

What Is Econometric Simultaneity?

Econometrics is a method of causal inference applied to economics. In econometrics, something called the simultaneity occurs when a variable on the right-hand side of the casual inferential model equation and the variable on the left-hand side of the same model equation influence each other at the same time. In the logic of causal order, the main issue is the direction of causality between two such variables. Single-equation simultaneity is contrasted with the simultaneity bias in a simultaneous-equations system. Each of the two or more equations in a simultaneous-equations system may include one or more single-equation simultaneities and thereby may be invalid for logical inferences.

Three distinctions can be made for different types of single-equation simultaneity. First, single-equation simultaneity is either circular or isolated. Circular single-equation simultaneity occurs when a variable on the right-hand side of the model equation is linearly related to the variable on the left-hand side of the model equation. Circular single-equation simultaneity, therefore, is logically circular, and it is an example of violation of genuine method in the form of vicious circular reasoning. There is no counter-example, and it ends a logical argument. Circular single-equation simultaneity is not isolated in the algebraic sense of isolating the unknown. Isolated single-equation simultaneity is isolated in the algebraic sense and is not logically circular. A single-equation, whether it is a complete model it itself or rather is part of a simultaneous-equations system, that contains econometric circular simultaneity is not valid for drawing logical inferences.

Second, circular single-equation simultaneity (CSES) is either direct or indirect. Direct CSES is directly specified in a model equation. Indirect CSES is included indirectly in the model by grouping a sample before testing and estimating econometric models. A grouped sample is not a random sample. A grouped sample is like a stacked deck in a game of cards. A stacked deck is a prearranged deck, and it does not enable random drawing of cards. A well-shuffled deck does provide random drawing of cards. Grouping a sample on a model-specific CSES-entailing variable is econometrically equivalent to directly specifying the CSES-entailing variable in the model equation, either explicitly or embedded in another variable that is explicitly specified. Thus, indirect CSES is economically equivalent to direct CSES.

Third, a CSES-entailing variable is either concealed or revealed. When the name of an explicit CSES-entailing variable does not disclose the name of the embedded CSES-entailing variable, such an embedded CSES-entailing variable can be called hidden or concealed in contrast to open or revealed. A concealed CSES and its implications are not explicitly disclosed.

In the case of an econometric model of return, the left-hand-side variable is expected total return. Total return is operationally defined by five variables: beginning price, ending price, beginning shares, ending shares and dividends. A CSES-entailing right-hand-side variable is concealed when its name does not explicitly include the word “price”, “shares” or “dividends”, e.g., size, market capitalization, value, book-to-market equity ratio and style. A CSES-entailing right-hand-side variable is revealed when its name does explicitly include the word “price”, “shares” or “dividends”, e.g., price-earning ratio, stock-split (a/k/a shares-split) and dividend yield.

The Three-Factor Model of expected total return for stock-portfolio pricing, contains four instances of concealed, direct or indirect CSES, two each in the size- and value-related factors, whether these two factors are operationally defined by size and value or by zero-net-investment portfolios formed on size and value. Size is measured by market capitalization or cap. Value is measured by book equity-to-market equity ratio, book-to-market value ratio or style. The Three-Factor Model is illogical, logically meaningless, non-interpretable, indeterminate, unscientific, economically wasteful and destabilizing in the sense of moving market prices of securities away from their fundamental values. Ironically, given that Mr. Fama is one of the foremost champions of rational pricing theory and the originator of the Efficient Markets Hypothesis, the Three-Factor Model is also irrational and inefficient.

The Fama-French Three-Factor Model and its size- and value-related factors are a hoax in the sense that Messrs. Fama and French had reason to know that CSES-entailing stock-pricing factors and models of return are not logically valid and not scientifically valid. They are pseudoscience in the sense that they seriously deviate from generally accepted standard scientific methodological practice. They are junk science in the sense that they are acknowledged to have commercial motivations and not scientific motivations.