Essays on Empirical Market Microstructure

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In Chapter 2, we propose a measure of liquidity that captures the feature of liquidity leaks, and we examine its pricing in the cross-section of stock returns. Previous literature suggests that liquidity is time-varying and there are good reasons to believe that there exists an illiquid regime and a liquid regime. When a stock has a long life of the illiquid regime, we say it is stuck in a liquidity leak (or liquileak) situation. Liquidity leaks thus have two dimensions, a low liquidity level and a long duration of illiquidity. Risk-averse investors should demand a high return to compensate for the losses they may incur in a liquidity leak event. We propose to measure liquidity leaks by the liquileak probability, which is the probability that a stock remains in the illiquid regime for five consecutive trading days, estimated by the Markov regime switching model. The conjectured relationship between a stock's liquileak probability and its required return is tested in two conventional ways: portfolio sorts and Fama-MacBeth regressions. The portfolio sort analysis reveals that a trading strategy that is long in high liquileak stocks and short in low liquileak stocks yields a significant average annual excess return of 3.36%. To explore whether this positive return is only due to one of the two factors of the liquileak probability (i.e., frequency or duration) or just captures the (unconditional) average liquidity level, we double-sort and find that, still, the return differential across low and high liquileak stocks remains significantly positive. The Fama-MacBeth regressions enable us to also control for the standard Fama-French factors and other stock characteristics. We find a positive return premium for the Liquileak probability. A one standard deviation increase in liquileak probability increases annual returns by 1.33%. These regressions are repeated for the two equal-length sub-periods and the results indicate that the liquileak probability has become more important for returns over time whereas, consistent with earlier literature, liquidity level has become less important.

In the robustness check, we propose an alternative measure of liquidity leaks, which is calculated directly from raw data without any model specification. We proxy the persistence of the illiquid regime by the average duration that a stock is in the illiquid regime and the frequency of the illiquid regime by the percentage of the days that a stock is in the illiquid regime over total number of trading days. Correspondingly, the interaction of these two variables is the measure of liquidity leaks. Again, we find consistent evidence that this measure of liquidity leaks also has a significantly positive relation with stock returns. In addition, our results are robust to the January effect and the financial crisis period 2007-2008.

Chapter 3 investigates the pricing of the downside liquidity. We argue that investors regard downside market differently from upside market, and stocks that have a high liquidity level and low liquidity risk in downside market are especially valuable to investors. In a declining market, investors are very likely hit their funding constraint and have to liquidate their stocks. Thus they prefer to hold stocks that can be executed at a low cost during the market downturns and would demand higher returns for stocks that have high downside liquidity. We set the average market return as a cutoff level and define a market is in a downside (upside) if its return is lower (higher) than this cutoff level. Amihud ILLIQ measure is used as our daily illiquidity measure. The downside (upside) illiquidity level is defined as the average of daily ILLIQ measure in a downside (upside) market. The downside and upside liquidity beta is the comovement of stock's illiquidity level with the market illiquidity level conditioning on the market return.

We use two approaches to investigate the relation between the downside liquidity and stock returns in the cross-section. One is the portfolio sorting approach, which produces easy-to-interpret returns on a feasible investment strategy. We sort individual stocks into five quintiles based on the their downside (and upside) illiquidity level and downside (and upside) liquidity beta, and find that

stocks with high downside illiquidity level and beta have higher returns than stocks with low downside illiquidity level and beta. For example, a trading strategy that is long in stocks with high downside illiquidity level and short in stocks with low downside illiquidity level yield an average monthly excess return of approximately 0.94%. The return difference between the two extreme downside liquidity beta quintiles is 0.74% per month. To differentiate the effects of downside and upside illiquidity level and beta, we further conduct a double-sorting analysis. After control for the upside illiquidity level we still find that the return spread of portfolios sorted by the downside illiquidity level is significantly positive. Also, the increasing pattern of return from the low downside liquidity beta to high downside liquidity beta remains after first sort on the upside liquidity beta. The other approach is the Fama-MacBeth regression, which allows us to regress cross-sectional excess returns directly on the downside illiquidity level and beta and enable us to control for other well-known return determinants. The regression is conducted on the firm level. We find evidence that the downside illiquidity level and beta have a significantly positive effect on stock returns in the cross-section. For example, an increase of one standard deviation in the downside illiquidity level would increase monthly returns by 0.15%. It is approximately 1.8% on an annual basis, which also indicates economical significance. The downside liquidity beta also has a significantly positive effect on stock returns. However, when the downside illiquidity level, the upside illiquidity level, the downside and upside liquidity beta are included jointly in the cross-sectional regression, only the downside illiquidity level still has a significantly positive coefficient on returns. In the robustness check, we find that our results are robust to the January effect.

In Chapter 4, we examine the effect of designated market maker on small-caps in Euronext Amsterdam market. Firms care about stock liquidity as it affects their cost of capital. Small-caps care most as their stock exhibits lowest liquidity level and highest liquidity risk. Euronext allows them to contract with designated market makers (DMMs) who then have to supply minimum liquidity unconditionally. In Amsterdam, 74 small-cap firms out of 101 eligible firms sign up on the introduction day. We analyze 11 months before and after the introduction of designated market makers and find that DMM stocks generate a significant cumulative abnormal return of 3.5% in a three week window that includes the announcement and the effective day. Most of it occurs in the week after Euronext publishes the list of DMM stocks. In aggregate, this amounts to a value creation of about e1 billion. Based on what is essentially a difference-in-difference approach (post-event minus pre-event differenced across DMM and nonDMM stocks), we find that the effective spread declines significantly and the effective spread covaries significantly less with market effective spread (i.e. β in Acharya and Pedersen (2005)). We therefore argue that DMMs improve liquidity level and reduce liquidity risk. Moreover, both the liquidity level change and the liquidity risk change are significant explanatory variables for the positive abnormal returns associated with DMM stocks. We further find that DMMs participate in more trades and incur a trading loss on high quoted-spread days, i.e., days when their constraint is likely to bind. Finally, we find that DMMs reduce daily pricing errors.