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Via E-mail and FedEx

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Phil Angelides
Chairman

Hon. Bill Thomas
Vice Chairman

Re: Follow-up to the Financial Crisis Inquiry Commission Forum

Brooksley Born
Commissioner

Byron S. Georgiou
Commissioner

Senator Bob Graham
Commissioner

Keith Hennessey
Commissioner

Douglas Holtz-Eakin
Commissioner

Heather H. Murren, CFA
Commissioner

John W. Thompson
Commissioner

Peter J. Wallison
Commissioner

Dear Dr. Kroszner:

The Financial Crisis Inquiry Commission thanks you once again for your participation in the "Forum to Explore the Causes of the Financial Crisis" on February 26 and 27, 2010.

Enclosed are follow-up questions which were posed by the Commissioners during the forum, as well as additional questions which have arisen over the course of our investigation which we would like your assistance in answering.

Please respond to the questions by Friday, July 2, 2010. If you have any questions, or would like more information, please contact Scott Ganz at sganz@fcic.gov.

1. During the forum, you described Federal Reserve Board research on financial literacy. Can you provide the Commission with this research?
2. You discussed the interconnectedness of financial institutions and how it contributed to the financial crisis. Please describe the role of the over-the-counter derivatives market in creating interconnections among firms.
3. You suggested that central clearing of over-the-counter derivatives might be useful in diminishing problems related to interconnectedness. Please describe the problems that central clearing would address. Did those problems contribute to the financial crisis?

Sincerely,

Wendy Edelberg

Wendy Edelberg
Executive Director

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July 27, 2010

Wendy Edelberg
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Re: Follow up to the Financial Crisis Inquiry Commission Forum

Dear Wendy:

Thank you for your letter with the follow up questions from the Commissioners to the Financial Crisis Inquiry Commission Forum. I have attached a document with responses to the three questions.

Please do not hesitate to be in touch for further clarification or information.

Sincerely,

A handwritten signature in black ink that reads "Randall S. Kroszner". The signature is written in a cursive style with a prominent initial "R".

Dr. Randall S. Kroszner

Responses to Follow-up Questions from the Financial Crisis Inquiry Commission Forum

Randall S. Kroszner
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1. During the Forum, you described the Federal Reserve Board’s research on financial literacy. Could you provide the Commission with this research?

Yes. Here is a list with links to some key pieces of recent research conducted by the staff at the Federal Reserve Board and throughout the Federal Reserve System. Sandy Braunstein’s testimony on “Financial Literacy” provides an overview of the research and of ongoing efforts by the Federal Reserve to improve financial literacy.

Bell, C.J., Hogarth, J.M., and Gorin, D.R. [Teaching for the Test, and Life Is the Final Exam](#). Association for Financial Planning and Counseling Education 2009 Conference Proceedings, 22-32.

Bell, C.J., Gorin, D.R., and Hogarth, J.M. [Does Financial Education Affect Soldiers’ Financial Behavior?](#) Networks Financial Institute Working Paper 2009-WP-08, August 2009.

Bell, C.J., Gorin, D.R., and Hogarth, J.M. What Makes a Good Money Manager Good? Insights from an Evaluation of a Financial Education Initiative. American Council on Consumer Interests 2010 Conference Proceedings (in press).

Braunstein, S. [Financial Literacy](#). Testimony before the Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate, Washington, D.C. April 29, 2009

Braunstein, S. and Welch, C. [Financial Literacy: An Overview of Practice, Research, and Policy](#). *Federal Reserve Bulletin*, November 2002, 445-457.

Choi, L. [Outcomes and Evaluation in Financial Education](#). Federal Reserve Bank of San Francisco. October 2008.

Choi, L. [Bank Accounts and Youth Financial Knowledge: Connecting Experience and Education](#). Federal Reserve Bank of San Francisco Working Paper 2009-07. September 2009.

Hilgert, M.A., Hogarth, J.M., and Beverly, S.G. [Household Financial Management: The Connection between Knowledge and Behavior](#). *Federal Reserve Bulletin*, July 2003, 309-322.

2. You discussed the interconnectedness among financial institutions and how it contributed to the crisis. Please describe the role of over-the-counter derivatives in creating interconnections among firms.

The over-the-counter (OTC) derivative market is one important channel through which interconnections among financial services firms can be created. A “derivative contract” derives its value based on the characteristics of an asset or security, for example, a stock or a bond. An “OTC contract” is not traded on an organized exchange or cleared through a central counterparty such as a clearinghouse. By interconnection, I mean that the evaluation of the safety and soundness of one institution may depend crucially on the safety and soundness of others so that there can be knock-on effects of concerns about the health of one institution on others.

To be concrete, I will focus on a prominent OTC derivative market, namely the credit default swaps (CDS) market. The CDS market involves buying and selling insurance against the default of a firm named in the CDS contract. Specifically, the seller of the contract (“seller of protection”) promises to make a payment to the purchaser (“buyer of protection”) if the firm named in the contract defaults on its bonds.

When a stock or bond is traded, the firm buying the security is not exposed to the risks of the seller after the transaction is settled and the security is transferred, usually no more than a few days. Derivative contracts, however, typically involve longer or ongoing relationships. In CDS, the buyer is typically purchasing protection against default over a year or longer horizon. It is this ongoing relationship that creates the interconnection between the buyer and seller. The buyer is exposed to the risk that the seller may face financial difficulty over the life of the contract and not be able to make-good on its promises. Thus, the buyer of the contract is exposed to “performance risk” of the seller. In other words, the health of one institution will be related to the ability of its counterparties over time to perform as promised on their contracts.

This performance risk exposure exists in all OTC derivative contracts but is particularly acute in CDS. The circumstances that may cause the firm named in the CDS contract to default, for example, may be precisely the same circumstances in which the seller of the protection faces distress and cannot make the promised payment. In other words, the risks can be correlated.

Consider the case of an institution that hedged its bond portfolio by purchasing protection in the CDS market against default of the bonds it holds. If the sellers of protection cannot make the payments, then what had appeared to be a well-hedged position is now unhedged and the institution is exposed to the risk of default on the bonds. Thus, what may have appeared to be a sound institution may suddenly become much riskier due to concerns about the soundness of its counterparties as a consequence of the interconnection in the OTC derivatives markets.

Interconnections created through the OTC derivatives markets also can increase the correlation of risks making the system more fragile. If one large seller of protection faces distress, then its counterparties all become riskier. That then also makes all counterparties of these counterparties riskier. Since there is generally low transparency in OTC derivatives markets, it is difficult for outsiders to know the counterparty exposures, even if the portfolio positions are reported. In some cases, record keeping was so poor that individual institutions did

not even know internally their own counterparty exposures. Such circumstances can lead to a market-wide loss of confidence and a freezing of markets. Participants become unwilling to trade with each other because they cannot easily evaluate others riskiness. The loss of liquidity further exacerbates the confidence problems in the markets as it becomes more difficult to know what current market values of assets are when markets become illiquid, further eroding confidence, etc.

3. You suggested that the central clearing of over-the-counter derivatives might be useful in diminishing the problems related to interconnectedness. Please describe the problems that central clearing would address. Did the problems contribute to the crisis?

Central clearing can address important problems that contributed to the crisis.

Central clearing can directly reduce interconnectedness among firms. The central clearing counterparty, typically called a clearinghouse, acts as a guarantor of the performance on derivative contracts. If, for example, a seller of protection in the CDS market were to experience distress and be unable to make good on its promises to pay, the clearinghouse would make the payment. With a clearinghouse as guarantor, concerns about the safety and soundness of an individual institution thus will not have knock-on effects on its counterparties since they are not exposed to performance risk. A credible central counterparty thus acts as a barrier that helps to prevent the ripples of a failure of a market participant turning into a tidal wave that can sink other institutions.

In the recent crisis, lack of a credible central counterparty increased interconnectedness and contributed to the crisis. (See answer to #2 above for a definition of interconnectedness.) During the crisis, in order to judge the soundness of an institution, market participants needed to be able to evaluate the likelihood that the counterparties to the institution's OTC derivatives contracts would be able to make good on their payments. Such concerns about interconnectedness were a motivation in the exercise of the Fed's section 13(3) emergency powers to avoid the collapse of Bear Stearns in March 2008.

Although information about risk exposures to a particular asset class, for example, may be reported, the identities of counterparties are not. As noted in the answer to #2 above, given the poor back-office record-keeping in some OTC markets, some institutions did not know internally the extent of their counterparty exposure to particular firms. In addition, to assess the soundness of the counterparties, it was necessary to know the soundness of the counterparties of the counterparties, etc. throughout the chain of intermediation. Uncertainty about the ability of counterparties to perform thus raised questions about the value of and risks in a financial institution's portfolio, e.g., if well-hedged positions suddenly might become unhedged due to the non-performance of a counterparty.

The lack of transparency and knowledge contributed to a market-wide loss of confidence since it became nearly impossible to obtain the information necessary to evaluate the exposure to, as well as the soundness of, counterparties. Without this information, institutions with significant participation in the OTC derivatives markets could become suspect, as well as those with important dealings with such institutions, even if not directly through the OTC derivatives markets. Such institutions then faced increasing difficulty obtaining funding for their positions and some experienced "funding runs" (see Kroszner 2010 and forthcoming). Traditional funders instead preferred to hold short-term Treasury securities. This preference can be so strong, as we observed on a few days during the crisis, that investors were willing to take slightly *negative* interest rates on short-term T-bills.

With the loss of confidence, markets can freeze as investors and institutions are unwilling to transact given the high level of uncertainty. Bid-ask spreads widen and price discovery in markets can break down, further contributing to the difficulty of evaluating the value of a financial firm's assets, hence its solvency.

With central clearing, however, market participants and supervisors can have much more information about risk concentrations and counterparty exposures. Reducing or eliminating counterparty "performance" exposure and increasing the information available in these markets will make it easier to evaluate the safety and soundness of any individual institution, without needing to know the safety and soundness of the counterparties. Central clearing thus can mitigate problems associated with interconnectedness and make a market-wide loss of confidence much less likely.

In addition, central clearing is much more likely to prevent building of excessive risk concentrations in the first place. The clearinghouse would quickly become aware of rapid changes in exposures of market participants and could undertake actions to try to limit them. If CDS were centrally-cleared, there would have been much more uniform and consistently enforced margin requirements. This would have slowed the growth of risk exposures at a seller of protection, such as AIG, since AIG would have been required to post collateral and margin up front.

Supervisors also could have much more easily monitored risk concentrations, unlike in OTC markets, and have become aware of risk exposures at institutions that the supervisor may not directly regulate but that could have system-wide consequences. It was difficult for bank regulators, for example, to observe the growing concentration of risks at AIG. Central clearing thus makes it more likely the excessive concentrations of risk can be detected and defused earlier, and thereby contribute to stability by improving the informational infrastructure of the marketplace.

More broadly, central clearing tends to promoting greater standardization and homogeneity of contracts and help to enhance the liquidity of these markets even in times of stress.

As this discussion illustrates, a credible central counterparty can reduce precisely the types of fragilities that can arise in an interconnected financial system and that contributed to the severity of the recent crisis. The benefits of central clearing, however, rely crucially upon the safety, soundness, and credibility of the central counterparty. Ensuring that the clearinghouses are able to manage the risks of guaranteeing performance on, for example, large amounts of CDS contracts, is necessary for them to be a stabilizing force in a crisis (see Pirrong 2008/2009).

Clearinghouses have a long history of dealing successfully with the interconnection issue (Kroszner 1999 and forthcoming). In the 19th and early 20th centuries, futures markets struggled with the challenges of trying to make contracts more readily tradable on exchanges by making them more consistent and thereby more easily traded. The last major step toward full fungibility of the contracts was limiting and homogenizing counterparty risk. Even if all of the other features of the contract were identical, the potential for non-performance would vary with the

identity of the stability of the institution on the other side of the transaction – that is, counterparty performance risk (see answer to question #2 above) – since the contracts were bi-lateral obligations between the buyer and seller.

To solve this problem, the clearinghouse came to act as a guarantor of performance of all the contracts, thereby eliminating the performance risk of individual counterparties. Central counterparty clearing has been quite robust to stressful market conditions, allowing them to operate through the Great Depression, World War II, and the failures of major market participants in previous and the most recent crisis.

The clearinghouse generally runs a balanced book to try to avoid direct market exposure. The clearinghouse requires margin to be posted by the members, thereby limiting leverage and providing consistent treatment across market players. The clearinghouse also cumulates a fraction of its clearing fees in a reserve fund. In the case of a member's default, the central counterparty can draw upon the proprietary margin of the defaulting member, its own reserve fund, pre-established lines of credit, and the assessment of members for share purchase.

Strong incentives, such as higher capital charges for OTC derivatives relative to centrally-cleared derivatives, could motivate the major players in derivatives markets to migrate existing contracts, to the extent possible, onto such platforms and to develop contracts with sufficient standardization that they can be centrally cleared. To summarize, this would reduce the likelihood of institutions threatening to become “too interconnected to fail” for two reasons: the supervisors and exchanges can more readily monitor and prevent the buildup of exposures, and the consequences of the failure of an institution is mitigated by the ability of the central counterparty to reduce interconnections and hence the disruption of the markets. Naturally, the extent to which the central counterparty will be successful will depend on its perceived ability to withstand the failure of key players in the market. If the clearinghouse is not believed to be sound, then the interconnection problem could become worse since so many institutions would be relying upon its performance guarantees. Thus, the strength and credibility of central clearing counterparties to manage risk in new areas such as CDS will be critical to their success in mitigating fragilities associated with the interconnectedness.

References

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Kroszner, Randall (forthcoming 2010) "Making Markets More Robust," forthcoming Benjamin F. Friedman, editor, *Reforming the Financial Markets Once the Crisis is Over*, MIT Press.

Kroszner, Randall (2010) "Interconnectedness, Fragility, and the Crisis," prepared for the Financial Crisis Inquiry Commission, February.

Pirrong, Craig (2008/2009), "The Clearinghouse Cure?," *Regulation Magazine*, Winter, vol 31, no 4.