



**University of
Zurich**^{UZH}

An Analysis of Liquidity, its Volatility and the Capital Structure: The Case of Switzerland

MASTER'S THESIS

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Executive Summary

The relationship between stock liquidity and the capital structure of the firm has only recently been examined in academic research. Lipson and Mortal (2009) and Frieder and Martell (2006) report a negative relation between liquidity and leverage for the US market. Udomsirikul, Jumreornvong and Jiraporn (2011) showed also a negative relation for firms in Thailand. Haddad (2012) did not find any significant relationship between liquidity and leverage by analysing firms listed on the Amman Stock Exchange. The lack of existing research for Switzerland and the special characteristics of the Swiss market are the reasons to analyse this particular market. Switzerland is compared to the US (market-oriented country) a bank-oriented country (Demirgüç-Kunt and Maksimovic (2002)), has a higher ownership concentration (Vasiliou and Daskalakis (2009)), a lower corruption index (Fan, Titman and Twite (2012)) and Ranaldo (2001 and 2002) points out that the Swiss Stock Exchange is a pure order-driven market compared to a price-driven market like the NASDAQ. Furthermore, the impact of the volatility of liquidity on the capital structure is analysed. The volatility of liquidity has been analysed in other contexts, but as to the knowledge of the author, it was never directly linked to the capital structure of the firm. Prior evidence (Chordia, Subrahmanyam and Anshuman (2001) and Pereira and Zhang (2010)) suggests that the volatility of liquidity is negatively related to expected stock returns. Here, the volatility of liquidity is analysed in a different setting by examining its influence on a firm's cost of capital and therefore also the capital structure decisions.

Since this thesis focuses on Switzerland, the analysis takes firms into account which are part of the SPI. For the *ILLIQ* measure, the time period considered is from 1994 to 2015 and for the *Zeros* measure, the time period is from 1991 to 2015. These two samples represent the unbalanced panels. Two balanced panels were also constructed, which cover for both liquidity measures the time period between 2005 and 2015. Additionally, "financials" were excluded in each of these four samples to create samples five to eight. The thesis concentrates on the two unbalanced panels without financials because they include more observations than the balanced ones and the exclusion of financials is common in capital structure research. Two different liquidity measures (*ILLIQ* and *Zeros*) and two different leverage measures (market and book leverage) are used for the analysis. The volatility of liquidity is calculated as the yearly standard deviation of the daily *ILLIQ* measure and the monthly

Zeros measure. Control variables are included in the regression analysis which were identified in the academic literature as factors that have an influence on the capital structure of a firm. The data used stem from Bloomberg or Thomson Reuters Datastream. First, descriptive statistics and the correlations among the used variables are presented. Then, the relation between liquidity (level and volatility) and capital structure is analysed by conducting first an univariate analysis after controlling for size and then the regressions are performed.

The univariate analysis of liquidity and leverage shows first, that larger firms seem to have higher leverage but also that this relation is not consistent across all liquidity ranks. Second, a negative relation between liquidity and leverage within each size quintile is found. Third, the difference in average liquidity levels is larger for smaller firms. However, these results are of greater magnitude for market leverage. The regression analysis further suggests that a negative relation between liquidity and leverage is existent. The univariate analysis for the volatility of liquidity implies a positive relation between the volatility of liquidity and leverage. The difference in the average volatility of liquidity values is also greater for smaller firms. Results of the regression analysis imply a positive relation too. The regression results of the other constructed samples confirm these results to a great proportion. However, the results do not survive all robustness checks.

As Lipson and Mortal (2009), Frieder and Martell (2006) and Udomsirikul, Jumreornvong and Jiraporn (2011), a negative relation between stock liquidity and leverage is found. This result supports the first hypothesis and the view that liquidity reduces the cost of equity and that the more liquid firms will rely more on equity. The results for the volatility of liquidity are in contradiction to the second hypothesis, since they imply a positive relation between the volatility of liquidity and leverage. However, this result is consistent with the intuition that risk-averse investors will require a higher rate of return if they are exposed to liquidity risk (Amihud, Mendelson and Pedersen (2005)). Therefore, a higher rate of return makes equity more expensive compared to debt and the firm will potentially employ more debt (argumentation using the trade-off theory of capital structure). It has to be noted that the results do not survive all robustness checks, especially the inclusion of firm fixed-effects reduces their statistical significance.