

## Presentation of a Grand Design: Background

Stock equity index mutual funds that partition the stock market into groups (a/k/a slice and dice into so-called asset classes), e.g., index funds based on the Fama and French Three-Factor Model or the Morningstar Investment Style Box, each with size- and value-related risk factors, charge higher asset management fees to pay the cost of this added service. Yet these same investment companies cannot logically, scientifically, or economically earn premium expected returns attributable to such partitioning if the risk factors are vicious circular reasoning in the form of econometric simultaneity such as size and value in return models. That is the hoax in a nutshell.

The seminar-style presentation is based on two published articles that demonstrate that the Three-Factor Model for stock pricing is an irremediable fatal fallacy and costly harmful hoax. There is no gray area concerning the logically circular econometric simultaneity in this model; rather, it is a black and white question of scientific validity. The two articles reveal the biggest hoax in stock market history as measured by each of six major criteria including total direct cash cost to investors, total net realized harm to all persons impacted, duration, and the number of professionals who either overlooked it or remained silent about it.

The Three-Factor Model was published in 1992, and the ongoing costs to investors exceed far more than \$1 billion each year. It would be unconscionable to unduly delay publicizing the research findings in the two articles much beyond their publication date or to not seek the greatest amount of publicity appropriate for the occasion to inform as many investors, finance practitioners, finance researchers and educators as possible.

### Articles about the Grand Design

The following two financial economics articles about the grand design, fatal fallacy and hoax have been published in two international, scientific, refereed, economics and finance journals, indexed and abstracted in the *Journal of Economic Literature*, both of whose editors serve on the faculties and staffs of leading universities and institutions.

Coleman, Robert D. (2005), "Asset Pricing Simultaneity, Three-Factor Model and Cost Analysis", *Indian Journal of Economics and Business*, Vol. 4, No. 1 (June), 73-94. <http://www.ijeb.com/Issues/data/IJEBv4n1a4Proofs.pdf>. The theme of this issue is finance and financial reform.

Coleman, Robert D. (2006), "Asset Pricing Simultaneities: Phases and Patterns", *Annals of Economics and Finance*, Vol. 7, No. 4 (May), 49-76. <http://www.aecon.net/contents.htm>.

Millions of investors worldwide have lost billions of dollars as a result of investment strategies and financial products based on the 1992 Fama and French Three-Factor (FF3F) stock-portfolio pricing model of return, the FF3F model risk factors (size: small cap and large cap; and style: value and growth), and variants of the FF3F model and its risk factors, since 1981 when the size effect was published. The largest class of investors consists of participants in employee-sponsored retirement-savings plans, and the typical investor loses an estimated \$20,000 from his or her 401(k) or other retirement-savings account. Another class of investors includes celebrities, sports stars and high-net-worth families who invest through an exclusive network of fund-affiliated financial advisers and who each typically lose an estimated \$250,000.

### Summary

**Research Field, Subject and Topics:** The field of knowledge of concern in this paper is financial economics, and the subject of concern in this paper is asset pricing. The

general topic of concern in this paper is single-equation simultaneity (SES) models, and more particularly, the topic is price-entailing asset pricing factor models of price-entailing return such as the increasingly adopted prominent Fama and French Three-Factor Model (FF3F). To be relevant to the specific research question, newer published research must explicitly refer to FF3F validity. There is a growing FF3F literature, and FF3F continues to be accepted in academia worldwide and applied in security markets worldwide. At a higher level, the field is general economics, the subject is capital markets, and the topic is cost of capital. On a parallel level, the field is econometrics, the subject is hypothesis testing (CLRM, SDF, etc.), and the topic is the simultaneity.

The FF3F literature speculates about factor interpretation but is silent on the logically prior point of factor validity. Logically circular factors cannot be interpreted beyond the fact that they are meaningless, fallacious and unscientific. The first key issue is the validity of the atheoretic FF3F model which is an example of SES. The second key issue is the cost of the practical application of the FF3F model in market-traded financial products. These two key issues do not include the CAPM which is a totally different topic in the same subject and the same field with a very large literature of its own. FF3F is a *factor model* for asset pricing. FF3F is *not* a CAPM. The FF3F authors, Eugene F. Fama and Kenneth R. French, assert that FF3F outperforms the most widely accepted conventional CAPM, i.e., univariate with sole non-simultaneity market-beta variable.

**Research Questions:** Price-entailing stock pricing factor models are the primary question of concern, and cost-benefit analysis of these models is the secondary question of concern. The articles make two new contributions to important issues in stock pricing research. They can be expressed as research questions.

**Question 1:** *Is FF3F scientifically valid?* No. The creators of FF3F assert that it outperforms in tests the CAPM which is the most widely adopted asset pricing model. By any method of scientific hypothesis testing and estimation, an asset pricing model of price-entailing return with price-entailing risk factors, such as the FF3F, is logically circular and thus a fatal fallacy. Markets and individual investors may be irrational, but scientific methodology is not irrational. What is known in econometrics as the single-equation simultaneity is never valid, although systems of simultaneous equations can be valid.

An analogy may be useful. Madam Curie spent years sacrificing her health in unceasing labor to isolate a tiny sample of the then-unknown radioactive element radium from tons of pitchblende ore. As a scientist, who won a Nobel Prize in 1903 and 1911, she understood that nothing could be meaningfully described or explained until it was isolated from everything else. This method is so basic that it is part of beginning algebra (isolate the left-hand side of an equation) and introductory science courses, including logic, chemistry, biology, and physics. The method applies to ideas as well as to chemical elements. A causal inferential model of return cannot include elements of return either as specified explanatory factors or embedded in explanatory factors.

**Question 2:** *What does FF3F cost?* Total cost is billions of dollars. Commercial application of the FF3F has caused since inception and continues to cause vast widespread long-running costs. Many investors worldwide are harmed in the amount of more than \$1 billion total each year, and this very conservative estimate applies only to a certain category of investors whose excess fees are easy to quantify. A more accurate estimate would include all categories of investors and all other harmed parties.

**Published Research:** The known extant published research on asset pricing totally supports the Three-Factor Model (FF3F with factors based on non-market beta, size, and book-to-market equity or B/M), is silent about scientific validity, and thus does not raise the question of FF3F harm to investors and others. The latest known relevant article that refers to FF3F is in 2002 in the *European Finance Review*, renamed *Review of Finance*.

Three letters from Robert D. Coleman were written jointly to Mr. Fama and Mr. French seeking clarification of their published articles about FF3F. No response was received except for a brief erroneous and misleading note from Mr. French written by hand on my first letter and returned to me. Mr. French confuses the terms applicable to simultaneous-equation systems with the terms applicable to single-equation simultaneity. Mr. Fama was listed as the correspondence author on the articles in question. The editor of the *American Economic Review* recommended that I call Mr. French at his university office. When Robert D. Coleman telephoned Mr. Fama at his university office to ask about technical details concerning the Fama and French articles about the Three-Factor Model, he refused to speak and abruptly ended the call by saying “I don’t do that” and hanging up the telephone before explaining what he meant.

**Research Findings:** These papers demonstrate that (1) FF3F was never scientifically valid and has cumulatively cost billions of dollars to investors alone; and (2) as long as circular reasoning is a fatal logical fallacy, FF3F will never be valid and will continue to cost additional billions of dollars until published research authoritatively demonstrates its non-validity in terms suitable to researchers, practitioners, educators and investors.

Another analogy may be useful. A highly successful blockbuster drug [FF3F] on the market is approved by the FDA and shown in the professional literature to be beneficial,

but it is actually a placebo at best that continues to needlessly cost patients vast sums of excess money annually. The blockbuster drug is claimed by its creators and sellers to outperform in tests the earlier most widely prescribed drug [CAPM]. Doctors and their patients need to know authoritatively about the validity of allegedly scientific double-blind controlled testing [OLS, CLRM, GMM, Hausman's specification error test modified to test endogeneity (circular simultaneity), Fama-French split-sample *ad hoc* diagnostic test of FF3F, etc.] of the blockbuster drug.

Likewise, the investment strategies and financial products such as equity index mutual funds based on the price-entailing FF3F factors (size: small cap, large cap; style: value or high B/M, and growth or low B/M) cannot be rationally expected to deliver superior returns relative to the market portfolio consisting of a broad well-diversified range of market-traded stocks in market proportions. Yet these same strategies and products charge premium fees relative to market index equity funds (S&P500, Wilshire 5000, MSCI, etc.).

### **Event Publicity**

The two articles cut a wide swath in financial economics and overturn a large number of articles by prominent academicians at prestigious universities that are published in the leading financial economics and finance journals with the top editors. These research findings also make corrections to some books about investments and the CFA Body of Knowledge about capital asset pricing. By conservative estimates, millions of participants in capital markets worldwide have been materially adversely impacted by Fama and French Three-Factor (FF3F) stock pricing model, and billions of dollars are at stake.

In light of the importance of these findings, it is recommended that the sponsor or host contact the news media to publicize the public service presentation. *The Wall Street Journal* could be among the media contacted because of its financial news coverage worldwide and its readership, even though the *WSJ* indirectly benefits from the Three-Factor Model due to the Dow Jones Style Indexes. In addition Mr. Fama could be invited to defend the FF3F model. In view of his failure to respond so far, Mr. Fama is not likely to accept the invitation but it would demonstrate openness and fair play and add to the news value of the presentation event.

Jon E. Hilsenrath is the sole author in the byline of a page-one above-the-fold article in the *WSJ*, Monday 18 October 2004, continued in four columns above the fold on page A16 (61 column inches). The article is entitled "Stock Characters: Two Economists Debate Markets, The Tide Shifts: Belief in Efficient Valuation Yields Ground to Role of Irrational Investors: Mr. Thaler Takes on Mr. Fama." The article says on page A16, "Mr. Thaler, meanwhile, is a principal at Fuller & Thaler, a fund-management company with \$2.4 billion under management. Its asset managers spend their time trying to pick stocks and outfox the market." This, of course, indicates bias in the view of Thaler. Thus, it is curious that the article says nothing about the financial industry ties of Fama, who also has a biased view. Mr. Fama is a member of the board of directors, director of research, member of the investment committee, member of the marketing committee, a revenue-sharing financial product designer, and a minority shareholder in the privately owned Dimensional Fund Advisors Inc. (DFA), which he was instrumental in founding in 1981 and has grown to \$86 billion of assets under management in 2005. The asset managers at DFA are quantitative indexers who place no value on fundamental analysis, stock

picking, technical analysis or market timing. Mr. Hilsenrath seems qualified to cover this event for the news media if he has no conflicts of interest and knows in advance what to look for in the case of DFA funds. He seems to understand rational pricing, efficient markets hypothesis and other concepts in financial economics. His contact information is *WSJ*, U.S. Television, News Gathering and PDN, New York, Staff Reporter, jon.hilsenrath @ wsj.com, 212-416-2420.

Fama by some measures is the most frequently cited and arguably the best known financial economist in the world. The most important thing reported in the referenced article by Hilsenrath is that Thaler caused Fama to unexpectedly concede a very important point that is the foundation of Fama's career-long academic work and his Efficient Markets Hypothesis. Thus the news item is essentially negative. The referenced article by Hilsenrath appears on the first page first column full length of a Monday issue of the *WSJ* and is continued above-the-fold in four columns on page A16. Therefore, a presentation based on the paper on asset pricing circularity may get equal or greater prominence because of economic science issues, public impact and public policy. In addition, the paper on asset pricing circularity causes Fama not to just yield ground but to abandon the field entirely on FF3F. It is the most widely adopted model for capital asset pricing since the CAPM. The FF3F news is bigger than the interminable debate between Fama and Thaler about rational risk versus irrational interpretations of financial asset pricing models, and has more pragmatic public and private applications than does the Thaler-Fama debate. Hilsenrath's article does not mention that Thaler accepts Fama's arguments at the level of the scientific logical validity of return models and their explanatory factors, as indicated by Fama's acknowledgment of comments by Thaler in

Fama, E.F. (1991), “Efficient Capital Markets: II”, Fiftieth Anniversary Invited Paper, *Journal of Finance*, Vol. 46, No. 5, December, 1575-1617, and that Thaler disagrees merely on the interpretation of those explanatory factors, which also are undisclosed embedded logically circular econometric simultaneities.

Timothy Middleton, <<http://www.timothy.middleton.net>>, is mutual funds columnist for CNBC on MSN. He was formerly mutual funds columnist for the *New York Times*, Abreast of the Market columnist for the *Wall Street Journal Europe*, and a senior editor of Crain’s New York Business. He was twice nominated for the Pulitzer Prize in investigative journalism. He wrote an article for CNBC on MSN entitled “DFA Funds Hard to Buy, Easy to Own” dated June 2002. He reports the DFA assertions that small-cap stocks are riskier, in some sense, than large-cap stocks, that value or high book-to-market equity stocks are riskier than growth or low book-to-market stocks, and that higher risk somehow earns higher returns. Mr. Middleton and DFA do not explain how higher risk, as defined by standard deviation of share price or Gaussian volatility, is related to size (market capitalization) and value. He seems qualified as a financial investigative journalist to cover a mutual fund stock market story if he has no conflicts of interest and knows in advance what to look for in the case of DFA funds.

William L. Fouse, CFA, MBA University of Kentucky, Chairman Emeritus and member of the Board of Directors, Mellon Capital Management Corporation, 415-546-6056, was an outspoken critic of the alleged size effect in stock pricing. His conclusion in an article in the July/August 1989 issue of *Financial Analysts Journal* entitled “The ‘Small Stocks’ Hoax” was: “What should one conclude from all of the above? There is no mysterious return to smallness. There is no free lunch. The moral of the story is:

Beware of quasi-academics bearing anomalies!” Unfortunately Mr. Fouse’s arguments did not address the key issue of econometric simultaneity and the fatal fallacy of logical circularity. The founders of Mellon Capital, William Fouse and Thomas Loeb, are recognized as the originators of value-based tactical asset allocation and index fund management, and Fouse is widely recognized as the “Father of Indexing.” Mellon Capital is a San Francisco-based investment manager specializing in global quantitative investment strategies for institutional investors. Founded in 1983 by innovators in the investment management field, the firm had \$120.3 billion in assets under management including dual officers, overlay strategies and securities lending pools as of March 31, 2004. Mr. Fouse rejects size but accepts value as a valid factor in financial asset pricing and for investment strategies, yet each factor is an undisclosed logically circular type of simultaneity.

Eugene F. Fama is Professor of Finance at the Graduate School of Business (GSB) at the University of Chicago. He also is Chairman of the GSB’s Center for Research in Stock Prices (CRSP) with its unique proprietary commercial database of U.S. daily and monthly stock prices, dividends, capital changes, and calculated returns since January 1926. Mr. Fama is reported to be the most-often cited financial economist in the world based on the number of downloads of papers in the Financial Economics Network at SSRN on the Web. Mr. Fama is the foremost champion and defender of rational pricing theory and the originator of the Efficient Markets Hypothesis (EMH). It is quite ironical that he is the primary originator of the widely adopted FF3F model which is both irrational and inefficient in pricing stocks, and is the culmination of his publication of numerous articles with undisclosed embedded econometric simultaneities.

How many Nobel laureates in Economic Sciences does it take to recognize that the FF3F stock-pricing model is fatally fallacious and that the corresponding investment strategies are not what they are represented to be? It seems that at least five are required. Four Nobel Prize winners, Robert C. Merton, Merton H. Miller (deceased), Myron S. Scholes, and William F. Sharpe, have approved and accepted the Three-Factor Model and its risk factors but have remained silent about the undisclosed embedded logically circular econometric simultaneities. The concealed circular simultaneities, once revealed, could be understood to be irremediable fatal fallacies and not scientifically valid by anyone who understands introductory econometrics. In addition, the hoax can be understood by any non-specialist who can detect vicious circular reasoning.