# Detecting Time-Variation in Corporate Bond Index Returns: A Smooth Transition Regression Model

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**Abstract**

This paper investigates the time-variation of investment grade and high yield corporate bond index returns in a multi-factor smooth transition regression model, where state variables, i.e., term spread, default spread, dividend yield, excess stock index returns and real short term interest rates are used as risk factors in forecasting index returns. We find that expected index returns vary between weak and strong economic regimes, where the transition from one regime to the other is governed by the 3-quartered growth of industrial production. Weak economic regimes are characterized by low growth of industrial production, *vice versa* for strong economic regimes. Further, the variation of sensitivities and statistical significance of the risk factors also explain time-varying index returns: risk factor sensitivities are generally more negative in strong economic regimes than in weak regimes, implying that index returns are low when economic conditions are good and high when economic conditions are bad.

*Key words:* Corporate bond index returns; smooth transition regression model; heuristic optimization

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