A Grand Design

Financial Engineering

Grand Design

- The Grand Design is price-, shares- and dividends-related explanatory factors in econometric models of total return.
- By definition, return is calculated from observed prices, shares and dividends.
- The Grand Design is, therefore, a set of financial asset pricing models that entail something known in econometrics as circular simultaneity, to be explained.

Econometric Simultaneity

- Econometrics is a method of causal inference applied to economics.
- Inference is the deriving of a conclusion in logic by either induction or deduction.
- Econometric circular simultaneity is a form of the fallacy in logic known as vicious circular reasoning.

Inception

- The Grand Design was introduced in a 1969 academic journal article by four finance professors at the Graduate School of Business at the University of Chicago.
- The four co-authors are Eugene Fama, Lawrence Fisher, Michael Jensen and Richard Roll.

Purpose

- The acknowledged purpose of the Grand Design was to create greater demand for CRSP* data. Since 1964, CRSP had a monopoly on databases of U.S. stock market prices, dividends, capital changes (shares) and monthly total returns.
- CRSP was established in 1960 as a scientific research center at the Graduate School of Business, University of Chicago.

First Phase

- The 1969 academic journal article* by Fama, Fisher, Jensen and Roll, included shares- and dividends-related explanatory factors in an econometric model of total return.
- This article was the first so-called event-study, and the return model was used to analyze stock splits.

Second Phase

- A March 1981 article* based on a doctoral dissertation (heavily influenced by Mr. Fama) alleged that the size factor is “priced” in an econometric model of return.
- Mr. Fama and two PhD dropouts co-founded Dimensional Fund Advisors (DFA) in May 1981 and August 1981 incorporations.
- DFA’s first fund (a U.S. micro-cap stock index fund) first traded in December 1981.

Third Phase

- An October 1988 article* by Messrs. Fama and French included dividends and price in dividend yield as an explanatory factor in an econometric model of total return.
- This article alleges that dividend yield is "priced" in an econometric model of return.
- *Priced* means it is statistically significant at conventional levels of probability.

Fourth Phase

- A 1992 article* by Messrs. Fama and French included price and shares in the allegedly “priced”, size- and value-related risk factors in the Three-Factor Model of return for stock-portfolio pricing.
- A 1993 article** by them included an *ad hoc*, split-sample, diagnostic test of the Three-Factor Model with portfolio-based, size- and value-related risk factors.

Fifth Phase

- DFA, a private asset management firm, added value-based stock index funds to its family of size-based stock index funds.
- Size is market equity. Size is also known as cap (small-, mid- and large-cap).
- Value is book-to-market equity ratio. Value is also known as style (value- and growth-style).
- The third risk factor is market-related.

Sixth Phase

- A 1998* article by Messrs. Fama and French alleged that the size- and value-related risk factors were “priced” in countries other than the U.S.
- DFA added international stock index funds to their family of U.S. funds once this article was published and extended the Grand Design to more countries.

Patterns

- The price-, shares- and dividends-related return factors have the same origin. Their common origin is Eugene F. Fama.
- Mr. Fama is professor of finance at the Graduate School of Business at the University of Chicago and head of CRSP. He is also Director of Research, a board member and a co-owner of DFA. He was instrumental in founding and building DFA.

Financial Engineering

- The Grand Design ends in the Fama-French Three-Factor Model of return.
- The Grand Design is viewed by some as a monument of financial engineering.
- The Grand Design is considered to be a wonder of the academic finance world and of the financial services industry.

Non-Disclosure

- Not disclosed in more than 20 published articles by Messrs. Fama and French:
  - Circular simultaneities concealed in their econometric models
  - Their bias-inducing ties to CRSP
  - Their multiple, major, financial conflicts of interest with DFA
- This is egregious academic fraud and misconduct in science.

Circularity

- Circular simultaneity is an irremediable, material, fatal fallacy in the Grand Design.
- Circular simultaneity is a violation of genuine method due to the fallacy of vicious circular reasoning. This fallacy of logic is fatal because it has no counter-example and ends a logical argument.

Levels of Circularity

- *Philosophy*: Genuine method.
- *Logic*: Fallacy of vicious circular reasoning.
- *Math*: Algebraic isolation of the unknown.
- *Econometrics*: Error of circular simultaneity.
- *Chemistry*: Physical isolation of an element.

Implications of Circularity

- Circular simultaneity is logically invalid, logically meaningless, non-interpretable, indeterminate, irrational, inefficient, economically wasteful, destabilizing (in the sense of moving market prices away from fundamental values) and scientifically invalid.
- Circular simultaneity in scientific models must be rejected.

Invariances of Circularity

- Circular simultaneity is invariant to:
  - Scientific research methodology
  - Econometric techniques (CLRM or GMM)
  - Sample size (number of stocks and years)
  - Data interpretation (rational or behavioral)
  - Countries and investable securities
- Circular simultaneity is logically prior and invariant to data analysis.

Hoax

- The Grand Design is a hoax in the sense that its creators knew or had reason to know that it was neither logically valid nor scientifically valid.
- The Grand Design is pseudoscience in the sense that it seriously deviates from generally accepted scientific methodology.
- The Grand Design is junk science in the sense that it has no scientific motivation.

Contagion

- The Grand Design is a vast, wide-ranging, long-running contagion that is actively spreading to more investments, investors, investment products, stock exchanges and countries worldwide.
- The Grand Design is realistically estimated to cost investors alone $4 to $5 billion each year and growing.

Sources

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. The theme of this issue is finance and financial reform. *IJEB*

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Robert D. Coleman, Ph.D.

rcoleman @ mba1971.hbs.edu

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