# Commentary on 'The International Transmission of Asset Price Volatility'

*Michael Mussa*

In reading Charles' paper on "The International Transmission of Asset Price Volatility," I divided the paper into three main parts. There are some perspicacious comments at the start, followed by a summary primarily from the work of King and Wadhwani, and then Charles' own efforts to relate asset price volatility and its international transmission to movements in the foreign exchange market as a kind of index of international disturbances.

Let me comment on those three elements in turn and then make a few remarks about how I view the international transmission of financial market disturbances. The context of this discussion is, of course, the stock market crash of last year and the associated volatility that followed that disturbance. Charles makes the point early in his paper about the general complaints about asset market volatility. I think Henry Kaufman's point was apparently not well appreciated. Sometimes it is appropriate for things to be volatile—after all, economic circumstances do change and it is appropriate for prices to adjust to reflect those changes. Nevertheless, Charles writes, "Bank of England officials not only complained about worsening asset price volatility, they frequently asserted that such enhanced volatility was imported from abroad." New York was usually the proposed perpetrator. New York apparently felt the heat, because they tried to shift the focus of concern about a thousand miles west to the futures markets in Chicago.

On this general point, who is to blame? I recall a favorite story from the days when I first started teaching at the University of

Rochester. I saw a television news report of the suppression of a great riot in the Ohio state prison. The National Guard placed a huge charge of dynamite against a cellblock wall, blew a big hole in the wall, and then rushed in to beat up all the prisoners. Reporters asked the governor after the riot was over who was responsible for the riot. The governor replied with an absolutely straight face that it was the work of outside agitators.

.The outside-agitators theory is, of course, a very popular one whenever anything goes wrong. And I think we want to be a little bit careful in view of the fact that—reference to astrology notwithstanding—it is probably appropriate to view the world as a closed economy with no outside agitators.

In his paper, Charles points to one key fact. The most important and relevant fact about the stock market crash for the purpose of the current issue, which is discussion of international transmission, is that the crash was not limited to a single country, the United States. Rather, the crash occurred of roughly equal magnitude essentially simultaneously, allowing for the natural rotation of the earth, in virtually every stock market around the globe. And that key fact suggests that either there must have been some huge common disturbance that was affecting all markets simultaneously, or somehow a disturbance that occurred in one market must have rolled through to affect other equity markets around the world, suggesting international transmission disturbances.

I would add to Charles' observation two further observations of my own. First, the stock market crash of mid-October was certainly not the only major stock market crash that we have observed around the world in the last decade. There were significant drops in the previous decade in the Milan market, the Tel Aviv market, the Mexico City market, and the Hong Kong market. These were all relatively small markets, but they did not cause any significant reverberations in the rest of the world. I think these examples serve to show there can be individual disturbances in particular equity markets that are not reflected in the rest of the world.

It is relevant to note, however, that if you have a big disturbance in a particularly large stock market—or if you say that New York and Tokyo are subject to a simultaneous impulse—perhaps the rest of the world cannot simply ignore this disturbance the way they did the disturbance in the Hong Kong market, the Tel Aviv market, the

Mexico market, or the Israeli market. This is an issue to which I'll return in a little bit.

My second observation to add to Charles'—and a key fact—is that since the stock market crash of last fall, the real economy has not seen any disastrous consequences of that stock market decline. And I think that is equally impressive as a fact as the sort of common magnitude of stock market declines on a worldwide basis.

After discussing these general issues, Charles turns to a summary of results that are found by his colleagues, King and Wadhwani. Through their empirical technique, King and Wadhwani attempt to measure contagion or cross-effects of stock market movements. The theoretical story they tell is that in each individual stock market around the world there are sets of disturbances that affect stock prices. There are two fundamental types of these disturbances—disturbances that ought to affect only your market and disturbances that ought to affect all stock markets on a worldwide basis. The difficulty for people in other stock markets, however, is that they see only the price change in your particular market, and they don't know whether that price change has occurred because of an idiosyncratic factor that ought to be limited to your market or because of some common element that ought to be influencing all stock markets around the world. Not knowing for sure the source of the price disturbance, and not having independent information of their own to make a complete evaluation, they look at the price change in your market. Then they decide they ought to take this information into account. And so the stock price abroad responds to a change in the stock price in the United States.

We have a contagion effect when the source of the price change in the United States is an idiosyncratic factor that ought to be limited in its effect only to the U.S. market rather than spreading to the rest of the world. But the incapacity to distinguish between these two sorts of disturbances leads to this spreading of what ought to be idiosyncratic effects on stock prices. King and Wadhwani attempt to measure these contagion effects by a relatively ingenious technique of looking at stock price changes either when a market opens, or between its opening and its close, and relating these changes to simultaneous movements, or to open-close or close-close movements, in other stock prices.

The key findings that come out of this hypothesis are that con-

tagion effects will increase with the increase in volatility, and that there is in fact an increase in volatility associated with their measure of contagion effects. King and Wadhwani conclude from this that increases in contagion increase overall stock market volatility.

I have a couple of problems with the King and Wadhwani paper. First, I wasn't sure whether technically the conclusion follows. The coefficient in the theoretical model ought to be sensitive to variances —and to covariances for that matter—of the two types of shocks. If we have the little-boy-who-cried-wolf model, which is to say all shocks in the U.S. market are idiosyncratic, then people will know that and in the rest of the world there will be no response to U.S. price movement. On the other hand, if people know those shocks are idiosyncratic, they will respond all the time. However, we should change the rules of the game on them. And you say, well look, people believe that the United States never cries wolf but the United States starts to cry wolf like mad; then, of course, you get contagion effects spreading to the rest of the world. But it seems you haven't played an entirely fair game, in the sense that you're using the parameters from one situation and applying them to another situation. And one would technically need to consider whether those coefficients should be adjusted if the fundamental nature of the shocks—the variances and the covariances between them—are being changed.

Moreover, as I indicated earlier, I think there can be other explanations for why very large movements in one stock market can be reflected in movements in stock prices in other markets. Even if it is because the United States is going totally nuts for some completely idiosyncratic reason—if the U.S. stock market declines by 500 points in a given day—that fact is simply not relevant in Tokyo, regardless of the source of the disturbance. If that magnitude of change occurs in the stock market, it is a relevant piece of information.

Now let's turn to Charles' own efforts to look at foreign exchange movements, particularly when stock markets are closed, as a source of information about the international disturbances. He finds two key things. One, when the dollar goes up, that is generally good for stock markets. And two, he rejects his own hypothesis that large foreign exchange movements during times when the stock market is closed would have relatively larger effects on stock prices when the markets open. Let me comment on those two things. First, the relationship of the dollar going up to the performance of stock markets, I suspect,

is a particular consequence of the circumstances that prevailed in **1987** when we had coordinated efforts on the part of major governments to attempt to limit the dollar's downward movements. Those efforts needed to be reinforced, some would argue, by pushing up U.S. interest rates when the U.S. trade balance deteriorated. So if the dollar did come under downward pressure, there might be an expectation that bad things would happen, and the stock markets would react to that understanding of the structure of the situation. And that would not necessarily be a situation that would prevail in other circumstances. Second, concerning the hypothesis about the magnitude of foreign exchange rate volatility versus stock market volatility, I think there are considerable difficulties in attempting to draw such a relationship. For one thing, there have been times in the past when exchange rates were completely fixed, and with that, of course, we would not expect any relationship at all between exchange rate volatility and stock market volatility. Second, we have not lived in a world in which exchange rates are completely and freely flexible. Particularly during **1987,** there were fairly vigorous efforts to limit exchange rate movements. And it may well have been the absence of exchange rate movements, combined with the effort to limit those movements, that created stock market reaction rather than movements in the foreign exchange market itself. I think Charles said, "Well, it may just be that the foreign exchange rate is a poor proxy for international disturbances." I might add that it is probably a particularly poor proxy in view of the linkages of other economic policies to the exchange rates.

Finally, let me comment on the general issue of whether international transmission of the major disturbance was associated with the stock market crash of last October. I think this cannot be rigorously proved by the usual standards of statistical analysis, but a careful reading of the chronology of the facts suggest an important degree of international transmission. As was suggested earlier from the floor, during the week before October **19** there were a number of important changes in fundamental factors: the deterioration of the U.S. trade account, the increase in U.S. and other interest rates, the policy dispute between the U.S. government and the West German government over who should be raising and who should be lowering interest rates, and a variety of other views, which probably fed together with the general impression that the stock market was overvalued.

In any event, when the Brady Commission sent out its survey to ask people what, in the week preceding the crash, was responsible for the stock market decline, the respondents indicated that fundamental rather than psychological factors were predominant in their estimates. They pointed in particular to the increase in interest rates and ''overvaluation'' of the stock market as the leading fundamental factors. When these same people were asked for their explanations of the 500-point decline on October 19, the leading category of explanation was ''psychological factors.'' By far and away the most important psychological factor was ''pure heck.'' This is, I think, consistent with the facts that on the opening—even given the delay in opening—the New York stock market exchange dropped 100 to 150 points, recovering during the mid-morning 50 to 70 points, and dropping again by the early afternoon. So it was down about 200 points by the 2 o'clock measurement on the Dow. In the next two hours, it dropped another 300 points. It is difficult to find the news that would have produced this result.

Indeed, having served in Washington for nearly three years now, I know it is true that the only safe secret is a secret known by only one person. It is inconceivable to me that some great fundamental economic change occurred roughly between 2 o'clock and 4 o'clock (New York time) on October 19—a change that would have produced a 300-point drop in the Dow—and a change that no one would even recognize. It is also inconceivable to me that there was a vast and successful conspiracy of silence to prevent knowledge of this change from permeating to the *Wall* Street *Journal,* to the New York *Times,* and to other investigative reporters who have sought to find the true explanation of the crash.

Subsequent to the decline in New York, I think we saw reactions in Tokyo and in London, and the situation was only finally stabilized on the afternoon of October 20, when the U.S. market began to show some recovery. So I think the chronology of developments in mid-October certainly suggests that something peculiar happened in the U.S. market, particularly on October 19, and the effects of this disturbance were transmitted around the world to influence stock behavior in other markets.