

Black Monday in Retrospect and Prospect: A Roundtable

INTRODUCTION

The Plenary Session of the EEA Meetings consisted of a roundtable discussion of the causes and implications of the stock market crash in the Fall of 1987. The four participants, Martin Feldstein, Franco Modigliani, Allen Sinai, and Robert Solow, spoke to a large audience of several hundred economists. In view of the widespread interest in this session, we have transcribed the audiotape and, with some modest editing, present here the statements of each of the participants. Thus, these are not papers that were written for the journal, but rather an edited transcript of the session itself. I am grateful to the participants for their willingness to take part in the roundtable discussion and for their permission to publish their remarks.

Wallace E. Oates

Dr. Martin Feldstein: I can see there's more than a little interest in this subject by the size of the group here. I have interpreted the assignment as dealing with two questions. First, why did the market fall so sharply, and second, was government policy, that is to say Federal Reserve policy, at that time appropriate. It is much easier to speculate after the fact on these questions, and it is even easier, especially with a panel like this, to be the first speaker.

Let me speculate on a few of the reasons for the very sharp fall in the market last October. First, I think a case can be made that the market was overextended—that prices were too high and that what we were seeing was a speculative bubble. Look at what happened to the earnings-price ratio over the preceding few years. In 1981 the earnings-price ratio was 12%. By 1984 it had fallen to 10%, by 1986 it was 6%, and by August of 1987 it was less than 5%. There had been a dramatic fall in the yield on common stocks, and one doesn't have to be a devotee of Graham and Dodd and their magic number of 10 to think that when the yield got down below 5%, stock prices had simply gotten too high by historic and sustainable standards.

People in the financial markets tried to talk themselves into living with these earnings-price ratios by arguing that profits were going to expand. And they did, but at the same time a lot of people worried that we were in the late stage of an expansion and, if a recession didn't occur in 1988, then it would probably occur in 1989. In any case, earnings couldn't continue to rise to justify these earnings-price ratios or to bring them back into normal perspective. The theory that had gained some currency by midsummer of 1987 was the theory of a one-world equity market—that we were going to become more like the Japanese. If they could have price-earnings ratios of 60 to 1, then surely 20 to 1 for us was modest, and we might be on our way to some happy compromise between the two.

Alas, that was not true. We were above an equilibrium, and it had to return. One of the things that I think was important in precipitating the crash, and that's the second thing I put on my list, is monetary policy and rising interest rates; just as the earnings of equities were falling, interest rates were rising. In January, long-term Treasury bonds had a yield of 7¼%; by April it was 8%, by August it was 8¾%, and by October it was more than 10%. Franco has taught us in the past that equity markets are not always as sophisticated as economists at making the distinction between real and nominal interest rates. Those who focused simply on nominal

interest rates saw a 10% yield on bonds and a 5% yield on stocks; it is not surprising that people woke up one day and decided that the rise in stock prices had gone too far.

But even if one looks at real interest rates, I think one can see evidence of rapidly rising rates. Of course it is hard to know what "the real interest rate" is. You can't look it up—at least you can't look it up in the conventional sources, but Dick Hoey, the Chief Economist at Drexel, Burnham, Lambert, has been running a survey of a couple of hundred senior financial executives since the late 1970s and has produced some interesting numbers. The real interest rate on ten-year bonds according to Hoey during 1987 started at 2% in January, moved towards 3% in May, to 4% in September and exceeded 4% in October. In other words, there was a rapid convergence between earnings-price ratios and real interest rates that made a lot of investors think about moving out of stocks and into bonds. Interestingly, among the groups that saw all this early on in the Hoey survey were the economists. He breaks down his results into economists, chief financial officers of corporations, chief financial investors of financial institutions, and I took a certain perverse pleasure in noting that it was the professional economists who saw early on what was going on and that it was likely to produce a downturn in the stock market.

But it didn't happen until the others, the ones with their hands on the money, actually came to the same conclusion. Why did interest rates rise? Basically because of tightening by the Federal Reserve and the fear of further tightening. I think the critical thing that made all that happen was the decision to try to stabilize the dollar. If you look at monetary aggregate growth at the end of 1986 and the six months before the Louvre Accord, M-2 was growing at 8%. In the six months between February and August, M-2 grew at only 2%; the link between the slowing growth in the money supply and rising nominal and real interest rates is not hard to find. Partly, that was driven by a fear that inflation was beginning to pick up. But much more importantly, I think, it was the fear that without higher interest rates here and lower interest rates abroad, the dollar would fall. Since we had made a (mistaken) commitment to try to stabilize the dollar, the Fed tightened, pushed up interest rates, and contributed to this mismatch between equity yields and bond yields.

As I said, partly it was the Fed and partly it was the market's own expectations, because after a while, the markets came to understand that defending the dollar did not mean merely intervention by the Fed; it meant tightening monetary policy. And so, when in the week or so before the stock market crash, we had some very bad trade figures (the August trade figures that came out in October), and Germany had what for them were positive trade figures, it was clear to the players in this market that the dollar would come under pressure. Judging by what the Fed had been doing for the last six months or so, they knew that this meant a further ratcheting up of interest rates, and even before the Fed had a chance to do it, they went ahead and pushed up interest rates. I think at that point the Fed was not tightening, but the markets were acting as if that's what the Fed would do in response to the trade figures. So we got higher interest rates.

A third thing that I will put on this list is simply "market nervousness." Somebody in the equity markets said to me late in the summer that this is a "market of fully invested bears," that everybody knew the market was overpriced but everybody was greedy and didn't want to miss out on a continuation of the wonderful rise that had been going on since the beginning of the year. But they were very, very nervous, and (as Bob Schiller taught us in his very interesting analysis of a survey that he did in the weeks immediately after the crash), as soon as the market begins to break, the hypersensitive investing public, anticipating that an avalanche might start, rushed to join in.

Now why was there this nervousness? Partly it stemmed from the level of equity yields relative to interest rates that I've talked about. In addition there was an increased awareness that portfolio insurance (both explicit and informal) was out there—and that once the snowball started, there were new forces at work that could turn it into an avalanche. Even if you weren't part of that process, you knew that as soon as there was any hint of that, you wanted to try to bail out. And I think the fact that it came late in the year, a year in which the market had gone up so dramatically, also contributed to this perception. There were a lot of professional money managers who knew they would be judged by how they came out roughly ten weeks after October 19th. If they managed to lose money in a year in which the stock market had initially gone up so much, they stood to lose their jobs or their clients, and, rather than holding on until the bitter end, they wanted to leap out.

How shall we judge what the Fed did at the time? I think the Fed basically had learned the lesson of the 1930's. They knew that it was important to provide liquidity. Alan Greenspan's eloquently short statement said that that's exactly what they would do; that indeed was the right thing to do at the time, and it reassured markets.

But there was something else that has received a lot less attention and I'll just close by commenting on that: the problem of the securities firms. Some of the securities firms were in trouble, and they came to the Federal Reserve and asked for credit. The Federal Reserve quite properly said to them they were very sorry, but they were in the business of lending to banks and couldn't lend to securities firms; such firms didn't have the privilege of the discount window. However, the Federal Reserve said that it would do some leaning on their friends at the banks to make sure that the banks would be receptive when the brokerage firms came along. So the brokerage firms went to the banks, the Federal Reserve stood behind the banks, leaned on them, and the two parties managed to make a deal that would not otherwise have been possible.

Now in the end, this has had a happy ending. None of the major securities firms folded, but the question that I think we should ask ourselves is what if some of them had folded and what if there had been very large losses at some of our major banks as a result. The Fed's usual rule is that if it finds that a bank on its own authority, on its own decisions, has made the wrong investments, then the Federal Reserve will protect the depositors but not the management and shareholders. But they couldn't do that in a case like this. If it had worked out badly, the Federal Reserve could hardly have said to the officers and shareholders of the major banks on whom they had leaned, "Well, we leaned on you, we told you to do it, but you shouldn't have done it." So we don't know what would have happened. And now we have to ask ourselves, How will the securities firms behave in the future?; What kinds of risks will they be willing to take? Will they take more excessive risks in the future because they have seen that when the crunch comes, the Fed, while not prepared actually to lend to them, is prepared to do something which is equivalent? In other words, have we created more risks for the future?

Dr. Franco Modigliani: With this excellent opening statement, I will steer in slightly different directions. I would like to play a little more on the theme that I love these days, the theme of market irrationality. Having made a name through a theorem using super-rationality, I think I can afford to be on the other side and try to cash in on both sides of the street. Then I want to look beyond what Martin has said and talk about the effect of the stock market on the economy.

On the first topic, the crash of Black Monday and Tuesday certainly did not come as a surprise to me. On the contrary, it came as a needed, desirable confirmation of the theory I had

been espousing for some time. Actually, I predicted Black Monday, roughly in 1980. I did not say that it was going to come right away; I said that it would eventually come.

Let me explain how this goes. Back in 1979, I studied carefully why stock markets all over the world and at all times seemed to perform poorly during times of inflation. There seems to be a direct relation; the higher is inflation, the worse the stock market goes—and this relation holds very well in this country. You will find that historically stock markets have done poorly during inflation; they did badly in the post-war inflation of 1919–1920; and they have done quite poorly in the recent inflation. As you look across the world, you find essentially the same thing.

Whether or not that extends to the case of hyperinflation is another matter. It does seem to apply even there, but not in full proportion to the higher inflation rates. When inflation is 10, 15, or 20 percent, you have horrible consequences; when it goes up to 500 percent, perhaps it's not that much worse.

I have tried to understand why inflation has such bad effects on the market and have concluded that the reason is simply that most of the agents in the market have not understood how to value assets in the presence of inflation. They make two crucial mistakes. The first is that they tend to capitalize streams of earnings at the nominal interest rate instead of capitalizing them at the real rate. Since inflation raises nominal rates significantly even though it doesn't change real rates (it might even reduce them), market valuations can be affected by a very large factor. The other mistake is one that has to do with the calculation of profits. In calculating profits in the presence of inflation, one should use inflation accounting and, in particular, this means that the interest rate on debt should be calculated at the real rate, not at the nominal rate because the nominal rate includes an inflation premium which represents a repayment on the part of the firm. If the firm pays 20 percent interest and the real rate is 5 percent and inflation is 15 percent, then, in reality, it is not paying 20 percent because 15 percent of the 20 percent is repayment of principle. At the end of the period, the firm owes 15 percent less in real terms. If you realize that, then when inflation gets high (and interest rates got quite high in this country due to the inflation), then you'll see that any company which has large amounts of debt will underestimate its profits to a very large extent.

There are other effects of inflation which are in part real. For example, the government taxes several things which are not income and permits firms to deduct items which are not expenses. In particular, in taxing corporate income, it permits firms to deduct the entire interest rate not just the real rate; this essentially allows firms to deduct the repayment of principle which, of course, is advantageous to the firms. Against that it does tax profits calculated not on the basis of present cost but at the original cost and that tends to reduce real profits. But I suspect that these tax effects are relatively minor. I think that Marty and I disagree as to whether the favorable effect on interest is or is not larger than the unfavorable effect on inventories and depreciation. I think it is, but, in any event, I say these are really minor things; they largely cancel out.

What's left is simply that profits are underestimated by significant amounts and capitalized at the wrong rate. And that, I think, explains to a large extent what has happened to the market during the inflation and why in 1979 when I was writing the paper to which I have referred, the market was about, I said, half as much as it should have been under rational calculations. Now, that was the first step. The next step was to announce (and that was done in my original article) that the undervaluation would disappear as inflation disappeared. In other words, the market was wrong and would keep being wrong as long as inflation lasted. When I say the price is half as much as it should be, it means that at that level large profits will be made

by the time the market corrects its error. And it will correct the error as inflation disappears. That's exactly what happened. As inflation went down, the market went up, and up, and up.

And then comes the third statement which I made (unfortunately not in the original paper but in a 1980 paper distributed by the Industrial Liaison Office at M.I.T.) which warned that as the inflation abates and the market goes back to the right level, there will be large capital gains made—and it is very likely that will create a bubble. Though the capital gains earned cannot be interpreted as being part of normal earnings, still people will be capitalizing not just earnings, but earnings plus the transitory capital gains; this will lead to excessive valuation which eventually will create a bubble. And I pointed out that that's precisely what happened in 1929. Following the great inflation at the end of the war, the stock market was very naturally undervalued in 1920; it gained rapidly back to the right level then overshot substantially in 1928 and 1929. So I was expecting this overshooting in the 1980s, and I noted that we had crossed the line of correct valuation somewhere around the beginning of 1986 or 1987. From then on, it was entirely a bubble. So when the bubble burst, I thought that this was confirming what I had been expecting for a long time.

I think that the fact that the market is unable to value correctly under inflation is a very important proposition. It is evidence of irrationality—irrationality, however, that is due to misunderstanding. There are ways of being irrational in the sense that you make a poor decision knowing all the correct facts or instead in the sense that you simply have not learned how to compute correctly. And that I think is the kind of thing that is happening.

If I had any doubts about the fact that the market is unable to value correctly in the present of inflation, I think they have been laid to rest by the evidence of the last few years when firms were asked by the Financial Accounting Standard Board (FASB) to provide inflation-adjusted accounting figures together with the standard figures. The adjustment may not have been the best but it was in the right direction. We know from inquiries made on behalf of FASB that business and, even more, financial analysts do not look at those figures. Or if they look at them, they pay no attention to them. Only a very few say they use them. So, I'm afraid, that this means that we have not learned; if we go into another bout of inflation, the world can expect a very similar phenomenon to be repeated. It may be that people learn gradually, but so far, the evidence is that they haven't.

Now the next question is, What have been the implications of the large decline in the value of stocks? Here, my work on saving is relevant as I have spent a fair amount of my life trying to explain that consumption and saving are determined by life-cycle allocation and this implies that, at any point of time, consumption is a function of income and wealth—wealth is an important component. Then one can ask (in fact, many newspapers called me up at the time of the crash), doesn't this recent episode mean that a lot of wealth has been lost, and if a lot of wealth has been lost, doesn't that mean we should expect declining consumption? To this I always add and, quite possibly, a fall in investment because the market value also is relevant in determining the cost of capital to evaluate the rate of return. So there could have been both kinds of effects.

Now what is the story about the wealth effect on consumption. Ex post we have seen that there isn't much evidence of a large decline in consumption. The crash doesn't seem to have had much of an effect on consumers' readiness to spend money on consumption. But this conclusion is consistent with life-cycle models and empirical estimates of the same. And the reason is the following. According to the life cycle model, consumption depends on wealth. For the coefficient of wealth, in the original stripped-down Modigliani-Brumberg model, we suggested a value of something like .08. But on the basis of somewhat richer models which allow for a

variety of things (like interest rates), perhaps it should be somewhat lower—empirical estimates come up with somewhere around .04 plus or minus .01, say between .03 and .05. Now, what was the wealth of the household sector in the form of stocks? Total wealth, the net wealth of society at that time, was roughly 14 trillion dollars. (You can estimate wealth if you know what income is; because the life-cycle model says wealth is 4–5 times income; it almost always is $4\frac{1}{2}$ times with very small deviation.) Anyway, of this 14 trillion dollars (consisting of roughly 17 trillion gross assets minus 3 trillion debt), how much is in stocks? According to the best estimates we have, the stock component is a bit less than 3 trillion dollars or about 20 percent of wealth. There had been times in the 70's when it was much less, about 10 percent of wealth. If it was around 3 trillion and if the market lost about a quarter of its value, the loss in wealth was roughly 750 billion. If you multiply that by say .04, you get about 30 billion. So consumption should have declined by 30 billion. But 30 billion is only about one percent of consumption which is 3 trillion. So the only impact that you would expect is something on the order of one percent, which is obviously small compared to the other kinds of shocks in the economy.

From this perspective, the finding that the crash had little effect on consumption is not entirely surprising. There may have been more selected effects, perhaps on luxury apartment houses or luxury cars; there may be a little evidence of that, but on the whole the effect was very modest. That doesn't mean the effect will always be small, because the decline in the market could persist for more than a quarter. After all, a single quarter is not a lot. In fact, I must confess that I should have expected matters to persist somewhat longer.

So, I think that the crash, on the whole, has not had major repercussions. And, of course, I would add personally that I think that any repercussion that would be slightly deflationary would be welcome at this point, because I think we are going overly fast—the danger of overheating and inflation is getting to be very real. When unemployment is down to 5.6 percent, I worry, and so if there was any effect, it was on the good side.

Dr. Allen Sinai: My remarks address what I call the generic, fundamental problem underlying the financial markets. I will consider the economic and institutional setting of the Crash and the effects of the Crash, making use both of theory and some computer simulation results relating to what actually has happened since the Crash. I put a lot of stress on what I call the generic fundamental problem of the financial markets which is rooted in the global imbalances of deficits and debt on the part of the United States and the relative fiscal restraint and large trade surpluses abroad.

In an open world economy with globalized financial markets, flexible and quasi-flexible exchange rates, and slowly adjusting or sticky quantities (in this case continuing large structural budget deficits and nominal trade deficits in the United States, accompanied by the associated debt and interest payments on the debt), a large supply of dollar-denominated assets relative to demand can arise, both expected and in actuality. To achieve equilibrium, the dollar must fall, generating expectations of higher inflation (which, in turn, can generate an actually higher inflation). This can further depress the dollar, which generates expectations of even more inflation, which depresses the dollar, etc.

When the nominal budget and trade deficits fail to improve significantly over a reasonable time horizon, for whatever reason, a consequence is that the dollar falls further, increasing expected losses and the risk on dollar assets held abroad and raising the nominal return on newly issued dollar-denominated assets required to compensate foreign and domestic savers. As nominal U.S. interest rates rise through this process, U.S. stocks may become overvalued given growth or profits expectations relative to the going interest rate. In this process the Central

Bank itself may well keep short-term interest rates higher than otherwise to restrain an actual or incipient inflation. In an extreme situation (which I do not think we have had yet), the prospects of losses on dollar assets may become so overwhelming that foreign investors will dump U.S. financial assets, spiking interest rates sharply higher for a time and threatening or actually bringing about a recession in the United States and possibly overseas.

This possibility existed as a backdrop to the Crash and was incorporated in much financial market thinking reaching as far back as May 1986. It first appeared in U.S. fixed-income markets at the time around the U.S. Treasury auctions and against the backdrop of a declining dollar and concerns over foreign demands for securities. It appeared again in August and September 1986, spilling over into the equity markets during September in a short, sharp correction. Interest rates moved higher once again in February and March 1987, again near a Treasury auction. In April and May 1987, interest rates rose nearly a percentage point and an eight percent stock market correction appeared, again, to some extent, based on fears of losses on dollar assets.

Finally, in late summer and early autumn last year, a similar pattern appeared first with respect to interest rates. Long-term and short-term interest rates rose, based on market actions and expectations and a hike in the discount rate by the Federal Reserve. At the time of the Crash, there were expectations of additional rises of interest rates. The rates on long-term U.S. Government bonds were approaching $10\frac{1}{2}$ percent at the time of the Crash—up from 7.1 percent at its low in May 1986.

One lesson is that financial market asset prices respond to the absence of policies to correct such things as global imbalances of deficits, debts, and surpluses. Prices in these markets move freely and with great volatility to equilibrate the quantities demanded and supplied. This fundamental problem of the financial markets, sticky quantities and fast price adjustment, remains today, altered only a little by the events that have occurred subsequent to the Crash.

Various institutional factors, trading practices, and policy decisions in the economy magnified the fundamental problem that I have described. They have been discussed in the various reports of the Brady Commission, GAO, and the Securities and Exchange Commission. They were important, I stress, in that they basically served to magnify the fundamental moves in financial market prices that emerged from the process I have described.

These magnifying elements included the pyrotechnics of computerized trading, new financial instruments such as stock index options in futures, the global and interrelated nature of investments, and huge, quick flows of funds from investors who switch opinions. They also included the speed and technology of information flows which now compress into a short period of time movements in asset prices that used to take months, but now occur in days or hours.

There was also an important psychological element: the "madness of crowds." As panic sets in, the herd instinct takes over with everyone moving in the same direction—in this case, massive selling of stocks all at the same time with few buyers at going prices.

The setting at the time of the Crash speaks to the fundamental process that I have described. The dollar was under pressure; there was concern over rising inflation; there was a mini-quarterly refunding with a full refunding coming in November with concern over the absorption of the new securities; there was a large trade deficit announced the Wednesday before the Crash reminding participants that the twin-deficit problem was still there; interest rates were rising and expected to rise; and there was a crisis of confidence in the dollar stemming from disagreement between the United States and Germany over the Germans raising interest rates the weekend before, adding to dollar fears. There was no significant progress on the budget deficits with Congress and the Administration at loggerheads after a long budget

process. And there was uncharacteristically loose Federal Reserve talk on inflation and the current prospects, suggesting to some financial market participants that the Federal Reserve was overly optimistic and not aware of the fundamental problem of the financial markets.

I turn next to the effects of the Crash. In theory, any analysis would link the effects and the large stock market correction from August 25th to October 19th to lost household net worth as Franco has mentioned. The more dire predictions of what would happen after the Crash, I think, were based simply on the correlation of past big declines in stock markets with the recessions or depressions that typically followed. This, after all, was the biggest decline in stock prices in our history. By our estimates there was about a trillion dollars of lost net worth. The estimates on the coefficient for consumption in response to household net worth range from 3 cents on a dollar to 6 or 7 cents on a dollar. If we take 6 cents on a dollar of lost net worth as the effect in terms of lost consumption, our model with 13 consumption equations and a fairly heavy influence of net worth displays lags of three or four quarters before the full effect shows up. The translation is somewhere from \$30 billion to \$70 billion of lost consumption. In addition, there are other effects as the lower consumption reverberates through the economy—including specific effects on capital spending. The cost of capital is increased, for example. *But these alone do not produce a recession; the magnitudes are not sufficiently great. There is not enough here to produce a recession, contrary to the usual historical correlation of stock market crashes and economic downturns.*

Two factors served to mitigate the impact of the Crash on the economy in the model. One is that we now import so much of our consumption that reduced imports absorb a lot of the loss of spending from reduced household net worth; this raises (assuming exports stay up) net foreign trade, accounting for part of the loss in consumption. The second factor is lower interest rates—the Federal Reserve allowed interest rates to fall and cushion the blow. In fact, the central bank promoted lower interest rates for longer to prevent any further financial-market trouble and weakness of the economy.

Thus, in my own work with a full scale 300 to 400 equation model of the U.S. economy, the Crash *itself* would not generate enough to produce a recession. I hate to say it, but there must be more financial trouble to cause a recession than that “small Crash” of October 19th.

There is no comprehensive theory nor are there any models that can really analyze this event; the Crash was an outlier in terms of history anyway one looks at it. More and more it looks like a one-time, transitory event which is having only transitory effects on the economy. The economy is moving back to the track it was on before the Crash.

What has happened since the Crash? The economic damage since the Crash (six months now) in the U.S. and overseas has been extremely light. The Crash is so far a “nonevent” in terms of the economy. Consumption in the fourth quarter was down 3.1 percent on an annual rate. At first glance, one might say “Aha!, Here is the Crash causing consumption to go down.” However, a careful look at the monthly data shows that consumption spending was weak only in October and that was in auto sales, reversing big increases in August and September. The Crash could not have affected auto sales prior to October 19. Retail sales have been rising nicely, not in any boom way, since that time, on a monthly basis. As far as confidence goes, the University of Michigan Survey showed about a 10 percent drop in confidence immediately after the Crash. But now confidence is almost back to the pre-Crash level. The latest University of Michigan Survey is 91.6—it was 93.6 before the Crash.

Housing has been weak—both residential and non-residential—but the question is whether that would have occurred anyway. Most forecasts, I think our own, said housing was

going to be weak. Here, I think home sales is where one does see some effects of the Crash—caution on the part of consumers. Mortgage rates have come down since the Crash, and fairly weak housing still has occurred. On capital spending, there was weakness in the fourth quarter, but it looks to us to be very strong in the first quarter. I can see no signs of the Crash having altered the path of capital spending. The surveys on capital spending are very strong. The track on trade is about the same now as before the Crash. Employment growth, as you all know, has been nothing short of sensational. The Administration can be very happy about that if it keeps up through November; the unemployment rate is not showing any signs of the Crash.

The effects of the Crash were very concentrated and localized. Some statistics on household net worth and equity holding show that most households are not directly in stocks—only 60 percent of stock is directly held and that immediately lowers the impact of the \$1 trillion loss of net worth. In addition, the 1984 surveys indicate that 20 percent of households own stock. That's fairly small. And if you look at those who do own stock, it's affluent Americans, high net worth individuals. But the percentage of wealth held in stock is less than 10 percent for them as a group. That's a fairly small, localized effect. Moreover, I think there was a sense of “easy come, easy go”—there were a lot of lost profits (paper losses), but on the heels of earlier huge gains that had not been taken. The Fed reacted appropriately with a one percentage point drop of the federal funds rate and that helped circumvent any potential worsening of confidence. We now have international policy coordination back on track, supposedly, with the Germans. The Federal Reserve is more careful in its public comments. A budget compromise finally was reached, although in late December. The budget and trade deficits have improved a bit, although they are still the root of the fundamental problem. Overseas there are no real signs that the crashes there are anything more than passing events in financial markets.

So, the Crash is a nonevent, so far. And in looking at history, one sees that there have to be other factors that go along with a bear stock market in order for them to induce a recession or depression. Those other factors turn out to be rising interest rates, unemployment, and, very frequently, a “boom-and-bust” economy—factors that we have not had in the last six months.

Can it happen again? As Santayana said “Those who forget the past are doomed to repeat it.” The Crash, the October 19th event, appears to me to be a transitory event neutralized by adept Fed action and localized in its impact, but the fundamental problem as I see it, is still there. Nothing has been altered much: internal and external deficits in the U.S., excessively high surpluses overseas, potential for further declines in the dollar, and the same inflationary expectations of a declining dollar from several sources—expectations which, in turn, could well drive interest rates up. And now that the Federal Reserve indicates concern about the yield curve and inflation expectations, it is more inclined to tighten credit markets in response to these indicators. With higher interest rates, the stock market could become overvalued again. It wouldn't take much to produce a further mini-dose of trouble. In fact, I'd be amazed if we don't have mini-doses of what we saw last October as the way that markets impose on the U.S. and world economies the adjustments necessary to correct those global imbalances which are in our historical sweep of events. Something like the Crash is likely to happen again. The trick is to figure out when. If for some reason the trade balance improves or the budget deficit is corrected before we have had massive trouble again, then I would say we won't have these market problems repeating themselves. I doubt that all of the various deliberations and discussions of the various commissions will really make the difference. My own view is that fundamentals

move markets—everything else can magnify what goes on but it is fundamental forces that matter. And, until the forces connected with the twin deficits are altered, I'd be surprised if markets don't move adversely again.

Dr. Robert Solow: Marty was right, of course. Every reasonable statement that could be made on this subject has been made. That's different from the usual performance—usually all possible statements, reasonable and unreasonable, have been made. So we're doing better than that, and I anticipated this. We who live in the last third or so of the alphabet are used to this phenomenon, so I only want to make a few comments here and there, rather than to try for a systematic view of these issues.

On the main question, of course I know why the market fell on October the 19th and so does each of you. There was an excess supply of stocks at the existing price level on the morning of October 19th. How do I know there was an excess supply of stocks? Well, the prices of stocks fell, didn't they. I'm very sympathetic with Marty's remarks on this question—there was an excess supply of stocks on the morning of October 19th, and I think more or less for the reasons that Marty described.

Everybody, not only Franco—everybody knew that stock prices were high. First of all, remember that the market decline began in August (I'm going to come back to that). But, everybody in the late spring and in the earlier part of the summer knew all that. The conversation around faculty club tables was "Why on earth are stock prices so high, and rising?" And nobody that I can remember produced an answer to that question. So all those people around the faculty club tables could hardly have been surprised when the bubble burst. Now, why the stock market fell smoothly but rapidly between August and October and then took this drastic drop on October 19th, nobody knows—and, I think, nobody can know. I don't think that is the kind of question that has an answer.

When you look at it seriously there was no news that weekend to precipitate the Crash. It is always possible to produce "after the fact" news items out of the back pages of the *New York Times*. The *New York Times*, of course, contains far more than all the news that's fit to print—about twice that, I would say—and out of the back pages of the *New York Times* you can always find little bits of news about which after the fact you can say "Aha! That's why it happened." Had the market, by the way, not fallen on October 19th but fallen on November 1st, we would also have been able to produce out of the back pages of the *New York Times* a whole catalog of items that might have accounted for that. I believe we should think of the particular timing and particular allocation of movements today in the stock market as in very large part, a random process. Not a random walk, but there are stochastic processes that have large outliers and the day, a particular day, that a bubble bursts, is one of them.

On the question of the effects of the stock market on the economy, of course, I have to listen to Franco—I can never remember what the coefficient on wealth is so when I need to know it, I always call Franco and ask. And, Allen's remark, I think is exactly right on this. I put it to myself when I was thinking about what to say here; being a theorist, I said to myself, "Let's think about the inverse problem." Suppose I had the real data, suppose I had the national income and product accounts and the industrial production index, all that in my hands right now. Look back at them. Could you tell from looking at those numbers that the stock market fell drastically on October 19th? The answer is clearly NO. That is not to say that at this very moment there are not 100 Ph.D. students running regressions, at least one of which will provide an answer to the question and large t-statistics at the same time. But the serious answer to the question is that there is no way that a look at any page of Economic Indicators (except the page

that has security prices and stock yields on it) would tell you, that something big happened on October 19th. And so if you define something big as only something that shows up in the National Income and Product Accounts, or on some page of Economic Indicators other than the security prices page, than it must be that nothing big happened on October the 19th. And, in a way, I think that's right.

There was another phrase that Allen used which was actually on my lips, and that's "easy-come, easy-go." The end of all this excitement is that stock prices went back to where they were at the end of 1986. Stock prices were at the end of 1987 just where they were at the end of 1986. I can easily forget the events of one year, so that cannot be regarded as a major economic shock.

I don't know the proper coefficient for consumption expenditure—this is another thing I have to call up Franco about. Franco, does the coefficient of .04 apply to consumer expenditure or to consumption in the peculiar definition that you people use? I don't remember which one it is, but I think that the number is of the order of magnitude of one percent of consumption, maybe. Allen has larger coefficients and estimates a larger loss in equity values, so it might come up to 2 percent of consumption. That could easily get lost in the noise. This is especially so, since there were probably a lot of people in the world who never regarded their gains from January to August as anything other than Monopoly money anyhow, and so were not surprised to see them go up in smoke. I did look to see what happened to personal consumption expenditures and personal disposable income between the last quarter of 1986 and the third quarter of 1987; and I found that there must have been some consumption out of wealth since the increment in personal consumption expenditures between those two points of time was larger than the increment in disposable income. We know that the savings rate was falling during the interval so perhaps there was some consumption out of existing wealth. It's also true that between the third quarter of 1987 and the fourth quarter of 1987, consumption rose hardly at all as against an \$80 billion annual rate increase in disposable income.

In fact, I think that there has been very little effect on the real economy from the Crash. And when you think about it in these dispassionate terms, free of the newspaper headlines and people who are losing their cool on the evening news, one ought not to have expected very much.

The last point I want to make is to ask a question. Let me preface it with one tidbit of information that I discovered reading this morning's newspaper: we find the stock market seems to have recovered its cool and we are told that junk bonds are back in style—that the yield gap between junk bonds and Treasury securities, let's say, has shrunk back to where it was before. Why do we care about the stock market? Does it, in fact, matter? If we don't like the stock market going up and down so fast, should we put a transactions tax on short-term stock transactions so people won't buy and sell so much?

It is not clear to me that the stock market plays the role that it does in primitive economic thinking; I don't think that new equity issues amount to so very much at all, and I am not so sure that stock prices do a good job of allocating real capital among industries and firms. Remember, Keynes' famous image of the stock market. It's a sexist thing but I have to say it because I'm quoting. He described the stock market as like a beauty contest, only one in which each judge is trying to think not which is the prettiest girl but which is the girl that the other judges will think is the prettiest girl (remembering that the other judges are likewise not trying to think which is the prettiest girl but trying to guess which girl the other judges will think is the prettiest girl). This sort of process (magnified by all the gimmicks, new assets and what-not that are created) dominates the dynamics of the market. And this may make a case for introducing some forms of

“friction” into the market. I know this will rub people the wrong way; I know, for instance, it will rub George Stigler the wrong way because you suggest doing anything to put friction in a market and George won’t care if it’s the market for faintly unstable dynamite or anything; it must be bad to interfere with it. The stock market, by magnifying the impulses of all those ignorant traders, forces governments to respond—sometimes rightly and sometimes wrongly. So, after all this fuss, there is a question in my mind as to whether a little bit of friction in the stock market might not serve the purpose of dampening some scary instability without interfering with any useful allocative function.