"Financial Risk and Crisis Management after
the Global Financial Crisis" Series No.9 (6/2016)

General Overview: "Financial Risk and Crisis Management after the Global Financial Crisis"[1]

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1. Introduction

In this series of papers, eight researchers have authored articles on the topic of "Financial Risk and Crisis Management after the Global Financial Crisis." During their writings, each author has been aware of numerous factors during the global financial crisis and the Eurozone crisis: the financial risk management undertaken by financial institutions and corporations; financial crisis management undertaken by the International Monetary Fund (IMF) and central banks, such as the US Federal Reserve Board (FRB); the problems faced by financial regulations; and the manner in which these regulations reacted and were revised in the aftermath of these crises.

The discussions found in this series can be broadly classified into micro-focused and macro-focused discussions. Micro-focused discussions primarily concern themselves with financial risk management by organizations, such as financial institutions and corporations, observing the characteristics of financial markets during and after the global financial crisis. On the other hand, macro-focused discussions make observations on regional financial collaborations among parties such as the Association of Southeast Asian Nations (ASEAN)+3 nations, the IMF and FRB, as well as the European Union (EU). These macro discussions also observe the roles expected of and fulfilled by fiscal regulations in the realm of financial crisis management.

This paper presents a comprehensive view on the aforementioned problems based on the concepts espoused by the following eight papers in this series. In addition, it discusses the issues in financial risk and crisis management following the global financial crisis, including the state of financial risk and crisis management going forward. Please note that the eight papers authored for this series are as follows.

a) "The Global Financial Crisis and Management of the Eurozone Crisis" Eiji Ogawa (Oct.2015)
b) "New Movements of Financial Risk Analysis in Post Financial Crisis" Hisashi Nakamura (Nov.2015)
c) "Shocks in Japanese Corporate Bond Market during the Global Financial Crisis" Yukihiro Yasuda (Dec.2015)
d) "The US-origin Global Financial Crisis and the Development of Financial Regulations" Hanazaki Masaharu(Jan.2016)

e) "Financial Crisis Management and the Development of the Banking Union in the EU" Yuri Sasaki (Feb.2016)
f) "Capital Flow, Exchange Rate and Financial Risk Management in Asia －Roles and Issues of Intra-Regional Financial Cooperation－" Junko Shimizu (Mar.2016)
g) "The Federal Reserve's Management of the Financial Crisis through Quantitative Easing and Currency Swap Agreements" Chikafumi Nakamura(Apr.2016)
h) "The IMF as a Global Framework for Currency and Financial Crisis Management" Junko Koeda(may2016)

2. The Global Financial Crisis and Management of the Eurozone Crisis

In the article "The Global Financial Crisis and Management of the Eurozone Crisis," Eiji Ogawa examines the phenomenon of US dollar illiquidity and policy responses during the global financial crisis, following an inquiry into the state of financial risk management as it pertains to US dollar illiquidity. He continues with observations of policy responses to the Eurozone crisis, after which he investigates the state of financial risk management as it relates to the interplay between the IMF and regional financial cooperation.

The global financial crisis had its epicenter in the US subprime loan crisis. Yet, there was also the resulting corruption of the security instruments that had these subprime loans as collateral and were being used for funding operations by European financial institutions. These facts, in actuality, led to great effects in short-term funding procurement for financial institutions not only from credit risk in the securities and lending markets but also from counterparty risk in the short-term interbank lending market. In addition, amid the global imbalance, European financial institutions played the role as international financial intermediaries between nations with positive balances of trade (such as oil-producing countries) and the US (a nation with a negative balance of trade). This fact resulted in knock-on effects from the American subprime loan crisis on the European institutions that had been utilizing those securitized instruments in their funds operations. Simultaneously, as economies began to sink into deeper downturns worldwide, many nations saw their fiscal deficits balloon; one of them, Greece, fell into a fiscal crisis, which affected numerous Eurozone nations.

The European Commission (EC), European Central Bank (ECB), and IMF formed a three-party troika system in response to this Eurozone crisis, working together to provide financial support.

Numerous lessons have been learned from the responses to the global financial crisis and Eurozone crisis. As a generalization, it is necessary to establish a crisis management scheme during economic stability before the onset of crisis. Often, we do not reach conclusions (or have discussions) about establishing crisis management schemes until we experience the imminent shadow of crisis. However, the delays experienced by the establishment of a crisis management scheme after being confronted with crisis not only lead to a deeper crisis in the relevant country but also increase the risk of spreading the effects of the said crisis to other nations. A classic example of this is the two and a half years required to establish the European Stability Mechanism after the onset of the Greek crisis, shackled by the ban on fiscal transfers stipulated by a condition of the Lisbon Treaty. This issue was already witnessed in eastern Asia, however; when the region faced the Asian currency crisis of 1997, no regional financial cooperative framework existed, forcing them to rely on assistance from the IMF. Furthermore, while there had been discussions on establishing the Asian Monetary Fund (AMF), they never came to fruition. Stakeholders were forced to wait until 2000 for agreement on the first regional financial cooperative system in eastern Asia for financial crisis management, called the Chiang Mai Initiative (CMI).

Another lesson gained from the global financial crisis is that through the provision of dollar liquidity, the FRB was able to respond to US dollar illiquidity (at times a liquidity crisis) and, at the very least, rapidly curtail credit spreads. The FRB was likely able to act in this area in a consistent fashion given that this event had, by chance, coincided with illiquidity in the US, which was the source of the global financial crisis. If, by chance, the US economy had been under inflationary pressure and the FRB resultingly attempted to adopt more restrictive fiscal policies, it would not be a foregone conclusion that the FRB would be able to take the same actions for foreign nations afflicted by the liquidity crisis. In preparation for such a situation, complementary efforts from the IMF through independent measures and regional financial cooperation would likely be necessary. To make such a response viable in eastern Asia, the ASEAN+3 nations agreed to a currency swap system under the CMI framework. Further, in the interest of evolving the system's functionality, the CMI currency swaps were multilateralized from their initial two-party system (CMI Multilateralization or CMIM). The

ASEAN+3 Macroeconomic Research Office (AMRO) has also been established to provide a surveillance function in the region for not only crisis management but also crisis prevention.

A third lesson is that though the Eurozone crisis met with crisis management efforts from the troika system formed by the EC, ECB, and IMF, this was a cooperative crisis management response between the IMF and regional financial cooperation. Normally, for an international balance of payments or currency crisis, the IMF would act alone in crisis management. However, for the Asian currency crisis, though the IMF led the charge in crisis management, over half of the financial support provided in this crisis yielded from the coffers of eastern Asian nations. That being said, in the CMIM currency swaps, participating nations are working to increase the IMF delinked portion, the amount a nation can receive without requiring borrowing from the IMF. As such, actions are being taken to distance this system from the IMF despite its extolling of its complementary nature with the IMF.

3. Risk Management in Financial Markets Post Financial Crisis

In "New Movements of Financial Risk Analysis in Post Financial Crisis," Hisashi Nakamura begins by explaining the textbook fundamentals on the theoretical frameworks behind asset pricing theory. The rampant use of financial techniques, such as derivative instrument development and securitization, saw significant growth in financial markets and resulted in segmented individual business risks. Diversified and absorbed risks within massive capital markets led players at the time to believe around the mid-2000s that they had constructed a robust system against risks in the financial markets and the real economy.

However, 2007 passed with the outbreak of the subprime crisis and the collapse of Lehman Brothers (the Lehman Shock). The risks that had been believed to be diversified and absorbed into the capital markets came back into the light, wreaking unparalleled losses on the financial markets and the real economy. As experienced in this global financial crisis, no-arbitrage pricing approach that had been the primary tool for financial risk analysis was unable to fully analyze recent financial market movements. Financial sources of friction, such as information problems (moral hazard, adverse selection, monitoring), transaction costs, defaults, psychological factors, and network effects, can render markets incomplete. The Nakamura piece indicates that these sources of friction make asset pricing difficult, suggesting that it is an urgent issue, both academically and in actual financial practice, to construct a new asset valuation (asset pricing) model that allows for appropriate analysis of financial risk after the global financial crisis.

After these statements, Nakamura introduces new directions in asset pricing theory and financial risk analysis since the global financial crisis, indicating three specific directions for future research. The first considers financial market models that introduce behavioral finance factors to investment behavior, which quantitatively analyze asset pricing models from network effects (Kobayashi, 2016). The analysis results illustrate that regardless of the lack of random elements in each investor's investment decision making, the interlinkage and accumulation in the market between deterministic investment behaviors lead to the generation of seemingly random and chaos phenomenon-like price movements. This suggests that hypothesizing a probability model for financial markets, as had been done in models so far, is certainly not the only modelling method available.

The second direction introduced in the study by Nakamura comes from empirical research on interest rate volatility predictions using information contained within the yield curve (Takamizawa, 2015). The results of this analysis can be divided into three parts. First, interest rate factors can effectively explain the volatility in the slope of the yield curve, on par with the generalized autoregressive conditional heteroskedasticity model. Second, when interest rate factors are combined with volatility factors, they can explain the volatility of the curvature of the yield curve. Third, although the simultaneous explanation of cross-sectional and time-series data by interest rate models that satisfy arbitrage-free conditions has been traditionally considered to be challenging, the discovery made by Nakamura is the potential for resolving trade-off problems between cross-section and time-series without unnecessarily increasing the number of factors. Although this research does not necessarily predicate itself on the equilibrium approach, the empirical interpretation via induction of a structure that consistently explains both cross-section and time-series implies a financial model framework yielded from the equilibrium approach.

The third research introduced is the theoretical verification of distortion effects on pricing in financial markets yielded from moral hazard (Misumi, Takaoka, and Nakamura, 2015). This research focuses on the moral hazard when a broad distribution is displayed with a significant shortcoming in success rates, in situations where corporate managers can not only alter normal distributions based on the Brownian motion but also alter the overall probability prediction, including the downward jump rate. It establishes a formula for how this flavor of moral hazard distorts asset pricing in the macro market, with the following three analysis results. First, it indicates that moral hazard decreases the Sharpe ratio and hinders the attractiveness of investment in risk assets. Second, it moves market pricing of risk in the opposite direction versus that of investors' marginal utility, acting as a risk hedge and therefore raising risk-free interest rates. The conclusion reached therein is that moral hazard amplifies the risk-free rate puzzle, which was initially proposed by Weil (1989). Third, it clarifies that the distortions in real assets brought on by moral hazard can be alleviated when investors can access financial markets.

4. Corporate Fund Procurement during the Global Financial Crisis

In "Shocks in Japanese Corporate Bond Market during the Global Financial Crisis," Yukihiro Yasuda considers the effects of the global financial crisis on Japanese corporations. Moreover, he considers ways in which Japanese corporations responded to the effects of crisis in their funding procurement processes. Specifically, he focuses on Japan's publically traded firms and analyzes their behavior in terms of funding procurement in the corporate bond market. This is because for Japan's financial sector, bond and commercial paper markets had fallen into dysfunction, especially after the Lehman Shock of September 2008, thereby leading to skyrocketing levels of bank lending. On the other hand, regarding the question of specifically how Japanese firms responded to the global financial crisis, a need for broad-based verification still exists. This is because our attempts to clarify the effects of the global financial crisis are unsuccessful if we only base them on aggregate data from the corporate bond market due to the realization through Yasuda's research that those effects can widely differ based on the traits of each firm.

Analyzing the funding procurement environment for Japanese firms from a somewhat broad perspective, Yasuda outlines that since the late 1990s, Japan's corporate sector provided excess funds, i.e, Japan's banks, which were major moneylenders, shrugged off bad debt problems and remained healthy, and the contrary trend after the financial crisis in Japan that lending balances continued to hold a sluggish pace.

Yasuda goes beyond this observation, refining his focus in the Japanese corporate bond market and making a detailed inquiry into the manner in which the global financial crisis affected Japan's publically traded firms. The global financial crisis, especially after the Lehman Shock, inflicted a temporary dysfunction upon Japan. Although 2008 saw decreased amounts of procured funding and lower numbers of bond issuances, the following year saw a dramatic increase in the amount of procured funding.

On the topic of corporate bond ratings, frozen effects were significant for firms with relatively high credit risk; however, firms with relatively low credit risks were more apt to experience safe haven effects from low procurement costs. As such, a polarized phenomenon occurred in corporate bond ratings. Further, Yasuda indicates that companies facing difficulty in funding procurement made up the difference through borrowing from banks, while overall, facility investment and other such areas did not see such clear impact from the crisis.

As a result, the above analysis suggests that the corporate bond and bank moneylending markets played complementary roles to one another, implying joint application of both direct and indirect finance for healthy system function instead of an adversarial relation between the two methods.

5. New Movements in Financial Regulations after the Global Financial Crisis

In "The US-origin Global Financial Crisis and the Development of Financial Regulations," Masaharu Hanazaki clarifies the context and traits behind the global financial crisis, on which he bases an organization of trends in financial regulatory reform in recent years and a clarification of the problems facing these reforms. Hanazaki indicates an expansion of fiscal deregulation in the US as a key trait of the financially expansionary period of the 2000s, the decade which also spawned the global financial crisis. America's traditionally restrictive financial system began to shift toward deregulation during and after the 1980s. Precisely, the effective removal of barriers between banking and securities operations in America was one factor that influenced the expansion of a financial bubble being inflated primarily by financial institutions.

Given this sort of context for the global financial crisis, post-crisis financial regulations saw a dominant wave of stronger capital adequacy requirements, introduction of liquidity regulations, increased capital adequacy requirements for large-scale financial institutions, and other such bolstered financial regulations. More specifically, financial regulations in the US after the Lehman Shock included the establishment of the Emergency Economic Stabilization Act, announcement of financial regulatory reforms, and enactment of the Dodd–Frank Act, which included the Volcker Rule. On the global stage, discussions were conducted on fundamental reform in the Basel Accords by the Basel Committee on Banking Supervision, leading to enhanced capital adequacy regulations—the first pillar of the third Basel Accord—to be implemented in a stepwise fashion with full enforcement expected in January 2019. Macroprudential policies, a new perspective on fiscal responsibility, have also seen increased necessity. Macroprudential policies intend to suppress financial systemic risk. The introduction of liquidity regulations, the second pillar of Basel III, is predicated on the concepts of macroprudential policies.

Within the financial regulatory reforms that are in progress as of the time of this writing, including Basel III, we may safely say that the scope and strength of these regulations are both expanding. However, this is not only due to the lax or nonexistent nature of regulations at the time of onset and intensification of the global financial crisis. In other words, Hanazaki indicates that the strengthening of fiscal regulations is unlikely to be able to prevent the occurrence of another financial crisis. In contrast, the existence of fiscal regulations and the systems borne thereof could themselves encourage the onset of financial crisis.

More precisely, capital adequacy regulations carry the adverse effects of assisting risky behavior on the part of banks as well as procyclicality. In addition, global capital adequacy requirements ignore the differences in financial systems that exist between nations. In the future, shifting the onus from global regulations toward local ones would be critical. Hanazaki concludes that the experience surrounding the global financial crisis is a reminder signaling the need for fundamental re-evaluation of the state of our financial regulations.

6. Financial Crisis Management and the Development of the Banking Union in the EU

To resolve the problems with the controversial introduction of a shared currency that had become evident following the global and European financial crises, the financial regulatory systems that had been largely controlled by each home nation were unified within the Eurozone and a banking union was formed. In "Financial Crisis Management and the Development of the Banking Union in the EU," Yuri Sasaki explores this banking union. Sasaki tracks the integration path of the EU up to the formation of the banking union, reflects on the crisis and its effects, and clarifies the reasons for delays in unification of financial regulations while making notes on the costs of unification.

Until the occurrence of the global and Eurozone financial crises, the Eurozone had fundamentally been based on home-country financial regulations. Therefore, although there were internationally unified regulations, such as the Basel Accords in place at the time, each nation would be in charge of regulatory oversight for other regulations or even for national implementation of the Basel Accords. This is because the roots of each nation's regulations, financial business frameworks, and presence of political issues faced by each nation varied from nation to nation. However, at the outbreak of crisis, the use of a single currency in Europe led to the necessity for public bailout and sovereign risk propagated among the nations involved, leading to an increased necessity for financial regulations to be unified further. The European banking union includes regulations such as the Single Supervisory Mechanism, Single (Bankruptcy) Resolution Mechanism, and Deposit Guarantee Scheme, which is, as of this writing, being implemented as a tool of the banking union.

After the financial crises, Europe has greatly reformed its financial oversight system. With regard to microprudential oversight, financing was the only primary tool for dealing with crisis and macroprudential oversight had only just been recently implemented. As such, fundamental reform had not been introduced at that point. However, as the Greek-borne crisis spread its effects across the Eurozone, a new sovereign crisis deepened in the region and discerning the financial crisis from the sovereign crisis became a critical matter. Further, in the 2013 Cypriot crisis, the limits began to come to view for only adopting a home-country oversight system for banks in nations using the Euro as a common currency. As such, the banking union framework picked up real traction.

With unification came the question of scope of application for these issues in instances where the Euro currency area and the EU's scope were different. However, there were numerous obstacles to this effort, including difficulty presented by attempting to keep a similar level of oversight, the existence of nations where securing deposit insurance funds is challenging, and so on. In the introduction of the Euro as a common currency, or even when considering the logic of optimal currency zones, no clear explicit considerations existed concerning the costs of unifying such regulations or the costs that would occur from non-unified regulations. However, as has been made clear from the experience of the financial crisis, the costs of non-integrated regulations are significant, and consequently, the situation demands further unification in regulations. Therefore, Hanazaki indicates that in the consideration of the pros and cons behind market and currency integration, these types of issues with oversight regulations may well require more consideration in the future.

7. Currency/Financial Crisis Management for Asian Regional Financial Cooperatives

In "Capital Flow, Exchange Rate and Financial Risk Management in Asia—Roles and Issues of Intra-Regional Financial Cooperation—," Junko Shimizu provides an overview on the changes in capital flow in Asia after the global financial crisis, analyzing the type of factors that influenced Asia's capital flows. Shimizu also examines the oft-called-for bolstering of crisis response systems and Japan's role in Asian currency/financial crisis management.

Beyond push and pull factors, the major influences on capital flow come from short-term capital flows that are reliant on future expectations of exchange rates. For example, in 2015 and thereafter, the rise of dominant expectations of a weakening Chinese renminbi (RMB) saw Asian currencies fall into a cycle of devaluation. However, if we compare devaluation rates versus the dollar over the 12 months of 2015, we see that many currencies experienced greater devaluation versus that felt by the RMB. For the nations experiencing greater currency devaluation than that of the RMB, Shimizu indicates that plummeting raw resource prices, one more disrupting factor in international finance of late, is an additional factor behind these more significant devaluations.

Notably, nations relatively less reliant on exports to China (India, Japan, the Philippines) saw lower devaluation rates in their currencies. Yet, it is also true that even Hong Kong, Singapore, and Taiwan, nations with high reliance on exports to China, did not see such significant drops in their currencies. According to Shimizu, the reason for this differs per nation: for Hong Kong, its currency board system based on US dollar foreign reserves;

for Singapore, its highly creditworthy (to external players) central bank, the Monetary Authority of Singapore (MAS), and its wealth of foreign currency reserves, 10.2 months' worth as of September 2015; for Taiwan, its holdings of 22.3 months of foreign reserves and other such factors played roles in its stability.

One disruptive factor in international financial markets in 2015 was the decline of resource prices, including crude oil. This damaged the fiscal stability of resource-rich nations, such as Indonesia and Malaysia, trapping it into a vicious cycle of currency devaluation. Shimizu divides the region's nations into those with 20% of more of their economies taken up by fuel exports (e.g., Indonesia, Malaysia, India) and those with fuel exports comprising less than 5% of their economies (e.g., Hong Kong, Japan, the Philippines). If we take this viewpoint and connect it with exchange devaluation over the 12 months in 2015, we find that exchange rates were more favorable for nations that were more reliant on fuel reports.

In May 2000, minister-level talks were conducted in Chiang Mai, Thailand, between finance ministers of 13 countries (the ASEAN+3 nations), intending "to build two-party support systems between each nation through mutual financial agreements"; this intention led to agreement on the creation of the CMI. As a collective financial support system, this framework seeks to maintain stability of currency and financial markets as well as supplement existing international funding support systems, such as that available from the IMF.

To expand the IMF delinked portion, the amount that can be leveraged without any IMF financial support requirements, currency regulators from the ASEAN+3 nations were forced to construct a decision-making system to activate currency swaps by their own determination rather than relying on the IMF. One specific measure to this end is the establishment of a mutual monitoring system whereby countries monitor each other's economic status (regional surveillance). At present, finance ministers from the ASEAN+3 countries meet in May every year to discuss each nation's economic situation, with participants from each country's central bank also participating in a similar policy discussion twice a year. The agreement to multilateralize the CMI swaps (initiating the CMIM) coincided with the April 2011 establishment of the independent monitoring institution, the AMRO, in Singapore. Along with conducting economic surveillance in the ASEAN+3 regions, the institution also supports execution of CMIM currency swaps.

Today, the Chinese RMB is widely traded in the world's offshore markets, and the RMB's future exchange rates significantly influence Asia's capital flow and movement in Asian currencies. The China Foreign Exchange Trade System (CFETS), operated by the People's Bank of China, announced and initiated a new RMB-based index with a basket of 13 currencies in December 2015 called the CFETS RMB Index. In the future, based on the supply and demand of exchange markets, China will increase the RMB's flexibility through the adoption of a managed float system that references the currency basket. This shift to a currency basket system for the RMB is expected to also lead to an Asia-wide shift toward exchange policies that utilize the basket-band-crawling rule. The RMB and the Japanese Yen have served asymmetrically as investment currencies or safe haven currencies during risk-on and risk-off, respectively. Shimizu concludes that in all likelihood, each will exert its particular strengths and collaborate mutually, ushering in an era of collaborative intra-regional exchange policies that can stabilize Asian currencies overall.

8. The FRB's Quantitative Easing and Currency Swap Agreements as Financial Crisis Management Tools

After the onset of the global financial crisis, the US found itself needing to resolve the US dollar illiquidity that had originally occurred within its own borders and later spread to the rest of the world. The US government provided liquidity through untraditional monetary policies, such as quantitative easing (QE), domestically and through currency swap agreements with other nations. In "The Federal Reserve's Management of the Financial Crisis through Quantitative Easing and Currency Swap Agreements," Chikafumi Nakamura focuses on the role played by the QE policies and currency swaps of US that were ongoing since 2008 in terms of crisis management for the world's financial systems.

Taking a look at movements in financial institutions receiving direct and significant amounts of liquidity from the FRB, we can see a dramatic pull away from provision of external credit at the beginning of the global financial crisis. However, this returned to a new outflow due to the QE1 round that followed, while the outbreak of the Eurozone crisis in late 2011 saw a return to net inflow that would continue for some time after. Further, US financial institutions were not proactive in securities investments during QE. This suggests ineffective functioning of portfolio rebalancing effects, whereby financial institutions rebalance their portfolios by leveraging increased deposits from bought-up US sovereign debt and investing in riskier assets. This suggests that the tender provided to the US financial system through its QE policies did not generate sufficient portfolio rebalancing effects and that the indirect QE attempts to effect the world's financial system were also limited.

Contrastingly, the FRB's liquidity provision mechanism through currency swap agreements set the FRB in the role of "international lender of last resort" in the global financial system, where the US dollar is a core trading currency. A significant portion of the US dollars the FRB provided through these currency swap arrangements was taken up by the ECB, exceeding $580 billion shortly after the occurrence of the global financial crisis. Furthermore, the two facts (the May 9, 2010 decision to resume US dollar swaps when the Eurozone crisis deepened and the accelerated use of currency swaps from late 2011 into 2012) provide evidence that the Fed-provided dollar swaps not only worked to handle the global financial crisis but also functioned as a crisis management system for other international crises.

At the end of a string of extensions, the FRB announces that it would normalize currency swap arrangements with the Bank of Canada, Bank of England, Bank of Japan, ECB and Swiss National Bank. This supply of US dollar liquidity allows for each nation's central banks to engage in currency swaps as their central banking authorities deem necessary based on market conditions.

However, the reason why the FRB, an organization tasked with the maximal well-being of the US domestically, would work to ensure the stability of international financial systems is in fact consistent with its reasons for QE. When the US dollar faces insufficient liquidity, unless central banks can obtain dollar supplies via swaps, they may be forced to draw down their dollar-denominated reserves, which would cause higher interest rates for US sovereign debt. Illiquidity of the dollar in global financial markets, where it is a key currency, can also suppress the US economy and create concerns over deflation.

This suggests a problem with the FRB's function as an international lender of last resort. For example, if a country's economic cycle was asymmetric to that of the US, then such a currency swap agreement could work against the Fed's monetary policy. Nakamura raises the concern that these swaps agreed upon by the FRB with other central banks may not in fact occur for that reason. Nakamura also cites the paper of Prasad (2014), indicating that the FRB's swap agreements with only a limited number of countries during the global financial crisis were imposed upon by political decisions as to whether these swaps would actually be executed. According to the author, having the liquidity of the world's financial systems reliant on a single country's central bank is in itself a problem that invites uncertainty.

As such, Nakamura concludes that the FRB's crisis management system centered on its swap agreements is, in fact, not a panacea but is one that invites uncertainty. Therefore, it is vital to consider a new, more neutral way to secure liquidity in preparing the world for the next crisis.

9. The IMF as a Global Framework for Currency and Financial Crisis Management

In "The IMF as a Global Framework for Currency and Financial Crisis Management," Junko Koeda takes a theoretical view on the particular characteristics of the IMF, amid the context of the IMF's crisis management framework that played a major global role as an "international lender of last resort" in the international society. Koeda compares the roles played by the FRB's currency swaps and Asia's regional financial collaborative frameworks as studied in other papers, observing the characteristics and problems of the IMF's crisis management framework.

Koeda clarifies that due to the IMF's inability to shirk fiscal limitations, it will find it difficult to provide "unlimited" funding. The IMF has instead set up a more flexible lending framework. Specifically, the establishment of the Flexible Credit Line (FCL) in 2009 made it possible for the IMF to provide funding to countries with strong economic fundamentals without imposing access limits or conditionality. However, there has not been visibly active use of the FCL. One reason that has been indicated is the rigorous loan qualification criteria (Reichmann and Resende, 2014). In theory, the existence of a liquidity supply function can help prevent a liquidity crisis. Thus, it is not necessarily accurate to say that this function is ineffective just because it is not in use. However, the lending framework likely needs further revisions. Koeda suggests that it would be meaningful to enhance the ability to preapprove lending criteria and respond rapidly to a crisis as well as simultaneously set up a new framework in which loans could be provided to numerous countries simultaneously.

Even without the ability to provide unlimited funding, the IMF can still fulfill a critical role as a "crisis manager." However, because of the strong lingering stigma against the IMF and growing presence of other international lenders of last resort, such as the FRB, Koeda indicates that providing a global viewpoint beyond national and regional benefit and contributing to appropriate policy execution are major issues for the Fund. Further, although enhancing multilateral dialogues could also be effective, dealing appropriately with the rapidly changing global economy is difficult. Further, even if the IMF is able to provide the appropriate advice, a nation in crisis that does not request the IMF's funding will not be bound to execute policy based on that advice; therefore, as indicated by Koeda, IMF's policy surveillance activities have major limitations.

10. Conclusion

If we observe financial risk management from the micro perspective, we clearly see the limits of financial risk analysis from the experience of the global financial crisis. On the other hand, there is no universal analysis method to replace it as yet. Hisashi Nakamura focuses on investor behavior, moral hazard, and information contained within the yield curve, conducting individual analyses from new angles on specific issues. However, the results of these analyses are, by nature, limited to providing suggestions. Actual implications for risk management require further study.

Yukihiro Yasuda specifically focuses on corporate finance from a micro perspective, examining funding procurement behavior for corporations during the global financial crisis. The results of his analysis suggest that the corporate bond and bank lending markets played complementary roles to one another. His suggestion has implications that instead of the traditional adversarial model applied to the relation between direct and indirect finance, the joint inter-workings of these two funding procurement routes can function healthily. Going forward, with the experience provided by the global financial crisis, it will be critical to analyze the sort of effects leveled on corporate funding procurement behavior as financial institution behavior and the relevant regulatory stance switches to a more risk-emphasizing attitude.

These tendencies that been observed at the micro level among financial institutions and financial markets, as well as corporate funding procurement, will naturally be affected by future changes in monetary regulation. As such, it is critical to consider financial risk management after the global financial crisis when studying financial regulations. The issue presented by Hanazaki—monetary regulations also invite financial crisis—is crucial. Furthermore, Hanazaki indicates that though the world's eye is focused entirely on global monetary regulations, these global regulations ignore the diversity in financial systems among different nations. Further, if we include observations of the development of a banking union in the EU as brought up by Sasaki, it is likely that there needs to be greater concern for local financial regulations as they pertain to the relation among national, regional, and global levels.

On the other hand, in the study of the development of a banking union in the EU as a financial crisis management tool, Sasaki indicates the issue that optimal currency area theory, a theoretical framework for currency integration, has not considered financial regulations to any significant degree. Optimal currency area theory argues the importance of labor transfer, open economies, and fiscal transfers (fiscal unions) during asymmetric shocks; however, it is likely necessary to consider the topic of currency integration that the costs of differing monetary regulations and the costs of unified monetary regulations are both significant.

Ogawa, Chikafumi Nakamura, Shimizu, and Koeda explore financial crisis management as it was when confronted by the global financial crisis and the Eurozone crisis from a macro perspective. While Ogawa opines on the overall picture, Nakamura mentions the FRB, Koeda focuses on the IMF, and Shimizu focuses on East Asia's financial cooperative system, the CMIM.

An issue made clear by the global financial crisis is the liquidity crisis caused by increased counterparty risk among financial institutions. In other words, they faced a crisis of liquidity in the US dollar. In response, the FRB leveraged its power through the currency swap agreements it had established with other major central banks. This means that the world did not see such significant activity from the IMF, which had played a major role in balance of payment crises in the past. It may well have been that the IMF's limits as an international lender of last resort were revealed due to its inability to provide US dollars on an unlimited scale. On the other hand, we cannot surely say that the FRB can always respond as an international lender of last resort. During the global financial crisis, it had happened by chance that the US was in a situation requiring liquidity supply domestically through the enactment of QE policies, meaning that its internal and external policies were in sync, allowing the FRB to act; however, if there had not been in sync, it is possible that it would have prioritized the US domestic economy rather than international welfare.

Further, financial support in the Eurozone crisis from the troika system among the EC, ECB, and IMF was conducted under a collaborative system whereby the IMF did not have more than half of the decision-making rights. The IMF's financial support systems up to that point had been one-party systems whereby the IMF alone would make decisions regarding support. Further verification is likely necessary regarding the effectiveness of crisis management provided by such financial support systems. On the other hand, financial cooperation in eastern Asia has seen the ASEAN+3 nations take the experience of the 1997 Asian currency crisis and build the CMIM system and AMRO surveillance framework while maintaining a complementary role with the IMF. At this stage, the goal is to decrease IMF links, limiting the IMF's enforcement of its monetary support conditions. It is an urgent issue for the IMF to put together financial crisis management that is effective from a macro standpoint when it comes to the IMF's role as a lender of last resort and the IMF's relationship with regional financial cooperatives.

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