Valuation Model Bias and the Scale Structure of Dividend Discount Returns: Discussion
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Source: *The Journal of Finance*, Vol. 37, No. 2, Papers and Proceedings of the Fortieth Annual Meeting of the American Finance Association, Washington, D.C., December 28-30, 1981 (May, 1982), pp. 573-576
Published by: Blackwell Publishing for the American Finance Association
Stable URL: http://www.jstor.org/stable/2327364
Accessed: 27/11/2009 08:16

Valuation model bias is not inherently positive or negative; it provides substantial investment value to the extent that it is consistent with a reliable investment outlook. The structured DDM can be a useful investment tool for linking a top-down with a bottom-up approach to the investment management process. However, positive, statistically significant *ex post* component correlations, often observed over the 1973–80 period, are fundamental to the value of the structured DDM as a valuation technology. The dichotomization of information in valuation forecasts into return structure and analysts' inputs may lead to a better understanding of the valuation process and improved forecasting performance.

While conclusions reached in a statistical analysis are never definitive, given the data limitations of this study, the tentativeness of our results should be emphasized. Nevertheless, because the standard DDM is a widely used investment management tool, an interim report and the advisability of mid-course corrections may be useful.

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## DISCUSSION

F. B. RENWICK*: These three papers, in the context of The Great Debate regarding whether U. S. capital markets are efficient, together appear consistent with prior Scotch Verdict type evidence (Kuehner & Renwick 1980). One paper concludes "yes", another concludes "no", and the third implies "maybe". After some quarter century (e.g., dating from the articles reprinted in Cootner [1964]), the debate apparently rages on.

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Michaud-Davis found that evidence, from eight annual observations (1973–1980), was "consistent with the efficient market hypothesis . . ."; and discovered bias in the well-developed (Lerner-Carleton [1966] and Renwick [1971]) Dividend Discount Return Model. Given bias, M-D proceed rationally to "structure" that bias with *ex-ante* exogeneous information to increase accuracy and precision of *ex-post* realizations using the DDM over the eight year time period. Critical discussion of the M-D methodology and findings includes at least the three following fundamental issues.

Is the observed statistically significant bias illusory? That is, for a given *ex-post* time period, we know that peaks, troughs and trends in say the S&P-500 Index can be observed, verified and analyzed (Owen [1968]). Careful analysis shows that over many such time periods, what appear to be trends and patterns in fact are indistinguishable from random sequences drawn by demons of chance (Cootner, and Roberts [1959]). The issue goes beyond the "representativeness" of the 1973–1980 time period but is related to the process which generates returns on common stocks. If the "true" process generates illusory Roberts-type patterns, and if a systematic correction is made or recommended pursuant to randomly selected parts of that illusion, then what confidence can prudent investors have that the next, and all future, corrections will not be worse than "no correction"? In short, further investigation would seem appropriate regarding the nature of the bias discovered by M-D in the DDM; which leads to my second point.

Is the best expectation of the next price change (i.e., the alleged source of bias) not equal to zero? Over the short run (daily, weekly, monthly), a martingale process is generally accepted. But M-D use annual data, thereby focusing on the likelihood of departure (i.e., a different generator) as time horizons lengthen to 1, 5, 10 years and beyond. Theoretically (Samuelson [1965]), current prices should reflect expectations regarding future price distributions. So the martingale model ought to be equally valid for 1 year or 1 month. In short, M-D's question, "Is the observed *ex-ante* bias a necessary property of the DDM?", appears to need further investigation; which leads to my third point.

Are the inputs of the analysts unbiased? M-D find in general "yes". But other researchers are less sure. Dreman (1979) for example finds institutional and personal pressures on analysts to conform to consensus beliefs, satisfice, extrapolate existing illusions, and the like. Analyst aversion to martingales, not the DDM itself, might be M-D's source of bias.

On balance, we can conclude: if the "true" $E(g) = 0$, then $g' = ag + b$ adds, not reduces bias. Conversely, if the "true" $E(g) \neq 0$, then which equilibrium should be regressed onto? M-D choose CAPM equilibrium expectations, which suffer at least both from bias (size effect[1]) and from non-stationarity (of beta). Some alternatives to CAPM include Arbitrage, which also fails to explain size (Reinganum [1981]). Stochastic Dominance, which is rather intractable or simply demand/supply equilibrium (Working [1958]). Some useful and convincing evidence regarding the merits of the M-D "Structured DDM" strategy versus a

[1] Size effect, although well-known for many years in the investment community (Metz 1969), was recently introduced to the academic community. Metz reported performance of a New York City Bank Trust Department's "small Company" portfolio which was developed pursuant to a proprietary study done by this discussant.

standard CAPM only strategy would be portfolio performance results, over many time periods, using the former as compared with the latter methodology.

Rosenberg-Rudd found evidence from monthly data, January 1973–December 1980, which caused "rejection of the weak form of the efficient market hypothesis". Monthly factor-related returns were found to have positive serial correlation, while monthly specific returns have substantial negative serial correlation which results in increased predictability of monthly total rates of return.

Autocorrelation within a time series of common factors (e.g., macro indexes) is plausible and appealing for many reasons set forth by R-R, and for simpler reasons such as the interacting multiplier-accelerator in macroeconomics, distributed lags between capital appropriations and final changes in earnings per share, perturbations to equilibrium induced for example by monetary or fiscal policy actions and the like. Since "properly anticipated prices fluctuate randomly" (Samuelson 1965), this discussant has been amazed at the market's uncanny ability to render "proper anticipations" such that observed prices and returns in fact fluctuate randomly, always. On balance, the R-R paper appears to be a significant breakthrough in discovering and utilizing serial correlation within factors which covary with returns on common stocks.

Nagorniak assumes validity of the CAPM, and proceeds to develop a "better" index than the S&P-500 for "gaming" portfolio performance. Essentially, he discovers how to get better performance test scores when performance is designed and gamed against a "Complete Index" but actually assessed, *ex-post*, against a popular index, say the S&P-500. Critical thought leads to the following question: What happens when the professional vendors of performance analysis systems also scrap the S&P-500 benchmark and substitute, the "Nagorniak-Complete Index"? Schumpeterian imitators are known and expected to follow Nagorniak-innovators. Instead of searching for bigger, better indexes, focus might be directed to fundamental notions regarding investment portfolio performance measurement.

If the investment objective is to maximize expected utility of the resultant portfolio, then performance depends upon precision and accuracy of the realized results relative to *ex-ante* expectations. It should accommodate: (a) different utility functions (quadratic, log, exponential, *et al.*), which imply (b) different risk aversion choices (increasing, decreasing, constant aversion, skewness preference, *et al.*), and (c) different constraint classes of portfolios (e.g., multi-billion dollar institutional portfolios with time horizons of 20, 30 or more years; and say $25,000 individual portfolios with time horizon of 30 or 60 days).

Since performance evaluations presently occur almost always within a mean-variance framework, managers who follow optimal strategies for a given utility (e.g., wealth maximization, given logarithmic utility) are penalized when assessed as if they should have been holding a mean-variance efficient portfolio. In short, our knowledge regarding how to assess performance generally needs improving.

Overall, these three papers set forth important empirical results. More critically, they provide background for further research. The problem of asset valuation remains "unsolved". All available models appear to be biased or intractable. Martingales can have serial correlation, with expected changes equal to zero, but serial correlation within stock market returns is rarely observed. Finally, we need

to know more regarding how to assess performance of portfolios whose owners and managers diverge from the tenets of quadratic utility and mean-variance perfectly competitive markets theory.

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