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## Index revisions, systematic liquidity risk and the cost of equity capital



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### ABSTRACT

This study investigates the impact of FTSE100 index revisions on firms' systematic liquidity risk and the cost of equity capital. We show that index membership enhances all aspects of liquidity, whereas stocks that leave the index exhibit no significant liquidity change. We also show that the liquidity risk premium and the cost of equity capital decline significantly after additions, but do not exhibit any significant change following deletions. The control sample analysis indicates that observed decline in liquidity premium and the cost of equity capital is not driven by factors other than index revisions. Our evidence is consistent with Journal of Financial Economics, 1, 17 (1986)'s argument that since liquidity is priced, an increase in liquidity will result in lower expected returns. Furthermore, the asymmetric impact of additions and deletions on stock liquidity and cost of capital is consistent with the view that the benefits of index membership are permanent (see, e.g. Journal of Finance, 59, No. 4 1901–29, August 2004; Journal of Investment Management 4, 23–37, 2006).

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## 1. Introduction

Several studies (e.g. Shleifer, 1986; Harris and Gurel, 1986; Dhillon and Johnson, 1991) show that stocks experience significant liquidity increase (decrease) after joining (leaving) a major stock index.

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Others, including [Amihud and Mendelson \(1986\)](#), [Chalmer and Kadlec \(1998\)](#), report a positive association between individual stock liquidity and stock market returns. [Chordia et al. \(2000\)](#), [Pastor and Stambaugh \(2003\)](#), [Amihud \(2002\)](#) and [Liu \(2006\)](#), among others, show that liquidity risk represents a source of non-diversifiable risk that needs to be reflected in expected asset returns. Thus, it can be argued that if index revisions affect stock liquidity and if liquidity is priced, the cost of equity capital may also be influenced by the revision events.

This study investigates the impact of the FTSE 100 index revisions on the systematic liquidity risk and the cost of equity capital. Its contributions to the literature is twofold. First, existing studies (e.g. [Pruitt and Wei, 1989](#); [Beneish and Whaley, 1996](#); [Doeswijk, 2005](#); [Vespro, 2006](#); [Becker-Blease and Paul, 2006](#); [Gregriou and Nguyen, 2010](#)) usually focus on the impact of index revisions on a single dimension of individual stock liquidity. [Liu \(2006\)](#) argues that since liquidity is multidimensional, conventional measures, such as trading volume, bid-ask spread and [Amihud's \(2002\)](#) illiquidity ratio, may not fully capture the liquidity risk. [Kyle \(1985\)](#) and [Lesmond \(2005\)](#) also argue that since liquidity is very difficult to define and even more difficult to estimate, a menu of measures would be required to capture the various aspects of liquidity. Given the uncertainties surrounding liquidity estimation, we use effective bid-ask spread, turnover ratio, [Amihud's \(2002\)](#) illiquidity ratio, and [Lesmond et al.'s \(1999\)](#) proportion of zero returns to capture the impact of index revisions on trading costs, trading quantity, price impact, and trading continuation dimensions of liquidity, respectively.

Second, we use [Liu's \(2006\)](#) liquidity-augmented capital asset pricing model (LCAPM) to measure, with greater precision, the effect of index revisions on both the liquidity risk premium and the cost of equity capital of the event firms. Existing studies on index revisions tend to use capital expenditure and investment opportunities as proxies for the cost of equity capital. [Gregriou and Nguyen \(2010\)](#) and [Becker-Blease and Paul \(2006\)](#), for example, argue that if required returns rise (fall), and thus the cost of capital increases (decreases), one would expect, at the margin, a reduction (enhancement) in the capital expenditure and investment opportunity set. However, the authors do not directly investigate the changes in the cost of capital around additions and deletion events. Furthermore, several other studies posit that the cost of equity capital is not the only determinant of capital expenditure and investment opportunities. [Milton and Raviv \(1991\)](#) suggest that investment opportunities depends on many factors, including the relationship between managers and shareholders, accessibility to both debt and equity markets, financial constraints, the feasibility of investment projects and the default probability. Similarly, [Stenbacka and Tomnak \(2002\)](#) argue that investment decisions are not only related to the cost of capital, but also to the levels of retained earnings, debt to equity ratio, the nature of capital markets, the availability of the internal funds and the characteristics of the investment opportunities available to the firm. Therefore, [Gregriou and Nguyen \(2010\)](#) finding that index deletions do not affect corporate investment opportunities, does not necessarily imply that index revisions have no impact on the cost of equity capital.

We begin our empirical analysis by examining the impact of index additions and deletions on different liquidity dimensions. We use effective spread, turnover ratio, [Amihud's \(2002\)](#) illiquidity ratio, and the proportion of zero returns to capture the different dimensions of liquidity. Then, we use a mimicking liquidity factor (LIQ hereafter) and the market return (MKT hereafter) to produce liquidity risk from the liquidity-augmented model (LCAPM) of [Liu \(2006\)](#). Subsequently, we use [Lin et al.'s \(2009\)](#) approach to estimate the cost of equity capital in the pre- and post-index revision periods. For robustness checks, we include [Fama and French-three factors \(1993\)](#) and momentum factor of [Carhart \(1997\)](#) as additional variables in the LCAPM. Finally, we use a control sample methodology to account for changes in liquidity risk and cost of equity capital which may be caused by factors other than index revisions.

Our results suggest that stock liquidity improves after additions, but does not diminish following deletions. We also show that the liquidity premium and the cost of equity capital decrease significantly after additions, but do not exhibit any significant change following deletions. Similar results are reported when [Fama and French's \(1996\)](#) factors and [Carhart's \(1997\)](#) momentum factor are used as additional explanatory variables in the LCAPM. Our findings are also robust to various liquidity measures and estimation methods. The control sample analysis indicates that observed decline in liquidity premium and the cost of equity capital are statistically significant even after accounting for other relevant factors. Thus, our results are consistent with [Amihud and Mendelson's \(1986\)](#) argument

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