

To What Extent Should Individual Investors Rely on the Mechanisms of Market Efficiency: A Preliminary Investigation of Dispersion in Investor Returns

Howell E. Jackson*

I. INTRODUCTION.....	000
II. THE EFFICIENT MARKET FALLACY.....	000
III. EVIDENCE OF ACTUAL DISPERSION OF STOCK INVESTMENT BY INDIVIDUALS.....	000
A. <i>The Standard View</i>	000
B. <i>Another View of Dispersion in Stock Market Returns</i>	000
1. <i>Evidence of Actual Returns on Individual Brokerage Accounts</i>	000
2. <i>Hypothetical Portfolios in 401(k) Accounts with Employer Stock</i>	000
3. <i>Mutual Funds and Other Diversified Instruments</i>	000
C. <i>Market Indeterminacy Makes it Hard to Regulate Financial Markets</i>	000
IV. FURTHER RESEARCH AND REFORM PROPOSAL.....	000

I. INTRODUCTION

In the years since Kraakman and Gilson published their article, the concept of market efficiency has permeated analysis of the field of securities regulation. Almost all issues are discussed against the background of market efficiency: whether issuers should be required to make duplicative disclosures; whether company insiders should be permitted to speak privately with institutional investors and analysts; and how damages can be inferred from stock price movements. Market efficiency and the mechanisms of market efficiency factor into all of these policy debates—and quite appropriately.

But there have also been less appropriate—or at least less carefully considered—invocations of market efficiency. While regulatory authorities can legitimately rely on market efficiency in certain contexts, that reliance is not always justified. In particular, in the context of undiversified investments, informationally efficient markets do not provide investors any assurance of an appropriate risk-adjusted return. In addition, where investors are subjected to non-trivial and heterogeneous transaction costs, such as brokerage commissions and mutual fund fees, returns will on average fall below market averages and may become surprisingly dispersed.

My goal in this Comment is two-fold. First, I will review a few illustrations of ways

* Finn M.W. Caspersen and Household International Professor of Law, Harvard Law School. Joshua Cohen (HLS '05) and Pierre-Luc Arsenault (HLS '06) provided excellent research assistance for this comment. I also benefitted from helpful comments from participants in the Journal of Corporation Law Symposium, *Revisiting the Mechanisms of Market Efficiency*, in April 2003.

in which principles of market efficiency, and even Professor Gilson and Kraakman's classic article, have been improperly invoked in policy debates over the past twenty-five years. Second, I will present several sets of data regarding the dispersion of investor returns in various real and hypothetical contexts. Finally, I will conclude with a discussion of some policy implications of this data.

II. THE EFFICIENT MARKET FALLACY

Let me begin with a few illustrations of inappropriate invocations of the efficient market hypothesis in legal analysis. Consider the following excerpt from a law review article published just a year after Gilson and Kraakman's article:

[T]he market is divided into two classes of investors: first, market professionals, such as market analysts, who have an advantage in obtaining and interpreting complex information; and second, "market model" or average investors, who have no incentive to read disclosures and who rely instead on the expertise of the professional to translate disclosure information into practical investment advice. Those who criticize the efficient market theory fail to account for the first group of investors. The market will be efficient, and the disclosures meaningful, as long as the first class has access to sufficient capital to move the price of the stock. The activities of the market professionals, who have evaluated the disclosures, protect the average investors, who may not have read the complex disclosure documents. *Because all available information is embedded in stock prices, average investors who accept the market price by purchasing a security should be on an equal footing with market professionals.* The average investor will be no better off with more information and worse off with less.¹

This excerpt nicely illustrates what I will call the efficient market fallacy for individual investors. Just because a market is informationally efficient does not mean that an individual can purchase securities on that market and "be on an equal footing with market professionals."² Even assuming market professionals have no special access to inside or quasi-inside information, individual investors will earn comparable risk-adjusted returns only if their portfolios are appropriately diversified and their transaction costs approximate those of market professionals. Without these important caveats, the efficient market hypothesis cannot ensure investment equality for individual investors.

While I could fill up many pages with further instances of the efficient market fallacy, I will limit myself to just one more recent example, this one from a leading scholar in the field, who implicates Professors Gilson and Kraakman by citation:

[U]nder the semistrong version of the efficient markets hypothesis, the market price of securities that trade in liquid markets and are well-followed by investment analysts will reflect all publicly available information on the securities. As investors trade based on publicly available information, the signal sent to other investors through these trades will cause the price of the securities

1. David J. Schulte, *The Fraud on the Market Theory: Efficient Markets and the Defenses to an Implied 10b-5 Action*, 70 IOWA L. REV. 975, 983-84 (1985) (emphasis added) (citations omitted).

2. *Id.* at 984.

to adjust. [Citation to Gilson & Kraakman.] *So long as the market price reflects a company's investment risk, even unsophisticated investors are compensated ex ante.* In an efficient market, the incentive for issuers to protect investors is the same as if all investors had complete information on the risks surrounding any individual company.

For example, consider John, an unsophisticated investor. If IBM's stock trades on an efficient market, John's lack of specific knowledge on IBM-related public information does not matter. Rather, IBM's stock price will already incorporate all public information. Where IBM adopts a valuable investor protection device that raises investor valuation of the company by \$5 per share, Widget's stock price will increase by \$5. John, as a result, only must look to the stock price in determining whether to purchase IBM shares.³

The excerpt's bottom line—"John . . . only must look to the stock price in determining whether to purchase IBM shares"⁴—is clearly wrong. John must also look to the costs of effecting the trade and also the overall diversification of his portfolio. In other words, John needs to know more than that the stock price of IBM shares is informationally efficient.

The problem of the efficient market fallacy is not just that it permits overbroad statements in law review articles. The fallacy also subtly influences the entire field of securities regulation in important ways. In promoting and trumpeting reforms designed to enhance the efficiency of our securities markets, public officials have implicitly been encouraging individual investors to trade in those markets without adequately apprising investors of the limited protections that market efficiency affords.

A good example of this development is Regulation FD, which established new rules governing the selective disclosure of non-public information.⁵ To a degree, Regulation FD alters the mechanisms of market efficiency. Rather than allowing market professionals to profit from selective disclosure—as was previously countenanced to a certain degree—Regulation FD requires most disclosures of non-public, material information to be made in a manner that allows individual investors informational parity with market professionals.⁶ In a release accompanying the final rule, the SEC explained the reform in the following terms:

Individual investors expressed frustration with the practice of selective disclosure, believing that it places them at a severe disadvantage in the market. Several cited personal experiences in which they believed they had been disadvantaged by the practice.

The inevitable effect of selective disclosure, as indicated by numerous comment letters we received, is that individual investors lose confidence in the

3. Stephen Choi, *Regulating Investors Not Issuers: A Market-Based Proposal*, 88 CAL L. REV. 279, 303 (2002) (emphasis added) (citations omitted); *but see* Stephen J. Choi & A. C. Pritchard, *Behavioral Economics and the SEC*, STAN. L. REV. (forthcoming 2003) (noting at several points the importance of investor diversification).

4. Choi, *supra* note 3, at 303.

5. See Regulation FD, 17 C.F.R. §§ 243.100 - .103 (2003).

6. *Id.* § 243.100(a).

integrity of the markets because they perceive that certain market participants have an unfair advantage. Although one commenter questioned this investor confidence argument, we agree with the common sense view— expressed by both the Supreme Court and the Congress— that investors will lose confidence in a market that they believe is unfairly rigged against them.⁷

The implication is that by adopting Regulation FD, the SEC has eliminated an important source of unfairness for individual investors and that, with the adoption of Regulation FD, individual investors should be more prepared to trade in our securities markets, notwithstanding their degree of diversification or the transaction costs associated with trading. To a similar effect are recent SEC proposals to expand the number of items subject to immediate disclosure under the Form 8-K and to quicken the disclosure of insider trades under the Sarbanes-Oxley Act. Both reforms increase the scope of our mandatory disclosure regime and both implicitly encourage individual investors to venture directly in the trading markets.

III. EVIDENCE OF ACTUAL DISPERSION OF STOCK INVESTMENTS BY INDIVIDUALS

But should we be encouraging individual investors to become more heavily invested in direct stock market investment? One way to answer this question is to ask how well individual investors have actually fared with equity investments. That is my goal in this part. First, I discuss what I denominate the standard view of risk in equity securities investment. I then present several additional data sets showing the actual dispersion of investment returns reported in two large-scale studies of actual returns on individual investor trading accounts. Next, I present some hypothetical data about returns in 401(k) accounts that permit participants to invest in employer securities.

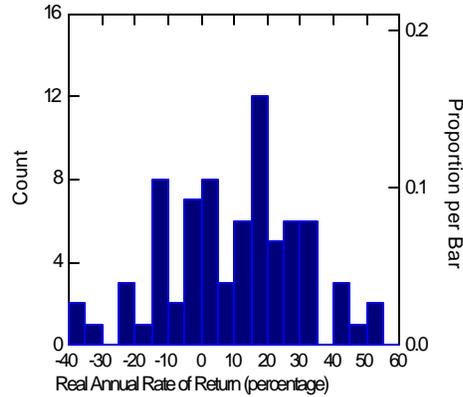
A. The Standard View

Everyone—or at least everyone who reads conference volumes of this sort—knows that stock market returns are widely dispersed. The risk-return trade-off, which lies at the heart of financial theory, posits that risk (that is, dispersion) and return are positively correlated. And there is ample empirical evidence in support of this proposition. A familiar figure in introductory finance texts are histograms of annual returns on the U.S. stock market throughout the past seven or eight decades (typically drawn from data that Ibbotson Associates publishes each year). Figure One below illustrates such a histogram. It reports annual real rates of total return on large company stocks between 1926 and 2001. During this period, the average real rate of return on large company stocks was 9.6% with a standard deviation of 20.2% and a median annual real return of 10.5%. Typically such historical dispersions of stock market returns are compared with other classes of assets, such as corporate bonds (which have lower average returns but less dispersion) or smaller company common stock (which have higher average annual returns but greater dispersion).⁸

7. SEC Final Rule: Selective Disclosure and Insider Trading (2000) (to be codified at 17 C.F.R. pts. 240, 243, 249), available at <http://www.sec.gov/rules/final/33-7881.htm> (last visited Aug. 19, 2003).

8. See, e.g., STEPHEN A. ROSS ET. AL., CORPORATE FINANCE 221 (5th ed. 1999).

Figure One
Annual Returns on US Large Company Stocks (1926-2001)



Source: Ibbotson Associates, *Stocks, Bonds, Bills and Inflation: 2002 Yearbook* 87-88 (2001) (table 4-1).

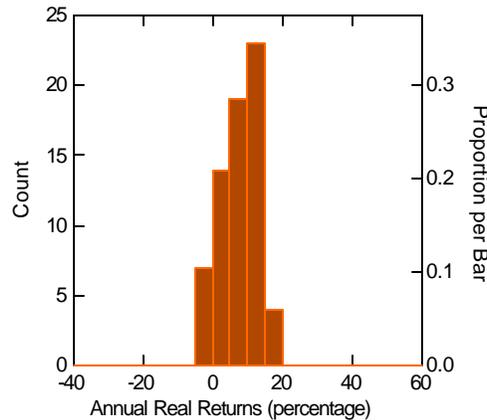
Another common presentation of equity returns is average returns on the stock market over longer periods of time, such as ten years.⁹ What these presentations are typically used to demonstrate is that, when investors hold common stock for longer periods of time, much of the variation in annual returns washes out. For example, Figure Two indicates that the performances of large company stock during all ten-year holding periods between 1926 and 2001 were much more tightly bunched than the annual rates of return shown in Figure One. The average annual real rate of return for these ten-year “rolling” periods was 7.5% with a standard deviation of 5.6% and a median annual real rate of return of 7.8%. Analysis of this sort leads investment advisers to encourage long-term investors to allocate increasing portions of their portfolios to common stock. To be sure, much in the financial literature has been written in recent years questioning the relevance of data of the sort outlined above. There is something problematic about drawing inferences about the future based solely on the performance of the most successful market economy drawn almost exclusively from a century during which it rose to world dominance.¹⁰ Additionally, a growing number of economists are questioning the true magnitude of the long-run equity premium.¹¹ These are important points, but for purposes of this Comment, I am prepared to accept the relevance of this historical data and the further assumption that the past is prologue with respect to the risk-return trade-off. My goal in this comment is simply to note that the actual returns that individual stock market investors have achieved in the past has differed substantially—and in particular, has been much more dispersed—than suggested by the stylized data presented above.

9. See Figure Two.

10. See HOWELL E. JACKSON ET AL., *ANALYTICAL METHODS FOR LAWYERS* 269 (2003).

11. Peter A. Diamond, *What Stock Market Returns to Expect for the Future?*, ISSUE IN BRIEF NO. 2, (Ctr. For Ret. Research, Boston College, Boston, MA), Sept. 1999.

Figure Two
Annual Rates of Return on US Large Company Stock
Ten-Year Holding Periods (1926-2001)



Source: Ibbotson Associates, *Stocks, Bonds, Bills and Inflation: 2002 Yearbook* 44-45 (2001) (table 2-9).

B. Another View of Dispersion in Stock Market Returns

How well do individuals actually do in the stock market? As it turns out, there is surprisingly little good information on this subject. But, as summarized below, the evidence that exists indicates that individual investors actually experience much more dispersion of returns than is suggested by the annual variation in returns for broader market indices summarized in the previous section.

1. Evidence of Actual Returns on Individual Brokerage Accounts

In the financial literature, the best information on the subject comes from two sets of studies about individual investment returns.¹² The primary focus of this literature has been to determine whether individual accounts do better or worse than market averages, and the evidence turns out to be somewhat ambiguous on this score.¹³ But what is not

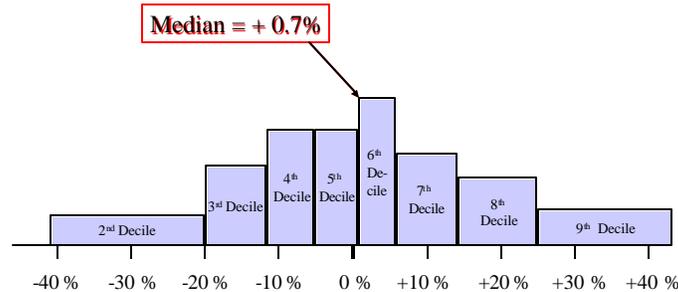
12. Compare Gary G. Schlarbaum, Wilbur G. Lewellen & Ronald C. Lease, *Realized Returns on Common Stock Investments: The Experience of Individual Investors*, 51 J. BUS. 299, 301-02, 309-11 (1978) (analysis of 75,123 trades from a sample of 2506 individual accounts at a large retail brokerage house during 1964 to 1970 showing that median and mean rates of return exceed average returns); with Brad M. Barber & Terrance Odean, *Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors*, 54 J. FIN. 773, 785-88 (2000) (analyzing 66,465 household accounts at a large discount brokerage firm during 1991 to 1996 and reporting gross and net returns below market adjusted averages).

13. In my view, the later and more sophisticated study of Barber and Odean, which reports that individual accounts on average underperform the overall market on a risk-adjusted basis, has the better side of the argument. In addition, the earlier study was based on actual trades, which may tend to inflate actual returns because individual investors seem to have a tendency to hold on to their losers and sell their winners. See Brad M. Barber & Terrance Odean, *The Courage of Misguided Convictions*, 55 FIN. ANALYSTS J., Nov.-Dec. 1999, at 41(1999) (highlighting of mistakes investors make such as excessive trading and holding loser while selling

ambiguous is the fact that there is a substantial amount of dispersion in the actual performance of individual investors.

Below, in Figures Three, Four, and Five, I have reconstructed the dispersion of returns reported in these two studies. Figure Four reports the dispersion of returns from the first of the studies, a sample of 2506 individual brokerage accounts at a large retail brokerage between January 1964 and December 1970. The measures of return, which are based on some 75,123 round trip trades in the sample accounts, are adjusted for the returns on a value-weighted market portfolio. Thus, Figure Four shows how much better or worse these individual accounts did than market averages (before taking account of transaction costs).

Figure Three
Distribution of Returns on Trades
 (Annualized Returns Compared to Weighted Market Portfolio;
 Before Transaction Costs; Middle Eight Deciles Shown)



Source: Gary G. Schlarbaum, Wilbur G. Lewellen, Ronald C. Lease, *Realized Returns on Common Stock Investments: The Experience of Individual Investors*, 51 J. Bus. 299, 316 (1978) (table 9).

For current purposes, what is interesting about Figure Three is the wide range of dispersion in individual account returns revealed. While the median gross rate of return surpassed a value-weighted market portfolio by 0.7%, the accounts reported a wide dispersion of returns. Indeed the bottom four deciles showed gross annual returns at least 5% below a value-adjusted market portfolio return. Were transactions costs taken into account, the returns of the worst performing accounts would have been even worse.¹⁴

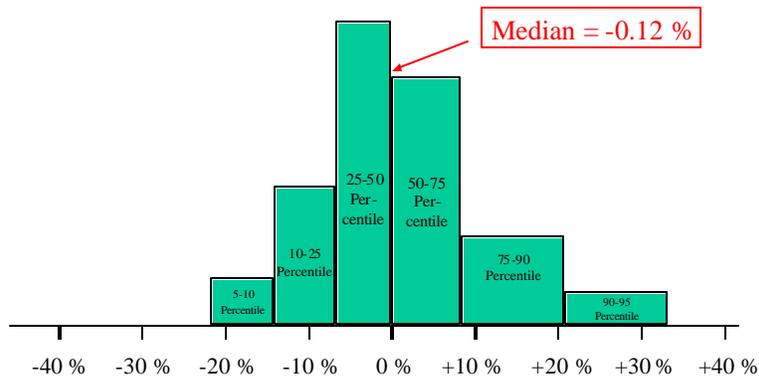
The second large scale study of individual account performance shows similar dispersion. This study involved 66,465 individual accounts at a large discount brokerage house between January 1991 and December 1996, for which position statements in more than twelve months were available. Figures Four and Five report the cross-sectional distribution of annual gross and net market-adjusted returns for these accounts. Figure Four reveals that the median gross market-adjusted return from this sample was negative

winners).

14. Cf. Wilbur G. Lewellen, Ronald C. Lease & Gary G. Schlarbaum, *Investment Performance and Investor Behavior*, 14 J. FIN. & QUANT. ANALYSIS 29, 36 (1979) (further analysis of same sample indicated that average risk-adjusted rate of return for middle quintile of accounts was negative 2.9%).

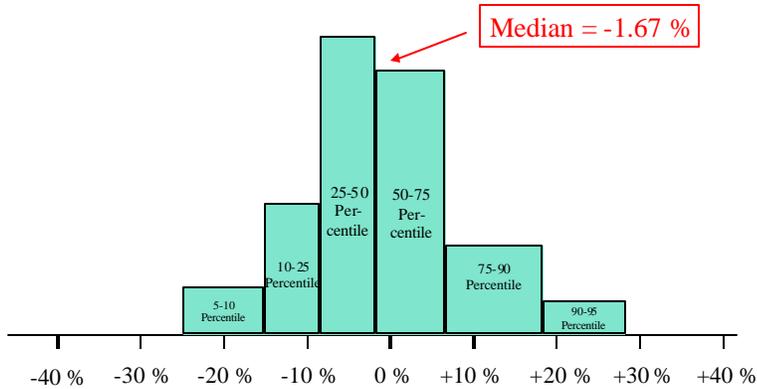
0.12% and that bottom 25% of accounts earned gross returns more than 6.63% below market-adjusted returns. Figure Five shows that the median net market-adjusted return was negative 1.67%, and that the bottom 25% of accounts earned net returns of more than 8.42% below market-adjusted returns.

Figure Four
Distribution of Gross Annual Returns
 (Deviations from Market-Adjusted Return; middle nine deciles shown)



Source: Brad M. Barber & Terrance Odean, *Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors*, 60 J. Fin. 773 (2000) (table IV).

Figure Five
Distribution of Net Annual Returns
 (Deviations from Market-Adjusted Return; middle nine deciles shown)



Source: Brad M. Barber & Terrance Odean, *Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors*, 60 J. Fin. 773 (2000) (table IV).

Taken together, what the foregoing figures reveal is that individual accounts do not necessarily approximate market-adjusted returns. To be sure, this data on individual stock dispersion is extremely difficult to interpret. It is unclear how much of this dispersion reflects diversifiable risk, for which investors are not compensated.¹⁵ Also, it is not clear whether the dispersion of returns for individual investors would look materially different if the investors' overall investments portfolios were taken into account. One would hope that the SEC would conduct more complete analyses of investor returns. Comprehensive analysis of investor portfolios would be very useful to understand the actual dispersion of returns that investors experience and also suggest a variety of policy implications, including in the first instance investor education programs.

But for my purposes, this preliminary data is instructive because it suggests that actual investor returns on equity investments may be a good deal more dispersed (read, risky) than evidence about returns on broad market indices suggest. Moreover, it suggests that individual investors should not assume that they will earn market returns just because the capital markets in which they invest are informationally efficient.

2. Hypothetical Portfolios in 401(k) Accounts with Employer Stock

My second set of evidence deals with employee investments in 401(k) plans which include investment options in employer stock—that is, the common stock of the sponsoring corporation. These 401(k) plans offer another context in which we can observe at least some of the investment decisions of a subset of individual investors. This issue came into the national spotlight after the Enron debacle. As it turned out, a number of Enron employees had invested all of their retirement savings in Enron stock, and, in total, over fifty-seven percent of Enron 401(k) assets were invested in employer stock. Subsequent congressional hearings revealed that many large companies were including such investment options in their 401(k) plans and that a surprising number of employees were choosing to place a substantial percentage of their 401(k) assets in employer stock.¹⁶

15. The second study—Barber and Odean's from the 1990s—does attempt to control for characteristics of stocks in individual portfolios. This control may explain why the dispersion reported in the second study is tighter than the dispersion report in the first study, which simply adjusted for the return on a value-weighted market portfolio.

16. For example, among large companies (those with more than 5000 employees), most (seventy-three percent) offer employer stock as an investment option in 401(k) plans. Among large companies offering employer stock as an investment choice, twenty-three percent report that more than fifty percent of employee 401(k) investment was in employer stock, forty-seven percent report employer stock investments between ten and fifty percent of 401(k) assets, and thirty-one percent report less than ten percent of 401(k) assets in employer stock. See EBRI Special Report, *Company Stock in 401(k) Plans: Results of a Survey of ISCEBS* (Jan. 31, 2002) (based on survey of 375 member of the International Society of Certified Employee Benefit Specialists; note that a low response rate of just over ten percent raises some question about the representativeness of this data).

One factor that affects the level of 401(k) investment in employer stock is whether the employer makes a matching contribution that is required to be invested in employer stock. Among large companies with employer stock options and employer matching programs, forty-nine percent require employer matches to be invested in employer stock. *Id.* at 4. When employers require employer contributions to be invested in employer stock, thirty-three percent of employee-directed contributions also go into employer stock. *Id.* at 2. Where matched contributions are not made into employer stock but employees are offered this as an investment option, twenty-two percent of employee-directed contributions are directed to employer stock. *Id.*

Overall, the aggregate percentage of 401(k) assets invested in employer stock is estimated to be

Losses in the Enron 401(k) plan and the revelations about broader industry practices prompted a short-lived debate about whether Congress should amend ERISA to limit the amount of 401(k) plan assets that could be invested in employer securities.¹⁷ Proposals to impose restrictions on 401(k) investments in employer securities have, however, failed to gain wide-spread support. Many factors contributed to this failure,¹⁸ but prominent among them is a view that the Enron situation was atypical—that many employees and employers want to include employer securities as 401(k) investment options, and that, on balance, the benefits of restricting 401(k) investments in employer stock would not outweigh its costs. Illustrative of opposition to 401(k) reform proposals is the following statement of the American Chamber of Commerce, discussing a proposal to limit the ability of employees to direct their own 401(k) contributions into employer stock:

The bill in effect prohibits employees from investing any of their own wage elective deferral in company stock in any situation where the company has chosen to match employee contribution in stock. This would be true regardless of how voluntary or how informed the employee's desire to invest in company stock may be. This paternalistic, government-knows-best, limitation would be contrary to the best interests of many employees who would benefit with an ownership stake in their company.¹⁹

In an effort to explore the claim that the results in the case of Enron were anomalous as well as the proposition that it is in the best interest of employees to permit unrestricted investments of 401(k) assets in employer stock, I constructed two separate data sets: the first based on the financial performance of the common stock of all companies in the

nineteen percent of 401(k) assets. When a plan includes employer stock as an investment option, the percentage of 401(k) assets invested in employer stock jumps to thirty-two percent of 401(k) assets if the plan does not include a guaranteed investment contract option and twenty-eight percent if it does. See *Protecting the Pensions of Working Americans: Lessons from the Enron Debacle: Hearing Before the Senate Committee on Health, Education, Labor, and Pensions*, 107th Cong. 80-85 (2002) (written statement of Dallas L. Salisbury, President, EBRI).

For a review of other recent studies into the subject of 401(k) investments in employer stock, see Susan J. Stable, *Another Look at 401(k) Plan Investments in Employer Securities*, 35 MARSHALL L. REV. 539, 542-43 (2002). See also Alicia H. Munnell & Annika Sundén, *401(k)s and Company Stock: How Can We Encourage Diversification?*, ISSUE IN BRIEF NO. 9 (Ctr. for Ret. Research, Boston College Boston, MA), July 2002 (noting high amount of employer stock ownership in many 401(k) plans); Shlomo Benartzi, *Excessive Extrapolation and Allocation of 401(k) Accounts to Company Stock*, 56 J. FIN. 1747, 1760-62 (2001) (finding that employees are more likely to invest in employer stock when a company match in employer stock is present and when company stock performed well in prior periods).

17. As applied, current statutory requirements stipulate only that shares of company stock sold into 401(k) accounts be sold at fair market prices and that participants have effective control over their investment. See §§ 404(c), 408(e) of ERISA, 29 U.S.C. §§ 1104, 1108(e) (1993). For an overview of these rules, see Susan J. Stable, *Freedom to Choose Unwisely: Congress' Misguided Decision to Leave 401(k) Plan Participants to Their Own Devices*, 11 CORNELL J.L. & PUB. POL'Y 361, 373-78 (2002); JAY CONISON, *EMPLOYEE BENEFIT PLANS* 276-82 (2d ed. 1998).

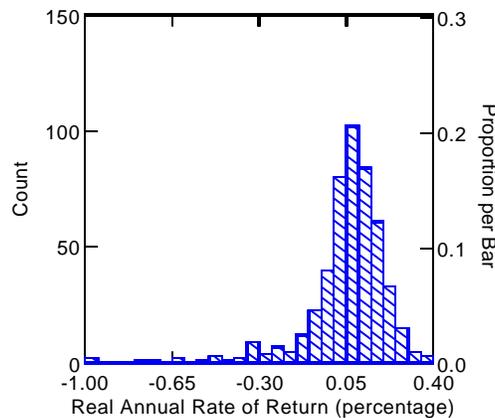
18. See Munnell & Sundén, *supra* note 16, at 8 (noting that cap might reduce level of employer match contributions and, hence, reduce plan participation and contributions); see also Aaron Lucchetti, *Tough Sell: Lighten Up on Employer Stock, Despite the Scandals, Advisers Have Hard Time Getting Investors To Diversify Their Holdings*, WALL ST. J., Apr. 11, 2003, at C1.

19. UNITED STATES CHAMBER OF COMMERCE, S 1992, PROTECTING AMERICA'S PENSIONS ACT OF 2002 (Mar. 19, 2002) at <http://www.uschamber.com/government/issues/socialsecurity/020319s1992.htm> (last visited Oct. 16, 2003).

1991 S&P 500 index for the ten years between 1992 and 2001; the second based on the financial performance of the common stock of companies in the 1983 S&P 500 index for the ten year period 1983-92. For each data set, I calculated the real annual rate of a return across the relevant ten-year time horizon for a plan participant who invested all of his or her 401(k) account in his or her employer's common stock—an investment strategy currently permitted under federal law and actually adopted by a number of Enron employees.²⁰ For purposes of generating these returns, I assumed that participants made an equal 401(k) contribution at the beginning of each of the ten years surveyed.

Figure Six presents a distribution of the real rate of return that employees at each of these companies would have achieved from such hypothetical accounts with the cohort of companies that were included in the S&P 500 at the end of 1991 during the ten years between 1992 and 2001.

Figure Six
Hypothetical Returns on 401(k) Account: 1992 -2001
 (Fully Invested in S&P500 Employer Stock; n= 496)



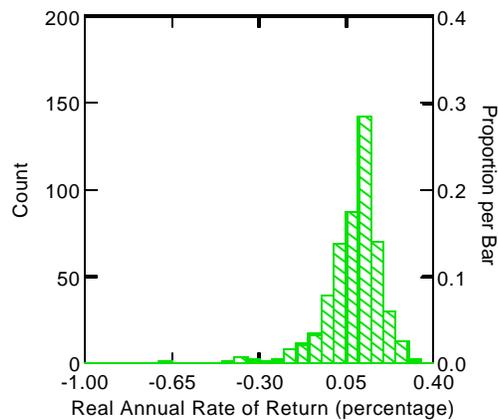
While the average annual real rate of return for these accounts was a positive 4.8% over this period, the distribution of returns was substantial, with a standard deviation of returns equal to 16.3%. Notably, at 22.7% of the companies, employees pursuing this investment strategy would have earned a negative real rate of return on their 401(k)

20. The unit of observation for this and subsequent hypothetical distributions is the company. For a variety of reasons, ranging from mergers to bankruptcies, some companies do not have reported returns throughout the ten years of observation. To prevent problems of survivor bias, I made the simplifying assumption that employees working for such firms took new positions at the S&P 500 that next preceded the omitted firm in alphabetical list of companies. In all, 148 companies in the 1991 S&P 500 did not have reported returns for the full ten year period. From the 1983 S&P 500 group, 136 firms did not have reported returns for the full ten year period.

accounts across the ten year period.

Figure Seven presents a similar distribution for the 1983 S&P 500 for the ten year period from 1983 through 1992. While average returns on hypothetical portfolios were 7.5% in this early decade, the distribution of returns remained substantial (standard deviation equal to 11.4%), and over 17% of firms would have generated negative real rates of return for employees fully invested in employer stock during this period.²¹

Figure Seven
Distribution of Returns on S&P500: 1983 -1992
(100 % Invested in Employer Stock; n= 496)



What these two figures suggest, at least to me, is that, while the experience of Enron 401(k) plan participants was extreme, a regulatory regime which permits employees to invest up to 100% of their retirement savings in employer securities can be reasonably expected to generate a wide dispersion of returns for plan participants. In the two distributions presented above, employees at one in five companies experienced real losses on their investments. In all likelihood, the shares involved were sold to participants at the fair market value established through informationally efficient markets.²² Still, participants in such plans likely assumed a substantial amount of diversifiable risk, for which they would have received no compensating return. Why the U.S. Chamber of Commerce and other defenders of the status quo value the right of employees to allocate

21. For a more formal attempt to quantify the costs of non-diversification for such investment in employer stock, see Lisa Meulbroek, *Company Stock in Pension Plans: How Costly is It?* (Harvard Business School Working Paper No. 02-058, 2002). Cf. Shlomo Benartzi & Richard Thaler, *How Much Is Investor Autonomy Worth?*, 57 J. FIN. 1593 (2002) (using survey results to suggest that employers might actually prefer 401(k) portfolios selected by professional advisers than the portfolios that the employees select themselves).

22. Under ERISA, employer securities must generally be valued at their market price when sold into 401(k) plans. Cite ERISA. Companies large enough to be included in the S&P 500 are generally understood to be large enough to support stock market price that is informationally efficient in at least the semi-strong sense.

401(k) portfolios is hard to understand, particularly when one considers opportunities afforded by other readily available investment opportunities.

3. Mutual Funds and Other Diversified Investments

One plausible reaction to the foregoing data is to deplore the fact that many individual investors seem to be ignorant of the benefits of diversification and then to take a degree of smug satisfaction in the fact that our own assets are invested in well-diversified investment portfolios managed by such titans as Fidelity or TIAA-CREF. I will turn to evidence of the superiority of mutual fund investments in a moment, but before doing so, I would like to pause on the implications of this response. Those of us—and I would include myself in this indictment—who have been pushing the relevance of stock market efficiency as a fact of social science that should influence public policy, have some responsibility for ensuring that our advice is being properly absorbed. One should be at least a little sympathetic to an individual investor who picks up the notions that common stock has a higher return and that the market is informationally efficient but overlooks the proviso that appropriate risk-adjusted returns will be achieved only in the presence of adequate diversification and reasonable transactions costs.

To get a better sense of dispersion of returns in various types of mutual funds, I constructed two more distributions of real returns for the 1992 to 2001 period. The first is drawn from the fifty largest diversified stock mutual funds in December 1991. The second is drawn from the fifty largest bond funds in December 2001. Using the same methodology described above for hypothetical 401(k) plans fully invested in employer stock, I computed a distribution of returns for each of the funds in these groups for which returns were available for at least a portion of the period of analysis.²³ Again, I assumed a constant level of contributions at the beginning of each period of analysis.

Figure Eight reports the dispersion of returns for equity fund investments. The histogram is strikingly different than the histograms shown in Figure Six for 401(k) accounts fully invested in employer stock over the same period. Not only is the dispersion of returns much more tightly bunched (standard deviation of 2.8%), but no equity funds suffered a negative real rate of return during the period.²⁴ In addition, the average real rate for return for equity funds was substantially higher (8.3%) than the average real rate of return for 401(k) accounts fully invested in employer stock.²⁵

23. When a fund ceased to report returns in the course of the ten year period, I assumed that investors moved their account balance to the next largest fund in the 1992 list of top fifty funds. See also JOHN C. BOOGLE, COMMON SENSE ON MUTUAL FUNDS 126 fig. 5.6 (1999) (analyzing dispersion of returns in 200 growth and value funds between 1983 and 1998).

24. While the dispersion of returns in this histogram is much tighter than those presented in Figures Six and Seven, the dispersion is still not insignificant. And, in certain contexts, the variation could be significant. For example, in projecting the value of individual accounts in a partially privatized social security system, analysts often assume average rates of return on equity and bond portfolios, even though many privatization plans contemplate that participants would be allowed to choose among a range of mutual fund vendors. If such choice is permitted, we should expect to see variations comparable to those reported in Figure Eight. As a result, some participants will achieve lower-than-average returns and, thus, receive lower-than-projected levels of retirement income.

25. This is largely a product of the construction of the histograms. Returns on equity funds presented in Figure Eight approximate a value weighted market portfolio, whereas the employer stock investments reported in Figure Six give all covered S&P 500 companies an equal weighting.

Figure Eight
Distribution of Returns on Equity Mutual Funds: 1992-2001
(based on 50 largest funds by assets in 1992; n= 46)

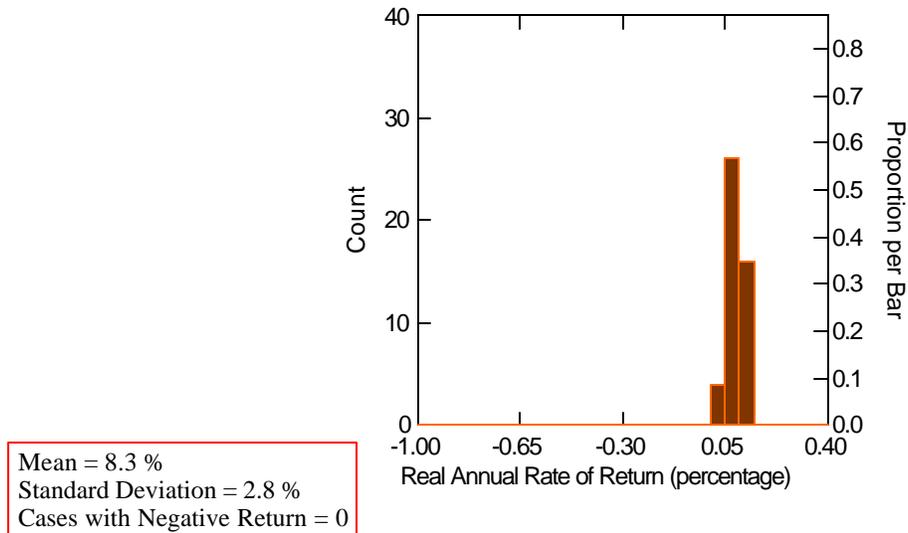
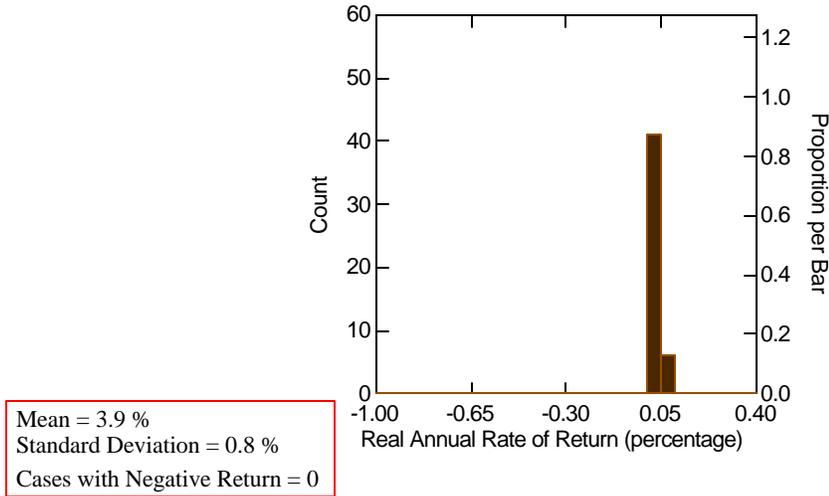


Figure Nine, which reports real returns on hypothetical returns in 401(k) accounts invested in the largest bond funds from 1992 to 2001, is even more tightly bunched. With an average return of 3.9%, these hypothetical accounts had a standard deviation of only 0.8% and, again, no accounts with negative real rates of return.

Figure Nine
Distribution of Returns on Bond Mutual Funds: 1992-2001
 (based on top 50 funds in 1992; n= 47)



What Figures Eight and Nine suggest is the extent of the opportunity costs that 401(k) participants face when they exert their current right to invest all or most of their retirement savings in employer securities. While some participants may enjoy high rates of return from undiversified investments in employer stock, this investment strategy will predictably generate a high dispersion of investment returns, including at least some extremely negative returns comparable to those experienced in the case of Enron. That is what happened in the 1980s and the 1990s—decades generally characterized by strong performance in our equity markets—and that is what we can be reasonably sure will happen in future decades if we continue to allow 401(k) participants to invest all of their retirement savings in employer stock—the mechanisms of market efficiency notwithstanding.

IV. FURTHER RESEARCH AND REFORM PROPOSAL

Let me conclude with a few thoughts on the implications of my analysis for development of policy and further research.

I will begin with the more general question of individual investments in equity securities. I would recommend that the emphasis of the SEC and other regulatory officials should be less on improving the mechanisms of market efficiency and more on making sure that individual investors fully understand the risks associated with equity investments, particularly the risks of undiversified investments and investment strategies subject to high transaction costs. One could imagine, for example, the SEC commissioning more detailed studies of the actual investment performance of individual

investors—comparable to the academic studies I described above. The Commission could then develop a disclosure document that reveals the actual investment returns that individuals experience and perhaps even basic information about which factors contribute to the dispersion of returns.²⁶ Currently, mutual fund companies are required to make such disclosures for the past performance of mutual funds, but brokerage firms make no such disclosures when individuals open new accounts or receive their annual statements.²⁷

In terms of 401(k) investments, I think much more attention needs to be given to the regulatory restrictions on individual investment in employer stock. Under ERISA, 401(k) participants are assured that their purchases of employer stock will be made at the market price—typically derived from an informationally efficient market—but not much more.²⁸ The diversification requirements imposed on other ERISA plans are expressly waived for employer stock purchased for qualifying 401(k) plans.²⁹ As a result, employees are encouraged to, and often do, invest substantial portions of their tax-favored retirement savings in employer stock. As the analysis presented above illustrates, the results of such an investment strategy is predictably dispersed and often unprofitable.

In considering alternative regulatory regimes, Congress and federal authorities should consider the likely results of more paternalistic investment structures. For example, in Figure Ten, I constructed a dispersion of hypothetical returns for 401(k) plans during the 1992-2001 time frame in which plan participants were restricted to investing fifty percent of their assets in employer stock and fifty percent in an indexed equity fund.³⁰ While there is still a reasonable amount of dispersion in annual real returns (standard deviation of 9.6%), the distribution is more tightly bunched than in the case of

26. As explained above, incomplete diversification and heterogeneous transaction costs likely contribute much to the dispersion of returns. Various studies have also suggested that frequency of trading also seems to lower returns, thereby implying dispersion of returns if investors trade with different frequency. See Barber & Odean, *supra* note 13, at 790-94 (noting that households with high turnover rates tend to perform less well); Terrance Odean, *Do Investors Trade Too Much?*, 89 AM. ECON. REV. 1279, 1294-95 (1999) (stating that additional trading tends to lower returns); see Brad M. Barber & Terrance Odean, *Boys Will be Boys: Gender, Overconfidence and Common Stock Investment*, 116 Q. J. ECON. 261 (2001) (exploring significance of overconfidence on trading levels). See also Mark M. Carhart, *On Persistence in Mutual Fund Performance*, 52 J. FIN. 57, 66 (1997) (presenting evidence that mutual fund expenses and turnover rates tend to reduce overall performance). Another possibility—in tension with the efficient market hypothesis—is that some of the dispersion in investor returns is caused by difference in stock-picking ability. See Joshua D. Coval, David Hirshleifer & Tyler Shumway, *Can Individual Investors Beat the Market?* (Harvard NOM Research Paper No. 02-45, Dec. 2002); see also Alok Kumar & Vincente Pons, *Behavior and Performance of Investment Newsletter Analysts* (Working Paper, Nov. 2002) (suggesting that an identifiable subset of investment newsletters outperform the market on a risk-adjusted basis).

27. In my view, this is not a context in which market force will readily provide appropriate information. Brokerage houses face fairly strong incentives not to educate investors about the drawbacks of direct stock investments and may not—in the absence of governmental pressure—even be willing to disclose the underlying data necessary to reveal the kind of information that investors should have when choosing between direct stock investments and intermediated investment strategies.

28 Footnote needed

29 Footnote needed

30. For purposes of this calculation, I assumed that the indexed equity fund earned the S&P 500 value-weighted average minus an annual administrative expense of fifty basis points. In addition, I assume that the account portfolios were rebalanced to maintain a fifty-fifty investment split between employer stock and the indexed equity fund at the beginning of each year.

the dispersion for accounts fully invested in employer stock. Moreover, the number of companies showing negative real rates of return is cut by more than half (dropping from 22.7% to 9.1%), and the truly disastrous Enron-style losses are entirely eliminated.

Figure Ten
Hypothetical Returns on 401(k) Account: 1992-2001
(1/2 in Employer Stock & 1/2 in Indexed Equity Fund)

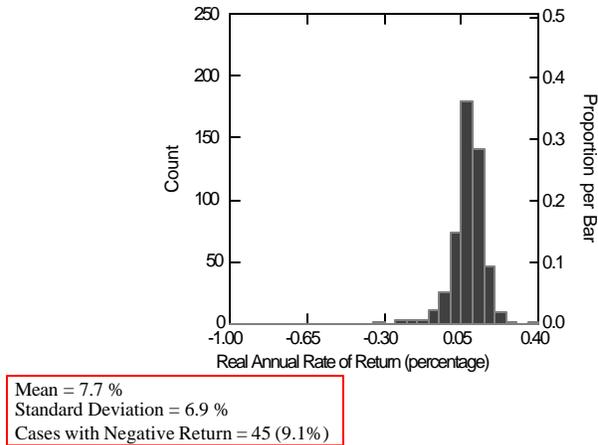
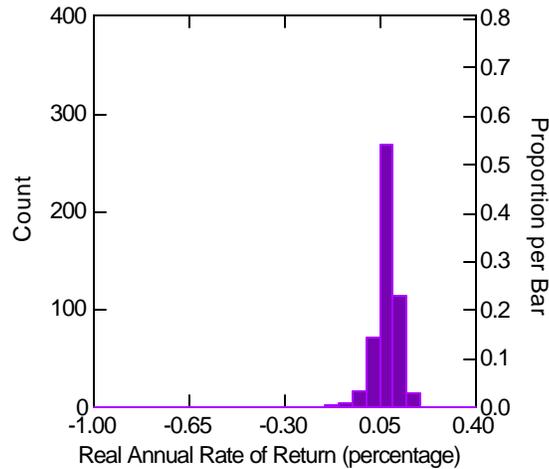


Figure Eleven presents the dispersion of hypothetical returns from another, more restrictive investment structure, in which employer stock is limited to one-third of account balances and the remaining two-thirds is split evenly between an indexed equity fund and an indexed bond fund. The dispersion shows a modest drop in average annual real returns (7.2%), as well as a further reduction in the dispersion of returns (standard deviation of 4.9%). In addition, the number of accounts showing negative real rates of return is nearly halved again, dropping to 4.8% of companies.

Figure Eleven
Hypothetical Returns on 401(k) Account: 1992-2001
 (1/3 in Employer Stock, 1/3 in Indexed Equity Fund, & 1/3 in Indexed Bond Fund)



Mean = 7.2 %
 Standard Deviation = 4.5 %
 Cases with Negative Return = 24 (4.8%)

At a minimum, employees making investment decisions regarding 401(k) accounts that include employer stock should be provided with information comparable to the distributions presented in this comment. Preferably, at least in my view, plan participants should be prohibited by statute from investing more than a limited amount of 401(k) balances—say twenty-five percent of balances—in employer stock. But, at a minimum, policy debates about the rules governing the 401(k) plans should be informed by more detailed analyses of the actual dispersion of returns that 401(k) plans have experienced and the range of likely investment returns that permissible investment strategies can be expected to generate for plan participants in the future. At least as far as individual investors are concerned, the dispersion of expected investment returns, and not stock market efficiency, should be our guiding light.