigners' domestic portfolio investment showed a net outflow in stocks and a net inflow in bonds. Foreigners' stock investment, mostly in a net outflow position for the year to September influenced by developments in the COVID-19 pandemic, shifted to an inflow in October on improving investor sentiment. There was a massive inflow of foreigners' bond investment in January to July, driven by public investment funds, on an increasing preference for safe assets. Since September, however, foreigners' bond investment has been showing a slight outflow on diminished arbitrage incentives and an increase in the volume of redemption at maturity.

Overseas portfolio investment by residents continued on an upward path, centered on stocks, even though net investment decreased. While net investment increased in stocks, driven by general government, other financial institutions and individual investors, the growth in bond investment sharply slowed as low global interest rates worsened returns.

Continuous upward trend in foreigners' domestic portfolio investment

In January to November 2020, foreigners' domestic portfolio investment[1] posted a net inflow of 5.8 billion dollars (-16.1 billion dollars in stocks, 21.9 billion dollars in bonds). In the stock market, after the massive outflow[2] of foreigners' portfolio investment following the COVID-19 outbreak early this year hit a lull, the size of the outflow tapered off thanks to policy responses by the governments of major countries. Starting in October, inflows resumed on the improvement of investor sentiment as the uncertainty surrounding the US presidential election was eased and progress was made in the development of COVID-19 vaccines, as well as on the improvement of domestic economic indicators, upswing in stock prices and the strength of the Korean won.

In January to July, a strong demand for safe assets amid the COVID-19 pandemic led to a large inflow of foreigners' portfolio investment in bonds, centered on public investment funds. However, starting in August, the inflow of public investment funds slowed down, and from September onwards, foreigners' bond investment gave way to a slight outflow as the inflow of private investment funds decreased on diminished arbitrage incentives[3] and the volume of redemption at maturity increased[4] (Figure Ⅳ-1).

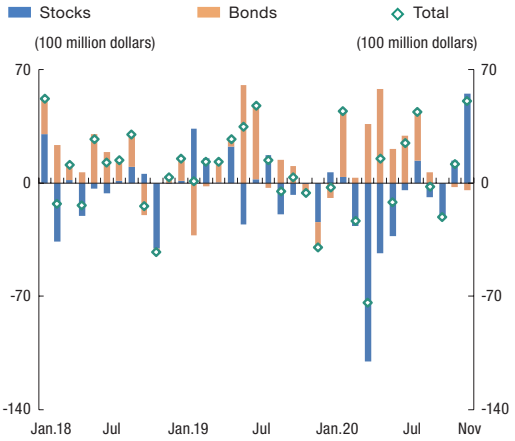
1) The stock investment considered includes exchange-traded and OTC transactions in KOSPI- and KOSDAQ-listed stocks, as well as initial public offerings (IPOs) (but excludes ETFs, ELWs, ETNs, etc.), while bond investment is based on exchange-traded and OTC transactions in listed bonds (reflecting repo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

2) In March, in particular, the outflow of stock funds reached 11.04 billion dollars, surpassing the intra-month record set in August 2007 (-9.99 billion dollars).

3) Arbitrage incentives (3-month bonds, period daily average) decreased from 50bp in August to 44.8bp in September, 45.5bp in October and 35.9bp in November.

4) In September to November 2020, the average monthly redemption stood at roughly 4.5 billion dollars (2.8 billion dollars in January to August 2020).

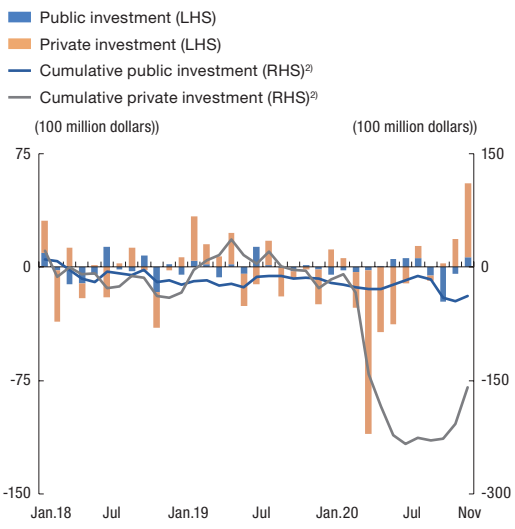
Figure Ⅳ-1. Changes in foreigners' domestic portfolio investment[1)]



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

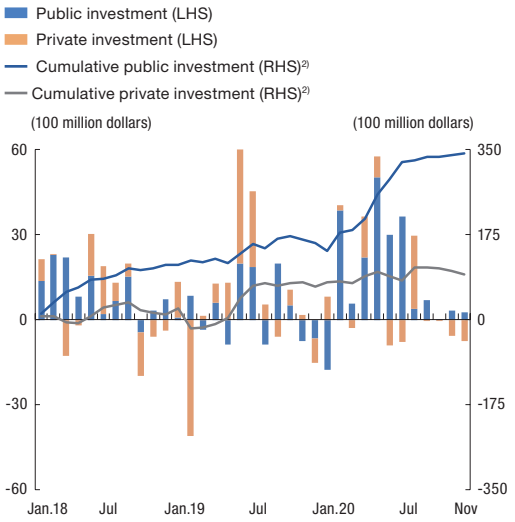
By investor type, capital flow volatility in stocks was driven by global funds and other types of private investment capital, and that in bonds by public investment capital (Figure Ⅳ-2, Figure Ⅳ-3).

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

At the end of November 2020, the balance of foreigners' stock investment stood at 675 trillion won, representing 31.6% of stock market capitalization,[5)] a decrease of 2.1%p from the end of the previous year (33.8%). The balance of foreigners' bond investment amounted to 150 trillion won, corresponding to 6.7% of the total balance of listed bonds, an increase of 0.5%p from the end of the previous year (6.2%).

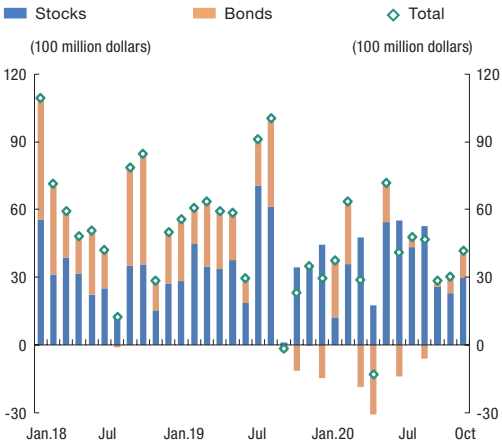
Going forward, foreigners' domestic portfolio investment is expected to show a net inflow, centered on stock investment, on the rising expectation of economic recovery in Korea. Nonetheless, the possibility of a new surge in capital flow volatility remains, should a fresh resurgence of COVID-19 worldwide leading to wide-scale lockdowns cause investor sentiment to worsen.

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

Slowing growth in overseas portfolio investment by residents

From January to October 2020, overseas portfolio investment by residents increased by 38.6 billion dollars (38.4 billion dollars in stocks, 0.2 billion dollars in bonds), slower growth (-13.3 billion dollars) than the corresponding amount during the same period of the previous year (51.9 billion dollars) (Figure Ⅳ-4). At the end of September 2020, the balance of overseas portfolio investment by residents stood at 632.6 billion dollars, of which 397.8 billion dollars was accounted for by stocks and 234.9 billion dollars by bonds.

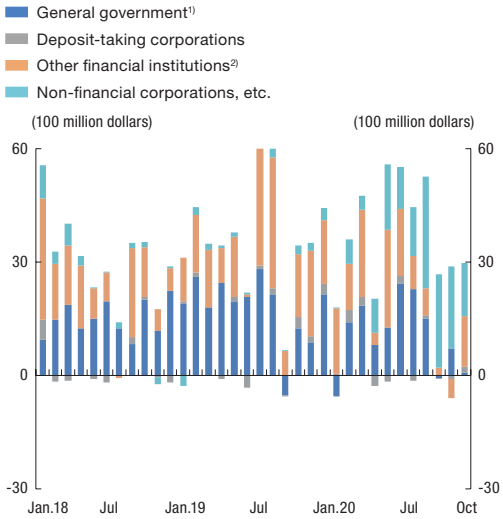
Figure Ⅳ-4. Changes in residents' overseas portfolio investment[1)]



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

By investor type, the global pandemic notwithstanding, stock investment increased steadily, driven by general government (National Pension Service (NPS), Korea Investment Corporation (KIC), etc.) and other financial institutions (asset management companies, etc.). From July onwards, as the investment in overseas stocks by retail investors rose sharply, the increase was led by non-financial corporations (Figure Ⅳ-5).

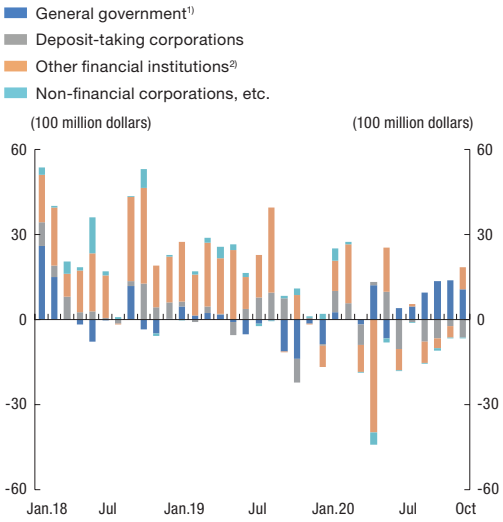
Figure Ⅳ-5. Net residents' overseas stock investment outflows, by investor type



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

There was a marked slowdown in investment in overseas bonds as the reduced returns in the global low interest rate environment caused a decrease in investment by other financial institutions such as asset management companies and insurance companies (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.

Moving forward, overseas portfolio investment by residents is expected to continue on an upward path. The National Pension Service (NPS) plans to continuously increase the allocations of overseas stocks and bonds in accordance with its fund asset management policy.[6] Investment in overseas stocks by retail investors is also likely to rise on the expectation of higher returns.

6) According to the 2021-2025 Mid-term National Pension Fund Asset Allocation Plan (draft), the allocation of overseas stocks in the National Pension Fund's portfolio will be increased to 25.1% at the end of 2021 from 22.3% at the end of 2020, with the target allocation to be reached by the end of 2025 set to 35%. The allocation of overseas bonds will be also increased from 5.5% at the end of 2020 to 7.0% at the end of 2021, and then to around 10% at the end of 2025.

Resilience of Financial System

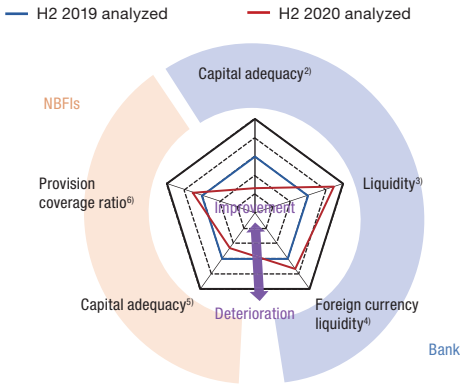
Ⅰ. Financial Institutions

The capital adequacy ratio of commercial banks rose on the earlier-than-scheduled adoption of the Basel III reforms. The liquidity ratio, measuring the capacity to respond to sudden outflows of funds, trended down, but was still in excess of the regulatory minimum for all banks.

The resilience of NBFIs has remained satisfactory, with the capital adequacy ratio improving in most sectors to a level largely exceeding the regulatory minimum.

Going forward, a persistent slowdown in the real economy could cause credit risk to rise, centered on loans, which expanded significantly during the response to the COVID-19 pandemic. Therefore, in order to maintain a stable level of resilience, continued efforts are needed to set aside sufficient loan loss provisions and increase capital (Figure Ⅰ-1).

Figure Ⅰ-1. Map of changes in financial institution resilience[1)]



Notes: 1) Extent of change as of end - Q3 2020 compared to end - 2019 indexed.
2) Total capital ratio under Basel Ⅲ.
3) Liquidity coverage ratio (LCR).
4) Foreign currency LCR.
5) The weighted average of NBFI sectors' capital adequacy ratios by their total assets.
6) Excluding securities companies.
Sources: Bank of Korea, Financial Institutions' business reports.

1. Banks

Sound loss absorption capacity

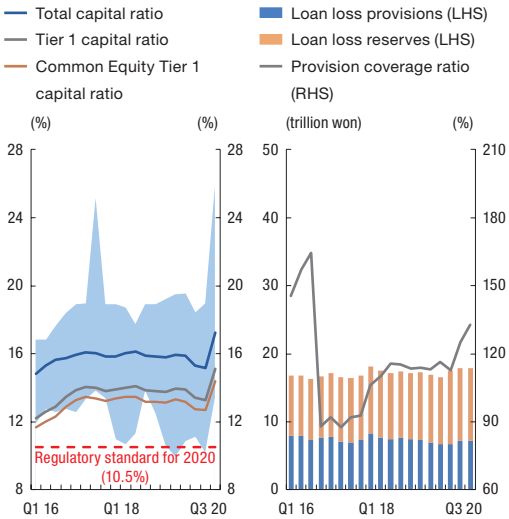
Commercial banks' capital adequacy ratio sharply increased with the earlier-than-scheduled adoption of the Basel III reforms.[1)] As of the end of the third quarter of 2020, the total capital ratio stood at 17.24%, up 1.35%p from the end of the previous year (15.89%), and the Common Equity Tier 1 capital ratio at 14.40%, up 1.24%p. The total capital ratio largely exceeded the 2020 regulatory minimum (10.5%, 11.5% for D-SIBs,[2)] 8.625% for

1) To prevent the expanded financial support from causing a sudden drop in banks' capital ratio, the government decided to adopt the Basel III counterparty credit risk reforms in June 2020, earlier than the initially planned date (January 2022). These reforms include a downward adjustment to the risk weight on corporate loans. As a result, while the total capital ratio of commercial banks under the old credit risk rules (excluding internet-only banks) dropped by 0.55-1.35%p from the end of the previous year, that of commercial banks under the new rules (2 at the end of June 2020, 7 at the end of September 2020) rose by 0.93-3.78%p.

2) The domestic systemically important banks (D-SIBs) are Shinhan (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).

internet-only banks) for all banks. The provision coverage ratio (loan loss provisions / substandard-or-below loans), an indicator of the capacity to absorb expected losses, jumped 16.4%p from the end of the previous year (116.2%) to 132.6% as loan loss provisions were set aside in advance amid looming economic uncertainty (Figure Ⅰ-2).

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

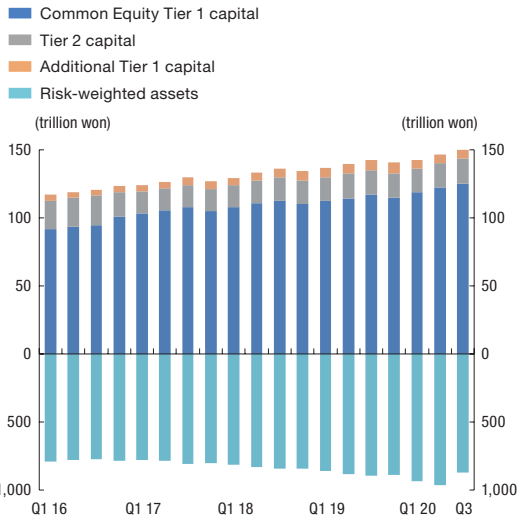


Notes: 1) End-period basis.
2) Provision coverage ratio = Loan loss provisions / Substandard-or-below loans. Loan loss reserves were included in loan loss provisions until Q3 2016, and loan loss reserves have been included in common equity Tier 1 capital since then.
3) Regulatory standards for 2020: 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.

Commercial banks' capital adequacy ratio dropped during the first half of this year due to an expanding credit supply driven by an increase in corporate loans. However, starting in September 2020 as many banks adopted the Basel III counterparty credit risk reforms, credit risk was sharply lowered, raising the capital adequacy ratio[3)] (Figure Ⅰ-3). Since this rise in capital adequacy ratio is the result of regulatory reforms, rather than that of an actual improvement in loss absorption capacity, banks need to continue to be prepared for an increase in credit risk,[4)] which may occur if the downturn in corporate performance continues for a prolonged period.

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



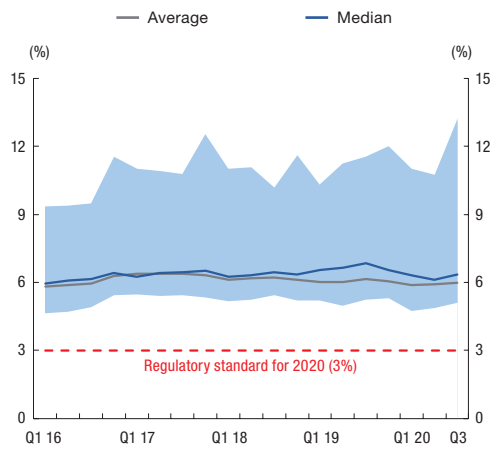
Notes: 1) End-period basis.
2) From Q4 2016, Common Equity Tier 1 capital includes loan loss reserves.

Sources: Commercial banks' business reports.

3) The average risk weight of commercial banks, which climbed to 52.1% at the end of June 2020 from 50.9% at the end of 2019, edged down to 46.6% at the end of September. This was mainly because of the adoption of new credit risk rules under the Basel III reforms in seven commercial banks, including three nationwide banks (Kookmin, Shinhan, Woori), which lowered the risk weight on loans such as corporate loans. The capital adequacy ratio improved as the lower risk weight raised it (+1.38%p) by more than the increase in total assets lowered it (-1.06%). The growth in retained earnings during this period, in tandem with the increase in total capital (9.1 trillion won) as a result of capital expansion by internet-only banks, also contributed to the improvement of the capital adequacy ratio (+1.03%p).

At the end of the third quarter of 2020, commercial banks' leverage ratio[5] fell by 0.05%p from the end of the previous year (6.05%) to 6.00%. This drop was mainly the result of an increase in household and corporate loans, which raised banks' total exposure. However, the leverage ratio still remains well above the regulatory minimum requirement (3%) for all banks (Figure Ⅰ-4).

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.

Generally satisfactory liquidity response capacity

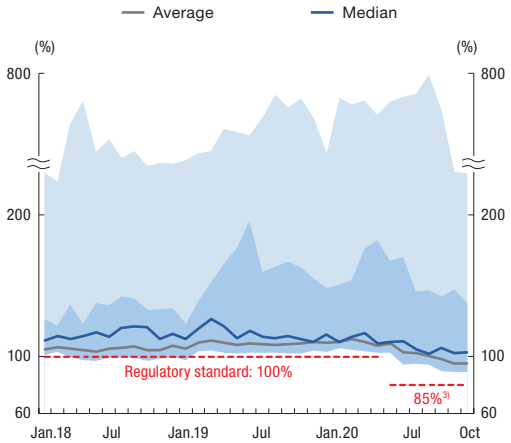
At the end of October 2020, banks' liquidity coverage ratio (LCR) stood at 95.0%, down 15.4%p from the end of the previous year (110.4%). This drop was primarily due to a rise in corporate deposits, most often reserve funds with a high runoff rate, which lifted banks' total net cash outflows.[6] Nevertheless, the LCR has stayed significantly above the regulatory minimum (temporarily lowered from 100% → 85% for the period April 2020 through March 2021) for all banks[7] (Figure Ⅰ-5).

4) If the current real economic downturn continues in the long term under the impact of the COVID-19 pandemic, the default risk on corporate loans, which sharply expanded this year, could increase. The possibility of a spike in credit risk cannot be ruled out especially if concerns about the deteriorating performance of SMEs come to a head when the current relief measures expire, resulting in the downgrade of their credit ratings or a worsening in financial soundness indicators related to corporate loans. For detailed information, refer to <Box 6> 「Post-COVID-19 Changes in Domestic Banks' Credit Risk and Implications」 (page 96).

5) Here, the leverage ratio means the simple Tier 1 capital ratio under the「Banking Business Supervision Regulations」. This 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. Calculated based on total exposure, the leverage ratio 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.

6) The total net cash outflow is defined as the total projected amount of cash outflow less the total projected amount of cash inflow during a 30-day period, under a specific stress scenario. The amount of cash outflow is calculated by multiplying the balance of liabilities, including deposits, by the projected runoff rate of each liability type. In the case of unsecured wholesale funding from non-financial corporations and other financial institutions, a high runoff rate in the 40-100% range is applied. In January to October this year, the rise in corporate free savings deposits (+38.1 trillion won) and other corporate deposits caused commercial banks' cash outflow to increase, pushing down the LCR.

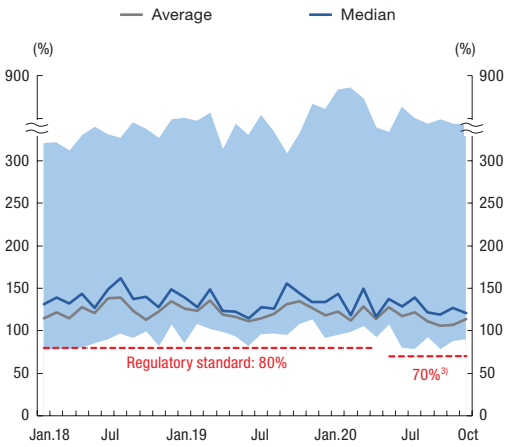
Figure Ⅰ-5. Commercial bank LCRs[1)2)]



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.
3) Temporary adjustment in place from April 2020 through March 2021.
Sources: Commercial banks' business reports.

The foreign currency LCR[8)] slipped by 8.5%p from the end of the previous year (122.7%) to 114.2% at the end of October 2020. This was mainly attributable to an increase in non-operational deposits such as foreign currency corporate deposits. However, the foreign currency LCR was still above the regulatory minimum (temporary lowered from 80% → 70% for the period April 2020 through the end of March 2021) for all banks (Figure Ⅰ-6).

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.
3) Temporary adjustment in place from April 2020 through March 2021.
Sources: Commercial banks' business reports.

Banks' net stable funding ratio (NSFR),[9)] measuring the long-term stability of their funding profiles, amounted to 110.1% at the end of the third quarter of 2020, with all banks satisfying the regulatory minimum (100%) (Table Ⅰ-1).

7) However, in the case of some banks, their LCR dropped below the minimum level recommended under Basel III (100%) as they used surplus funds from the increase in corporate deposits to expand credit supply amid the COVID-19 pandemic, rather than to increase high-quality liquid assets.
8) 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 region-based banks with only small amounts 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 liquid assets in response to the economic fallout of COVID-19, the supervisory authorities temporarily lowered the foreign currency LCR by 10%p.
9) 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).

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

(%)

	2018	2019				2020		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3
Average	113.0	112.1	111.2	111.2	113.5	110.7	110.6	110.1
Median	111.9	111.2	110.3	108.3	111.3	111.9	110.1	109.4

Notes: 1) Available stable funding / Required stable funding; end-period basis.
2) Regulatory standard for 2020 is 100%

Sources: Commercial banks' business reports.

Box 6.

Post-COVID-19 Changes in Domestic Banks' Credit Risk and Implications

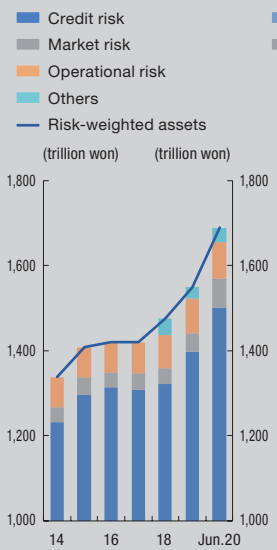
As domestic banks aggressively participated in the provision of financial support amid the COVID-19 pandemic this year, the credit supply rose sharply, driven by corporate loans. With the expansion of banks' credit exposure, if the real economy remains sluggish for an extended period of time, the credit risk of domestic banks is likely to rise quickly.

Here, the changes in the credit risk of domestic banks after the COVID-19 outbreak are reviewed, and implications are derived.

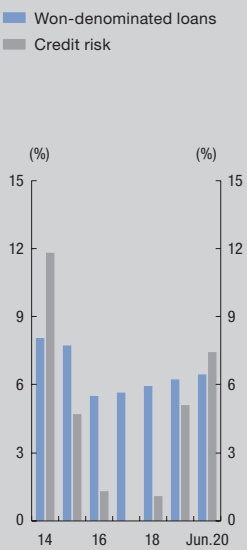
Trend of risk-weighted assets of domestic banks

As of the end of June 2020, the risk-weighted assets of domestic banks[1] rose by 139.4 trillion won compared with the end of last year, representing the largest six-month increase since the introduction of Basel Ⅲ. By component, while risk-weighted assets related to market risk and operational risk climbed by 25.4 trillion won and 2.5 trillion won, respectively, those related to credit risk soared by 103.7 trillion won. This drastic expansion of credit risk is attributed largely to the significant increase in Korean won-denominated loans in the course of the pandemic response during the first half of this year. However, as credit risk has been rising at a faster pace than Korean won-denominated loans, an in-depth examination of the change in credit risk is necessary.

Changes in composition of risk-weighted assets



Growth rates of loans and credit risk[1]



Note: 1) Year-on-year basis; compared to end-2019 for June 2020.
Sources: Financial institutions' business reports.

Status of change in credit risk after the outbreak of COVID-19

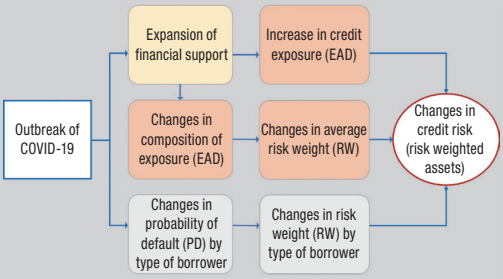
The credit risk of banks can be affected by changes in total credit exposure,[2] composition of exposure, and probability of borrower default. After the COVID-19 outbreak, banks' financial

1) Domestic banks estimate risk-weighted assets (RWA) based on credit risk, market risk, and operational risk. As of the end of June 2020, the total RWA of domestic banks reached 1,688.4 trillion won, up 9.0% from the end of the preceding year (1,549.0 trillion won). RWA related to credit risk ("credit risk" hereafter) (1,500.3 trillion won), accounting for 88.9%, is determined by multiplying banks' credit exposure by the probability of borrower default ("risk weight" hereafter).

2) Total credit exposure consists of loan exposure, financial product exposure, and overseas investment exposure. Here, the analysis is focused on loan exposure. To reflect unexpected credit loss, loan exposure includes off-balance-sheet items such as unused limits as well as on-balance-sheet items such as loans. For off-balance-sheet items, a credit conversion factor of 20% to 50% was applied to calculate exposure.

support for vulnerable borrowers increased the total credit exposure and average risk weight.

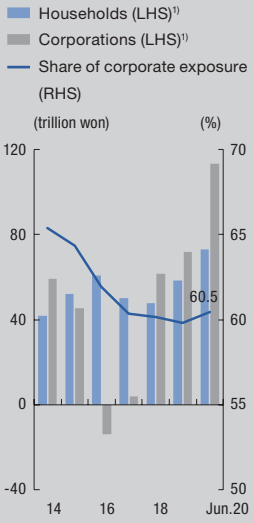
Impact of COVID-19 on credit risk



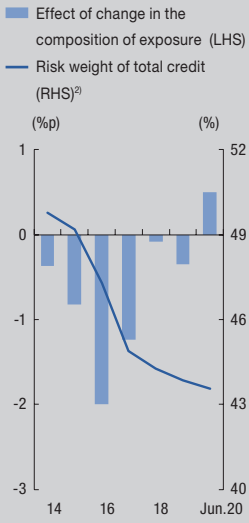
Regarding the impact of the credit supply implemented after the COVID-19 outbreak on total credit exposure, in the first half of this year, Korean won-denominated loans increased by 109.1 trillion won (6.4%) from last year, leading to an increase in total credit exposure of 254.1 trillion won (8.0%). By type of borrower, the growth of corporate loans (+81.3 trillion won) was nearly three times that of household loans (+27.3 trillion won), raising corporate loans' share of total loan exposure from 59.8% at the end of 2019 to 60.5% at the end of June 2020.

As the share of corporate exposure, which has a relatively higher risk weight,[3] has risen, the downward trend of the average risk weight of total credit exposure since 2014 has slowed.[4]

Exposure by type of borrower



Average risk weight



Notes: 1) Year-on-year increase.
2) Year-on-year basis; compared to end-2019 for June 2020.
Sources: Financial institutions' business reports.

Regarding average risk weight by firm size, large enterprises saw their risk weight rise due to the sluggishness of the real economy amid the COVID-19 pandemic. On the other hand, the average risk weight of SMEs has continued to slide, which is largely attributable to the improvement in borrowers' credit rating distribution[5] caused by the fact that financial support measures, such as maturity extension and deferral of principal and interest payments, were focused mainly on SMEs. Adding to this, the earlier-than-scheduled adoption of the revised

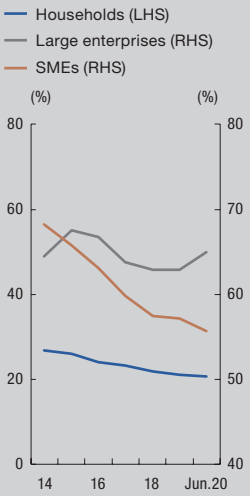
3) The share of collateralized and guaranteed loans out of corporate loans (66.4% as of the end of June 2020) is smaller than that of household loans (75.5%). Moreover, as for unsecured loans, borrowers with middle credit ratings account for a higher portion of corporate loans (63.7% as of the end of July 2020), but borrowers with high credit ratings account for a larger share of household loans (68.9%), suggesting that a higher risk weight is applied to corporate loans.

4) Due to continued low interest rates since 2014 and portfolio operation focused on safe assets, including collateralized and guaranteed loans, the average risk weight of total credit exposure had steadily declined. Despite the decline of the risk weight of individual assets (-0.7%p), the increase in the average risk weight of loan exposure associated with the growing share of corporate loans (+0.5%p) has slowed the rate of decline of total risk weight.

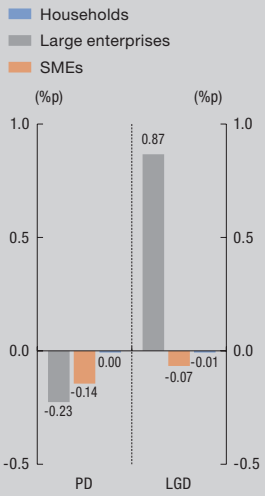
5) The government instructed banks to maintain the existing asset soundness classification standards for the deferral of principal and interest payments for SMEs hit by the pandemic. As a result, contrary to concern over the deterioration of the debt servicing capacity of borrowers, the share of SME borrowers below investment grade (grade 7) out of total SME exposure fell by 3.7%p from the end of last year.

method of calculating credit risk under Basel III in June 2020 is likely to have contributed to the decline of the risk weight for SMEs.[6)]

Risk weight by type of borrower[1)]



PD[2)] and LGD[2)] by type of borrower[1)3)]



Notes: 1) SMEs include exposure of SMEs and other retailers (SMEs), and households include exposure of residential home mortgages and other retailers (individuals).
2) Weighted average of PD and LGD by each bank and credit rating; changes as of June 2020 compared to end-2019.
3) Based on 12 banks using the internal ratings-based approach.

Sources: Financial institutions' business reports.

Examining change in domestic banks' credit risk if corporate credit risk emerges

If the real economy remains sluggish for an extended period amid the COVID-19 pandemic, corporate loans, which increased significantly this year, will likely see an even higher probability of default. In particular, if various financial support measures are terminated, concern over a slump in corporate earnings will be heightened, leading to credit rating downgrades and the deterioration of the soundness indicators of corporate loans.

To assess this, the change in banks' credit risk was estimated in the event that the distribution of corporate credit ratings worsens to the level seen at the end of 2015,[7)] when concern over corporate debt defaults peaked after the global financial crisis.

For reference, risk weights by type of borrowers are estimated using either the standardized approach[8)] or internal ratings-based approach (IRB),[9)] depending on the individual bank's risk

6) As part of the relaxation of regulations on banks implemented to cope with the COVID-19 pandemic (April 16), the government decided to introduce the revised method of credit risk estimation under Basel III earlier than planned, in June 2020 rather than in January 2022. The revised credit risk estimation method includes downward adjustment of the risk weight for loans to unrated SMEs (standardized approach) and downward adjustment of LGD for corporate loan default (internal ratings-based approach). In line with the preparations made by each bank, two banks began to apply the revised method of Basel III at the end of June 2020, followed by nine banks at the end of September, with four additional banks expected to apply it in the first half of 2021.

7) In 2015, there was heightened concern over corporate debt, especially in the shipbuilding and shipping industries. At the end of 2015, the substandard-or-below loan ratio extended to large enterprises and SMEs stood at 4.05% and 1.64%, respectively, which are 2.71%p and 0.81%p higher than the 1.34% and 0.83% recorded at the end of June 2020.

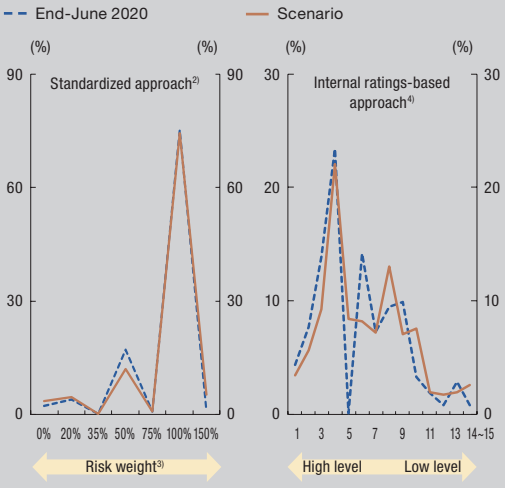
8) As per the standardized approach, risk weights of 20% to 150% are used depending on borrowers' credit ratings, but a risk weight of zero is applied for loans guaranteed by the government. If financial support, such as government guarantees, continues to be provided amid COVID-19, the share of exposure with zero risk weight is likely to remain at the current level (47.4%). Under the scenario, however, the share of exposures with zero risk (28.0%) recorded at the end of 2015 was used for the estimation, in consideration of the fact that the government guarantees may be terminated.

9) For banks using the internal ratings-based approach, with the probability of default (PD) as per crediting and loss given default (LGD) fixed, the change in risk-weighted assets responding to the change in exposure distribution by credit rating was estimated. Meanwhile, the downgrade of corporate credit ratings impacts PD, raising the expected credit loss and loan loss provisions, which thus increases loan loss expenses and reduces profitability, ultimately leading to an additional decline of the capital ratio. However, this analysis did not reflect such effects.

management capacity. The standardized approach uses credit ratings assessed by credit rating agencies to apply risk weights for borrowers. The internal ratings-based approach, on the other hand, calculates the risk weights of borrowers by allowing banks to use their own models to estimate the probability of default and loss given default (LGD) based on borrowers' credit ratings.

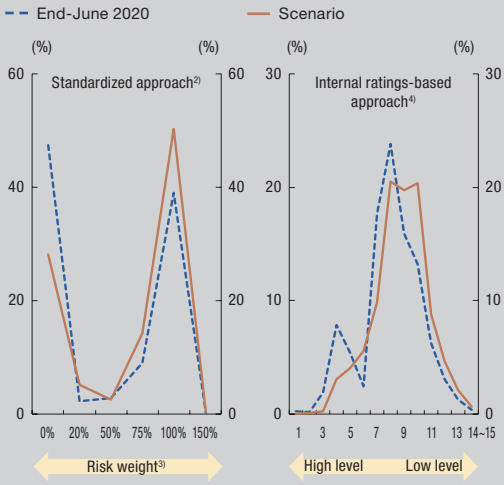
According to the risk weight calculation methods used by banks (standardized approach: 5 banks; internal ratings-based approach: 12 banks), changes in the credit risks of large enterprises and SMEs are measured.

Scenario in case of emergence of large enterprises' credit risk[1)]



Notes: 1) The distribution of large enterprises' credit ratings at end-December 2015 is assumed.
2) Based on 5 banks using the standardized approach.
3) Applied weight of 20%, 50%, 75%, 100%, 150% by credit rating.
4) Based on 12 banks using the internal ratings-based approach.
Sources: Financial institutions' business reports.

Scenario in case of emergence of SMEs' credit risk[1)]



Notes: 1) The distribution of SMEs' credit ratings at end-December 2015 is assumed.
2) Based on 5 banks using the standardized approach.
3) Applied weight of 20%, 50%, 75%, 100%, 150% by credit rating for small and medium-sized corporations & wholesale sole proprietors, 100% for SMEs with no rating, and 75% for retail sole proprietors.
4) Based on 12 banks using the internal ratings-based approach.
Sources: Financial institutions' business reports.

The estimation results showed that, for large enterprises, credit risk rose by 0.1% (2.0 trillion won) due to the adjustment of credit ratings, reducing the total capital ratio of the 17 domestic banks by 0.02%p.[10)]

On the other hand, as for SMEs, credit risk increased by 3.4% (56.9 trillion won), lowering the total capital ratio of the 17 domestic banks by 0.47%p.[11)]

In summary, if the distribution of credit ratings worsens to the level seen at the end of 2015 as the credit risk of businesses increases, the cred-

10) For the five banks that use the standardized approach, total credit risk increased by 4.7 trillion won (4.0%), and the total capital adequacy ratio (average of five banks) fell by 0.43%p. Meanwhile, the 12 banks that use the internal ratings-based approach saw their total credit risk decrease by 2.7 trillion won (1.5%) and total capital ratio (average of 12 banks) climb by 0.03%p.

it risk of lending to SMEs will likely increase more significantly than that of loans extended to large enterprises.[12] Given that corporate earnings are in a slump due to the protracted COVID-19 pandemic, the impact of SMEs' credit risk may have been underestimated in the current assessment of banks' capital adequacy.

Result of scenario analysis[1]

(trillion won, %p)

	Large enterprises		SMEs	
	Risk-weighted asset by credit risk	BIS total capital ratio	Risk-weighted asset by credit risk	BIS total capital ratio
Domestic banks (17 banks)	+2.0 (+0.1%)	-0.02	+56.9 (+3.4%)	-0.47
Internal ratings-based approach (12 banks)	-2.7 (-1.5%)	+0.03	+46.4 (+3.1%)	-0.44
Standardized approach (5 banks)	+4.7 (+4.0%)	-0.43	+10.4 (+6.6%)	-0.92

Note: 1) Changes compared to end-June 2020.
Sources: Financial institutions' business reports.

Implications

Domestic banks have maintained a capital adequacy level that exceeds the regulatory ratios by a large margin through risk management focused on extending low-risk loans, such as household loans and collateralized/guaranteed loans. Against this backdrop, banks were able to actively supply credit to cope with the COVID-19 pandemic this year, increasing the credit risk of banks as a result. However, to ensure banks are able to perform financial intermediation smoothly going forward, the following points need to be noted.

If corporate loans continue growing, the credit risk of total assets could climb, given the situation observed in 2015. In particular, regarding loans to SMEs, it should be noted that the credit risk of borrowers may have been underestimated because credit rating adjustment did not occur due to the financial support measures implemented this year.

Moreover, to avoid a rapid decline of the capital adequacy ratio, the regulations on banks' capital adequacy were relaxed. As a result, banks' capacity to extend loans to support the real economy was bolstered, but their ability to respond to crisis over a long-term horizon may have been weakened.[13]

Domestic banks need to take note of these considerations and strengthen their efforts to increase resilience by replenishing the capital and liquidity that were consumed to support the real economy amid the COVID-19 pandemic.

11) For the five banks that use the standardized approach, the average risk weight rose by 15.8%p, total credit risk expanded by 10.4 trillion won (6.6%), and the total capital ratio (average of five banks) fell by 0.92%p. For the 12 banks that use the internal ratings-based approach, the weighted-average PD for SMEs rose by 1.32%p and the average risk weight (RW) increased by 6.21%p, leading to total credit risk climbing by 46.4 trillion won (3.1%) and the total capital ratio (average of 12 banks) falling by 0.44%p.

12) As of the end of September 2020, domestic banks' loans extended to large enterprises amounted to 189.5 trillion won, while loans issued to SMEs reached 819.0 trillion won, or about four times the loans extended to large enterprises.

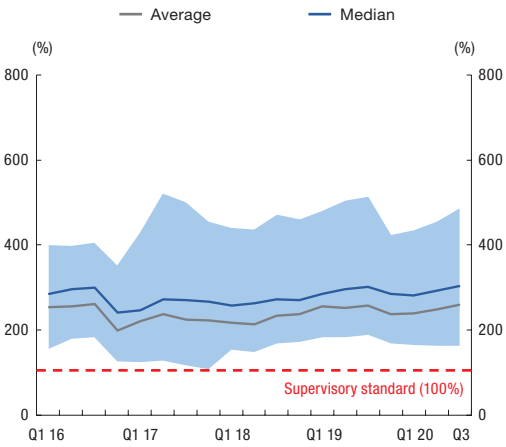
13) The government allowed banks to apply revised provisions on the credit risk calculation under Basel III earlier than planned in order to reduce the risk weights for certain borrower types, such as SMEs. As a result, the capital ratio of domestic banks is estimated to have risen by an average of 1.91%p. In October 2020, the IMF pointed out that, although the responses of policy authorities of major economies to expand banks' credit supply capacities after the COVID-19 outbreak contributed to preventing the rapid decline of banks' capital adequacy ratio, a prolonged slump of the real economy will make banks more vulnerable by undermining their loss-absorption capacities.

2. Non-Bank Financial Institutions

Satisfactory level of resilience

At the end of the third quarter of 2020, life insurance companies' risk-based capital (RBC) ratio,[10] an indicator of loss absorption capacity, stood at 303.5%,[11] representing an increase of 18.9%p from the end of the previous year (284.6%) (Figure Ⅰ-7).

Figure Ⅰ-7. Life insurance company risk-based capital (RBC) ratios[1]

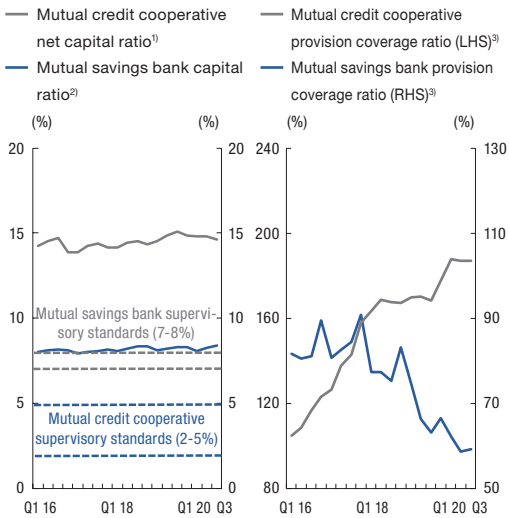


Note: 1) Amount of available capital / Amount of required capital; shaded area indicates highest and lowest value of RBC ratios among companies with assets of more than 1 trillion won.
Sources: Financial institutions' business reports.

The net capital ratio of mutual credit cooperatives edged up by 0.1%p from the end of the previous year (8.3%) to 8.4% at the end of the third quarter of 2020, while the provision coverage ratio fell by 14.6%p from the end of the previous year (113.1%) to 98.5% on the rise in substandard-or-below loans.

The BIS capital ratio of mutual savings banks fell by 0.2%p from the end of the previous year (14.8%) to 14.6% at the end of the third quarter of 2020,[12] whereas the provision coverage ratio (103.6%) showed an increase of 4.7%p from the end of the previous year (98.9%) (Figure Ⅰ-8).

Figure Ⅰ-8. Mutual credit cooperative and mutual savings bank resilience indicators



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

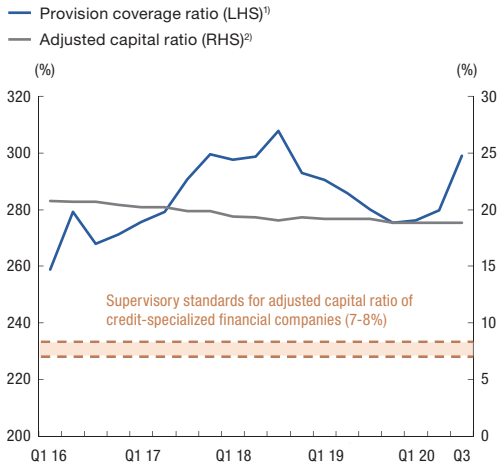
10) The RBC ratio is the amount of available capital divided by required capital. Required capital, the denominator, is calculated by measuring the total amount of insurance risk, interest rate risk, credit risk, market risk, and operational risk.

11) At the end of the third quarter of 2020, general insurance companies' RBC ratio stood at 247.7%, up 6.6%p from the end of 2019.

12) The risk-weighted assets of mutual savings banks were lifted by the brisk loan growth in recent months to 72.7 trillion won at the third quarter of 2020, representing an increase of 13.3% from the end of the previous year, which is slightly above the rate of increase in capital (11.6%) during the same period.

At the end of the third quarter of 2020, the adjusted capital ratio of credit-specialized financial companies remained unchanged from the end of 2019 at 18.8%. The provision coverage ratio jumped 23.7%p from the end of 2019 (275.2%) to 298.9% (Figure Ⅰ-9).

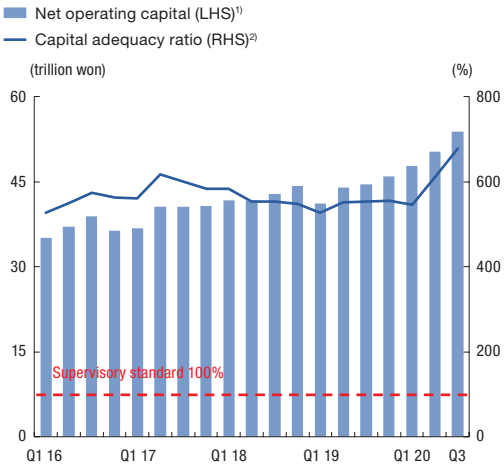
Figure Ⅰ-9. Credit-specialized financial company resilience indicators



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.

The net capital ratio of securities companies increased massively by 121.4%p from the end of the previous year (555.9%) to 677.3% at the end of the third quarter of 2020, buoyed by the increased revenue from consignment sales of stocks and the expansion in subordinated debt issuances[13] (Figure Ⅰ-10).

Figure Ⅰ-10. Securities company resilience indicators



Notes: 1) Net assets minus tangible assets, etc, plus subordinated bonds, etc.
2) (Net operating capital - total risk) / Required maintenance equity
Sources: Financial institutions' business reports.

Since NBFIs tend to have a high share of vulnerable borrowers compared to banks and there is a great disparity between financial institutions in terms of capital adequacy ratio,[14] efforts must be made to build up capital buffers to prepare for the possibility of a protracted economic downturn, which is especially important for institutions with a lower loss absorption capacity.

13) In the first to third quarters of 2020, the balance of subordinate debt issues increased 39.5% (annual rate), far exceeding the annual average rate of increase in 2016-2019 (5.9%).

14) By type of NBFI, at the end of the third quarter of 2020, the range of the capital adequacy ratio was 5.0-20.4% for mutual credit cooperatives (Nonghyup), 162.5-486.4% for insurance companies (1 trillion won or more in assets; the same hereafter), 10.5-18.0% for mutual savings banks, 11.9-32.9% for credit-specialized financial companies and 225.6-2,032.1% for securities companies.

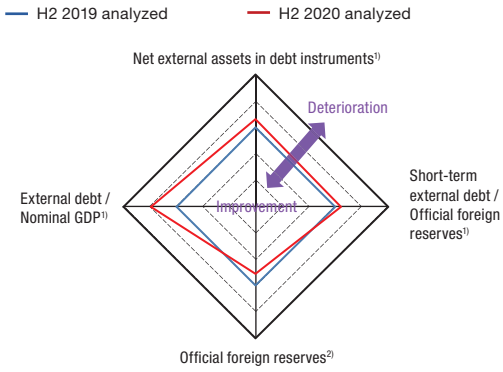
Ⅱ. External Payment Capacity

Korea's external payment capacity showed a brief weakening after the introduction of foreign exchange market stabilization measures at the onset of the COVID-19 pandemic, but later returned to a stable level on the sharp increase in official foreign reserves.

Net external assets fell from the same period of last year as growth in external debt outpaced growth in external assets. However, this increase in external debt, much of which is accounted for by an increase in foreigners' portfolio investment in domestic bonds, does not appear to have had a negative impact on Korea's external debt soundness. The external debt-to-nominal GDP ratio inched higher, while the ratio of short-term external debt relative to total external debt dropped slightly.

The official foreign reserves soared to 436.4 billion dollars at the end of November 2020, but the ratio of short-term external debt relative to official foreign reserves showed a marginal year-on-year increase at the end of the third quarter (Figure Ⅱ-1).

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

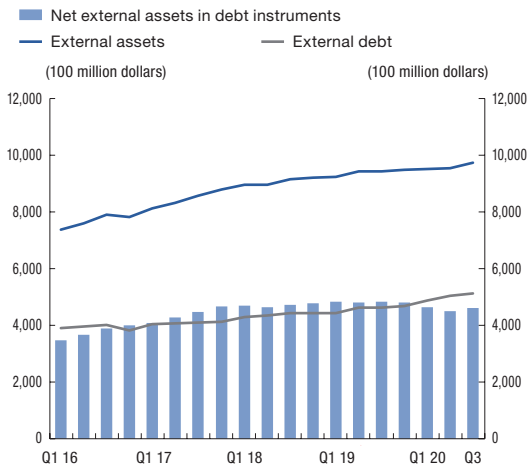


Notes: 1) Extent of change as of end-Q3 2020 compared to end-Q3 2019 indexed.
2) Extent of change as of end-November 2020 compared to end-December 2019 indexed.
Source: Bank of Korea.

Moderate drop in net external assets

At the end of the third quarter of 2020, Korea's net external assets (external assets - external debt) amounted to 461.4 billion dollars. Although this represents a year-on-year decrease of 4.3% (-20.7 billion dollars), it is an increase from the previous quarter (Figure Ⅱ-2).

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

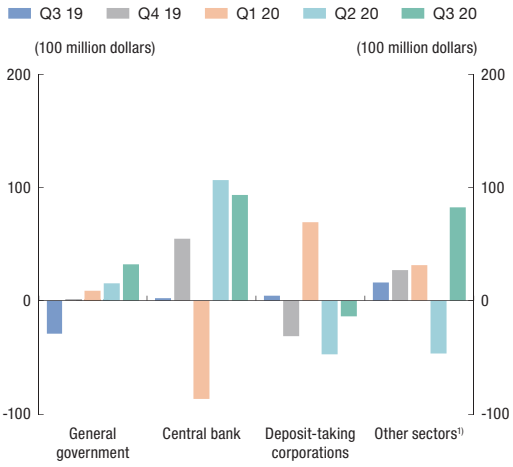


Note: 1) End-quarter balance basis.
Source: Bank of Korea.

External assets rose 3.2% (+30.1 billion dollars) year on year to 972.4 billion dollars at the end of the third quarter of 2020.

In the second to third quarters of this year, the change in external assets (+22.3 billion dollars) breaks down by sector to an increase of 4.8 billion dollars for general government and 3.6 billion dollars for other sectors. The central bank's external assets also expanded by 20 billion dollars on a steep rise in official foreign reserves. On the other hand, the external assets of deposit-taking corporations declined by 6.1 billion dollars (Figure Ⅱ-3).

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

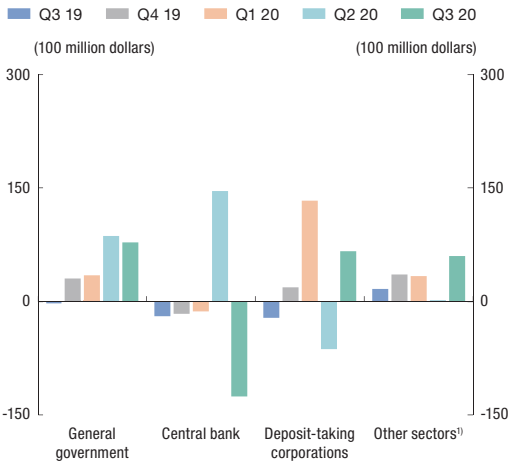


Note: 1) Including other financial corporations (securities companies, asset management companies, insurance companies, etc.) and non-financial corporations.
Source: Bank of Korea.

At the end of the third quarter, external debt stood at 511.0 billion dollars, representing a year-on-year increase of 11.0% (+50.8 billion dollars).

In the second to third quarters of this year, much of the change in external debt (+25.1 billion dollars) was driven by general government, which added 16.5 billion dollars' worth of liabilities on the rise in foreigners' portfolio investment in domestic bonds. The central bank's external debt, which was sharply increased during the second quarter by the proceeds of the Korea-US currency swap deal, decreased during the third quarter as the funds were repaid. The external debt of deposit-taking corporations and other sectors rose by 0.3 billion and 6.2 billion dollars, respectively (Figure Ⅱ-4).

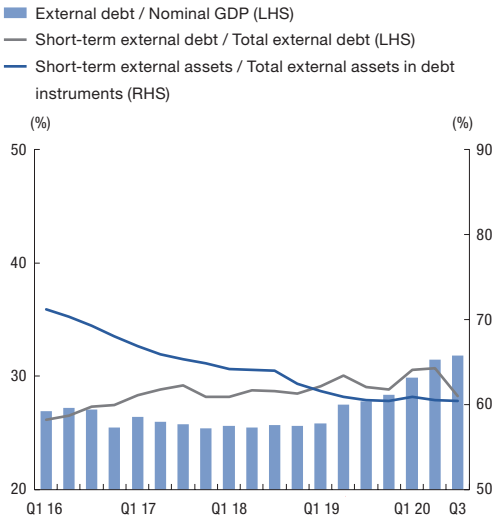
Figure Ⅱ-4. Changes in external debt, by sector



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 third quarter of 2020, the ratio of external debt relative to nominal GDP climbed to 31.8% from the same period of the previous year (27.8%). The share of short-term external debt in total external debt fell to 28.2% from the same period a year ago (29.0%). The share of short-term assets in total external assets stood at 60.4%, virtually unchanged from the same period of the previous year (60.5%) (Figure Ⅱ-5).

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

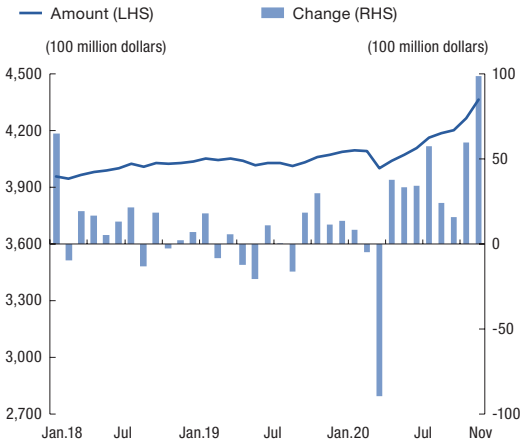


Note: 1) End-quarter basis.
Source: Bank of Korea.

Steep rise in official foreign reserves

As of the end of November 2020, Korea's official foreign reserves stood at 436.4 billion dollars, a massive increase of 27.6 billion dollars from the end of 2019. The steady growth in investment income from foreign currency assets contributed to this result, together with the issuance of foreign currency-denominated Foreign Exchange Market Stabilization Bonds and the recent weakness of the US dollar which increased the conversion value of assets denominated in other currencies such as the euro and the Japanese yen (Figure Ⅱ-6).

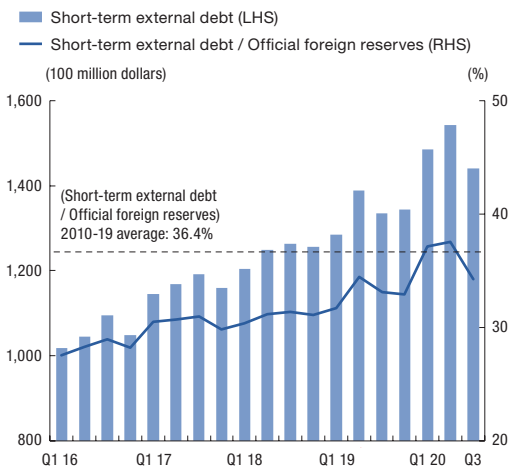
Figure Ⅱ-6. Balance of and changes in official foreign reserves[1]



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

Meanwhile, the ratio of short-term external debt relative to official foreign reserves edged up by 1.2%p from the same period of 2019 (33.1%) to 34.3% at the end of the third quarter of 2020, but remained below the average of previous years (36.4% in 2010-2019) (Figure Ⅱ-7).

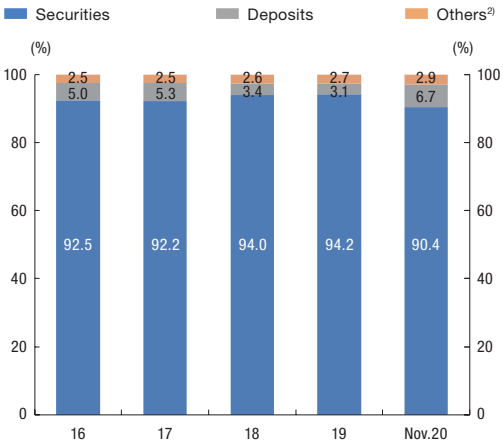
Figure Ⅱ-7. Short-term external debt-to-official foreign reserves ratio[1]



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

As for the composition of the official foreign reserves at of the end of November 2020, the majority was accounted for by securities (90.4%) and deposits (6.7%). Securities consisted 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 transfer by individuals and companies. On October 12, 2020, the next-generation BOK-Wire+ with improved settlement methods and settlement accounts was rolled out upon completion of a five-year development project. It is expected to substantially enhance the security of the settlement systems and the overall efficiency of settlement.

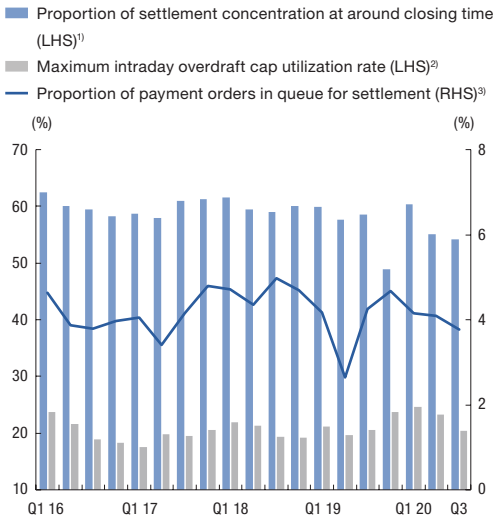
Going forward, to prepare for the possibility of a prolonged COVID-19 pandemic,[1] continuous efforts to ensure the stability of payment and settlement systems will be necessary for smooth functioning of the systems.

BOK-Wire+

During the third quarter of 2020, the daily average amount of settlement through BOK-Wire+, which provides final settlement of mutual obligations between financial institutions, reached 403.9 trillion won, continuing the upward trend from the previous year (369.9 trillion won), while 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 stable at levels of 20.4% and 3.8%, respectively, during this period. Of the total settlement amount, the portion settled near the closing time (16:00-17:30) decreased to 54.2% from the same period of the previous year (58.6%) (Figure Ⅲ-1).

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

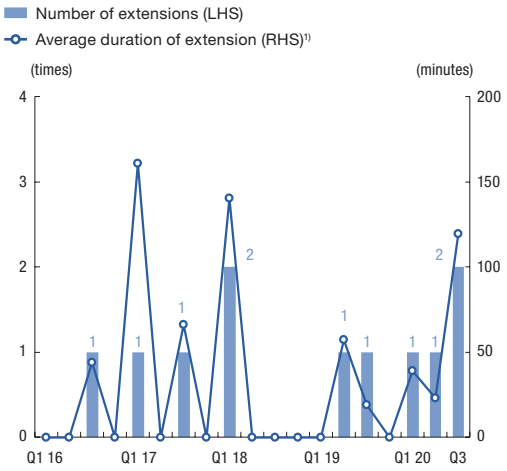


Notes: 1) Amount of settlement processed after 16:00 / Total settlement amount during the period.
2) Daily average rate of maximum utilization of participants' intraday overdraft caps.
3) Average ratio of the amount of participants' payment orders in queue for settlement / Total settlement amount (excluding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

Meanwhile, during the third quarter of 2020, BOK-Wire+'s operating hours were extended twice, due in part to repo purchases that took place on the last day by which banks are required to deposit their reserves (Figure Ⅲ-2).

1) The widespread shift to work-from-home amid the pandemic, coupled with the accelerated digital transition in finance, is giving rise to growing concerns about cyberattacks. For detailed information, refer to <Box 7> 「Post-COVID-19 Cyber Risk Response in Major Countries and Implications」 (page 111).

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



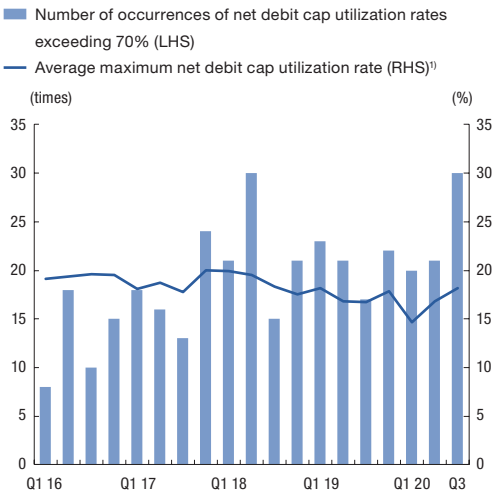
Note: 1) Total duration of extension / Number of extensions during the quarter.
Source: Bank of Korea.

Retail payment systems

In the third quarter of 2020, the daily average amount of settlement through the retail payment systems, operated by Korea Financial Telecommunications and Clearings Institute, stood at 82.4 trillion won. Amid this massive increase from last year (69.4 trillion won), driven by the increase in electronic funds transfers by individuals and companies, related settlement risks were managed smoothly overall.

Among retail payment system-related risk indicators, the net debit cap[2] utilization rate of net settlement participants exceeded the cautionary level (70%) 30 times during the third quarter, a noticeable increase from the same period last year (17 times), caused by large amounts of funds transferred in connection with IPO subscriptions and refunds. The average maximum net debit cap utilization rate, although recording a slight increase from the same period last year (16.8%) to 18.2%, was managed adequately (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 been managed stably in the securities settlement systems operated by Korea Exchange and Korea Securities Depository amid the continuous increase in the amount of settlement. The daily average amount of settlement reached 191.2 trillion won during the third quarter of 2020 as the upward trend persisted from last year (186.4

2) In the retail payment systems, including the CD Network System, the Interbank Remittance System and the Electronic Banking System, a transaction payee is paid immediately but the credits and debits between financial institutions, arising from this payment, are settled on the following business day at the designated time (11:00) through BOK-Wire+. As this results in the provision of credit between financial institutions, to control related 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.

trillion won), centered on inter-institutional repo transactions.

During the third quarter of 2020, settlements on transactions in exchange-traded stocks and exchange-traded government bonds, as well as OTC stock transactions by institutional investors, were completed by their respective deadlines (16:00, 17:00, 16:50) (Table Ⅲ-1).

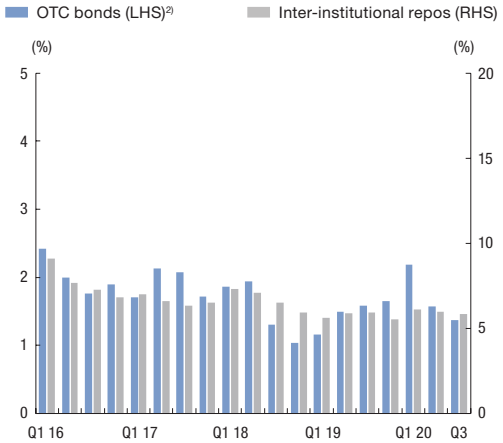
Table Ⅲ-1. Proportions of securities settlement completed after the deadline

	Penalty deadline[1]	Proportions of payments (%)				
		2019		2020		
		Q3	Q4	Q1	Q2	Q3
Exchange-traded stocks	16:00	-	-	-	-	-
Exchange-traded government bonds	17:00	-	-	-	-	-
Institutional investors for OTC stocks	16:50	-	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 maintained stable levels of 1.4% and 5.8%, respectively, during the third quarter of 2020 (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[3]

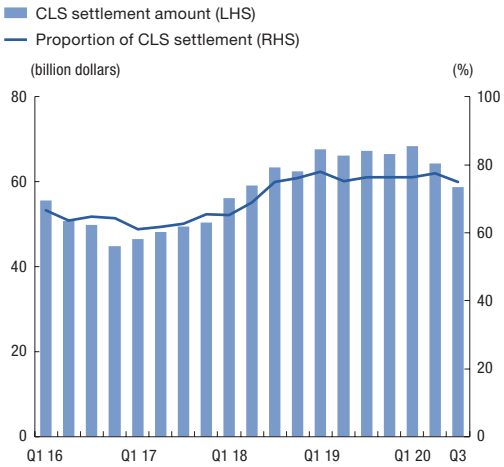
During the third quarter of 2020, the daily average amount of settlement through the foreign exchange payment-versus-payment (PvP) system operated by CLS Bank (the CLS system)[4] decreased somewhat from 2019 (66.90 billion dollars) to 58.77 billion dollars.

As PvP settlement via the CLS system accounted for a continuously high share in total foreign exchange settlement of 74.9% during this period, related settlement risks appear to have stayed at a stable level (Figure Ⅲ-5).

3) Foreign exchange settlements are conducted through the interbank correspondent network, the PvP 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.

4) 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, 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 large-value payment systems (including BOK-Wire+) run by central banks issuing the 18 CLS settlement currencies.

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.

Post-COVID-19 Cyber Risk Response in Major Countries and Implications

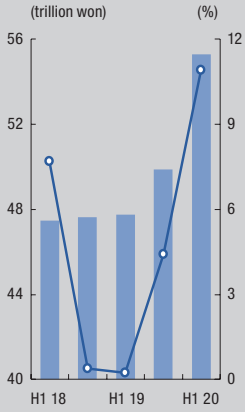
With the expansion of remote work and acceleration of digital transformation in the financial sector amid the COVID-19 pandemic, the potential for cyberattacks is surging. Cyber risks[1] can affect financial stability[2] through various channels, reducing the stability of financial transactions due to data loss and undermining confidence in the financial system overall. Thus, growing attention has been paid[3] to cyber risks since the outbreak of the coronavirus, and the financial supervisory authorities of various countries have reviewed related circumstances and implemented measures. Here, responses to cyber risks taken by major economies after the outbreak of COVID-19 are reviewed, and implications are derived.

Status of cyber risks after COVID-19

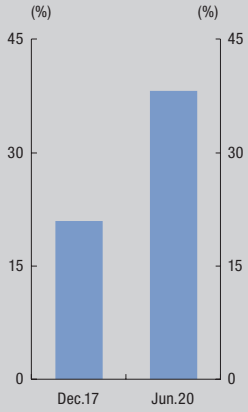
The preference for contactless transactions amid COVID-19 and rise of remote work are accelerating the ongoing digitalization of financial services and use of third-party service providers.[4] This year, as a result of the increase in online transactions, the use of digital-based financial services such as electronic payment services, funds transfers and loan applications through Internet banking has increased.[5] Furthermore, the use of third-party service providers has further increased along with cloud computing for remote work.[6]

1) Though there is no commonly agreed definition of cyber risk, it refers to the threat of financial loss, disruption, and/or reputational damage from a malicious breach of an entity's information systems ("Financial Stability Review," Reserve Bank of Australia, 2018).
2) The Bank of England argued that cyber risk has several features in common with systemic risk (triggered via external shocks, gradual buildup, impact on all or parts of the financial system, transmission and expansion of risks through interconnectedness between institutions, amplification of shocks due to change in behavior of market participants as a result of reduced confidence in the financial sector, and negative impact of failure of financial service supply on the real economy) ("Quarterly Bulletin," Bank of England, Q4 2018).
3) Central banks such as the Bank of Canada and European Central Bank have mentioned in their financial stability reports and other publications that COVID-19 could increase financial institutions' exposure to cyber threats, and the Financial Policy Committee (FPC) of the Bank of England listed cyber security and payments as two priority areas to promote operational resilience after the COVID-19 outbreak.
4) External entities such as cloud computing service providers and consultants that have a business arrangement with financial institutions.
5) According to a McKinsey survey of European consumer sentiment, after the COVID-19 outbreak, the banking sector commanded the highest digital service usage rate (77%), of which those using digital banking services for the first time since the onset of the coronavirus pandemic accounted for 23%.
6) On the global front, based on data on about 30 million firms that use security platforms of the global security software company McAfee, the use of cloud services in tandem with the expansion of remote work was investigated. Between January and April 2020, the use of cloud computing services rose by 50% in all industries, and increased by 36% in the financial services sector.

Use of Internet banking services



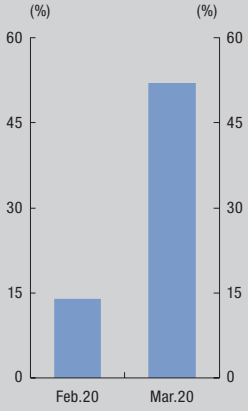
Use of cloud computing in financial sector2)



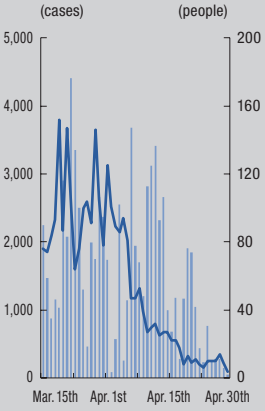
Notes: 1) Compared to previous quarters.
2) Survey of 110 major financial institutions (banks, securities, insurance, etc.) on current status of use.
Sources: Bank of Korea, Financial Supervisory Service.

Under these circumstances, the number of cyberattacks against the financial sector has continuously increased, especially after the outbreak of COVID-19 earlier this year. In particular, cyberattacks such as malicious emails using “COVID-19” as a keyword have increased globally along with the increase in confirmed cases. In the domestic financial sector, a daily average of 1,500 (from March 15 to April 30) COVID-19-related malicious emails that spread malicious code or links to phishing websites purporting to sell face masks or requesting donations for the WHO were detected.

Cyberattacks against global financial sector1)



COVID-19-related malicious emails in domestic financial sector2)



Notes: 1) Share of attacks against financial service sector in total cyber attacks calculated using data of VMware Carbon Black security cloud.
2) Number of malicious mails detected by financial securities operations center of Financial Security Institute.
Sources: Financial Security Institute, VMware Carbon Black, Ministry of Health and Welfare

Cyberattacks have resulted in the leakage of the information of both financial institutions’ systems and financial service users, as well as the theft of funds. However, there have been no cases of serious monetary loss in Korea.

Cases of cyber risk home and abroad

Domestic	• Theft of funds by showing manipulated stock prices in fake securities company HTS and inducing users to invest more (November 20)
	• Illegal payments amounting to 10 million won occurred at domestic Fintech companies (KakaoPay, Toss, etc.) (June - September 2020)
	• Fraudsters, pretending to provide COVID-19-related government support loans to sole proprietors, induced victims to install remote programs on their phones and stole the funds (April 2020)
Overseas	• At American Bank Systems (ABS), which provides operational services to financial institutions, information of financial institutions and financial service users was leaked following a ransomware attack (October 2020)
	• At Dave, an Internet bank in the United States, information of its service users was leaked following a cyber incident involving a third-party service provider (July 2020)
	• In the United States, theft of funds occurred through fake text messages pretending to be from the Internal Revenue Service that purported to provide COVID-19-related support funds (June 2020)
	• In England, fraud using Internet and mobile banking reached 0.6 trillion won in 2019 (2019)

Sources: Financial Supervisory Service, central banks.

Responses of major economies and international organizations

Major economies and international organizations have taken various measures to enhance cyber resilience in response to the growing cyber risks after the COVID-19 pandemic.

(Announcement of cyber resilience-related guidelines)

The financial supervisory authorities of major economies and international organizations announced guidelines for the cyber resilience of financial institutions.

First, they prepared guidelines for Business Continuity Plans (BCPs) amid the pandemic. The Federal Financial Institutions Examination Council[7] (FFIEC) of the United States issued pandemic planning guidance to remind financial institutions that their BCPs should provide for a preventive program including coordination with third-party service providers and employee education, a strategy scaled to the stages of a pandemic outbreak, a BCP testing program, and updating of internal procedures or systems including remote working.

Next, guidelines on governance related to the cyber security of financial institutions, ex ante and ex post responses, and means of recovery were announced. Recently, the Financial Stability Board (FSB) stressed that, in light of the COVID-19 pandemic, remote working environments have heightened the need for attention on cyber incidents, and unveiled8) a guideline for cyber incident response and recovery for financial authorities and financial institutions. In particular, the guideline contained detailed governance considerations, including a clear definition of the structure and responsibilities of organizations in charge. Amid the increase in remote work and potential rise of cyberattacks, the ECB recommended that financial institutions review their existing IT infrastructure and assess risks of financial fraud targeting customers and financial institutions.

7) The council consists of the Board of Governors of the Federal Reserve System (FRB), Federal Deposit Insurance Corporation (FDIC), National Credit Union Administration (NCUA), Office of the Comptroller of the Currency (OCC), Consumer Financial Protection Bureau (CFPB), and State Liaison Committee (SLC).

8) "Effective Practices for Cyber Incident Response and Recovery," FSB, October 2020.

FSB's guideline[1] for cyber incident response and recovery (CIRR)

Components	Summary
Governance	• Clearly define the roles and responsibilities for the board, senior management, and all departments that are involved in CIRR activities, as well as having clear and direct reporting lines • Allocate sufficient budget to CIRR
Planning & Preparation	• Stress tests based on cyber scenarios • Risk management across the supply chain including third-party service providers and technology solution vendors
Analysis	• Identify the severity, impact and root cause of cyber incidents by conducting analysis, including forensic analysis
Mitigation	• Activate containment measures best suited to each type of cyber incident • Business continuity plan for maintaining critical operations
Restoration & Recovery	• Prioritize recovery activities, and restore data and systems based on approved restoration procedure
Coordination & Communication	• Timely report to relevant stakeholders within the organization and the authorities • Share trusted information through cross-border coordination and media engagement
Improvement	• Improve CIRR activities and capabilities through lessons learnt from post-incident analysis, exercises and tests.

Note: 1) The guideline comprises 7 components and 49 effective practices.
Source: Financial Stability Board.

Meanwhile, financial supervisory guidelines related to the responses of financial institutions were also presented. The US financial supervisory authorities recommended through joint guidance that the assessment of cyber security-related measures amid the COVID-19 pandemic be incorporated into the management component of the CAMELS rating system to assess the overall condition of banks.

(Information sharing[9])

Major economies are sharing information related to cyber risks through consultative bodies of financial supervisory authorities and private financial infrastructure operating institutions.

In particular, the Euro Cyber Resilience Board (ECRB), chaired by the ECB, created the Cyber Information and Intelligence Sharing Initiative (CIISI-EU)[10] to promote information-sharing between core financial infrastructure operating institutions and cyber security-related institutions. The Canadian Financial Sector Resiliency Group (CFRG),[11] led by the Bank of Canada, has been holding biweekly meetings since the COVID-19 outbreak to share information related to cyber threats.

(Cyber risk tests of financial institutions)

Some financial supervisory authorities have recommended that financial institutions conduct cyber risk tests.

The ECB recommended[12] that banks participate

9) Pre-COVID-19 information-sharing initiatives among nations include groups and forums within regions. In Asia, the ASEAN Cyber Capacity Development Project (2019) and ASEAN-Singapore Cybersecurity Centre of Excellence (ASCCE) (2019) were launched.
10) The CIISI-EU Community is comprised of central banks, clearing houses, securities exchanges, payment system providers, and Europol.
11) The CFRG is a public-private partnership that aims to strengthen the resilience of Canada's financial sector in the face of risks to business operations. The initiative brings together the Bank of Canada, Department of Finance Canada, Office of the Superintendent of Financial Institutions (OSFI), Canada's systemically important banks, and designated Canadian financial market infrastructures (FMIs), which include the payment, clearing, and settlement systems.
12) "Are banks cyber-proof in the digital world?", ECB, October 2020.

in TIBER-EU[13] (Threat Intelligence-Based Ethical Red-teaming), which aims to assess financial institutions' preparedness by conducting simulated cyberattacks against financial institutions' core functions and systems. Participants of the test are subjected to cyberattacks similar to real-world ones and receive assessments of their capabilities to prevent, detect, and respond to cyber threats.

Implications

Cyber risk management has become increasingly important to protecting financial consumers and financial system stability while still taking advantage of the digital transformation of finance, which will continue in the post-COVID-19 era. In Korea, the status of BCP establishment and operation was reviewed, and remote work security measures were prepared. However, to ensure there are no vulnerabilities in our cyber security should the coronavirus pandemic persist for an extended period of time, BCPs and guidelines need to be continuously enhanced by referring to cases of major economies.

Furthermore, during the IT sector assessment[14] that is part of financial institutions' management assessment (CAMELS rating), the financial supervisory authorities need to closely examine responses to cyber risks that are likely to occur due to changes in the operational environment associated with the pandemic, and should conduct supervisory activities to prevent risk in advance by raising the weight of the IT sector in the assessment, if necessary.

Financial institutions themselves need to continue making their own efforts as well. Based on guidelines, etc., they should strengthen governance related to financial security and secure sufficient IT personnel and budget. Moreover, given the possibility of cross-border risk transmission, they need to actively participate in international cooperation systems and collect related information.

13) Participants of the TIBER-EU test prepared by the ECB in 2018 include people in the financial institution subject to the test, whose response capabilities are being tested without their foreknowledge (blue team), a company that looks at the range of possible threats against the given financial institution (threat intelligence provider), a company that carries out the simulated attack by attempting to compromise the critical functions of the given financial institution by mimicking a cyber attacker (red team), a small team within the target entity that is the only group aware that a test is being conducted (white team), and a team within the authority that is responsible for overseeing the test (TIBER cyber team).

14) The assessment of financial institutions' IT sector, including IT security, accounts for at least 20% of the share of internal control items or risk management items (15% each) in the management assessment.

Analysis of Financial Stability Issues

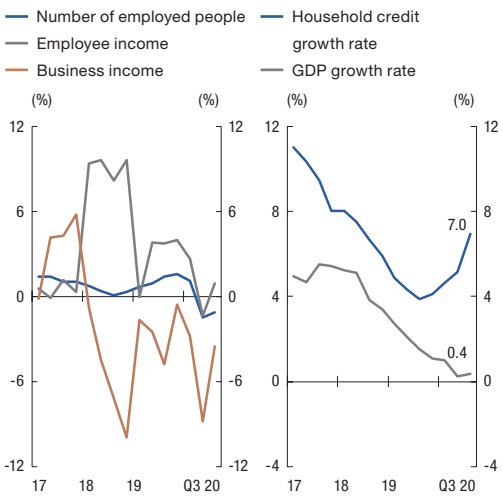
Ⅰ. Recent Changes in Household Borrowers' Debt Repayment Capacities

1. Background

Amid the prolonged COVID-19 pandemic, household debt is growing at an accelerated pace while household income conditions have deteriorated due to job insecurity and reduced sales of self-employed businesses. In the third quarter of 2020, the number of employed people decreased by 1.1% year on year, driven down by temporary or daily workers. In the same period, employee income rose by 0.9% year on year, showing a slower pace than the 2.8% recorded last year, and the business income of self-employed business owners decreased by 3.5% year on year, as a result of the social-distancing rules (Figure Ⅰ-1). On the other hand, household debt (household credit statistics basis) rose to 1,682.1 trillion won at the end of the third quarter of 2020, up 7.0% on a year-on-year basis, showing an accelerated rate of growth since the end of the previous year. This change in household debt has raised concerns over borrowers' debt repayment capacities.

This article examines changes in debt repayment capacities of household borrowers following the worsening of household income conditions and acceleration of household debt growth by using the Consumer Credit Panel.

Figure Ⅰ-1. Household income conditions and debt growth[1]



Notes: 1) Year-on-year basis.
2) Sum of nominal GDPs in quarter concerned and in immediately preceding three quarters
Sources: Bank of Korea, Korea Statistics.

2. Status of household debt

A. Share of debt by income level[1]

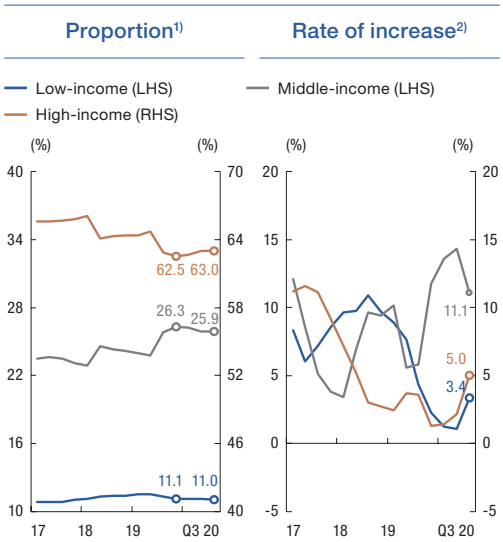
At the end of the third quarter of 2020, the share of debt owed by middle-income borrowers and high-income borrowers accounted for 25.9% and 63.0%, respectively, of the total household debt, representing a downward

1) High-income borrowers are the top 30% of borrowers based on income, and low-income borrowers are the bottom 30%, with the remaining 40% in the middle being classified as middle-income borrowers. Borrowers' income records in the Consumer Credit Panel are obtained from proof of income or from the estimates of NICE, a credit information service company.

trend for the share of high-income borrowers' debt and an upward trend for the share of middle-income borrowers' debt. However, the share of debt of high-income borrowers increased slightly (+0.5%p) this year, whereas that of low-income borrowers remained low at 11.0% (Figure I-2).

The rise in the share of middle-income borrowers' debt is attributed to the fact that the debt of middle-income borrowers has surged more than that of low-income and high-income borrowers since 2018. Given that the average debt of all borrowers has increased gradually, the increase in the share of middle-income borrowers' debt appears to be due to the increase in the number of middle-income borrowers (Table I-1).

Figure Ⅰ-2. Debt by income level



Notes: 1) Share in total debt, by income level.
2) Year-on-year basis (moving average of two quarters).
Source: Bank of Korea (Consumer Credit Panel).

Table Ⅰ-1. Average amount of debt, by income level[1)]

(10 thousand won)

	2017	2018	2019	3Q 20
Low-income	4,481	4,741	5,142	5,414
Middle-income	5,145	5,350	5,556	5,819
High-income	11,585	12,050	12,396	12,845

Note: 1) End-period basis.
Source: Bank of Korea (Consumer Credit Panel).

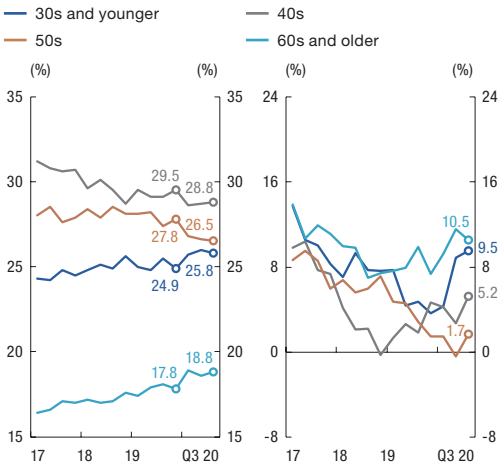
B. Share of debt by age group

By age group, the share of debt owed by borrowers in their 40s was the highest, amounting to 28.8%, despite showing a gradual downward trend. On the other hand, the share of debt held by borrowers in their 30s or younger and in their 60s or older has risen gradually because their debt is increasing faster than that of other age groups (Figure I-3).

Meanwhile, the average amount of debt held by borrowers in their 30s or younger has surged, while the average debt of borrowers in their 60s or older has shown a moderate increase (Table I-2). The main reasons for the rising debt shares of these two age groups are the increase[2)] in debt per borrower aged 30 or younger, largely affected by the increase in housing-related loans, and the rise in the number of borrowers in their 60s or older due to population aging.

2) For details on the rise of household debt of young adults in their 20s and 30s, refer to Box 1 「Recent Trends in Household Loans to Young Borrowers and Assessment」 (page 25).

Figure Ⅰ-3. Debt by age group



Notes: 1) Share in total debt, by age group.
2) Year-on-year basis (moving average of two quarters).
Source: Bank of Korea (Consumer Credit Panel).

Table Ⅰ-2. Average amount of debt, by age group1)

(10 thousand won)

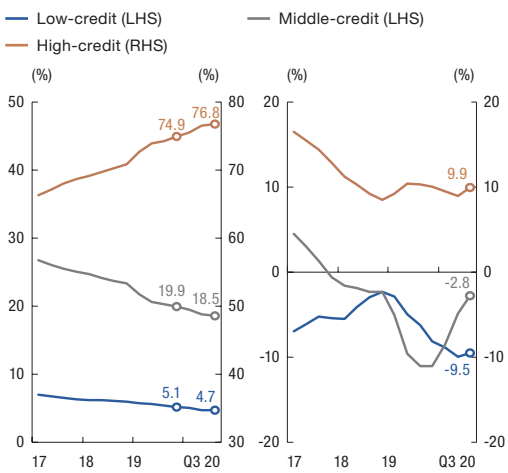
	2017	2018	2019	3Q 20
30s or younger	5,801	6,174	6,427	7,020
40s	9,081	9,435	9,687	10,169
50s	9,272	9,400	9,476	9,773
60s or older	8,346	8,406	8,484	8,655

Note: 1) End-period basis.
Source: Bank of Korea (Consumer Credit Panel).

C. Share of debt by credit rating3)

The share of debt owed by high-credit rating borrowers out of total debt maintained its upward trend, amounting to 76.8% by the end of the third quarter of 2020. Meanwhile, the share of debt of low- and middle-credit rating borrowers accounted for 4.7% and 18.5%, respectively, showing a gradual decline. While the total debt held by low- and middle-credit rating borrowers is falling, that of high-credit rating borrowers has continued to increase (Figure Ⅰ-4). This reflects an overall improvement of borrowers' credit ratings owing to the decline of the household loan delinquency rate, the government's credit recovery support for individuals, and financial institutions' efforts to strengthen risk management, and also shows that the recent increase in household debt has been driven by high-credit rating borrowers.

Figure Ⅰ-4. Debt by credit rating



Notes: 1) Share in total debt, by credit rating.
2) Year-on-year basis (moving average of two quarters).
Source: Bank of Korea (Consumer Credit Panel).

3) Credit ratings 1 to 3 are classified as high-credit, 4 to 6 as middle-credit, and 7 to 10 as low-credit.

Table Ⅰ-3. Average amount of debt, by credit rating[1)]

(10 thousand won)

	2017	2018	2019	3Q 20
Low-credit	3,607	3,665	3,622	3,645
Middle-credit	6,646	6,647	6,284	6,451
High-credit	9,635	9,894	10,180	10,593

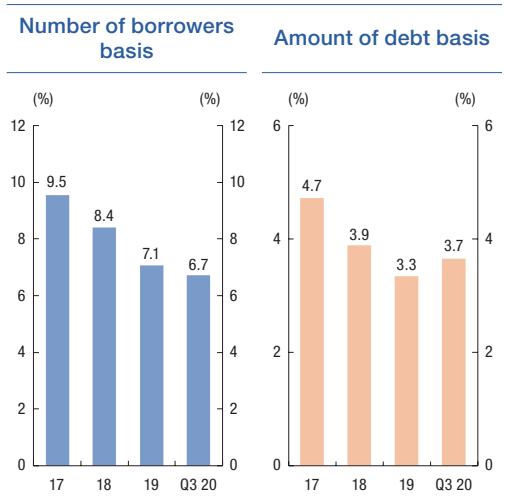
Note: 1) End-period basis.
Source: Bank of Korea (Consumer Credit Panel).

D. New borrowers

For the first nine months of this year, the number of new borrowers accounted for 6.7% of all borrowers, with their share falling. However, the share of their debt stood at 3.7%, up slightly compared to last year (3.3%), owing to the increase in the average amount of loans taken by new borrowers compared to the previous year[4)] (Figure Ⅰ-5).

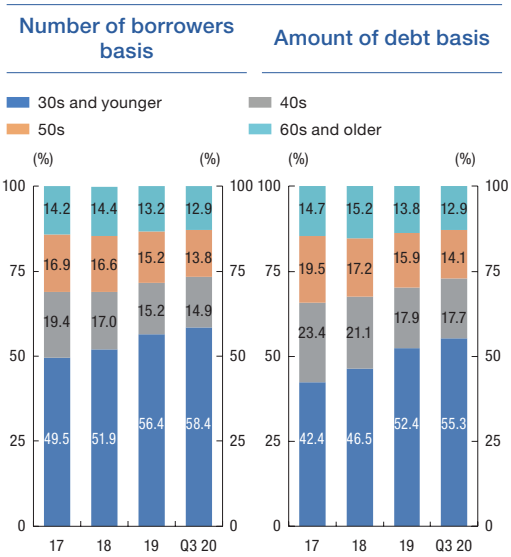
By age group of the new borrowers, for the first nine months of 2020, the share of new borrowers in their 30s or younger stood at 58.4%, continuing its upward trend, whereas the share of new borrowers in other age groups declined steadily. In terms of the share of debt, new borrowers in their 30s or younger represented the largest share at 55.3% (Figure Ⅰ-6). In particular, the average amount of loans taken by this age group is surging sharply compared to that of other groups (Table Ⅰ-4). This seems to be attributable largely to the increase in the amount of loans to fund the recent increase in housing purchases in addition to the increase in first-time loans taken by young adults after finding a job.

Figure Ⅰ-5. Shares[1)] of new borrowers



Note: 1) Shares of the number and the debt amount of new borrowers compared to those of total borrowers (annual average).
Source: Bank of Korea (Consumer Credit Panel).

Figure Ⅰ-6. Shares[1)] of new borrowers, by age group



Note: 1) Shares in total number of new borrowers and their debt.
Source: Bank of Korea (Consumer Credit Panel).

4) Average amount of loans taken by new borrowers: 38.56 million won (2017) → 37.23 million won (2018) → 39.09 million won (2019) → 45.84 million won (first nine months of 2020).

Table Ⅰ-4. Average amount of debt per new borrower, by age group

(10 thousand won)

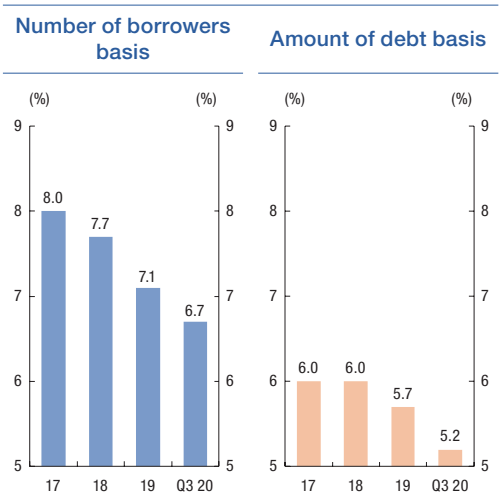
	2017	2018	2019	3Q 20
30s or younger	3,307	3,333	3,632	4,355
40s	4,656	4,618	4,614	5,393
50s	4,445	3,845	4,087	4,677
60s or older	3,978	3,928	4,074	4,601

Source: Bank of Korea (Consumer Credit Panel).

E. Vulnerable borrowers

Vulnerable borrowers, defined as borrowers with low income or low-credit ratings and having multiple loans, have weak debt repayment capacities. They accounted for 6.7% of total borrowers at the end of the third quarter of 2020, showing a continued decline. The share of debt owed by vulnerable borrowers has dropped to 5.2% of total household debt (Figure I-7). The reduced share of debt taken by vulnerable borrowers, despite debt having grown faster than income, seems to be largely an effect of the falling share of low-credit borrowers associated with the overall improvement of borrowers' credit ratings.

Figure Ⅰ-7. Shares[1] of vulnerable borrowers

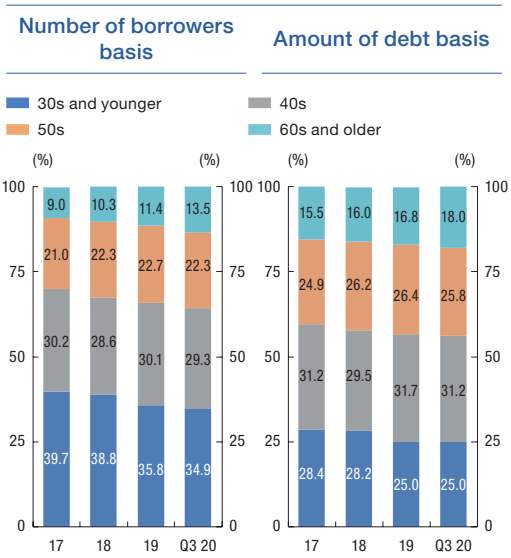


Note: 1) Shares of the number and the debt amount of vulnerable borrowers compared to those of total borrowers; end-period basis.

Source: Bank of Korea (Consumer Credit Panel).

By age group of vulnerable borrowers, those in their 30s or younger accounted for the largest share at 34.9%, which has been declining, but the share of those in their 60s or older is gradually rising. It is noteworthy that the share of debt held by vulnerable borrowers in their 60s or older is on an upward trend (Figure I-8), despite being lower than those of other age groups, since their source of income is not stable.

Figure Ⅰ-8. Shares[1] of vulnerable borrowers, by age group



Note: 1) Shares in total number of vulnerable borrowers and their debt; end-period basis.

Source: Bank of Korea (Consumer Credit Panel).

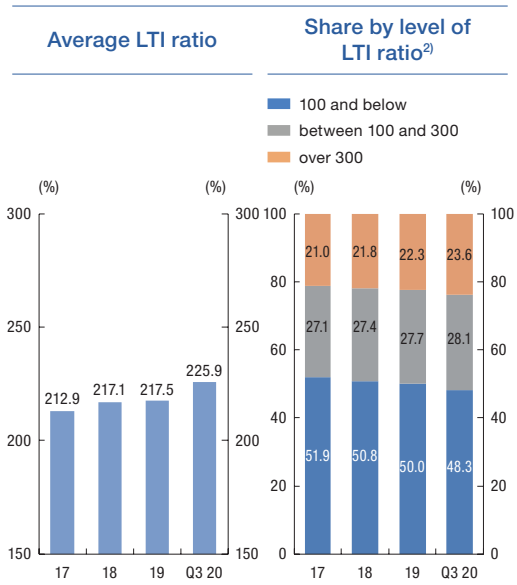
3. Borrowers' debt repayment capacities

In this section, the change in household borrowers' debt repayment capacities is analyzed in terms of the loan-to-income (LTI) ratio, debt service ratio (DSR), and delinquency rate.

A. LTI ratio

The average LTI ratio of total borrowers stood at 225.9% at the end of the third quarter of 2020, up 8.4%p from the end of last year, suggesting an overall increase in the debt service burden. As for the share of borrowers by level of LTI ratio, borrowers with an LTI ratio of 100% or below accounted for 48.3% of total borrowers, showing a slight decline, while borrowers with an LTI ratio of over 300% accounted for 23.6%, increasing by 1.3%p from the end of last year (Figure I-9).

Figure I-9. LTI ratio[1] of total borrowers

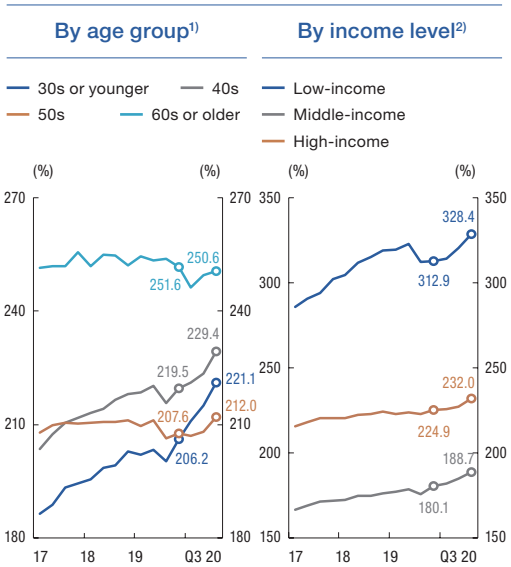


Notes: 1) Sum of loans / Sum of income, of total borrowers; end-period basis.
2) Share in number of total borrowers; end-period basis.
Source: Bank of Korea (Consumer Credit Panel).

(By age group) The LTI ratio of borrowers in their 60s or older was the highest at 250.6%, while that of borrowers in their 30s or younger and in their 40s rose rapidly. The LTI ratio of borrowers in their 30s or younger recorded 221.1%, increasing by 14.9%p from the end of last year, and the LTI ratio of borrowers in their 40s stood at 229.4%, up by 9.9%p (Figure I-10). This is due to the fact that the rate of debt growth significantly outpaced the rate of income growth this year among borrowers in both of these age groups.[5]

(By income level) The LTI ratio of low-income borrowers was the highest, reaching 328.4%, with the steepest rise of 15.5%p from the end of last year. The LTI ratio of middle-income borrowers climbed to 188.7%, up 8.6%p, but remained lower than other income groups, and the LTI ratio of high-income borrowers rose to 232.0%, up 7.1%p (Figure I-10).

Figure I-10. Average LTI ratio, by characteristics of borrowers



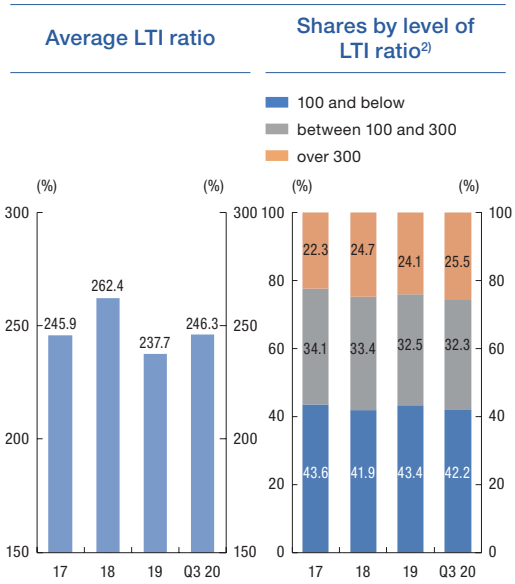
Notes: 1) Sum of loans / Sum of income, by age group.
2) Sum of loans / Sum of income, by income level.
Source: Bank of Korea (Consumer Credit Panel).

5) In the third quarter of 2020, the average income of borrowers in their 30s or younger and in their 40s rose by 1.8% and 0.4%, respectively, from the end of 2019, and their debt grew by 9.2% and 5.0%, respectively, significantly outpacing the income growth rates.

(Vulnerable borrowers) The LTI ratio of vulnerable borrowers, with low income or low-credit ratings and having multiple loans, was 246.3% at the end of the third quarter of 2020, up slightly from the end of last year, but lower than the LTI ratio of the low-income group (328.4%) (Figure I-11). This is attributable to the fact that the LTI ratio of low-credit borrowers with multiple loans (142.8%) is much lower than the ratio of low-income borrowers (328.4%) due to the limited borrowing of the former group, and to the fact that this type of borrower accounts for a relatively large share (52.9%) of total vulnerable borrowers.

Meanwhile, in terms of the number of vulnerable borrowers by LTI level, the share of borrowers with an LTI ratio of over 300% was 25.5%, showing a slight increase of 1.4%p (Figure I-11).

Figure Ⅰ-11. LTI ratio[1] of vulnerable borrowers



Notes: 1) Sum of loans / Sum of income, of vulnerable borrowers; end-period basis.
2) Shares in number of total vulnerable borrowers; end-period basis.
Source: Bank of Korea (Consumer Credit Panel).

B. DSR[6]

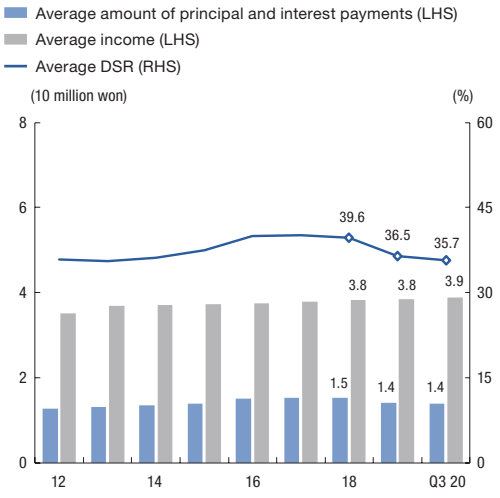
(DSR overview)

The average DSR of all borrowers stood at 35.7% at the end of the third quarter of 2020, down slightly compared to the end of 2018 (39.6%) (Figure I-12). The decrease in the DSR despite the increase in the average LTI ratio of the borrowers is likely attributable to a confluence of factors, including the steady decline of loan interest rates during the period, the

6) With the implementation of DSR-related rules, such as "Improved standards for screening a borrower's creditworthiness (Financial Services Commission, Nov. 2017)," a standard method based on regulatory guidelines was used to estimate the DSR. Specifically, interest payments were calculated by multiplying actual interest rates over a relevant period by the balance of the principal. Regarding principal repayment, for home mortgage loans with maturity date information, the value of installment repayment was calculated using the information, while for home mortgage loans without such maturity information, the value of installment repayment was calculated based on a 15-year repayment period. For unsecured loans and loans secured by collateral other than housing, a repayment period of 10 years was assumed. For loans for leasehold deposits, only the interest payment was considered.

sharp increase in loans for leasehold deposits,[7] which do not require principal repayment prior to maturity, and the trend toward longer maturities[8] for home mortgage loans.

Figure Ⅰ-12. Trend of DSR[1]



Note: 1) Sum of principal and interest payments / Sum of income, of total borrowers; end-period basis.
Source: Bank of Korea (Consumer Credit Panel).

Regarding the factors contributing to the decline of the DSR (-3.9%p) from 2018 to the end of the third quarter of 2020, while the increase in the loan balance acted to raise the DSR by 3.6%p, the contributions of the longer average maturity, the decline of the average loan interest rate, and income growth were 3.6%p, -1.9%p, and -2.1%p, respectively (Table I-5).

Table Ⅰ-5. Factor analysis of DSR change

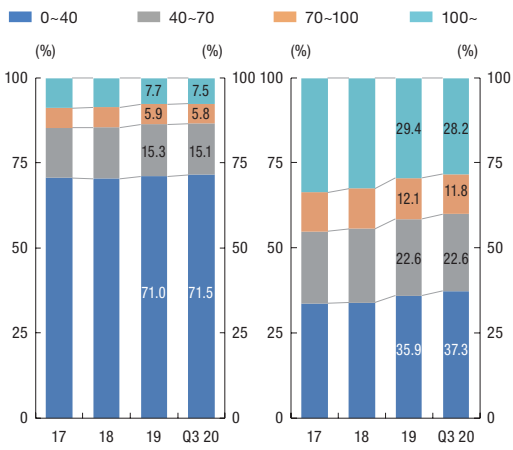
	DSR	principal of loan	average maturity[1]	loan interest rate	income
Changes[2]	-3.9%p	+10.0%	+12.9%	-0.7%p	+5.7%
Contributions(%p)	-3.9	+3.6	-3.6	-1.9	-2.1

Notes: 1) Estimated figures using Principal of loan / Amount of principal repaid, and could be affected by changes in individual loans' maturity and proportion in total loans, etc.
2) As of end-Q3 2020 compared to end-2018.
Source: Bank of Korea (Consumer Credit Panel).

By level of DSR, borrowers with a DSR less than 40% who bear a smaller debt service burden accounted for 71.5% of all borrowers at the end of the third quarter of 2020, showing a slight increase. Their debt accounted for 37.3% of the total debt, which is smaller than their share in the total number of borrowers, but still represents a continued upward trend. On the other hand, borrowers with a DSR exceeding 70%, who are perceived as having a significant debt service burden (high-DSR borrowers), held 40.1% of the total debt, far exceeding their share in the total number of borrowers (13.4%). This suggests that the higher the DSR, the greater the average amount of debt (Figure I-13).

7) Share of loans for leasehold deposits by year: 4.5% as of the end of 2017 → 5.9%, end of 2018 → 7.7%, end of 2019 → 9.2%, end of Q3 2020.
8) Average maturity of home mortgage loans by year: 18.1 years as of the end of 2017 → 19.1 years, end of 2018 → 20.5 years, end of 2019 → 21.3 years, end of Q3 2020.

Figure Ⅰ-13. Distribution[1] of borrowers, by DSR level



Note: 1) Shares in total number of borrowers and their debt; end-period basis.

Source: Bank of Korea (Consumer Credit Panel).

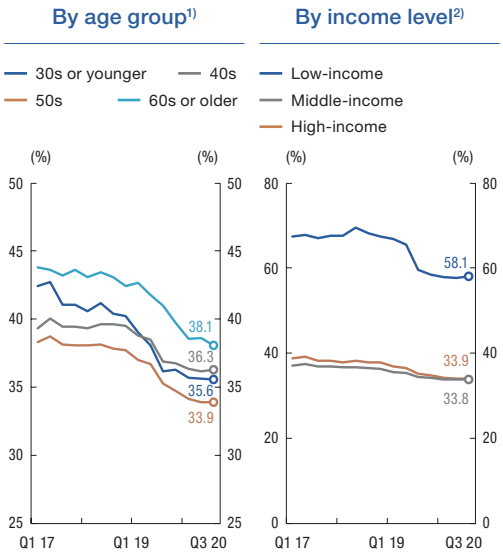
(DSR by age group) The DSR for all age groups has fallen gradually since 2018. Whereas the DSR of borrowers in their 60s or older, an age group which includes the majority of retirees, was 38.1%, the DSR of borrowers in their 50s stood at 33.9%, the lowest among all age groups. As for borrowers in their 30s or younger, the LTI ratio rose sharply, but their DSR declined slightly (Figure I-14). This, besides the structural factors lowering the DSR mentioned earlier, seems to be attributable to the fact that borrowers in their 30s or younger tend to have a higher proportion[9] of bank loans with lower interest rates and hold an increasingly larger portion of loans for leasehold deposits, which require only interest payments during the term of the loan. In fact, the proportion of loans for leasehold deposits out of total housing-related loans held by borrowers in their 30s or younger was 33.7%, well above that of other age groups (10.1%), and is on an upward trend.

(DSR by income level) The average DSR of low-income borrowers at the end of the third quarter of 2020 reached 58.1%, meaning that more than half of their income is spent on principal and interest payments. The average DSRs of middle- and high-income borrowers were 33.8% and 33.9%, respectively, showing little difference and falling below the average DSR of all borrowers (Figure I-14). Meanwhile, the DSR of low-income borrowers had approached nearly 70% by 2018, then dropped by a large margin[10] due to higher income growth than middle- and high-income borrowers.

9) As for household loans, the share of bank loans was 70.3% for borrowers in their 30s or younger at the end of the third quarter of 2020, which is higher than that of other age groups (55.4%).

10) The average income growth rate from 2018 to 2020 was 10.7% for low-income borrowers, far exceeding the 3.3% for high-income borrowers and 1.8% for middle-income borrowers. This appears to be partly attributable to the fact that, during the same period, the income of borrowers on credit recovery schemes began to be newly counted. (Until the second quarter of 2019, the income of borrowers on credit recovery schemes was counted as zero.)

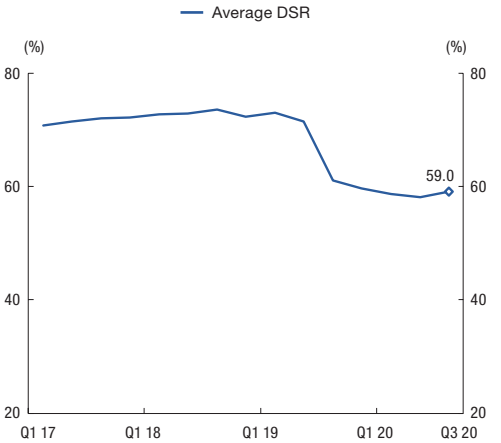
Figure Ⅰ-14. Average DSR, by characteristics of borrowers



Notes: 1) Sum of principal and interest payments / Sum of income, by age group.
2) Sum of principal and interest payments / Sum of income, by income level.
Source: Bank of Korea (Consumer Credit Panel).

(DSR of vulnerable borrowers) The DSR of vulnerable borrowers recorded 59.0% at the end of the third quarter of 2020, well above the average DSR of all borrowers (35.7%). However, it has dropped significantly since peaking at 73.6% during the third quarter of 2018. This appears to be affected by the drop of the interest rate of loans from non-bank financial institutions on which low-income, low-credit borrowers often rely, due to the decline of the legal interest rate. Another possible reason of the drop of the DSR of vulnerable borrowers is the introduction of DSR rules for non-bank financial institutions in June 2019, which made it harder for them to use loans from non-bank financial institutions (Figure I-15).

Figure Ⅰ-15. Average DSR[1)] of vulnerable borrowers



Note: 1) Sum of principal and interest payments / Sum of income, of vulnerable borrowers.
Source: Bank of Korea (Consumer Credit Panel).

(Borrowers with DSR exceeding 70%)

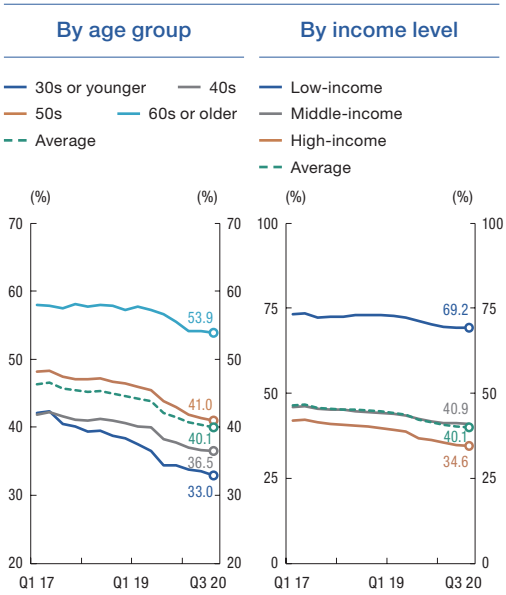
The share of borrowers with a DSR over 70%, who carry a significant debt service burden against their income, was 40.1% as of the end of the third quarter of 2020, fell slightly from the end of preceding year (41.5%).

(Borrowers with high DSR by age group) Within each age group, the share of debt held by borrowers with a DSR over 70% exceeded 30% in all age groups. The age group of 60s or older recorded the highest fraction of debt held by borrowers with a DSR over 70%, reaching 53.9%. This suggests that a significant number of borrowers in all age groups faced a heavy debt service burden. However, a positive sign is that the share of debt held by borrowers with a DSR over 70% is gradually declining across all age groups[11)] (Figure I-16).

11) Generally, if borrowers hold sufficient balances of financial and real assets even when they bear a heavy debt service burden against income (DSR), their actual capacity to repay the debt may not be significantly impaired. In Korea, the ratio of financial liabilities to total assets of households with a DSR exceeding 70% was 27.9%, indicating adequate ability to repay debt when assets are considered (calculated using the 2019 Survey of Household Finances and Living Conditions).

(Borrowers with high DSR by income level) Among low-income borrowers, the share of debt held by borrowers with a DSR over 70% reached 69.2% at the end of the third quarter of 2020, indicating that most debt of low-income borrowers was owed by borrowers with a heavy debt service burden. For middle- and high-income borrowers, the shares of debt held by borrowers with a DSR over 70% were 40.9% and 34.6%, respectively, which are considered high (Figure I-16).

Figure I-16. Proportions of borrowers with high DSR[1)]



Note: 1) Share of debt held by borrowers with a DSR over 70%.
Source: Bank of Korea (Consumer Credit Panel).

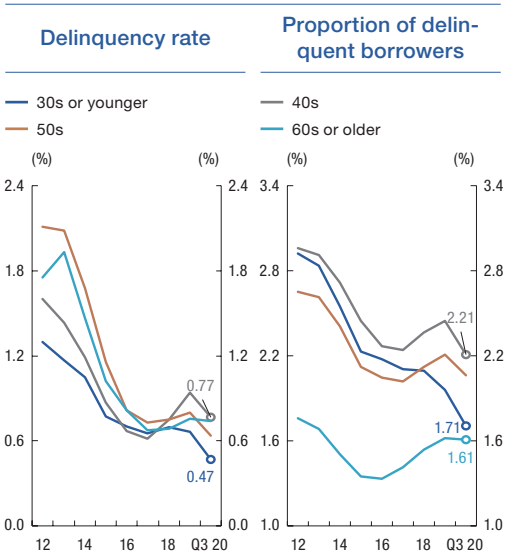
C. Delinquency rate

The delinquency rate of household borrowers showed a downward trend from 2012 to 2017, since which time it has remained largely the same, although sometimes showing a moderate increase.

(By age group) The delinquency rate of borrowers in their 40s stood at around 0.6% in 2017, which was the lowest among all age groups, but has since risen to 0.77% at the end of the third quarter of 2020, reaching the highest level across all age groups. The delinquency rate of borrowers in their 50s and 60s or over has shown an overall increase since 2017, but that of borrowers in their 30s or younger has been on a downward trend, reaching 0.47%, the lowest among all age groups (Figure I-17).

Regarding the share of delinquent borrowers by age group, the share of delinquent borrowers in their 40s reached 2.21%, the highest across all age groups, and the share of delinquent borrowers in their 30s or younger was 1.71%, showing a continued decline. On the other hand, although the share of delinquent borrowers in their 60s or older was the lowest at 1.61%, it should be noted that the share has risen gradually over the last four or five years (Figure I-17).

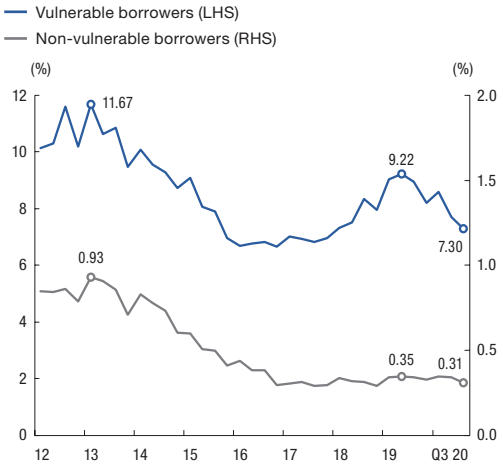
Figure I-17. Delinquency rate[1)] of borrowers, by age group



Note: 1) It should be noted that these delinquency rates differ from those obtained from financial institutions' business reports (end-period basis).
Source: Bank of Korea (Consumer Credit Panel).

(Vulnerable borrowers) At the end of the third quarter of 2020, the average delinquency rate of vulnerable borrowers recorded 7.30%, much higher than that of non-vulnerable borrowers (0.31%). However, it has fallen significantly since the middle of 2019 (9.22%) (Figure I-18).

Figure I-18. Delinquency rate of vulnerable borrowers



Note: 1) End-period basis.
Source: Bank of Korea (Consumer Credit Panel).

4. Overall assessment

As the growth of household loans accelerated this year, the LTI ratio rose moderately overall but showed a steep rise among borrowers with low income or borrowers in their 30s or younger. However, the DSR moved in opposite direction due to lower interest rates and structural changes such as longer average loan maturity. This suggests that borrowers' debt repayment capacities have not worsened as feared, notwithstanding the increase in household debt and deterioration of income. Reflecting this, the overall delinquency rate of household loans still remains low, despite the signs of a rise among some borrowers.

However, if household debt continues to grow rapidly, combined with a delayed economic recovery amid the prolonged COVID-19 pandemic, it is more likely for households to become insolvent following a deterioration of their debt repayment capacities. While borrowers with a DSR over 70% bearing a significant debt service burden hold about 40% of the total debt, it should be noted that such borrowers hold more than half the debt of low-income borrowers and borrowers in their 60s or older.

Moreover, it is also to be noted that the impacts of major factors lowering the DSR, such as the interest rate decline and longer average loan maturity, are expected to gradually dissipate. As long as the growth of household debt far outpaces that of income, as it currently does, the DSR is more likely to rise. Furthermore, the insolvency risk of household debt seems likely to grow in the medium and long term considering (i) the gradual rise of the delinquency rate despite the decline of the DSR; (ii) the temporary mitigation of the risks of non-performing household loans thanks to the government's active financial support measures, such as deferments of principal and interest payments and the increasing supply of credit amid the COVID-19 pandemic; and (iii) the steep rise of unsecured loans,[12] which carry a higher default risk than home mortgage loans.

12) The delinquency rate of banks' unsecured loans was 0.37% at the end of the third quarter of 2020, about twice that of home mortgage loans (0.16%). The delinquency rate of other loans (including unsecured loans) from non-bank financial institutions reached 1.98%, which is much higher than that of home mortgages (1.16%).

Hence, to curb the excessive growth of household debt, the risk management of household credit should be strengthened and more stringent and consistent policies to ensure macroeconomic soundness need to be maintained.

II. Impact of the Protracted COVID-19 Pandemic on Corporate Operations

1. Background

As the protracted COVID-19 pandemic has caused domestic business activity to contract[1], there is now concern regarding corporate credit risk. So far, thanks to accommodative monetary policy, financial support[2] from the government and financial institutions, and efforts of companies to secure liquidity, the corporate default risk that many fear has not yet emerged, as shown by the continued low level of the business delinquency rate.[3]

However, in 2021, if the recovery of the global economy remains sluggish, the financial conditions of domestic businesses may deteriorate, and credit and liquidity risk may soar due to the real-sector shocks at home and abroad. Furthermore, given that some of the financial support measures implemented by the government may end in March 2021, vigilance with respect to corporate business activity and debt repayment capacity is still required.

Moreover, even when the spread of the COVID-19 is slowed through the deployment of vaccines, there may still be high uncertainty over when and how the domestic and global economies will recover and corporate business activity will normalize.

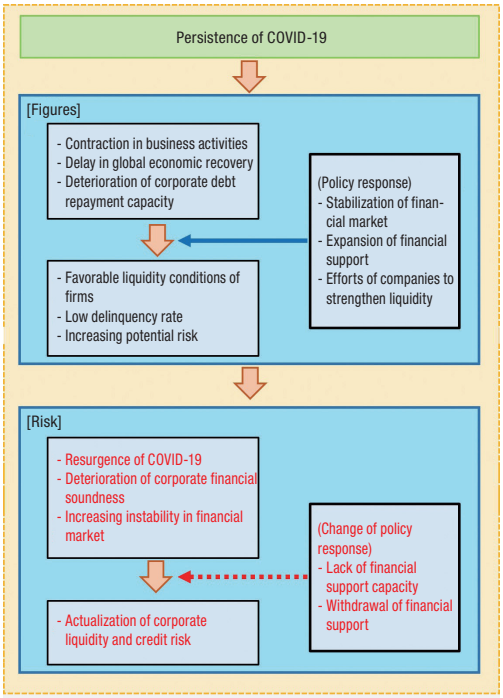
Considering these developments, this paper examines multiple aspects of the impact of the protracted COVID-19 pandemic on corporate operations and assesses the possibility of potential liquidity and credit risk being actualized. Based on this, the impact of whether the policy responses of the government and others continue is examined and countermeasures are sought (Figure II-1).

1) A total of 2,298 domestic companies (1,219 large enterprises and 1,079 small- and medium-sized enterprises, "SMEs" hereafter) (2,013 listed companies and 285 non-listed companies that disclose quarterly financial statements) were analyzed. As of 2019, the sales of these companies accounted for 40.4% of the sales of all corporations in Korea.

2) Since the COVID-19 outbreak (from February 7 to November 6, 2020), financial institutions supported SMEs and sole proprietors with new loans totaling 104.5 trillion won and maturity extensions for loans totaling 137.7 trillion won, and the policy authorities supplied funds of 15.8 trillion won to help stabilize the financial market.

3) As of the end of September 2020, the delinquency rate of corporate loans granted extensions by domestic banks (0.37%, based on the business reports of financial institutions) is the lowest since the compilation of the statistics began in 2007.

Figure Ⅱ-1. COVID-19 shock and potential risk

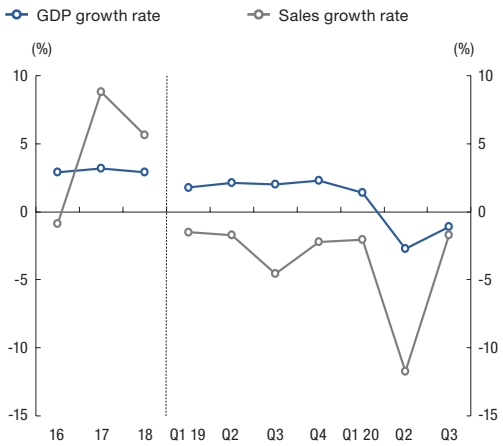


2. Financial soundness and liquidity of firms

A. Financial soundness

During the first quarter of this year, corporate sales hovered around the average level of recent years, but in the second quarter, reflecting the impact of the COVID-19 pandemic on the real economy, corporate sales dropped sharply by 11.7% year on year. In the third quarter, however, sales showed some recovery compared with the preceding quarter despite the prolonged pandemic[4] (Figure II-2).

Figure Ⅱ-2. Sales and GDP growth rates[1]

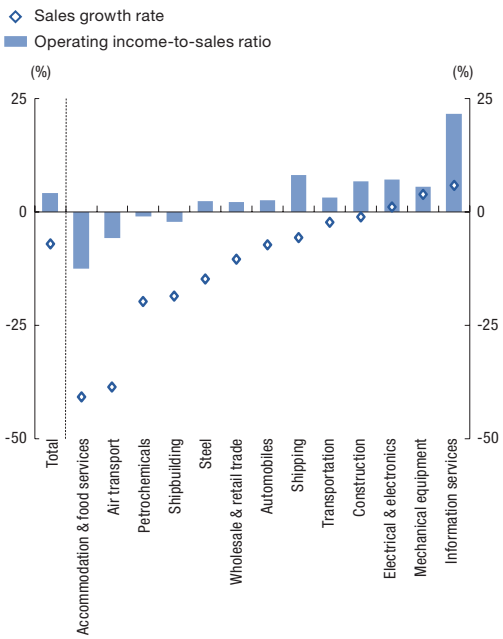


Note: 1) Year-on-year basis.
Sources: Bank of Korea, KIS-VALUE.

During the first half of this year, sales decreased significantly in most industries. In particular, sales in the accommodation & food services (year-on-year, -40.7%), air transport (-38.7%), petrochemical (-19.8%), and shipbuilding (-18.6%) industries dropped markedly. On the other hand, sales in the information service (+5.9%), mechanical equipment (+3.9%), and electrical & electronics (+1.1%) industries showed favorable results, reflecting positive impacts from changes in the pattern of consumption[5] and so on (Figure II-3).

4) The sales growth rate for the third quarter of 2020 was calculated for domestic listed companies whose data are available.
5) The spread of the "homeconomy" phenomenon, meaning that the home becomes a place to work, study, and play rather than just to live in, due to the persistence of COVID-19, increased demand for smart devices and consumption of non-face-to-face services.

Figure II-3. Sales growth rate[1)2)] and operating income-to-sales ratio[1)], by industry



Notes: 1) First half of 2020 basis.
2) Year-on-year basis.
Source: KIS-Value.

(Comparison with past crises)

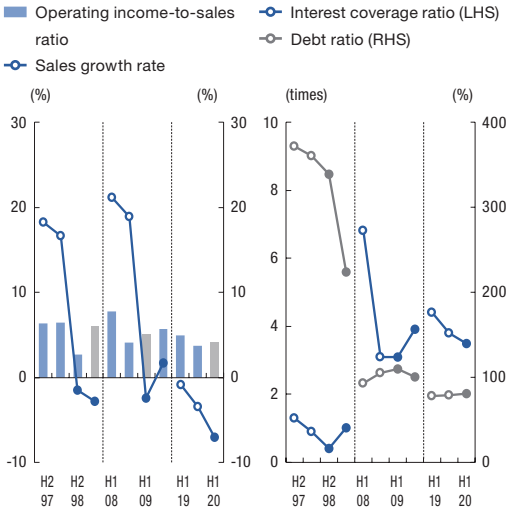
Comparing the recent decline of corporate financial soundness with those which occurred during past crises[6)] showed that, despite its significant impact on sales, the current crisis has had a limited impact on corporate financial soundness. The sales growth rate in the first half of this year (-7.0%) was the lowest recorded[7)] since 1996, falling well below the rates seen during past crises (foreign currency crisis: -2.8%, global financial crisis: -2.4%). As a result, the operating income-to-sales ratio (4.2%) was lower than the ratios seen during the foreign currency crisis (6.1%) and global financial crisis (5.1%), but the year-on-year decline of the same ratio (-0.8%p) was smaller than the year-on-year declines recorded during those two crises (foreign currency crisis: -3.7%p, global financial crisis: -2.7%p). Furthermore, the interest coverage ratio and debt ratio (3.5 and 81.1%) were better than the ratios observed during the foreign currency crisis (1.0 and 339.2%) and global financial crisis (3.1 and 109.8%)[8)] (Figure II-4).

6) The comparison of financial indicators was conducted between the sales of the first half of 2020 and the lowest value of sales recorded during past crises (the second half of 1998 to the first half of 1999; the first half of 2009 to the second half of 2009). However, for the operating income-to-sales ratio and interest coverage ratio, given the seasonality of operating income, comparison was done between the first half of 2020, the first half of 1999, and the first half of 2009. (As a substantial portion of operating losses is accounted for at the end of the year, profits for the second half are less than those for the first half.)

7) The comparison was conducted using values after 1996, when the KOSDAQ market was launched. Meanwhile, the large decreases in sales during the second half of 2002 (-7.8%) and first half of 2003 (-9.1%) are largely attributed to a change in the accounting method for general trading companies.

8) Despite the large decrease in sales in the first half of 2020, the financial soundness of companies was relatively favorable thanks to the prompt policy responses of the Bank of Korea and the government as well as firms' continuous efforts to improve their financial structure.

Figure Ⅱ-4. Comparison with past crises



Note: 1) Year-on-year basis.
Source: KIS-Value.

B. Liquidity conditions

Despite the protracted COVID-19 pandemic, corporate liquidity was generally favorable due to the financial market stabilization measures and fund support measures of the policy authorities. In the first half of 2020, the liquidity shortfall of businesses[9] amounted to 0.5 trillion won and the share of companies struggling with liquidity shortages was 2.4%, showing slight increases from the 0.2 trillion won and 1.4% observed in the first half of 2019. However, it is estimated that without the government support measures, the liquidity shortfall and share of companies struggling with liquidity shortages would have been 4.9 trillion won and 5.8%[10].

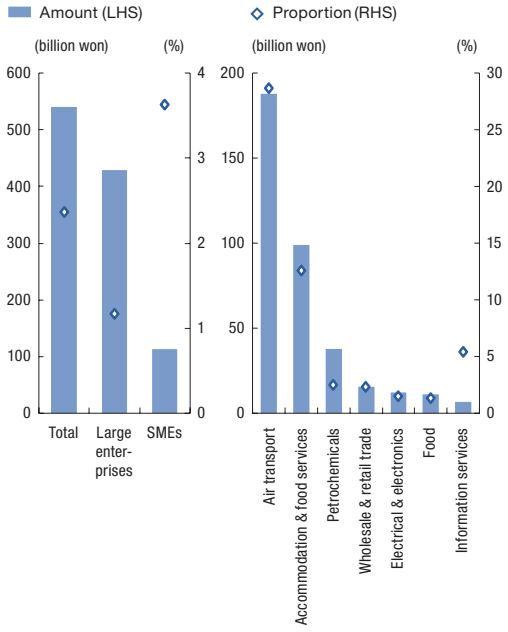
Meanwhile, as for the liquidity shortfall (0.5 trillion won) during the first half of this year, by company size, large enterprises accounted for 79.3% of the total liquidity shortfall, and by industry, the shortfall was especially prominent in the air transport (0.2 trillion won) and accommodation & food services (0.1 trillion won) industries (Figure II-5).

9) "Liquidity shortfall" refers to the situation where liquid assets, including operating income, fall below the funds for debt service during a given period. The size of liquidity shortfall (SL) was estimated using the formula below. As for the cash conversion rate, the turnover of non-cash liquid assets was referred to, and regarding the refinancing rate of liquid liabilities, the loan maturity extension rate and net issuance of corporate bonds were considered, with each rate near 90%.

$SL = \sum_{i=1} | \text{cash equivalent assets}_i + (\text{inventory} + \text{account receivables})_i \times \text{cash conversion rate} + \text{operating income / losses}_i - \text{liquid liabilities}_i \times (1 - \text{refinancing rate}) |$

10) The cash conversion rate and refinancing rate of enterprises that would occur without the financial support measures were set 5%p and 20%p lower than this year in consideration of the difficulty of cash conversion and refinancing due to the sales shock and heightened market vigilance against credit risk.

Figure Ⅱ-5. Proportion of corporations with liquidity shortfalls and amount of their shortfalls[1)]



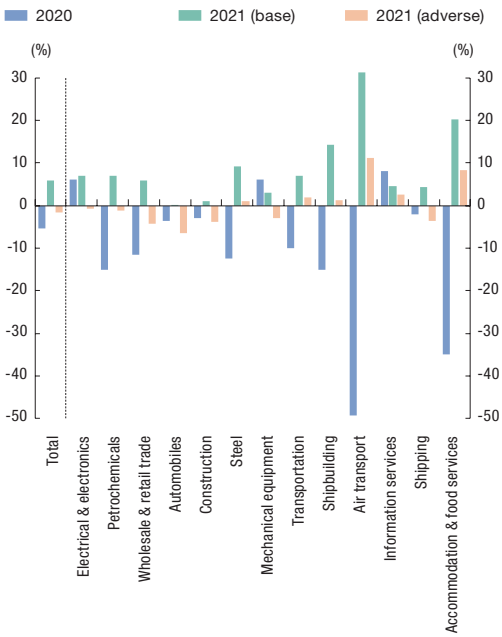
Note: 1) First half of 2020 basis.
Sources: KIS-Value, Bank of Korea staff calculations.

3. Prospects and potential risks

A. Prospects for business conditions and stress test scenarios

The sales growth rate for next year was estimated based on the economic growth rates forecast by the Bank of Korea and IMF and prospects for major industries. Although there remains heightened uncertainty over recovery of the global economy, corporate sales for 2021 are expected to increase by 5.8% year on year if the pandemic abates somewhat. By industry, sales of the electrical & electronics and information service industries are projected to remain favorable, and sales of the air transport and accommodation & food services industries, which were hit hard in 2020, are likely to recover to a certain extent (Figure Ⅱ-6).

Figure Ⅱ-6. Outlook of sales growth rate, by industry



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

To measure the impact of the COVID-19 pandemic on the financial soundness, liquidity risk and credit risk of businesses over an extended period of time, the following two scenarios were set based on the sales projections above.

A gradual recovery of business performance (sales growth rate of 5.8% in 2021) was set as the base scenario, and a situation where sales growth remains as sluggish as it was in the third quarter of 2020[11)] (-1.7%) due to the delay

11) Based on the sales growth rate of domestic listed companies whose data is available.

in the improvement of business performance was set as the adverse scenario. In addition, for each scenario, two cases were assumed: continuation of financial support (0% withdrawal of financial support[12]) and termination of financial support (100% withdrawal of financial support) (Table II-1).

Table II-1. Scenarios

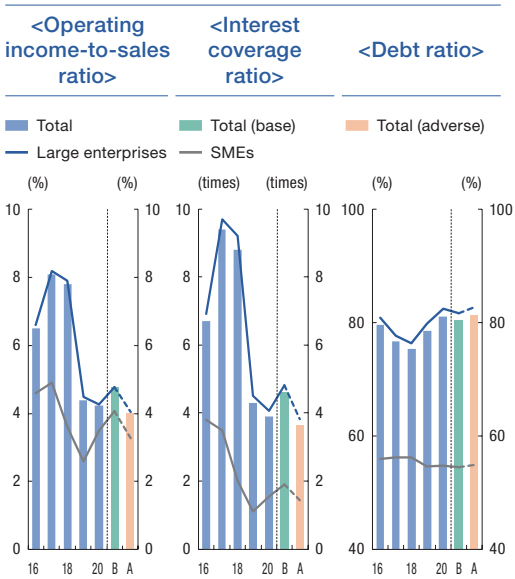
	Sales growth rate	Withdrawal rate of financial support
Base	5.8%	0%
		100%
Adverse	-1.7%	0%
		100%

B. Prospects for corporate financial soundness

Regarding the change in financial soundness[13] in 2021, due to the change in sales by scenario, financial soundness was found to be likely to improve overall under the base scenario, but is likely to be worse than in 2020 under the adverse scenario.

Under the base scenario, the operating income-to-sales ratio is expected to rise to 4.8% (+0.6%p from the estimated 4.2% for 2020), but under the adverse scenario, it is projected to dip to 4.0%. The interest coverage ratio and debt ratio will likely improve to 4.6 and 80.3% in 2021, respectively, from 3.9 and 81.1% this year under the base scenario, but will reverse to 3.7 and 81.3% under the adverse scenario, showing a slight deterioration compared to 2020. Meanwhile, the interest coverage ratio under the adverse scenario (3.7) is similar to that during the global financial crisis (3.8 in 2009) and higher than that during the foreign currency crisis (0.6 in 1998) (Figure II-7).

Figure II-7. Changes in corporate financial soundness, by scenario[1)2)]



Notes: 1) Annual data for 2020 is estimated based on corporate earnings in Q3 2020.
2) B (A) indicates the base (adverse) scenario for 2021.
Sources: KIS-Value, Bank of Korea staff calculations.

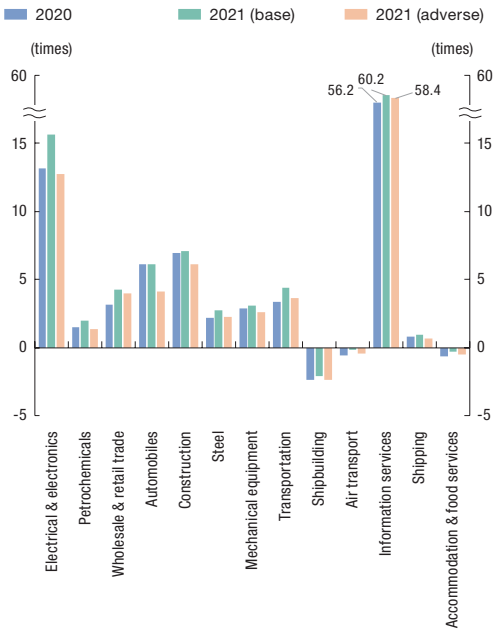
12) The financial support amount was calculated by deducting the change in the borrowings of firms with low and medium credit ratings (including corporate bonds) in 2019 from the change in their borrowings (including corporate bonds) in 2020. Generally, firms with high credit ratings are able to raise funds independently without any financial support measures, and thus this paper focused only on firms with low and medium credit ratings. As a result, total financial support this year was estimated at 60 trillion won.

13) It is assumed that corporate financial soundness will not be affected by whether the government's financial support is continued. Generally, the termination of interest payment deferment reduces the interest coverage ratio, but this was excluded from this analysis given that the total amount of deferred interest payments during the year is not expected to be significant (39.4 billion won from February 7 to August 21, 2020) and that almost none of the companies subject to this analysis applied for interest payment deferment.

(Prospects by industry)

By industry, even under the base scenario, the interest coverage ratios of some industries, such as shipbuilding (-2.0), accommodation & food services (-0.3), and air transport (-0.2), are projected to drop significantly, either due to operating losses or interest expenses exceeding operating income. Under the adverse scenario, in addition to the previously mentioned industries, the shipping industry (0.7) will likely see its interest coverage ratio fall as well. Meanwhile, the electrical & electronics and information service industries are expected to show favorable interest coverage ratios under both scenarios as contactless activities become more common (Figure II-8).

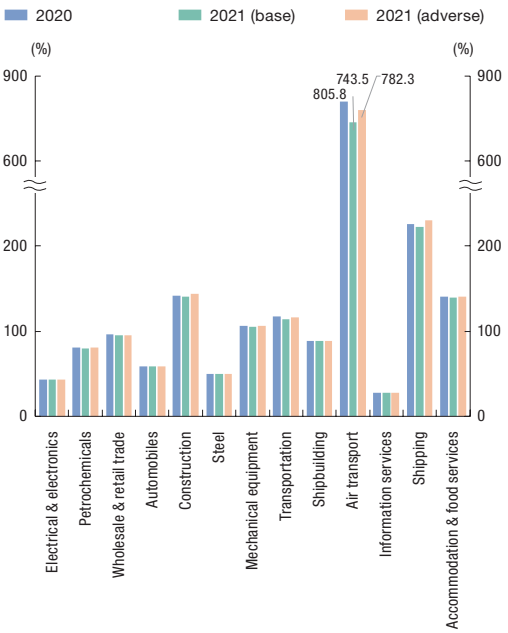
Figure II-8. Changes in interest coverage ratio, by industry



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

The debt ratio is expected to remain around the level of 2020 for most industries in 2021. However, the air transport industry[14] will likely see its debt ratio fluctuate widely in tandem with a significant variation of operating income by scenario (Figure II-9).

Figure II-9. Changes in debt ratio, by industry



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

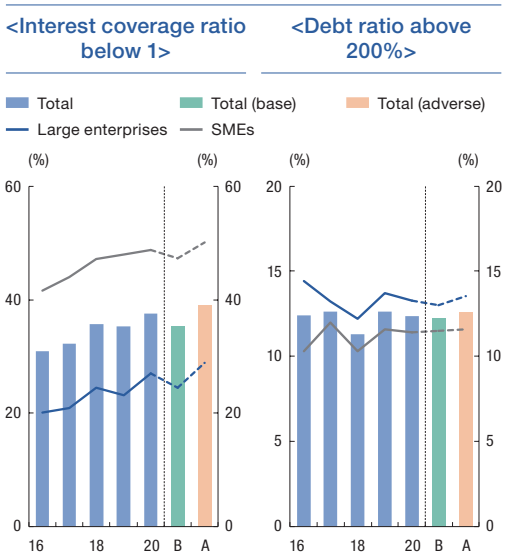
(Vulnerable businesses)

Meanwhile, the share of firms with vulnerable financial soundness, an interest coverage ratio of less than 1.0, and a debt ratio exceeding 200% (“excessive debt”) is projected to rise under the adverse scenario. The share of firms with an interest coverage ratio of less than 1.0 is expected to fall to 35.5% from 37.5% in 2020 under the base scenario, but under the adverse scenario, the share is expected to climb to 39.1%, which is higher than that recorded

14) Korean Air’s planned acquisition of Asiana Airlines and a related funding support plan were not considered.

during the global financial crisis (32.7% in 2008) but lower than that seen during the foreign currency crisis (41.1% in 1998). The share of firms with excessive debt will likely slip to 12.3% from 12.4% in 2020 under the base scenario, but under the adverse scenario, it will edge up to 12.6% (Figure II-10).

Figure II-10. Changes[1] in proportions[2] of corporations with weak financial soundness



Notes: 1) B (A) indicates the base (adverse) scenario for 2021.
2) Proportions of corporations with an interest coverage ratio below 1 (debt ratio above 200%) among firms subject to analysis.

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

C. Liquidity and credit risks

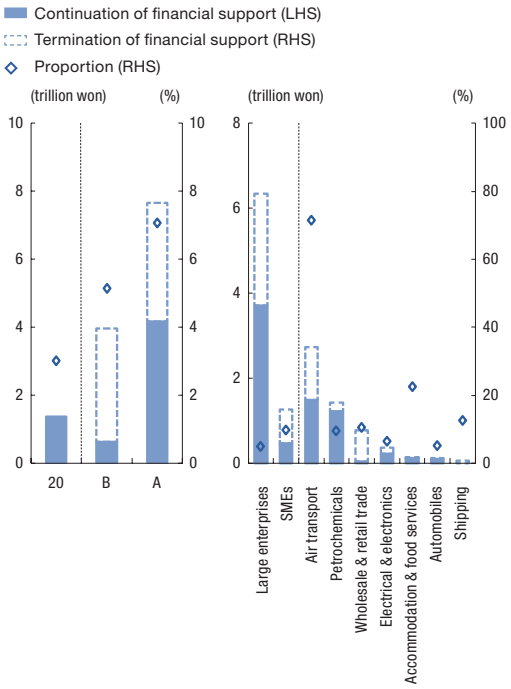
(Liquidity risk)

Liquidity conditions of companies for next year appears to be dependent on whether the financial support measures are withdrawn. If the financial support is extended, the liquidity shortfall[15] will dip to 0.6 trillion won under the base scenario, down from 1.4 trillion won in 2020, and under the adverse scenario, it is likely to rise to 4.2 trillion won. However, if the financial support is fully withdrawn, the liquidity shortfall is expected to rise to 4.0 trillion won under the base scenario and to 7.7 trillion won under the adverse scenario, and the shares of firms with liquidity shortages under the base and adverse scenarios will jump to 5.1% and 7.0%, respectively, from 3.0% in 2020.

Moreover, if the financial support is fully withdrawn under the adverse scenario, the majority of the liquidity shortfall (7.7 trillion won) is expected to be sustained by large enterprises (6.3 trillion won), and by industry, the air transport (2.7 trillion won), petrochemical (1.4 trillion won), and wholesale & retail trade (0.7 trillion won) industries will likely experience larger liquidity shortages. As for the share of firms with liquidity shortfalls, the share of SMEs (9.6%) exceeded large enterprises (4.8%), and by industry, the shares of the air transport (71.4%) and accommodation & food services (22.2%) industries are expected to be very high (Figure II-11).

15) The size of the liquidity shortfall under each scenario (SL_scenario) was estimated using the following formula. The cash conversion rate was assumed to be similar to this year under both scenarios, and the refinancing rate of liquid liabilities (excluding financial support money to be withdrawn) was adjusted in consideration of the sales shock for each industry under different scenarios.
: $SL\_scenario = \sum_{i=1}^{I} \text{cash equivalent assets}_i + (\text{inventory} + \text{account receivables})_i \times \text{cash conversion rate} + \text{operating income}_i - (\text{liquidity liabilities}_i - \text{financial support}_i) \times (1 - \text{refinancing rate}) - \text{financial support}_i \times \text{withdrawal ratel}$

Figure Ⅱ-11. Amount of liquidity shortfalls, by scenario[1]

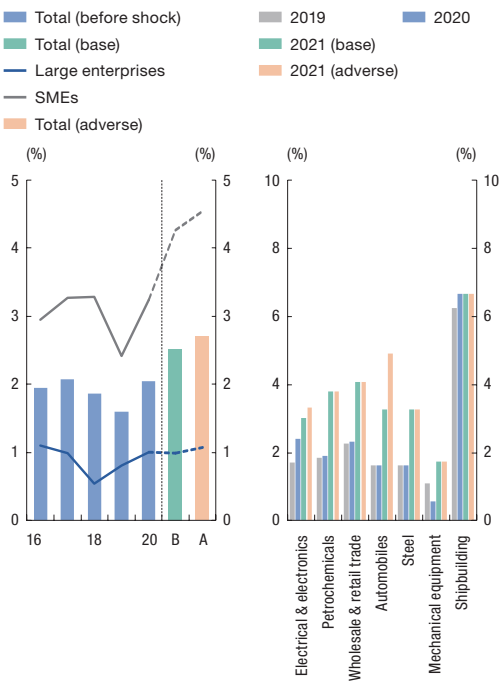


Notes: 1) 2021 basis.
2) B (A) indicates the base (adverse) scenario for 2021, and dots show the proportions of corporations with liquidity shortages when financial support is suspended under each scenario.
3) In case of termination of financial support under the adverse scenario.
Sources: KIS-Value, Bank of Korea staff calculations.

(Credit risk)

To assess credit risk of corporations, the change in the share of firms with capital impairment was analyzed. The share of companies with impaired capital[16] is expected to rise from 2.0% 2020 to 2.5% under the base scenario and 2.7% under the adverse scenario. By company size, the share of SMEs is projected to be higher, and by industry, the shares of the shipbuilding, automobile, and wholesale & retail trade industries are expected to be higher (Figure II-12).

Figure Ⅱ-12. Changes in proportion[1] of corporations with capital impairment, by scenario



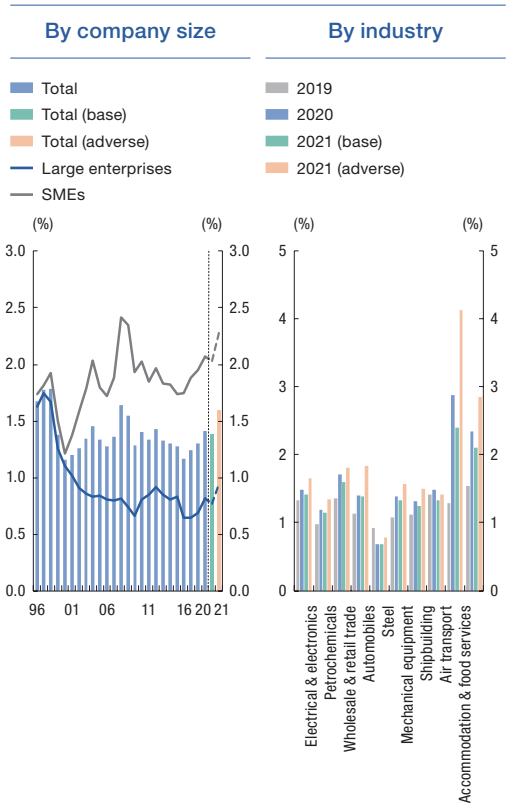
Note: 1) B (A) indicates the base (adverse) scenario for 2021.
Sources: KIS-Value, Bank of Korea staff calculations.

16) For 2016 to 2019, “capital impairment” is defined as the situation where the net assets (total assets minus total liabilities) of a firm at the end of the given year are negative. For 2020 to 2021, “capital impairment” refers to the situation where the sum of net assets at the end of the preceding year and operating income for the given year are negative.

Meanwhile, regarding the probability of default[17] for 2021, based on projected financial indicators, under the base scenario the probability of default would edge down from 1.41% 2020 to 1.38%, but under the adverse scenario it would jump to 1.59%, which is the highest level since 2010, although lower than those recorded during the global financial crisis (1.64% in 2008) and foreign currency crisis (1.79% in 1998).

By industry, the probability of default is expected to rise in most industries under the adverse scenario. In particular, the automobile, air transport, and accommodation & food services industries are likely to see higher probabilities of default due to the sales shock (Figure II-13).

Figure II-13. Trend and outlook of probability of default,[1] by scenario



Note: 1) Average of the probability of default of individual companies.
Sources: KIS-Value, Bank of Korea staff calculations.

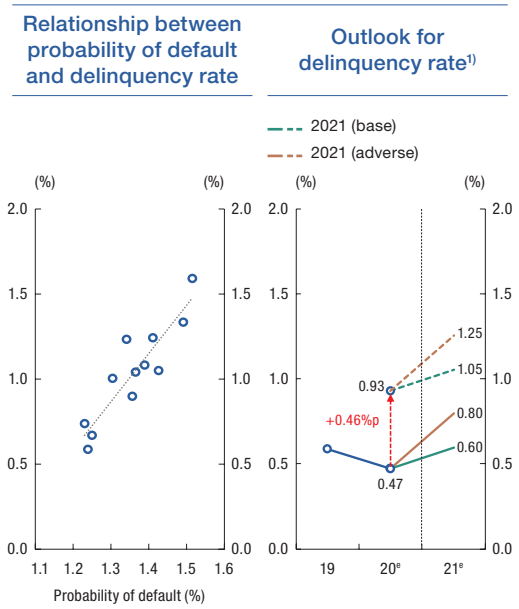
Considering the correlation[18] between firm's average probability of default and delinquency rate of corporate loans, the delinquency rate of 0.47% (average of 2020) this year, which is relatively low, would have risen to 0.93%

17) With the occurrence of default after one year being the dependent variable and major financial indicators for the base year being the explanatory variable, the "probability that a firm may face default in one year (probability of default)" was estimated using a logit model. "Default" is defined as the state of a firm facing actual default due to business closure or insolvency (total assets being less than total liabilities) according to the KIS-Value data. Exogenous variables included: growth (sales growth rate), profitability (operating income-to-sales ratio, ratio of retained earnings to total assets), liquidity (ratio of liquid assets and liabilities to total assets), stability (ratio of shareholders' equity to total assets, dependence on borrowings), debt servicing capacity (interest coverage ratio being less than 1, marginal firm, debt ratio of over 200%), investment efficiency (ratio of sales to total assets), firm size (log of total assets), etc.

18) Based on the definition of probability of default (PD) (probability that default will occur in one year), the correlation coefficient between PD from 2007 to 2019 (mean of PD values for periods (t-2), (t-1), and (t) and the delinquency rate (period t)) was 0.90, which is very high, implying that a 0.1%p increase in PD leads to a 0.3%p increase in the delinquency rate.

(+0.46%p[19]) if financial support had not been provided. For the next year, if the financial support measures are kept in place under the adverse scenario, the delinquency rate will likely rise to 0.80%, but if the measures are terminated, it will rise to 1.25% (Figure II-14).

Figure II-14. Probability of default and corporate loan delinquency rate, by scenario



Note: 1) The solid (dotted) line indicates the situation when the financial support persists (terminates).
Sources: KIS-Value, commercial banks' business reports.

4. Overall assessment

Although corporate financial soundness is deteriorating amid the spread of COVID-19, the potential risk of loan defaults has not been actualized due to policy support and companies' efforts to secure liquidity. If the pandemic recedes next year, the real economy will likely recover and companies' debt repayment capacity will improve. However, even if the pandemic is brought under control, the pace of the economic rebound may be slower than expected due to a delay in the recovery of global production and trade structures.

Even under the base scenario, where corporate performance recovers gradually, if the financial support measures are terminated, the liquidity shortfall is expected to reach 4.0 trillion won, and a significant portion of enterprises (5.1%) to experience liquidity shortages. In the adverse scenario, where the improvement of corporate performance is delayed, if the financial support is fully withdrawn, the liquidity shortfall is projected to soar to 7.7 trillion won, with the share of firms with liquidity shortages climbing to 7.0%. In particular, the share of firms that are least likely to survive in the long term due to capital impairment is likely to rise from 2.0% this year to 2.5% under the base scenario and 2.7% under the adverse scenario.

Given these circumstances, complete withdrawal of the financial support measures is more likely to constrain corporate business activity. Furthermore, heightened market vigilance against credit risk may further affect the liquidity of firms and increase the number of firms with capital impairment. As a result, the buildup of credit risk may lead to corporate defaults.

On the other hand, if the accommodative financial support measures are sustained, it

19) The gap (0.46%p) between the estimated delinquency rate of 2020 (0.93%), calculated based on the long-term relationship between the delinquency rate of corporate loans and the probability of default, and the actual delinquency rate of 2020 (0.47%) was considered to be a policy effect of the financial support.

could delay corporate restructuring and hinder the efficient allocation of financial resources. Hence, going forward, the financial support measures should be gradually withdrawn in accordance with the rate of improvement in corporate financial soundness and business conditions, and targeted liquidity support should be offered to firms that are more likely to survive in the long term.

Ⅲ. Assessment of the Impact of Delayed Economic Recovery and Financial Imbalance Adjustment: Stress Test on Household and Non-financial Firms' Loans, and Financial Institutions

1. Background

The financial markets, which were volatile after the COVID-19 outbreak, have rapidly regained stability thanks to the active provision of liquidity by the policy authorities and financial institutions. However, as asset prices have soared amid the sluggish real economy and liabilities have expanded rapidly, there is concern over the widening disconnect between the real economy and financial markets.[1)]

In the event of future internal and external shocks, the increasing imbalance between the real economy and financial sector[2)] could trigger systemic disruption through declining asset prices and deleveraging and adversely affect the real economy. If the sluggishness of the real economy persists amid the protracted COVID-19 pandemic, household income and corporate sales will likely not improve, and the debt servicing capacity of economic agents will deteriorate, heightening market vigilance against credit risk. As credit risk assessment in the financial markets changes, involving factors such as the widening credit spread of corporate bonds and increase in bank loans, financial imbalances could be rapidly corrected via rapid declines in asset prices and contractions of credit supply. This correction of the real-financial disconnect could lead to a vicious cycle of growing downside risks to the real economy and a worsening credit crunch in the financial markets (Figure III-1).

This paper reviews the status of credit risk assessment in the financial markets and examines how households, businesses, and financial institutions would be affected in a stress scenario where, amid a deepening economic downturn, financial imbalances are rapidly corrected by credit risk reassessment.

1) The IMF assessed that, despite the high uncertainty in the overall economy, the real-financial disconnect persists amid growing investor appetite for risk ("Global Financial Stability Report: Bridge to Recovery," October 2020).

2) According to the FSB, etc., financial imbalances are caused by the simultaneous occurrence of a rapid buildup of credit, excessive rise of asset prices, and stronger risk appetite, and indicate a state where potential risks in the financial sector exceed the level that can be tolerated by the real economy.

Figure Ⅲ-1. Spillover channels of financial imbalances correction

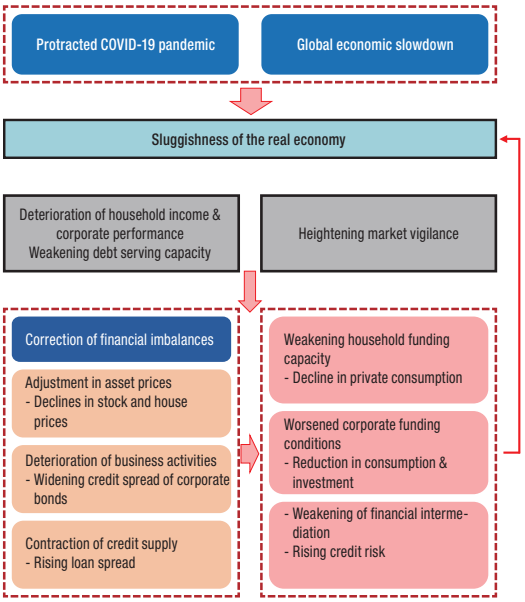
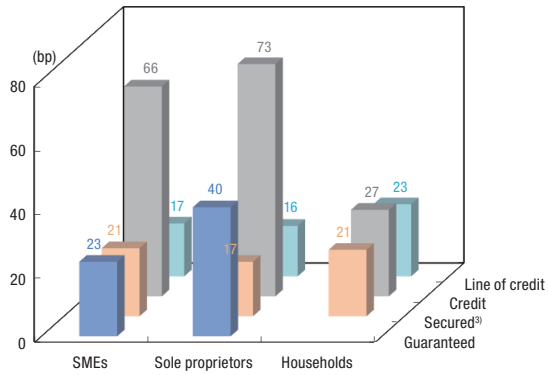


Figure Ⅲ-2. Changes[1] in loan spread[2]



Notes: 1) The increase as of Oct. 2020 compared to the lowest during 2020.
2) Based on the average of four banks; moving average of three months including the month the loans are made for SMEs and sole proprietors, and average among the month the loans were made for households.
3) Based on physical collateral for corporations, and home mortgage loans (amortized) for households.
Source: Korea Federation of Banks.

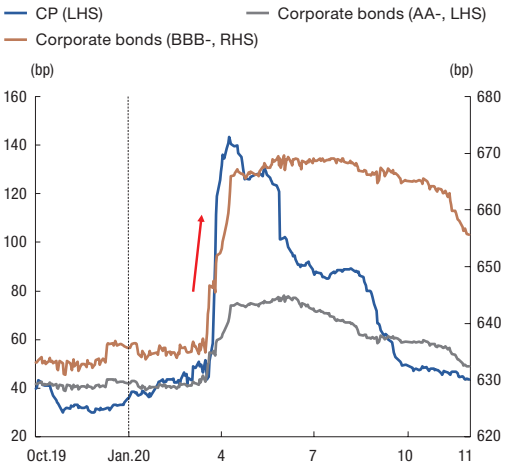
2. Credit risk assessment

A. Status

Regarding the movement of prices in the financial markets, financial market vigilance against credit risk has climbed moderately since the COVID-19 outbreak. The bank lending spread declined in the early stage of the pandemic owing to efforts by financial institutions to provide funding support, but as the pandemic persisted, the spread increased significantly. Overall, the increase in the spread of unsecured loans taken by SMEs, sole proprietors, and households accelerated (Figure III-2).

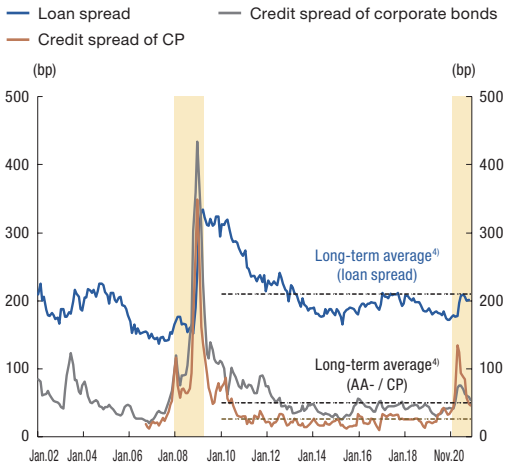
The credit spreads of corporate bonds and CP widened moderately compared to before the COVID-19 outbreak. In particular, the credit spread of subprime corporate bonds (BBB-, three-year) has remained at an elevated level despite the stabilization of the overall financial markets. (Figure III-3).

Figure Ⅲ-3. Credit spreads of CP[1] and corporate bonds[2]



Notes: 1) CP (91-day, final quotation yield) - Monetary Stabilization Bonds (91-day, final quotation yield).
2) Corporate bonds (3-yr, average of four agencies) - Treasury bonds (3-yr, final quotation yield).
Source: Korea Financial Investment Association.

Figure Ⅲ-4. Loan spread,[1] credit spreads of corporate bonds[2] and CP[3]



Notes: 1) Loans of deposit-taking banks (newly extended amount basis) - bank debentures (3-month, average of four agencies).
2) Corporate bonds (3-yr, average of four agencies) - Treasury bonds (3-yr, final quotation yield).
3) CP (91-day, final quotation yield) - Monetary Stabilization Bonds (91-day, final quotation yield).
4) Monthly average from Jan. 2010 to Dec. 2019.
Sources: Bank of Korea, Korea Financial Investment Association.

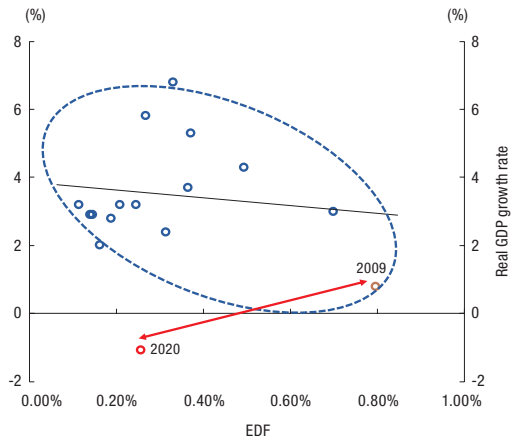
However, viewed from a long-term horizon, the degree of market vigilance reflected in financial market prices is lower than in the past.

In the direct and indirect financing markets, the spread of bank loans and credit spreads of corporate bonds and CP, despite the COVID-19 shock, are significantly lower than those seen during the global financial crisis, hovering around the average long-term (10 year) spreads prior to the pandemic (Figure III-4).

In the meantime, the expected default frequency (EDF)[3] reflected in stock prices remains at a very low level, unlike in the past, despite the projection that the post-pandemic economic growth rate is likely to fall below its long-term (10-year) average and below the rate observed during the global financial crisis. For example, while the projected economic growth rate for 2020 is -1.1% (Bank of Korea, November 2020), much lower than the 0.8% recorded in 2009, the estimated EDF in the stock market stands at 0.25%, well below the 0.8% (daily average) seen in 2009 (Figure III-5).

3) EDF, developed by Kealhofer, McQuown, and Vasicek based on the Merton model, refers to the probability of the market value of firms' assets (estimated by market capitalization) falling below the default point (amount of debt maturing) within one year. The ratio is calculated by estimating the distribution of firm values at a certain future time, based on asset value, growth, and volatility, and comparing that distribution with the current level of nominal debt. EDF typically rises when the economy is sluggish, showing an inverse relationship.

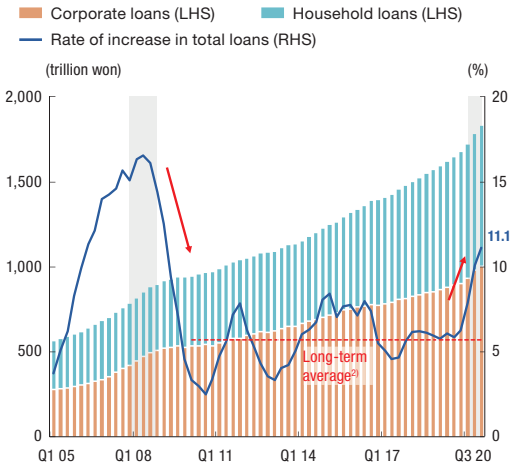
Figure Ⅲ-5. Real GDP growth rate[1] and expected default frequency[2]



Notes: 1) Annual economic growth rate since 2005, and Bank of Korea forecast for 2020 (-1.1%).
2) 2020 figures are based on daily average between January-November.

Sources: Bank of Korea, KRM

Figure Ⅲ-6. Domestic banks' loan amount and growth rate[1]



Notes: 1) Year-on-year basis.
2) Quarterly average from Q1 2010 to Q4 2020.

Sources: Financial institutions' business reports.

Next, as for the supply of credit, as banks maintained an accommodative lending attitude unlike in past crises, the credit supply provided by banks increased greatly since the coronavirus outbreak. Whereas immediately after the global financial crisis, domestic banks' lending attitude tightened rapidly and the credit supply was drastically reduced[4], amid the response to the COVID-19 pandemic, bank loans expanded considerably, resulting in the loan growth rate outpacing its long-term average (Figure III-6).

B. Background of reduced credit risk assessment

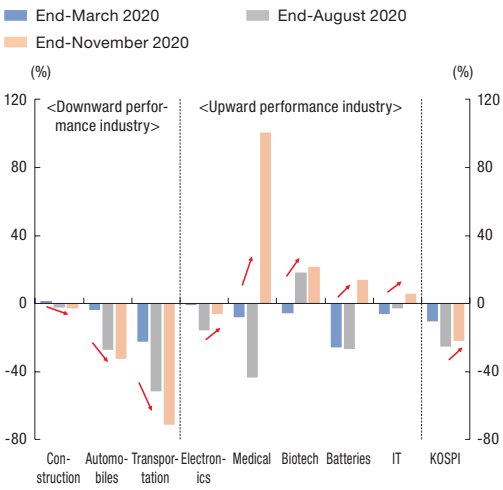
The fact that credit risk was not fully reflected in financial market price variables and the amount of credit supply, relative to past crises and present real economic conditions, was above all due to the expectation[5] of economic recovery. Some economic agents expect prompt economic recovery with the development of COVID-19 vaccines and treatments. Given that the recent real economic crisis was not prompted by structural problems within the financial and economic systems but by a public health shock external to the economy, they believe that, as the coronavirus situation improves, the economy will recover quickly.

4) The lending attitude indicator measures the extent of domestic banks' accommodation with respect to the supply of credit. It recorded an average of -17 in 2008, well below 2020's average of 4. The loan growth rate peaked in the second quarter of 2008 (16.5% YoY) and sharply declined to 2.5% in the third quarter of 2010.

5) The IMF Global Financial Stability Report released in June 2020 judged that the broad recovery of the financial markets has been accompanied by growing investor optimism regarding the prospects for a speedy economic recovery ("Global Financial Stability Report Update," June 2020).

Furthermore, some anticipate that the socio-cultural changes triggered by the pandemic could help boost the growth potential in the long term through changes[6] in industrial structures. This expectation is supported by the fact that the operating profit of biotech and IT corporations has expanded since the outbreak of COVID-19 (Figure III-7).

Figure III-7. Change[1] of consensus[2] in operating profit, by industry



Notes: 1) Compared to forecasts of 2020 operating income estimated at the end of December 2019.
2) Based on KOSPI-listed companies with uninterrupted consensus data since December 2019.

Source: FnGuide.

Another important factor is the confidence in and expectations[7] of policy support.[8] The prompt and strong response of the government and Bank of Korea to the pandemic helped the financial markets recover swiftly, likely boosting trust in economic policies.

Moreover, there is now an expectation of continued policy support to ensure economic recovery and financial market stabilization if financial instability arises again going forward. It is believed that, despite the sluggish economy, if prompt policy support similar to the current support is introduced, there will be no significant possibility of widespread defaults.

The fact that credit risk is currently assessed by the financial markets as being lower than during past crises is attributable more to the positive expectations for the economy than to any improvement in the fundamentals. However, the expectations of economic agents may change rapidly depending on how financial and economic conditions evolve going forward. Given that the recent economic uncertainty is unprecedented, if the economic conditions at home and abroad deteriorate again, the financial market assessment of credit risk may change.

6) For details, refer to "Change of economic structure after the COVID-19 outbreak and impacts on the Korean economy" (Bank of Korea, June 2020).

7) The IMF assessed that the recent disconnect between the financial markets and real economy can be traced to the expectation of economic agents concerning policy support, and, if investors reassess the scope for the policy support or if the recovery is delayed, the odds of a sharp adjustment of the current risk asset valuations may rise ("Global Financial Stability Report," October 2020).

8) The BIS also believes that governments' unprecedented policy support has contributed to the financial markets' perception of relatively low default risks ("BIS Bulletin," October 2020).

3. Risk spillover channel and scenarios

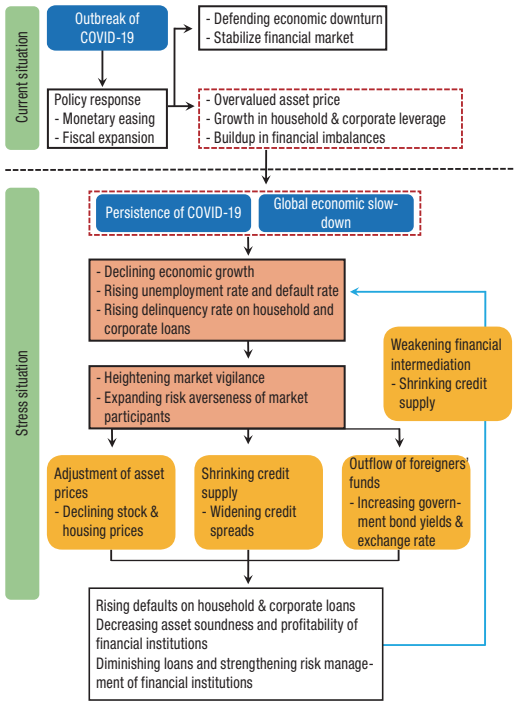
A. Spillover channel

While the financial markets have stabilized rapidly following the huge impact of the COVID-19 pandemic on the real economy, potential vulnerability within the financial system appears to have accumulated in the process. Under these circumstances, if the current economic conditions worsen and the recovery is sluggish due to the persistence of the pandemic, the debt servicing capacities of households and enterprises may deteriorate, undermining the soundness of financial institutions.

Furthermore, stronger risk averseness of economic agents due to a delayed economic recovery could lead to the reassessment of credit risk, prompting a sharp decline in the value of assets such as corporate bonds, stocks, and real estate. Declining asset prices could serve as a factor undermining the profitability and soundness of financial institutions.

If financial institutions respond by liquidating risk assets, curtailing new loans, and strengthening the risk management of existing loans in order to meet regulations such as the capital ratio, there is a significant likelihood of a vicious cycle where the credit crunch further intensifies and the economic growth rate continually falls (Figure III-8).

Figure III-8. Risk spillover channel within the financial system



B. Stress test scenarios

This stress test assumed that accumulated financial imbalances are corrected while economic recovery is delayed. The reference time is the end of the second quarter of 2020, and the shocks under each scenario continue for three years.[9)]

(Delay of economic recovery)

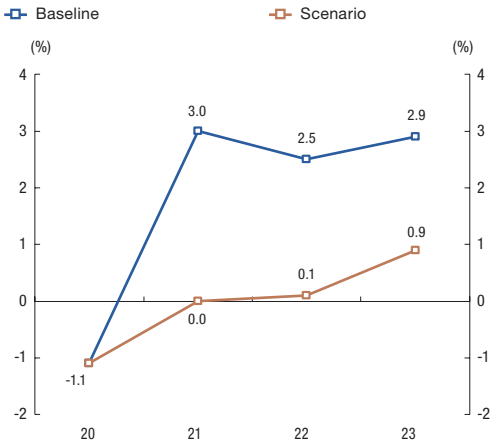
The baseline projections of the growth rates of the world and domestic economies were set based on the economic outlook data of the Bank of Korea and IMF.[10)] The stress test sce-

9) For macroeconomic and financial variables as of the third quarter of 2020, actual values were used.

10) As for the baseline GDP growth rate of Korea, for the period of 2020 to 2022, the Economic Outlook Report (November 2020) of the Bank of Korea was referred to, and for 2023, the IMF World Economic Outlook (October 2020) was referred to.

narios refer to the IMF's downside estimates[11] of economic growth rates and assume that the domestic economic growth rate remains below the baseline projection (Figure III-9).

Figure Ⅲ-9. Scenario of domestic GDP growth rate[1]



Note: 1) Based on annual real-GDP growth rate.
Sources: Bank of Korea (Nov. 2020), IMF (Oct. 2020)

(Growing uncertainty in financial markets and financial imbalances correction)

It was assumed that the expanding risk averseness of market participants and increasing credit risk leads to a fall in risk asset prices, a decrease in the credit supply, and a correction of financial imbalances. In estimating the path of major macroeconomic and financial variables, reference was made to macro scenario modules[12] of the Bank of Korea and the figures observed during the global financial crisis.[13] (Table III-1).

Table Ⅲ-1. Scenario of major financial variables[1]

(%, bp)

	Q3 2020	Scenario	
		Average of test period[2]	Maximum decrease[3]
Stock prices	2,302	1,672	1,345
Changes in housing prices[4]	3.8	0.1	-1.4
Treasury bond (3-yr) credit spreads[5]	37	90	122
Corporate bond (3-yr) credit spreads[6]	64	193	292

Notes: 1) Quarterly average basis.
2) Q3 2020 - Q2 2023.
3) Maximum increase for spreads of treasury bonds and corporate bonds.
4) Based on housing sales prices; year-on-year basis.
5) Treasury bond (3-year) yield - call rate.
6) Corporate bond (AA-, 3-yr) yield - Treasury bond (3-year) yield.

4. Impact by sector

In addition to the existing stress test method, which focuses on analyzing the impact on the capital adequacy of individual financial institutions and financial sectors, this paper divides financial institutions' loans into household loans and corporate loans, and examines the possibility of these loans be-

11) The IMF estimated the future GDP growth paths of the world economy, advanced economies, and emerging market economies under an upside scenario, baseline scenario, and downside scenario (IMF World Economic Outlook Report, October 2020). Under this stress test, Korea's GDP growth rates are based on a combination of the baseline projection and the IMF's downside estimates of advanced economies' GDP growth rates (decline from baseline).

12) For details, refer to the Bank of Korea's Financial Stability Report of December 2018, 「Analysis of Financial Stability Issues, I. Results of Extensive Stress Test Model Development」 (page 95).

13) During the global financial crisis, the stock index (average for the quarter, hereafter) tumbled to 1,132 (-41.9% relative to the immediately preceding peak), and the spread between the Treasury bond (3-year) yield and call money rate widened to 230bp. Meanwhile, the spread between corporate bond (AA-, 3-year) and Treasury bond (3-year) yields increased to 364bp.

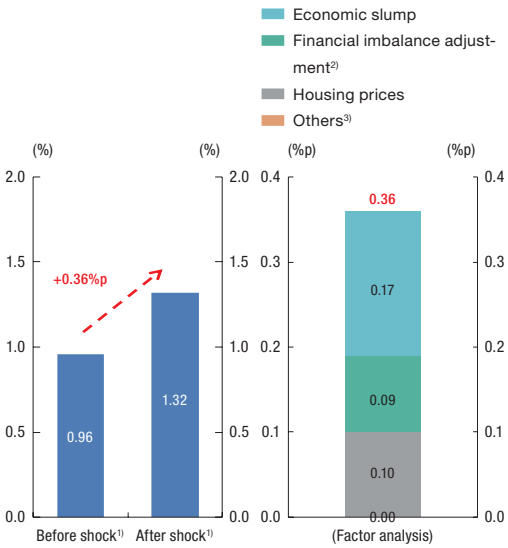
coming non-performing. This is necessary to identify sectoral vulnerabilities because, with the delayed economic recovery and correction of financial imbalances, the impacts on households and businesses may be different. To do this, the probabilities of default[14] for the loans held by households and businesses were estimated, and the causes of the increasing probability of default were analyzed in terms of delayed economic recovery and the financial imbalance correction.

The analysis results showed that the scale of non-performing corporate loans (48.1 trillion won, cumulative balance for three years, hereafter) of the total (1,791 trillion won at the end of the second quarter of 2020) far exceeds the size of non-performing household loans (18.7 trillion won) out of total household loans (1,429 trillion won).[15] Financial institutions were expected to suffer contagion losses of 18.2 trillion won due to the soaring credit risk associated with the defaults of some financial institutions, in addition to credit losses (66.8 trillion won) and market losses (76.4 trillion won).

A. Households

The probability of default of households rose by 0.36%p (Q2 2020: 0.96% → Q2 2023: 1.32%) in the event of economic slump and financial imbalance adjustment shocks. Such change of the default probability was driven mainly by economic sluggishness (0.17%p) and the slower rate of increase in housing prices (0.10%p) (Figure III-10).

Figure Ⅲ-10. Factor analysis of household loans' probability of default



Notes: 1) Before (after) shock represents baseline (stress) situation.
2) Housing price effects excluded.
3) Lagged dependent variables, etc.

The household loan defaults of financial institutions due to the deterioration of the debt repayment capacity of households were projected to reach 18.7 trillion won.[16] This represents 1.3% of financial institutions' total household loans (1,429 trillion won) at the end of the second quarter of 2020, an increase of 5.2 trillion won compared with the base scenario. The factors behind household loan defaults included decreased income associated

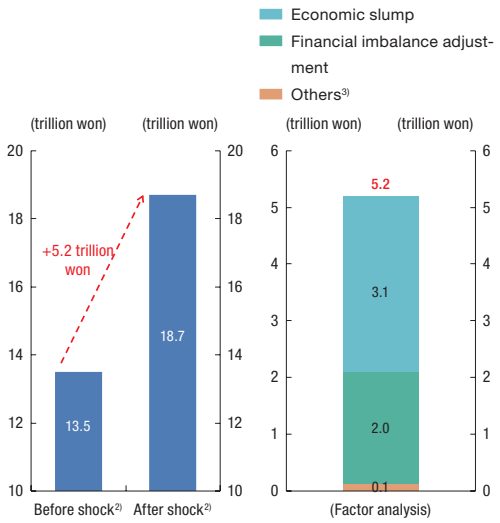
14) The probability of default (PD) was estimated using the logit model. Explanatory variables included a lagged dependent variable and macroeconomic variables such as growth rate, interest rate, corporate bond yield, exchange rate, stock price, and housing price.

15) The loan balance is based on the household and corporate exposures of financial institutions subject to the stress test.

16) Financial institutions refer to the probability of household loan default as "credit losses," as it is equal to credit losses due to a downgrade under the asset soundness classification guideline.

with the economic slump (3.1 trillion won), and financial imbalance correction such as the decline in asset prices and credit growth rate (2.0 trillion won)[17] (Figure III-11).

Figure Ⅲ-11. Factor analysis of household loans' credit losses[1]



Notes: 1) Based on accumulated losses for three years.
2) Before (after) shock represents baseline (stress) situation.
3) Lagged dependent variables, etc.

By financial institution sector, household debt defaults are likely to affect the soundness of credit card companies and savings banks most seriously (Table III-2). The ratio of credit losses to household loans for credit card companies and savings banks is expected to stand at 8.3% and 5.4%, respectively, which are higher than those of other financial sectors, owing to the significant impact of decreased household income (Figures III-12 and III-13). Meanwhile, as for banks, the household debt default rate is likely to remain low overall, and credit losses to stay at 0.4% of the total.

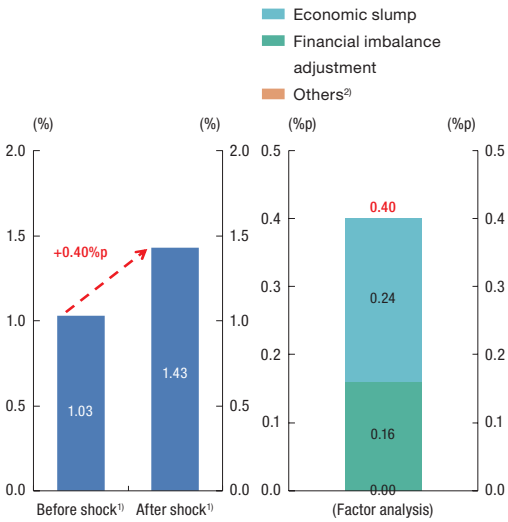
Table Ⅲ-2. Estimated credit losses[1] on household loans by financial institution sector

(trillion won, %)

Sector	Credit losses (A)	Household loan balance (B)	A / B × 100
Total	18.7	1,428.6	1.3
Banks	3.4	878.4	0.4
Mutual savings banks	1.5	27.8	5.4
Mutual credit cooperatives	3.9	347.2	1.1
Credit card cos.	9.8	117.8	8.3
Insurance cos.	0.2	57.4	0.3

Note: 1) Based on accumulated losses for three years.
Sources: Financial institutions' business reports.

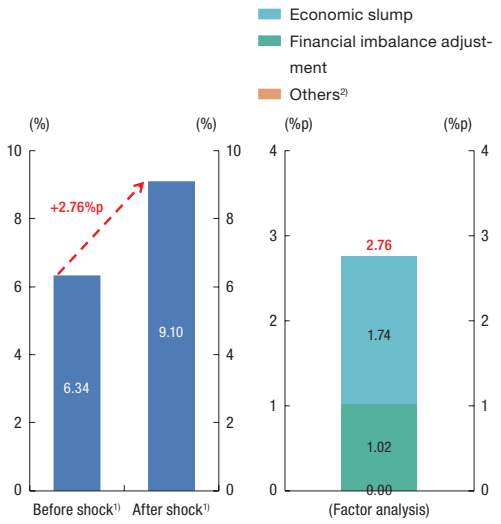
Figure Ⅲ-12. Factor analysis of household loans' probability of default (credit card companies)



Notes: 1) Before (after) shock represents baseline (stress) situation.
2) Lagged dependent variables, etc.

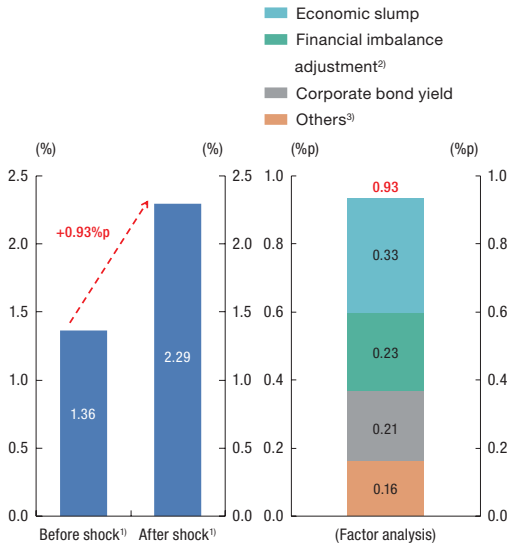
17) The balance (0.1 trillion won) from the total growth of 5.2 trillion won is due to the effect of the lagged dependent variable, etc.

Figure Ⅲ-13. Factor analysis of household loans' probability of default (mutual savings banks)



Notes: 1) Before (after) shock represents baseline (stress) situation.
2) Lagged dependent variables, etc.

Figure Ⅲ-14. Factor analysis of corporate loans' probability of default



Notes: 1) Before (after) shock represents baseline (stress) situation.
2) Corporate bond yield effects excluded.
3) Lagged dependent variables, etc.

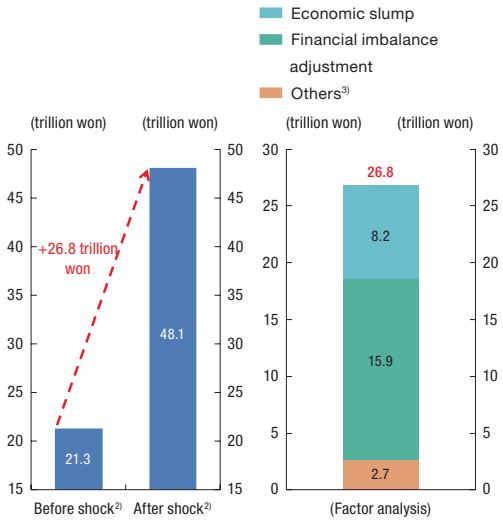
B. Corporations

The probability of default on loans to the corporate sector is projected to rise by 0.93%p from 1.36% in the second quarter of 2020 to 2.29% in the second quarter of 2023. Major contributors to the rise of the default rate included the deterioration of corporate performance (0.33%p) and widening credit spread (0.21%p) amid the economic slowdown (Figure III-14). This is attributed to rising funding costs of businesses and limited access to borrowings amid growing financial market vigilance against credit risk due to protracted economic sluggishness.

As corporate loan defaults soar, financial institutions are projected to incur credit losses totaling 48.1 trillion won over the next three years, far exceeding the credit losses of households (18.7 trillion won). The share of credit losses on loans was 2.7% for businesses, much larger than the 1.3% for households, and this result was observed in all financial sectors.[18] Meanwhile, by factor, compared with the base scenario, the corporate credit losses are largely attributable to the economic slump (8.2 trillion won) and financial imbalance correction (15.9 trillion won) (Figure III-15).

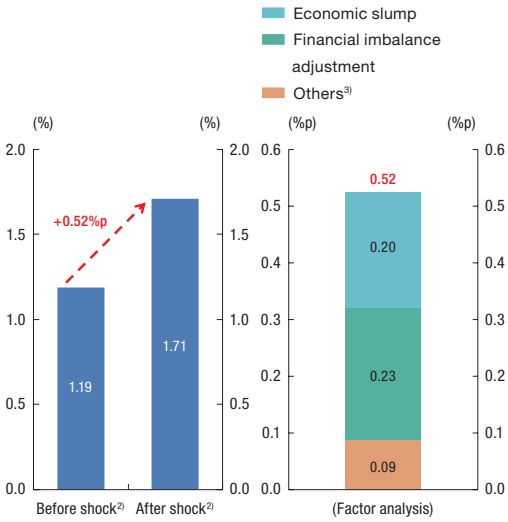
18) The shares of credit losses on loans to households and enterprises were 0.4% and 2.5%, respectively, for banks, 5.4% and 8.9% for savings banks, 1.1% and 3.2% for mutual credit cooperatives, and 0.3% and 2.3% for insurance companies.

Figure Ⅲ-15. Factor analysis of corporate loans' credit losses[1)]



Note: 1) Based on accumulated losses for 3 years.
2) Before (after) shock represents baseline (stress) situation.
3) Lagged dependent variables, etc.

Figure Ⅲ-16. Factor analysis of loans'[1)] probability of default

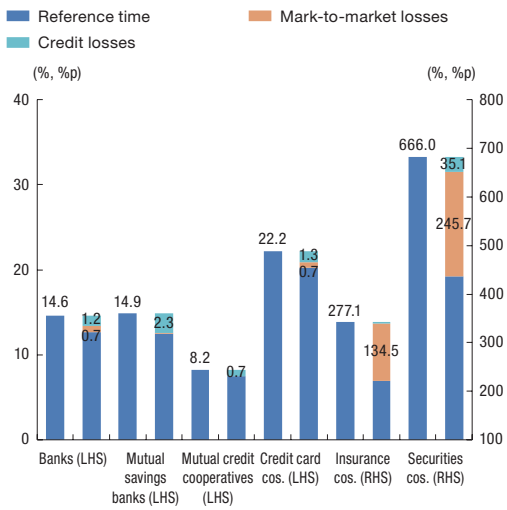


Notes: 1) Household and corporate loans basis.
2) Before (after) shock represents baseline (stress) situation.
3) Lagged dependent variables, etc.

C. Financial institutions

In the scenario of economic slump and financial imbalance correction, with credit losses associated with household and corporate loan defaults and mark-to-market losses caused by asset price declines, the capital ratio[19)] of some financial institutions drops significantly (Figures III-16 and III-17).

Figure Ⅲ-17. Contribution[1)] of credit losses and mark-to-market losses to changes in capital ratio

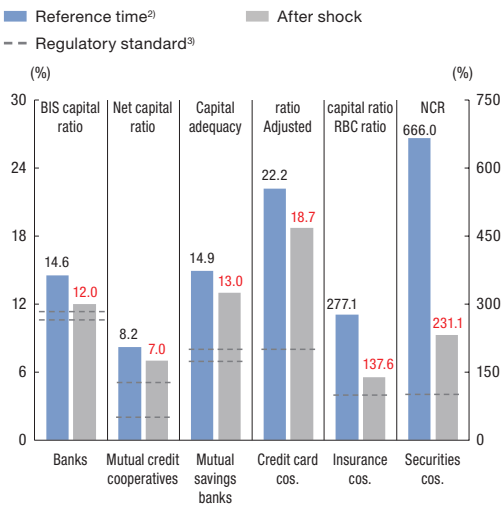


Note: 1) Relative to reference time.

19) It should be noted that, in this paper, the change in the capital ratio did not reflect the Basel III regulatory reforms introduced by banks since June 2020.

Under the stress situation, the average capital adequacy ratio in all financial sectors may be above regulatory levels, while the decline of the ratio among securities companies (-434.9%p) and insurance companies (-139.5%p) is expected to be very high. This is possible because, among their total assets, these sectors hold large portions[20] of securities, and thus mark-to-market losses rise significantly, due mainly to the decline of financial asset prices in the process of financial imbalance correction (Figure III-18 and Table III-3).

Figure Ⅲ-18. Changes in capital ratios[1] by sector under 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) Reference time is the end of Q2 2020, and after shock is the end of Q2 2023.
3) 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.

Table Ⅲ-3. Estimated market losses by financial institution sector[1]

(trillion won, %)

Sector	Market losses (A)	Securities balance (B)	A / B × 100
Total	-76.4	1,304.6	-5.1
Banks	-5.1	357.3	-2.0
Mutual savings banks	0.0	2.6	0
Mutual credit cooperatives	0.1	10.0	1.0
Credit card cos.	-0.9	4.1	-22.0
Insurance cos.	-67.0	588.6	-11.4
Securities cos.	-3.7	342.0	-1.1

Note: 1) Accumulated estimation for next three years (Q3 2020-Q2 2023).

If the factors behind the decline of financial institutions' capital ratio are divided into economic slump and financial imbalance correction, the effect of financial imbalance correction is greater than the impact of economic slump (Table III-4). This is because, while the decline of the economic growth rate increases credit losses by raising the possibility of borrower defaults, financial imbalance correction affects both credit losses and market losses as it involves widening credit spreads.

20) As of the end of the second quarter of 2020, the share of securities in assets were 60.3% for insurance companies and 56.4% for securities companies.

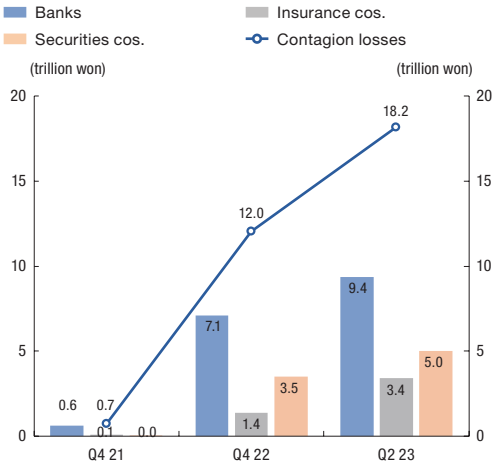
Table Ⅲ-4. Contributions to changes in capital ratio

(%p)

Sector	Economic slump	Financial imbalance adjustment	Widening credit spread[1)]
Banks	-0.2	-1.6	-0.3
Mutual savings banks	-1.2	-1.0	-0.4
Mutual credit cooperatives	-0.5	-0.5	-0.1
Credit card cos.	-0.6	-2.7	-0.2
Insurance cos.	-2.9	-100.8	-40.5
Securities cos.	-3.2	-316.7	-124.4

Note: 1) Based on corporate bond (AA-, 3-yr) yield - Treasury bond (3-yr) yield.

Figure Ⅲ-19. Contagion losses[1)]



Note: 1) Accumulative size relative to reference time.

Meanwhile, some financial institutions saw their capital ratio fall substantially below the regulatory ratio level due to the expansion of market and credit losses. In the event that the capital ratio falls under the regulatory level, contagion losses caused by the interconnectedness of assets and liabilities of financial institutions are estimated at 18.2 trillion won (Figure III-19). The emergence of contagion loss[21)] may weaken the financial intermediation of financial institutions, thus shrinking the credit supply, because financial institutions with a capital ratio near the regulatory level will likely mitigate their risk by curtailing new loans and sell risk assets to increase their capital ratio. This credit crunch may further reduce the economic growth rate, which could accelerate the defaults of household and corporate loans.

5. Overall assessment

In an exceptional situation where the economic slump continues and financial imbalances are corrected, the credit losses of financial institutions, driven by corporate loans, are highly likely to expand significantly. Also, the decline in risk asset prices and growing financial market vigilance against credit risk are expected to increase the mark-to-market losses of securities companies and insurance companies substantially, seriously undermining the resilience of these financial institutions. Nevertheless, under these unusual circumstances, the average capital ratio will remain above the respective regulatory levels in all financial

21) "Contagion loss" refers to all losses that could be incurred in the course of financial institutions' bankruptcy or their efforts to recover and meet the regulatory ratio level. In the event financial institutions are finally determined to be bankrupt, some loans between financial institutions will not be redeemable, leading to losses for creditors, and as the number of financial institution defaults rises, credibility among financial institutions decreases. In this case, withdrawal of existing loans and suspension of new loans could bring about a credit crunch among financial institutions, leading to further increases in funding costs. Meanwhile, financial institutions with capital ratios below or near the regulatory level will reduce their risk assets by liquidating them and curtail new loans to boost their capital ratio. In this case, the decline of asset prices due to risk asset dumping may cause additional losses for other financial institutions.

sectors, suggesting favorable resilience.

Nevertheless, some financial institutions may see their capital ratio slip below the regulatory level under a stress situation, and given that the interconnectedness between financial sectors has steadily risen recently, the possibility that the defaults of these financial institutions may spill over to other sectors must be noted. In the case of delayed economic recovery and a protracted downturn, financial institutions with a relatively low capital ratio will be more vulnerable to shocks than others and need to make efforts to strengthen their risk management and expand their capital buffers.

Contributing Departments & Authors by Section

Section	Author	
Planning & Coordinating	Financial Stability Dep.	Min Gyu Lee
[Executive Summary]	Financial Stability Dep.	Sangki Ahn, Jung In Lee
[Financial Stability Situation by Sector]		
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1. Credit Leverage	Financial Stability Dep.	Hyunman Kim, Soo Sung Moon
2. Household Credit		Hangseo Cho, Dahee Park
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Box 2		Jungmin Park, Jae Hyun Kim, Min Kyung Cho
3. Corporate Credit		Yongpil Moon, Kyoung Ho Kim, Shin Young Lee, Jae Hyun Kim
II. Asset Markets		
1. Bond Markets	Financial Markets Dep.	Eun Woo Kim, Jae Eun Lee
2. Stock Markets		Seokchang Kang, Hui Hun Ahn
3. Real Estate Markets	Financial Stability Dep.	Sangki Ahn, Sangwoo Kim, Jung In Lee, Min Kyung Cho
III. Financial Institutions		
1. Banks	Financial Stability Dep. International Dep.	Seo Rim Jung, Dong Gil Min, Chang Hoon Ryu, Bokyeon Park
Box 3	Financial Stability Dep.	Jisoo Park, Euna Cho, Youn Ah Seo, Jae Hyun Cho, Yeojin Yoon, Eunji Choi
2. Non-Bank Financial Institutions		Jae Hyun Cho, Yeojin Yoon, Eunji Choi, Min Ji Woo
Box 4		Jae Hyun Cho, Min Ji Woo
Box 5		Yeojin Yoon, Eunji Choi, Eun Young Oh
3. Interconnectedness		Young In Na, Youngdae Kang, Hong Ryeal Kim
IV. Capital Flow	International Dep.	Byung Jae Choi, Jae Hoon Kang

Section	Author	
[Resilience of Financial System]		
I. Financial Institutions		
1. Banks	Financial Stability Dep.	Hyeonsoo Kim, Kyusik Kim
Box 6		Sang Ho Lee, Hyeonsoo Kim, Kyusik Kim
2. Non-Bank Financial Institutions		Jae Hyun Cho, Yeojin Yoon, Eunji Choi, Eun Young Oh
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Please contact Financial Stability Analysis Team, Financial Stability Department, Bank of Korea (Tel: +82-2-750-6886, Email: finstabla@bok.or.kr)

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