Journal of Financial Economics 105 (2012) 82–112

Contents lists available at SciVerse ScienceDirect

Journal of Financial Economics

journal homepage: www.elsevier.com/locate/jfec

Understanding commonality in liquidity around the world ☆

G. Andrew Karolyi [a,*], Kuan-Hui Lee [b], Mathijs A. van Dijk [c]

[a] Johnson Graduate School of Management, Cornell University, Ithaca, NY 14853, USA
[b] Seoul National University Business School, Seoul National University, Seoul, South Korea
[c] Rotterdam School of Management, Erasmus University, Rotterdam, The Netherlands

ARTICLE INFO

Article history:
Received 2 June 2009
Received in revised form
20 June 2011
Accepted 23 June 2011
Available online 24 December 2011

JEL classification:
G12
G14
G15

Keywords:
Commonality
Liquidity
International markets

ABSTRACT

We examine how commonality in liquidity varies across countries and over time in ways related to supply determinants (funding liquidity of financial intermediaries) and demand determinants (correlated trading behavior of international and institutional investors, incentives to trade individual securities, and investor sentiment) of liquidity. Commonality in liquidity is greater in countries with and during times of high market volatility (especially, large market declines), greater presence of international investors, and more correlated trading activity. Our evidence is more reliably consistent with demand-side explanations and challenges the ability of the funding liquidity hypothesis to help us understand important aspects of financial market liquidity around the world, even during the recent financial crisis.

1. Introduction

The liquidity of a stock and how it evolves over time are of important concern to many investors. Empirical evidence shows that investors prefer stocks that are liquid (Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996; Amihud, 2002; Liu, 2006). Other studies find that a stock's exposure to systematic liquidity risk and whether its liquidity dries up at inopportune times matter for investors (e.g., Pástor and Stambaugh, 2003; Acharya and Pedersen, 2005; Sadka, 2006; Korajczyk and Sadka, 2008; Lee, 2011). Acharya and Pedersen (2005) propose

☆ We thank Michael Brandt, Christian Lundblad, Randall Morck, Mark Seasholes, René Stulz, "Vish" Viswanathan, Masahiro Watanabe, Bernard Yeung, and seminar participants at Cornell, Erasmus, Georgia State, Korea University Business School, Nanyang Technological University (Singapore), National University of Singapore, Ohio State, Robeco Asset Management, Singapore Management University, Miami, UNC Chapel Hill, SungKyunKwan University Business School, South Carolina, South Florida, Victoria, Virginia (Darden), the First Erasmus Liquidity Conference, the Cass Emerging Markets Conference, the 2008 European Finance Association Meetings, and 2008 Western Finance Association Meetings for helpful comments and Tim Vogelsang for providing the code for his trend test. We acknowledge, in particular, the valuable suggestions of our referee, Avanidhar Subrahmanyam, and our conference discussants: Allaudeen Hameed (Erasmus), David Lesmond (Cass), Piet Sercu (EFA), and Akiko Watanabe (WFA). Xiaoyu Xie provided able research assistance. Karolyi thanks the Dice Center for Financial Economics at Ohio State University and the Alumni Professorship at Cornell University for financial support. Lee acknowledges financial support from the Whitcomb Center for Research in Financial Services of Rutgers Business School, the Korea University Grant, and the Research Settlement Fund for the new faculty of Seoul National University. Van Dijk thanks the Netherlands Organization for Scientific Research (NWO) for financial support through a "Vidi" grant. The paper has previously circulated with the title "Commonality in Returns, Liquidity, and Turnover around the World."

* Corresponding author.
E-mail address: gak56@cornell.edu (G. Andrew Karolyi).

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doi:10.1016/j.jfineco.2011.12.008

an asset pricing model in which a stock has a significantly lower average return if its liquidity moves inversely with market returns or market liquidity. Intuitively, investors are willing to pay more for stocks that allow them to exit positions at a reasonable cost during pervasive market declines or liquidity dry-ups. Overall, these findings suggest that a full assessment of how liquidity affects investors and asset prices requires an understanding of the co-movement—or so-called "commonality"—in liquidity among individual stocks.

Although extensive research has documented significant commonality in liquidity among stocks (Chordia, Roll, and Subrahmanyam, 2000; Hasbrouck and Seppi, 2001; Huberman and Halka, 2001), we know relatively little about the fundamental sources that drive it. Some empirical studies have found support for *supply-side* sources of commonality in liquidity related to the funding constraints of financial intermediaries (Coughenour and Saad, 2004; Hameed, Kang, and Viswanathan, 2010). Other work has explored *demand-side* sources driven by correlated trading activity (Chordia, Roll, and Subrahmanyam, 2000; Hasbrouck and Seppi, 2001), the level of institutional ownership (Kamara, Lou, and Sadka, 2008; Koch, Ruenzi, and Starks, 2009), and investor sentiment (Huberman and Halka, 2001). Almost all of the evidence of commonality in liquidity to date focuses on U.S. markets. Indeed, little is known about the level of commonality in liquidity in other countries and even less about what determines how it varies over time.[1]

In this paper, we furnish a better understanding of both supply-side and demand-side sources of commonality in liquidity by taking a global perspective. Our encompassing approach examines how and why the level of commonality in liquidity among stocks within a country differs across countries and varies over time by investigating monthly time-series measures of commonality in liquidity based on daily data for 27,447 individual stocks from 40 developed and emerging countries from January 1995 through December 2009. Our empirical strategy is to exploit the rich variation in institutional backgrounds and capital market experiences in these countries over an extended period of time to uncover the determinants of commonality. This global approach allows us to investigate not only which institutional characteristics help to attenuate a country's level of commonality in liquidity (a potential indicator of the financial fragility of its markets), but also whether the relative ability of supply- and demand-side sources to explain time-series variation in commonality in liquidity varies across countries in a meaningful way.

Our cross-country experimental setting is designed to evaluate a number of specific hypotheses related to supply- and demand-side explanations for commonality in liquidity. An intriguing *supply-side* explanation arises from recent theoretical models that investigate the role of funding constraints for liquidity provision. Brunnermeier and Pedersen (2009) and other models predict that large market declines or high volatility adversely affect the funding liquidity of financial intermediaries that act as liquidity suppliers on financial markets. As a consequence, these intermediaries reduce the provision of liquidity across many securities, which results in a decrease in market liquidity and an increase in commonality in liquidity. We also consider three potential *demand-side* explanations for commonality in liquidity. First, Kamara, Lou, and Sadka (2008) and Koch, Ruenzi, and Starks (2009) argue that the correlated trading behavior of institutional investors can give rise to commonality in liquidity. Second, commonality in liquidity can arise when demand for liquidity is correlated across stocks because investors have weak incentives to trade in individual securities. Prior studies (among others, Morck, Yeung, and Yu, 2000) link these incentives to the level of investor protection and transparency in a country. Third, various studies suggest that commonality in liquidity may in part be driven by investor sentiment. We discuss these hypotheses and how they relate to prior research in detail in the next section.

We propose four empirical tests to evaluate the predictions of these supply- and demand-side explanations for commonality in liquidity. The first is a cross-sectional test based on cross-country regressions of the average level of commonality in liquidity in each country on country characteristics that proxy for the importance of the supply- and demand-side channels. The second is a time-series test based on seemingly unrelated regression (SUR) models across countries to link our time-series measures of commonality in liquidity to proxies for time-variation in supply-side and demand-side factors in each country, while controlling for general variation in capital market conditions. The third and the fourth are also time-series tests based on similar SUR models, but they specifically evaluate the predictions of the supply- and demand-side explanations regarding differences in the time-variation of commonality within the cross-section of individual stocks and within the cross-section of countries, respectively.

For each stock in each month, we define its commonality in liquidity as the R^2 (Roll, 1988) of a regression of the stock's innovations in daily liquidity measured by the price impact proxy of Amihud (2002) on innovations in daily market liquidity (defined as the value-weighted average of the daily liquidity innovations of each stock within the country, excluding the stock of interest). For each country, we create a monthly time-series measure of commonality in liquidity as the equally weighted average of the R^2 in that month across the individual stocks in the country. We subject our analyses to a number of robustness tests to deal with concerns about data screens, sample selection, and potential endogeneity of the supply- and demand-side factors we investigate.

There are large differences in the average level of commonality in liquidity across the 40 countries in our

[1] To our knowledge, there are only four studies of commonality in liquidity in markets other than the U.S. See Brockman and Chung (2002) and Domowitz, Hansch, and Wang (2005) for evidence on commonality in liquidity in Hong Kong and Australia, respectively. Two recent cross-country studies are Qin (2006) and Brockman, Chung, and Pérignon (2009). None of these studies attempts to explain the sources of cross-country and time-series variation in commonality in liquidity.