

THE BEST OF NERA II WEDNESDAY JULY 27, 2005

THERESA GABALDON: Good afternoon. I'm Theresa Gabaldon, Professor of Law and Carville Dickinson Benson Research Professor of Law, at The George Washington University Law School, and moderator today of an online program – The Best of NERA II, presented by the Securities and Exchange Commission Historical Society. The Securities and Exchange Commission Historical Society is a non-profit organization, separate from and independent of the US Securities and Exchange Commission. The Society preserves and shares SEC and securities history through its virtual museum and archive at www.sechistorical.org. That museum and archive already contains the “Best of NERA”, which it was my privilege to host last July. I look forward to an equally robust discussion of current securities issues in today's online program. Today's program also will be preserved in the museum so you can listen to the discussion or read the transcript later.

The Best of NERA II is made possible through the support of NERA Economic Consulting, and offers some of the top presentations from NERA's recent Finance, Law and Economics Securities Litigation seminar, an annual event held over the Fourth of July holiday. Dr. David Ellis will be discussing hedging restricted stocks. Dr. James Jordan will be discussing analysis of the diversification of investment funds, and Dr. Stephanie Plancich will be discussing economies of scale in mutual funds. We will conclude the program with a discussion among all the panelists of some of the issues raised. The remarks made today are solely those of the speakers and are not representative of those of the Society. Our speakers cannot give investment or legal advice.

We'll begin by introducing Dr. David Ellis. Dr. Ellis is a vice-president in NERA's securities and finance practice. He is a graduate of the University of Durham, Brigham Young University, and the University of North Carolina at Chapel Hill.

David, you're addressing hedging restricted stock, an issue which should be of concern to quite a number of investors, financial professionals, and, oh yes, lawyers. We listen with interest.

DR. DAVID ELLIS: Thank you, Theresa, and I'd also like to thank the Society and its members for inviting us here today and giving us this opportunity of speaking. And as you mentioned, today I will be focusing on a fairly narrow aspect of litigation that concerns hedging and diversification topics, namely as it arises with respect to the hedging of restricted stock positions. In particular, I will be addressing the questions of whether and how restricted stock positions can be hedged or diversified. Restricted stock positions by their nature are typically very highly concentrated and liquid, the very type of portfolio that is crying out to be diversified, and yet the restricted nature of the security often means the position cannot be diversified or even hedged. When then can one hedge a restricted stock position?

I will attempt to answer that question by discussing three situations that on the surface at least seem very similar. In the first one, Mr. F had sold his company in exchange for restricted stock in the company that acquired his. In the second, a lady by the name of Ms. S sold her company in exchange for restricted stock in a different company, and finally another person, Ms. N received restricted stock as part of her annual bonus. What, if anything, could these individuals do?

Well, it turned out that Mr. F could hedge and did hedge his restricted stock, buying an over-the-counter derivative known as a costless collar. Ms. S on the other hand could not hedge, while finally, the third individual, Ms. N could hedge, but chose not to. Why did these three apparently similar situations have such different outcomes, and moreover, since we know that I wouldn't even be discussing these situations unless litigation had taken place at some point, why did all three of them sue their brokers?

Well, Mr. F, it turned out, sued his broker over the terms of the costless collar that he entered into, and some things that happened when the collar was unwound. Both Ms. N and Ms. S sued their brokers over alleged failures to hedge and alleged failures to diversify.

I'm going to be focusing first of all on the economics of restricted stock, and then I'm going to take a look at the details of these three cases that led to such different outcomes, and finally I'm going to discuss a little bit about what is the role of people such as myself who are brought in as economic experts in these cases.

When it comes to restricted stock, not all restricted stock is created equal. It can arise from a couple of situations. First, it can come out of private contractual agreements between a company and its employees. In these cases, the restrictions that are imposed are usually in order to align the incentives of the employees to those of the shareholders or stockholders, trying to make sure that the actions the employees take will serve to maximize the shareholders welfare. Alternatively, stock is sometimes restricted because it's issued under Rule 144 of the 1934 Securities and Exchange Act. Such securities are private placements, they are not registered, and it comes with a whole package of actions that have to be taken in order for the restrictions to be lifted. As we'll see shortly, the source of the restrictions matters when it comes to whether or not the individuals can hedge their restricted stock positions and how.

Sometimes companies, in addition to the basic restriction of not being able to sell the stock whenever they would like, impose even harsher additional restrictions on their employees. They sometimes have requirements that they cannot sell the stock short, nor buy puts or sometimes even sell calls. Why is this? Well, most of those actions are designed to allow investors to profit if the stock price goes down, and if you were to do that when you own the stock, you are effectively removing the downside risk from your stock position, and employers want to keep their employees' incentives aligned with those of the shareholders because if they were to hedge the downside risk, that would no longer be the case.

When it comes to the restrictions that are imposed under Rule 144, the SEC has maintained a fairly consistent position in terms of what hedging actions can be taken – no short selling and no use of exchange-traded options such as puts or calls. And there are reasons for that; primarily the concern is that if an individual were to get into some of these transactions, it could be the case that if the options were exercised that it would lead to a transfer of the stock before the restriction was lifted.

Coming back to our three individuals, why this different ability to hedge? Why was it the most fundamental case? Why was it that Ms. F could not hedge, but Ms. N could? It came down in this case to a question of wording. Both had very similar language in their stock agreements as far as what was restricted, namely the ability to transfer or otherwise dispose of the shares. But the two stock agreements had different definitions of what constitutes a transfer. In the case of Ms. N, the term transfer meant "any sale, exchange, gift or bequest." Whereas in the case of Ms. S to that definition was added some crucial wording that was defined as "any sale, exchange, gift, bequest, hypothecation, pledge or grant of a security interest." The addition of those words - hypothecation, pledge, or granting of a security interest - were crucial because hedging transactions for restricted stock positions typically involved the stock being pledged as collateral or granting a security interest to the broker-dealer who undertakes the transaction. So if that wording is there, it is effectively precluding any type of hedging taking place. So we see why Ms. S could not hedge.

Why was it then that Ms. N could, but chose not to? Well, despite repeated suggestions by her broker to hedge and diversify, she refused, saying that she was still bullish on the stock. She was basically reluctant to give up any upside potential in order to obtain downside protection. At the time the strategy had been proposed, her stock was trading at about \$20 a share, down substantially from its all-time high of about \$60 a share some nine months previously. Her broker had proposed a derivative strategy called a costless collar, and a costless collar is simply a long position in the stock plus a long position in the put and a short

position in the call. The put provides a flaw to the position so that no matter how low the stock price sinks, the investor is guaranteed the floor price. However, the price of this downside protection comes in the form of a cap created by the short call position. The put strike is typically 5 to 10% below the current stock price, and the call strike is above the current stock price, and the collar is said to be costless because the strike price is set so the cost of the put is exactly offset by the premium received from riding the short call. But Ms. N chose not to do that because, as I said, she did not want to give up that upside potential that was there because of the cap.

Now with Mr. F, his stock was restricted under Rule 144 and there were no additional restrictions, and he chose to hedge his position with something known as a variable pre-paid forward. A pre-paid forward takes that costless collar I've just described and adds essentially a loan or a financing to it and it's an OTC transaction. On the transaction date, the investor agrees to that at expiration, the contract will be settled by delivering a number of shares that depends on the stock's price at expiration. Then the investor receives up front, as initial proceeds, the present value of the floor price, so he's effectively sold today for delivery at the end of the contract, his shares.

What happened with his hedge? Well, instead of waiting for the hedge to terminate, he chose to unwind it as soon as the restrictions were lifted, as soon as the holding period was over, but as he found out the hard way, a costless collar is only costless at the time it is created. If you unwind an over-the-counter derivative contract, you have to mark to market. As the stock price, level of interest rates, volatility all change, so will the value of the collar components. With any security, a dealer will sell it back to you, sell you something rather, at a slightly higher price than he will buy it from you, and this is called crossing the bid-ask spread. So it led to the situation where he actually had to pay over a million dollars to unwind his position because the stock price had risen over the cap price, and so he had to give up that upside gain.

Alternatively, if the stock price had dipped below the floor, he would have received a payment from the broker. And the other aspect of his case was that the hedge was removed as soon as the restrictions were lifted, but as anyone who has removed restrictions on Rule 144 knows, it doesn't happen immediately, it is a two to three week period before that can happen and the stock can then be sold. So he was left on hedge for that two to three week period, during which time the stock price continued to fall, and that was another part of the litigation that ensued.

We've heard a little bit about these three cases and seen a little bit how they differed. What were the three outcomes, and what was the role of the expert? Well, in the case of Mr. F, the expert's job was to explain to the NASD Arbitration Panel, the economics of pre-paid forwards, how they work, how they're priced, and how it was that they gave to Mr. F substantial economic benefits. And then he showed that it was, contrary to the allegations, that the variable pre-paid forward was the most suitable hedging vehicle in those circumstances and as a result partly of that testimony, the NASD panel dismissed nearly all of the allegations. In the case of Ms. N, the expert demonstrated that the collar was the most suitable hedge vehicle given her circumstances, and demonstrated that the hedging strategy proposed by her expert was neither affordable, feasible nor suitable. As a result, the NASD panel that was held to listen to the arguments dismissed all the allegations with prejudice. Finally, in Ms. S's case, I was hoping to be able to discuss the outcome here, but it's been postponed unfortunately because of the illness of the plaintiff. But when it comes down to it, what is going to happen is that similar to the other cases, the expert is going to demonstrate why hedging was not possible given the stock agreement terms, and then even if it had been possible that the hedge proposed by her expert was neither affordable nor suitable. The bottom line is that the details of the restrictions matter, and it's important to understand them both in legal terms and in economic terms, and also if hedging is possible, it is important to understand the details and the economics of the hedging transactions. Thank you.

THERESA GABALDON: Thank you, that was very interesting. Our format today calls for me to turn to the other speakers and then at the conclusion of their presentations, we'll reconvene for some discussion and certainly there will be some intriguing things to talk about based on what you've just told us. We now focus our attention on a discussion of the diversification of investment funds. Our speaker on this topic is Dr. James Jordan, a NERA Senior Vice-President who provides expertise in securities and derivatives markets. Dr. Jordan is a graduate of Mississippi State University and Southern Illinois University, and received his PhD from the University of North Carolina at Chapel Hill. Jim, will you enlighten us?

DR. JAMES JORDAN: Thank you, Theresa, and again thanks to the SEC Historical Society for this opportunity to participate in the program. My presentation is about analyzing the diversification of investment funds such as mutual funds and hedge funds. I'm going to discuss this topic similar to David's approach as if I were an expert in a litigation matter and I've been asked to analyze a complaint about a lack of diversification of a hedge fund. I will present a hypothetical complaint and an analysis of a hypothetical hedge fund and portfolio. Please keep in mind that although these are based on actual situations, they do not represent any actual case.

My story about diversification begins with the stock market of the late 1990's, which is now known as a speculative bubble that burst in 2000. The bubble was even worse in Nasdaq stocks which included many so-called technology stocks, and there is a tech stock component to my story. The hypothetical complaint says the following. The fund was not diversified despite the fact that the fund's prospectus stated "the fund's objective is to achieve long-term growth by managing a diversified portfolio. The portfolio will be diversified across industries and market sectors." The complaint goes on to say 80% of the fund's portfolio was invested in high-risk technology stocks.

In order to address this complaint, we need a clear understanding of diversification. We think we know diversification when we see it and when we don't. Think about diversification in your diet, for example. The USDA food pyramid, which encourages you to eat grains, vegetables, fruit and dairy, promotes a diversified diet. On the other hand, a diet consisting mainly of soda and potato chips could be called the heart attack pyramid. Eating three different kinds of chips, such as potato chips, Cheetos, and corn chips, is not the way to diversify your diet. Diversification of investments is similar in nature. We seek to reduce risk by spreading investments across securities with different risk exposures. Another way to say different risk exposures is to say that the securities' returns are not highly correlated. I'll use that word correlated or correlation a number of times in this talk. It simply means the extent to which security prices tend to move together.

To assess a claim about diversification, we need to do at least two things. First, measure portfolio concentration, and by that I mean the proportions of the money invested in different industries, and these proportions are also known as the portfolio allocations or portfolio weights. By the way, we could also analyze weights by other categories than industries. We could analyze by style categories such as growth stocks versus value stocks, and large cap stocks versus small stocks. For brevity today, I will discuss only industry categories. Secondly, and most importantly, we need to measure the risk of the portfolio. Since the purpose of diversification is to reduce risk, an analysis that does not actually measure risk does not tell us all we need to know about whether a portfolio is diversified.

Now the case put forward in the complaint is flawed. I will show that the complaint about lack of diversification fails on two counts. First, the complaint overstates the concentration in technology stocks, and second, the complaint fails to measure and analyze risk. Let's turn to that first issue, overstating concentration in technology stocks. This actually occurs in two ways. The complaint reports levered weights, rather than unlevered weights, as I will explain in a moment, and secondly, it uses an overbroad industry category known as information technology, which I will also explain in a moment.

First, the problem of using levered weights. The fund's portfolio consisted of \$40 million of so-called tech stocks, and \$60 million of other stocks, for a total asset portfolio of \$100 million. Now all of us would say that the weights are 40% in tech stocks and 60% in other stocks. Then how can the complaint claim a weight in tech stocks of 80%? Well, the answer is that the fund financed itself with debt. It borrowed from banks and brokers so that its equity was only \$50 million. Plaintiffs calculated the weights of the portfolio as a percent of equity, so \$40 million in tech stocks indeed is 80% of the \$50 million in equity. However, this is not the number that's appropriate for a diversification analysis. Diversification is a question of the asset mix, not whether you use debt to finance the assets or not.

I caution that in fund financial statements, you typically see percentage allocations expressed as a percentage of net assets, that is, of equity. However for a diversification analysis, these weights relative to net assets can just confuse the issue. In addition, if a fund engages in strategies such as short selling and hedging, the weights analysis is more complex than the example I can present today.

Turning now to those industry categories, you will recall that I said the complaint used an overbroad category known as information technology. This category is found in a system for classifying stocks known as the Global Industry Classification Standard, or GICS, if you will allow me to use that acronym. GICS was specifically developed for investment purposes by Standard & Poor's and Morgan Stanley. I would venture to say that it is now the most popular classification system when the question involves investing. The highest level of the GICS classification system puts stocks into one of ten categories called sectors. One of those sectors is information technology, another is consumer discretionary, there's financial, healthcare, and so on. At the highest level of classification, the fund's portfolio consisted of 40% information technology stocks, which is big enough to raise a question about whether the fund was sufficiently diversified, but be careful about the choice of classification level when you analyze diversification. There are four levels in the GICS system – the highest is the sector that I just discussed, and there are ten sectors. These are then broken down into 24 industry groups, and these are further broken down into 64 industries, and 139 sub-industries. If we measure the concentration of the fund's portfolio at the second and third level of classification, instead of at that highest sector level, we find quite a different answer. The highest weight in any industry group was about 16%. The highest weight in any industry at the third level was about 10%. Neither of these weights suggests a lack of diversification.

So which classification level should be used in the analysis? To answer this question, we would like to see some objective support that's not simply the expert's opinion and we get some help from the Standard and Poor's Corporation, which is one of the co-inventors of that system. In one of their publications, they suggest that industry group or industry levels, the second or third levels, would be appropriate for a risk analysis. In addition, there is academic research that has used the industry level when comparing the various classification systems for risk evaluation purposes. Moreover, it simply makes sense that the smaller the classification, the smaller the category, the more likely it is to contain similar companies which are exposed to similar risk factors and are highly correlated.

So on these grounds, the conclusion from the portfolio concentration analysis is that the evidence supports the conclusion that the fund was diversified. Now we can't stop there. As I mentioned earlier, we need to go on to the second and final step, which is the analysis where we measure portfolio risk. Portfolio risk is determined by the following four factors. First, the number of stocks in the portfolio, then the weight in each stock, then the risk of each stock, and when we say risk, think of volatility or fluctuation. We measure risk by a statistic that's calculated from historical returns, and it's called a standard deviation. And finally, the fourth factor is the correlations of returns between all of the stocks in the portfolio, and that's another statistic calculated from historical returns which measures this extent to which the stock prices tend to move together.

Considering first the number of stocks in the portfolio, research has shown that as stocks are added to a portfolio, there is a sharp decline in risk as the first ten to twenty stocks are added, but once you get into the range of 20 to 30 stocks, the decrease in risk really slows down, and as more than that are added, any further decrease in risk is virtually immaterial. In other words, many experts would agree that twenty to thirty stocks are enough to diversify a portfolio. Of course, it depends also on those other four factors. To see the effects of these, that is the weights, the individual stock risk, and the correlations, let's consider for a moment a two stock portfolio. The two stocks are Oracle, which is a tech stock as you probably know, and Waste Management, which is not. Now if the portfolio manager invests all the money in Waste Management, the portfolio risk, which we would measure using historical returns as I mentioned, let's say that risk is 50%. This means the stock could easily fluctuate plus or minus 50% in any given year. If all of the money is in Oracle, the risk is 60%. Now let's suppose the portfolio manager has put these two stocks in the portfolio, but has failed to notice that they are actually perfectly positively correlated. This means they move in virtual lockstep – when Oracle is down, Waste Management is down, and vice versa. You don't diversify or reduce risk by choosing stocks that move together. With a half-and-half allocation to these two stocks, 50% of our money in each, the risk if they were perfectly positively correlated is simply the average risk of the two, and so they had risk of 50% and 60% and that average would be 55%. We can think of this as a benchmark for a lack of diversification because it is the risk in a portfolio that results from choosing highly correlated stocks. Now if the two stocks were negatively correlated, we could actually choose a weighting of the two that would drive the portfolio risk all the way to zero. That would be a type of perfect hedging. In reality, correlations lie between these two extremes and our risk choices do as well. For these two stocks, the actual correlation is about zero, and in a 50-50 portfolio, these two stocks have a risk of about 40%. So the actual risk of a portfolio which is based upon low correlations in the case of these two stocks is 40% compared to the benchmark for a perfectly positively correlated set of stocks of 55%. So that's a substantial reduction of about 15 percentage points in risk due to the portfolio manager being careful about choosing stocks with low correlation.

We applied this analysis to the entire portfolio and we found a risk reduction of over 30 percentage points of the risk of the actual portfolio compared to the risk of a undiversified portfolio, so it's hard to argue that there is a lack of diversification when there is that large a reduction in risk due to choosing stocks that are relatively uncorrelated.

So let's recap. We looked at portfolio concentration. We considered levered weights and found them to be irrelevant and misleading. We looked at unlevered weights and at the appropriate classification level and we found that there were low allocations to industries. Both of these supported a conclusion of diversification, and in the risk analysis we found substantial risk reduction due to the choice of relatively uncorrelated stocks. So all of the findings in this analysis supported a conclusion of diversification. Thank you, Theresa.

THERESA GABALDON: Thank you. Indeed I am enlightened, but I will have a question or two later. Right now though, I would like to say that I was very disappointed to learn that my strategy of eating assorted chocolates was not diet diversification. Oh well.

At the moment, we turn to the subject of economies of scale in mutual funds, presented by Dr. Stephanie Plancich. Dr. Plancich is a senior consultant in the securities and mass torts practices at NERA. She is a graduate of the London School of Economics and of the Massachusetts Institute of Technology. Stephanie?

DR. STEPHANIE PLANCICH: Thank you, Theresa. Recently, there has been a good deal of regulatory and public attention paid to the policies of the mutual fund industry. Allegations of market timing and late trading have led to investigations and fines. Now, the focus has turned to the fund industry's fees, with both regulators and fund shareholders asking questions about the way fund fees are determined. In particular, the existence of economies of

scale in mutual fund production has become a hotly debated issue, as funds began to experience litigation related to fees and economies of scale.

Before I discuss the issues of economies of scale, I first want to go over some general background about: one, mutual fund fees and fund corporate structure; two, the legal precedents that have established some guidelines on this issue; and three, a basic review of the concept of scale economies. Finally, I'll discuss the way economies of scale have been measured to date in the literature, and how economists would measure scale effects with an ideal set of data. There are some unique characteristics of fund structure that can lead to real difficulties in measuring scale effects for funds.

But first, I want to start with some basic definitions. Much of the recent public discussion has centered on the level of fees in the industry, so, to start, it makes sense to figure out exactly what we mean when we say fees. There are a number of different costs or charges associated with running a mutual fund. When fund managers buy and sell securities, they pay brokerage services costs. Some brokers charge loads, or sales charges, when fund shareholders buy shares. However, these charges are not part of fund fees. Instead, it is only the charges included in a fund's expense ratio that are part of fees. The fund expense ratio is made up of three components: the advisory fee, the administrative fee, and the 12(b)1 fee. Advisory fees compensate the investment advisor or portfolio management team for fundamental investment research and valuation analyses. Administrative fees are for tasks such as servicing of investor accounts, maintenance of accounting and controls, and the preparation of annual reports. And finally, 12(b)1 fees, while not charged by all funds, are used to finance fund distribution costs. In the fund's prospectus, the advisor and administrative fees are aggregated and called the fund expense ratio, and 12(b)1 fees are listed separately. All of these fees and expenses are measured as a percentage of assets under management; consequently, fund management companies will make more revenues when the expense ratios are higher, or when the fund has more dollars under management.

So this is a broad description of what fees are, but the next question is: who gets these fees? To answer this, we have to look at the way mutual funds are structured. To start, a management company, say Management Company X, will set up a mutual fund; we'll call it Fund Y. The fund will then hire someone to provide investment, advisory, and administrative services. Although the fund can hire any company to provide these services, it is typical for Fund Y to turn around and hire Management Company X to manage the portfolio and handle the administration of accounts at Fund Y. Then, Fund Y will charge an expense ratio to the fund's shareholders. Management Company X receives the fees and the difference between the fees charged and the cost of service production is the management company's profits. Fund Y shareholders receive a return net of fees and expenses.

This mutual fund structure has a potential for conflict of interests. Management Company X has an incentive to raise fees and generate higher profits at the expense of fund investors. But you might argue this is true for all kinds of products. A manufacturer of soda pop can raise his price, hurting his customers and potentially boosting his profits. Why doesn't that cause concern? Well the standard answer is that soda pop is a highly competitive market. If our soda pop company raises its price too high, its customers will stop buying and then move to another, cheaper brand. To at least some extent, this is also true for mutual funds. If fund expense ratios are too high, customers can sell their Fund Y shares and buy a new fund, say Fund Z instead. There are certainly plenty of funds in the market to choose from, and in this way, competition serves as a natural cap on fund fees.

Funds, at least in part because they are complex financial products, also have other regulatory safeguards that keep Management Company X from taking advantage of the Fund Y shareholders. For example, Fund Y has a Board of Directors tasked with reviewing and approving all fee agreements. In addition, Management Company X itself has a fiduciary duty to its clients. In theory, these three factors should ensure that fund fees are set at a fair level. The

recent litigation at fund companies is forcing fund boards to make sure that fees are set appropriately in practice as well as in theory.

So, are there any established guidelines to help us analyze fees? Well to date, one major legal precedent has been set that provides some guidelines for fund companies in the analysis of these schedules. In *Gartenberg versus Merrill Lynch Asset Management*, plaintiffs alleged that Merrill Lynch had breached its fiduciary duty in the setting of fees for a money market fund. The court in *Gartenberg* determined that Merrill did not breach any fiduciary duty because its fees were not excessive. The judge said that the test to determine if fiduciary duty had been breached was to see if a fund's fee schedule represents an arm's length negotiation between the fund and the management company in light of all the surrounding circumstances. In particular, the court listed six factors that should be taken into consideration. One, the nature and quality of services provided to the fund; two, the profitability of the fund to the advisor or management company; three, economies of scale; four, comparative fee structures; five, fallout benefits; and six, the independence and conscientiousness of directors. All but the sixth factor require economic analyses, but the most recent attention has been paid to the issues of economies of scale.

I'm going to continue that trend today and focus on scale economies as well, but before I get to the specifics of the way we might measure economies of scale in the fund industry, let me run through just a quick refresher on the basics of economies of scale. So I have to warn you first, that I'm at a bit of a disadvantage in an audio broadcast because economists hate to be without charts and graphs to explain economic concepts; however, I'll try my best to illustrate economies of scale without any pictures. The basic definition of economies of scale is when a company's total cost of production per unit decreases as the number of units produced increases. So imagine our soda pop company again. Let's say they can produce one million cans of soda for a total cost of \$150,000, \$50,000 to buy a soda making and canning machine and then 10 cents to produce each can. If they make one million cans, then the average cost is 15 cents per can. If they make two millions cans, however, the cost per can falls to 8 cents because the \$50,000 in fixed costs is now spread over more cans.

Fixed costs are one reason that a company may experience economies of scale. Economies of scale might arise for other reasons too; for example, workers may gain productivity and knowledge as they make more cans of soda and decrease the cost per can. Input costs can also drive economies of scale. If the company gets volume discounts on the sugar it uses in its soda, it can reduce per-can input costs when the production rises.

Note that a company may experience economies of scale over a range of output but not necessarily forever. For example, the canning machine purchased by the soda pop company may be big enough to produce up to two million cans of soda, but once the company makes its two million-and-first can, they will need to buy another machine and double their fixed costs. At some point, the firm may even experience diseconomies of scale. It's possible that going from two to three million cans makes the business too big to run effectively. Perhaps the factory becomes so crowded that it takes twice as long to get the cans packed and labeled. At that point, costs per can actually go up when production increases.

So while there are a lot of factors that can affect the economies of scale in production, the basic concept is really quite straightforward in our soda pop example. Why is there so much more uncertainty and confusion when we talk about economies of scale in mutual fund production?

As I described a minute ago, economies of scale are really just a measure of cost per unit of output, and these concepts, cost and output are simple in soda pop production. But in mutual funds, the concepts are trickier.

First, what exactly is the output of a fund? Technically, output should be measured as services provided – account administration, return on investments – but this is not always easy to do for funds. Consequently, people typically use dollar assets under management as a proxy

for output. How good a proxy this may be is not clear. For example, assets under management grow both because the fund generates positive return on its holdings and because new shareholders invest in the fund. Should new cash be treated the same as investment growth when measuring fund output?

Second, the costs of the fund aren't always easy to measure either. Ideally, we want to measure the cost of investment management and account administration directly - staff, the technology, etc. However, it is very difficult to obtain this kind of data, particularly at the fund, rather than the fund family level. Here people have typically provided, excuse me, proxied for costs by using published fund expense ratios. Again, it's not clear how good this proxy is. Part of the issue in the recent fund litigation is precisely the question of whether economies of scale are actually passed on to fund shareholders in the form of lower expense ratios. If we're using the expense ratios themselves to measure economies, it's a bit of circular logic.

Many people have argued that investment advisory services are likely to have a large fixed cost component. If portfolio managers are already doing research on large cap equities for a \$500 million fund, the story goes, why would doubling the assets under management necessarily lead to a doubling of portfolio research costs? There's some logic to this argument, but proving or disproving the existence and magnitude of fund's scale economies is still an empirical challenge.

Given that it's very difficult to clearly define output and get an accurate measure of costs for mutual funds, what have people done to date to measure economies of scale in the fund industry? Typically, authors have used publicly available information on fund net assets and expense ratio for a large number of funds, and then they track the correlation between fund size and expense ratios. In a 2001 paper, authors Freeman and Brown examine a large sample of mutual funds and find that equity fund expense ratios declined with assets under management. The authors also found that administrative expenses fell with assets under management faster than advisory expenses, and concluded in their study that economies of scale exist in mutual funds, but that the investment advisors are unwilling to pass these scale benefits on to fund shareholders.

Other authors have examined fund assets and expense ratios and come to slightly different conclusions. Deli, in 2002, reviewed fund advisory fee agreements and concluded that his analysis was "consistent with economies of scale being passed on to investors" and that the fund market was a competitive environment. Thus, while there's a general consensus in the literature that economies of scale appear to exist in fund management, there is no agreement about whether these economies are truly passed on to fund shareholders. Also, it is very important to remember that most of these analyses still use assets as a proxy for output, and expense ratios as a proxy for costs, and no one has yet been able to determine empirically how useful and appropriate these proxies are.

So, given that the academic studies in this arena are inconclusive, how should a fund company faced with litigation or a board attempting to evaluate expense ratios address the issues of economies of scale?

Theoretically, the answer is simple. Management companies and funds should focus on actual cost data of investment and account management and should differentiate between asset growth due to inflows of new investment as opposed to growth due to fund appreciation.

But even for the management company itself, this task may not be easy. A look at costs as reported in the financials of a publicly traded management company illustrates this point. A management company will typically aggregate its costs by type for purposes of financial reporting. For example, the compensation and benefits paid by the management company may be for both portfolio managers and customer services reps and not broken down into an administrative or advisory category. The IT and computer services department may support both the administration and the investment advice group. How should these costs be spread across categories? In addition, costs are often aggregated across different account types inside

the management company - like pension funds, private clients and retail mutual funds - all serviced by the same portfolio management team. The management company may provide services to dozens of retail mutual funds and the investment advisors may share information as they manage the different funds. How does the board of Fund Y figure out what proportion of the investment fees are attributable solely to our Fund Y?

NERA believes that the first step towards estimating fund economies of scale is to start with the fundamental cost data and then to use economic and accounting tools to build a model of each fund's cost structure. This methodology allows the funds to get a true estimate of economies of scale at a fund level and thus helps the board respond to shareholder litigation and ensure that their fiduciary duty has been met. While we have yet to see any published results on this type of cost base analysis, I think that this is likely to be the next major focus in the study of mutual fund fees and economies of scale.

THERESA GABALDON: Thank you, Stephanie, and thank you all. Your topics each raised some fascinating questions, although we'll have time to cover just a few of them. What I'd like to do is to throw out some questions. I may attach names to some of them, but that shouldn't preclude the other two of you from chipping in because I'm sure that your joint expertise will give you all something to say about these matters. David, since your presentation was first, I'll go ahead and start with you.

DR. DAVID ELLIS: Thank you.

THERESA GABALDON: You spoke on hedging restricted stock and gave the hypothetical cases of Mr. F, Ms. S and Ms. N. You indicated that your poster child cases did give rise to litigation, and it caused me to wonder whether something as simple as better broker communication would have taken care of the whole problem.

DR. DAVID ELLIS: In some cases, it might. In some cases, however, what happens is cases of what can only be described as "buyer's regret" or perhaps more accurately put, "non-buyer's regret," two or three years after not having obtained a hedge, people suddenly realize, oh, I should have hedged. And so it does sometimes come down to that, but in some cases, yes, it can be a question of the broker making sure that the client understands the full implications of their actions and aren't making the client understand that not doing this right now means that they're exposing themselves to the possibility of losses in the future. So it's a question of explaining a possible transaction in both the gains from doing so and also the possible risks of not doing so. So that is I think one way of looking at it, yes.

DR. JAMES JORDAN: I might add, this is Jim, that a lot of these customers who wind up suing, they're getting large stock positions in their own company that are restricted, and they believe in their company and so they don't want to cut off the upside potential of their company and so you may have these cases where, so to speak, they're in love with their stock and they don't, in some sense, rationally analyze the risk that they're taking with a large concentrated position and it may be hard for the broker to talk them into reducing that risk.

THERESA GABALDON: I guess that's something the broker might very well think about putting in writing.

DR. JAMES JORDAN: That's true, and brokers indeed do often keep notes of their interactions with customers and they can play a role in litigation.

DR. DAVID ELLIS: I have found that the more notes that they take in a timely fashion, the more helpful they can be.

DR. JAMES JORDAN: Of course the customer should take their own notes also.

THERESA GABALDON: Good point. Jim, your subject was diversification in investment funds, and from your talk it sounded as though each investment fund gets to choose whether to present levered or unlevered percentage allocations. That is, to decide whether their financial statements will express industry or market sector allocations as percentages of net assets or of total assets. Why would it ever be an advantage to show levered weights and why would it be a good idea to allow funds to present non-comparable figures?

DR. JAMES JORDAN: Well actually, most funds will show levered weights because, and there is a regulation, I believe it's Regulation SX from the SEC, that requires when you have subtotals of categories of investments by business groupings, I think the language may be there, you should show the subtotal of the category in dollars, and also as a percentage of net assets. Now for most mutual funds, that's not really a material issue because most mutual funds don't use a lot of leverage. They have some liabilities on their balance sheet, but they're kind of incidental to operations and they're not really engaged in borrowing strategies or even engaged in a lot of margin trading. That applies to most mutual funds. So the regulation probably makes sense in the context in which it was written, which is the mutual fund context. It's when we get to hedge funds, which are the relatively unregulated side of the investment fund market that it can matter, and I think there also, if those hedge funds are registered with the SEC, they fall under the same regulation and they're going to report percentages of net assets. So it's a built-in historical accident perhaps, that these levered funds are reporting in that manner, and it's up to the investor to look through that and see how much of that waiting is due to the leverage, and how much is really the asset weighting itself.

THERESA GABALDON: I see. Stephanie, your subject was economies of scale and mutual fund fees and obviously it involves some confusion of just what output is and what costs really are. Do you think that the problems that you describe are largely the result of poor accounting practices? Is that a failure of the accounting profession to devise something more meaningful?

DR. STEPHANIE PLANCICH: No, I don't think that this is about poor accounting practices, at least in the conventional sense. Accounting guidelines are standardized for the purposes of financial reporting, and there are no allegations that are calling reporting itself at any of these funds into question. It's not that the accountants and auditors are failing to provide information or suppressing any cost information, it's rather that the traditional purpose for which financial reporting has been used is not necessarily leading to the information being provided in the same format that it needs to be used by individual fund boards, rather than the management companies management itself.

I think that the data that boards need to assess issues of economies of scale at an individual fund exists at the management companies right now. They just need to start dicing it up and looking at it in a slightly different way to try to figure for each specific fund - of the dollars spent on investment management for the whole company, what part of that is attributed to my fund and how can I measure economies of scale in that way? It's not that the aggregate numbers are wrong; it's just that they need to be redistributed for the boards to make educated decisions. And I think boards have paid attention to this in the past, it's just now that the focus is increasing, they're looking at a finer and finer level and dicing the numbers up into smaller and smaller pieces to make sure that their fiduciary duties are being met.

DR. JAMES JORDAN: And Stephanie and I know of fund companies that are making a real push in this area of figuring out how they should properly allocate, for example, the research cost across Funds X, Y and Z, right, how much of the research costs is impacting those three funds in that example. It's not always an easy question to answer, but there's a big push in the industry to get better data and better cost allocation so that these questions can be answered.

THERESA GABALDON: Now here's something that I've been sneaking up on in each of the three questions that I've just put to you, which is are these all things that either can or should be addressed by regulation of some sort, and if so, should the regulation be of actual terms and practices and amounts, or should it merely be of disclosure of the actual terms and practices are described to some sort of consuming public? David?

DR. DAVID ELLIS: I'll address the first question. I think a lot of it is already addressed by regulation to the extent that there are new questions surfacing, for example the mutual fund litigation that Stephanie was referring to. As problems surface, I think that regulators are

addressing them and deciding whether or not additional regulation is needed or simply additional disclosure. And I think that it's a dynamic process. I think that both regulators and market participants are actively trying to find what is the appropriate equilibrium there, but in many areas, I believe that regulations exist and it's a question of determining whether or not they are adequate or whether they need to be fine tuned.

THERESA GABALDON: Jim, any other thoughts on that?

DR. JAMES JORDAN: I think that question of disclosure is the value of disclosure. I think it must be one of the hardest questions to answer about regulation. I mean, think about the brokers who are providing disclosures to their customers about the risk of options trading, for example, which is a required disclosure, and the risk of futures trading, which is a required disclosure. You can make the disclosure, and then there's a question of does the customer understand the disclosure and read the disclosure, and so the value of the disclosure depends a great deal on two-way communication, not just making this disclosure. We were in conversation recently with the financial regulator in the UK, and they are also wrestling with this problem of creating more disclosure in that case for hedge funds, and they are actively raising the question - what kind of disclosure would be meaningful to investors and would be such that the investors are likely to really pay attention to it? I think that two-way issue in the disclosure area makes it very difficult to know the value of regulation through disclosure.

THERESA GABALDON: Stephanie?

DR. STEPHANIE PLANCICH: I agree. Particularly in the mutual fund industry, which is already a very highly regulated industry with a lot of mandatory disclosure there. In some ways, it's the regulation that sort of spurred this issue in the first place, and I think everyone's wrestling with how to get the number that needs to be disclosed that can go out to the fund's shareholders.

But relative to other kinds of production markets - because it's such a complicated product - I think that there's already regulation in place to help fund investors understand exactly what they're buying

DR. DAVID ELLIS: The other thing too with regulation is that any time a new regulation is introduced, the regulated entities are going to react to it and change their way of proceeding, not only to keep in compliance with the regulation but to, if you will, see what they can do within the bounds of the regulation. I think regulators need to keep that in mind when they are drafting regulations, to anticipate or be aware how our market participants will react to the regulations they introduce.

THERESA GABALDON: I think we have time for one or two more fairly quick, questions, the first of which I'm going to direct to David. I'm intrigued by the question of how the terms of restricted stocks should be structured in the first place. You gave two reasons why stock might be restricted, to align employee interests with those of stockholders generally, and to comply with Rule 144, which constrains resale of stock sold in private placements. If the purpose is alignment with shareholder interests, how should restrictions be stated to preclude any hedging at all?

DR. DAVID ELLIS: That partly depends, I think, on the circumstances. Who is the individual receiving the restricted stock? I think the restrictions would ideally be different if you were talking about restricted stock given to the Chairman of the company as opposed to a middle management employee, so I think the type of individual who's receiving the restricted stock needs to be taken into consideration. There has been a lot of press given recently to companies where employees and their 401k plans are heavily concentrated in company stock and the inability of those employees to diversify, so that is something else that I think companies should keep in the back of their minds when they're designing stock agreements in terms of what specific restrictions to impose. How much do they want to bind their employees? How tight do they want to keep those incentives aligned with those of shareholders, bearing in mind that sometimes, some of these litigation cases can be turned against the company too for imposing

those restrictions that won't allow them to diversify.

THERESA GABALDON: You gave some quick language in the case of Ms. F I think it was. Is that a fairly common formulation?

DR. DAVID ELLIS: That's the most restrictive agreement I've ever seen. It was the narrowest definition. Every i was dotted, every t was crossed. Every possible manner of transferring stock or pledging it or whatever was taken into consideration. Usually, they're nowhere near as restrictive as that.

THERESA GABALDON: Doctors Ellis, Jordan and Plancich, David, Jim, Stephanie, thanks once again for today's superb presentation. I also would like to thank NERA Economic Consulting for making today's program possible. The program is now archived by audiotape in the Securities and Exchange Commission's Historical Society's virtual museum and the transcript will be ready soon. I will be returning as host of the Society's fireside chats on Tuesday, September 20th. Our topic will be cross-border regulation with Louis Bevilacqua of Thelen Reid & Priest, and Professor Richard Booth, of the University of Maryland School of Law. Please join us at 3 PM Eastern Daylight Savings Time. Thank you for being with us today.