

Changes in Determinants of Financial Stress in Emerging Market Economies after the GFC

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I. Introduction

Since the global financial crisis (GFC) in 2008, various forms of financial instability have repeatedly emerged when considering the European debt crisis, US interest rate hikes, plunge in commodity prices, and concerns about a hard landing in the Chinese economy. Recently, the international financial market has been unstable due to the COVID-19 pandemic and the intensifying US-China conflict. During this time, emerging countries and Korea have suffered from severe financial instability to a larger extent than advanced economies. Korea experienced de facto financial crisis twice, in 1997 and 2008, due to external shocks. The Korean financial market has recently been very unstable due to external shocks such as the COVID-19 pandemic and the deepening US-China dispute.

Upon this backdrop, this study first attempts to diagnose the recent Korean financial instability through developing the KIEP Financial Stress Index (KIEP FSI). Next, we use the KIEP FSI to analyze the changes in determinants of financial stress after the GFC in Korea and emerging countries. Through this, we suggest policy implications to Korea, which is a highly open economy and vulnerable to external shocks.

II. Measuring the Level of Financial Stress in Korea Using the KIEP FSI

The KIEP FSI was developed to measure financial stress levels systematically in a single and continuous value. The KIEP FSI is calculated for each sub-sector by dividing the financial market into three sectors: the money market (funding market), the foreign exchange market, and the stock market (Table 1).

The KIEP FSI suggests that the Korean financial market has been unstable recently, exceeding the threshold of financial instability (18.3) (Figure 1). The KIEP FSI of Korea, which was stable during 2018-19, increased significantly due to uncertainty following the global pandemic of COVID-19 in 2020. It reached 21.6 in March 2020. After April 2020, FSI fell below the instability level as major countries implemented countermeasures against the spread of COVID-19, and the economic slowdown and the spread of COVID-19 slowed in Korea. The level of KIEP FSI decreased to 14.3 in June 2020.

Table 1. KIEP Financial Stress Index

| Sub-sectors | Variables | Definitions |
|---|---|---|
| Money Market (Funding Market) ¹⁾ | Relative volatility in financial (banking) sector ²⁾ | Monthly standard deviation of daily returns in financial (banking) sector / monthly standard deviation of daily returns of stock market |
| | TED spreads | Short-term interest rate (Money Market Rate) - Government bond (1year) yield |
| | Sovereign bond spreads | Government bond (5year) yield – US Treasury bond (5year) yield |
| FX Market | FX volatility | Monthly standard deviation of daily FX change |
| | Exchange rate depreciations | The rate of depreciation in domestic currency against US dollar (- % change over same period previous year) |
| | Declines in FX reserves | The rate of decrease in FX reserves (- % change over previous month) |
| Stock Market | Stock market volatility | Monthly standard deviation of daily returns of stock market |
| | Declines in equity prices | The rate of decrease in stock price index (- % change over same period previous year) |

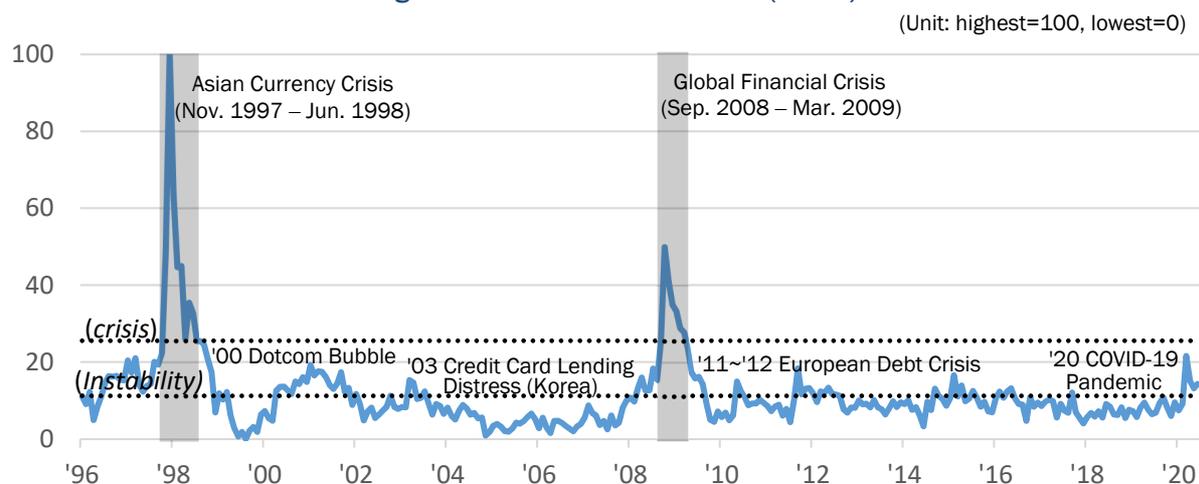
Notes: 1) In addition, we also use corporate yield spreads (corporate bond (3year, AA-) yield – government bond (3year) yield) for Korea.

2) For the countries that financial (banking) sector stock price index is not available, we alternatively use stock prices of major banks.

The recent financial market stress in Korea was found to be mainly due to high volatility in the stock market, among three sub-sectors. Considering the contribution rate to the rise in KIEP FSI, the stock market was the highest at 52.3%, followed by the FX market at 29.0% and the money market at 18.7% (Table 2). This was caused by large withdrawals by foreign investors from the Korean stock market due to

concerns about the sharp economic downturn triggered by the spread of COVID-19. On March, the Bank of Korea and US Federal Reserve signed a \$60 billion bilateral currency swap agreement and the Korean government eased its FX regulations. This contributed to the relative stability of the FX market. The level of stress in money market was also limited due to the interest rate cut and liquidity supply.

Figure 1. Trends of the KIEP FSI (Korea)



Note: We divide the degree of financial market stress into stability (under its average), instability (above its average), and crisis (1.5 standard deviation above its average) levels. FSI signifies the relative level of financial market stress to its long-term average.

Source: Authors' calculation.

Table 2. Contributions of Sub-sectors to Major Increase in KIEP FSI

| | KIEP FSI | | Money Market | FX Market | Stock Market |
|-------------------------|-----------|-------|--------------|-----------|--------------|
| Asian Currency Crisis | May 1997 | 12.3 | 35.8 | 42.5 | 9.4 |
| | Dec. 1997 | 100.0 | (40.8%) | (48.5%) | (10.7%) |
| Global Financial Crisis | May 2008 | 12.6 | 4.8 | 20.3 | 12.3 |
| | Oct. 2008 | 49.9 | (12.8%) | (54.4%) | (32.8%) |
| COVID-19 Pandemic | Jan. 2020 | 7.4 | 2.6 | 4.1 | 7.4 |
| | Mar. 2020 | 21.6 | (18.7%) | (29.0%) | (52.3%) |

Note: Numbers within parentheses show the contribution ratio of each sub-sector.

Source: Authors' calculation.

III. Analysis on Changes in Determinants of Financial Stress before and after the GFC

1. Panel analysis for emerging countries

We examine the changes in determinants of financial stress before and after the global financial crisis (GFC) by using fixed effect panel regression with the KIEP emerging countries financial stress index. The analysis focuses on foreign capital flows of emerging countries. This is because the huge global liquidity due to the expansionary monetary policies of advanced economies including the quantitative easing and the ultra-low interest rate has flowed into emerging countries. We used data from 17 emerging countries, for which data are available among the 27 countries included in the MSCI Emerging Countries Index, with a sample period of Q1 1999 to Q2 2018. Our investigation is conducted for two different periods, pre-crisis and post-crisis, in order to compare the two results.

The results show that the effect of foreign capital flows such as foreign portfolio investment and foreign other investment on the emerging country FSI has changed before and after the GFC. The results of equation (1) in Table 3 indicate that the negative effect of foreign portfolio investment on the FSI after the GFC increases compared to the pre-crisis period while the negative effect of other investment (e.g. loan) decreases. This seems to be mainly due to the fact that tightening financial regulations on banks, for instance through the Basel III reform, results in reducing foreign capital flows via banks while the flow of foreign funds through the capital market, where financial regulations have been less tight than banking sector, is active.

In the case of foreign equity securities and foreign debt securities, the results of equation (2) shown in Table 3 show that the negative effect of foreign equity securities and foreign debt securities on financial stress is amplified after the GFC. To be more specific, the negative effect of foreign equity securities on financial stress is greater than that of the foreign debt securities. This can be because foreign capital largely

flows into the stock market rather than the bond market due to both the long-lasting low interest rate in emerging countries and the ultra-low interest rate in advanced countries.

2. Time series analysis for Korea

We investigate the dynamic changes in determinants of financial stress in Korea before and after the GFC by using the recursive least squares method. The results indicate that the negative effect of foreign portfolio investment and foreign other investment on Korean FSI has increased after the GFC. Dynamically, the degree of these effects elevated right after the GFC and has continued or slightly risen (see Figure 2). In the case of foreign equity and debt securities, the estimated value of the two variables sharply dropped right after the GFC and has stably continued. More specifically, in terms of the level of estimates, the decrease in the estimated value of foreign debt securities exceeds that of foreign equity securities and the gap between two estimated values has been maintained.

In Figure 2, the influence of unrest in the China stock market on the Korea FSI changed from negative (-) to positive (+) right after the GFC, and the positive relationship has continued up to recently. This implies that Chinese financial stress has emerged as one of the significant determinants of financial instability in Korea after the GFC.

IV. Policy Implications

First of all, the monitoring of foreign capital flows such as foreign equity securities and foreign debt securities should be strengthened in order to identify and prepare for financial risks

in Korea and emerging economies. In addition, when weighting the possibility of financial turmoil in emerging economies, current account balance, fiscal balance, and world commodity price index should also be carefully monitored because the effect of these variables on emerging countries FSI has expanded after the GFC.

Next, the results of examining the dynamic changes in determinants of Korea's FSI show that the negative effect of foreign portfolio investment, foreign equity securities, foreign debt securities, and foreign other investment on FSI has expanded after the GFC. Since foreign debt securities among the foreign capital flows have the biggest impact on the financial stress index, the Korean policy authorities should not only monitor the investment patterns of global private institutional investors, but also build up long-term relationships and maintain a hotline with foreign central banks and sovereign wealth funds.

Finally, the current financial stability system should be reviewed from a larger perspective. This is because global capital flows have changed after the financial crisis, from other investment to portfolio investment, and the influence of portfolio investment on financial stress has become larger than that of other investment among the factors causing financial instability. However, the existing financial stability system, which involves measures such as imposing limits on forward position, bank levy and foreign currency liquidity coverage ratio, focuses on other investment (i.e. financial institutions such as banks). Therefore, it will be necessary to establish a comprehensive financial stability system including foreign portfolio investment and the capital market. **KIEP**

Table 3. Fixed Effect Panel Estimates during Two Periods (Pre-Crisis and Post-Crisis)

| Dependent Variable | Emerging country FSI | Eq (1) | | Eq (2) | |
|-------------------------------|---------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | pre-crisis | post-crisis | pre-crisis | post-crisis |
| Foreign capital flows factors | Foreign portfolio investment | -0.073*** (0.019) | -0.126*** (0.0174) | | |
| | Foreign equity securities | | | -0.027 (0.0378) | -0.201*** (0.0519) |
| | Foreign debt securities | | | -0.087*** (0.0241) | -0.113*** (0.0195) |
| | Foreign other investment | -0.085*** (0.0171) | -0.002 (0.0099) | -0.085*** (0.018) | -0.002 (0.0099) |
| Domestic factors | Current account balance (t-1) | -0.054*** (0.0274) | -0.195*** (0.0257) | -0.048* (0.0292) | -0.192*** (0.0259) |
| | Fiscal balance (t-1) | 0.010 (0.0221) | -0.046** (0.0195) | 0.021 (0.0246) | -0.048** (0.0199) |
| Global factors | Trade policy uncertainty change | 0.003*** (0.0011) | 0.001** (0.0005) | 0.003** (0.0012) | 0.001** (0.0005) |
| | World commodity price change | -0.004 (0.0106) | -0.054*** (0.0055) | -0.004 (0.0115) | -0.054*** (0.0055) |
| | Global GDP growth | -0.557*** (0.0933) | 0.160* (0.0834) | -0.541*** (0.1009) | 0.155* (0.0836) |
| Obs | | 415 | 577 | 374 | 575 |
| Country | | 17 | 17 | 17 | 17 |
| R-squared | | 0.28 | 0.27 | 0.25 | 0.27 |

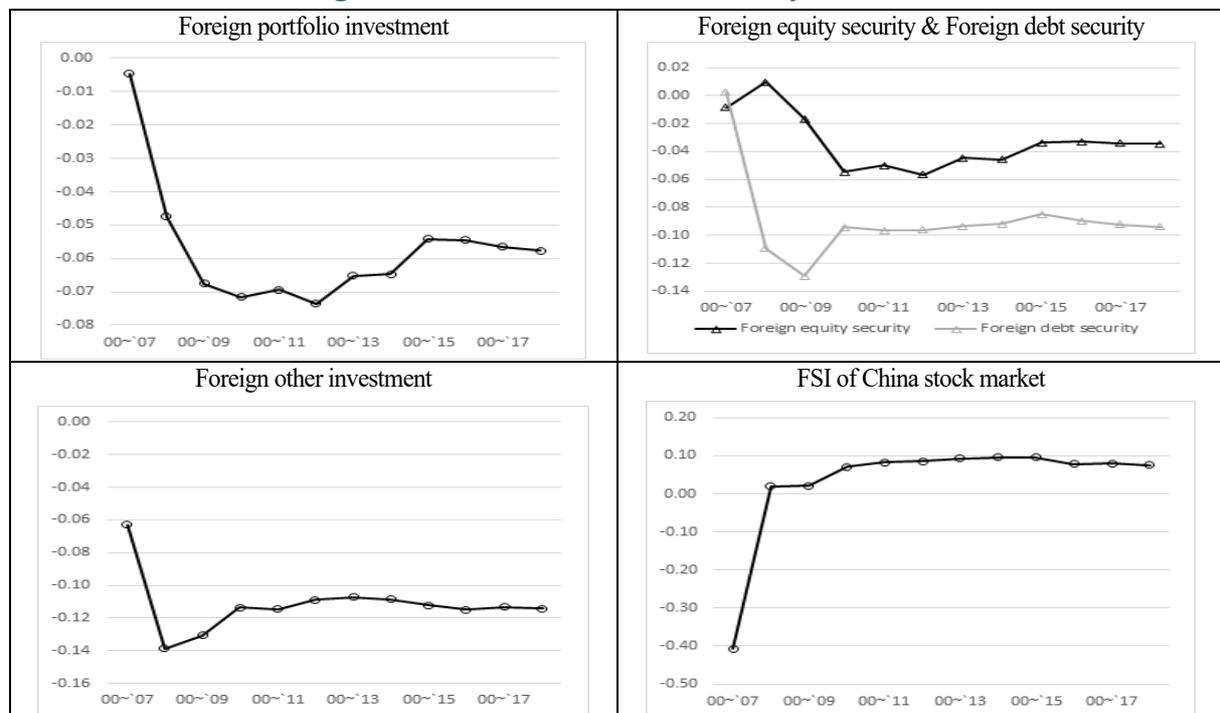
Notes : 1) *, ** and *** denote the significance levels of 1%, 5% and 10%, respectively.

2) Numbers in parentheses are robust standard errors.

3) Eq (1) and Eq (2) use first lagged variables of domestic factors.

4) The pre-crisis period is from Q1 1999 to Q2 2008, and the post-crisis period is Q3 2009 – Q2 2018.

Source: Authors' estimate.

Figure 2. Trend of Estimates of Four Key Variables

Source: Authors' estimate.