

# **Evidence - Based Portfolio Management**

**By**

**Frank Sortino, Mark. Kordonsky and Hal Forsey**

*A working paper not for publication*

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# **Evidence - Based Portfolio Management**

*Act on what you know while seeking to know more<sup>1</sup>*

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Professors Jeffrey Pfeffer and Robert Sutton [2006] at Stanford University have recently published a book that investment professionals would be wise to read. It presents the case for “Evidence - Based Management” for business executives. While it is directed to CEO’s for corporate guidance, we believe it has application to portfolio management. The basic idea is that one should look at the evidence to see if it supports what they are doing or the philosophy that underlies their actions.

## **What Inhibits Innovation?**

Pfeffer and Sutton point out the difficulty of overcoming ideas that become part of the bedrock belief system of the power elite. The history of medicine provides some excellent examples. Joseph Ellis [2005] in his best seller relates how George Washington went out for a ride on his favorite horse one stormy morning in 1799 and came down with a cold. Since his face was flushed the doctors applied the standard practice of draining blood from his body until his face turned the right color. When it remained flushed they tried it again and again and yes, a fourth time until 5 pints of blood had been drained from his body. Finally, they administered a strong laxative...twice. That did it. He died soon after his color returned to normal. Blood-letting was a time honored procedure that had been practiced for hundreds of years, so no one questioned its use... until 1836 when Dr. Pierre Louis conducted one of the first clinical trials and showed that this practice more often killed than cured the patient. In spite of this evidence, it took another 37 years before the practice of blood-letting stopped.

Did the obvious failure of blood-letting act as a catalyst for innovations in the practice of medicine? Forty years later, in 1876, most physicians still did not wash their hands before an operation or sterilize their surgical equipment. This in spite of the fact that Dr. Lister provided clinical proof that fewer patients died in hospitals that took these precautions, and Louis Pasteur proved the existence of germs that could only be seen under a microscope. In a debate at the first American Centennial Lister debated the head of the American Medical Association, Dr. Gross, who opposed sterilizing his surgical equipment and boasted of wearing the same blood splattered suit for each surgery. Who won the debate? Once again, the evidence was ignored and it was business as usual.

These were not isolated incidences. Thomas Kuhn [1962], a philosophy professor at M.I.T. University offers further evidence of this resistance to change. He notes that the scientific community has seldom been persuaded by facts to shift from one paradigm to another. The views of Copernicus were not generally accepted for a century after his death. A half century after the publication of *Principia* by Newton, the facts he presented were not generally accepted. Max Plank remarked, "A new truth does not triumph by

convincing its opponents and making them see the light, but rather because its opponents eventually die."

### **What Promotes Innovation?**

For hundreds of years evidence has failed to produce change amongst learned men of science. But, as the song from Cabaret says, "Money, money, money makes the world go round." While Lister was unable to sell his antiseptic to doctors to sterilize their equipment, a salesman suggested they bottle the disinfectant as a mouth wash that promised kissing sweet breath. Have you ever tasted the stuff? Right, but the advertising sold it. Listerine mouthwash made millions of dollars in the next few years and continues to make millions to this day. The Listerine story has been reborn a thousand times as witness the endless commercials we are forced to watch even to see the evening news. We believe that portfolio management is following the same path as the medical profession 200 years earlier. Innovation is marketing driven not technology driven. Time and again outmoded ideas trump evidence. Innovation in medicine finally reached the tipping point in the 20<sup>th</sup> century.

### **If it sells it won't work. If it works it won't sell.**

Let's examine the evidence. In the early 1950's Dr. Harry Markowitz offered a risk-return framework for managing portfolios that fell on deaf ears for over twenty years because it was too complicated and required mathematical skills beyond the level of most market professionals. It was rejected by investment experts who felt threatened by any attempt to quantify the risk they were taking. Academics, including members of his dissertation committee, also rejected the Markowitz theory until this simplification was offered: If there exists a risk-free asset and a market portfolio, it would no longer be necessary to know how every asset covaried with every other asset to measure the risk-return tradeoff proposed by Markowitz. Without proof, a linear relationship between a risk free asset and one risky asset was presented. In equilibrium the risky asset would have to be the market portfolio. Thus, Alpha and Beta were born and a whole new financial services industry called consulting came into being to sell performance measurement based on the Capital Asset Pricing Model (CAPM). Consulting firms could now rank all managers relative to the S&P 500, a surrogate for the market portfolio, and sell this one analysis to hundreds or even thousands of different clients. Today there are literally thousands of consultants circling the globe that use the same standard procedure to make \$ billions.

This, in spite of the fact that empirical research began to show the CAPM didn't work the way it was supposed to. These results were called anomalies, e.g., stocks with high Betas did not produce higher returns. The supposed coup de grace came when professors Fama and French [1992] at the University of Chicago wrote several papers [1992,1996, 2004] claiming Beta is insufficient in explaining average return, survivor bias does not explain the weak relationship between beta and the average return, and conclude that "**empirical failures of the CAPM invalidate most of its applications.**" One reason for these failures is, there is no such thing as a market portfolio out there in financial markets. Huh? The S&P 500 is not the market specified in CAPM! The theory requires that the market portfolio consist of every asset in the world in the proportion that it exists in the

world. Are there any bonds in the S&P 500? Is there any real estate? There is not even a representative sample of the 6000 stocks in the U.S. market as a recent study by Ron Surz<sup>2</sup> shows.

**Figure 1**

**Surz Style Definitions**

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| <p><b>Capitalization</b></p> <ul style="list-style-type: none"> <li>• <b>Large : Top 65% of \$s</b></li> <li>• <b>Mid : Next 25%</b></li> <li>• <b>Small : Bottom 10%</b></li> </ul> | <p><b>(E/P + y + B/P)*</b></p> <ul style="list-style-type: none"> <li>• <b>Value : Top 40%</b></li> <li>• <b><u>Core : Middle 20%</u></b></li> <li>• <b>Growth : Bottom 40%</b></li> </ul> |
|--|--|

Implied Weights:

LgVal	LgCor	LGro	MdVal	MdCor	MdGro	SmVal	SmCor	SmGro	
26	13	26	10	5	10	4	2	4	Surz
34	16	35	6	4	5	0	0	0	S&P

The implied weights show the S&P 500 over weights large cap (34%,16%, 35%), under weights mid cap and ignores small cap. This makes it easy for a money manager to game the evaluation of his performance relative to the S&P 500 by just adding a little small cap.

We at PRI have repeatedly pointed out that there is also no such thing as a riskless asset. U.S. treasury bills are the most popular surrogate for the hypothesized risk free asset. It is painfully clear that the vast majority of investors could never accomplish their investment goals by investing solely in t-bills. True, investing in t-bills would eliminate uncertainty as t-bills would virtually guarantee failure to achieve one’s goal. Yes, t-bills are hopefully free of default risk, but not investment risk. What does this have to say about stable value funds as a default option in 401(k) plans? The goal for 401(k) participants is not preservation of capital, it is retirement with dignity. We should not expect 401(k) participants to understand the difference in goals...but investment professionals should.

The cover of Institutional Investor Magazine<sup>3</sup> announced, “Beta Is Dead!” Well, you can’t kill a money making idea with rigorous evidence. CAPM is everywhere and used by everyone. We are not suggesting that CAPM is comparable to blood-letting. We believe CAPM serves a useful purpose in teaching students how assets should be priced in equilibrium so that all returns are equal when adjusted for risk. Our problem with

CAPM is with the misapplication of the theory to real world investment problems where equilibrium and the other restrictive assumptions do not hold.

Enter Dr. Peter Fishburn [1977], who offered an improvement to this form of portfolio surgery. He provided mathematical proof that a richer more robust framework existed that included the Markowitz model. He suggested that investors focus on the “target rate of return” that would accomplish goals like, retirement, or putting their kids through college. This antiseptic didn’t sell. Maybe it was because it became known as the Mean-lower-partial-moment theory and required a knowledge of calculus to understand. Two decades later Sortino and Lee Price called it “downside risk”[1994] and offered a performance statistic that focused on beating Fishburn’s target return<sup>4</sup>, subject to the risk of falling below the target return. It still didn’t sell. A decade later, hedge funds found that by applying our statistic, which they called the Sortino Ratio, it made them look like they could make very high returns with very low risk. In spite of the fact that Sortino<sup>5</sup> renounced this statistic publicly and published empirical evidence that it provided misleading results, it gained in popularity. A consultant told us he attended a conference that was praising the Sortino Ratio. When he raised his hand and said, “I have heard Dr. Sortino condemn this ratio and ask consultants to stop using it before their clients got hurt; the answer to his comment was, “well, it’s not his anymore. It’s in the public domain and it’s in our computer and it’s going to stay there.” A few years later the market collapse of 2000 began and we suspect a number of portfolios lost enough blood to be near death’s door. Did that finally end the use of the Sortino ratio? No, its popularity has risen with the explosive growth of hedge funds. Even research from the creator can’t kill a money making idea.

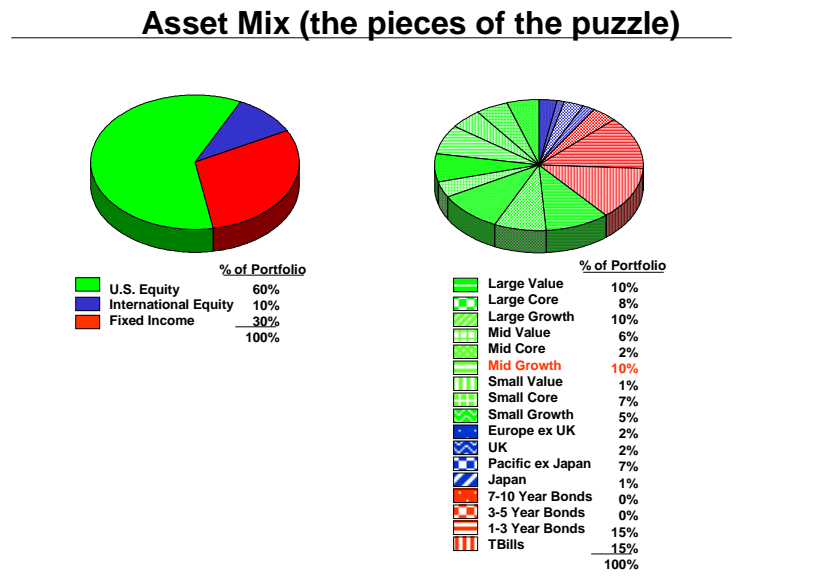
Money might explain why consultants and portfolio managers continue to promote theories that evidence does not support. But why would all financial text books end with CAPM and not mention the work of Fishburn [1977], Kahneman & Taversky<sup>6</sup>, and others? Pfeffer and Sutton claim “ideology is one of the most widespread and potent impediments to using evidenced-based management. People believe their theories so fervently they are incapable of learning from new evidence. People see what they believe and ignore evidence that contradicts their most precious beliefs.” Amen! We would add that business schools have their ideology and economics departments have their own. Fishburn’s work came from the Economics Department at the University of Pennsylvania while CAPM is the ideology of the Wharton School of Business at the University of Pennsylvania. At most universities CAPM is never mentioned by economists and Fishburn’s contribution is ignored by finance professors.

### **How To Ensure A Suboptimal Asset Allocation.**

The asset allocation decision is generally accepted to be the most important investment decision. Brinson, Hood and Beebower [1995] provided evidence it was the most important decision variable. Yet, most of a fiduciary’s time is spent in selecting managers to fit the asset allocation. Furthermore, the way that consultants select managers guarantees they will change the asset allocation in some indeterminate manner. What? Yes, the methodology consultants use guarantees they will change the most important investment decision in such a way that no one will know what the final asset allocation is.

This is how it happens. Let's suppose a consultant proposes the asset mix shown in Figure 2.

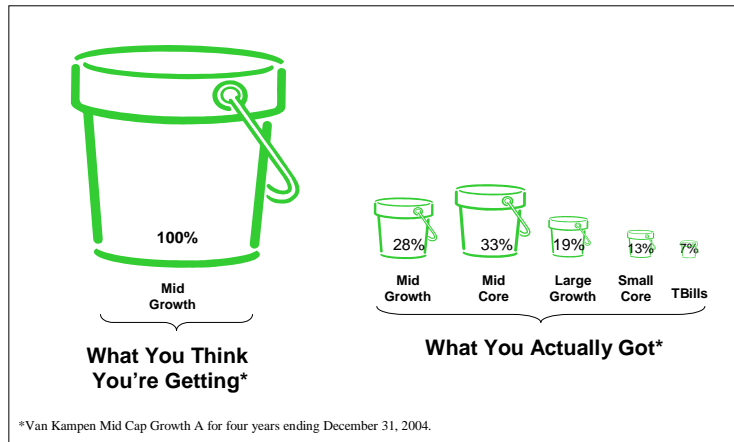
**Figure 2**



The consultant believes that 10% should be allocated to mid cap growth and he hires Van Kampen Mid Cap Growth Fund to fill that allocation as if this fund was invested solely in mid cap growth stocks. Figure 3 presents reality versus belief. At the time of this analysis, the fund was only 28% in mid cap growth so he only ends up with 2.8% in mid cap growth instead of 10%. What is more, he will now have more allocated to the other style categories (e.g., 33% Mid Core) than he wanted. By the time he hires 8 more managers to fill the 9 U.S. style boxes in Figure 2 he won't know what the final asset mix is. If the pension fund did have the optimal asset allocation initially it is now suboptimal. This did not need to happen. The theory for analyzing thousands of managers in an instant was proposed by William Sharpe [1992]. Of course, returns based style analysis was immediately rejected by many consulting firms including the prestigious Frank Russell Company, whose officers wrote numerous articles condemning it.

Figure 3

### Manager Style—Perception vs. Reality



The obvious flaw consultants make is pretending that each manager hired is a pure style when in fact almost all managers are a blend of styles. The empirical evidence that managers are a blend of styles is overwhelming. Amazingly, the same companies that sell this flawed advice also sell the style analyzer that identifies each manager's style blend. So, why do they sell flawed advice when they have the technology to do better? KISS<sup>7</sup> seems to be the marketing motto. Pfeffer and Sutton make the observation that "Consultants are always rewarded for getting work and seldom rewarded for advice that actually enhances performance (2006,p33). For example, financial consultants get a fee for recommending a portfolio manager. If the manager does not do well, the consultant recommends terminating the manager. No one evaluates the manager to determine if the methodology is flawed...if they all use the same analytical tools. This provides a disincentive for consultants to innovate.

Wait, it gets worse. Now the most simple minded approach imaginable is gaining momentum in the 401k market. The financial equivalent of "take two aspirin and go to bed." It is called the "Lifestyle fund." Just subtract each participant's age from 100, put that percentage in our zesty equity fund and the remainder in our tranquil bond fund. This will protect you from the bad breath of SEC investigators and civil action attorneys. To paraphrase Pfeffer and Sutton, suppose you go to a doctor and he says, "I'm going to perform an appendectomy on you." When you ask why, the doctor answers, "because I did one on my last patient who was your same age and he got better." How could anyone be so naive as to think the president of the company and the janitor should have the same portfolio because they are the same age. Their lifestyles are not the same because they

are the same age. Their needs are not the same because they are the same age. Their financial abilities are not the same. So why on earth should they have the same portfolio? This is now the most popular option. Pensions and Investments<sup>8</sup> reports this option had a 19.5% increase in 2005 versus a 10.9% gain for total DC assets. KISS wins again.

### **Who Do You Trust, Professionals or Yourself?**

Another area where belief trumps evidence concerns the questionnaires investors are asked to fill out in an effort to quantify their feelings about risk and their tolerance for risk. The underlying theory is called utility theory which attempts to explain how people should make rational decisions in a world of uncertainty. It is not uncommon for investors to be bombarded with 50 or more questions that make no sense to them in order to satisfy the legal department's belief that the firm cannot be sued for giving clients what they said in writing they wanted. Smith Barney was recently provided evidence that this legal assumption was not valid. The court ignored the firm's paper trail and found in favor of the investors. There is a large body of literature known as "Behavioral Finance" that documents the inability of investors to make rational choices or learn from their mistakes. Summaries by Kahneman [2000] and Shefrin [2000] provide evidence that investors have relatively weak preferences and weak convictions about risk and return. Therefore, asking investors to make their own asset allocation decisions is like giving a child a loaded gun. For at least a decade researchers in this area have provided evidence to show that questionnaires are counter productive and lead investors to make bad decisions. Yet, every brokerage firm still requires clients to fill them out and most consulting firms and independent Registered Investment Advisors employ them. Additional findings in the behavioral finance literature detail why the last person an investor should trust is himself because:

1. They don't know how to think about how much risk to take.
2. They rely more on past returns than anything else for choosing managers.
3. They are not interested in being educated about investing.

This plethora of evidence suggests that investors should seek highly educated professionals to help them. 401 (k) participants in particular would be better off to go to a doctor who uses outmoded surgical procedures than to operate on their own portfolio.

### **The Alpha Beta Death Knoll?**

In a special report,<sup>9</sup> Andrew Rudd, former chairman of Barra, Inc. proposes a new paradigm to replace CAPM that looks at an investor's needs (not preferences) to balance their current assets and future liabilities, i.e., a balance sheet approach. The goal, he says, is to retire (not to beat the market) and performance should be measured relative to the goal of retirement. We salute Rudd's recognition that the CAPM is not appropriate for investors planning for retirement. We have had the same view on goals and performance for over 20 years.

In an interview for Pensions & Investments Magazine<sup>10</sup> William Sharpe, who received the Nobel Prize for conceptualizing the CAPM, said it needed a makeover; that CAPM is an oversimplification of the Mean-variance model of Markowitz which Sharpe rejects in

favor of a new methodology. Is that the knock out blow for alpha and beta? Is this the beginning of a paradigm shift in portfolio management? After reading Dr. Sharpe's new text book [2006], we find he still makes all the old assumptions of a linear relationship between a risk free asset and a market portfolio under equilibrium conditions. Alpha and beta live on dressed in the state preference framework developed by Kenneth Arrow [1953]. Yes, that was about the same time Markowitz developed the mean-variance model. In this pristine world rational investors make choices based on their preferences and tolerance for risk. As Pfeffer might say, "this is a shiny new cure?" Sharpe replaces Markowitz's view of uncertainty (a bell shaped curve) with a discrete distribution, making the heroic assumptions that one knows each state of the world that could occur and the probability of its occurrence. We believe the advances proposed by Aitchinson and Brown at Cambridge University<sup>11</sup> offer a more realistic way to describe uncertainty.

While we join those who laud Rudd and Sharpe and welcome their new approaches, we would ask, "**Where is the evidence?**" Until there is some evidence that these new theories work, we recommend revisiting Fishburn's approach: find out what the investor needs to accomplish his or her goal and measure risk and reward relative to the target return that will accomplish the goal. We have published a considerable amount of evidence for the past two decades showing that this model works better than any alternative.<sup>12</sup>

In the words of Pfeffer and Sutton, "We should be committed to doing the best we can with what we have at the time while taking steps to gather new and possibly more useful information."

## References

- Brinson, G., R. Hood, and G. Beebower. "Determinants of Portfolio Performance." *Financial Analysts Journal*, January 1995.
- Ellis, J. "His Excellency George Washington." *Vintage Books*, 2005
- Fama, E.F. and K.R. French. "The Cross Section of Expected Stock Returns." *Journal of Finance*, 1992.
- . "The CAPM Is Wanted Dead or Alive." *Journal of Finance*, 1996.
- . "The Capital Asset pricing Model: Theory and Evidence." *Journal of Economic Perspectives*, Summer 2004.
- Fishburn, P. "Mean-Risk Analysis With Risk Associated With Below-Market Returns." *American Economic Review*, March 1977.
- Kahneman D. and A Tversky. "Choices Values and Frames." *Cambridge University Press*, 2000.
- Pfeffer, J. and R. Sutton. "Hard Facts, Dangerous Half-Truths and Total Nonsense." *Harvard Business School Press*, 2006.
- Sharpe, W. "Asset Allocation: Management style and performance measurement." *Journal of Portfolio Management*, Winter 1992.
- . "Investors and Markets." *Princeton University Press*, 2006
- Shefrin, H. "Beyond Greed and Fear." *Harvard Business School Press*, 2000
- Sortino, F. and L. Price. "Performance Measurement in a Downside Risk Framework." *Journal of Investing*, Fall 1994.
- Sortino, F. and S. Satchell. "Managing Downside Risk in Financial Markets." *Butterworth – Heinemann*, 2001.

## End Notes

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<sup>1</sup> Our interpretation of the essence of “Evidence-Based Management” as described by Pfeffer & Sutton, *Hard Facts*, Harvard Business School Press, 2006.

<sup>2</sup> Ron Surz is President and founder of PPCA Inc. This is a slide that Ron used at an APIC conference November, 2006.

<sup>3</sup> Institutional Investor Magazine, Anise Wallace, July 1980

<sup>4</sup> We called it the Minimal acceptable rate of return or MAR. We were advised not to call it the MAR because that might imply it was guaranteed or promised and that could carry legal implications.

<sup>5</sup> The text of statements I made at several conferences is available at [www.sortino.com/sortino](http://www.sortino.com/sortino) ratio.

<sup>6</sup> Daniel Kahneman and Amos Tversky are considered by many to be the fathers of Behavioral Finance. Though Amos Tversky died in 1996 his long time friend and partner Daniel Kahneman received the Nobel Prize for their work.

<sup>7</sup> KISS stands for Keep It Simple Stupid. They are taught to “Sell the sizzle not the steak.”

<sup>8</sup> Pensions & Investments, “It’s an Asset Allocation World Out There.” May 29<sup>th</sup> 2006.

<sup>9</sup> See [www.advisors.ssga.com](http://www.advisors.ssga.com) or <http://knowledge.wharton.upenn.edu> for “High Net Worth/High Net Risk: Meeting Retirement Goals.

<sup>10</sup> Front page article Pensions & Investments Magazine October 2<sup>nd</sup>, 2006.

<sup>11</sup> The three parameter lognormal distribution was suggested to us in the mid 1980’s by Larry Siegel of the Ford Foundation. Research at PRI provides evidence that it is superior to the standard normal distribution. The source code for this calculation is provided in Sortino & Satchell [2001].

<sup>12</sup> Many of the articles and research results are available on-line at [www.sortino.com](http://www.sortino.com).