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Sensitivity analyses of anomalies in developed stock markets

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Abstract

The literature on anomalies in developed stock markets produces no consensus on specification. This study uses extreme bound analysis (EBA) to evaluate the robustness of 15 stock-return anomalies given data covering 16 developed markets from May 1984 to March 1999. Two factors are sturdy according to the "extreme" decision rule in the panel design – *D*/*P* and momentum. Under a less stringent EBA criterion, long-run lagged returns, country risk, and the January effect are also robust. Time-series EBA for individual markets produces one robust result according to relaxed decision rules across a majority of cases – long-run government bond yields. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

An extensive literature addresses stock market "anomalies". When researchers discuss such a statistically significant finding, they customarily suggest that the result is a true market anomaly, a risk proxy, or a statistical

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artifact due to data snooping or survivorship bias. Whether equity markets are efficient is a crucial inquiry. But, this paper focuses on statistical biases, namely specification bias, and employs extreme bound analysis (EBA), which economists commonly prescribe to other empirical questions such as macroeconomic growth and the demand for money.

There is no consensus regarding (multivariate) specification in the empirical literature on stock market anomalies. Given several incommensurable studies, this application of EBA to country-level stock market anomalies in developed economies employs three alternative decision rules and two data designs for 16 countries from May 1984 to March 1999. The first design, time-series/cross-sectional panel data, produces the most sweeping test with spatial and temporal variance. Briefly, the dividend yield and momentum are sturdy with the hypothesized signs under the most stringent inference criterion. Also, a less stringent EBA inference criterion indicates that long-run lagged returns, a survey-based country risk measure, and the January effect are comparatively robust with the expected signs. The remaining variables in the panel design – *P/B*, *P/E*, absolute market size, short-run lagged returns, level inflation, inflationary shocks, level unemployment, relative unemployment changes, long-term interest rates, and the yield curve – are fragile according to the three decision rules.

The second design, time-series data for each individual country, addresses some methodological shortcomings associated with panel regressions. With the exception of the long-run lagged returns, every factor is robust according to at least one EBA decision rule given data for at least one country. The most consistent result suggests that long-term government bond rates are sturdy with the expected negative sign in nine of 16 countries, but no other variable is robust according to any decision rule in a majority of cases.

Of course, like any econometric study, the underlying data ultimately limit EBA inferences. Indeed, given only overlapping data, fragile results might be as attributable to "out-of-sample" as specification bias per se. Nonetheless, whatever the particular empirical results, this paper recommends more rigorous econometric tests that limit specification bias. Given extensive use in other areas of econometrics, particularly including growth and the demand for money, applications of EBA to anomalies in developed stock markets are overdue.

Section 2 describes specification bias in the literature. Section 3 outlines EBA as well as the recent debate regarding decision rules, and Section 4 briefly lists the relevant "doubtful" variables. Section 5 describes the underlying panel estimation methods and results, and Section 6 presents time-series EBA findings. Section 7 includes additional sensitivity analyses, including use of raw instead of excess total returns and division of the sample, as well as suggestions for further research. Section 8 concludes this paper.

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