
Currents

Portfolio Insurance and Stock Market Risk

Concern about stock market volatility has reached a record high. This spring, John J. Phelan Jr., chairman of the New York Stock Exchange (NYSE), launched a personal crusade against program trading, warning all who would listen that the sophisticated trading strategies now in use—as distinct from changes in fundamental values—could lead to a “meltdown” of the stock market. Phelan joined the chorus of complaints led by Representative John D. Dingell, chairman of the House Energy and Commerce Committee, who charges that program trading “is rapidly destabilizing our capital markets and eroding investor confidence.”

In the burst of activity surrounding these charges, the NYSE recently announced the appointment of former attorney general Nicholas Katzenbach to head a study of program trading. In addition, Phelan has proposed increasing margin requirements on stock index futures contracts and, in the event of a drop in the stock market of 25 percent or more, imposing trading halts on selected stocks.

With this image of the Great Crash now firmly in mind, it is worth taking a look at what lies behind the meltdown scenario. To begin with, the alleged culprits, referred to by Phelan and the popular press as program traders, are portfolio insurers, aided and abetted by stock index arbitrageurs. Stock index arbitrageurs, recall, are the now familiar stars of the Triple-Witching Hour. (See “Thank God It’s . . . the SEC,” *Regulation*, Sept/Oct 1986.) They buy and sell futures and options contracts on stock indexes (contracts which generally are traded on the futures exchanges, not on the stock exchanges), and simultaneously sell and buy the stocks that make up the indexes; the goal is to profit from pricing discrepancies between the futures market and the stock market. Portfolio insurance, by con-

trast, is a sophisticated new hedging strategy; its goal is to protect a portfolio against loss in equity value while retaining some participation in price appreciation.

A typical portfolio insurance program attempts to assure a minimum return over a specified period of time, say 0 percent over three years. The “cost” of the insurance is the underperformance of the portfolio in a rising market. The portfolio insurer (Leland O’Brien Rubinstein Associates, Chase Investors Management Corporation Company, or Aetna Life and Casualty Company, for example) arranges and executes the program for a portfolio comprising the assets of many investors. Presently, there are about a dozen portfolio insurers protecting over \$50 billion in assets for pension funds, foundations, and endowments.

Portfolio insurance strategies can be (and were originally) carried out directly in the cash markets. In this case, an initial hedge position is created by allocating part of the portfolio to equities and part to Treasury bills or bonds. The hedge is dynamically adjusted to increase protection when the market is falling and to decrease protection when the market is rising. In a rising market, for example, the equity portion is increased while the Treasury bill or bond portion is simultaneously reduced.

Most current applications of portfolio insurance involve stock index futures, because of the relatively greater liquidity, speed of execution, and lower commissions associated with these contracts. Portfolio insurers generally take a long position in stocks that is partially hedged against the risk of a market decline by a short position in index futures. Index futures are sold in a declining market and bought (actually, the short futures positions are offset by a long position) in a rising market.

The “meltdown” conjured by Phelan proceeds as follows: An adverse event, such as a worsening of the trade deficit, causes the stock market to drop. Portfolio insurers begin selling index futures so as to reduce their equity expo-

sure and increase their hedged positions. The price of index futures falls, causing these contracts to sell at a discount relative to the basket of stocks underlying the index. When the discount reaches a critical value, stock index arbitrage is triggered. Arbitraders step in to buy index futures and sell the basket of stocks underlying the index. These large block sales of stocks depress stock prices, triggering portfolio insurance programs again, prompting another wave of index-futures sales and price reductions. The cycle repeats itself, leading ultimately to a collapse of the stock market.

While dramatic, the meltdown scenario overlooks a couple of important points. First, like most exercises in verbal dynamics, it ignores the feedback effects that tend to dampen explosive tendencies in markets. If stock prices were declining as a result of trading in index futures, for example, this would create buying interest in stocks since their fundamental values would be unchanged. In addition, investors who buy stocks after the market has fallen and sell stocks after the market has risen—investors who can be thought of as “sellers” of portfolio insurance—would enter the market. For both reasons, the decline in the stock market would tend to be halted. At the same time, the index arbitrage triggered by the availability of discounted index futures would tend to bid up and stabilize futures prices. As futures prices firmed up, there would be fewer arbitrage opportunities, and thus less arbitrage-related selling of stocks. To the extent that the discount widened or persisted, portfolio insurance strategies would become more costly to implement. Portfolio insurers would tolerate a lesser degree of accuracy in their hedges and would limit their selling of index futures.

Second, if there is any merit to Phelan's argument, the prospect of explosive growth in the market is just as real as the prospect of a collapse in the market. The reason, of course, is that the event that triggers the whole dynamic adjustment could be good news rather than bad news. As Securities and Exchange Commissioner Joseph Grundfest put it, “the market meltdown scenario can be translated into a story about the market levitating itself—and that doesn't make much sense either.”

In questioning the activities of portfolio insurers and other program traders, Phelan seems to have forgotten what the world was like in the 1970s or even the early 1980s. In the days before index futures and the sophisticated trading strat-

egies they have fostered, a declining market led to stock sales, but in a far less orderly fashion than is now possible. Portfolio managers simply bailed out of the equity market when losses exceeded some critical amount. The portfolio insurance strategies now in use permit institutional investors to carefully adjust equity exposure and avoid all-or-none decisions.

So much for the logic of portfolio insurance. What about the evidence of increased stock market volatility? Proponents of new federal regulation charge that since the development of index futures and index-related trading strategies, the stock market has experienced a sharp increase in volatility. They point to days like September 11, 1986, when the market fell 86 points—the largest daily price decline in history—or to February 17, 1987, when the market increased 54 points—the largest daily increase in history. As noted in the press, the drop in the market on that ill-fated day, October 28, 1929, was 38 points, less than the size of six daily price declines in 1986.

Given the greatly increased value of the stock market of the 1980s, absolute changes in daily stock prices provide little useful information on market volatility. A 38-point drop in today's market would be the equivalent of a 2 to 3 point drop in the 1920s, or a 13 to 14 point drop as recently as 1982. As some in the futures industry have been prompted to say, if market volatility is a problem that can be measured by changes in the absolute level of daily stock prices, “the problem could be solved by splitting the Dow 10 for 1.” When daily price changes are calculated on a percentage basis, over the period 1940 to 1987, only 3 of the 20 largest declines in the Dow occurred since 1982, when index futures were first traded; 4 of the 20 largest increases occurred in this period.

Several careful empirical studies, conducted both by the Securities and Exchange Commission staff and by outside experts, reveal no increase in volatility related to the introduction of index futures. There is some evidence, in fact, that there may be less volatility. A recent study by Dr. Franklin Edwards, Director of the Columbia Futures Center at Columbia University, finds that the average daily percentage change (a measure of interday volatility) in the Standard and Poor's 500 Index was significantly lower in the period 1982 to 1985 than in the period 1973 to 1979. In an evaluation of the period 1980 through 1986, G. J. Santoni, senior economist at the Federal Reserve Bank of St. Louis, finds no

"DING DONG, THE WITCH IS DEAD!" —William J. Brodsky, President, Chicago Mercantile Exchange

On June 5, the Chicago Mercantile Exchange, the New York Stock Exchange (NYSE), and the New York Futures Exchange (NYFE) jointly announced new settlement procedures for certain stock index futures and options contracts, which became effective for contracts expiring on Friday, June 19.

The new procedures are designed to ameliorate some of the price volatility experienced in the "Triple-Witching Hour." Before the change, this was the final hour of trading on the third Friday of each quarter when stock index futures, stock index options, and options on individual stocks all expired at the same time. Stock index

arbitraders generally close out their positions when the index contracts are settled, causing huge order imbalances for the stocks that make up the indexes. Before the change in procedures, these order imbalances could result in dramatic price swings in the final minutes of trading on the NYSE.

Under the new procedures, index futures and options contracts are settled on the basis of opening stock prices on expiration Friday, rather than on closing prices, and trading in these contracts terminates at the close of business the preceding day. Stock orders relating to expiring index contracts must be received by 9:00 a.m. on expiration Friday. The new procedures affect the Chicago Merc's S&P 500 Index contracts, the most actively traded of index futures contracts, as well as certain con-

tracts traded on the NYFE and on the NYSE. The NYSE and the Chicago Merc have also set up special procedures for disseminating information on order imbalances for 50 selected stocks.

The new procedures are based on the belief that order imbalances can be accommodated with minimal price effects in the morning. Before the opening, NYSE specialists can disseminate information about order imbalances to attract orders on the opposite side. They can also delay the opening of stocks when there are unusually large imbalances.

It is too early to tell whether "the witch is dead." But there were no significant price moves in the stock market on the June 18 close or on the open or close of the market on June 19. The September expiration was quiet too.

significant change in interday volatility, but a significant decline in intraday volatility since 1982. As Santoni concludes, in an article published in the *St. Louis Federal Reserve Bank Review*, "While closer scrutiny and regulation of trading in stock index futures markets may be justified on other grounds, the evidence presented here suggests that regulation based on the proposition that it has increased price volatility in the spot market would be misdirected."

Notwithstanding all of the above, some investors are getting edgy about a possible turn in the market. That is not surprising. The stock market has, it would seem, defied all odds over the past five years, breaking the 1,000 mark, the 2,000 mark, and now the 2,500 mark. Any reasonable investor is likely to be having that nagging feeling: the bull market can't last forever.

The suggestion of a "market meltdown" seems well-timed to capitalize on this anxiety. If the bears arrive, some fingers will undoubtedly be pointed at Chicago, the center of trading in index futures. But these new instruments did not cause the bull market nor will they end it.

Index futures provide a fast and efficient means of adjusting equity exposure and improving the alignment of prices between the futures market and the stock market. They have facilitated the development of new risk management strategies that benefit institutional investors and the millions of individuals they represent. Unfor-

tunately, these benefits are poorly understood by the public and, if critics have their way, easily could be lost in a push for regulation.

Investors, and the public generally, should be wary of claims that new federal regulations are necessary to prevent the destruction of the stock market—or any other market for that matter. As Commodity Futures Trading Commissioner Robert Davis said recently, "Some complaints about portfolio insurance and other index-related trading strategies sound like a case of sour grapes—they can often be traced to firms that are losing business because they don't have the capability to compete in the market. This doesn't mean you shouldn't ask questions, but it's our job to look through the smokescreen."

With the emergence of new financial instruments and new trading strategies, linking markets both in the United States and abroad, competition between the exchanges and between traders is as intense as ever. The struggle between the traditional market for securities, centered in New York, and the new and rapidly growing market for financial futures and options, centered in Chicago, is but one example of this competition. Let us hope that the regulators can resist the temptation to intervene in this struggle. The way in which the problems associated with the Triple-Witching Hour were handled gives us reason to be optimistic.

Giving Back the Takings Clause

After decades of neglect, the Supreme Court infused new vitality into the "takings" clause of the Fifth Amendment with two decisions handed down in June. It is too soon to tell whether these decisions mark a major new beachhead in constitutional law. Nor is it clear whether these decisions should be credited as a victory for contemporary market economists or for old-fashioned champions of limited government. Still, the Court's recent rulings hint strongly at a reemergence of constitutional checks on regulatory policy making.

Prior to the 1930s, both state and federal government regulation had to contend with a variety of constitutional obstacles, as the U.S. Supreme Court broadly interpreted the Constitution's restrictions on government powers. Regulations might be held to violate the constitutional prohibition against "impairing the obligation of contracts," for example, or to transgress (in either direction) the boundaries between federal interstate commerce powers and state police powers. When no other constitutional clause clearly applied, the Court was prepared on occasion to find economic restrictions in violation of the Fourteenth Amendment's guarantee against deprivation of liberty or property "without due process of law." Most of this protective jurisprudence was quickly and resolutely abandoned after the Supreme Court's bruising confrontation with the New Deal.

The takings clause of the Fifth Amendment seemed to suffer the same fate as other constitutional checks on government. By its terms— "... nor shall private property be taken for public use without just compensation"—the takings clause seems to require compensation for any governmental takings of private property. Before the 1930s, the Supreme Court readily acknowledged that the clause applied not only to outright exercises of eminent domain powers, but also to regulatory restrictions on the free use of private property, "if," as Justice Holmes put it in a 1922 decision, "the regulation goes too far." Many regulations apparently did not go too far, however. The Court ruled that municipal zoning restrictions (land use controls designed to protect the character of particular neighborhoods at no cost to the residents) were legitimate, non-compensable regulatory actions. After the "constitutional revolution" of the late 1930s, the Court was even less inclined to impose signifi-

cant compensation requirements when dealing with regulatory restrictions, especially when the restrictions might be distinguished from complete, physical takings of property.

In four separate cases after 1980 where this issue was pressed, the Court found procedural grounds to avoid setting forth a remedy for claims of uncompensated regulatory takings. As late as March of 1987, when the Court finally gave a direct ruling on the merits of one such claim, it actually seemed to endorse a very broad scope for the imposition of regulatory restrictions without compensation: in *Keystone Bituminous Coal Association v. DeBenedictis*, the Court upheld a Pennsylvania regulation restricting the amount of coal that could be extracted from particular properties—effectively expropriating some 27 million tons of coal without compensation. Ironically, this was virtually identical to the regulation that went "too far" for the 1922 court.

Four justices, led by Chief Justice William Rehnquist, dissented from the ruling in *Keystone*. The concerns of the dissenters found majority support in the two rulings handed down in June, which put a very different gloss on the regulatory implications of the takings clause. In *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles*, a majority of six, including Justices William Brennan and Thurgood Marshall, held that even a temporary regulatory taking may justify damage claims by the owner.

In this case, a church had purchased land for a recreational center for handicapped children in 1957. When this center was destroyed by a flood in 1978, the county rezoned the land to bar any reconstruction. The church's suit for damages was dismissed in the California courts, which held that compensation was limited to those cases where the relevant regulatory restriction had already been judged by a court to be a taking and was still maintained without compensation by the government. The Supreme Court, in an opinion by Chief Justice Rehnquist, found this approach to violate the takings clause by leaving the initial property losses with owners. The Court insisted "that 'temporary' takings which, as here, deny a landowner all use of his property, are not different in kind from permanent takings, for which the Constitution requires compensation."

The Court's decision in *Nollan v. California Coastal Commission*, handed down less than three weeks later, may prove still more impor-

tant. The Nollan family had purchased a dilapidated beach bungalow and requested a permit to demolish the structure and build a new home. The Coastal Commission agreed to issue the permit only on the condition that the Nollans grant a public easement over their land to the beach. The California Court of Appeals upheld this restriction on the permit, but the U.S. Supreme Court, in a 5 to 4 decision, ruled that it violated the takings clause. Justice Antonin Scalia's majority opinion described the Coastal Commission's conditional permit as "an out-and-out plan of extortion."

The Court acknowledged that the Coastal Commission might properly condition its construction permit on compliance with some relevant zoning concern, such as maintaining an unobstructed public view of the beach, which might otherwise justify a total prohibition on construction. But the commission could not impose a conditional permit where "the condition . . . utterly fails to further the end advanced as the justification for the prohibition." Increasing public access to the beach might be a worthwhile goal, the Court concluded, but if the state "wants an easement across the Nollan's property, it must pay for it."

The *Nollan* decision is consistent with the broad trend of post-New Deal takings cases in deferring to governmental conceptions of "public use." The Court did not question California's power to force the Nollans to make an easement through their property, so long as the state was prepared to pay "just compensation" for its demands—just as the Court did not question the authority of Los Angeles County to rezone the church's property in *First English Evangelical Church*. But *Nollan* may still have far-reaching implications for land use regulation, insofar as it suggests a more limited constitutional scope for uncompensated regulatory restrictions.

Many municipalities and counties around the country now routinely adopt "inclusionary zoning" measures. Instead of merely seeking to exclude some property uses as neighborhood disturbances, such measures force developers to pursue particular, governmentally favored uses. For example, developers have been required to construct a certain amount of low-cost housing in order to receive building permits. Many California cities also condition their approval of construction plans on developer contributions to public day care, mass transit, and arts projects. If the courts follow the logic of the *Nollan* decision,

they may come to regard more and more of these measures as "out-and-out extortion"—so long as governments offer no compensation for the costs involved. And under *First English*, governments may have to pay for the delays imposed by their efforts to negotiate such schemes, even if they subsequently give them up as too expensive.

It is far too early to tell where the boundary between compensable and non-compensable regulatory impositions will be drawn. But it seems clear that whether or not the Rehnquist court finds absolute constitutional limits on government powers, it will sometimes use the takings clause to present governments with a bill for damages when their actions tread too heavily on private property rights.

This approach may not satisfy rigorous nineteenth-century champions of property rights and limited government—nor their contemporary libertarian followers. But it may be a position that is more defensible—and perhaps more sustainable—for unelected judges in an era when public opinion is sharply divided on the proper role for government. Economists and other analysts concerned about the costs of regulation should be heartened by a constitutional doctrine that forces more of these costs into the open. Perhaps when more of these costs are laid directly on taxpayers, we will see a more settled and encompassing public consensus develop about what governments should and should not try to control.

An Environment of Risk and Uncertainty

In a recent public address, President Reagan urged the Senate to confirm his Supreme Court nominee, Judge Robert Bork. He correctly noted that, "As a member of [the U.S. Court of Appeals], Judge Bork has written more than 100 majority opinions and joined in another 300. The Supreme Court has never reversed a single one of these 400 opinions."

Ironically, just 15 days before the President spoke, Judge Bork reversed himself. Writing for a unanimous eleven-judge D.C. Circuit Court of Appeals (in *Natural Resources Defense Council v. U.S. Environmental Protection Agency*), Bork overturned his own majority opinion, issued just

eight months earlier by a three-judge panel of the same court. Bork's second opinion in this case appears to undercut longstanding decision-making practices at the Environmental Protection Agency and other regulatory agencies, and may mark an important watershed in health and safety law.

The court vacated the EPA's 1985 decision to withdraw a proposed emissions standard for vinyl chloride. The proposal was made in 1977, and would have tightened an emissions standard issued the previous year. In granting the Natural Resources Defense Council's (NRDC) petition for review and remanding the decision to the EPA, the court found that the Clean Air Act required the EPA to make a determination that the emissions levels under the 1976 rule were "safe." Its instructions to the agency on how to decide what is safe and when to consider cost will affect health and safety regulation throughout the federal government.

The debate in health and safety regulation has long been between those who balance safety (or risk) against cost and those who refuse to do so. It is sometimes possible to reconcile these two positions, as when agencies regulate chemicals that appear to have thresholds of toxicity. In these cases, zero risk can be attained at less than infinite cost by setting acceptable exposure at the "no effects" level. These cases are rare, however. Modern techniques can detect the presence of chemicals at the parts-per-billion level or lower. Cancer is the most prominent (if not the most important) health effect of concern, and risk assessment methods predict non-zero cancer risk for any non-zero dose. For most chemicals of interest, therefore, no-effects thresholds have disappeared as an obvious point of compromise. As noted in the first sentence of Bork's opinion:

Current scientific knowledge does not permit a finding that there is a completely safe level of human exposure to carcinogenic agents.

The risk-cost balancers and the zero-riskers have become increasingly polarized in recent years, leaving many legislators and policy makers in an uncomfortable position. Congress has written environmental statutes that explicitly require risk-cost balancing, notably the Toxic Substances Control Act of 1976, and the Federal Insecticide, Fungicide, and Rodenticide Act of 1978 (FIFRA). It has also written zero-risk stat-

utes, such as the infamous Delaney clause of the Food, Drug, and Cosmetic Act, which applies to some pesticides as well as to food additives. But in most cases, Congress has ducked the question, telling OSHA to ensure that the workplace is "safe" and the EPA to "protect human health and the environment." The regulators (and ultimately the judges) are left to figure out what, precisely, Congress means.

In the case of the vinyl chloride emissions standard, the EPA concluded that, in passing the Clean Air Act, Congress could not have meant for hazardous emissions to be totally banned. The court agreed:

The EPA has determined that a zero-emissions standard for non-threshold pollutants would result in the elimination of such activities as "the generation of electricity from either coal-burning or nuclear energy; the manufacturing of steel; the mining, smelting, or refining of virtually any mineral; the manufacture of synthetic organic chemicals; and the refining, storage, or dispensing of any petroleum product." It is simply not possible that Congress intended such havoc on the American economy and not a single representative or senator mentioned the fact.

If agencies are to avoid wreaking havoc, however, they must find some "stopping point" at which they can rationalize a non-zero standard. They cannot do this if they focus exclusively on the objective of safety.

One common stopping point is "economic feasibility," which is code for clemency. It usually means that a firm or industry may be brought to the brink of bankruptcy, but should not actually be shut down. Some health and safety statutes make economic feasibility an explicit consideration for rulemaking; in other cases agencies apply it as a form of prosecutorial discretion. It is politically popular because it embodies the principle that shareholders' equity can be appropriated in the pursuit of environmental goals, but not jobs—at least not in an obvious way. Many economists criticize this procedure because it rewards inefficient firms and punishes efficient ones, and because it is used to rationalize goals that appear "affordable" rather than those that are worthwhile. Economists within agencies, however, tend to be less critical. Economic feasibility is often the only form of economic analysis that agencies are able—or willing—to use.

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MR. WALSH SITS DOWN TO A QUIET EVENING DINNER AFTER A HARD DAY AT THE OFFICE. HE STARES AT THE FATTY STEAK—THE BROCCOLI WITH PESTICIDE RESIDUE—THE PROCESSED MASHED POTATOES WITH A POUND OF BUTTER—THE THREE STRIPS OF BACON—THE LITTLE PORCELAIN BOWL OF SACCHARIN—THE CUP OF STEAMING COFFEE. MR. WALSH SUDDENLY COMES TO A STARTLING REALIZATION: HIS WIFE IS TRYING TO KILL HIM.

Another common stopping point is technological feasibility. At the EPA this takes the form of “technology-based” standards. Agency engineers decide what the “best” technology is for a particular industry, and require all firms to install it. Sometimes this is explicitly required by statute; in other cases the EPA has used its administrative discretion to propose technology-based standards.

In the wake of the court’s decision, these traditional stopping points will have to be rethought. The vinyl chloride emissions standard before the court was technology-based. Section 112 of the Clean Air Act requires the EPA Administrator to set standards “at the level which in his judgment provides an ample margin of safety to protect public health.” The Administrator did not believe that a total ban on vinyl chloride emissions was justifiable, and interpreted his mandate to require the best available technology. The 1976 vinyl chloride standard requires

firms to use what the EPA thought at the time was the “best” technology. In 1985, the EPA withdrew its proposed revision because it still believed the 1976 technology was the best available. Not good enough, said the court. You must decide what is “safe,” and you must do so without regard to cost or feasibility. In Bork’s words:

This determination must be based solely upon the risk to health. The Administrator cannot under any circumstances consider cost and technological feasibility at this stage of the analysis. The latter factors have no relevance to the preliminary determination of what is safe. Of course, if the Administrator cannot find that there is an acceptable risk at any level, then the Administrator must set the level at zero.

What risk is acceptable if the costs of eliminating it cannot be considered? The only rational answer seems to be no risk at all. The court does not necessarily agree:

... the Administrator's decision must be based upon an expert judgment with regard to the level of emissions that will result in an "acceptable" risk . . . [He] must determine what inferences should be drawn from available scientific data and decide what risks are acceptable in the world in which we live. ("There are many activities that we engage in every day—such as driving a car or even breathing city air—that entail some risk of accident or material health impairment; nevertheless, few people would consider these activities 'unsafe.'")

Ralph Nader does and so do many others. Drawing unambiguous inferences about what people regard as safe will be no small task.

Once a "safe" level has been determined, according to the court, the Administrator must decide what "margin of safety" to apply. This, the court reasons, is intended to take account of scientific uncertainty in the degree of risk. Here the Administrator has a great deal of discretion, and may consider costs, technological feasibility, and whatever else he deems relevant to setting a reasonable margin of safety.

In Brief—

NAAGing the Airlines. The National Association of Attorneys General (NAAG) recently gave the Justice Department's Antitrust Division some competition by issuing its own merger guidelines that contrasted sharply with the federal merger guidelines. Now NAAG is planning to compete with the federal Department of Transportation (DOT). It has formed a task force of 20 state attorneys general who have written standards for regulating airfare advertisements.

The proposed standards include requirements to:

- enlarge the print size of the restrictions in advertisements, and place the restrictions in a special box or in the middle or top of the advertisements;
- advertise round-trip prices (not one-way prices for half the round-trip price, unless one-way tickets can be purchased at the prices that

are listed); and

- make a reasonable number of seats available at the advertised prices.

NAAG will vote on the revised guidelines in December.

While it is not clear that the revised guidelines would be enforced even if approved (the Airline Deregulation Act of 1978 gives the DOT jurisdiction over airline advertising), NAAG's action puts all federal regulatory agencies on notice. If the agencies show restraint in the face of a demand for regulation, NAAG stands ready to step in and increase the supply of regulation.

Reel Colors. The U.S. Copyright Office's June ruling that computer colorizations of black-and-white films are entitled to copyright protection has created a real stir in the movie industry.

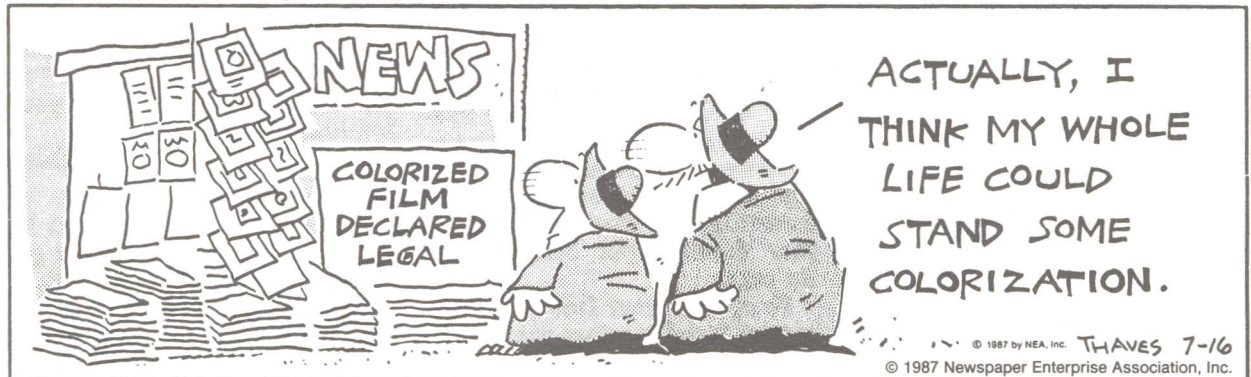
According to the rules, colorized versions of old movies have protection for 75 years as "derivative works." Studios that produce colorized films (including Walt

Disney Productions, 20th Century Fox, and Turner Broadcast Systems) will be able both to sell the films to broadcast and cable television stations and videotape distributors, and to collect damages if other firms copy their products. Copyrights will cover only the color selections added to films, not the films themselves; films will remain in the public domain if their original copyrights have expired.

In making its decision, the Copyright Office stressed the creative role of human operators in generating colorized films, noting that there are more than 16 million tints and tones that can be selected for computer colorizing. This emphasis hints at a possible future policy issue: Are the protections of intellectual property law available to the intellectual product of computers? Someday soon, computers might be able to produce a tastefully colorized movie without relying much on the color judgments of humans.

Members of the Directors Guild of America have voiced outrage at

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It is difficult to say where this discretion begins. "Risk" is generally used to refer to an unbiased probabilistic assessment of the harm that is expected to result. "Uncertainty" is something different in the court's view. The most plausible distinction is that it is some measure of the variance in the estimate of risk.

This is an important distinction, since much of what passes for environmental risk is really uncertainty. Many chemicals (although not vinyl chloride) are classified as carcinogens on the basis of animal evidence, and the projected risk es-

timates to humans are highly speculative. At every stage of a risk assessment, regulatory agencies are prone to incorporate worst-case scenarios, "conservative" assumptions, and upper-bound estimates. (See Albert L. Nichols and Richard J. Zeckhauser, "The Perils of Prudence," *Regulation*, Nov/Dec 1986.) All of these techniques are intended to create a margin of safety, and are therefore matters of discretion. They are, in the terms made popular by the National Academy of Sciences, properly regarded as part of the risk management process, and not

the Copyright Office's decision. They claim an inalienable "moral right" to control the content of their artistic product. Two bills are now pending in Congress that would give directors and screenwriters control over film coloring, regardless of who actually owns the copyright.

Regardless of how these moral rights and intellectual property rights are sorted out, colorization is a technology that enjoys strong public demand. In less than a year as a color movie, "Captain Blood" grossed \$800,000, four times the amount it grossed in its history as a black and white movie.

Chernobyl Fallout. One of the factors that makes environmental "risk-management" difficult is the gap between the experts' judgment of relative risks and the public's perception of those same risks. Consider the accident at Three Mile Island in 1979. This event greatly aggravated public apprehensions about nuclear power. In its aftermath, however, the experts reduced their estimates of the riskiness of nuclear power plants. By now, public concern has virtually ruled out nuclear power as a viable option for making electricity, despite the heavy toll of human lives associated with the production and use of one of its principal alternatives, coal.

Opponents of nuclear power might feel vindicated by the nuclear accident at Chernobyl. Once again, though, there is expert opinion on the other side. Harvard professor Richard Wilson, in a recent article in *Science* magazine, esti-

mates that a nuclear reactor would have to go through a Chernobyl-sized meltdown *every year* to be approximately as hazardous as an equivalent-sized coal-burning power plant.

Vying Over Spilt Milk. The New York State Legislature, in one of its final actions before summer recess, passed a bill ending the state's milk marketing laws that for years had restricted entry into the milk distribution market. The legislature was following the lead of a Federal court, which in January had set aside the state law to allow a New Jersey processor, Farmland Dairies, to market milk in New York City. (See "The Milking of New York City," *Regulation*, 1987 Number 1, and *Letters* in this issue.)

Farmland's entry into the market has sparked intense price competition. Between January and July, the retail price of whole milk in the New York Metropolitan area dropped by almost 10 percent. Though milk prices are normally somewhat lower in the summer, this drop is largely attributable to the collapse of the distributors' cartel in the city.

But consumers may not get to enjoy lower milk prices for long. On July 10, the Regional Cooperative Marketing Agency (RCMA), which includes farmers in eleven states in the Northeast, including New York and New Jersey, announced a new minimum price for raw milk. The U.S. Department of Agriculture already sets minimum prices for wholesale fresh milk under its marketing order program.

The RCMA has antitrust immunity for setting "over-order" prices. Its minimum price is \$1.25 per gallon, 2 cents higher than the federal minimum price.

It remains to be seen whether the RCMA can make its higher price stick; even cartels with antitrust immunity face serious enforcement problems when they cannot invoke the coercive powers of federal or state governments.

Food for Health. On August 4, the Food and Drug Administration (FDA) proposed new regulations for food labeling that would allow food manufacturers to advertise the beneficial health effects of their products (52 *Federal Register* 28843). The proposed rule would permit messages that are truthful and substantiated by clear scientific evidence, but does not impose a "consensus" requirement—an agreement of experts for each health claim—as stipulated in an earlier draft. The proposal would set up a committee of experts from the FDA, the Department of Agriculture, the Public Health Service, and the Federal Trade Commission to develop exemplary health messages to guide advertisers; whether advertisers would be bound by the committee's suggestions is still unclear.

Formerly, the FDA fought to keep health claims out of food labeling. (See "A Food By Any Other Name," *Regulation*, 1987 Number 1.) Kellogg's All-Bran advertisements challenged this policy in 1984, initiating a debate that still continues. Stand by for the FDA's final decision.

part of the risk assessment process.

We are left with an *absolute* mandate to achieve a *relatively* low risk with a *discretionary* degree of certainty. The court can be forgiven for not attempting to make a silk purse out of a sow's ear. This confused paradigm may be a reasonable reading of an unreasonable Congress's intent. But with what result? Regulators will have to identify some acceptable level of safety; the quest for consistency, economy, and certainty across agencies will create strong pressures for a single number that characterizes what that level is.

In response to the court's decision, environmentalists can be expected to advocate a low, if not precisely zero, level of risk as safe. A leading candidate is one in a million. That number, 10^{-6} , has been emerging as a sort of consensus view of the *de minimis* level of risk for all sorts of environmental hazards. Its name comes from a legal precept: *de minimis non curat lex*, or "the law does not concern itself with trifles." The idea is that some disputes are technically actionable under the law, but are so insignificant that no public policy argument can be advanced for consuming the resources of the legal system in their resolution.

De minimis risk has lately become a flag around which would-be moderates—those who are reluctant to embrace either the zero-risk or the cost-risk balancing view—are rallying. Simply by defining zero as anything less than 10^{-6} , a threshold is restored that quantitative risk-assessment models had taken away. Earlier this year, the National Academy of Sciences sent the EPA a report on FIFRA, urging the EPA and Congress to adopt a uniform *de minimis* threshold of 10^{-6} for registered pesticides, in place of the current statutory mandate to balance benefits and costs.

It seems clear, however, that the court did not have a *de minimis* risk in mind. *De minimis* defines a floor below which government agencies cannot reasonably go even when the Congress mandates zero risk. The court, on the other hand, seems to contemplate a ceiling above which things are manifestly unsafe and below which the law and the agency may still be concerned. Between the two, one can imagine a "zone of reasonableness" within which agencies may exercise discretion.

A paper published this year describes exactly such a zone of reasonableness. (Curtis C. Travis, Samantha A. Richter, Edmund A. C. Crouch, Richard Wilson, and Ernest D. Klema, "Cancer

Risk Management: A Review of 132 Federal Regulatory Decisions," in *Environmental Science and Technology*, Vol. 21, No. 5, 1987.) The authors attempt to measure the levels of risk that cause agencies to act. They coin a new term to demark the ceiling: *de manifestis* risk, "literally a risk of obvious or evident concern, . . . one that is instantly recognized by a person of ordinary intelligence." For small populations, they find the *de manifestis* level to be about 4 times 10^{-3} , or 4 in 1,000. For large populations at risk (where large is approximately the entire U.S. population), it drops to 3 in 10,000.

The authors report that below the *de minimis* level of risk (which they also find to vary with the size of the exposed population), agencies almost never act. Above the *de manifestis* level, they always act. In between those levels, the decision to regulate is triggered by a threshold of roughly \$2 million per life saved—an indication that cost balancing is a common practice even at agencies that typically disavow it.

This is an observation about what agencies do, as distinct from a normative statement of what they should do, or a legal analysis of what they are obliged to do. If the courts find such a pattern of decision making acceptable, then the Bork decision may not require a total abandonment of established decision-making habits.

Note, however, that the risk estimates used in this analysis were those presented by the agencies making the decisions. Some were unbiased estimates; others were exaggerated to incorporate large margins of safety. Even if a single number, or a zone of reasonableness, emerges from the court's decision, regulatory policy will not necessarily become more uniform or sensible. The technocrats who produce risk estimates will still be prone to exaggerate risks. As long as the degree of uncertainty, and the degree of exaggeration, vary so greatly across risks and agencies, a policy of uniformity will produce little more than the illusion of uniformity.

If the EPA Administrator could cleanly separate estimates of risk from associated estimates of uncertainty, he might find that the court's decision left him far more discretion than it appears. Judging by past experience, however, risk assessments will be fully cooked by the time they reach the Administrator's desk. Between the lawyers and the technocrats, it is unlikely that much discretion will be left to the appointees who are charged with making the decisions.