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Does the Stock Market Rationally Reflect Fundamental Values?: Discussion

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DISCUSSION

ROBERT F. STAMBAUGH*: This interesting paper by Professor Summers questions the power of common tests of market efficiency. The inefficiency entertained is one in which the deviation of the price from the rational market fundamental is persistent and potentially large. This deviation is similar to a speculative bubble, which can induce "excess" volatility and negative autocorrelation in returns (e.g., Tirole [1]). The major contribution of this paper lies in the observation that, while the pricing error can contribute substantially to the variance of returns, the negative autocorrelation can be too small to detect using common techniques. Thus, Professor Summers argues that most tests of market efficiency have had little power to reject market efficiency against this alternative version of inefficiency.

Researchers often face the reality that a statistical test has power to reject the null against only certain classes of alternatives—a uniformly powerful test is the

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exception rather than the rule. For example, one can test the stationarity of a time series, but a specific test is not powerful against all forms of nonstationarity. Many previous tests of efficiency have been concerned with detecting cases where prices are slow to incorporate publicly available information. Event studies, for example, can in principle detect such violations of efficiency. Those tests were clearly not designed to detect the kind of inefficiency proposed in this paper. In fact, the paper assumes the market is efficient in this respect, in that news about fundamental value is assumed to be reflected immediately (in e_t).

I think it is fair to say that many of the tests discussed by Professor Summers indeed have little power against the kind of inefficiency he proposes. Space limitations here do not permit a case-by-case discussion of the evidence cited in favor of this version of inefficiency. Much of the recent, and no doubt forthcoming, literature addresses these questions. I believe that most of us would agree, however, that more evidence would be useful. Given past successes of the efficiency hypothesis against some alternatives, it is probably a bit harsh to characterize its acceptance as "a shared act of faith." Perhaps some agnosticism would be healthy, but atheism is premature.

This paper calls our attention to the deficiencies of past tests against the proposed alternative, but the paper does not suggest new statistical tests. As demonstrated in the comparison of values for monthly versus daily returns, the model implies that the negative autocorrelation of returns approaches zero as the length of the return interval decreases. Alternatively, these negative autocorrelations grow larger in absolute value as the return interval lengthens. If n is the number of periods over which a return is computed, then the k th-order autocorrelation (ρ_k) is

$$\rho_k = - \frac{\alpha^{n(k-1)}(1 - \alpha^n)^2 \sigma_u^2}{2(1 - \alpha^n)\sigma_u^2 + n\sigma_e^2}$$

For example, given the author's values, ρ_1 for five-year returns ($n = 60$) is approximately $-.23$. Higher-order autocorrelations should decay geometrically as $\rho_k = (.298)^{k-1} \rho_1$. I computed twenty five-year real returns on the S & P Composite (excluding dividends) beginning in 1981. The first six sample autocorrelations are $-.31$, $+.28$, $-.50$, $+.04$, $+.06$, and $-.01$. Although the first-order autocorrelation is close to the predicted value, the higher-order estimates do not obey the predicted pattern. While this is by no means a formal test, it might at least suggest that the proposed model of inefficiency be viewed as tentative. Nevertheless, although the estimates are not reliably nonzero given the small sample, the magnitudes are somewhat unexpected under the null hypothesis of zero autocorrelation. It would seem, in any event, that a more efficient use of long-run return data might shed light on whether prices behave in a manner similar to that hypothesized in this paper.

Whatever the course of future empirical research on market efficiency, however, Professor Summers has posed an interesting question.

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