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Characteristic liquidity, systematic liquidity and expected returns

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ABSTRACT

We investigate whether the effect of liquidity on equity returns can be attributed to the liquidity level, as a stock characteristic, or a market wide systematic liquidity risk. We develop a CAPM liquidity-augmented risk model and test the characteristic hypothesis against the systematic risk hypothesis for the liquidity effect. We find that the two-factor systematic risk model explains the liquidity premium and the null hypothesis that the liquidity characteristic is compensated irrespective of liquidity risk loadings is rejected. This result is robust over 1931–2008 data and sub-samples of pre-1963 and post-1963 data both in the time-series and the cross-sectional analysis. Our findings provide clear guidance on the impact of liquidity on expected returns and can have practical implications in portfolio construction and investment strategies.

1. Introduction

Liquidity affects equity prices; illiquid stocks have higher returns than liquid stocks. There are two common hypotheses for the liquidity effect. One considers liquidity as a stock characteristic, and the premium for this characteristic (liquidity level) has been widely investigated (e.g. Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996; Hasbrouck, 2009). The analysis in these studies includes control variables that account for the differences that can be explained by the different

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cash flows, and then tests whether the price differential that is unexplained by the control variables is significantly related to differences in the liquidity level of the stocks. From this point of view, the liquidity premium is the rational response of investors in an efficient market seeking compensation for bearing transaction costs and frictions underlying illiquidity (e.g. Amihud and Mendelson, 1986). The result is lower prices and higher expected returns for illiquid stocks relative to the liquid stocks. This premium is not due to a systematic risk, but rather characteristics of the stocks.

The second hypothesis for the liquidity effect states that the high expected returns for illiquid stocks are compensation for a market level (systematic) liquidity risk. It is based on the idea that liquidity varies over time, and because there is commonality in liquidity, the market liquidity risk should also be priced. Accordingly, because liquidity varies over time risk-averse investors require compensation for being exposed to the liquidity risk. Studies based on this hypothesis generally define and construct a common risk factor that is related to liquidity and investigate the risk premium for the sensitivity of stock returns to that liquidity-based factor (Pastor and Stambaugh, 2003; Acharya and Pedersen, 2005; Liu, 2006, 2010).

Some studies have tried to connect these two lines of research in liquidity–equity pricing by examining the relationship between liquidity as a characteristic and liquidity as a systematic risk factor in equity asset pricing. However, the results have not been conclusive. For example, Watanabe and Watanabe (2008) take the innovation in liquidity shocks as the liquidity risk factor and show that systematic liquidity captures the effect of characteristic liquidity. Korajczyk and Sadka (2008) extract the liquidity common factor using the asymptotic principal components (APC) approach and report a cross-sectional premium for the level of liquidity after controlling for the liquidity systematic risk. Liu (2010) constructs a liquidity-related return factor, defined as the returns of a zero-cost portfolio, and shows that systematic liquidity picks up the effect of characteristic liquidity.

However, past research that has examined the returns of liquidity-sorted portfolios (as in Watanabe and Watanabe, 2008; Liu, 2010) has not been able to distinguish the systematic risk hypothesis from the characteristics model in equity–liquidity pricing tests[1]. This is because the liquidity characteristic is associated with co-variation in returns, and so the liquidity loadings may capture co-variation in returns not due to liquidity risk, but to the liquidity characteristics. In other words, the co-variation between the illiquid stocks may not be the result of a liquidity risk factor, rather reflect the fact that illiquid stocks tend to have similar properties as they operate in similar industries or related businesses. It is illustrative to focus on periods in which industries have become relatively (il)liquid due to market-wide (il)liquidity. When liquidity characteristic-based portfolios are formed in order to pick up the co-variation related to the market-wide liquidity risk, the captured variation has been always present in the industry, but for the moment happens to be related to the market-wide, common source of liquidity risk. Hence, the liquidity premium seems to be associated to the covariance of returns with a common liquidity risk factor, when in fact it is due to the liquidity characteristic of the stocks. To discriminate between these two cases we need to apply a method that separates the firms that are illiquid, but that do not behave like illiquid firms by loading on liquidity factor.

We use the triple-sort portfolio construction suggested by Daniel and Titman (1997) in order to isolate the variation in liquidity-related co-variation from the changes in liquidity level. More specifically, we apply a low-frequency liquidity measure, the effective tick developed by Holden (2009), and employ a time-series regression on portfolios over a long sample period of 1926–2008 to test the risk model against the characteristics model for the liquidity premium. We first establish a liquidity–equity pricing risk model that includes only the market factor and the liquidity factor. Our liquidity factor is the returns on a mimicking arbitrage portfolio, which is long in illiquid stocks and short in liquid stocks, and it is neutral to the market factor. We show that this two-factor model can explain the expected returns over a long data sample period from 1931 to 2008, and sub-samples of pre- and post-1963. The use of a long time series enhances the power of our asset pricing tests. We then test the characteristics hypothesis versus this two-factor risk model by triple-sorting stocks

[1] Daniel and Titman (1997) and Davis et al. (2000) show that the set-up in which the test portfolios are formed based on sorted characteristics does not have enough power to distinguish characteristics models from the risk models in asset pricing tests.