

Downside Risk in Credit Markets: A Lower Partial Moments Extension of the CAPM

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Abstract

This thesis investigates whether a lower partial moment extension of the Capital Asset Pricing Model (LPM-CAPM) is theoretically and empirically applicable to credit markets. Credit instruments differ from equities through their asymmetric payoff structure: upside potential is limited, while downside losses may be substantial in adverse states. This motivates the use of downside risk measures rather than variance-based. Building on utility theory, lower partial moments, and downside beta pricing, the thesis derives a credit-oriented version of the LPM-CAPM in which expected excess returns are related to exposure to systematic downside market risk.

The empirical analysis is conducted using weekly excess returns on 30 total return bond indices from January 2000 to April 2026. A two-pass cross-sectional regression framework, is used to compare the standard CAPM with several LPM-CAPM specifications across different choices of the target return τ and downside sensitivity parameter α . To account for serial dependence and uncertainty from estimated betas, inference is based on a stationary bootstrap procedure.

The results provide partial support for the relevance of downside risk in credit markets. Several LPM-CAPM specifications are not rejected by the hypothesis tests, and some specifications achieve slightly higher average cross-sectional explanatory power than the standard CAPM. However, the improvement is modest, and the LPM-CAPM does not clearly dominate the CAPM. The CAPM remains a competitive benchmark, particularly under bootstrap inference. The findings therefore suggest that downside beta contains useful information for explaining credit-index returns, but that a single-factor downside-risk model is not sufficient to fully capture the cross-section of credit excess returns.

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