



# Liquidity risk, leverage and long-run IPO returns

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## Abstract

We examine the risk-return characteristics of a rolling portfolio investment strategy where more than 6000 Nasdaq initial public offering (IPO) stocks are bought and held for up to 5 years. The average long-run portfolio return is low, but IPO stocks appear as “longshots”, as 5-year buy-and-hold returns of 1000% or more are somewhat more frequent than for non-issuing Nasdaq firms matched on size and book-to-market ratio. The typical IPO firm is of average Nasdaq market capitalization but has relatively low book-to-market ratio. We also show that IPO firms exhibit relatively high stock turnover and low leverage, which may lower systematic risk exposures. To examine this possibility, we launch an easily constructed “low-minus-high” (LMH) stock turnover portfolio as a liquidity risk factor. The LMH factor produces significant betas for broad-based stock portfolios, as well as for our IPO portfolio and a comparison portfolio of seasoned equity offerings. The factor-model estimation also includes standard characteristic-based risk factors, and we explore mimicking portfolios for leverage-related macroeconomic risks. Because they track macroeconomic aggregates, these mimicking portfolios are relatively immune to market sentiment effects. Overall, we cannot reject the hypothesis that the realized return on the IPO portfolio is commensurable with the portfolio’s risk exposures, as defined here.

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## 1. Introduction

As shown by Ritter (1991) and Loughran and Ritter (1995), stocks performing either IPOs or seasoned equity offerings (SEOs) generate surprisingly low returns over holding periods of 2–5 years following the issue date. To some researchers, this long-run return evidence challenges the efficient markets hypotheses and motivates the development of

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behavioral asset pricing models.<sup>1</sup> Responding to this challenge, [Brav and Gompers \(1997\)](#), [Brav et al. \(2000\)](#) and [Eckbo et al. \(2000\)](#) present large-sample evidence that the low post-issue return pattern is consistent with standard multifactor pricing models, and tend to be concentrated in small growth stocks. Thus, the low post-issue returns may be a manifestation of the more general finding of [Fama and French \(1992\)](#) that small growth stocks tend to exhibit low returns during the post-1963 period.

This paper presents new evidence on potential risk-based explanations for the low IPO returns. Despite the controversy, surprisingly little is known about the true long-run risk-return characteristics of IPO stocks. With a sample exceeding 6000 Nasdaq IPOs over the 1972–1998 period, we show that IPO stocks exhibit significantly greater stock turnover and are less leveraged when compared to non-IPO firms matched on stock exchange, equity size and book-to-market ratio.<sup>2</sup> The discovery of greater stock turnover is important as it suggests a potential liquidity-based explanation for lower *expected* returns to IPO stocks not previously accounted for. Our finding of lower leverage is consistent with the fact that IPO firms tend to have fewer assets in place and lower current earnings to support extensive borrowing as compared to more seasoned companies. We explore these findings by estimating parameters in empirical factor models where the risk factors have links to stock liquidity and leverage. Our main hypothesis is that IPO stocks have lower expected return due to lower exposures to these and other risk factors.

Starting with our analysis of liquidity, a number of empirical studies suggest that greater stock liquidity reduces risk.<sup>3</sup> To examine this possibility, we expand the [Fama and French \(1993\)](#) model with momentum and two alternative liquidity risk factor representations. The first liquidity factor is original to this paper. It is generated in a similar manner to the Fama–French size and book-to-market factors, except that we sort first on size and then on percentage stock turnover. The (characteristic-based) liquidity factor is then a portfolio that is long in low-turnover stocks and short in high-turnover stocks, henceforth “low-minus-high” or LMH. For comparison purposes, we also explore the liquidity factor estimated by [Pastor and Stambaugh \(2003\)](#) using order-flow related return reversals. Since the two factors capture different aspects of liquidity, an examination of both enhances our understanding of liquidity pricing effects in the context of new issues.

We apply the factor model with liquidity risk to our portfolio of IPOs. For purposes of comparison, we also apply the model to the portfolio of 1704 industrial seasoned equity offerings (SEOs) compiled by [Eckbo et al. \(2000\)](#) over the period 1964–1995. As was shown in the earlier paper, SEO industrial stocks also exhibit high (turnover) liquidity relative to non-issuing firms matched on size and book-to-market. We test directly for differences in expected returns between issuer and matched firms by applying the factor

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<sup>1</sup> See, e.g., [Daniel et al. \(1998\)](#), [Barberis et al. \(1998\)](#), and [Hong and Stein \(1999\)](#). In behavioral models, the marginal investor is either slow to assimilate publicly available information, or ignores this information altogether.

<sup>2</sup> Over the sample period, more than 95% of all IPOs took place on Nasdaq. While the typical NYSE/Amex IPO remaining in the population is somewhat larger (in terms of market value), including NYSE/Amex IPOs in our sample does not materially affect any of the paper’s conclusions. Thus, in the empirical analysis below, both the sample of IPO firms and matched non-IPO companies are Nasdaq firms.

<sup>3</sup> See, e.g., [Brennan and Subrahmanyam \(1996\)](#), [Brennan et al. \(1998\)](#), [Datar et al. \(1998\)](#), [Chordia et al. \(2001\)](#), [Eckbo and Norli \(2002\)](#), [Easley et al. \(in press\)](#), and [Pastor and Stambaugh \(2003\)](#).

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