

Suppressing Volunteer Firefighting

BY MARSHALL L. STOCKER

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IN 1980, THE OCCUPATIONAL SAFETY AND HEALTH Administration first issued safety regulations for fire brigades, mandating the use of such equipment as self-contained breathing devices and fire-retardant clothing. From 1979 to 2002, there was a 52 percent decrease in annual firefighter fatalities recorded at structure fires. One might infer that the decline was a result of efficacious OSHA regulations that protected firefighters from occupational dangers.

But between 1979 and 2002, the number of structure fires also decreased by 50 percent. Today, firefighters are just as likely to die at a structure fire as before OSHA issued its safety regulations for fire brigades. What is worse, OSHA regulations may be leading to the decline of volunteer fire departments and may be a contributing factor in firefighter fatalities.

INVINCIBILITY OSHA's Standard 29 CFR 1910.134 mandates that firefighters entering a burning building utilize a self-contained breathing apparatus. To achieve OSHA compliance, firefighters must carry the device's 30 lbs. (or more) of weight for the duration of interior firefighting activities. Another standard, 29 CFR 1910.156, mandates that "employers" assure firefighters wear heavy protective clothing that meets OSHA requirements. That adds another 30 lbs. of weight. The 60 lbs. of mandated protective equipment contribute to the excessive physical stress and exhaustion that often precedes cardiac arrest — the leading on-duty killer of firefighters.

Wearing their fire retardant gear and protected by breathing devices, firefighters are now more aggressive with interior fire operations. And, worrisomely, they may be less informed about the conditions in which they are working. Longtime veterans of firefighting will tell you that, in the old days, firefighters used their ears as thermometers. If a firefighter's ears

became painfully hot, it was time to leave the building and fight the fire from the outside. Now a mandated flame retardant hood covers the ears. When firefighters recognize painfully high temperatures, absolute fire temperature is much closer to a fatal fire dynamic called "flashover." Flashover occurs when the room's temperature becomes so high that everything, including the firefighter, ignites simultaneously.

Before the widespread adoption of self-contained breathing devices, inhalation of a fire's toxic smoke led to coughing fits, lightheadedness, and headaches. Those certainly are undesirable but, much like painfully hot ears, veteran firefighters considered the coughing and dizziness a useful signal that it was time to get out of the burning structure, before

smoke accumulated to form a zero-visibility atmosphere devoid of a life-supporting quantity of oxygen. Today, firefighters regularly train to work under zero-visibility conditions by utilizing their breathing devices to provide the respiratory protection in an oxygen deficient environment. Fighting fire under those conditions exposes firefighters to life-threatening disorientation created by the denser concentrations of smoke. The heavier concentrations of smoke also threaten firefighter lives as they contribute to "rollover," the sporadic ignition of densely accumulated smoke.

TWO IN / TWO OUT OSHA's respiratory protection Standard 1910.134 mandates that interior structure fire operations not commence until two backup firefighters are assembled as a rescue team. Known as the "Two In / Two Out" rule, this regulation attempts to harness the benefits of rescue teams designated to assist interior firefighters in trouble. However, under OSHA's directive, fire departments must now assemble the standby team prior to commencing interior fire attack.

At some fires, the best strategy to protect firefighter health is to extinguish a fire immediately before it grows into a less manageable and more dangerous size. Yet, because of OSHA's mandated "Two In / Two Out" rule, fire department officers cannot exercise discretion over when an immediate attack is warranted prior to the establishment of a rescue team. Thus, precious time is lost in requesting and

Regulation may be leading to the decline of volunteer fire departments and may be a contributing factor in firefighter fatalities.

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assembling the standby rescue teams, while the fire grows unimpeded, multiplying the already dangerous conditions faced by firefighters.

FEWER VOLUNTEERS Three years after OSHA's mandated safety and training standards were issued, the number of volunteer firefighters in America reached a record high. But from that point in 1983 to now, the number of volunteer firefighters has steadily decreased. From 1983 through 2001, the last year of data, the number of volunteer firefighters in America has fallen by 11 percent to a total of 784,700. Volunteer firefighters represent 73 percent of all firefighters.

A press release published by the National Volunteer Fire Council succinctly summed up the causes for the decline:

The biggest factor contributing to the decline is increased time demands on the volunteer. This results from increased training hours to comply with more rigorous training requirements, [and] increased fund raising demands [to purchase mandated equipment].... In addition, expectations of the fire service have changed over the years due to perception and [OSHA] standards development. In many cases, this is a positive change; however, it has caused many to leave the volunteer service. These factors equate to a tremendous loss of talent each year.

CONCLUSION Today, firefighters face the same likelihood of being killed by a structure fire as they did more than two

decades ago. Meanwhile, OSHA has saddled departments with onerous safety, record-keeping, training, and financial requirements that have contributed to a decline in volunteers. And, clearly, a smaller number of firefighters does not enhance safety when battling a blaze.

To reduce firefighter deaths, each fire department should be freed of the regulatory burden of federal oversight and empowered to mitigate its own locally identified risks. Every fire department serves a community with different safety hazards and emergencies. Only local authorities are poised to identify and reduce the risks faced by their firefighters.

OSHA should return to its original directive of establishing voluntary standards — especially for volunteer fire departments. Doing so will allow departments to focus on highest-priority risks instead of OSHA's many, homogenous standards. Local departments will be better able to recruit new firefighters. The replacement of federally mandated standards with department-specific safety and training protocols will ease the time commitment required to volunteer as a firefighter and reduce firefighter fatality rates. **R**



NAAQS's 'Where's Waldo?' Problem

BY KAY H. JONES

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WHEN WEIGHING the costs and benefits of government regulation of some pollutant, it is helpful to first

identify the people who are exposed to harmful levels of that pollutant. That is not so easy in the case of the Environmental Protection Agency's National Ambient Air Quality Standard (NAAQS) for fine particulate matter (PM_{2.5}). Readers of EPA statements identifying the people who are over-exposed to PM_{2.5} might feel a little like a child with a "Where's Waldo?" book, feverishly searching for the bespectacled, stocking cap-wearing protagonist.

THE NUMBERS According to the EPA, the maximum acceptable annual exposure to PM_{2.5} is 15 micrograms per cubic meter (µg/m³). (Arguments about the merits of that threshold have been intensely debated, but we need not get into that here.) So, where's Waldo — how many people face exposures higher than that level?

EPA Administrator Mike Leavitt, in written testimony last April to the Senate Subcommittee on Clean Air, Climate, and Nuclear Safety, stated that there were 65 million people living in "non-attainment counties" — U.S. counties where actual monitoring data eclipsed the 15 µg/m³ threshold in 2000, 2001, and 2002. According to EPA documents, that occurred in 120 counties, with a combined population of 58.7 million. That is close enough to 65 million, I suppose — I think we found Waldo.

But wait; in June the EPA announced that after further analysis, they had determined that 99 million people suffer from high exposure to PM_{2.5}. How did they derive that number? They summed together the populations of the original 120 non-attainment counties with the populations of nearby counties whose emissions may contribute to their neighbors' non-attainment.

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That seems a bit of a stretch, but no disclaimer about the methodology appears anywhere in the recent EPA pronouncements.

Of the 58.7 million persons living in the 120 non-attainment counties in the United States, 21.8 million live in only 13 counties in California. Outside of California, 86 of the 107 counties with annual concentration levels, called "design values," above the EPA's 15 µg/m³ are only slightly above — within the range of 15–17 µg/m³. Only one county, Allegheny, Pennsylvania, has a design value above 20 µg/m³. Alternatively, 10 counties in California exceed 17 µg/m³, seven of which exceed 20 µg/m³. The worst is Riverside County, with a maximum exposure level of 28.9 µg/m³.

The EPA's risk projections from PM_{2.5}, in terms of the number of deaths, hospital visits, asthma attacks, work day losses, etc., are highly questionable and based on some dubious assumptions. The agency relies on a simple formula that multiplies the affected population by an incremental change in PM_{2.5}, and then by a health damage factor. For example, the number of excess deaths per a 1 µg/m³ change in PM_{2.5} exposure for all folks over age 30 is based on the oft-cited American Cancer Society Study by Pope et al. We can therefore compare the relative risk in California, to the rest of the nation by simply summing the products of each non-attainment county's population multiplied by the difference between that county's design value and 15 µg/m³, for each region. When the accounting is done, we find that 64 percent of the exposure risk occurs in California, regardless of the health effect one might espouse.

A further insight into the possible health risk posed by fine particulate matter is to look at the risk factors for persons who are exposed to PM_{2.5} at levels above 18.7 µg/m³. This average level is mathematically equal to a median level of 15 µg/m³. (The



EPA must not have read the original Pope paper with any degree of care because its city-by-city population exposure data were annual medians of $\text{PM}_{2.5}$, not means. The EPA, in a 1996 staff paper, assigned a $15 \mu\text{g}/\text{m}^3$ threshold to Pope's graphed city-by-city, mortality-versus-exposure data. Hence, when the agency reported this $15 \mu\text{g}/\text{m}^3$ threshold as the mean to support its NAAQS proposal, the EPA inadvertently set the threshold at an annual mean of $18.7 \mu\text{g}/\text{m}^3$. The agency has never corrected this error, but admitted the mistake in a press release in April 1997.) If we use $18.7 \mu\text{g}/\text{m}^3$ as the risk threshold, the portion of the nation outside of California that is at risk from fine particulate matter practically disappears; the relative exposure risk for California would be 93 percent of the total U.S. exposure risk. Wherever Waldo is, he is mostly in the Golden State.

THE COUNTY LEVEL Of course, not all of the people who reside within a non-attainment county have the same exposure as indicated by the design value, which is based on the worst monitored $\text{PM}_{2.5}$ level. The EPA's documentation sheds some light on this fact. For example,

in the non-attainment counties that are associated with the Chicago, Pittsburgh, and Baltimore/D.C. metro areas, only about half of the monitors within those counties measured annual average $\text{PM}_{2.5}$ levels above $15 \mu\text{g}/\text{m}^3$. In the Los Angeles basin, the percent above the NAAQS was 69 percent. In all of Ohio, it was 67 percent. Among the major cities in Tennessee — i.e., Knoxville, Chattanooga, and Nashville — the ratio was 55 percent. Surely, all of the folks living in the smaller counties with only one monitor are more than likely not equally exposed to that county's single design value. It is therefore appropriate to adjust the 58.7 million figure that Leavitt cited to account for intra-county exposure differences. If we use a correction factor of 60 percent, we would be left with a nationwide total of 34.6 million people exposed to $\text{PM}_{2.5}$ at levels the EPA considers unsafe.

Actually, the EPA has the ability to more precisely define the nation's population exposure distribution. The agency can actually model estimated exposures down to the census tract level, especially in major population centers where multiple monitoring sites exist. The EPA has conducted such modeling for assessing the potential exposure to most of the toxic air pollutants of concern. Such analysis for $\text{PM}_{2.5}$ already exists in part of the agency's Clear Skies benefits analysis.

For sure, we can say that the number of Americans who breathe particulate matter at levels above what the EPA considers acceptable is less than 99 million and probably less than the 35 million. Wherever Waldo is, he is not nearly as big as the EPA would have us believe.

THE FUTURE And where might Waldo be in the future? Current regulatory programs, mainly auto emissions reductions,

have reduced the contribution of secondary aerosols (which are formed in smog) to urban $\text{PM}_{2.5}$. That reduction should continue as the nation's vehicle fleet turns over and older cars are replaced with newer, lower-emitting vehicles. Nationwide, average $\text{PM}_{2.5}$ has declined by 10 percent in the past four years, according to the EPA's trends analysis, and that will likely continue for at least the next 10 years.

If that bears out, all of the current design values will fall by 15 percent over the next six years. The non-California contingent of non-attainment counties would thus number only 12 by 2010, with a population of around 14 million people. If we apply the 60 percent correction for monitoring differences as previously discussed, the number of people exposed to what the EPA considers an unacceptable level of $\text{PM}_{2.5}$ would then be 8.4 million.

On the other hand, this projected trend in reduced $\text{PM}_{2.5}$ would have little or no effect in California. Ten of the 13 counties currently designated as in non-attainment would remain so in 2010. Still, the number of people experiencing fine particulate matter exposure of more than $15 \mu\text{g}/\text{m}^3$ would shrink from the EPA's 99 million to about 20 million by 2010, without any further regulatory action.

In health risk terms, if we assume that the $\text{PM}_{2.5}$ NAAQS of $15 \mu\text{g}/\text{m}^3$ is the binding health effects threshold, the non-California risk would shrink to only 15 percent of the California exposure risk in 2010. If we were to use the EPA's assigned equivalent threshold of $18.7 \mu\text{g}/\text{m}^3$, the non-California risk would be zero. The California risk would be reduced by 62 percent by 2010, if the current trend continues.

EPA ALTERNATIVES The two regulatory strategies that EPA officials point to when discussing what will help non-attainment areas achieve the $\text{PM}_{2.5}$ standard in the future are the Interstate Rule and the Clean Air Non-Road Diesel Rule. The Interstate Rule is essentially the same as the Clear Skies Initiative that was submitted to Congress but not acted upon. The rule focuses on reducing sulfur oxides and nitrogen oxides emissions from coal-fired power plants in the eastern half of the United States. The modeled $\text{PM}_{2.5}$ reduction averaged less than $1 \mu\text{g}/\text{m}^3$ across the domain of the power plant impacts. There are no benefits from this rule in California, as there are no coal-fired power plants in the state. Hence, the rule does nothing to reduce the health risk where it is the dominant risk nationally.

The Non-Road Diesel Rule will only reduce $\text{PM}_{2.5}$ by about $0.33 \mu\text{g}/\text{m}^3$ by 2010. That incremental ambient reduction will not significantly reduce the exposure risk in California nor change the non-attainment picture there. Concerning $\text{PM}_{2.5}$, it is difficult to argue that the rule is even needed elsewhere in the nation.

CONCLUSION So where is Waldo? In the EPA's mind, more than one third of the nation's 290 million people experience unsafe exposure to $\text{PM}_{2.5}$. But when we look more carefully at the picture, we find a much smaller number of people, and that number is shrinking all the time under current regulations. Waldo, it seems, is slowly disappearing from sight. And the EPA has little to suggest as far as what to do in the places where he will remain in view. **R**

Auctioning Pollution Rights

BY TED GAYER

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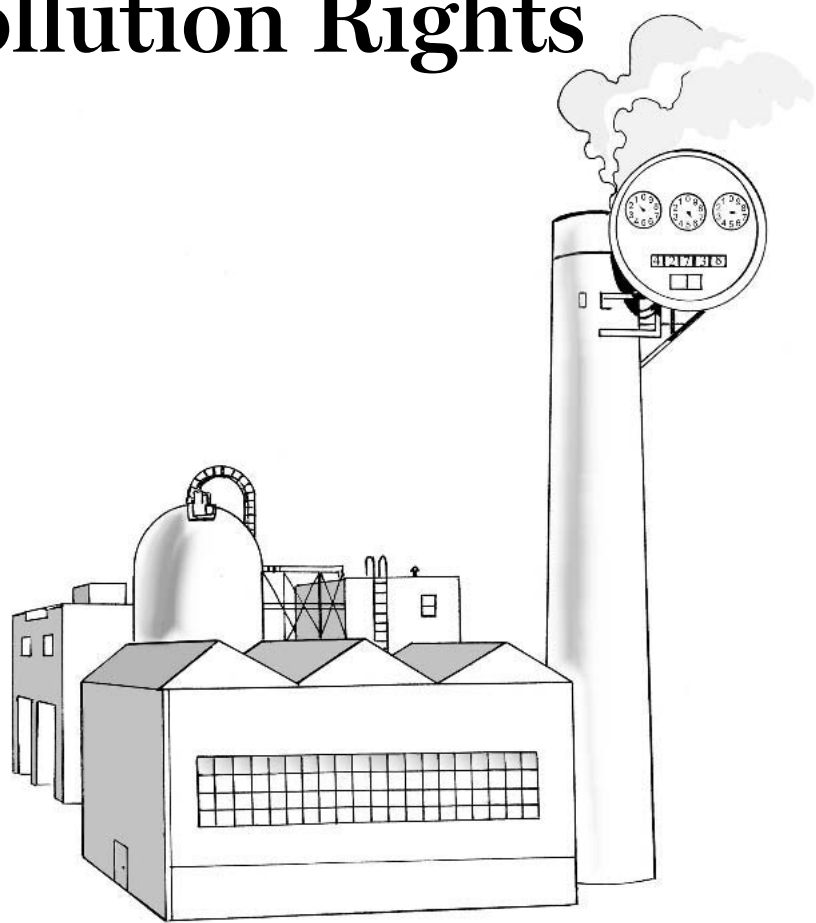
IN THE PAST 15 YEARS, CAP-AND-trade programs have become the preferred means of regulating air pollutants. A cap-and-trade program establishes the annual number of allowable emission permits (the "cap"), which is set below the existing emissions level. Each regulated entity must cash in one permit for each unit of air pollution it emits. The cost savings come from allowing firms to trade permits, so that a firm that finds it costly to reduce its marginal unit of pollution can instead purchase a permit from another firm that can reduce a unit of pollution for less cost. Because the overall cap is binding, the result is a reduction of pollution to the target level at costs much lower than the more rigid command-and-control regulations.

The cap-and-trade program often cited as a success story is the sulfur dioxide permit market created under Title IV of the Clean Air Act Amendments of 1990. The market has cut sulfur dioxide emissions from the electric power industry by about 40 percent from 1980 levels at a savings of about \$1 billion per year compared to the conventional command-and-control approach. In recent years, the Environmental Protection Agency has initiated a regional cap-and-trade market for nitrogen oxides and is currently considering a proposal to further reduce sulfur dioxide and nitrogen oxides using cap-and-trade approaches. The EPA is also considering reducing mercury emissions from power plants using a national cap-and-trade program.

ALLOCATION Though much has been written and discussed about the advantages and disadvantages of cap-and-trade programs, one issue of great importance is frequently neglected and can instead only be heard occasionally in conversations among academics. The issue is how to allocate the permits to the regulated entities once the cap is established.

That negligence is understandable because of the heavy attention that is given to the choice of the level at which the cap is established. The cap level imposes costs on the regulated entities (costs borne by shareholders, workers, and consumers), and it yields environmental benefits. The goal is to establish a cap level that maximizes the difference between benefits and costs. Given the difficulty in determining all the components of benefits and costs, and given the vested interests of stakeholders on all sides, it is no wonder that most of the policy

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debate focuses on the appropriate level for the cap.

Nonetheless, the question of how to distribute the permits is itself important. There are two general options: The permits can be given out for free each year or they can be auctioned off. Under the giveaway approach, characteristics of the firms could be used to rank which firms get priority for the permits. For example, electric utilities' permit allocation could be based on measures of heat input or electricity output in a baseline year. Under the auction approach, the highest bidders would receive the permits.

Not surprisingly, firms prefer to receive the permits for free. When asked the reason for that preference, they often argue that auctions hurt the economy. But their argument does not withstand scrutiny. Though the cap-and-trade system does impose costs, those costs result from the establishment of a cap below existing emission levels. The decision to allocate the permits for free or to auction them has only distributional impacts, not economic impacts. Unlike a tax on output or labor, an auction does not change any of the economic decisions of a firm. If a firm is given the permits for free, each unit of pollution it emits means that it must forgo selling a permit at the market price. Similarly, if a firm is in the auction setting, each unit of pollution it emits means that it must pay the market price for a permit. In other words, whether you are charged \$5 or you must forgo earning \$5 for every unit of emissions, your economic incentives are the same. The only difference between an auction and a giveaway is who gets the pot of cash.

It might be hard to believe that the government can raise revenues (through an auction) without imposing economic costs. The important point is that it is the permit cap itself that imposes costs by restricting the economic activities of the regulated firms. It is therefore important that the government strive to set the permit caps at the level that maximizes the difference between the environmental benefits and the costs that the permits impose on society. However, once the permit cap is established, there are no additional economic costs associated with auctioning the permits rather than giving them away for free. In economic parlance, the auction is a nondistortionary tax; i.e., a tax that does not inhibit economic activity and thus does not impose additional costs. Of course, it does no good if the government squanders the auction revenue on unproductive activities. But if the auction revenue is instead earmarked to reduce other distorting taxes, then auctioning permits is preferable to giving away permits.

Auctioning has other advantages over giving away permits for free. In a giveaway system, the government must establish criteria for how many permits each firm gets. As mentioned earlier, this typically means basing permit allocations on firm characteristics in a pre-established baseline year. However, the government may want to update the baseline year over time. For example, for the EPA's current proposal to reduce the cap for sulfur dioxide, the public comment period heard from many regulated firms that wanted the agency to update the existing baseline period (which is based on firms' characteristics from 1985 to 1987). The problem is that updating the baseline year could lead to perverse incentives for firms because they will try to change their characteristics to get more permits. That is, if firms think that their future allocation of permits will depend on their future electricity output, then they have an incentive to overproduce electricity. This distortion hurts the economy. In order to avoid those strange incentives, permit systems in the past have based allocations on one-time characteristics, which thus establish the allocations in perpetuity. In fact, the current EPA proposal for sulfur dioxide indicates that the baseline year will remain unchanged. This makes economic sense, yet it does introduce a peculiar equity issue in that firms get a "permanent right" to pollute, whereby they still receive valuable permits even after they eventually shut down their operations.

Another advantage of auctions is that they provide greater flexibility in the design of cap-and-trade programs. For example, auctions facilitate the use of a "safety valve" mechanism. A safety valve is a promise by the government to issue and sell additional permits (above the cap) upon request to any firm at a given fixed price. This offers a hedge against any unexpectedly sharp increases in the price of pollution reduction. For example, the government might establish a cap with the expectation that the associated marginal cost of reducing pollution will be \$5,000 per ton of pollution. However, in order to avoid a sharp increase in this price, the government can establish a safety valve price of \$10,000 per ton. That would guarantee that the market permit price would not exceed the safety valve price. If the safety valve is triggered one year, then the extra allowances can be deducted from future years' allocations. A safety valve therefore makes policy sense because it hedges

against the possibility of a short-term spike in the cost of reducing pollution, yet it maintains the environmental gains over the long term. With an auction system, reducing future years' allowances is simple. With a giveaway system in which allocations are pre-established based on historical firm characteristics, it is difficult to determine how to reduce future years' allowances. This could mean abandoning the safety valve idea, unnecessarily increasing the costs of pollution control without creating environmental gains.

EXPERIENCE Though auctioning makes good economic sense, it has been used only sparingly. On the legislative front, the sulfur dioxide market established by the Clean Air Act of 1990 contains annual auctions of 2.8 percent of the permits each year. In 2004, it raised approximately \$50 million. President Bush's Clear Skies program, which was introduced in 2002 to reduce sulfur dioxide, nitrogen oxides, and mercury, contains a more ambitious auction system that would be phased in over time. From 2008 to 2030, the auctions would bring approximately \$16.3 billion into federal coffers. If all the permits were auctioned, the program would bring in about \$128.7 billion without harming the economy. But Sen. James M. Inhofe (R-Okla.) recently introduced an amended version of the Clear Skies bill that would eliminate the auctions altogether, so the prospects of the auction remain in doubt.

On the administrative front, the EPA's new nitrogen oxides regional cap-and-trade market allocates permits to each state and allows the states discretion on how to distribute the permits to their within-state firms. Just this summer, Virginia decided to auction five percent of its permits, which raised \$10.5 million. Had Virginia auctioned all of its permits, it would have raised about \$210 million, and that is just for the first year. However, the Virginia legislature subsequently voted to ban all future auctions of permits.

One can legitimately debate what the appropriate pollution reduction level is. This level should be chosen to maximize net benefits and should not be chosen in order to maximize auction revenues. Indeed, we should be wary of the government designing future cap-and-trade markets strictly to raise auction revenue. But in instances where the cap level is established independent of the auction decision, it makes economic sense to auction the permits and use the resulting revenue to offset distortionary taxes. If and when President Bush's Clear Skies bill is again considered by Congress, the administration should push for the restoration of the auctions that were contained in the original proposal, especially given the president's stated goal of keeping distortionary taxes low while moving toward a balanced budget.

Similarly, over the next few months, the EPA will work toward finalizing the cap-and-trade rules for nitrogen oxide emissions and for mercury emissions. Both of those proposed rules assign permit budgets to the covered states and then allow the states discretion on how to allocate the permits within their boundaries. In the final rules, it is important that the EPA maintain this federalist approach of state flexibility, and that the states consider using auctions as a means to raise targeted revenues while protecting their economies. **R**

Options Are an Expense, But Mandatory Grant-Date Expensing Is Bad Accounting

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LAST JULY, THE U.S. HOUSE OF REPRESENTATIVES passed the Stock Option Accounting Reform Act (H.R. 3574). The legislation would effectively prohibit the expensing of stock options awarded to company employees, except for the firms' chief executive officer and the next four most highly compensated officers.

The legislation is viewed by many observers as an end-run around the Financial Accounting Standards Board (FASB), an independent organization responsible for establishing the nation's accounting rules. The FASB has long advocated subtracting the value of employee stock options from a firm's income at their grant dates, and had been working on eventually mandating that accounting practice prior to the House vote. The rationale behind the expensing requirement was stated succinctly by Rep. Paul Kanjorski (D-Pa.) who supports the FASB position: "Employee stock options are a type of compensation, just like a salary or a bonus. Because compensation is an expense and because expenses influence earnings, employee stock options should be counted against earnings and subtracted from income." Prominent investor Warren Buffett put it more bluntly: "If stock options are not a form of compensation, what are they? If compensation is not an expense, what is it? And if expenses shouldn't go into the calculation of earnings, where in the world should they go?"

Expensing opponents do not take it for granted that employee stock options must be an expense, at least not a normal one. William Niskanen, chairman of the Cato Institute and head of the editorial board of *Regulation*, argued in a commentary last summer, "A stock option is not like 'other forms of compensation'. Stock options are an incentive for future performance; they are not, like a bonus, a reward for prior performance." He further wrote, "Stock options have no 'related cost' in the period they are granted, in that there is no cash outlay or share dilution at that time." Similarly, venture capitalist Kip Hagopian argued in his article "Stock Option Expensing: Getting the Accounting Right" that an employee stock option's "hypothetical value to an employee does not mean that it is an expense to the employer." Instead, Hagopian continued, the option is a "potential or contingent" cost that should not be expensed before

it occurs because it is not yet "realized" or not "realizable."

The debate over whether employee stock options are an expense is actually unnecessary. While expensing proponents are right that stock options are an expense, expensing opponents, led by high-tech firms that often use options in employee compensation packages, are right when they claim that stock options should not be expensed at their grant dates.

AN EXPENSE INDEED In their *Harvard Business Review* article "For the Last Time: Stock Options Are an Expense," economists and financial experts Zvi Bordie, Robert Kaplan, and Robert Merton used a hypothetical example to illustrate how employee stock options, if not expensed, could distort the granting company's financial appearance. The authors hypothesize two firms, KapCorp and MerBod, that are identical in all respects save that KapCorp pays its employees a total of \$400,000 in cash and sells them \$100,000 worth of options while MerBod pays \$300,000 in cash and grants its employees \$100,000 in options for "free." The authors argue that without expensing, the intrinsically identical companies would have very different financial statements: MerBod's earnings would be \$100,000 higher because the use of options "saves" it \$100,000 in cash compensation expenses. "How legitimate is an accounting standard that allows two economically identical transactions to produce radically different numbers?" Bordie, Kaplan, and Merton ask.

But even though stock options are an expense used by companies to compensate employees, they may not need to be expensed. According to Bordie, Kaplan, and Merton, the \$100,000 earning difference between KapCorp and MerBod stems from MerBod understating its compensation cost by not accounting for the employee options. Yet, from another angle, one can also say that the difference is caused by KapCorp underreporting its income by accounting for the premium proceeds from issuing the \$100,000 worth of options as option holders' equity. Were the proceeds treated as income, the two companies would have identical earnings.

In general, if the implicit premium proceeds from issuing employee stock options should be accounted as income to the granting firm, expensing employee stock options at their grant dates would be a trivial process of adding the value of the options to both firm revenue and firm expenses, which would have no net effect on the final earnings. However, if the premium proceeds should be accounted as option holders' equi-

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ty, employee stock option accounting is a crucial expensing process that has real impacts: Earnings in the income statement will be reduced because while the granting of options is accounted as an implicit compensation expense, the implicit premium proceeds from the corresponding option issuance is not accounted as revenue but as option holders' equity.

EQUITY OR INCOME? Should the implicit premium proceeds from granting employee stock options be accounted as option holders' equity or as income to the granting firm? Conventional financial accounting standards point to the former: Stock option issuance, just like issuing stocks, is a financial transaction; the premium proceeds received by the issuer are not income but more like an investment from the option holder. In the above example, KapCorp's \$100,000 worth of option premium is not its revenue earned through providing goods or services but represents its employee option holders' investments for a chance to share in the company's future success. Similarly, MerBod's option granting does not save it \$100,000 in compensation expenses because the options represent its contingent future liabilities. In other words, the option granting would not save, but only postpone, the \$100,000 expenses to the future. Therefore, as far as the financing or expense-postponing function is concerned, expensing stock options at their grant dates is sensible.

However, it is well recognized by both expensing opponents and proponents that employee stock options are often used as an incentive mechanism to improve the granting company's long-term performance. In this case, option expensing is not justified. Consider, again, the hypothetical KapCorp–MerBod example. Suppose KapCorp expects that the \$100,000 worth of options, if held by employees, would become an inventive device that could increase its future earnings by say \$120,000 in current dollars. Then what is the minimum price KapCorp would be willing to charge its employees for the options? The answer is zero. KapCorp would be willing to give away the \$100,000 worth of options for free because that would generate \$120,000 in extra future earnings and hence give the firm a \$20,000 net gain. Now, should the options be expensed against the firm's earnings at the grant date? The

answer is, of course, no. The incentive options represent KapCorp's contingent future expenses that are intended to be covered by the extra future revenues they would help create. In fact, if one insists that KapCorp should expense the incentive options only because the \$100,000 potential liabilities they represent have been incurred (albeit not realized yet) at the grant date, then following the same logic, KapCorp should also add the \$120,000 potential extra future revenues to its current earnings because they are induced by the options. This is obviously not a sensible accounting practice.

Although KapCorp would be willing to grant the incentive options for free, it does not have to. Suppose that KapCorp offers to sell its employees the \$100,000 worth of options at the price of \$80,000. The employees would happily take that offer, figuring that their total compensation would be worth \$420,000, with \$320,000 in cash (i.e., the \$400,000 cash compensation minus the \$80,000 spent on purchasing the options) and \$100,000 in options. In that case, should KapCorp count the \$80,000 option premia as its employee option holders' equity or as its own income? The answer is the latter because the \$80,000 is a pure profit — after all, KapCorp would be willing to give away the options for free.

As mentioned above, conventional option premia should not be counted as income because they correspond to the issuer's contingent liabilities in the future. But the case here is different: KapCorp's contingent liabilities from issuing the options have already been covered by the potential extra future revenues induced by the options as an incentive to the employ-



ees. In fact, no matter whether KapCorp sells the options for nothing, for \$80,000, or for the \$100,000 "fair" value, the impact of the transaction on KapCorp's future earnings would always be the \$20,000 worth of net gain.

But where does KapCorp get the \$80,000 income without providing goods and services? It certainly does not come from thin air. It comes from putting stock options in the hands of its employees, who in turn help generate the \$120,000 worth of extra future earnings. If the options are granted for free, \$100,000 out of the \$120,000 would belong to KapCorp's employees who obtain the \$100,000 worth of options for free, and KapCorp would get only \$20,000 from the net gain in future earnings. If the options are sold for \$80,000, the employees would get only \$20,000 from paying \$80,000 for the \$100,000 worth of options, while KapCorp would get \$100,000 from the \$80,000 option premium and the \$20,000 net gain. Similarly, if the options are sold at their fair value of \$100,000, the employees would get nothing while KapCorp would get the entire \$120,000. In sum, selling (or granting) stock options to employees is both a mechanism to generate extra future earnings and a process to share them with the employees; the corresponding (implicit) option premium represents, to the granting company, a "rent" that it can extract from employees, and to the employees, a fee they are willing to pay to take part in the granting as a win-win value-added process.

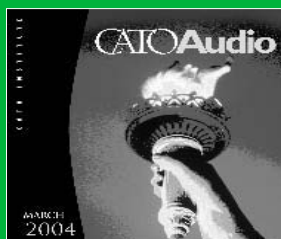
TO EXPENSE OR NOT TO EXPENSE? The answer to that question depends, according to the above analysis, on whether an option

granting is a hidden financial transaction that postpones the granting company's current compensation expenses to the future, or an incentive mechanism to improve the company's long-term performance. Option granting in the real world could be a combination of both; yet, intended or not, employee stock options would always have the incentive function. Therefore, the mandatory expensing pushed by the FASB is not justified in principle because it effectively forces a company to interpret its option granting as a sheer financial activity and deny the fact that it is as likely, if not more so, to be an incentive mechanism. In practice, the mandatory expensing would unduly deter the use of options as an incentive mechanism. KapCorp may not want to grant options for free if it has to expense their value at the grant date, even though the granting would cost it nothing at present but rather bring it extra earnings in the future.

CONCLUSION Let us conclude this article by answering the aforementioned three questions raised by Warren Buffett to challenge expensing opponents. Stock options are indeed a form of compensation—they are a special kind of compensation intended to reward the positive impacts of employee services on the granting company's long-term performance. Stock options are indeed an expense—they represent the granting company's contingent future expenses. And stock options as an expense should indeed go into the calculation of earnings—they should be expensed against earnings in the future when the expense is realized, but not at the grant date. **R**

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