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Commonality in liquidity in emerging markets: Another supply-side explanation

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Emerging markets share many distinct features that separate them from more developed markets, including low liquidity and high commonality in liquidity. This study on 18 emerging markets finds that individual stock liquidity is more affected by systematic volatility than by idiosyncratic volatility, suggesting that higher commonality in liquidity in emerging markets could be caused by higher co-variation in stock volatility and co-variation in inventory risk. Consistent with this conjecture, commonality in liquidity is found to be positively related to co-movement in volatility, and negatively related to the level of development of the financial markets. This study also documents that liquidity co-movement across emerging markets has a strong geographic component and is related to a correlation in market-wide volatility. The results do not support the presence of a global liquidity factor, and suggest that liquidity risk can be diversified by constructing global portfolios.

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1. Introduction

The liquidity of individual stocks co-moves with each other, a phenomenon called commonality in liquidity. Previous studies have shown that commonality is pervasive in many stock markets (Brockman & Chung, 2002; Chordia, Roll, & Subrahmanyam, 2000; Fabre & Frino, 2004; Hasbrouck & Seppi, 2001; Huberman & Halka, 2001), and is exceptionally strong in emerging Asian markets (Brockman, Chung, & Perignon, 2009; Bruno & Shin, 2013; Karolyi, Lee, & van Dijk, 2012; Vagias & van Dijk, 2012). Findings on commonality in liquidity have raised a new issue of whether shocks in liquidity constitute a source of non-diversifiable risk. This is important because even if liquidity affects the risk of an asset, it should not be a priced risk factor if it is idiosyncratic and can be diversified away at the portfolio level. Previous literature has provided both theoretical and empirical evidences on the pricing of liquidity risk (Acharya & Pedersen, 2005; Bekaert, Harvey, & Lundblad, 2007; Ho & Chang, 2015; Korajczyk & Sadka, 2008; Martınez, Nieto, Rubio, & Tapia, 2005; Pastor & Stambaugh, 2003; Sadka, 2006).

Following the extensive research on documenting commonality in liquidity, recent studies focus more on exploring the underlying reasons that drive this phenomenon. Some studies suggest supply-side sources of commonality in liquidity such as funding constraints of financial intermediaries (Coughenour & Saad, 2004; Hameed, Kang, & Viswanathan, 2010), while others provide evidence supporting demand-side sources such as correlated trading by investors (Chordia et al., 2000; Hasbrouck & Seppi, 2001; Karolyi et al., 2012; Koch, Ruenzi, & Starks, 2010) and investor sentiment (Huberman & Halka, 2001).

In this paper, we examine another supply-side source of commonality in liquidity, namely co-variation in inventory risk, which causes co-variation in liquidity provision. Liquidity is a complex concept. And it is affected by many factors. Liquidity providers,

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such as market makers, dealers, or pre-committed traders who submit limit orders face certain risks when they provide liquidity. These risks influence their bid–ask quotes, or the limit prices, and thus affect their provision of liquidity. Microstructure literature suggests two types of risks that liquidity providers face — inventory risk and adverse information risk (Glosten & Milgrom, 1985; Stoll, 1978). As most privileged information usually pertains only to a specific firm and few traders possess privileged information about broad market movements, asymmetric information should be less likely to cause co-variation in liquidity within the whole market (Chordia et al., 2000). Inventory risk, however, depends on volatility (Stoll, 1978), which can have a market component (Chordia et al., 2000) and is, therefore, more likely to co-move with each other.

Inventory risk is one of the most important determinant factors of liquidity. Liquidity providers buy from security sellers and sell to security buyers at a later time. Before they sell, they have to bear inventory risk of changes in security prices and require compensation by quoting a bid–ask spread (Stoll, 1978). The most important factor that affects inventory risk is the security's price uncertainty. If the price of a security is very volatile, the probability that the value of the security falls increases. Thus, liquidity providers are less willing to hold illiquid assets when they expect high volatility and, therefore, increase their bid–ask spread, or submit a more conservative limit order, which reduces the liquidity of the security. Copeland and Galai (1983) develop a model on the quoting decision of a profit-maximizing market maker, defining the profit as the difference between the gain from liquidity traders and the loss to informed traders. One important implication of their model is that increased uncertainty (volatility) widens the bid–ask spread and induces illiquidity, which is consistent with the empirical evidence.

Security prices fluctuate for firm-specific reasons, or for common macro-economic reasons. The latter is likely to cause the price volatility of securities to be correlated with each other, leading the co-movement in inventory risk and in liquidity provision. The first, and main, objective of this study is to examine this conjecture in the emerging market setting. In particular, we investigate whether it explains why liquidity co-moves more in emerging markets than in developed countries, a stylized fact documented in the previous literature. This hypothetical connection is inspired by Morck, Yeung, and Yu (2000), who show that R^2 from the market model is higher in emerging markets (which they label as high synchronicity in prices) than in developed markets. We take this one step further by investigating the several implications of this finding on liquidity and commonality. First, the high R^2 of the market model suggests that a large portion of the individual volatility comes from market-wide volatility. When the market is volatile, stocks with high R^2 also become more volatile, which increases expected inventory risk. Then, liquidity providers will increase the bid–ask spread and reduce the liquidity of the security. Second, high R^2 also indicates that the price of an asset reflects more of the market-wide information than of the firm-specific information. This could be due to the poor information environment of emerging markets, where not much firm-specific information is publicly available. Then, market makers, who are uninformed investors, have to form their expectation on the security and its inventory risk based on market-wide information. Third, as Morck et al. (2000) suggest, the high R^2 could be caused by the insufficient informed trading from arbitrageurs. Arbitrageurs not only help incorporate firm-specific information into asset prices and prevent security prices from deviating too far away from the assets' fundamental values, they also play an important role in transmitting liquidity among different markets. One effect of arbitrageurs' trading is to connect demands for liquidity in one market with offers of liquidity in another market. They demand liquidity in the market where it is most available and supply that liquidity in the market where traders demand it (Harris, 2003). Risk arbitrageurs accumulate information until the marginal cost of searching another unit of information exceeds their marginal return. When the transaction cost and information searching cost are high, which is common in most emerging markets, arbitrageurs are less willing to participate. The poor private property rights protection also discourages them from investing in these markets (Morck et al., 2000). The lack of participation from informed arbitrageurs could deter the diversification of liquidity shocks among markets and aggravate the intra-market liquidity co-variation. All these implications suggest an empirically testable hypothesis: Stocks with high R^2 from the market model, i.e., stocks whose variation in price is highly influenced by market uncertainty, or so-called stocks with high price synchronicity,[1] are likely to have high commonality in liquidity.

Our empirical tests show that in emerging markets individual liquidity is more affected by market uncertainty than by an individual security's idiosyncratic volatility. Consistent with our conjecture, stocks with higher price synchronicity exhibit higher commonality in liquidity. These results confirm that market volatility is one common factor that induces the co-variation of individual liquidity by affecting the inventory risk of stocks within the same market. This result is in contrast to what we find among stocks from the NYSE, where individual liquidity is more affected by idiosyncratic volatility than by market volatility. This finding reinforces the idea that co-variation in volatility and inventory risk could induce co-variation in liquidity. It also provides us with a plausible explanation for the empirical finding that commonality in liquidity is higher in emerging markets than in developed markets.

As inventory data are not available, many prior studies construct proxies for market maker inventories and their limited risk-bearing capacity. For example, Chordia et al. (2000) use trading volume as larger trading volume will help market makers to maintain their target inventory, reduce their inventory risk, which will reduce the bid–ask spreads and increase the liquidity provision of the stocks. They assert the inventory risk explanation for commonality in liquidity by documenting a negative relation between trading volume and their spread measures. Our approach of directly linking the liquidity measure with market, as well as idiosyncratic, volatility is complementary to their study. This paper broadens our understanding of the supply-side driven commonality in liquidity by studying it in an international emerging market setting.

Morck et al. (2000) attribute their empirical finding that R^2 is higher in emerging markets than in developed markets to the poor property rights protection in emerging markets, which deters risk arbitrage, causes more noise trading and, thus, generates more market-wide stock price variation. This explanation suggests a link between the country governance or market development and

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[1] Though our focus is not price co-movement, but another implication of R^2 – the extent to which price volatility is attributable to market volatility – we hereafter use the term “synchronicity” to indicate the high R^2 phenomenon. This allows consistency with the existing literature and facilitates the discussion.

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