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On the role of liquidity in emerging markets stock prices[☆]

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ABSTRACT

This paper investigates the impact of liquidity on emerging markets' stock prices. Particular attention is given to the estimation of Jensen's alpha and the quantity of risk. Our empirical analysis gives rise to two main issues. The first is related to the presence of an extra premium, i.e. "alpha puzzle". The second is the time-varying component of the quantity of risk, i.e. "beta puzzle". We find that local liquidity factors do not explain the presence of positive and statistically significant alphas. This puzzle is solved by means of transaction costs. In addition, we show that global liquidity factors, such as *VIX* and *Open Interest*, statistically affect the market price of risk. Our empirical finding proves the time varying nature of the global risk factors. Finally, we argue that standard asset pricing models cannot solve the two puzzles simultaneously.

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1. Introduction

It is largely accepted that differences in risk and return between developed and emerging stock markets are frequently huge. Emerging markets are characterized by volatile, but generous returns. The equity risk premium (ERP) provides an intuitive measure of the extent by which agents in an economy need to be compensated for the riskiness of the productive assets of that economy.[2] We claim that investing in emerging markets, which usually involves countries with less stable governments and economies, is still perceived to be extremely risky. Not surprisingly, emerging markets offer higher average excess returns than developed markets. To find the main causes of such asset pricing gap, we adopt an increasingly popular approach. It considers local and global movements in liquidity as determinant in stock prices.

Based on different liquidity measures, several studies have explored the effect of liquidity on asset pricing. Fujimoto (2003) argues that over the past two decades research on liquidity has been fundamental to measure its impact on asset prices. Amihud and Mendelson (1986), and Eleswarapu (1997) find a significant positive relationship between the bid-ask spreads and the stock returns. Eleswarapu and Reinganum (1993) find that the liquidity effect is restricted to the month of January. Based on Kyle's (1985) model, Brennan and Subrahmanyam (1996) estimate the price impact of a trade, and find that it is significantly positively related to average returns.[3]

The illiquidity–return relationship has also been studied extensively using different liquidity measures. For example, Chalmers and Kadlec (1998) use an amortized bid-ask spread. Brennan et al. (1998) use a daily dollar trading volume

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[2] Throughout the paper we use the terms equity risk premium, excess return, or stock price interchangeably.

[3] Easley et al. (2002) obtain a similar result.

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measure. Datar et al. (1998) provide an alternative test of Amihud and Mendelson's (1986) model using the turnover rate (i.e. number of shares traded as a fraction of the number of shares outstanding) as a proxy for liquidity. Their empirical results suggest that liquidity plays a significant role in explaining the cross-sectional variation in stock returns.

In addition to the level of liquidity, other aspects of liquidity are also found to influence expected returns, such as volatility and persistency of liquidity measures. Chordia et al. (2001b) find that the variability of dollar volume and share turnover has a significant negative effect on stock returns. Chan (2002) documents that stocks with greater persistence in illiquidity have higher average returns. Akbas et al. (2011) suggest that the positive correlation between the volatility of liquidity and expected returns is caused by investors' risk aversion. They claim that higher variation in liquidity implies that a stock may become illiquid with higher probability at a time when it is traded. If a stock's liquidity fluctuates within a wider range around its mean compared to similar stocks, an investor holding the stock may be exposed to a higher probability of low liquidity at the time he needs to sell the stock. Using monthly series of the turnover, dollar volume and volatility of liquidity, Chordia et al. (2001b) show a strong negative relation between the volatility of liquidity and expected returns. They argue that their finding is puzzling since risk averse investors should require a risk premium for holding stocks whose liquidity is volatile. Amihud et al. (2005) emphasizes the importance of volatility of liquidity and argue that risk averse investors should require compensation for bearing the risk associated with the time-variation of liquidity.

The financial literature also provides several empirical studies that aim to capture the impact of liquidity on stock prices.[4] Acharya and Pedersen (2005) propose that the persistence of liquidity forecasts market returns. Intuitively, if liquidity is persistent, higher illiquidity today predicts higher illiquidity next period and results in a higher required rate of return. The liquidity persistence also implies a negative contemporaneous return–illiquidity relationship. The authors claim that if there is a positive illiquidity shock today, investors will anticipate higher illiquidity in the following period and depress current prices in order to earn higher expected returns.

Amihud (2002) uses monthly and annual illiquidity-ratios and finds that expected market illiquidity positively affects ex-ante stock excess return over the period 1964–1997. Jones (2002) uses the proportional spread of Dow Jones stocks and the share turnover of NYSE stocks over the last century and finds that both spread and turnover predict annual excess market returns up to three years ahead. Baker and Stein (2002) obtain a similar result using annual aggregate NYSE turnover over the period 1932–1998.

The negative contemporaneous relation between the market's return and illiquidity is documented by Amihud (2002), Chordia et al. (2001b), and Pastor and Stambaugh (2003). Amihud and Mendelson (1990) suggest that the stock market crash of 1987 can be interpreted as a realization of expected illiquidity, which led to a change in investors' perception about future liquidity and contributed to the decline in stock prices. The positive correlation between volatility of liquidity measures and expected returns, as well as the negative correlation between liquidity and expected stock returns, suggest that risk averse investors require a premium for holding stocks with high variation in liquidity.

In this project, we first examine differences between developed and emerging markets' excess returns. Our empirical results show that such differences still take place. In contrast to a vast empirical literature on asset pricing, which mainly adopts data from the United States,[5] our analysis is based on a heterogeneous basket of countries. Following Bekaert et al. (2007), we try to observe the impact of liquidity on a number of markets where it ought to be particularly important.

Adopting standard linear asset pricing techniques we focus on the estimation of Jensen's alpha and the quantity of risk. Our empirical analysis gives rise to two main issues. The first is related to the presence of an extra premium, i.e. "alpha puzzle". The second is the time-varying component of the quantity of risk, i.e. "beta puzzle". Our findings contribute to the literature in the following ways.

Section 2, examines the performances of 13 developed and 19 emerging country stock indices, and 6 macro-equally-weighted portfolios. This procedure provides an up to date empirical view of the differences between developed and emerging average excess returns. In Sections 3 and 4, the "alpha puzzle" and its implications for model's validity are discussed. We generally find that local liquidity factors are not able to explain the presence of positive and statistically significant alphas. Section 5 presents a simple theoretical partial equilibrium model aimed at solving the puzzle. We prove that the puzzle can be solved by means of transaction costs. Section 6 shows that global liquidity factors, such as *VIX* and *Open Interest*, statistically affect the market price of risk. In addition, we argue that these puzzles cannot be solved simultaneously via standard asset pricing models. Section 7 concludes.

2. Data description and preliminary analysis

We use the Morgan Stanley Capital International (MSCI) Total Return Index for developed and emerging equity markets. All returns are monthly total returns denominated in US dollars.[6] We evaluate US$ returns in developed and

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[4] See Acharya and Pedersen (2005), Amihud (2002); Baker and Stein (2002), and Jones (2002), among others.

[5] Amihud and Mendenlson (1986), Brennan and Subrahmanyam (1996), Datar et al. (1998), Chordia, Roll and Subrahmanyam (2000) try to quantify the role of liquidity in US expected stock returns. Pastor and Stambaugh (2003) find that US expected stock returns are related cross-sectionally to the sensitivities of returns to fluctuations in aggregate liquidity.

[6] The MSCI Total Return Index measure the price performance of markets with the income from constituent dividend payments. The MSCI Daily Total Return (DTR) Methodology reinvests an index constituents dividends at the close of trading on the day the security is quoted ex-dividend (the ex-date).

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