Available online at www.sciencedirect.com
SCIENCE DIRECT®
Journal of Banking & Finance 28 (2004) 157–178
Journal of BANKING & FINANCE
www.elsevier.com/locate/econbase

The pricing of systematic liquidity risk: Empirical evidence from the US stock market

Rajna Gibson [a,*], Nicolas Mougeot [b,1]

[a] *ISB – Swiss Banking Institute, University of Zurich, 14 Plattenstrasse, Zurich 8032, Switzerland*
[b] *European Quantitative Research, Citigroup Smith Barney, Citigroup Center, Canada Square, Canary Wharf, London, E14 5LB, UK*

Received 11 January 2002; accepted 3 July 2002

Abstract

In this study, we examine whether aggregate market liquidity risk is priced in the US stock market. We define a bivariate Garch (1,1)-in-mean specification for the market portfolio excess returns and the changes in the standardized number of shares in the S&P 500 Index, the aggregate market liquidity proxy. The findings, based on monthly data, suggest that systematic liquidity risk is priced in the US over the period January 1973–December 1997. The liquidity premium represents a non-negligible, negative and time-varying component of the total market risk premium whose magnitude is not influenced by the October'87 Crash.

JEL classification: C32; G12
Keywords: Bivariate Garch; Equity risk premium; Systematic liquidity risk

1. Introduction

Liquidity is a fundamental concept in finance which can, broadly speaking, be defined as the time and cost which are associated with the liquidation (or purchase) of a given quantity of financial securities. Liquidity thus refers to both the time and costs associated with the transformation of a given position into cash and vice versa. Typically, continuous-time arbitrage or equilibrium asset pricing models ignore liquidity since the cost and time required to transfer financial wealth into cash is assumed to

* Corresponding author. Tel.: +41-1-634-29-69; fax: +41-1-634-49-03.
E-mail addresses: rgibson@isb.unizh.ch (R. Gibson), nicolas.mougeot@citigroup.com (N. Mougeot).
[1] Tel.: +44-20-7986-4247.

0378-4266/$ - see front matter
doi:10.1016/S0378-4266(02)00402-8

be nil and since trading is often ruled out by these equilibrium asset pricing models. Yet, in practice, recent financial crises (such as in Asia or in Russia) and the debacle of the LTCM hedge fund suggest that at times of tight credit and market conditions, liquidity can decline and even temporarily dry out. This leads investors to aggressively bid for the safest, that is, the most liquid securities, which raises their price relative to the one of their less liquid counterparts. If market liquidity evolves randomly, securities or portfolios that covary more with liquidity, should offer a lower liquidity risk premium. We ask ourselves whether market liquidity risk is priced and whether the omission of stochastic market liquidity shocks may explain the market risk premium's lack of significance reported in former empirical studies (see Table 1 in Scruggs (1998)). We attempt to test the latter conjecture and to further characterize the importance, magnitude and variations of the systematic liquidity premium as a component of the total expected excess market rate of return.

We focus on a broader definition of systematic liquidity in order to examine whether long term – in our case, monthly – random movements in market liquidity affect stock prices to the extend that their returns covary with changes in market liquidity. Such a relationship is often implicitly assumed. For instance, when used to explain the small firms effect, or to justify the higher expected returns of less liquid financial instruments such as hedge funds.

Recently, a number of studies have examined the presence of commonality in individual stocks' liquidity measures. Hasbrouck and Seppi (1999) look at the 30 constituent stocks from the Dow Jones Industrial Index and conclude, on the basis of principal component and canonical correlation analyses, that the source of commonality in intra-daily liquidity measures for these stocks is rather small. Chordia et al. (2000) reach a distinct conclusion however after examining the sources of commonality in the changes of several daily liquidity measures for 1169 US stocks during the year 1992. Using a market model for liquidity, they find that common market and industry influences on individual stock's liquidity measures such as their quoted spreads or depth are significant and material. In particular, they find that a stock's bid and ask spread is negatively related to the aggregate level of market trading. They interpret this result as being consistent with a diminution in inventory risk resulting from greater market trading. Their findings are however less supportive of common factors driving asymmetric information based stock trading. Thus, their results can explain common liquidity factors influence on stocks' expected returns through increased average trading costs. Huberman and Halka (1999) also explore the commonality in liquidity, using the depth as well as the bid–ask spread as proxies for the liquidity of 240 US traded stocks. Their findings are similar to the results of Chordia et al. (2000), and they attribute commonality in stocks' liquidity to the presence of noise traders. These studies have left open the question as to whether illiquidity is a systematic risk factor, in which case stocks that are more sensitive to unexpected market illiquidity shocks, should offer higher expected returns. An exception is to be found in Pastor and Stambaugh (2001) who introduce a market-wide liquidity measure and show that cross-sectional expected stock returns are related to fluctuations in aggregate liquidity. Along the same lines, the recent study by Amihud (2002) introduces a new measure of illiquidity defined as the ratio of a stock's