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1. Preface

I am grateful for this opportunity to speak before the time-honored Japan Society of Monetary Economics. Taking advantage of the occasion to address leading scholars, I would like to make half of my remarks today as a Deputy Governor of the Bank of Japan, and the other half as a former Economics Professor of the University of Tokyo, where we meet today. I hope that I can in some way contribute to your debates over the current financial crisis.

When Lehman Brothers went bankrupt last September, the financial crisis entered a new level of acuteness, though more recently it has begun to subside thanks to bold policy initiatives taken by countries around the world. Nevertheless, the financial crisis has had significant negative impacts on the real economy. The IMF has revised its 2009 real growth rate forecast for the world economy down to negative 1.3 percent. At the current point in time, the Japanese financial system is stable on the whole and our financial institutions remain sound. However, it is also a fact that Japanese financial institutions are facing a much more difficult earnings environment. We will therefore continue to carefully monitor whether the banking sector is able to maintain a sufficient level of robustness and appropriately provide financial intermediation functions.

While governments and central banks have been focused on current crisis management, the G20 Summit and many other fora have seen vigorous discussions of policies that will prevent recurrence of financial crisis. However, the primary interest in most of these debates is how to strengthen regulation, and it is my impression that critical re-examination of the effectiveness of existing regulations or consideration of the possible side effects of re-regulation have taken a back seat.

As a central banker whose mission is to maintain the stability of the financial system, I believe we should genuinely reflect whether our previous policies led financial institutions in the correct direction. Where there are mistakes, we must correct them and help financial institutions to set off again on the proper path. At the same time, we should recognize that regulation must not impede the growth of the financial services sector. The ultimate goal of regulation should be the creation of a sufficiently flexible financial system that is able to smoothly absorb internal and external shocks.

In my remarks today, I would like to focus on how we design systems that will prevent the recurrence of financial crisis, and consider this from a broad perspective that is not bound by established concepts and approaches. Obviously, the design of desirable policies and regulations requires a deep understanding of what is behind the crisis. Therefore, while it may strike many of you as being a bit roundabout, I would like to begin my remarks by reviewing the background to the current crisis and the mechanisms that have exacerbated it.

2. Emergence of the "credit bubble"¹

At the outset, I would like to set out the causes of the current financial crisis in my own way. We are currently in the midst of financial crisis. The global financial system may be in a lull, but we do not know when another challenging issue could erupt. The situation surrounding us does not allow for premature conclusions. Therefore, I would like to ask you to understand that my remarks are based on the information that is available to us at the current point in time and necessarily represent a provisional diagnosis.

No one would deny that the prologue to the current financial crisis was the subprime housing

¹ The word "bubble" should be used according to its strict economic definition, but usage is often much looser, as can be seen in policy debates, for example. In this paper, I have placed "credit bubble" within quotation marks to indicate that is being used colloquially rather than in its strictly defined sense.

loan crisis in the United States. But that was essentially a problem in a portion of the home mortgages in a single country -- albeit the United States -- and it would normally be inconceivable for that alone to plunge global financial markets into chaos. It is therefore more appropriate to look to macro global problems as the true background to today's financial crisis. It is undeniable that the low interest rates and excess liquidity that have prevailed around the world since the collapse of the IT bubble are behind the crisis. In that sense, we were in a situation in which it would have been quite plausible for a financial crisis to occur anywhere and in any form.

Why did the US subprime housing loans trigger the crisis? The US current account deficit has begun to expand rapidly since the latter half of the 1990s. Meanwhile, emerging Asian economies, including China and oil producing countries, have begun to see their current account surpluses expand. This is the phenomenon that has come to be called "global imbalances." I am sure that you will recall a variety of discussions over whether this situation would be sustainable.

In fact, when there are significant differences in the degree of development of individual countries' financial markets, a situation like the global imbalances that appear on the surface to be a disequilibrium can in fact be one kind of equilibrium itself.² In emerging economies and oil producing countries, many imperfections may be observed in the domestic financial markets. Stock markets are undeveloped, deposit interest rates are fixed at low levels by regulation, and so on. Because of this, these countries may lack financial assets that offer a safe store of wealth gained by rising incomes. One solution is to purchase "safe" financial assets from other countries. The development of information and telecommunications technologies has made it far easier to purchase foreign assets than it was in the past. And it was the United States that supplied those "safe" financial assets. For emerging economies and oil producing countries, this translated into current account surpluses, since the purchase of foreign assets is, ultimately, the export of capital. Conversely, for the United States, this resulted in current account deficits because the savings shortfall due to excess consumption was covered by importing capital. This set the stage for the spread of a US-made "credit bubble" to the rest of the world.

Obviously, the global imbalance on its own is insufficient to generate a "credit bubble" that is completely divorced from economic fundamentals. For that, we must turn to the problems inherent in the process by which subprime housing loans were turned into securitized instruments. On this point, I would like to focus on the question of the agency problem and how it relates to the expansion of the securitization business.³

The primary characteristic of the securitization business is its complexity. Today's securitized instruments have extraordinarily complex structures. For example, they bundle together thousands of subprime housing loans, dissect the cash flow that these loans produce and turn them into a number of different financial instruments with different levels of priority. Furthermore, these financial instruments are again bundled together and chopped up to create more financial instruments. As this process of synthesis and partition is repeated, the risk structure becomes too complex and it is no longer an easy task to measure risk exposure. Certainly, one could argue that instruments should not be purchased if the risks are not clear, but what happened was that many investors placed excessive faith in the ratings issued by ratings agencies for these securitized instruments and began to gobble up complex products regardless.

There is the second feature of securitization that we must also discuss: "functional

² Cabarello, R. J. (2006), "On the Macroeconomics of Asset Shortage," *The Role of Money: Money and Monetary Policy in the Twenty-First Century*, The Fourth European Central Banking Conference, 9-10 November 2006, edited by Andreas Beyer and Lucrezia Reichlin, pp. 272-283.

³ For a more detailed analysis from a slightly different perspective, see the following.

Nishimura, K. G. (2007), "Lessons from the Subprime Debacle: The Trust Is the Key in the Rating of Securitized Instruments," *Nikkei Shimbun "Keizai Kyoshitsu"*, 14 December 2007 (in Japanese).

differentiation." Most of the subprime housing loans in the United States were issued by financial operators called "mortgage banks." Instead of continuing to hold the credits after making the loan, these operators sold them to investment banks and other institutions. Investment banks and others then took the home mortgage credits that they had purchased, pooled them together and used them to back securitized instruments that were sold to investors. This is called the "Originate To Distribute" (OTD) model, whose process starts with the origination of home mortgages and ends with the sale of securitized products based on them. One of the problems with the OTD model is that it lends itself to moral hazards. If mortgage banks are able to sell home mortgage credits and transfer the risks, they have no incentive to seriously screen the loans. It is not hard to imagine loans being made to applicants who could not meet credit standards in normal times. This is a typical moral hazard, and I believe it is what planted the seeds of the "credit bubble."

Through this process, an enormous volume of securitized instruments backed by and related to subprime housing loans came onto the market. Moreover, many of these instruments were given "AAA" ratings, indicating the highest levels of creditworthiness. What is surprising is that the yield on these AAA-rated securitized instruments was often much higher than the yield on Treasuries even though they also had the same AAA rating. Had market functioned normally, this price distortion could not have been maintained over the long term. But in point of fact, no one questioned this state of affairs; not the banks, not the rating agencies, not the investors, not the regulators. Whether people thought the situation strange or not, everyone seems to have agreed to ignore it.

Why could such an abnormal situation continue for so long? Some would argue on this point that an important factor came from organizational behavior and a certain "responsibility avoidance" attitude on the part of organization members -- what is referred to in the literature as "plausible deniability."⁴ The sellers of securitized instruments maintain that they bear no responsibility, and to demonstrate that there were no problems with their instruments they point to the fact that other operators were selling the same kinds of instruments. They claim that they, like others, calculated the prices of their instruments on the basis of historical data and experience, and they were given the blessing of ratings agencies. In other words, nobody could have possibly foreseen the current price drops, and therefore nobody is responsible. It just happened. Meanwhile, the buyers of securitized instruments -- institutional investors -- use the similar logic to justify their purchases. Everybody else was buying the same financial instruments and nobody had a problem with it, the excuse goes. It is natural to believe that this plausible deniability was one of the reasons that the "credit bubble" in securitized instruments emerged and was maintained for such a long period of time.

Along with the emergence of the "credit bubble," there is another feature that distinguishes the current crisis -- the fact that virtually very few market participants believed that such a serious financial crisis could actually occur. How is it that market participants came to believe this? It has something to do with the phenomenon of so-called "Great Moderation." Beginning in the 1990s, the United States and other countries saw a significant decline in the volatility of their GDPs and other real economy indicators and, as a result, the volatility of financial indicators was stable as well. This situation remained in place for a long time and presumably market participants had an illusion that the same situation would persist in the future and economic upheavals could never occur.

There is an opinion that such an illusion was reinforced by the "Greenspan Put," named after Alan Greenspan, former chairman of the Federal Reserve Board (FRB). In other words, even if financial crisis were to occur, former chairman Greenspan and the FRB would certainly be able to use monetary policy to fix it. If the Greenspan Put were true, it could be rational for market participants to take risks on the assumption that the tail risk (the rarely-occurring risk such as

⁴ Calomiris, C. W. (2009), "The Subprime Turmoil: What's Old, What's New, and What's Next," in *Maintaining Stability in a Changing Financial System*, Federal Reserve Bank of Kansas City, pp. 19-110..

financial crisis) would never emerge. In short, the misplaced faith of market participants in monetary policy generated overconfidence in the market.

3. Erosion of confidence and deepening of the crisis

I would now like to turn to the collapse of the “credit bubble” and the deepening of the financial crisis that resulted. One of the distinguishing features of the current financial crisis is the liquidity crisis caused by the materialization of counterparty risk. On July 10, 2007, S&P and Moody's announced that they would be reviewing the ratings of several residential mortgage-backed securities (RMBS) backed by subprime housing loan assets. As a consequence, the AAA ratings of asset-backed commercial paper (ABCP) backed by these instruments were also downgraded. Indeed, an unremarkable change in the ratings of risk assets that were not all that important in the context of the market as a whole directly shook the global financial system.

In the United States, money market funds (MMFs) have been considered to be extremely safe financial assets. One of the primary reasons for this is that MMFs are only allowed to invest in AAA-rated assets. When ratings were downgraded for ABCP, MMFs did not reinvest. Naturally, funds that originated ABCP and used it to raise money found themselves in fund-raising difficulties: Funds under the Bear Stearns umbrella went bankrupt; BNP Paribas moved to freeze its affiliated fund's new applications and redemptions. The structured investment vehicles (SIV) created by banks to issue ABCP were unable to find funding sources, and then these banks were forced to provide liquidity enhancement instead. Banks, which frequently lend each other money, suddenly became aware of counterparty risk, the risk that the other party of a transaction might suddenly go belly up. They began to worry that some bank somewhere might suddenly be unable to secure liquidity and fail. Indeed, on August 9, a liquidity crisis actually occurred, with liquidity drying up quickly in the interbank market. The event has come to be known as the "Paribas Shock." Many European banks were among those facing liquidity difficulties. Confronted with this situation, the European Central Bank (ECB) promptly announced that it was prepared to supply massive amounts of liquidity into the short-term money market.⁵

Some argue that there may be an excessive maturity mismatch on financial institutions' balance sheets as a background factor that triggered the liquidity crisis. Certainly, a close observation of the facts in the current financial crisis exposes not only the maturity mismatch but also the "liquidity uncertainty" that is the fundamental risk inherent in all financial instruments. It is a truism that liquidity is largely unrecognized while it exists and only understood once it disappears. For example, the design of ABCPs assumes that they can be sold on the market at any time if necessary, but when crisis actually occurred, these instruments could not immediately be sold. Had institutional fund-raising been a little more long-term, there would have been a time cushion that might have enabled them to deal with the crisis in liquidity. Although it may not be possible to take every possibility into account in the selection of assets, a constant awareness of the uncertainty of liquidity and continuous assessment of the maturity gaps between assets and liabilities are key factors in improving the soundness of financial institutions.

One often-heard opinion is that credit default swaps (CDS) and other financial derivatives amplified the instability of the financial markets in the current financial crisis. Opinions will differ on the merits of CDSs themselves, but no one would deny that the dysfunction of the over-the-counter (OTC) market, where these instruments were primarily traded, undermined

⁵ In point of fact, MMFs played a role in deepening the crisis during the "Lehman Shock" of September 2008 as well, as will be discussed below. The Reserve Primary Fund, a major independent MMF, held large amounts of CP issued by Lehman Brothers. The fund incurred large losses because of the bankruptcy, plunging it into "break the buck" (net assets per dollar face value worth less than one dollar) status. This greatly undermined the confidence in MMFs as a whole, triggering a rapid outflow of money that translated into a major upheaval for the short-term money markets.

confidence in financial markets as a whole. On September 15, 2008, Lehman Brothers declared bankruptcy. Right around the same time, the market began to talk about American International Group, Inc. (AIG) being on the rocks as well, and its share price plummeted. AIG sold large volumes of CDS protection, in which it was believed that there were many contracts that used Lehman Brothers as a reference company. The bankruptcy of AIG would nullify CDS hedges. Were this to happen, financial institutions that had dealings with AIG would be unable to fulfill their CDS contracts with other financial institutions, raising the specter of a chain reaction. Market participants were suddenly forced to recognize this counterparty risk. Faced with these circumstances, the US government had little choice but to place AIG under its de facto administration.

Most CDSs are traded directly. As long as counterparty risk is limited to the parties directly involved in the negotiated transaction, the market as a whole does not recognize any broad risk. The reason the market as a whole became aware of this risk is that the market participants recognized that they are in complex intertwined relationships among themselves arising from the negotiated transaction network. If counterparty risk is recognized in some transaction somewhere -- in other words, if there is thought to be a risk that the other party will go bankrupt -- everyone who has dealings with that party is at risk of being pulled down too in a chain reaction of bankruptcies. So the initial counterparty risk spreads and spawns new counterparty risks for the parties that have dealings with the counterparty. These "network externalities" certainly played a major role in the process by which the current financial crisis expanded. Counterparty risk can be significantly reduced by centralizing transactions (institutionalizing a "central counterparty"), but in practice, many of the transactions were so complex that the creation of a central counterparty was a daunting task.

I do not think that the current sense of paralysis that pervades financial markets can be explained merely as the rupture of a "credit bubble." When bubbles rupture, one would ordinarily expect economies to return to their fundamentals. In other words, economies get back to functioning as they should. But I do not think there is anyone who would say that economies at the moment are functioning properly. The global economy today has fallen far beneath its potential and is seemingly unable to pull itself up.

The root cause of this is the erosion of confidence in the market. When confidence is eroded, market participants become extremely fearful that they might be confronting a completely unpredictable and uncertain world. In this case, for market participants who want to behave rationally, the most natural course is to assume the most pessimistic scenario and make the best of it.⁶ Such market participants will react more readily to bad news, to information about the worst conceivable circumstances, than they will to good news. What is more, in situations such as these, market participants tend to adopt a strategy of standing still until confidence has been restored.⁷ Actions that may be rational at the level of individual market participants can lead to a "fallacy of composition," which delays the restoration of functions for the market as a whole.

4. Institutional issues on the financial system

I would next like to explore the background of the current financial crisis from the following two perspectives: monetary policy implementation and financial system design. Let me begin by considering monetary policy in the context of the so-called "bubble" phenomena.

⁶ If a decision maker's confidence is "contaminated" or eroded in the sense that she thinks, though with a small probability (say ϵ), she is ignorant about the situation she faces, her rational behavior can be described as "maximin" optimization. See, Nishimura, K. G., and H. Ozaki (2006), "An Axiomatic Approach to ϵ -contamination," *Economic Theory*, Vol. 27, 2006, pp. 333-340.

⁷ Nishimura, K. G., and H. Ozaki (2007), "Irreversible Investment and Knightian Uncertainty," *Journal of Economic Theory*, Vol. 136, pp. 668-694.

It is extremely difficult for central banks to be aware in real time of the emergence and collapse of “bubbles”.⁸ There are two schools of thought about how to deal with bubbles. One says that you should wait and clean up after the collapse because it is difficult to be aware of bubbles as they emerge. The other argues that they should be dealt with quickly by reading the signs of a bubble from numerous indicators like asset prices. Both positions, however, acknowledge that it is difficult to identify the emergence and collapse of bubbles in real time.

When a large bubble collapses and severely damages the financial system, monetary policy has extremely limited effects, as we have seen in the current financial crisis. Furthermore, if the process of bubble formation involves "Greenspan Put"-type expectations among market participants, it may lead to excessive risk-taking activities.

Thus, the current financial crisis raises the extraordinarily difficult question of how central banks should conduct monetary policies to stabilize financial systems, and ultimately, economies. While it is very important that this be discussed in detail, I will refrain from doing so in my remarks today because I wish to highlight another important question regarding the design of financial systems.

The “credit bubble” and its collapse we have witnessed have resulted in a growing impetus in Europe and the United States to reconsider the existing regulatory framework. In the background is the financial deregulation that made great strides after the 1990s. The United States, under the Glass-Steagall Act, maintained a clear delineation between the banking and securities businesses ever after 1933. The Glass-Steagall Act came out of the lessons learned from the Great Depression and was designed to protect depositors by separating banking business from securities business so as to improve the soundness of banks. However, in 1999, amidst a global deregulatory movement, the Gramm-Leach-Bliley Act effectively tore down the walls between banking and securities businesses. This enabled large commercial banks to enter the securities business.

Meanwhile, in 2004, the Securities and Exchange Commission (SEC) relaxed the leverage restrictions on investment banks. This deregulation was of decisive importance in the current financial crisis.⁹ It is said that this deregulation resulted in a sharp increase in the leverage of US investment banks from a multiple of 12 to 33.

Recent years have, in addition, seen a growing role for the "shadow banking system" of financial operators outside the framework of banking regulation. Hedge funds and private equity funds epitomize the rise and fall of this shadow banking system. Able to freely engage in financial transactions without being bound by banking regulation, these financial operators used leverage to earn large profits. Investment banks can also be considered part of this shadow banking system because their regulation was looser than that imposed on commercial banks. There is nothing particularly wrong with the enlargement of shadow banking system itself if failure here does not pose a systemic risk. However, large commercial banks also developed close ties with the shadow banking system by having hedge funds under their umbrellas or by creating special purpose companies off their balance sheets to transfer related operations. It reached the point where the performance of these companies began to impact the soundness of major commercial banks themselves. In addition, the shadow banking system also had greater influence on the global financial system. When it began to face liquidity shortfalls, it accelerated the sale of its assets, bringing a downward spiral to asset prices, which in turn became one of the factors in systemic risk. The current financial crisis indicates that some form of regulation is necessary for the shadow banking system.

Another important point to be raised concerns the relationship between the Basel Accord (BIS

⁸ Shirakawa, Masaaki (2009), "Way Out of Economic and Financial Crisis: Lessons and Policy Actions" (Speech to the Japan Society, New York), Bank of Japan, April 23, 2009.

⁹ Blinder, A. S. (2009), “Six Errors on the Path to the Financial Crisis,” *The New York Times*, January 25, 2009.

rules) and the financial crisis, specifically the procyclicality of capital adequacy requirements. When the economy improves, bank lending increases and the economy accelerates because capital requirements become smaller, corresponding with reductions in downside risk. Conversely, when the economy deteriorates, bank lending decreases and the economy decelerates because capital requirements become larger as downside risk increases. Thus, capital adequacy requirements are considered to have the effect of amplifying business cycles.¹⁰ The procyclicality of capital adequacy requirements has been criticized for exacerbating the economic downturn in the current financial crisis. Nonetheless, it does not appear that a consensus has been reached on exactly how serious the procyclicality is. It will be important in the future that a new quantitative analysis be performed of the procyclicality to facilitate a more objective debate.

5. Re-stabilizing the financial system

For the remainder of this speech, I would like to trace the recent debates from those concerning regulations to maintain the soundness of individual financial institutions to those about safety nets to maintain the stability of the entire financial system. In so doing, I will add some theoretical examinations.

In reviewing the recent debate, the framework of the "3 Cs" can be of some assistance.¹¹ The 3 Cs stand for the words "comprehensive," "contingent" and "cost-effective." "Comprehensive" regulations are best understood as regulations without loopholes. Unless the regulatory net spans all financial institutions comprehensively, the more regulations are beefed up, the more funds will flee from strictly regulated sectors to more loosely regulated sectors.

"Contingent" regulations have the following properties. During the up-phase period, they should mitigate overconfidence to prevent the accumulation of systemic risks. Once systemic risk actually emerges, however, they should impose few restrictions to avoid reinforcing economic deterioration. In preparation for a severe erosion of confidence, they may be furnished with some policy incentives to restore confidence. To sum up, it is desirable that regulations be contingent on risk-taking attitudes of market participants, and thus strict during booms and loose during busts.

"Cost-effective" regulation is a concept which is important in the evaluation of regulations. This standard dictates that when one or more regulations could achieve the same results, the least expensive approach should be chosen. For example, if it is desirable to induce financial institutions to raise capital, it is better to do so during boom times when funding is readily available as opposed to slump times when the economy has begun to turn sour and the funding cost is higher. This standard is also important when considering how to use public funding. When making the decision between injecting capital and purchasing nonperforming credits, one must consider costs involved as well as benefits of policy effects.

Currently, the Basel Committee on Banking Supervision and many other fora, interest groups and ad hoc groups are floating many different proposals about how best to regulate finance. Taking the "3 Cs" in mind, I would like to take up several regulatory reform proposals that have come out of the international debate and examine their significance. In doing so, it is perhaps easiest to divide regulations into two categories: "*ex ante* measures" to be taken to prevent the crisis and "*ex post* measures" to influence how the crisis plays out when it happens. These could also be termed "policies for normal times" and "policies for emergency times."

¹⁰ Kashyap, A. K., and J. C. Stein (2004), "Cyclical Implication of the Basel II Capital Standards," *Economic Perspectives*, 1Q/2004, Federal Reserve Bank of Chicago.

¹¹ Rajan, R. G. (2009), "Cycle-Proof Regulation," *The Economist*, April 8, 2009.

(1) *Ex ante measures*

The Basel Committee on Banking Supervision is taking the lead in a discussion on ways to alleviate the procyclicality of capital adequacy requirements. As I explained, current capital adequacy requirements are considered to have procyclicality properties. In response, the discussions focus on the idea of introducing variable "buffer capital." This would make it acceptable for institutions to accumulate capital when the economy is booming and draw it down when the economy slumps. However, one can also critique this argument in terms of the "3 Cs." Capital adequacy requirements are meaningless if they do not apply to all broadly-defined financial institutions, not just banks.

Even if this proposal is understood as being desirable from a qualitative standpoint, there are still many problems that would be involved in actual implementation. For example, on the idea of accumulating capital during boom times, there still is the question of specifically how much capital and at what pace it should be accumulated. And therein is the even more difficult question of how one defines and determines the business cycle. Implementation involves real-time judgments about when it is allowed to begin drawing down the buffer. However, as can be seen from the business-cycle dating problem for the Japanese economy, a long period of time is required before the peaks and troughs of the business cycle can be identified. There is also the need to clearly articulate how time lags between national business cycles will be treated. These are just a handful of issues that must be resolved before any such regulations could be fleshed out.

There is another international debate taking place on liquidity monitoring. As I noted, the current financial crisis initially emerged as a liquidity crisis. At the time, the system used by regulators to monitor the liquidity of internationally-active banks was inadequate. The discussion therefore turned to ways to increase the effectiveness of international monitoring by developing common liquidity metrics and sharing information among regulators. At the current point in time, the debate focuses on which liquidity metrics would be appropriate to use. However, there are significant differences from country to country in the effectiveness of liquidity monitoring. Japan engages in detailed monitoring with the cooperation of the institutions involved, but there are some countries where the quality of monitoring is not very high. One-size-fit-all-type arguments are therefore not very realistic. Mechanisms must be sufficiently flexible and adaptable to the circumstances of individual countries.

With this in mind, I would like to mention a very interesting approach to the liquidity risk.¹² Without a doubt, when the financial crisis is viewed as a liquidity crisis, the root cause is the excessive maturity mismatch on the balance sheets of funds and the like. Therefore, it would be desirable to have regulations that would provide incentives to alleviate this maturity mismatch, thereby preventing crisis. One possible solution would be to link the maturity mismatch between assets and liabilities with the capital requirement. For example, a bank raising funds from longer-term deposits would have a lower capital requirement than one raising funds in the overnight money market. This scheme would give banks an incentive to take longer maturities on the liabilities side in particular. Putting aside the question of whether it is desirable to link maturity mismatches with capital requirements, it is clear that the continuous monitoring for appropriate liquidity at financial institutions is an effective tool for detect the early-warning signs of financial crisis.

The G20 meetings held in April decided to reorganize the Financial Stability Forum (FSF) as a new "Financial Stability Board" (FSB). Previously, four international institutions, the

¹² Brunnermeier, M., A. Crockett, C. Goodhart, A. Persuad and H. Shin (2009), "The Fundamental Principles of Financial Regulation," International Centre for Monetary and Banking Studies & Centre for Economic Policy Research, Geneva Report on the World Economy, Vol. 11, 2009.

Basel Committee on Banking Supervision, International Organization of Securities Commissions, International Association of Insurance Supervisors and International Accounting Standards Board, made independent judgments and took independent actions. The FSB is expected to serve as a kind of supervisory body of these institutions and provide coordination functions. The measure aims to overcome the differences among sectors and create regulations and rules that are consistent throughout the financial system. The G20 also decided to regulate hedge funds. This is the first step in bringing the shadow banking system within the net of regulations.

(2) *Ex post measures*

The global economy is in the midst of a financial crisis. The *ex post* measures that I am about to describe are the policies and programs that are actually being implemented by governments and central banks today.

The United States and European countries have taken initiatives to address liquidity and fund-raising difficulties as part of steps to stabilize the financial system. These efforts can be organized into two categories: "granting government guarantees for market-based fund-raising" and "expanding deposit protection." Government guarantees for market-based fund-raising attempt to stabilize the market conditions for fund-raising, particularly for bond issuance by financial institutions, at a time when financial markets are increasingly strained. Most countries have also taken measures to raise deposit insurance ceiling in their deposit insurance schemes and/or to guarantee the unlimited protection of personal deposits. These measures succeed in alleviating the perceived uncertainties of depositors regarding the financial system, avoiding serious upheavals such as bank runs and providing banks with a stable source of fund-raising through deposits.

During the current financial crisis, countries have responded with comprehensive policy packages. Public capital injections were an important component in those packages. However, specific nature of these injections differs from country to country and even from time to time in the same country. In some cases, injections were made across the board, even to sound banks, as a preemptive measure, while in other cases injections were to bail out financial institutions that had recorded large losses and significantly impaired their capital. There are also a number of differences in the design of instruments and accompanying conditions.

The United States and European countries' governments purchase nonperforming assets and provide loss compensation schemes for these assets in order to cap loss amounts. These measures differed in terms of whether these assets were taken off balance sheets, timing when accounting losses on these assets are recognized and necessity for pricing of individual assets. Despite these differences, however, the aim was to remove concerns about the soundness of financial institutions by relieving uncertainty about their asset holdings.

When Japan confronted a severe financial system problem in the late 1990s, it began by buying up nonperforming assets and later moved to injections of public capital. In contrast, the first step for the United States and European countries in dealing with the current financial crisis was to inject public capital, and then they moved on to purchasing nonperforming assets.¹³ The reason for this difference, presumably, was the difficulty of valuing nonperforming assets and the speed with which the crisis was progressing. The nonperforming assets in the current crisis are complex securitized instruments, generally backed by home mortgages. With market functions significantly impaired, it is no easy task to arrive at pricing.

¹³ The United States attempted unsuccessfully to introduce a scheme called "M-LEC" to purchase nonperforming assets similar to what was done in Japan. Since September 2008, it has instead opted to inject public funding, just as the European countries.

In the United States, the public and private sectors joined together to create a fund for the purchase of nonperforming assets in an attempt to take them off balance sheets. It remains to be seen whether this system will function as intended. As the real economy worsens, the scope of nonperforming assets is moving from securitized products to commercial and other loans. A further development must be watched very closely.

The impacts of the upheaval in international financial and capital markets vary across countries and regions. While the financial systems of the United States and European countries have been visibly shaken, the Japanese financial system remains stable on the whole. However, there is no guarantee that Japan will be spared a decline in financial intermediation functions because worsening earnings and falling share prices are now impinging on institutions' capital. Japan has taken a number of measures to achieve its policy goal of maintaining financial intermediation functions. On December 16, 2008, the Act on Special Measures for Strengthening Financial Functions was amended to provide for injections of public capital. On April 10, the Bank of Japan decided to provide subordinated loans to financial institutions in order to help them increase their capital. Prior to this, on February 3, it restarted a program to purchase equities from financial institutions so as to ensure the stability of the financial system by supporting to mitigate equity holding risks of financial institutions. This is a unique policy that is geared towards Japanese financial institutions, which tend to have large equity holdings. The government also restarted a purchasing program in March.

6. Approach to new safety nets

Separate from the political movements to expand and strengthen regulation, there has also been a completely new approach proposed for stabilizing the financial system. What this financial crisis has clearly taught us is the extreme difficulty of strengthening banks' capital when a financial crisis is under way, that is, when macro systemic risk has materialized. Viewed from the opposite perspective, the creation of a safety net that would facilitate bank capital increases during times of crisis would greatly contribute to the stabilization of the financial system. The new approach that I will explain focuses on this point. I would first like to introduce the idea of private-sector "capital insurance," which is an expansion on the concept of ordinary insurance. Then, while reviewing some of the problems involved in private-sector capital insurance, I would like to discuss the potential for capital insurance in the form of a public-private partnership to overcome them. Finally, several other schemes are also introduced from a variety of schemes proposed so far. These schemes come under the general rubric of "contingent capital" in that they are safety nets that attempts to increase capital when necessary during crisis while having as little impact as possible on the market.

(1) Private sector "capital insurance"¹⁴

Let me begin with an overview of private-sector "capital insurance." As its name suggests, this scheme involves an insurance policy. The bank has the same position as the insured in an ordinary insurance policy, while the investor has the position normally occupied by an insurance company. When an insurance policy is agreed, the bank pays the investor a premium. In response, the investor locks away liability reserves in a "lock box." Should there be a financial crisis, it pays insurance benefits to the bank from the lock box. The bank can use those funds to increase its capital. If the policy term elapses without a financial crisis, the liability reserves in the lock box return to the investor. This is the basic idea behind capital

¹⁴ Kashyap, A. K., R. G. Rajan and J. C. Stein (2009), "Rethinking Capital Regulation," in: *Maintaining Stability in a Changing Financial System*, Federal Reserve Bank of Kansas City, pp. 431-471..

insurance.

What sorts of banks are envisioned as the insured? Professor Kashyap and other advocates of private sector capital insurance say that it should be open to all financial institutions subject to the Basel Accord (BIS rules). What is crucial is that all financial institutions with the potential to cause systemic risk be enrolled, although the proponents say that it should be up to the institutions to decide whether or not to enter into an insurance policy. I would like to return to this issue in a moment and discuss it more fully, since this issue is important in determining whether this will be an effective tool for avoiding systemic risk.

The next question is: Who are envisioned as insurers? Professor Kashyap and others argue that all investors not subject to the Basel Accord should be able to provide insurance. If an investor is subject to the Basel Accord, when financial crisis occurs, capital is merely transferred from one bank to another with no improvement in the soundness of the banking system as a whole. In other words, when crisis breaks out, maintaining the stability of the financial system requires the injection of capital from outside the system. According to Professor Kashyap and others, possible investors could be pension funds and sovereign wealth funds (SWF), but the problem is that there is no guarantee that these investors will invest in capital insurance.

Finally, there is a question of how to identify the "insured events" that will trigger payouts of insurance benefits. The standard advocated by Professor Kashyap and other proponents is that the payout is triggered when a moving average (e.g., an average over four quarters) of the total losses of all financial institutions entering into insurance policies exceeds a certain threshold value. Their point is that it is important to look at losses for the banking system as a whole, not those for individual institutions. It reflects the fact that the capital insurance they propose is ultimately an insurance against systemic risk or financial crisis. However, putting aside clear cases such as what we find now, it can be a very difficult and subtle task to determine what constitutes a financial crisis. This is another important point that needs to be addressed from the perspective of risk management, since it relates to the questions of how quickly the scheme would be able to strengthen capital without mistakes.

While the proposal of Professor Kashyap and others can seem a bit novel, it does constitute an attempt to provide a safety net for the financial system by attaching insurance so that capital is above a certain threshold. It is also an excellent attempt to internalize external diseconomies. During the 1990s, Japan injected enormous amounts of capital into its banks in order to stabilize its financial system. Likewise, enormous amounts of capital have been injected into European and US financial institutions during the current financial crisis. While there are some institutions that anticipate being able to repay the funds quickly, there are others that will continue to require larger and larger injections. If this capital is not returned, it will be the taxpayers that ultimately bear the costs. As I touched upon in the discussion of the "credit bubble," financial institutions engaged in excessive risk-taking under the assumption that governments and central banks would do something if there were a problem. That is, financial institutions generated the external diseconomies of systemic risk, not bearing the cost of its cleanup, but keeping all of the profits for themselves. This proposal asks institutions to bear the cost of materialized systemic risk in the form of premiums. In that sense, it internalizes external diseconomies.

That being said, the proposal tabled by Professor Kashyap and others also has many problems. First, the capital insurance that they advocate is entirely private and the main insurers will be private-sector investors. Will private-sector investors on their own be able to come up with the enormous liability reserves that would be required to halt systemic risk? They look to pension funds and SWFs to play this role, but will we always rely on them? Obviously, you might be able to attract enough investors if premiums are sufficiently high. But if premiums are

too high, most financial institutions would forgo insurance altogether.¹⁵

Also, as crisis deepens, institutions may require capital injections beyond the amounts initially envisioned. There is the potential for systemic risk to materialize after all of the liability reserves have been paid out of the lock box. A crisis like the current one that is global in its dimensions may be beyond what private sector funds alone can deal with. In these situations, will it really be possible to stop the erosion of confidence? That said, this idea should be better combined with additional government-based insurance as a set to deal with large losses, and only by doing so, will it be possible to maintain confidence in capital insurance.

The proposal by Professor Kashyap and others is that enrollment in capital insurance be voluntary. There is no guarantee, therefore, that all financial institutions that impact financial system stability would purchase capital insurance. This is the classic free-rider problem. In particular, a bank that considers itself "too big to fail" might very well decide not to purchase capital insurance. If it is indeed "too big to fail," then its bankruptcy would generate systemic risk and the government could be expected to bail it out regardless of whether it enrolled in capital insurance. If that assumption is correct, the bank has no incentive to purchase capital insurance. What we end up with is a situation in which no one purchases capital insurance as long as they believe that the government will never allow financial crisis to occur.

There is also the question of capital insurance pricing. For ordinary insurance products, pricing is based on the law of large numbers. However, a financial crisis is a "tail event" that rarely occurs, or it is a phenomenon for which the probability distribution is completely unknown. In either case, the law of large numbers cannot be used to price capital insurance.

(2) *Capital insurance as a public-private partnership*

As I have noted, the scheme proposed by Professor Kashyap and others has many problems. However, some of them can be solved if public institutions are used to back up private capital insurance. First, by having public institutions responsible for a part of the insurance, it is possible to provide liability reserves of sufficient size. Moreover, there is no need to actually put liability reserves away. It is sufficient for there to be a commitment to fiscal outlays if an insured event occurs.¹⁶ In addition, government's involvement would prevent private premiums from becoming too high in the face of phenomena that carry large uncertainties.¹⁷

Private sector expertise must be marshaled in order for any such insurance program to be effective. Therefore, one option that is quite possible is to create a public-private partnership in which efficient private sector institutions originate capital insurance that is, for all purposes, "re-insured" by the government. That is the form that Japan uses to provide "earthquake insurance." A public-private partnership for capital insurance enables the system to draw upon the expertise of the private sector to achieve greater efficiency than would be seen if capital insurance were provided by public institutions only.

¹⁵ Professor Blinder made similar comments regarding the paper of Professor Kashyap et. al. at the symposium sponsored last year by the Federal Reserve Bank of Kansas City.

¹⁶ Rochet, J. C. (2008), "Comments on 'Rethinking Capital Regulation' by A. Kashyap, R. Rajan and J. Stein," prepared for Federal Reserve Bank of Kansas City symposium on "Maintaining Stability in a Changing Financial System," Jackson Hole, Wyoming, August 21-23, 2008.

¹⁷ Nishimura, K. G. (2009), "'The Past Does Not Repeat Itself, But It Rhymes': Four Lessons Learned from the Financial Crises," Remarks at the Panel Session "Responding to the Financial Crises: Lessons Learned" at the 45th Annual Conference on Bank Structure and Competition sponsored by the Federal Reserve Bank of Chicago on May 8, 2009.

To have a well-functioning capital insurance, we need not only its public nature, but also an element of mandatory enrollment. More specifically, financial institutions with the potential to trigger systemic risk must be required to enroll in an insurance program. This solves the free-rider problem. It might also allow financial institutions to opt out of the insurance program. However, in such cases, the financial institution would be required to scale back its business and demonstrate that it will not trigger systemic risk. Even still, it is no easy matter to come up with objective criteria that can be used to identify "financial institutions with the potential to trigger systemic risk." There is also a question of whether only banks need be covered by the insurance. It is impossible to foresee which business models will be the source of future instability in the financial system. Therefore, regulators must constantly review the definition of a "financial institution with the potential to trigger systemic risk" as their financial sectors develop and evolve.

The remaining issue is that of pricing the insurance. The involvement of public institutions in the provision of insurance means that the burdens ultimately revert to the public. It goes without saying that it is only fair for the public to bear some of the cost because they enjoy the benefits of a stable financial system. An important issue in this will be convincing the public of the appropriateness of insurance pricing.

This will require a bit of creativity in the mechanisms used to set premiums. As a rather simple example, consider a mechanism by which premiums are based on a measurement of the institution's systemic risk, defined in terms of its gross assets. In such cases, a financial institution that is right on the border between enrolling and not enrolling in insurance may elect to reduce the size of its assets so that it is not compelled to enroll. If premiums are set on the low side to encourage these financial institutions to participate, they will be too low to provide a deterrent to further risk-taking by financial institutions that carry large systemic risks. Without going into detail here, this problem can be solved with a progressive premium geared to the size of the institution.

If the government is involved in insurance, it may be impossible to avoid giving the impression that this is a government-funded "bailout insurance." If that is the case, there may be new moral hazards for financial institutions. Indeed, it is not overstating the case to say that the biggest hurdle to the involvement of public institutions in capital insurance is how to suppress moral hazards. Therefore, the introduction of capital insurance with public institution involvement cannot be allowed to undermine the importance of the regulatory supervision of enrolled institutions.

Likewise, even if such an insurance program were to be created, it would not in any way reduce the importance of accurately communicating information on financial system stability to market participants and the general public in a manner that avoids amplifying uncertainties. The more complex the insurance program becomes, the less effective it will be in alleviating the "fear and panic" psychology of investors. For instance, if uninsured financial institutions were to fail during a financial crisis, would it be possible to maintain confidence? No one has ever tested this point, and no one can predict the outcome with any certainty.

(3) Other discussions

In addition to these schemes, there have been many other proposals put forward to enable capital to be strengthened when financial institutions are in crisis, and they have served as the starting points for active discussions on how to deal with macro systemic risk. I would like to give you a brief overview of some of them.

The first is an instrument called a "catastrophe bond." Most people use the abbreviated form "cat bond." The issuer of this instrument is relieved of its obligation to repay principal to

investors if certain conditions are satisfied. By selling investors a bond in which redemption is waived in the event of major losses, a bank is able to maintain its capital even if losses are incurred. For example, if the bank is holding nonperforming credits, it could forgive large amounts of debts so that it could simultaneously downsize both the asset and liability sides while keeping its capital untouched.

Another similar instrument is called the "reverse convertible debenture."¹⁸ This is a bond that is automatically converted to equity if certain conditions are satisfied. Putting aside the issue of accounting treatment, this instrument has very similar effects on capital to a cat bond. By selling investors a bond that is converted to equity in the event of major losses, a bank would be able to raise its capital automatically even if losses were incurred.

Finally, there is a contract known as the "margin call on shareholders."¹⁹ This contract allows an issuer to compel shareholders to purchase additional shares when certain conditions are satisfied. For example, by issuing equity with this kind of agreement attached, a bank that incurs large losses could cause its existing shareholders to purchase new equity, reducing the need to raise capital from the market.

With all of these instruments, it is possible to set the triggers differently according to specific purposes. For instance, if the objective is to maintain the soundness of a specific financial institution, the trigger would probably be the losses of that institution. If the objective is to prevent systemic risk, the trigger would be the total losses of all financial institutions enrolled in the system. In the latter case, uniform triggers would need to be set so that all contracts are fulfilled at the same time.

In this section, I have tried to give you an overview of several different forms of financial instrument that could be part of a safety net for the financial system. There would need to be some form of mechanism in place for all financial institutions with the potential to trigger systemic risk to hold such instruments. Mandatory purchases are one approach, but there should also be some thought given to incentives so that financial institutions purchase them of their own accord. One effective method might be to allow institutions to count such instruments as capital.

7. Conclusions

There is a growing momentum, particularly in Europe, for stronger bank regulation. The argument is based on the opinion that the current global financial crisis would not have occurred if regulation had been sufficiently strong. However, one must question whether stronger regulation by itself will prevent future financial crises. There has been no demonstration on this point, and indeed, it has not even been fully discussed, even in academic circles. There is an undeniable impression that most of the debate on banking regulation in recent months has accepted the assumption that stronger regulation is necessary to prevent the recurrence of crisis without any critical investigation.

There should also be a careful and cautious discussion of the side effects from more regulation. If one takes a step back to the fundamental economic perspective of government involvement versus economic efficiency, there are two trade-offs in particular that could be considered to be of importance. The first is the relationship between improved financial intermediation functions and financial system stability. Stronger regulation may indeed increase the stability of the financial

¹⁸ Flannery, M. J. (2005), "No Pain, No Gain? Effecting Market Discipline via 'Reverse Convertible Debentures'," Chapter 5 of *Capital Adequacy beyond Basel: Banking, Securities, and Insurance*, edited by Hal S. Scott, Oxford University Press, 2005.

¹⁹ Hart, O., and L. Zingales (2009), "To Regulate Finance, Try the Market," in http://experts.foreignpolicy.com/posts/2009/03/30/to_regulate_finance_try_the_market.

system. On the other hand, government interference has the potential to reduce economic efficiency. Inefficiency in the financial services sector manifests itself in the form of reduced financial intermediation functions. These questions can be viewed as issues of public economics and the tools of this discipline need to be applied to a cost-benefit analysis from the two perspectives of quality and quantity. Such an analysis should be applied to a wide range of candidate regulations in order to arrive at the best balance between economic efficiency and government regulation and interference.

The second point to consider is the trade-off between financial sector innovation and financial system stability. When unease in the financial system surfaces, there is always an argument about restricting the operations that financial institutions can undertake, as manifested by “narrow banking” approaches. However, in many cases, this argument is lack of a perspective of financial innovation. It would be very difficult indeed to enhance value added in the finance industry without using innovation to flexibly adapt to dynamic economic developments.

We must therefore consider approaches to promoting innovation while also maintaining the stability of the system. In doing so, we must pay attention to the two forms of innovation: One is achieved by the consolidation and attrition of companies and the other is achieved within a single company. Japan has a large number of "long-established" companies, a fact that illustrates the process of innovation in the latter sense that has taken place again and again over time. Financial sector is no exception: Innovation occurs primarily within banks. Therefore, promoting innovation in the financial sector can be seen as a question of promoting a "scrap and build process" within organizations as the environment changes.

The current global financial crisis raises significant issues for financial institution risk management and supervisory regulation. In my remarks today, I have described some of the very active debates that are currently taking place. Japan experienced the rupture of an asset bubble in the early 1990s and a prolonged period of financial and economic stagnation thereafter. We therefore have the advantage of being able to discuss issues realistically on the basis of our experiences. I look forward to greater contributions to the debate from the Japanese academic community, and with that hope I would like to close my remarks today. Thank you for your kind attention.