
Social Investing and Modern Portfolio Theory

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INTRODUCTION

Our country has a long tradition of directing social development via the economic "vote." Today, individuals concerned with "voting" their consciences through the products they purchase and the investments they pursue have inherited a legacy that dates back at least to the dumping of tea in Boston Harbor. Increasingly, people are applying a social or ethical test to both their product and investment choices. This trend has not gone unnoticed by numerous companies like Ben and Jerry's Ice Cream, Levi Straus, or Starbucks Coffee, that have distinguished themselves through their social agendas. The success of these firms' products may be due in part to that ethical reputation. On the investment scene there has been a proliferation of funds linking themselves to "social responsibility." In this paper, we discuss some possible effects of social investing, then we examine the implications for investors in the context of modern portfolio theory. We demonstrate that socially responsible funds may be valuable contributors to portfolio risk reduction and because of this characteristic will have economic benefits for investors who include them in their investment portfolios. This provides a natural extension to the Reyes and Grieb (1998) study that appeared in this journal.

SOCIALLY RESPONSIBLE PURCHASING AND INVESTING

The recycle symbol, "contains no phosphates," "not tested on animals," and "biodegradable" are all

product designations designed to appeal to socially responsible consumers. Books like *Shopping For A Better World*, which rate firms on several social dimensions in an effort to inform consumers, are widely read. Thus, using recycled material or engineering a biodegradable product may be a means of differentiating one's product and appealing to a significant segment of the market. There is an expected pay-off, in terms of commanding a premium price and enhanced customer loyalty, that results from promoting the social responsibility dimension of the company and its products.

We are accustomed to thinking of the segmentation of markets for consumer goods. It is basic marketing strategy for firms vying for competitive advantage to distinguish their products and services on multiple dimensions including, in some cases, social responsibility as well as price, quality, image and so on. This segmentation strategy, however, is not as well accepted in capital market theory. Neo-classical economics, for example, assumes that investors care about only two characteristics as they make their investment choices: an investment's expected risk and expected return. It is granted that forward-looking capital markets may consider a multitude of qualities that affect risk and return, including for example, the potential for a strike or lawsuit that could possibly lower returns and increase risk. But, holding risk and return constant, mainstream financial theory does not allow security values

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to be affected by non-fundamental factors such as social responsibility. Security prices traditionally are assumed to be set by investors analyzing each firm's projected cash flows, economic conditions, and other fundamental factors that influence return and risk expectations. If a company's prospects suffer a set-back as a result of either a firm-specific event or an overall economic downturn, traditional investors may sell their shares, driving down the value of the security.

Suppose, on the other hand, that certain people's investment selection criteria include a firm's record of social responsibility. And assume that a significant number of such investors congregate toward a group of stocks or certain mutual funds characterized as socially responsible. Moreover, trading in these securities is dominated by such social funds and investors. Perhaps, for these securities, trading is not solely a manifestation of the stock's fundamental value, but also of its social agenda and performance. We will consider how such funds might influence investors' choices in light of modern portfolio theory, but first we review the literature examining the performance of socially responsible firms and mutual funds.

THE PERFORMANCE OF SOCIALLY RESPONSIBLE INVESTMENTS

Numerous studies have been undertaken to determine whether there is a connection between social performance and economic performance. (Reviews of these studies are included in Arlow and Gannon, 1982; Frooman, 1994; Ullman, 1985; Wood and Jones, 1995; and Reyes and Grieb, 1998). Although individual studies have found significant positive and negative relationships, the reviews have concluded that, in general, there has been no finding of improved economic performance for companies with better social performance, but neither has there been worse economic performance. There is remarkable consistency, however, in finding negative returns following the announcement of a socially irresponsible event (eight out of nine studies as reviewed by Frooman, 1994; and ten of eleven in Wood and Jones, 1995).

Few studies have addressed issues concerning risk. One found a positive correlation between managers' concern for economic performance (versus concern for society) and a firm's total risk (Aupperle, 1984). Another found a negative correlation between manager's concern for society and a firm's total risk (Aupperle, Carrol and Hatfield, 1985). McGuire, Sundgren and Schneeweis (1988) found stock market risk and accounting measures of risk to be predictive of reputational measures of social performance (i.e., lower risk was associated with higher social performance).

With dozens of new mutual funds with a social agenda formed in recent years, there has developed a

fertile new area for research. By examining the performance of social funds, the researcher bypasses the problem of measuring corporate social performance. There is, however, an implicit acceptance of the social screens used by the funds in any sample as an acceptable way of distinguishing socially responsible from less socially responsible firms. This approach is not without its critics, and some advocates of corporate social performance are displeased with the simplicity of the screens that are used.

Despite these objections, numerous investors utilize social funds. They find it much more convenient as a means of socially responsible investing than to evaluate the social performance of firms themselves. This is similar to the practice of using mutual funds generally to achieve diversity and to avoid the task of evaluating particular companies as investment vehicles.

It seems reasonable, then, to examine the economic effects of investing in social funds. Such a study provides one measure of economic performance of firms with "higher" social performance. Further, this type of study provides useful information on expected economic consequences for investors who choose social funds.

The studies of social responsibility funds have given mixed results. Many authors have pointed to examples of social funds which outperformed the stock market and other mutual funds at certain periods (Bruyn 1987; Hylton, 1992; Stoval, 1992; and Kinder, 1993). Others have found weaker returns provided by social funds (e.g. Galen, 1994 and Teper, 1991).

In studies controlling for risk, Hamilton, Jo and Statman (1993) and Reyes and Grieb (1998) found no significant difference in performance between social funds and funds which do not follow socially responsible investment principles. Wall (1995) explores the conditions under which social investing is likely to be effective in influencing the market for the securities of particular firms. In this study we consider both risk and return contributions of socially responsible funds; and, rather than making a direct comparison, we look at the consequences of adding social funds to one's portfolio.

HYPOTHESES

Modern portfolio theory recognizes that an investor's risk exposure can be reduced (without sacrificing return) by way of diversification. This "portfolio effect" is a consequence of the imperfect correlation of returns between securities. In fact, the lower the correlations are, the greater will be the reduction in risk from carefully selecting one's portfolio. Once a portfolio is well-diversified, it will contain only unavoidable economy-wide risks, known as market risk. For example, risks of unexpectedly high inflation, or the risks associated

with an oil embargo, are largely unavoidable regardless of one's diversification strategy. Such events affect the values of almost all investments and their associated risks are non-diversifiable.

But in the previous section we noted that social funds may trade, in part, because of factors other than those that fundamentally influence value. Unlike traditional investors who are likely to make defensive trades in a downturn, social investors may be less inclined to follow the market.

Reyes and Grieb (1998) find evidence consistent with this hypothesis when they conclude that,

"... social screens cause [socially responsible] portfolios to behave quite differently from their respective peer groups." [p.3].

After all, the social performance of such investments will not be systematically changed by, for example, a recession, so there's no reason for social investors to alter their holdings. This leads to our hypotheses: 1) the portfolio turnover of social funds would be lower than that of traditional funds, and 2) correlations between social funds and the market will tend to be lower than between the market and more traditional investments. Following modern portfolio theory, low correlations should lead to enhanced risk-return choices for investors who include *both* social funds *and* mainstream securities in their portfolios.

METHODOLOGY

To investigate whether the effectiveness of diversification is improved by including social funds in one's portfolio, we screened the Morningstar Mutual Funds on Floppy data base to identify "socially conscious" equity funds. We then eliminated those funds that were either non-equity funds or for which we could not gather the past 48 monthly returns (12/91 through 11/95). Our screens left six funds, whose names and descriptive statistics are included in Table One.

The effect of diversification strategy was examined by constructing a portfolios possibilities

curve over the period December, 1991, through November, 1995. This curve represents the extent of diversification possible over that holding period had one considered investing in the Standard & Poors 500 index fund and any combination of these six mutual funds categorized as "socially conscious" by Morningstar. By assuming that investors prefer higher returns and less risk, we mathematically constructed¹ the parabola depicted in Figure One. This parabola is called the portfolio possibilities curve and is the extent to which one can either increase return or reduce risk (or both) through portfolio choices given the funds included in the study. Each point along the curve represents a portfolio achievable by investing different proportions of one's savings in the seven portfolios.

RESULTS

We first examined the data for support of the hypotheses that social funds have less turnover and lower correlations with market indices than do traditional equity funds. For comparison, we randomly sampled 200 equity funds from Morningstar and calculated average turnover and average correlation with the S&P 500 for both the traditional fund sample and the sample of social funds. Because of the small number of social funds included in our sample, the differences are not statistically significant, but the social funds did have less turnover and lower correlation with the market, as hypothesized. The results are reported in Table Two.

TABLE TWO
Differences in Turnover and Correlation Between Social and Traditional Equity Funds

	N	Mean Turnover (Standard Dev)	Mean Correlation with S&P 500 (Standard Deviation)
Social Funds	6	65.33 (86.5)	42.15 (17.65)
Equity Funds	200	92.47 (72.7)	81.9 (46.19)

TABLE ONE
Six Funds Categorized Socially Conscious

Fund Name	Mean Return	Variance
Calvert Social Equity	.00896*	.00334
Dreyfus Third Century	.00090	.00149
New Alternatives	.00349	.00069
Parnassus	.01434	.00736
Pax World	.00340	.00069
Righttime Social	.01354	.00469

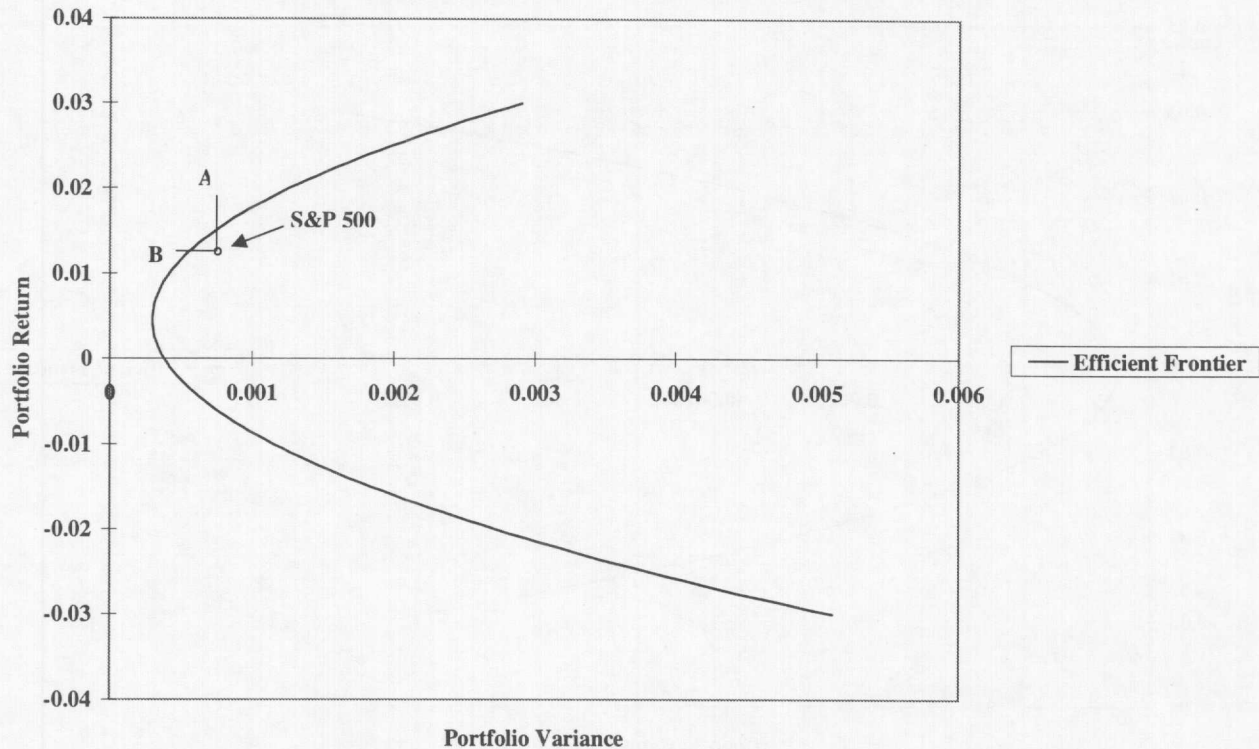
* Returns and variance are monthly and in decimal form.

Figure 1 illustrates the achievable set of preferred holdings which falls along the "northwestern" frontier (moving up and to the left of the diagram) for the six funds and the S&P 500 index used in the study.

The striking part of Figure One is that investing all of one's funds in the S&P 500, a currently popular strategy known as *indexing*², appears suboptimal. Note that either Point A or Point B would "dominate" indexing as investors at those points could have either achieved the same return with less risk or kept risk the same and achieved a higher return, respectively, had they chosen not to index. By investing in point B rather than the S&P 500, for example, an investor would have

FIGURE 1

Efficient Frontier with S&P 500 and 6 Socially Responsible Mutual Funds, 12/91 through 11/95



achieved the same return but reduced risk by about one-third. Choosing to invest solely in a social fund or funds would also entail a lost opportunity to diversify and improve one's trade off between risk and return.

Figures 2 and 3 are similar to Figure 1 except the data has been divided into two sub-periods (12/91-11/93 and 12/93-11/95, respectively). In each two year period, including social funds in one's portfolio strategy dominated indexing alone.

The difficulty in implementing the diversification strategies suggested by Figures 1 through 3 is that these portfolio possibilities curves by themselves fail to suggest which of the social funds are responsible for the improved portfolio performance and what fund characteristics contribute to that improvement. To gain that insight we tested each fund for inclusion in the portfolio using a bilateral complementarity analysis suggested by Elton, Gruber, and Rentzler (1987) as well as Eun, Kolodny, and Resnick (1991). This analysis tests whether or not the inclusion of a fund will provide gains in reward-to-risk ratio when added into a well-diversified portfolio. The test is:

$$\frac{\bar{R}_{fund} - \bar{R}_{Tbill}}{\sigma_{fund}} > \left(\frac{\bar{R}_{S\&P} - \bar{R}_{Tbill}}{\sigma_{S\&P}} \right) \text{corr}_{fund, S\&P}$$

If this inequality holds, then the fund should be added to the benchmark portfolio (in our case, the S & P 500). Table Three chronicles the results.

From Table Three, one fund emerges as being a

consistent contributor to improved performance in both subperiods as well as the entire period: Parnassus Growth. The data used in Table Three's tests are tabulated in Table Four. An examination of the

TABLE THREE^a
Analysis of 'Bilateral Complementarity'
S & P 500 and Social Funds

Fund	Early Period 1991-1993	Late Period 1993-1995	Entire Period 1991-1995
Calvert	Add	Do Not Add	Do Not Add
Dreyfus			
Third World	Do Not Add	Do Not Add	Do Not Add
New			
Alternatives	Do Not Add	Do Not Add	Do Not Add
Parnassus	Add	Add	Add
Pax World	Do Not Add	Add	Add
Righttime Social			
Awareness	Do Not Add	Add	Add

^aEun, Kolodny, and Resnick (1991) refer to the Elton, Gruber, and Rentzler (1987) model described above as a test of the "bilateral" complementarity of S&P 500 and a specific mutual fund. If the following inequality holds, then the fund should be added to an equity portfolio (i.e., S&P 500):

$$\frac{\bar{R}_{fund} - \bar{R}_{Tbill}}{\sigma_{fund}} > \left(\frac{\bar{R}_{S\&P} - \bar{R}_{Tbill}}{\sigma_{S\&P}} \right) \text{corr}_{fund, S\&P}$$

FIGURE 2

Efficient Frontier with S&P 500 and 6 Socially Responsible Mutual Funds, 12/91 through 11/93

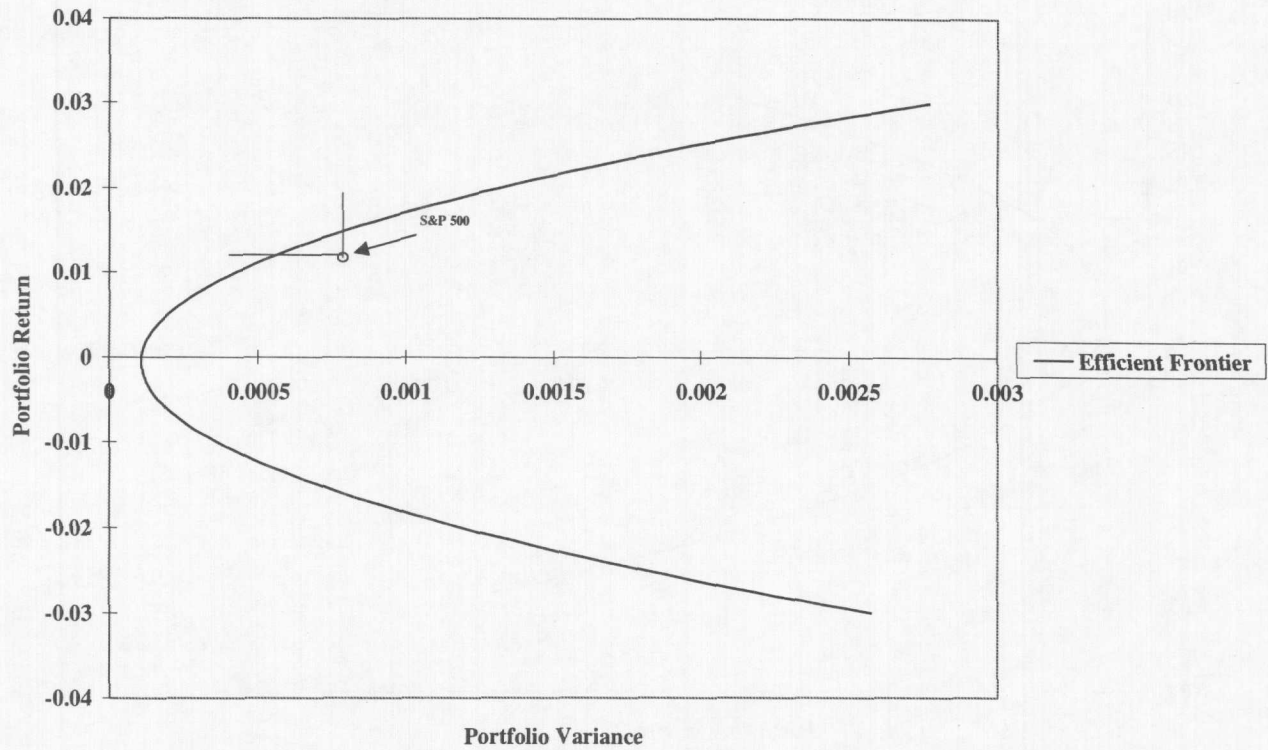
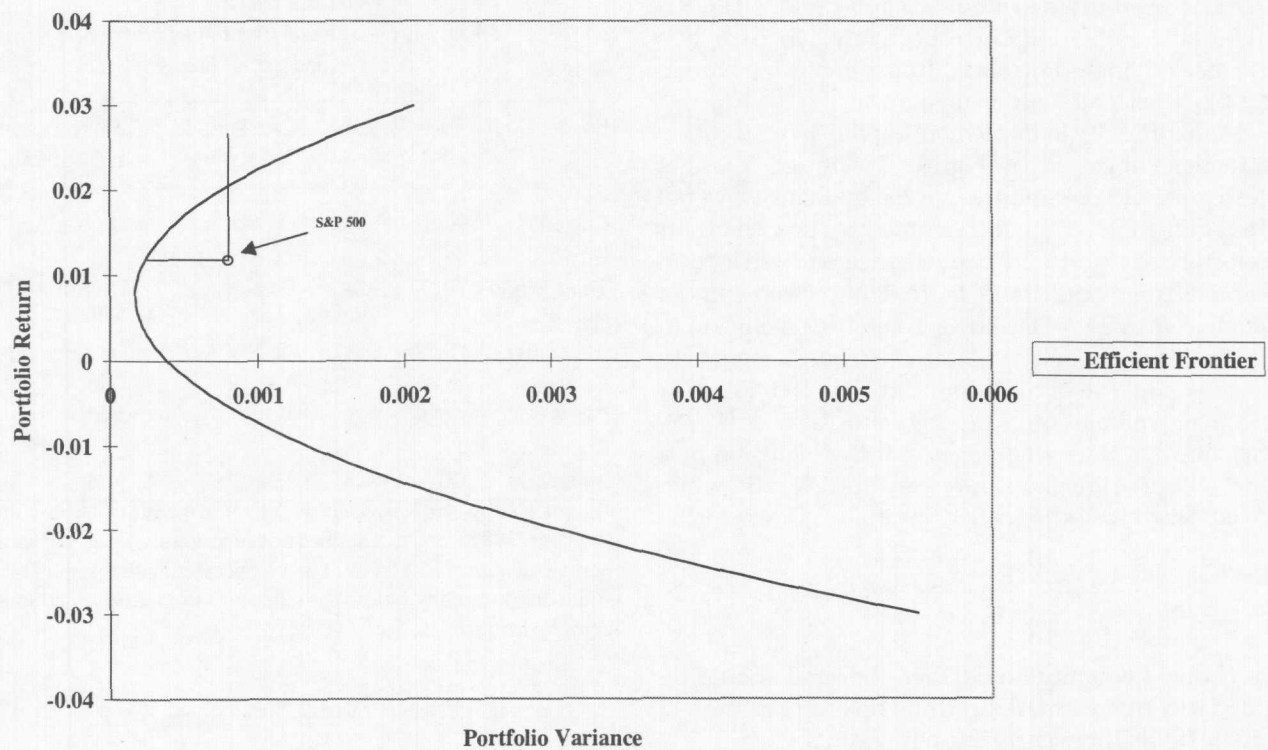


FIGURE 3

Efficient Frontier with S&P 500 and 6 Socially Responsible Mutual Funds, 12/93 through 11/95



complementarity inequality and of Table Four's information provides some insight into the characteristics of funds which contribute to their ability to improve portfolio performance. These characteristics include very low correlation with the S & P 500 as in Parnassus Growth's early period performance and relatively high rates of return such as those

the past. However, the benefit of diversification is a mathematical certainty, as is the fact that the benefit grows as correlations decline. In this paper, we discussed reasons why social funds may have relatively low correlations with the market, and we found that the data in our sample is consistent with such reasoning. In such a case, benefits of

TABLE FOUR
Monthly Return Characteristics S&P 500 and Social Funds

PANEL A: December 1991 --- November 1995			
Fund	Mean Monthly Return	Standard Deviation	Correlation With S&P 500
S&P 500	.0095	.0252	-----
Calvert Social	.0090	.0578	.649
Drefus Third Century	.0009	.0386	.386
New Alternatives	.0035	.0263	.509
Parnassus Growth	.0143	.0858	.124
Pax World	.0034	.0264	.372
Righttime Social Awareness	.0135	.0685	.487
T-bills	.0034	-----	-----
PANEL B: December 1991---November 1993			
Fund	Mean Monthly Return	Standard Deviation	Correlation With S&P 500
S&P 500	.0094	.0234	-----
Calvert Social	.0164	.0694	.682
Dreyfus Third Century	-.0005	.0441	.075
New Alternatives	.0022	.0227	.288
Parnassus Growth	.0144	.1134	-.075
Pax World	-.0012	.0312	.257
Righttime Social Awareness	.0188	.0933	.682
T-bills	.0029	-----	-----
PANEL C: December 1993 ---November 1995			
Fund	Mean	Standard Monthly Return	Correlation Deviation
With S&P 500			
S&P 500	.0098	.0278	-----
Calvert Social	.0004	.0407	.715
Dreyfus Third Century	.0025	.0323	.835
New Alternatives	.0050	.0304	.672
Parnassus Growth	.0142	.0374	.792
Pax World	.0087	.0188	.627
Righttime Social Awareness	.0075	.0147	.339
T-bills	.0039	-----	-----

achieved in both the early and late periods by Parnassus.

DISCUSSION

The results depicted in the three figures and in Table Three are period-specific and it remains to be seen if the same portfolios will generate the same efficient frontier in the future that they generated in

diversification can accrue to both traditional indexing investors who include social funds as part of their portfolio strategy, and to social investors who include some traditional funds or an index fund as a part of their portfolios.

NOTES

- ¹ For details on how to construct the portfolio possibilities curve, see "Comparative Efficiency of Market Indices: An Empirical Study," by Chi-Cheng Hsia in *Journal of Financial Research*, 9 (1986), pp. 123-135.
- ² Vanguard, for example, began its first index fund (Index 500) in 1975 with \$11 million in assets. By 1994, Vanguard's family of indexed funds had grown to \$18 billion in total assets. Their original \$11 million 500-stock portfolio reached \$50 billion, a testimony to the popularity of the indexing approach to investing. The history of Vanguard's indexing may be read on-line at www.vanguard.com in "The First Index Fund" by John Bogle.

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