Market liquidity and stock returns in the Norwegian stock market

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ARTICLE INFO

ABSTRACT

We analyze the liquidity sensitivity of stock returns in the Norwegian stock market over the period 1983–2015. Even though the liquidity measures we apply are standard in the literature, we find no evidence of a relationship between returns and market liquidity. This is in strong contrast to the evidence of a significant sensitivity to liquidity in the US market, and suggest further analysis on the topic.

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1. Introduction

Liquidity is broadly divided into *market* and *funding* liquidity, where a change in one affects the other. In this paper we investigate the impact of market liquidity on stock returns in the Norwegian stock market. Market liquidity is defined as the ease of trading financial assets, and has received considerable attention by both academics and practitioners the last decade. It is a concept which encompasses the driving force of any market: the ability to make money trading assets. The concept of turning assets into cash or other more liquid assets is something that every investor is, or should be, concerned about. The challenge is often to measure liquidity, and there is no single one measure that capture all facets of liquidity. Market liquidity has been studied by several authors since at least (Demsetz, 1968). The impact on stock returns has subsequently been studied by many others, see for example Roll (1984); Amihud and Mendelson (1986, 1991); Amihud (2002); Pastor and Stambaugh (2003); Acharya and Pedersen (2005); Spiegel (2008), and Amihud et al. (2015). A more recent paper, see Sensoy (2016), investigates the relationship between macroeconomic announcements and its impact on stock market

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Table 1
Summary statistics for the variables applied in the paper. All numbers are in percent and computed from daily observations.

Variable	N	Minimum	Maximum	Mean	Std.dev
r_m	8282	−21.2	10.5	0.05	1.4
BAS_t	8282	1.6	14.3	4.6	6.2
HL_t	8282	1.9	10.7	2.3	2.6
α_t	8282	0.6	14.7	2.6	1.9
TRN_t	8282	0.3	2.5	0.3	0.2

liquidity. The author investigates the Turkish stock market, and find that only US macroeconomic announcements affect commonality in liquidity. In this paper, we aim to quantify the market liquidity of stocks using a survivor bias free sample of stocks over the period 1983–2015.

2. Liquidity measures

In the paper, we analyze four different measures of liquidity; (1) The bid-ask spread derived by Amihud and Mendelson (1986), (2) A simple high-low ratio, (3) A bid-ask spread derived by Corwin and Schultz (2012), and (4) A turnover measure constructed for the Oslo Stock Exchange in Ødegaard et al. (2009). The bid-ask spread measure by Amihud and Mendelson is given by

$$BAS_t = \frac{Ask_t - Bid_t}{Ask_t} \tag{1}$$

where Ask_t is the average ask-price during the day, The simple high-low estimator we apply is the relative difference between the daily high and low prices:

$$HL_t = \frac{H_t - L_t}{H_t} \tag{2}$$

where H_t (L_t) is the highest (lowest) price during day t. This estimator is closely related to the bid-ask spread derived by Corwin and Schultz (2012), which again is given by

$$\alpha_t = (\sqrt{2} + 1) \cdot (\sqrt{\beta_t} - \sqrt{\gamma_t}) \tag{3}$$

where β_t is given by the sum of two consecutive days of the squared log-ratio between high and low prices, and γ_t is given by log-ratio between the two-day maximum price divided by the two-day minimum price. Specifically,

$$\beta_t = \sum_{j=0}^{1} \left(\ln \frac{H_{t+j}}{L_{t+j}} \right)^2 \tag{4}$$

and

$$\gamma_t = \left(\ln \frac{\max\{H_t, H_{t-1}\}}{\min\{L_t, L_{t-1}\}} \right)^2 \tag{5}$$

The Corwin-Schultz measure is a proxy for market liquidity, and shows significant time-variation. The turnover-ratio is a measure of a stock's trading activity, which is computed by taking the number of stocks traded every day divided by the total number of outstanding stocks. The equation is

$$TRN_t = \frac{\text{Number of shares traded at day } t}{\text{Number of shares outstanding at day } t} \tag{6}$$

All these estimators of liquidity have been applied in studies investigating the liquidity premium previously. However, many of the studies focus on the US stock market solely. In this paper we compute these liquidity measures for all stocks that is, or has been, listed at the Oslo Stock Exchange during the period January 1st 1983 through December 31st 2015 (Figs. 1 and 2).

Table 1 summarizes the variables applied in this paper. As one can see, there is substantial variation in the variables.

3. Data sample and benchmark model

Our key objective is to examine the relationship between stock returns and market liquidity in the Norwegian stock market. We apply a survivor bias free sample of Norwegian stocks over the period 1983–2015. Each stock includes daily data on prices, stock splits, reverse splits, dividends, and other corporate actions. We compute log-returns from adjusted daily prices. The benchmark market is OSEBX, an index of the 60 largest firms in the Norwegian stock market. The Norwegian stock market is small compared to the main stock markets in North America, Europe, and Asia. However, the Norwegian