

2000 HALL OF FAME ROUNDTABLE PORTFOLIO INSURANCE REVISITED

Ed Berko: 13 years after the stock market crash, dynamic hedging techniques remain one of the most controversial topics in finance. In the wake of recent global market disruptions, a number of critics have charged that derivatives trading continues to whipsaw the underlying markets. What lessons have we learned since 1987? Are dynamic hedging, trend following and option-replication strategies guiding prices away from underlying intrinsic values? Are they accentuating volatile movements and making the financial markets more fragile?

Bruce Jacobs: In the 1980s, portfolio insurance strategies promised to replicate options payoffs so investors could reap the reward of rising market prices while protecting themselves against price declines. An aggressive marketing campaign highlighting how insured portfolios outperformed the stock market suggested that portfolio insurance was the equivalent of a free lunch. In 1982, Leland O'Brien Rubinstein Associates was alone in offering portfolio insurance. As the market rose and the strategy gained popularity, virtually every major investment bank, insurance company and brokerage offered some portfolio insurance product, and LOR controlled about two-thirds of these assets.

By 1987, portfolio insurance had concentrated \$100 billion in a strategy that would require selling off all these assets in the event of a market decline of sufficient magni-

tude. Such a decline began in the week preceding October 19, 1987. In response, portfolio insurance programs called for a massive liquidation. A huge overhang of selling pressure

hit the market as it opened on the 19th. The result: a tremendous explosion—selling, understandable reluctance to buy, prices gapping down, investor panic.

In the 1990s, exchange-traded and over-the-counter puts became available for institutional needs, but the natural demand for both puts and calls tends to outstrip the natural supply. Investors like the protection puts can offer, and they like to gamble with calls. They are less fond of taking on the unlimited risk associated with selling options. Option market-makers and dealers thus tend to be short stock options. They hedge their risk via option replication, a.k.a. dynamic hedging, a.k.a. portfolio insurance.

Dynamic hedging is like a household thermostat gone berserk—the hotter the room gets, the more the heat gets

Excerpts from a roundtable discussion sponsored by ADP, held on April 14 at the Four Seasons Hotel in New York.

Participants

Ed Berko, Moderator, senior vice president of strategic planning at ADP

Bruce Jacobs, cofounder and principal of Jacobs Levy Equity Management, is the author of *Capital Ideas and Market Realities: Option Replication, Investor Behavior, and Stock Market Crashes*

Peter Vinella, senior consultant at Peter Vinella & Associates

William Brodsky, chairman and CEO of the Chicago Board Options Exchange

Mark Rubinstein, Paul Stephens professor of applied investment analysis at the University of California at Berkeley's Haas School of Business

Roger Lowenstein, a former reporter and columnist at the *Wall Street Journal*, is the author of *When Genius Failed: The Rise and Fall of Long-Term Capital Management* (to be published next month) and *Buffett: The Making of an American Capitalist*

Ivan Stux, senior quantitative strategist at Morgan Stanley Dean Witter

Martin Mayer, fellow at the Brookings Institution and author of 32 books on finance and money

turned up; the colder the room gets, the more the heat gets turned down. As asset prices rise, more and more capital gets concentrated in these assets; as prices fall, investors pull their money out as quickly as possible and asset prices drop precipitously.

Such forced selling was characteristic of portfolio insurance in the 1980s. It is present today in the hedging that

big. When that happens, they have the potential to take other investors with them, including innocent bystanders.

What can be done to protect investors from the periodic havoc wrought by such strategies? First, recognition of the real cost of such strategies might discourage the piling on of investments in them. Second, increased disclosure and transparency regarding derivative positions in particular might provide a clearer picture of the magnitude of trend-reinforcing dynamic hedging. This in turn would allow market discipline to set more realistic prices for insurance and might even encourage market participants to provide the liquidity the strategies demand. Then, the



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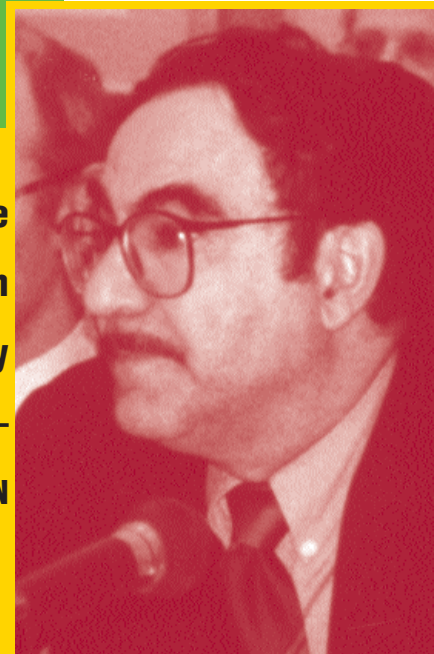
supports stock options. It is manifest also in the margin buying fueling momentum investors' purchases of high-tech stocks—and the margin calls forcing sales as prices drop. It was a crucial component of the failure of Long-Term Capital Management's highly leveraged—and supposedly low-risk—hedge portfolio, and the failure's devastating impact on stock and bond markets.

These strategies attract investors because of their perceived low risk and low cost. What participants in these strategies apparently don't realize is that, as their investments become concentrated, so does their need for liquidity. When they need to get out, they find they are stuck in illiquid positions that can be unwound only at steep discounts.

Investors using these strategies tend to eat like chickens and defecate like dinosaurs. They are successful for a while, and because of their success they get bigger, perhaps with the aid of leverage. Eventually, however, they lose and lose

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MARK RUBINSTEIN



markets will be able to avoid catastrophe.

Peter Vinella: I had left CSU Hayward where I was a math professor and, in 1986, was called by a major passive index fund to help one of its managers. He was doing some mathematical calculations and didn't quite understand the results of some performance stimulations. He noticed there was a strange effect with portfolio insur-

ance—in periods of low volatility, insurance seemed to be very helpful in doing all the things that it promised. However, when there was large volatility, especially on the downside, there tended to be a very fast divergence from the stated goals. I was brought in because I had worked extensively on fast Fourier transforms, which exhibit a similar type of divergence. We did a lot of work verifying the results, and we called Mark up and he said, “No, there isn’t any truth to this,” and that was the end of our conversation. Mark, I suppose you don’t remember this.

Rubinstein: I’m not sure what you mean.

Vinella: The fact that we had simulations that didn’t support LOR’s claims about portfolio insurance. We were told later that that you helped squash the publication of our results. In the case of the *Journal of Finance*, we were told that you specifically squashed the article.

Rubinstein: I’m sorry, but “squashed” is a loaded word. You can say “rejected.”

Vinella: I would use “squashed.”

Rubinstein: “Squashed” implies that I wasn’t objective. I find it offensive.

Vinella: The other thing I hold a grudge about is...

Rubinstein: In another age, I would have thrown my glove down and run him through. But today we don’t do that. I frankly don’t remember the paper.

Vinella: Let me continue. Whether or not dynamic hedging is a valid technique, much of the work performed by Mark Rubinstein and his peers helped a lot to make the markets more mature and investing more mature. Before Mark’s work, in the late 1970s and early 1980s, there was a lot less analysis. The markets were far more limited in terms of the types of investments that could be made. I think the growth in capital markets we’ve witnessed was specifically as a result of the kind of work that Mark has done.

As far as dynamic hedging, the issue isn’t so much whether it works or doesn’t work, but that most of the time it isn’t applied correctly. There are a lot of times when you don’t need dynamic hedging. If you’re looking at a convergence trade in the futures market, you don’t really care if things are going left or right as long as you have locked in the basis and it converges at expiry. Or in the case of a commodity trading company that wanted to use dynamic hedging to hedge the implied foreign exchange exposure of an offshore plant on their balance sheet. They

had to report this only once a year so dynamic hedging was simply not relevant.

I’ve spent a lot of time on trading desks and I’ve found that that there are too many factors to include in a single dynamic hedging strategy. There’s always a lack of liquidity in bear markets, whether you’re trying to sell futures or cash. Then there are competing market dynamics, particularly due to the different levels of leverage that the various investors employ. So it’s very difficult to develop a single strategy that incorporates all this into a dynamic, real-time model.

Again, I want to apologize. I was going to say I really don’t hold a grudge because it was so long ago. I don’t remember the case that well either. You just never let me get to the punch line!

Bill Brodsky: I believe a lot of what Mr. Jacobs said is more just shooting the messenger than really understanding the fundamentals.

I was president of the Merc at the time of the 1987 crash. I testified in Congress in 1987, 1988 and 1989 and was very involved with the Brady Report, which is the most thorough disposition on the issue. There was a lot of selling going on in those markets. There was a lot of program trading that had nothing to do with portfolio insurance or derivatives. People were just dumping stock on the market. To say that portfolio insurance was the cause of the market decline is just not correct.

Many things have been done since then. One of the most significant, at least in the listed markets, is the creation of cross-margining between the futures and options market, which has created a counterbalance that didn’t exist in ‘87. We now have the ability to manage risk in a much more sophisticated way than ever before. The use of derivatives, and in particular the use of equity options, has added to the liquidity of the stock market, and hasn’t had a deleterious effect.

A lot of the momentum trading nowadays would exist with or without derivatives. People who engage in excess are going to get their comeuppance.

Mark Rubinstein: Portfolio insurance originated, as I see it, in a paper written in 1953 by Kenneth Arrow that points out that if you consider revising your position over time, you can create outcomes for yourself that you otherwise wouldn’t be able to create. It changes what you would do today. Those were the basic things I thought we were doing.

The basic idea Hayne Leyland and I were bringing into practice was becoming popular in finance because of multi-period portfolio analysis and because of the Black-Scholes model. We picked portfolio insurance because it

was an easy sell. People liked that way of trying to change the future. In 1976, Hayne and I first talked for about 10 minutes about portfolio insurance as a possible way of doing this. I think one of us turned to the other and said, "Gee, what happens if everybody wants to do this?" So it certainly wasn't a new idea to us that the market could be affected by this strategy. We actually believed that this strategy would increase the volatility of markets, but we didn't think that was necessarily a bad thing. What basically happens is that people are taking advantage of sort of a new power they have—they can think explicitly in terms of revising their portfolios, and one effect might be that

astating to markets. That's what my effort has been about all the way back to the 1980s, when Mark and I would debate these issues, and all the way through the 1990s. I'm afraid we haven't learned the lessons we should have learned, because it's easier to make excuses for the past than to deal with the realities.

One of the difficulties associated with options is that they are nonlinear instruments. Human nature being what it is, we prefer to buy rather than sell options. We prefer to buy insurance and lottery tickets. This means the demand for options usually exceeds the natural supply. As a result, option sellers need to hedge their positions to avoid unlimited losses. The only way to hedge an instrument with nonlinear payoffs is with trend-following, dynamic trading. This represents positive feedback and is potentially explosive.

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Brodsky: I can't dispute one of your points: There should be a responsible way to use all derivatives. I agree with the need for more transparency and broader investor education, but a lot of things are happening that aren't consistent with what Bruce is saying.

markets are more volatile. I didn't see anything particularly wrong with that.

Now let's talk about the 1987 stock market crash. I thought these strategies were going to increase volatility, but I didn't think that they would lead to a crash. When the market makes big moves, as it did today, then strategies worked out by academics, which require you to revise your portfolio in the future, become less valuable. Yet I don't think the basic idea is completely damaged. I think when markets are moving as they normally do—I agree that 15 percent is a lot—the strategies can help you. But you have to be prepared for the time when they don't work so well. I could say some specific things about specific individuals, but I think I will just leave it at that.

Jacobs: I'd liken option pricing to atomic theory: It can have its benefits, like nuclear energy, but it can also lead to nuclear bombs. I'm not saying that derivatives can't be useful, but I am saying there is a responsible way to use them. I think we need to understand how derivatives can be dev-

One of the things I must take issue with: you say there's a demand for the long side of the option and that therefore that creates a dearth of supply on the short side. At the CBOE, on a day like today we'll trade more than two million options. When people on the floor or other professionals sell options and need to hedge, they buy stocks and do other things to offset their positions.

I met earlier today with Dick Grasso at the New York Stock Exchange. The CBOE is the biggest single participant at the New York Stock Exchange. Why do we deal with more than 100 million shares of stock a day? Because we're hedging our option business. This volume is not made up of naked sellers supplying an insatiable demand for people who want to buy puts and calls. In fact, hedging is more efficient than it's ever been before. It used to be that you didn't know until the end of the day how a trader was hedged, or where he stood. These days it's being done on-line.

Rubinstein: Bruce's rhetoric sometimes bothers me a bit.

If you read his book, you will see phases like such as “Mark admitted,” as if I were ashamed to admit something. What I’m saying is that’s the way I look at the world. I wasn’t admitting anything. That’s the way it is—that’s what I mean.

But I do agree with him about transparency. In fact, we once had a discussion that Steve Wunsch motivated when he was working at Kidder. He came to us and said, “Why don’t you just publish your demands for futures in the Wall Street Journal?” We thought seriously about doing that. We didn’t because we were afraid that if the market were to have a move, people would say, “Aha! It’s BECAUSE they published their demands in the Wall Street Journal.” But maybe we should have anyway.

We tried to engage in sunshine trading, where we would actually notify the market in advance that we were going to do a certain transaction a couple hours later. We found that there were rules against doing that.

Bruce says that portfolio insurance was sold as “something for nothing.” We did not sell it that way. We were very clear with people and said, “Yes, on the downside, if the strategy works as it’s supposed to, you’re not supposed to lose any money. But on the upside, you do not do as well as if you’d left all your money in the market.” There was a shortfall, which we likened to an insurance premium. That is not something for nothing, period. You can argue that it was oversold, and that’s another matter we could also discuss. But to say it was something for nothing is using rhetoric in a misleading way.

Jacobs: As to Mr. Brodsky’s comments, it is precisely the hedging of the options business on the NYSE that concerns me. This reflects the fact that option hedging cannot

be accomplished with static positions—dynamic, potentially destabilizing trades are required. I’d also like to respond to Mark. My work and effort here has been remarkably restrained, unlike the sale of portfolio insurance in the 1980s, which lacked any restraint at all.

The original simulations for portfolio insurance covered the decade ending 1982, a period when the stock market performed poorly, so portfolio insurance seemed to be a strategy that provided both risk protection and more reward. And it was with those simulations that the strategy was marketed.

At the time, I did a simulation going back to 1928 and spoke to John O’Brien about my results, and how costly the strategy was. He said my results were absolutely false—the strategy not only protects but also provides higher returns. Moreover, at a Berkeley Conference in Finance, Hayne Leland argued that you could make more money from portfolio insurance by allocating more assets to equities or by leveraging your portfolio. The advertisements in the 1980s stated that you would make 1 or 2 percent more return while protecting your assets.

Vinella: I don’t think anyone in this room wants to turn back the clock and do away with derivatives. They’ve done more to increase liquidity than almost any other product in the last three decades. The high yield markets and the whole growth of the international financial markets are linked heavily to derivative products and strategies.

One of the problems with portfolio insurance was that it was a relatively new product and was used on a massive scale. Now we can do the same type of strategy with different types of instruments. The markets are a lot less sensitive to one particular strategy now.

I don’t want to come off as negative as Bruce, but when you look at dynamic hedging, you’ll find that is a very difficult and expensive strategy to use on large portfolios. There are a lot more effective ways to do the same thing.

Roger Lowenstein: Let’s step away from portfolio insurance and 1987 for a mo-



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ment and just think about dynamic hedging and momentum-enhancing strategies.

Markets have a purpose. Their purpose isn't to be liquid or to allow people to make money, or to allow people like me to write about them. The purpose is price discovery, and that's a social purpose. That's why we're not living in Moscow. To price capital and companies adequately and so on.

The people who help the market fulfill its purpose are the people who—when prices get out of line—sell securities when they're high, buy them when they're low. Those investors are doing a public purpose.

When you have strategies attuned to following the trend, you're really doing the devil's work, because you're bringing prices away from true value.

Bill Brodsky made a point that people own securities that they wouldn't be able to own without derivatives. I question whether that's a good thing. I think we want more investors who own securities because they believe in the value of the securities. If they don't, it allows them to take an anesthetic, which dulls the pain or the healthy fear you'd have in owning that security based on its merit.

Ivan Stux: Portfolio insurance and momentum trading create what I call informationless trading. When you start to trade based only on when the market goes up or down, you're doing trading that's not based on information. The "information" you're using is the market price itself.

People who rely on information to trade will also use the market price movement itself to make additional trading decisions. If the market declines, dynamic hedging and momentum traders will respond by selling stocks. Then, as investors see the selling, they will sell more in response, thinking this movement is based on information. Then, dynamic trading and momentum strategies may find that another trigger has been touched, which generates more trades on their part, and so forth. You actually get a feedback loop that creates an explosion of volatility. Momen-

tum trading and portfolio insurance both do that. I think in that respect they're very dangerous. How do you overcome or stop that kind of a frenzy in one direction or another?

Rubinstein: Roger Lowenstein needs to expand his view of the services the market can render our society. Derivatives serve two other very important functions. They allow people to transfer money for consumption over time so they can save for the future or borrow for the present. I think that's a nice flexibility people ought to have. Another thing markets do is allow risk transfers. This is what I always thought portfolio insurance was about. It wasn't about price discovery—it was about allowing people who wanted to bear risks in a certain way to make an exchange with others who wanted to bear them in other ways.

These things can be misused, true. But those are basically valid functions for the market.

Martin Mayer: My colleague Barry Bosworth, who is a senior fellow at the Brookings Institution, likes to say that diversification devalues knowledge. Many of the techniques that we are talking about here are ways of devaluing knowledge, of assuming that if you have your standard deviations right, if you have your curves right, if you've got large enough numbers, you're going to come out all right. That's true most of the time, but the information content in trading is extremely important and, to the extent that noise dominates signal—which can happen in these situations—you can have a serious problem.

Much of what's done on a portfolio insurance basis is an effort to mitigate the danger of people putting their money in places they don't understand. There is a limit to how far you can go with that before getting in trouble, and the balances have gotten fairly badly out of whack in the last two years. They may have gotten back in whack today. ■