PERSPECTIVES

PESTICIDE POLE VAULTING

Why is the Environmental Protection Agency regulating pesticides as if it were a pole vaulting competition instead of requiring pesticides to simply be safe? The agency keeps raising the safety bar and crowing about how much it is improving public health. Yet the bar has now reached a ridiculous height. Increasing pesticide safety standards from one theoretical cancer case in a million to one in a billion provides no health benefit–especially since the EPA's means for calculating health risks vastly overestimates exposure and toxicity. And further increases in pesticide safety requirements are hurting public health.

It is no secret that the EPA is out to eliminate as many pesticides as it can. That has been a core goal of the agency ever since it was created by the Nixon administration in the midst of the uproar over DDT. In 1993, the EPA's current Administrator, Carol Browner, stated that "the most important thing is to reduce the overall use of pesticides. By doing that, we will automatically reduce risks and we won't have to spend all this time worrying about lots of complicated things."

Driving a pesticide off the market is an easy way for the EPA to win points with environmental activists and give a misinformed public the impression that it is working to improve public health. Naturally, the EPA chooses to ignore the decades of benefits from the use of pesticides and the adverse consequences from their cancellation.

As the world struggles with the need to produce even more food from a finite amount of farmland, effective pesticides will become even more important. The EPA ignores the problems that banning pesticides will create.

First, pesticides reduce crop losses from pests. Having a wide array of pesticides available reduces production costs and increases the availability of fruits and vegetables. Increased consumption of fruits and vegetables radically cuts cancer risks and has been strongly recommended by numerous health organizations. Currently, less than 10 percent of Americans meet the recommended level of fruit and vegetable consumption. By narrowing the range of available pesticides, the EPA inadvertently discourages fruit and vegetable consumption.

Second, pesticides reduce contamination of the food supply with dangerous microorganisms and the toxins that they produce. Canceling pesticides and leaving crops without adequate protection could seriously increase the danger from those natural hazards. Even if there are alternative pesticides available to replace older ones that are cancelled, when the EPA reduces the number of safe pesticides it creates another danger. When farmers have only one or two pesticides available, the opportunity for pests to develop resistance to a pesticide increases dramatically. In those situations, farmers must use the same pesticide over and over and cannot effectively rotate chemicals with different modes of action. When combating the development of pest resistance, the wider the spectrum of available pesticides the better.

The EPA touts the added safety of newer pesticides, which are often more narrowly targeted against specific pests. While such pesticides reduce potential effects on nontarget species, the higher specificity also increases the risk of pest resistance. Those pesticides usually work by disrupting unique biochemical processes in the target pests. However, those processes are often easily adaptable, so pests may develop resistance to the pesticides quickly.

The older, broader-spectrum pesticides work by disrupting more central biological functions in pests, which is why they affect a wider range of organisms. And it is more difficult for organisms to develop resistance to such pesticides.

The EPA claims to favor integrated pest management strategies, but it resists the logic that a wide array of pest-killing chemicals is essential to achieve that end.

The EPA regulates on the unwritten assumption that no pesticide will ever prove itself safe enough. Thus it forces pesticide producers to comply with near-constant requests for additional and expensive safety testing of already-registered pesticides. The agency's insatiable appetite for such data is slowly driving pesticides with time-tested human health and environmental safety records off the market. Because they have proven difficult for pests to develop resistance against, even after long periods of use, the impact on agriculture of the loss of those particular pesticides will be especially great. Thus American farmers will have access to a dwindling number of relatively high-priced pesticides.

A laundry list of pesticides have been "voluntarily" pulled off the market in light of the growing regulatory burden. Among them is Dyfonate, a fungicide used by mint and potato growers, and Phosalone, an insecticide used by pecan growers. The loss of Captafol, a fungicide used by cherry and cranberry growers is responsible for the reduction in fresh market cranberries. Chloramben, an herbicide used on lettuce in Florida, was dropped from the market in the mid 1980s. Growers in that state spent nearly $2 million per year for the next decade to weed lettuce fields by hand before finally getting a new herbicide registration.

As an example of just how high continual registration costs can be, over $50 million has been spent during the last decade to

maintain the registration of just one pesticide: atrazine. Widely used as a corn herbicide, Atrazine was first registered for use almost forty years ago. It plays a vital role in the no-till and conservation tillage systems that have drastically reduced soil erosion and chemical and fertilizer runoff on millions of acres of American cropland. After some four decades of use, no health risk has been attributed to atrazine exposure. In fact, according to a recent internal review of its own data, the EPA concluded that atrazine is actually significantly safer than previously believed. Yet the testing demands on that product continue.

Ironically, many cancelled pesticides could pass the new safety tests. But the market for many of those pesticides is too small to support the high costs of additional safety testing, so manufacturers just throw in the towel. Pesticides like atrazine, that are used on the biggest selling crops, can, to some extent, absorb such costs because of the huge size of the pesticide market in those crops. But pesticides used on fruits and vegetables that are grown on a relatively small number of acres are vulnerable.

Higher pesticide safety standards might be understandable if they lead to significant improvements in human health or environmental protection. But they do not.

The health risks from pesticide residues have clearly demonstrated to be immeasurably small or nonexistent. No medical or scientific organization has ever questioned the fact that the health benefits from consuming fruits and vegetables vastly outweigh any theoretical health risk from pesticide residues. (Those issues must be discussed in terms of theoretical risk because no one has ever demonstrated any actual risks.)

Further, the adverse effects of pesticides on the environment are virtually nonexistent. When real problems do exist, they are usually limited and correctable. For example, Furadan 15G, a granular soil insecticide, was found to be killing birds, including secondary poisonings of endangered bald eagles in many states. In response, the pesticide producers voluntarily pulled the product from the market in states with sensitive bird populations. Most environmental damage from pesticides is confined to accidental spills of concentrated chemicals and contamination of industrial sites, not to their regular use on crops.

The EPA is now implementing the Food Quality Protection Act of 1996. (See Daniel M. Byrd, "Goodbye Pesticides?" in *Regulation*, Vol. 20, No. 4, 1997.) The new law incorporates several provisions that will accelerate the cancellation of safe and effective pesticides.

Pesticides will now be grouped by their "mode of action." For example, if pesticide A and pesticide B both suppress the same enzyme system, risk-wise they will be treated as if they were one pesticide. Thus, residues of pesticides A and B will essentially be treated as residues of each other. However, because the allowable risk thresholds for each pesticide will not be combined and will remain the same, pesticides A and B will essentially share the risk threshold for only one pesticide.

Obviously that means that many pesticides will exceed their current theoretical risk allotment and will have to be cancelled. With more realistic exposure data, instead of the worst-case exposure assumptions the EPA has often used by default in the past, some pesticides may remain on the market. But the additional testing will certainly reveal crop uses with higher theoretical risk exposures, and those uses will likely disappear. Fruits and vegetables will be hardest hit. Products used not just by commercial farmers but by also by private consumers are likely to be affected. Carbaryl for example, the active ingredient in the widely used garden insecticide Sevin and diazinon, a common lawn insecticide, might be pulled from the market.

Additionally, the EPA now has the discretion to increase the safety factors it adds to allowable pesticide exposures to "protect infants and children." Environmental and public health groups are already pushing for an across the board application of those additional safety factors. If additional safety factors are widely imposed, even more pesticides and specific crop uses will be squeezed off the market.

All in all, the end result of the EPA's policies will leave farmers and society with drastically fewer pesticides. And that will be bad for our health and the environment.

ALEX AVERY
Director of research and education at the Center for Global Food Issues of the Hudson Institute. The opinions cited are not necessarily those of the Hudson Institute.

FARMING THE OCEANS: AN UPDATE

In a 1995 article in these pages (*Regulation*, Vol. 18, No. 3, 1995) I discussed the feasibility and possible benefits of farming the oceans. By fertilizing tracts of ocean hundreds of miles in size, more phytoplankton can grow. That would mean as much as a thousand-fold increase in fish production for human consumption. My company, Ocean Farming Inc., is working to make that scenario a reality.

There are two sets of fundamental problems to overcome in ocean farming. The first is technical; the second is economic and political—principally, the establishment of property rights in the ocean.

On the technical side, to increase the productivity of the sea requires developing unique fertilizers that initially float. The fertilizing elements must be released over time in the photic zone–the area down to about one hundred feet below the surface where sunlight penetrates and thus, where photosynthesis can occur. But the fertilizer must not sink below the photic zone. That has been a problem with iron-based fertilizers. They tend to form a hydroxide that rapidly agglomerates and sinks to the bottom.

Ocean Farming Inc.'s first voyage to test new fertilizers was made in the Gulf of Mexico in January 1998. Ocean conditions were rough, diluting the fertilizers. Still, there was a bloom of 450 percent in certain phytoplankton after a thirty-two hour period, showing that fertilizing the oceans is a viable concept.

Another promising result was reported on 16 October 1996 in *Nature* concerning IronEx II experiments. An iron and salt-based fertilizer was spread in the southeastern Pacific, but within minutes of application, about 95 percent of that fertiliz-

er sank below the photic zone. However, by making three additions at three-day intervals, even though 95 percent of that fertilize precipitated out, over a nine day period the level of phytoplankton reached 2700 percent over normal levels. While that increase was higher than the tests in the Gulf, the southeastern Pacific experiment was done over a nine day period, compared to only a day and a half of testing in the Gulf. The Pacific tests demonstrate the viability of ocean fertilization, even with an inferior fertilizer.

SIZE DOES MATTER

To make ocean farming technically and economically feasible requires the utilization of large tracts of open sea. Nets or other barriers cannot be used to keep fish enclosed in the fertilized area. The availability of food produced through fertilization will be the principle means of keeping the fish to be harvested in that area.

Many square miles of fertilized deep ocean will be required to achieve that aim. Ocean Farming Inc. estimates that with continuous fertilization, about one thousand tons of catchable fish per square mile can be produced each year. Therefore, 100,000 square miles of fertilized ocean should produce about 100 million tons of fish per year, about equal to the current annual world fish production.

Ocean fertilization also promises benefits that should be welcomed by those concerned about possible global warming. The growth of phytoplankton in the ocean removes CO_2, a greenhouse gas, from the ocean surface and the atmosphere. About half of the carbon removed in fertilized areas will sink to the bottom of the deep ocean. There it will be further oxidized and recycled back to the surface, through upwellings, only after a period of one thousand to two thousand years. The continuous fertilization of the same 100,000 square miles of tropical ocean should sequester about 30 percent of the CO_2 produced by the United States from the burning of fossil fuels.

OWNING OCEANS

The second set of fundamental problems to overcome in ocean farming is economic and political. On the top of the list: where to farm? In 1995 the place of choice was somewhere on the east coast of the United States. But the United States exclusive economic zone (EEZ) is a commons stretching two hundred miles from America's shores, in which there are no private property rights. Because it is a commons, if Ocean Farming Inc. invested the money and effort to fertilize the ocean and increase the fish yield, it would have no exclusive right to harvest those fish. Anyone could reap the fruits of Ocean Farming Inc.'s efforts.

Efforts to address that problem with Congress, the Administration, or local fisheries councils were to no avail. Fishing companies and fishermen were equally uninterested. They took the short-term view that there is always another fish in the sea, "you only have to be a good enough fisherman to catch it," this despite the fact that fisheries have been decimated by overfishing.

Because of U.S. government reluctance, Ocean Farming Inc. turned towards the Pacific. An agreement was negotiated with the Republic of the Marshall Islands (RMI). The Marshallese have a history of surviving under adversity, including German and Japanese occupations, World War II fighting, nuclear testing and subsequent contamination, and lack of resources. They have no commercial fishing industry and practice only artisanal fishing off of their beautiful coral reefs. The RMI has very little land area, about seventy square miles, almost exactly equal to the size of the District of Columbia. But because it is a nation of islands spread out over a wide area, their two hundred mile ocean EEZ is extremely large and constitutes that country's only untapped resource. A rapidly rising population has forced the country to look for new ways of creating economic growth and jobs.

Thus the RMI signed an agreement allowing Ocean Farming Inc. to option up to an 800,000 square mile area of open ocean. Once fish harvesting begins, Ocean Farming will pay the RMI $3.75 per square mile of ocean optioned or 7 percent of the value of the catch, whichever is more. In return, Ocean Farming has the exclusive right to fertilize that section of ocean and to harvest the fish. It can charge other companies for the right to fish in its section of the ocean. (Local island fisherman will be allowed to continue their artisanal fishing.) It can utilize other ocean resources, for example, in the future it might make use of the CO_2 sequestering that results from fertilization. In effect, the RMI has privatized all or part of the ocean it controls.

While the circumstances leading to the agreement with the RMI may be unique, the success of the endeavor will illustrate the increase in productivity available from the privatization of underused or misused resources. As such it could be a model for privatization of other potential resources worldwide. Private property on land has been essential since ancient times for the production of the crops and livestock that now feed the billions of inhabitants on this planet. Clearly, the benefits from farming portions of the almost three-quarters of the earth covered by oceans could be great indeed.

MICHAEL MARKELS, JR.
President and CEO
Ocean Farming, Inc.

SMART GROWTH, STUPID POLICY

Last year, on the theory that Maryland was running out of usable land and that government action was necessary to stop "suburban sprawl," the state enacted so-called "Smart Growth" legislation. Such state zoning laws are not confined to Maryland, the ironically nicknamed "Free State." Other states have adopted similar restrictions aimed at managing growth by increasing population densities in already developed areas.

The Maryland model, however, is being touted by the National Association of Counties, the U.S. Conference of Mayors, the U.S. Environmental Protection Agency, and Vice President Al Gore under a new umbrella organization called the Joint Center for Sustainable Communities. The EPA even

offers, on-line for $29.95, a "Smart Growth Starter Kit." Even the Bank of America praises the Smart Growth approach on its web site. But Smart Growth is based on discredited research and will likely ultimately discredit any state that adopts it.

THE SAGA OF STATE ZONING

Maryland Governor Parris Glendening promoted Smart Growth as a means to deal with stress on aging and overcrowded infrastructure, including roads, sewers, and schools. He also claimed it would deal with traffic congestion, pollution, crime, and the declining quality of life those problems inevitably produce.

Maryland law generally restricts state infrastructure expenditures to areas either already developed or planned for development that are approved by the state. In most cases, state funds are denied to areas without existing development. The law also provides that state taxpayer funds be used to purchase open farm and other rural land that will supposedly be preserved in pristine condition. (The taxpayer purchased lands need not, however, necessarily provide public access.)

The theory behind so-called "Smart Growth" is that "infilling" and other means of increasing population densities in areas with existing infrastructure and population will be less costly and will produce fewer environmental and other problems than would development in open space.

Although Maryland law does not bar developers from building in areas unapproved by the state under Smart Growth, they will likely be effectively barred by market realities. They will find it necessary to pay for roads, sewers, and the like themselves, without state funding support; and they will need to recoup those costs in higher purchase prices. Smart Growth supporters correctly assume that the necessarily higher prices will dampen or halt such development. (The policy might not be so bad were new residents and developers who are not standing to benefit from state infrastructure funds exempt from state taxes and regulation.)

ORIGIN OF SMART GROWTH

Smart Growth's assumptions and "solutions" are wrong because they are based on an antiquated economic model that is wrong. Maryland's Smart Growth, which offers increased density as a cure for density-related problems, is based on the state's 2020 Plan for growth management, issued in 1989. The 2020 Plan, and most others like it around the country, is based on a 1974 economic study, *The Costs of Sprawl*, commissioned by the U.S. Council on Environmental Quality (CEQ).

The Costs of Sprawl was a study which was, except for a few clone-like efforts, the first and last of its kind. It found that high-density, planned communities are less costly to build and live in than low-density "sprawl." It also suggested that sprawl produces more pollution than planned high-density developments.

The Costs of Sprawl was powerful, persuasive, and—according to the evidence—egregiously defective. At least in terms of real-world applications. In the real world, as population densities increase, so do traffic congestion, air pollution, taxes, infrastructure and other costs. More importantly, so does crime—especially violent crime.

Barrett Riordan was a senior manager at the Council on Environmental Quality in the 1970s who carried out certain administrative and design functions for *The Costs of Sprawl* study. Riordan was incredulous to learn recently that the quarter-century old study, which he recalls as "a very limited effort" designed just to "get people thinking," had actually been incorporated into real world state growth management plans. Riordan recalls that,

> We were probably aware that we were biting off more than we could chew, and that there was a certain risk that the project could not be carried out successfully. I suspect that none of the people involved with *The Costs of Sprawl* study ever expected that its conclusions would still be cited twenty-five years later. Relationships have undoubtedly changed, baselines are different, and behavior has adjusted. Also I would be most surprised if research techniques have not advanced to the point of giving society better insights and understanding than were generated by this single, limited research effort.

Land use and planning functions can go dangerously awry when the variables—the assumptions and conditions used—differ in any significant way from the real world conditions and situations being modeled. The *Costs of Sprawl's* hypothetical variables differed profoundly from real world conditions. In fact the study modeled a situation that is the opposite of the one for which Maryland's Smart Growth legislation is intended. The *Costs of Sprawl's* hypothetical assumptions were based on a raw ground, open land starting point without infrastructure or development of any kind. Open land, raw ground development is in most cases much less costly than "infill" or development within already developed areas. Ironically, infill and enforced density increases, are precisely what Smart Growth is all about.

THE DANGERS OF DENSITY

Unlike the Council on Environmental Quality researchers in the 1970s, Professor Helen Ladd of Duke University looked to real world conditions in her 1992 study, "Population Growth, Density, and the Costs of Providing Public Services," published in the *Urban Studies* journal. Ladd examined Census Bureau data from 247 U.S. counties, representing 59 percent of the American population, to determine how increases in population densities affect quality of life and costs. Unsurprisingly, Ladd's results were almost exactly the opposite of those reported in *The Costs of Sprawl*. Ladd found that taxes and costs, particularly for schools, police, and fire protection—which *The Costs of Sprawl* most seriously understated—were higher at every density category examined above "rural," or approximately 250 people per acre. Moreover, at the highest density studied, those costs were over 50 percent higher than at the lowest, or rural, density. Crime, the factor often cited by individuals and families as the main reason for relocating from crowded urban areas to more spacious suburbs, was particularly significant in Ladd's findings. The

strong relationship that Ladd found between density and crime, particularly violent crime, suggests that Smart Growth reproduces precisely the problems that drive people out of densely populated areas in the first place.

Economist Peter Gordon, head of the University of California's School of Urban Planning, and his colleague Harry Richardson summarized findings from their numerous earlier statistical studies in a 1997 article, "Are Compact Cities Desirable Planning Goal?" in the APA Journal:

> The equity case for compact cities is weak; the resource efficiency of compact development has never been adequately demonstrated; the traffic consequences of suburbanization are benign; low densities make high capacity transit systems unattractive and therefore wasteful; "government intrusions" are the real sources of energy crises; and America is not running out of open space, nor in any danger of having cities encroach on reserves of "prime" agricultural land.

CHANGING WAVES OF POLITICAL MOTIVES

Urban Institute senior fellow, George Peterson, claims that *The Costs of Sprawl* served an advocate function, and made only "one side of a two-sided case." He adds that "to use *The Costs of Sprawl* as the basis for policymaking today would be to stretch the study's results well beyond what is warranted." In his 1979 study "Critique of *The Costs of Sprawl*," University of Iowa professor Duane Windsor maintained that:

> *The Costs of Sprawl* was intended to encourage higher densities in the urban fringe around central cities. Ultimately the methodological defects in *The Costs of Sprawl* simply conceal the real problem, which was to persuade local officials and voters that they would be significantly better off at higher residential densities. Under prevailing incomes and suburban land prices households consume space because they want to do so. If urban sprawl is so grossly inefficient relative land prices would have readjusted to force higher densities.

Windsor's suspicions about the motives of those who commissioned the study are not borne out by Barrett Riordan, who helped commission the effort. (The study was actually performed by a consulting firm, the Real Estate Research Corporation of Chicago.) Riordan readily agrees that, while *The Costs of Sprawl* has definitely been used in highly political ways by varying successive interests since it was issued, it started out life as a purely experimental research effort. Riordan does recall that *The Costs of Sprawl* was originally devised in conjunction with the Department of Housing and Urban Development and used in connection with the Nixon administration's ultimately unsuccessful attempt to pass a national land use law. In *The Law of the Land*, an Urban Institute book, author Noreen Lyday maintains that the overriding concern of Nixon-aide John Erlichman and the handful of other lawyers involved in drafting the proposed land use law was the protection of the land or natural environment, not the promotion of better safety, schools, or other improvements in human-centered factors.

NOT SO SMART

Upon examination, Smart Growth plans cannot in any way deliver the benefits they promise. In fact, they will likely make pollution, crime, and infrastructure problems worse. Perhaps that is why the National Association of Counties—which in December 1997 announced a partnership with the EPA and other organizations to promote "Smart Growth" initiatives—is rethinking its action. In recent interviews, the group's president, Randy Johnson, stated that, "to the extent that Smart Growth rhetoric is misinforming or misleading real world policy debates and decision making, it must be changed."

Smart Growth-style initiatives are truly policies built on sand, resting on a flawed model and equally flawed assumptions. To the extent that politicians and the public buy into Smart Growth rhetoric, they will likely make more of the problems they seek to solve. Moreover, Smart Growth states and jurisdictions could easily become the slums of the twenty-first century.

FRIEDA CAMPBELL
Economist based in Bethesda, Maryland.

AIR POLLUTION–THE INSIDE STORY

Two policy initiatives from the early 1970s have had a lasting impact on the quality of the air we breathe today–the 1970 Clean Air Act and the federal government's response to the energy crisis. As a result, the air outdoors is now cleaner and the air indoors is now dirtier.

The original Clean Air Act helped, albeit at extravagant cost, to reduce ambient concentrations of several targeted pollutants. Carbon monoxide, sulfur dioxide, lead, ground level ozone, and particulate matter have all declined markedly over the last two decades. Though other factors such as technological advances and nonfederal pollution control efforts have also played an important role, the Clean Air Act has made a measurable contribution.

The so-called energy crisis also had an indirect but significant effect on air quality. Concerns that the nation faced dire energy shortages led to a variety of mandates and incentives designed to improve the energy efficiency of buildings and residences. That was accomplished, in part, by reducing ventilation in buildings and making them more airtight to retain heat in the winter and cooled air in the summer. In retrospect, the benefits of those measures were minimal—after all, the energy crisis turned out to be a false alarm.

But the costs of energy efficient structures have been substantial. The costs have gone well beyond the annoyance of not being able to open your office window or of having to pay higher prices for overly airtight new homes. More importantly, although the insufficiently ventilated offices and residences use less energy for heating and cooling, they also hold in more airborne pollutants, such as biological contaminants, volatile organic compounds, and formaldehyde. Consequently, those

and other compounds sometimes reach indoor concentrations that can cause physical discomfort, or more serious illnesses. Indoor air pollution and its health effects are in large part an unintended consequence of the energy efficiency crusade.

Outdoor air pollution still gets most of the attention. The EPA continues to crank out costly rules under the Clean Air Act to further reduce already-regulated outdoor pollutants. The recent tightening of existing ozone and particulate matter standards alone is estimated by that agency to cost $46.6 billion annually. However, by the EPA's own admission, indoor air pollution is much more of a health threat than outdoor air. The agency concedes that "indoor levels of many pollutants may be two to five times, and on occasion more than one hundred times, higher than outdoor levels," and that "most people spend as much as 90 percent of their time indoors." Nonetheless, indoor air is relatively unregulated, at least compared to outdoor air. But that could change.

The EPA and other agencies see the regulation of indoor air as a new opportunity. Yet there are several obstacles to the creation of a strong indoor air regulatory regime. First, while the Clean Air Act gives the EPA seemingly unlimited authority to target outdoor pollution, there is no comparably broad statutory mandate to micromanage indoor air. Indeed, the authority that does exist largely focuses on spurious indoor threats, such as asbestos and radon. Nor is there any indication that the current Congress would like to hand the EPA an indoor equivalent of the Clean Air Act, and for good reason.

The agency has a credibility problem when it comes to indoor air pollution. The EPA tends to ignore it when the regulatory agenda of the moment involves some outdoor pollutant. For example, during the debate over the new ozone and particulate matter rules, EPA Administrator Carol Browner blamed all manner of health problems, including pediatric asthma and other respiratory ailments, on the supposed inadequacy of the existing ambient standards. In truth, many of those health effects can more plausibly be linked to indoor air pollution, but it will be difficult for the EPA to make that argument now.

The EPA is not alone in its interest to regulate indoor air. In 1994, the Occupational Safety and Health Administration proposed an ambitious rule to regulate indoor air in workplaces. Its proposal focused primarily on secondhand smoke, which, like asbestos and radon, is a politically rather than scientifically chosen indoor air target. But in response to concerns about high costs, the proposal was shelved for the time being.

Undaunted, the feds may have found a way around the regulatory process. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) is currently revising its standards for indoor air quality. Though ASHRAE officially is a private group, its standards are often incorporated into state and local building codes throughout the nation, and thus are nearly as powerful as a federal law or regulation. Not surprisingly, the federal government has injected itself into the standards development process. In fact, the ASHRAE committee in charge of revising the standards was headed by a high level EPA employee. That employee later stepped down after an investigation by Rep. Joe Barton (R-Tex.) revealed that he had previously approved a $200,000 EPA grant to ASHRAE. However, the committee still has several federal employees on it, and questions about conflicts of interest persist.

ASHRAE's new standards, which will apply to commercial, institutional, and residential structures, are still being developed. Some critics have already attacked them as being too complex and costly. One engineer, Hank Rutkowski, a technical consultant to the Air Conditioning Contractors of America, noted that the ASHRAE committee has "made no attempt to reconcile the societal benefit with the anticipated increase in installation costs and operating costs," and calls its approach an "air quality at any cost point of view." That sure sounds like a federal regulation.

The evidence is clear that some indoor air quality concerns are legitimate, and should be addressed by affected parties. But before federal bureaucrats conclude that they have the best answers and try to inject themselves into the process, they should be reminded that they are engaging in precisely the kind of thinking that created the indoor air pollution problem in the first place. If not for federal energy policy, we might be able to open more windows and thus to clear the air.

BEN LIEBERMAN
An environmental research associate with the Competitive Enterprise Institute.

BANKS, INSURANCE COMPANIES, AND MERGERS

In the media discussion surrounding the proposed merger between Citicorp bank and Travelers Insurance, as well as NationsBank and BankAmerica, the focus has been on alleged problems that might result from those businesses' size and market power. But the fundamental sources of risk in fact stem from regulatory attempts to eliminate the risks that are inherent in financial services.

Government-provided deposit insurance and government regulation of the insurance industry conceal from both consumers and the owners of banks and insurance companies important facts about the market functions of and risks faced by such enterprises. A review of the fundamental economics of banking and insurance markets is needed to clarify the policy controversies surrounding the mergers.

BANKING BASICS

Banks essentially provide three services. First, they gather information about the credit-worthiness of potential borrowers. Second, they diversify risk among investors by pooling deposits among loan opportunities. Without banks, investors would have to make a series of time consuming bilateral transactions to diversify investments of their deposits. And third, banks provide liquidity for depositors even though the under-

lying investments (the loans) are less liquid.

Banking is one example of what are called principal-agent relationships. A depositor (the principal) hires a bank (the agent) to act on his behalf and optimize the rate of return versus the risk of default on loans. But agents do not always act on a principal's best interests. That is called shirking. To control shirking, principals must monitor agents' behavior. The gathering and dissemination of information to depositors about bank behavior is crucial for the optimal operation of a banking system.

Banks are an attempt to marry the most risk-averse demand-deposit investors with more risky fixed-term real investment. If depositors have information that leads them to believe that a bank's investments are failing, they are likely to withdraw their deposits. In such situations, banks need to raise cash quickly to pay back depositors and reduce the perception that the bank is failing.

The only way to raise cash is for the owners of the bank's equity to give that equity to depositors. That is because all the deposits are actually out in the community in the form of loans. Thus a bank that needs to raise cash first exhausts its equity and then sells assets (loans).

Loans are difficult to sell quickly because information about the creditworthiness of the borrowers is limited. A quick sale floods the market with assets and the fire sale prices paid for those assets are much lower than the true equilibrium prices. In such situations, a bank becomes insolvent not because it actually holds too many nonperforming loans, but because customers expect the bank to fail and thus demand their deposits.

PREVENTING FAILURES

Such bank failures can be prevented through the actions of a lender of last resort, in the United States that is the Federal Reserve Bank. Such a lender provides liquidity to dampen negative depositor expectations. Once depositor panic subsides, the lender of last resort is repaid.

But most bank failures result from bad loans made by the bank itself rather than simply negative perceptions held by depositors. Such failures can be reduced by more closely aligning the interests of the bank's owners with the interests of the depositors. Bank malfeasance arises from the disjunction of incentives between depositors and owners/managers. When the latter view the loan decisions that they make as involving other peoples' (the depositors') money, they are not as careful as they would be with their own assets.

All else being equal, the interests of owners/managers will align more closely with those of depositors as the percentage of bank assets provided by owners' equity increases. (A bank with $20 million in deposits, and thus $20 million in outstanding loans, with an equity value of $10 million, will appear more sound than one with an equity value of $2 million. In the former case the owners have more to lose from failure.) When loans fail, bankers' equity is used before any depositors lose their money. A high equity percentage shows consumers that the owners have enough confidence in their decisions to place their own money at risk.

Another factor affecting the ability of a bank to deal with a run and to instill confidence in depositors is the nature of the liquidity. If a bank lends all of its deposits to local small enterprises, for example, it likely will have difficulty raising funds quickly by selling off such loans because in the very short term, it is difficult to determine their true market value. But a bank might use some of its deposits to purchase short-term government securities or short-term debt from large, well-established corporations. The values of those assets at any given time are known and thus they can be liquidated quickly at the real market value rather than at fire sale prices. Further, depositors that know a bank has diversified assets are likely to see it as less risky and make fewer runs on the bank.

Short-term government debt carries virtually no risk, is completely liquid, but produces low returns on investment. Corporate debt is slightly more risky, still liquid, and perhaps yields slightly greater returns. The market can match easily the needs of consumers for varying degrees of liquidity and default risk, but the return on the safest investments is little more than the rate of inflation. Treasury bill and money market funds provided by Vanguard, Fidelity, and numerous other investment corporations provide consumers with liquid and secure investments without deposit insurance. If consumers want the returns that come from more risky investments, they should face those risks.

Federally provided bank deposit insurance dulls consumer awareness of the underlying risks of various loan investments and reduces competition among banks about the percentage of assets provided by owner equity. In addition, deposit insurance introduces moral hazard into the relation between owners and depositors thereby exacerbating the incentive to shirk. Deposit insurance socializes the cost of bad behavior by owners and reduces incentives of depositors to question owner behavior.

Thus the danger created by bank mergers is not size per se, but size backed by deposit insurance, which increases the incentive by bank owners and managers to shirk from the interests of depositors.

INSURING SECURITY

Turning to insurance markets, it is useful, as with banking, to start with the basics. Four concepts are important: expected value, risk seeking, risk neutral, and risk averse. Expected value is the cost of an event multiplied by the probability of its occurrence. If a car is worth $10,000 and the annual probability of an accident that reduces the value of the car to zero is 0.1, then the expected value of an accident is $1,000 per year. If a yearly auto insurance premium is $1,000, then its expected cost is also $1,000 because the probability of receiving a bill for the premium from one's insurance company is 100 percent.

Risk neutrality, risk aversion, and risk seeking are terms that describe people's preferences toward events that have the same expected value, but different probabilities of occurrence. Risk neutral individuals are indifferent between two events of the same expected value. Risk averse people will prefer the certain event with low costs (paying the insurance premium) to

the low-probability event that carries a much larger cost (a $10,000 accident). Risk seeking people will avoid the high-probability, low cost event (paying the annual insurance premium) and gamble that the low-probability, high-cost event (the accident) will not occur.

Insurance is a trade of equal expected-value events between the risk-averse individuals and risk-neutral companies. A one in ten chance of a $10,000 car accident has the same expected value as the 100 percent chance of paying a $1,000 premium. Risk averse individuals trade the latter with risk neutral companies to avoid facing the former.

Insurance companies are risk neutral because the collection of premiums from individuals equal to the expected value of damages (average damages per incident times population incidence) is financially identical to the payment of claims that actually occur. If people were risk neutral, gains to trade between them and insurance companies would not exist. We would all self-insure.

The sources of risk in insurance markets are several. First the data used to predict the expected value of damages by customers may be inaccurate. Second, the expected value of accident damages in the population used to set premiums may not reflect the expected value of accident costs in the population that buys insurance from the company. Third, insurance companies invest funds raised from premiums in various enterprises as ways to raise money. The owners' equity as well as the premiums collected from insured customers may be invested unwisely by the company resulting in bankruptcy.

What can be done about those sources of risk? The answers are similar to those in the banking context. The greater the percentage of an insurance company's assets in owners' equity, the greater the safety of the company.

Also, as with banking, the greater the percentage of insurance company assets invested in government and corporate debt rather than the stock of Indonesian companies, for example, the greater the likelihood that assets can be liquidated to respond to unexpected claims. Companies that possess such characteristics and communicate them to customers will grow at the expense of other companies.

Also, insurance companies with larger and more nationally representative customer bases likely will find that their losses (paying off policyholders that have accidents) will equal predictable population averages. But insurance companies often face state regulations that limit their freedom to diversify.

GOVERNMENT-CREATED RISKS

The risks created by the merger of banks and insurance companies then do not result per se from the size of the new resulting company. Federal deposit insurance is the main source of potential problems. A merged bank-insurance company, for example, might be perceived as too-big-to-fail. The combined Citicorp-Travelers company could engage in reckless practices and then be bailed out by the government.

In the absence of deposit insurance, combined bank-insurance companies would need to reassure customers that they would invest prudently and set premiums in line with the expected value of damages across customers. The companies would obtain customer trust by more fully describing the characteristic of their insurance pools and the investments in which their assets are placed. Companies that disclosed nothing would suggest to consumers that they had something to hide and would get less business.

Banks and insurance companies have risks. Federally provided deposit insurance does not eliminate those risks. It only transfers them to taxpayers and reduces the awareness of owners and customers about those risks. Market strategies exist to reduce the risks inherent in banking and insurance, but under the current policy regime no one has the incentive to implement them. We should repeal deposit insurance and insurance regulation and begin to take responsibility for understanding those risks and how to manage them.

PETER VANDOREN
Cato Institute