

Appendix 10A Is Beta Dead?

The capital asset pricing model represents one of the most important advances in financial economics. It is clearly useful for investment purposes because it shows how the expected return on an asset is related to its beta. In addition, we will show in Chapter 12 that it is useful in corporate finance because the discount rate on a project is a function of the project's beta. However, never forget that, as with any other model, the CAPM is not revealed truth but, rather, a construct to be empirically tested.

The first empirical tests of the CAPM occurred over 20 years ago and were quite supportive. Using data from the 1930s to the 1960s, researchers showed that the average return on a portfolio of stocks was positively related to the beta of the portfolio,¹ a finding consistent with the CAPM. Though some evidence in these studies was less consistent with the CAPM,² financial economists were quick to embrace the CAPM following these empirical papers.

Although a large body of empirical work developed in the following decades, often with varying results, the CAPM was not seriously called into question until the 1990s. Two papers by Fama and French³ (yes, the same Fama whose joint paper in 1973 with James MacBeth supported the CAPM) present evidence inconsistent with the model. Their work has received a great deal of attention, both in academic circles and in the popular press, with newspaper articles displaying headlines such as “Beta Is Dead!” These papers make two related points. First, they conclude that the relationship between average return and beta is weak over the period from 1941 to 1990 and virtually nonexistent from 1963 to 1990. Second, they argue that the average return on a security is negatively related to both the firm's price-earnings (P/E) ratio and the firm's market-to-book (M/B) ratio. These contentions, if confirmed by other research, would be quite damaging to the CAPM. After all, the CAPM states that the expected returns on stocks should be related *only* to beta, and not to other factors such as P/E and M/B.

However, a number of researchers have criticized the Fama–French papers. We avoid an in-depth discussion of the fine points of the debate, but we mention a few issues. First, although Fama and French cannot reject the hypothesis that average returns are unrelated to beta, we can also not reject the hypothesis that average returns are related to beta exactly as specified by the CAPM. In other words, although 50 years of data seem like a lot, they may simply not be enough to test the CAPM properly. Second, the result with P/E and M/B may be due to a statistical fallacy called a hindsight bias.⁴ Third, P/E and M/B are merely two of an infinite number of possible factors. Thus, the relationship between average return and both P/E and M/B may be spurious, being nothing more than the result of data mining.

¹Perhaps the two most well-known papers were Fischer Black, Michael C. Jensen, and Myron S. Scholes, “The Capital Asset Pricing Model: Some Empirical Tests,” in M. Jensen, ed., *Studies in the Theory of Capital Markets* (New York: Praeger, 1972), and Eugene F. Fama and James MacBeth, “Risk, Return and Equilibrium: Some Empirical Tests,” *Journal of Political Economy* 8 (1973), pp. 607–36.

²For example, the studies suggest that the average return on a zero-beta portfolio is above the risk-free rate, a finding inconsistent with the CAPM.

³Eugene F. Fama and Kenneth R. French, “The Cross-Section of Expected Stock Returns,” *Journal of Finance* 47 (1992), pp. 427–66, and E. F. Fama and K. R. French, “Common Risk Factors in the Returns on Stocks and Bonds,” *Journal of Financial Economics* 17 (1993), pp. 3–56.

⁴For example, see William J. Breen and Robert A. Koraczyk, “On Selection Biases in Book-to-Market Based Tests of Asset Pricing Models,” unpublished paper. Northwestern University, November 1993; and S. P. Kothari, Jay Shanken, and Richard G. Sloan, “Another Look at the Cross-Section of Expected Stock Returns,” *Journal of Finance* (March 1995).

Fourth, average returns are positively related to beta over the period from 1927 to the present. There appears to be no compelling reason for emphasizing a shorter period than this one. Fifth, average returns are actually positively related to beta over shorter periods when annual data, rather than monthly data, are used to estimate beta.⁵ There appears to be no compelling reason for preferring either monthly data over annual data or vice versa. Thus we believe that although the results of Fama and French are quite intriguing, they cannot be viewed as the final word.

⁵Points 4 and 5 are addressed in the Kothari, Shanken, and Sloan paper.