

“A foundation for ratio analysis”

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The paper proposes a theoretical foundation for the financial ratio measurement, showing that the multiplicative character of ratio components is a necessary condition for valid ratio usage, not just an assumption supported by evidence. Also, by assuming that firm size is a measurable statistical effect, the paper offers a better defined discussion of limitations of ratios. Thus a well-known limitation, non-proportionality, is re-assessed and a new, potentially serious limitation is described.

The paper has two parts, one where ratio components are viewed as deterministic variables and the other where they are random. Such approach allows an easier understanding of the expected ratio before the generalisation to encompass randomness takes place. In the second part, ratio components are compared to “random effects” models. It is shown that, in this case, a specific type of exponential Brownian motion leads to ratios which will not necessarily drift.

“Statistical approaches to identifying failing companies”

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Existing empirical studies on bankruptcy have traditionally used linear discriminant analysis (LDA) despite the fact that the data used in bankruptcy studies typically violate the assumptions on which LDA is based. The limitations of using LDA have recently led to a move in the literature towards using probit and logit models. However, no previous bankruptcy study has reported tests for model mis-specification in probit or logit models. We show that a well specified probit or logit model is able to predict bankruptcy more accurately than a LDA model. In addition, we find evidence for a non-linear relationship between certain financial ratios and the probability of bankruptcy. Accounting for this non-linearity improves the ability of the statistical model to identify failing companies. The non-linearity was discovered when testing for heteroscedasticity in the linear model, which emphasises the importance of model specification tests.