FUZZY NUMBERS

DESPITE THE REFORMS, CORPORATE PROFITS CAN BE AS DISTORTED AND CONFUSING AS EVER. HERE'S HOW THE GAME IS PLAYED.

BY DAVID HENRY

Construction giant and military contractor Halliburton Co. did something mind-boggling last year: It reported earnings of $339 million, even though it spent $775 million more than it took in from customers. The company did nothing illegal. Halliburton made big outlays in 2003 on contracts with the U.S. Army for work in Iraq—contracts for which it expected to be paid later. Still, it counted some of these expected revenues immediately because they related to work done last year. Investors didn't get the full picture until six weeks later, when the company filed its complete annual report with the Securities & Exchange Commission. Halliburton says it followed generally accepted accounting principles (GAAP).

Maybe so, but after three years of reforms in the wake of corporate scandals, the Halliburton case illustrates that earnings remain as susceptible to manipulation as ever. Why? Because accounting rules give companies wide discretion in using estimates to calculate their earnings. These adjustments are supposed to give shareholders a more accurate picture of what's happening in a business at a given time, and often they do. Bean counters call this accrual accounting, and they have practiced it for decades. By accruing, or allotting, revenues to specific periods, they aim to allocate income to the quarter or year in which it was effectively earned, though not necessarily received. Likewise, expenses are allocated to the period when sales were made, not necessarily when the money was spent.

The problem with today's fuzzy earnings numbers is not accrual accounting itself. It's that investors, analysts, and money managers are having an increasingly hard time figuring out what judgments companies make to come up with those accruals, or estimates. The scandals at Enron, WorldCom, Adelphia Communications, and other companies are forceful reminders that investors could lose billions by not paying attention to how companies arrive at their earnings. The hazards were underscored again Sept. 22 when mortgage-finance giant Fannie Mae said its primary regulator had found that it had made accounting adjustments to dress-up its earnings and, in at

ALEX NABAUM

least one case, achieve bonus compensation targets. The company said it is cooperating with government investigators. The broader concern is that corporate financial statements are often incomplete, inconsistent, or just plain unclear, making it a nightmare to sort out fact from fantasy. Says Trevor S. Harris, chief accounting analyst at Morgan Stanley: "The financial reporting system is completely broken."

Indeed, today's financial reports are more difficult to understand than ever. They're riddled with jargon that's hard to fathom and numbers that don't track. They're muddled, with inconsistent categories, vague entries, and hidden adjustments that disguise how much various estimates change a company's earnings from quarter to quarter, says Donn Vickrey, a former accounting professor and co-founder of Camelback Research Alliance Inc., a Scottsdale (Ariz.) firm hired by institutional investors to detect inflated earnings.

Income, balance sheet, and cash flow statements are out of sync with one another

The upshot: The three major financial statements—income, balance sheet, and cash flow—that investors and analysts need to detect aggressive accounting and get a full picture of a company's value are out of sync with one another. Often, the income and cash-flow statements don't even cover the same time periods. "A genius has trouble trying to get them to tie together because different items are aggregated differently," says Patricia Doran Walters, director of research at CFA Institute, the professional association that tests and certifies financial analysts. "You have to do an enormous amount of guessing to even come close."

Many of the reforms adopted by Congress and the SEC will not remedy the situation. Most are aimed at policing the people who make the estimates rather than the estimates themselves. And some changes have yet to go into effect. No doubt, chief executives and auditing committees are paying closer attention to the numbers, and accounting experts believe there are fewer instances these days of outright fraud. But that's to be expected in a stronger economy. The big question is whether increased scrutiny is yielding more realistic estimates or just more estimates documented by reams of assumptions and rationalizations. We'll only know the answer when the economy begins to falter and corporate earnings come under pressure.

Already, recent academic research suggests that the abuse of accrual accounting is pervasive across a broad swath of


ALEX NABAUM (2)

companies. And it's enough to goad Wall Street into action. Aware that executives have tremendous opportunity to manipulate the numbers through their estimates, the market is on alert, delving more vigorously than ever into the estimates that go into compiling earnings. Over the past two years, investment banks have beefed up their already complex computer programs to screen thousands of companies to find the cheerleaders who make very aggressive estimates.

As analysts and investors drill deeper into these financials, they're finding some nasty surprises. Accounting games are spreading beyond earnings reports as some companies start to

PUMPING UP THE CASH

Analysts used to believe that cash is a fact and earnings an opinion. Now they're discovering how accounting rules allow companies to massage the presentation of their cash positions, too. Here's what a company can do:

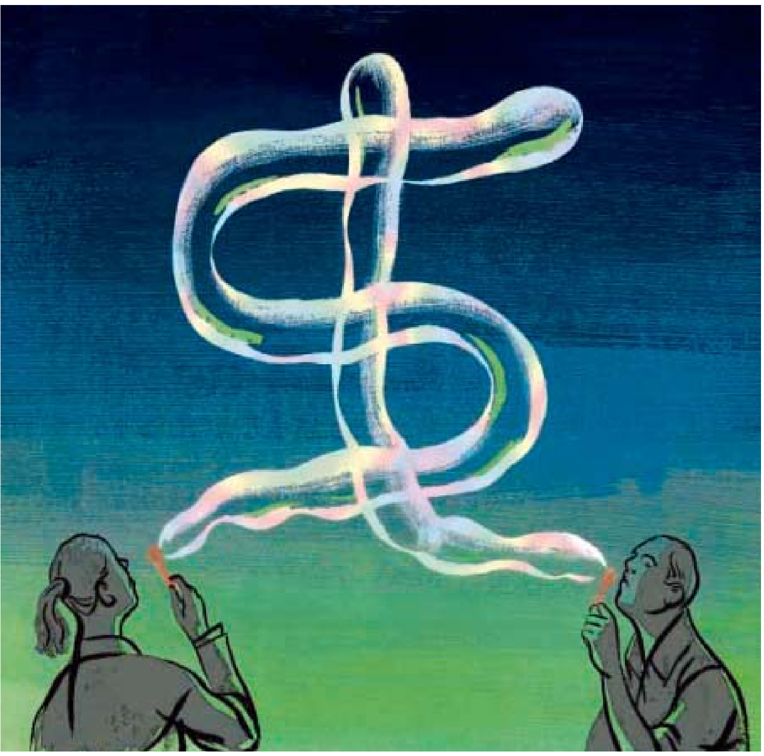
TRADE SECURITIES	FREE UP WORKING CAPITAL	SELL RECEIVABLES	TURN TRADE CREDIT INTO CASH
Company designates certain stocks or money market accounts it holds as trading instruments	Company cuts inventories, delays payments to suppliers, and leans on customers to pay faster	Company sells customer IOUs for less than face value, booking the cash immediately instead of waiting for customers to pay	Company lends money to customers to buy its products; resulting sales count as cash from operations, with loans shown as investments
EFFECT			
Inflates operating cash flow when the securities are sold; masks the volatility of the business	Raises cash flow from operations, but tends to hurt future growth; often reversed in later quarters, depressing cash flow	Gives cash flow from operations a one-time lift; reduces amount of cash company ultimately receives	Boosts operating cash flow with company's own money; encourages risky lending practices

SPINNING THE EARNINGS

Even when playing strictly by the book, companies have many ways to inflate–or deflate–the earnings they report. Here's how:

ESTIMATE SALES	PREDICT BAD DEBTS	ADJUST INVENTORY	FORECAST UNUSUAL GAINS OR LOSSES
Company estimates the revenues it will receive after allowing for discounts, product returns, and the like	As it sends out bills, company figures how much it will lose on customers who don't pay	Company underestimates how much inventory will become obsolete	Company predicts special costs, such as restructurings or special gains
EFFECT			
Optimistic adjustments inflate sales and earnings; conservative ones act as a cookie jar that stores earnings for thinner times	Understating bad debts lowers operating expenses and raises earnings; overstating bad debts gives profits a lift when the estimates are reversed	Lowballing losses on inventory overstates current profits and hurts future results when inventory is finally written off	Overestimating one-time expenses cuts earnings now, but banks them for the future; overestimating gains boosts profits, but sets up a potential earnings hit later

play fast and loose with the way they account for cash flows. That's a shocker because investors always believed cash was sacrosanct and hard to trump up. Now they're discovering that cash is just as vulnerable to legal manipulation as earnings. Companies from Lucent Technologies Inc. to Jabil Circuit Inc. have boosted their cash flow by selling their receivables—what customers owe them—to third parties. Says Charles W. Mulford, accounting professor at Georgia Tech's DuPree College of Management and author of an upcoming book on faulty cash reporting: "Corporate managers, knowing what analysts are looking at, say: 'Let's make the cash flow look better.' So the game goes on." A Lucent spokesman says it sells receivables to raise cash more cheaply than it could by borrowing the money. Jabil did not respond to questions.



Even with Wall Street's heightened scrutiny, many pros think the situation won't improve anytime soon—and it may well get worse. That's because accounting standard-setters at the Financial Accounting Standards Board (FASB) are deep into a drive to require companies to make even more estimates—increasing the potential for further manipulation of their bottom lines. One example: It's requiring companies to estimate changes in the value of a growing list of assets and liabilities, including trade names and one-of-a-kind derivative contracts. Eventually, companies will have to make corresponding adjustments, up or down, to their earnings.

There's some logic in FASB's position. It wants to improve the way changes in the value of corporate assets are reflected in financial statements because they can have a significant impact on a company's value. FASB argues the new estimates should be reliable since many will be based on known market prices. Unfortunately, others will rest on little more than educated guesses that in turn depend on a lot of other assumptions. "When you do that, you reduce the reliability of the numbers, and you open up the doors to fraud," says Ross L. Watts, accounting professor at the William E. Simon Graduate School of Business Administration at the University of Rochester.

FASB is understandably gun-shy about imposing even more rules on businesses. It has spent the last three years, and lots of political capital, trying to put in place requirements to expense the cost of stock options and to limit off-balance-sheet arrangements. But it has come up short by not insisting on financial statements that show in a simple way what judgments have gone into the estimates. FASB Chairman Robert H. Herz doesn't feel any urgency to do so. He argues that investors and analysts aren't yet using all the information they now have. Besides, he adds, he doesn't want to pile too many new requirements on companies. After the recent reforms, Herz says: "Right now, [they] are very tired."

Tired, maybe, but not tired enough to renounce numbers games. Even among execs who wouldn't dream of committing fraud, there are plenty who are ready to tweak their numbers in an effort to please investors. In a Duke University survey of 401 corporate financial executives in November, 2003, two out of five said they would use legal ways to book revenues early if that would help them meet earnings targets. More than one in five would adjust certain estimates or sell investments to book higher income. Faulty accounting estimates by execs caused at least half of the 323 restatements of financial reports last year, according to Huron Consulting Group.

The cost of this obfuscation is high. According to studies of 40 years of data by Richard G. Sloan of the University of Michigan Business School (page 88) and Scott Richardson of the University of Pennsylvania's Wharton School, the companies making the largest estimates—and thus reporting the most overstated earnings—initially attract investors like moths to a flame. Later, when the estimates prove overblown, their stocks founder. They lag, on average, stocks of similar-size companies by 10 percentage points a year, costing investors more than $100 billion in market returns. These companies also have higher incidences of earnings restatements, SEC enforcement actions, and accounting-related lawsuits, notes Neil Baron, chairman of Criterion Research Group, a New York researcher where Richardson consults. "Given the pressure on executives to reach expected earnings, it is not surprising," says Baron.

That's why more portfolio managers are using sophisticated screening to identify companies that make aggressive estimates and those that don't. Sloan and Richardson discovered that if you had sold short the companies with the biggest estimates and bought those with the smallest, you would have beaten the market 37 out of 40 years and by a huge margin—18 percentage points a year before trading costs. Now, Goldman Sachs Asset Management, Barclays Global Investors, and Susquehanna Financial Group, among others, are employing versions of the Sloan-Richardson models to guide their investments. Strategists at brokerages, including Sanford C. Bernstein Research, Credit Suisse First Boston, and UBS have built model portfolios using similar techniques.

Others on Wall Street seek an edge by going even further: They're deconstructing and rebuilding companies' financial reports. Morgan Stanley's Harris recently led an 18-month project aimed at filtering out the effects of accounting rules that can distort results from operations. His team gathered some 2.5 million data points and held countless discussions with analysts of individual companies. In an early test, the exercise determined that Verizon Communications Inc.'s pretax operating profit in 2003 was $13.7 billion rather than the $16.2 billion Morgan Stanley's star telecom analyst had first calculated using GAAP. That's mainly because GAAP allows companies to include estimates for what their pension plans will earn as current profits. A Verizon spokesman said the company has been careful to disclose its assumptions and tell investors how much its pension accounting boosts earnings.

Estimates—of pension-fund profits, unpaid receivables, old inventory—are easy to manipulate

Here are some of the ways companies can legally use accounting rules to inflate—or deflate—the earnings and cash flow they report:

ESTIMATE SALES With the stroke of a pen, companies can use estimates that make it appear as though sales and earnings are growing faster than they really are. Or, if they fear lean times ahead, they can create a cookie jar of revenues they can report later. Hospital companies, such as Health Management Associates Inc., report revenues after estimating discounts they will give to insurers and for charity cases. These discounts are typically two-thirds of list price, so a slight change in what HMA figures they will cost could have a large impact on its income. Vice-President for Financial Relations John C. Merriwether says the company uses conservative estimates.

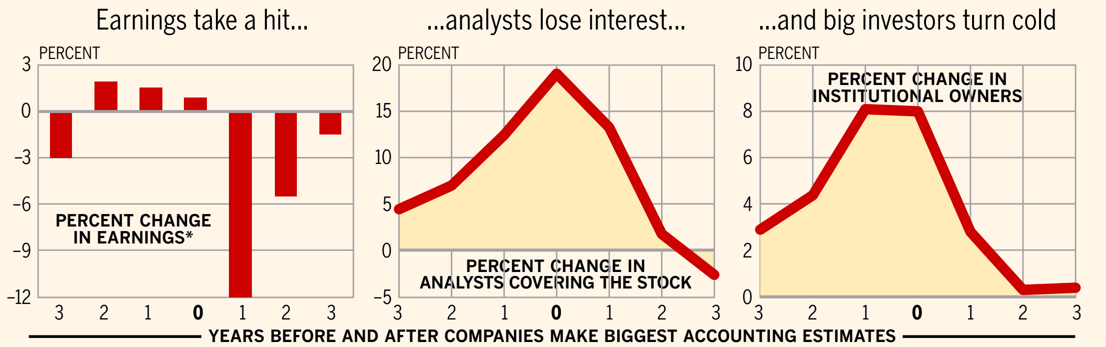
Getting the revenue right isn't easy. Computer software vendor IMPAC Medical Systems Inc. says three different auditors gave differing opinions on when it could count revenue from certain contracts that included yet-to-be-delivered products. Its latest auditor, Deloitte & Touche, resigned just 10 weeks into the job after declaring that the company had counted revenue from 40 contracts too soon. IMPAC Chairman and CEO Joseph K. Jachinowski says he's asking the SEC how to book the contracts.

PREDICT BAD DEBTS How companies account for customers' bad debts can have a huge impact on earnings. Each quarter they set aside reserves for loan losses—essentially guesses of how much money owed by deadbeats is unlikely to be paid. The lower the estimate, the higher the earnings. On July 21, credit-card issuer Capital One Financial Corp. reported quarterly results that would have been 3¢ a share below Wall Street estimates had it not reduced its reserves, says David A. Hendler, an analyst at researcher CreditSights. Capital One CFO Greg L. Perlin says the company made the change because it is lending to more credit-worthy customers now.

Sometimes companies on opposite sides of the same deal use different estimates. An example: Reinsurance companies have reserves of about $104 billion to pay claims they expect from property-and-casualty insurers. But the P&C insurers have booked $128 billion in payments they expect to receive from the reinsurers, according to Bijan Moazami, an insurance-industry analyst at Friedman, Billings, Ramsey Group Inc. He says the property-and-casualty companies will cut earnings as it becomes clear they won't collect all the money. Hartford Financial Services Group Inc. and St. Paul Travelers Cos. took such charges this spring, of $118 million and at least $164 million after taxes, respectively. The Hartford said it acted after reviewing its reinsurance arrangements.

THE HIGH-RISK EARNINGS GAME

Companies with the highest accounting estimates get an outsized lift to earnings, attracting analysts and investors. But once the estimates peak (shown as year 0 in the charts), bad things start to happen very quickly:



Data: Richard Sloan and Reuven Lehavy, University of Michigan

*CHANGE IN RETURN ON EQUITY

CHARTS BY ERIC HOFFMANN/BW

A St. Paul Travelers spokesman says: "We are comfortable with our estimates."

ADJUST INVENTORY By changing the costs they estimate for inventory that will be obsolete before it can be sold, companies can give their earnings a substantial boost. Vitesse Semiconductor Corp. took inventory expenses of $30.5 million in 2002 and $46.5 million in 2001. In 2003, it took no expenses but wrote off $7.4 million against a previously established reserve for obsolete inventory. Had it not tapped its reserves, the $7.4 million would have come out of current earnings, notes Terry Baldwin, an accounting analyst at researcher Glass Lewis & Co. Instead, Vitesse was able to report earnings of about 2¢ a share more than it could have otherwise. Vitesse's vice-president for finance, Yatin Mody, says the company properly counted the costs in 2002 when it foresaw that the goods were likely to become obsolete because of the telecom bust.

Inventory accounting can produce even more bizarre outcomes. Last year, General Motors Co. reported an extra $200 million in pretax income after using up more inventory than it replaced. In standard last-in, first-out inventory accounting, when the older and less costly goods are sold at today's prices, profits look better. But GM's future earnings could be hit if it needs to replace inventory at higher prices. GM says it properly applied accounting rules to its inventory management.

FORECAST UNUSUAL GAINS OR LOSSES The ability to time big and unusual gains or expenses can give companies plenty of control over their numbers. For 2003, Nortel Networks Corp. reported an earnings rebound when it reversed a portion of the $18.4 billion in charges it had logged for restructuring costs, bad customer debts, and obsolete inventory in the preceding three years. But last Apr. 28, the company said it "terminated for cause" its chief executive, its chief financial officer, and its controller amid an ongoing review and restatement of financial reports. In August, Nortel said it had fired seven more finance officers. Now the company says it had paid out $10 million in executive bonuses based on the trumped-up rebound. Nortel's new managers say they're trying to get the money back and that an independent panel "is examining the circumstances leading to the requirement for the restatements."

MASSAGE CASH Because analysts and investors are focusing on cash flow from operations as an indicator of financial health, those numbers are now a prime target for massaging. Companies have had to report cash flows since 1988, classifying them into one of three categories: operating, investing, and financing. By exploiting loopholes in GAAP rules, they can make their operating cash look a heap better. For example, in their consolidated financial statements, Boeing, Ford, and Harley-Davidson count as cash from operations the proceeds of sales of planes, cars, and bikes that customers bought with money they borrowed from the companies' wholly owned finance subsidiaries. As a result, cash from operations is higher, even though the companies didn't rake in any more of it. In its quarter through March, Boeing Co. reported $268 million in cash from operations that actually reflected what the company classified as investments by Boeing Capital Corp. in loans to customers to buy aircraft. Without the transactions, Boeing would have reported a $363 million drain of operating cash. For all of 2003, such transactions contributed $1.7 billion of Boeing's $3.9 billion in operating cash. The company says it has been preparing its accounts this way for years, and the method conforms to GAAP rules. Boeing began disclosing the amounts in a footnote in mid-2002. Harley-Davidson Inc. Treasurer James M. Brostowitz says its loans are properly disclosed, and analysts can make adjustments as they see fit. A Ford spokesman says the company's accounting complies with GAAP and accurately reflects its business.

The way cash flows are being finessed is as worrisome as '90s dot-com earnings were

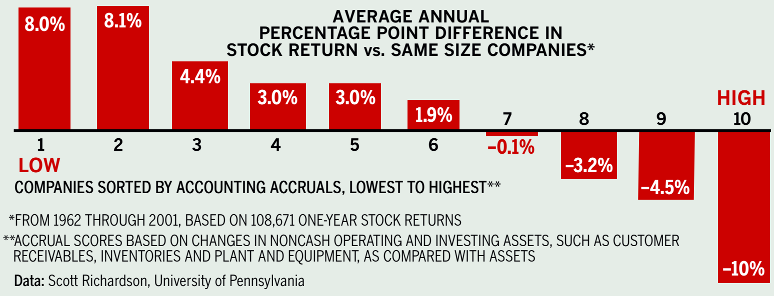
The simplest way for companies to pump up their cash is to sell what customers owe them to a third party. Increasingly, companies carve out these receivables from their most creditworthy customers, sell them at a discount, and then present the move as smart capital management that boosts liquidity. Such deals give analysts fits because they are really financing actions. Jabil Circuit sold some receivables in an arrangement with a bank in the two quarters ended in May. That added $120 million, or nearly half of the $275 million of operating cash flow it reported in the period. But Jabil had to sell its receivables at a discount and recognize a $400,000 loss. The company did not provide comments after repeated requests.

Some transactions just keep operating cash flows looking pretty: Companies can use excess cash to buy securities when business is booming and then harvest it by selling them when the business runs cold. In 2003, Ohio Art Co., the tiny maker of Etch-A-Sketch drawing toys, used cash from operations to buy $1.5 million worth of money market funds. It sold them this year, boosting cash flow. CFO Jerry D. Kneipp says the company relied on its auditors in reporting the transactions. Cable company Comcast Corp. reported $85 million in additional operating cash flow in 2003 from sales of securities. Though this move was by the book, it distorted cash flow from operations. Comcast says that before 2002 it counted such proceeds as cash from investments. It changed the way it reports such deals to meet a 2002 FASB standard.

Mergers, too, can cloud the numbers. Consider again the HMA hospital chain. It regularly has a higher ratio of receivables to sales than do its peers—a red flag to analysts because it might be a sign that a company is booking more revenues than it will ever collect. But HMA's Merriwether says the high receivables are explained largely by its steady acquisitions of hos-

BIG ESTIMATES, SMALL RETURNS

It pays for investors to know the extent to which managers make accounting estimates in their reported earnings. The reason: In 37 out of 40 years, stock returns were higher for those with low estimates.



*FROM 1962 THROUGH 2001, BASED ON 108,671 ONE-YEAR STOCK RETURNS

**ACCRUAL SCORES BASED ON CHANGES IN NONCASH OPERATING AND INVESTING ASSETS, SUCH AS CUSTOMER RECEIVABLES, INVENTORIES AND PLANT AND EQUIPMENT, AS COMPARED WITH ASSETS

Data: Scott Richardson, University of Pennsylvania

CHART BY ALBERTO MENA/BW

pitals, about four a year. With each deal, it has to submit new paperwork to the government and private insurers and wait weeks before they will pay new patients' bills, he says. With a continuous flow of deals, says Sheryl R. Skolnick, an analyst at Fulcrum Global Partners who has recommended selling HMA's stock, "you have no idea what is going on."

One of the quickest, but most fleeting, ways companies can increase cash flow is to shrink their working capital. That can include selling off inventory, pressuring customers to pay quickly, and stalling payments to suppliers. While executives often claim that these moves make the company increasingly powerful and profitable, the opposite may actually be the case. General Dynamics Corp., for example, boasts in its 2003 annual report that it "has proven itself an industry leader in generating strong cash flows, which have enabled it to enhance returns through strategic and tactical acquisitions and share repurchases." Cash generation was "particularly strong" in 2003, it said. But while cash flow from operations rose to $1.7 billion from $1.1 billion the year before, half of the improvement came from slashing inventories in 2003 after adding to them in 2002. While cutting inventory may make sense given the weakened market for planes, it was a one-time cash boost from downsizing a business, not a sign of strong future cash flows. A company spokesman notes that Chairman and CEO Nicholas D. Chabraja told analysts in January that while General Dynamics' cash flow may fluctuate from year to year, it has tracked earnings over the past five years, even as the company was investing for growth in other areas.

The way companies are spinning their cash flows looks to some analysts as worrisome as the press releases announcing "pro-forma" earnings that companies cultivated during the 1990s tech-stock bubble. General Motors, for example, boasted in a Jan. 20 press release that it had "generated" $32 billion in cash in 2003. "That's outrageous," says Marc Siegel, a senior analyst at the Center for Financial Research & Analysis. GM had actually borrowed about half of that money by issuing bonds and convertible securities. The auto maker says it had explained publicly the steps it was taking to get that cash number.

Concentrating too much attention on short-term cash flows can have significant effects. It could discourage companies from making investments that could add to economic growth and boost returns on capital. "They are routinely saying 'no' to valuable projects," laments Campbell R. Harvey of Duke University's Fuqua School of Business. Some stocks, such as Computer Sciences Corp., now tend to move up when they report higher "free cash flow," a measure that looks better when companies scrimp on capital investments. CSC declined to comment. The danger, warns Morgan Stanley's Harris, is that "we can end up inducing people to make wrong economic decisions for appearance purposes. Then the investor will lose." Indeed, CFOs' desire to show high free- cash flow may be one reason corporate investment is now far below average.

THE SOLUTIONS For now, investors are left largely to their own devices to make sense of companies' numbers. Auditors—the first line of defense against financial shenanigans—are under scrutiny by a new oversight board, which is rewriting audit standards. Other accounting reforms have yet to take effect. The requirement in the Sarbanes-Oxley Act of July, 2002, which compels executives and directors of big companies to establish internal controls on bookkeeping and valuations underlying financial reports, won't be in full force until next year. And while the SEC's Corporation Finance Div. has started prodding companies to disclose more of their critical accounting estimates in public filings, the results so far are spotty, and many disclosures are buried in dense text. FASB is talking about revamping the income and cash-flow statements, but not for at least a couple of years.

There's plenty that regulators could do now to improve the quality of financial information. FASB should put aside some of its less pressing projects and turn its full attention to making it easier for investors to get behind companies' earnings numbers. If the form and presentation of financial statements were cleaner and more consistent, investors would be better able to spot accounting tricks. For example, earnings statements could be recast to distinguish between profits that come from selling products from those that come from ever-changing estimates. "You want to understand the subjectivity involved in these different numbers," says the CFA Institute's Walters.

The statement of cash flow needs a lift, too. Regulators must change the mirror-image presentation in which increases in cash show up as negative numbers and decreases as positive. They also have to define more clearly what constitutes an operating, investing, or financing item.

And FASB should make it easier for investors to make reliable comparisons. An obvious and simple step would be for companies to present their statements of cash flows for the same periods as their earnings statements. Even better would be to show the cumulative earnings and cash flows for the previous four quarters as well. Now most companies simply compare the latest quarter's earnings with those for the same quarter a year be-

ALEX NABAUM

LIFTING THE FOG

Companies could help investors by showing clearly the estimates and judgments they make in reporting earnings. Here's what they need to do:

- Overhaul the statement of cash flow to keep transactions from investing and financing separate from operating cash.
- Redo the income statement to break out operating results from estimated changes in the value of assets and liabilities.
- Report income and cash flow for the same time periods; give comparable results for the previous four quarters.
- Show changes in important accounting estimates in easy-to-read tables each quarter.
- Use the same categories and terminology in quarterly reports so that each item can be compared over time.

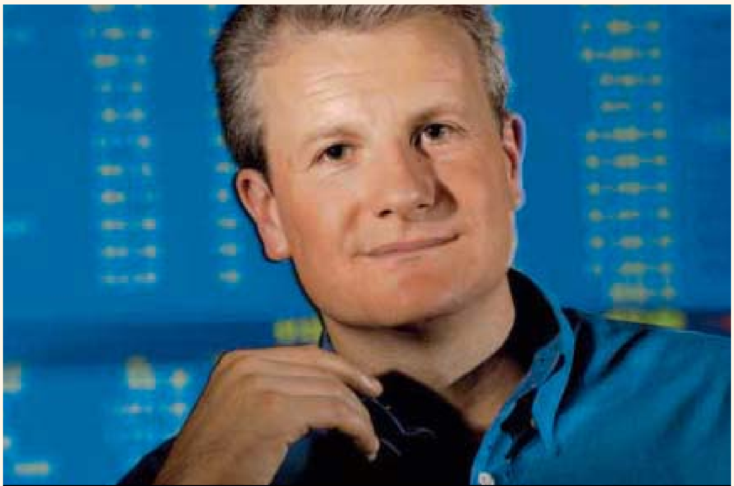
fore, but present a year-to-date statement of cash flows without a comparison. Many financial analysts rearrange company data to highlight meaningful comparisons, but they have to build special spreadsheets for the task, and they need a library of past reports to feed into them. Companies should also clearly display in tables—not just in text—the changes they make in reserves.

With better and more consistent information in financial statements, investors would be able to reward and punish companies based on the quality of their accounting. "Then [investors] would start providing some discipline by discounting stocks when they aren't sure what the numbers are going to be," says Lynn E. Turner, a former SEC chief accountant and now research director at Glass Lewis. What's more, auditors would be on increased alert knowing that investors are looking over their shoulders.

Because companies will be using even more estimates in the future, they'll have even more opportunities to hype their results. To avoid future blowups, investors need a clear picture of a corporation's finances. Investors shouldn't have to wait for another Enron for regulators to tackle these issues.

A MARKET SCHOLAR STRIKES GOLD

As an accounting professor at the University of Michigan, Richard G. Sloan was happy to receive a call inviting him to speak to a couple of hundred top institutional investors in New York City. Trouble was, Sloan was going to be on sabbatical in Western Australia when the conference was held in March. So Bernstein Research, the conference sponsor, flew him back—in business class.



SLOAN Investors put too much faith in reported earnings

DONNA TEREK

Such is 39-year-old Sloan's star power now that a Wall Street firm will hire him to travel 30 hours to give a one-hour talk and chat with some clients. His acclaim is founded on a paper he published in 1996 in a tiny journal, *The Accounting Review.* Using decades of data, Sloan was the first to find that investors habitually overlook the role accounting estimates play in determining a company's earnings and hence its stock performance. He sorted through clues in the financial reports and came up with the 10% of companies using the biggest estimates and the 10% using the smallest. His discovery, now known as the accrual anomaly, revealed that companies routinely using the highest estimates had stock prices most likely to fall, while those with the lowest tended to rise.

The market's inability to detect this pattern means that big money is left on Wall Street trading floors. How much? Well, if you had sold short the basket of stocks with evaporating earnings while buying the 10% on the rise, you would have beaten the market, before trading costs, by an average of 18 percentage points a year from 1962 to 2001, Sloan figures. Now investors are clamoring to exploit this market inefficiency. "They seem to be in a bit of a frenzy about it," he says.

It wasn't always so. For years, Sloan didn't get much credit for his insight. Academics didn't believe the market would consistently miss the relationship between estimates and stock price. Sloan even doubted it himself when he first ran the numbers in 1991. Then, the reigning view was that markets efficiently use all available financial information to determine a stock's worth. "I thought I must have done something wrong," he says.

He checked and rechecked the numbers. Then he submitted his paper to an academic journal four times in five years, only to have it returned each time with questions and suggestions for investigation. He finally sent the paper to *The Accounting Review,* which accepted it on his second try. Even so, Sloan was almost apologetic about his results in the article's conclusion. "He was still kind of keeping the door open for efficient markets even though he had discovered this anomaly," says Bruce A. Gulliver, president of Jefferson Research & Management, a Portland (Ore.) firm that uses Sloan's analysis in its stock research and investing.

Doubters among his peers persisted. "A very large number of papers followed up to check on him," says Charles M.C. Lee, a Cornell University accounting professor now on leave to help Barclays create portfolios using Sloan's ideas. "It is not a statistical fluke." The big accounting scandals proved Sloan was right: Investors had put too much trust in reported earnings.

Debate continues over why this anomaly occurs. Some scholars think it's less a matter of earnings manipulation and lazy investors than executives trying to grow their companies too fast and investors going along. Sloan and a colleague, Scott Richardson at the University of Pennsylvania, have concluded that growth isn't the big factor. They say the primary blame lies, if not with manipulation, with the hubris of executives and investors who want to believe that their assumptions will drive the stock higher.

Whatever the cause, Sloan and others say there's still money to be made. But as more people catch on, this trading opportunity should diminish. How long it lasts depends on the ability and determination of investors to review earnings estimates skeptically.

–By David Henry in New York

A fuzzy number is a generalization of a regular, real number in the sense that it does not refer to one single value but rather to a connected set of possible values, where each possible value has its own weight between 0 and 1[1]. This weight is called the membership function.Â Calculations with fuzzy numbers allow the incorporation of uncertainty on parameters, properties, geometry, initial conditions, etc. YouTube Encyclopedic. 1/3. A fuzzy number is a generalization of a regular, real number in the sense that it does not refer to one single value but rather to a connected set of possible values, where each possible value has its own weight between 0 and 1. This weight is called the membership function. A fuzzy number is thus a special case of a convex, normalized fuzzy set of the real line. Just like Fuzzy logic is an extension of Boolean logic (which uses absolute truth and falsehood only, and nothing in between), fuzzy numbers A 'fuzzy number' is a quantity whose value is imprecise, rather than exact as is the case with ordinary (single-valued) numbers. Any fuzzy number can be thought of as a function whose domain is a specified set (usually the set of real numbers), and whose.