

Three Essays on S&P 500 Index Constituent Changes

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In Essay I, we attempt to assess the impact of the S&P 500 index committee's decisions to change the constituent firms in the index on the benchmark risk measures and tracking error. Indexes are managed and changed discretionally by index committees to make them as representative of an industry or the economy as possible, in addition to the fact that indexes constantly change due to natural corporate events such as bankruptcies, mergers and acquisitions, and spin-offs. We find that portfolios obtained by keeping all discretionally deleted firms in a five year period at every deletion date provide betas similar to the betas obtained from the constantly updated S&P 500 portfolio. We also find that these portfolios are as representative of the business cycle as the S&P 500 portfolio. However, if left unchanged the portfolios' returns obtained by keeping all discretionally deleted firms deviate significantly from the returns of the S&P 500 index over the studied period, October 1989 to December 2007.

In Essay II, we model the shocks to returns around additions and deletions from the S&P 500 index in terms of the components of the total derivative of beta and expected cash-flow changes and expected discount rate changes. We utilize the total derivative of beta and decompose beta into correlation, firm volatility and index volatility components. Additionally, we utilize Campbell and Vuolteenaho (2004) methodology to decompose added or deleted firm's beta into cash-flow and discount rate betas. We find a significant increase in correlations of the event firms' returns and the market proxy

returns and cash flow betas, and a decrease in discount rate betas for added firms and the opposite effects for deleted firms. We find that these effects to beta are strongest in recent times and disappear within five years of the event. Robustness tests indicate that the total derivative changes effects are typical for the added or deleted firm's industry but that the cash flow correlation changes are specific to the added or deleted firm. Our findings suggest that addition or deletion from the S&P 500 index is not an information free event.

In Essay III, we examine the probability of a firm in the S&P 500 index of being removed from the index due to a decision of the Index Committee because the firm did not satisfy the share price, liquidity, company fundamentals, market capitalization or other index committee criteria. We study the probability of deletion with Survival Analysis and Neural Networks methods. We document that deletion might be predictable, which is contrary to the assumption of most studies that find that the market cannot predict the timing of a company deletion and inclusion to the S&P 500 index. It might also be beneficial to know ahead of time which company might be deleted from an index, to supplement the arbitrage opportunities that exist already during the announcement-effective date event window.