

Remarks

Robert B. Litterman
Goldman, Sachs & Co.

Last year, when the Bank of Japan, the Bank for International Settlements, the Bank of England, the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York agreed to host this conference as part of their continuing efforts to conduct research into the robustness of financial systems and market mechanisms under stress, they could not have anticipated the events of the past several months.

We have, in an incredibly short period of time, gone from a financial market environment characterized by “exuberance” to one in which asset prices in emerging markets have collapsed and the avalanche of losses in relative value trades created by the excessive leverage and subsequent collapse of an unregulated quantitative hedge fund, Long Term Capital Markets, nearly brought disaster to financial markets. Although the markets currently seem relatively calm, not so long ago we seemed to be heading toward massive illiquidity, widening credit spreads, declining stock prices, and global financial market gridlock.

I have to admit, I am thankful, but also quite frankly shocked, that a surprise 25 basis point cut in the US federal funds rate apparently signaled the determination of the Federal Reserve to provide liquidity and seems to have had such a positive and profound effect on investor psychology.

No doubt others understand the workings of financial markets better than I, but my reaction as I think through the issues raised in this conference in the context of recent events is that we financial economists really understand very little about how the financial system will react in conditions of stress.

The financial system is, after all, in reality an incredibly complex, non-linear, non-stationary system, populated by a community of emotional information-processing animals whose nervous systems evolved over millions of years, prior to the invention of money. Today this system is globally connected by networks and computers that instantaneously communicate and process information. I’m not sure we can be confident in its stability or its rationality.

In fact, our limited understanding of the reaction of the financial system to stress has been a common theme in several of the papers presented at this conference. I applaud these authors for being so honest.

To quote a few examples (though I admit that these quotes are perhaps taken out of context) De Bandt and Hartmann in their survey article write, “While ‘systemic

risk' is now widely accepted as the fundamental underlying concept for the study of financial instability and possible policy responses, most work so far tackles one or several aspects of that risk, and there is no clear understanding of the overall concept of systemic risk and the linkages between its different facets."

Yoshifuji and Demizu apply some tools from the recently developing science of complexity theory and conclude "There are still numerous outstanding issues regarding each analysis and we do not draw any definitive conclusions."

Despite this uncertainty, many of the presenters at this conference have nonetheless attempted to build models of financial markets under stress. Models can be described as either structural, which attempt to model cause and effect, or reduced form, which simply try to capture statistical relationships in historical data. We have seen many examples of the latter, which obviously have less ambitious goals, but also which hopefully point in the direction of helping to clarify with which empirical facts the structural models should attempt to be consistent. Unfortunately, even the empirical regularities which are found are often only very approximate, uncertain, unstable, and often linear descriptions of economic phenomenon.

The structural models, which are the type of model required to investigate the impacts of alternative policies, are generally even more approximate, uncertain, and difficult to validate. And compounding the usual difficulties in economic science, the particular problem that we have in modeling markets in times of stress is that we have only a handful of examples of relevant data, and it is very difficult to test hypotheses against the evidence of a few historical events and, needless to say, expensive to generate new data.

Nonetheless, we have had presented here a number of very interesting and useful structural models. A common theme of these models is to justify, or at least raise issues about, the role of the central bank as a lender of last resort. For example, two models of payments systems, both the mathematically sophisticated, but nonetheless very practical model of Fujiki, Green and Yamazaki, and the location model of Freixas, Parigi, and Rochet, attempt to provide such a role for the central bank.

Models and their limitations are a common theme in conversations among risk managers recently. Risk managers in financial institutions today rely extensively on statistical models to quantify the degree of uncertainty in the distribution of outcomes of their investments. With a fair amount of effort and attention to detail these "Value-at-Risk" models can give a quite good idea of what the distribution of outcomes will look like most of the time.

Unfortunately, as many of us have recently been made very aware, financial firm management cares very little about what happens most of the time, but cares a lot about what might happen in periods of financial market stress.

Although we rarely see the financial markets in stress, we have seen such conditions often enough to know that the system has a tendency, in periods of stress, to feed back on itself and create highly non-linear patterns of behavior.

Two examples of such reaction in recent years are noteworthy. In 1987 the then relatively new, but popular investment strategy, “portfolio insurance,” created an automatic increase in sellers attempting to get out of the market if it were to start to decline in value. In October, 1987, market participants, sensing that a price decline fed by portfolio insurance selling was underway, headed for cover and liquidity vanished as large sellers expecting relatively liquid and continuous markets were unable to get out. By the time the market reached a new equilibrium prices had declined, relative to previous volatility, by 25 standard deviations.

More recently, overly leveraged relative value traders at hedge funds and other financial institutions who were forced into sales ran into a similar decline in liquidity coupled with a radical increase in price volatility. For relative value and spread traders the combination of higher volatility, high cross-correlation of returns across the many markets in which they were involved, and positive serial correlation—as these trades moved against the hedge fund community for several weeks in a row—created a similar 25 standard deviation event relative to the risk measured in prior periods.

And although most of us in the risk management business were quite prepared to admit that financial markets are not normally distributed, most of us were not prepared for an event of this magnitude. Significantly, one of our biggest mistakes was to treat market prices as if they were exogenous processes. Just as in 1987, market participants following a new type of trading strategy themselves created the overhang that led to the collapse of liquidity and increased volatility that subsequently engulfed them and other market participants in losses beyond all previous experience. In both cases the external shock which touched off the event was not particularly large.

These two events suggest that it will be very difficult to extrapolate typical market behavior to periods of stress. Several of the papers at this conference have touched on this theme, particularly the Rational Expectations Model of Financial Contagion by Kodres and Pritsker.

One of the more disturbing features of recent events is the light they have shed on the ineffectiveness of the current financial firm regulatory framework. Highly regulated banks extended loans without margin to an entity whose positions and leverage were unknown. Global securities firms created huge off-balance-sheet exposures through unregulated derivatives business entities. At least one hedge fund became perceived as too big to fail when, very late in the game, regulators in the Federal Reserve System saw its positions.

Although regulatory policy was not a focus of the conference, as mentioned before, models providing a role of central banks as lender of last resort were discussed in several papers. In addition, a number of papers question the wisdom or magnitude of such a role. Goodfriend and Lacker draw the illuminating comparison between central bank lending and private lending and make the important point that agents’ behavior will change, and potentially create large hidden costs, particularly those associated with excessive risk taking, when agents are con-

fronted with a more lenient central bank lending policy regime. Central banks can say whatever they please about not bailing out institutions that get into trouble, but as every parent understands, “actions speak louder than words,” and the authors argue the only practical way for a central bank to credibly commit to limit its lending is for it to build up a reputation over time for not lending.

Similarly, Shimizu and Ui question “whether or not the current execution framework of lender of last resort falls short in providing outcomes which are socially optimal with regard to the purpose of avoiding systemic risk.” And my former colleagues at the Minneapolis Federal Reserve, Rolnick, Smith, and Weber, measure the benefits provided by a private bank, acting as lender-of-last-resort in a context in which no central bank existed.

What do I conclude as I think about these issues? First of all, I think I must admit that I know very little about systemic risk and contagion, thus I should be cautious about concluding anything. Perhaps we all should be very careful to highlight what we do not know about this topic, lest policy makers put too much faith in our conclusions.

Second, clearly we have seen that financial markets under stress behave quite differently than during normal times, thus we must be very careful not to extrapolate normal behavior to that during periods of stress. Those of us who use statistical risk models, in particular, should augment them with scenario analysis, stress tests, and other more qualitative judgements, not to mention a pool of capital with a significant buffer for model risk.

Third, let us be very careful about the unintended consequences of governmental policies. Citizens certainly expect their central banks to try to protect their economies from the real economic losses associated with financial market disruptions. Thus, in times of financial stress we should expect political pressures on governments and their central banks to take actions to protect against systemic failure.

Nonetheless, I would caution—as do several of the presenters at this conference—that governments must be conscious of the unintended side effects of their actions. In particular, in this context we should be careful that our concern about systemic risk, which is understandable, does not create an environment in which central banks and other regulators will have a political imperative to provide liquidity in times of stress, and ultimately to become lenders of last resort. No matter what is the stated policy, market participants will observe and understand political realities, and if that reality is a free put option for large financial firms then those firms will have incentives to take on more risk than they otherwise would. In this case the unintended side effect of a concern about systemic risk would then itself be the creation of more systemic risk.

After all these cautions, I feel compelled to try to suggest some positive actions that governmental entities can take to reduce systemic risk. I think the answer is simple and obvious: “be prepared.” The most destructive element of a financial disaster is the panic and emotional flight to safety and liquidity that it

creates. Governments should prepare themselves and strongly encourage their regulated financial institutions to be prepared ahead of time for this type of environment. Financial panics will happen, but if there are enough institutions prepared to take advantage of the opportunities they present, the outcomes won't be so bad.

Preparation means adequate capital, adequate liquidity, perhaps purchase of various types of financial insurance, more and more of which becomes available each year. But most importantly being prepared simply means thinking through, ahead of time, the implications of various financial market scenarios and the optimal actions required.

Financial institutions, as well as governmental bodies, should have written policies and plans describing how they will react to the next financial crisis. The same kind of extensive preparations that are currently being made for the year 2000 should also be in place for the next stock market crash, for the next major financial system bankruptcy, and so on.

Business schools and perhaps central banks should sponsor courses in the history of financial panics, and I applaud the papers presented by Schoenmaker, and Rolnick, Weber and Smith, for their contributions in this area.

Central banks should also have disaster training courses for their staff. Just as the military has boot camp, war games, and so on to prepare for any kind of military conflict, central banks should think through financial disaster scenarios and develop similar exercises and game plans in order to be better prepared for all types of market events.

And as part of their planning central banks should have clearly articulated and publicly stated policies for what they will do, and what they will not do, in such scenarios. I would strongly encourage central banks to articulate a policy that no institution is too big to fail and to think through the implications of such a policy. I encourage private sector initiatives to prepare for large financial institution failures—and in fact I would encourage central banks to suggest to other financial institutions that they view financial shocks as opportunities—and to be prepared to take advantage of them.

While the types of policies I advocate will marginally reduce profitability for firms in normal times, because they will encourage paying for various types of insurance and will encourage them to take less risk, such actions are very likely to be profitable in the long run since many of the best opportunities are available only during periods of general distress. And perhaps more important for enhancing shareholder value we all understand that a firm which generates higher returns during such periods of financial stress is worth much more than would be a firm that produces the same total returns, but only during good times.

Thus, to summarize, I think governments should focus less of their time, energy and resources in trying to prevent financial disruption. And I definitely think governments should not provide free disaster insurance to bankrupt firms and countries. Rather governments should adequately prepare themselves, and en-

courage all private participants in financial markets to prepare themselves for the next financial market shock.

We should all assume that financial shocks will occur. There is uncertainty in the real world, and in equilibrium there will be shocks to the financial system with real consequences.

Ironically, however, if we are all prepared for such shocks, then that preparedness in itself will make the next financial shock less painful, and panic and contagion less likely to occur.

Finally, I would like to say that I view conferences such as this as an important part of a policy of attempting to better understand and prepare for future financial market disruption, and thus I want to sincerely thank the conference sponsors, participants, presenters and organizers for all of their efforts and hard work.