DBJ Discussion Paper Series, No.1402

Asian Pennies Are Not like US Pennies

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June 2014

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This paper relates the issue of the large presence of penny stocks in Asia Pacific markets to market quality using daily and intraday data in 2007. Contrary to common views, we find that not all firms in the lowest price decile in each market are small firms lacking in liquidity. In some markets, notably China, Hong Kong, and Korea, we find that turnover is not monotonically decreasing in price. This finding is in contrast to evidence found in Australia, Japan, and US (NASDAQ), where stocks with lowest price denominations exhibit poor liquidity in all measures. Nevertheless, smaller price denominations results in larger spreads and price impact suggesting higher intraday volatility.

JEL Classification: G14

Keywords: Asia-Pacific Exchanges; Emerging Financial Markets; Liquidity ; Market microstructure

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This paper relates the issue of the large presence of penny stocks in Asia Pacific markets to market quality using daily and intraday data in 2007. Contrary to common views, we find that not all firms in the lowest price decile in each market are small firms lacking in liquidity. In some markets, notably China, Hong Kong, and Korea, we find that turnover is not monotonically decreasing in price. This finding is in contrast to evidence found in Australia, Japan, and US (NASDAQ), where stocks with lowest price denominations exhibit poor liquidity in all measures. Nevertheless, smaller price denominations results in larger spreads and price impact suggesting higher intraday volatility.

1. Introduction

The median stock price in Asia Pacific equity markets (except Korea and Japan) is below USD 5.0. Even in relatively advanced market in the region like Hong Kong and Singapore, the median stock price is under USD 1.0. By the standards of NASDAQ and NYSE any stock trading below this USD 5.0 benchmark is considered a penny stock. The preponderance of stocks with small price denominations in Asia Pacific equities provides interesting area of research as they have thus far receive little research interest given their lack of liquidity and their association with small speculative and poorly performing firms in US markets. Unlike in the US, the term penny stocks do not carry such pejorative connotations in Asian markets. In fact, the relatively low price denomination across the market could be associated with clientele preferred trading range. [1]

This study examines the relationship between stock price trading range and microstructure characteristics using daily and intraday data in 2007. The twelve markets in this study account for 90% of trading value in Asia Pacific and include Australia (Australian Securities Exchange, ASX), China (Shanghai Stock Exchange, SSE, and Shenzhen, SZX), Hong Kong, (Hong Kong Stock Exchange, HKSE), Indonesia (IDX), Japan (Tokyo Stock Exchange, TSE), Korea (Korea Stock Exchange, KRX), Malaysia (Bursa Malaysia,

[1] Amihud et al. (1999) and Pavabutr and Sirodom (2010) documents retail investors preference for small price denomination in Japan and in Thailand.

KLSE), New Zealand (New Zealand Exchange, NZX), Singapore (Singapore Exchange, SGX), Taiwan (Taiwan Stock Exchange, TSEC), and Thailand (Stock Exchange of Thailand, SET). For comparative purposes, we also include NASDAQ into the study.

Asia Pacific equity markets continue to experience continuous strong growth in trading value in recent years at a compounded annual rate of 33% between 2004 to 2007.[2] This growth rate has been achieved even though the exchanges in this region tended to develop independently of one another unlike the paths of consolidation chosen by the European markets under the Euronext (ENXT) and OMX Nordic. While it may be optimal to allow market structures to vary depending on the uniqueness of securities traded and on the clientele composition as O'Hara (2001) observes, it is quite clear that such spectacular growth rates in new listings and trading value is not equally shared in the markets of this region. Comerton-Forde and Ryde (2006) discuss the market microstructure designs of Asia Pacific exchanges and identify the challenges that the regional exchanges must address such as acknowledging different needs of its clientele and seek execution mechanisms to solve different trading problems. In this regard, we find that one interesting aspect that sets developed markets and emerging markets in our sample apart is the clientele compositions which are predominantly institutional in the developed group and largely retail in emerging markets. [3]

Such differences in clientele structure is bound to effect the interrelationship among trading variables within each market as small and large investors have heterogenous preferences about trading. Despite paying a relatively higher commission bracket, retail investors do have certain advantage over institutional traders as they can obtain priority at less cost in limit order trade and have lower implementation shortfall.[4]

As noted earlier, we observe that a number of these markets tend to have relatively low trading price range. Using a number of daily and intraday liquidity measures, we find that penny stocks in Asian markets, except Japan and Australia have higher liquidity than stocks in the top price deciles. For example, turnover velocity of stocks in the bottom decile on SSE, SZX, HKSE, and MYX is more than

[2] This number is based on statistics from World Federation of Exchanges.

[3] This is based on responses from our market surveys on clientele composition.

[4] This refers to the difference between the decision price and the final execution price for a trade. For institutional investors, the final execution price can be substantially above (below) the decision price to buy (sell) as they may have to walk up (down) the limit order book to acquire all the shares they want.

double the amount of turnover of stocks in the top decile. On KRX, this number is more than tripled and on SET, there is a U-shaped relationship between turnover and price deciles. Other measures liquidity such as proportion of zero returns, Liu (2006) adjusted turnover measure, as well as the number of trade frequency leads to similar conclusion that stocks in the bottom decile do not show traits of low liquidity in these markets.

We find a wide variation in quoted and effective spreads. This difference is expected to be a consequence of variations in brokerage commission rates as well as minimum price variation rule (tick size) imposed by each market. However, within each market, we find that below median price stocks exhibit higher bid-ask spreads and price impact and yet surprisingly some appear to have higher turnover levels. While bid-ask spreads and price impact are more often referred to as liquidity costs or part of execution cost of a trade, in the views of a day-trader, these frictions may instead represent the necessary margins for more profitable intra-daily round-trip trades.

The paper is organized as follows. Section 2 reviews literature on the significance of liquidity and transaction costs. Section 3 describes market backgrounds and data. Section 4 discusses the various liquidity measures used in this paper and summarizes the empirical results followed by a cross country comparison of liquidity of transaction costs in section 5. Finally section 6 concludes the paper.

2. The role of liquidity and transaction costs

Liquidity and transactions are related issues and are both important building blocks in ensuring market success. The higher the transaction costs, the more costly it is for investors to trade and hence the lower level of investor participation and trading. There are numerous aspects of liquidity. Ubiquitous measures like trading volume and turnover captures the trading quantity aspect. Alternatively, liquidity can be measured in terms of transaction costs, explicit (taxes, commissions, and settlement costs) and implicit costs such as bid-ask spreads (Amihud and Mendelson (1986)), and price reaction to trading volume (Amihud (2002)). Lesmond et al. (1999) and Liu (2006) propose new liquidity measures that captures multiple dimension of liquidity such as trading speed, quantity, and costs.

Cross-country studies indicate that interaction between transaction costs, liquidity, and volatility (Domowitz et al. (2000)) and that market design explains liquidity differences. Jain (2003) investigates 51 stock exchanges and find that spreads are lower and trading volume is higher when exchanges use

consolidated limit order book, automation, and market makers. In addition, relative tick size and order flow fragmentation adversely affect trading costs. Similarly, Swan et al. (2004) examine three models of trading design; hybrid markets with dealers, electronic limit order book markets and, hybrid markets with limit order book and designated dealers in less liquid stocks, in 38 major exchanges on their trading costs and volatility. Dealer markets are shown to attract highest trading activity but with highest volatility. Swan et al. (2004) also concurs with Comerton-Forde and Rydge (2006) that market consolidation should help reduce costs.

Other authors find that countries' institutional environments affects market liquidity. Lesmond (2005) uses a number of liquidity measures to show evidence that emerging markets with weak political and legal institutions tend to have higher liquidity costs. Hearn (2009) compares liquidity and trading costs of emerging African markets to two European markets, London and Paris and report considerable variation in trading costs within the African markets and with the two European markets. He notes that uncompetitive equity markets is a consequence of a strong bank-based and internal finance from family networks.

3. Market background and data description

3.1 Overview of Asia Pacific exchanges

Asia Pacific exchanges has experienced phenomenal growth between 2004-2007 with market capitalization and trading value growing at a compounded annual growth rate of 26% and 33% respectively. [5] Panel A of Table 1 breaks down client composition by exchange. The table shows that retail clients account for over 50% of trading value in some markets such as SSE, KRX, TSEC, and SET.

All exchanges in our sample are order-driven. Most exchanges use call auctions in pre-opening sessions followed by a continuous auction. Apart from China and Japan, which has more than one market location, all other exchanges have one concentrated trading platform. There are some fragmentation issues as some foreign investors' trading are separated from local investors on a separate trading board (SET) or different share class (SSE). Except for China's SSE that impose uniform decimalization on tick size for all listed shares, all other exchanges implement a multiple tick rule that is an increasing function of price.

[5] Authors' computation using data from World Federation of Exchanges.

3.2 Data description

The study utilizes daily and intraday data from Datastream and the Securities Industry Research of Asia-Pacific (SIRCA) as of 2007. NASDAQ daily data comes from CRSP files. There are twelve markets Asia Pacific markets in our sample plus US NASDAQ which is included as a control sample. The Asia Pacific markets include Australia (Australian Securities Exchange, ASX), China (Shanghai Stock Exchange, SSE, and Shenzhen, SZX), Hong Kong, (Hong Kong Stock Exchange, HKSE), Indonesia (IDX), Japan (Tokyo Stock Exchange, TSE), Korea (Korea Stock Exchange, KRX), Malaysia (Bursa Malaysia, KLSE), New Zealand (New Zealand Exchange, NZX), Singapore (Singapore Exchange, SGX), Taiwan (Taiwan Stock Exchange, TSEC), and Thailand (Stock Exchange of Thailand, SET).

For each market, we maintain all equity listings in the year 2007 and apply the screening rule suggested by Ince and Porter (2006) to discard recording errors by Datastream. Figure 1 plots the median price of stocks in the fifth deciles while Panel B of Table 2 reports median price for decile groups by market. As shown, the median stock price in the bottom decile are under USD 1.0 and the median stock price in the top decile for is below USD 10.0. This excludes TSE, KRX, and NASDAQ where the median price is above USD 1.0 for bottom decile and above USD 50.0 for top decile. Panel C of Table 2 reveal that it firms size tend to be increasing in price denomination. However, for some markets, the difference between the median firm size in the bottom and top deciles in are very stark. For instance, in ASX, the median size of bottom and top price decile firms is USD 9 million and USD 2,205 million, respectively. In SGX and SET, the median size of the top decile firm is less than three times the median size of those in the bottom decile. A cross-country comparison of firms in the lowest price deciles indicates that these firms are not necessarily small firms relative to market size. More specifically, the median firm size in most markets are close to that of NASDAQ and in some such as SSE and SZX are even larger than NASDAQ.

4. Liquidity measures

As there are many dimensions of liquidity, we group the liquidity measures into univariate measures and multivariate measures to be described as follows:

4.1 Univariate measures of liquidity

4.1.1 Turnover

Daily turnover data is obtained from datastream from the ratio between daily number of shares traded to total number of shares outstanding. The turnover is a common measure of trading quantity. A higher turnover points to a high proportion of shares changing hands each day.

4.1.2 Trade frequency

Trading frequency indicates time dimension in liquidity. The higher the amount of trade completed in each half hour is indicative of the speed of execution.

4.1.3 Bid-ask spreads

Spreads measure the price of immediacy that the trader must pay. The percentage quoted spread is computed from the average of the best standing bid-ask spreads every half an hour of continuous trading session as shown below,

$$\%BAS = \left(ASK - BID\right)/\left[\left(BID + ASK\right)/2\right] \quad (1)$$

We eliminate spreads during the pre-opening and pre-closing sessions. Since all exchanges in our sample are limit order markets, most transactions occur at either the best outstanding bid or ask and so the percentage quoted spread is the key measure of trading costs. Although block trading facilities exist in many of these markets, the amount is quite small and some block trading is executed off-hours.

Since some trades occur within the inside quote, the percentage effective spread, measures how much above or below the mid-point that traders must pay for immediacy is computed from,

%ESPR = |Transaction price - Mid-point price|/Mid-point price (2)

The mid-point price is defined as (bid+ask)/2.

4.2 Multidimensional measures of liquidity

Multidimensional measures of liquidity incorporates more than one measure of liquidity within a single measure.

4.2.1 Price impact

Price impact measures the price response to a trade. Low price impact implies that the trader can trade with little impact on price. The average daily price impact measure, ILLIQ is based on Amihud (2002) and defined by,

$$ILLIQ_i = \frac{1}{D_i}\sum_{t=1}^{D_i} |R_{id}| / TVAL_{id} \quad (3)$$

where, D_i is the number of trading days in the sample, R_i is stock *i* return, and $TVAL_i$ is trading value of stock *i* in millions of USD. *ILLIQ* measures how much a dollar's worth of trading value causes absolute price change. This measure is multiplied by 10^6 for better representation.

Another approach to capture the cost of trade is the use of intraday price impact from,

% Price impact = |VWAP - Closing price|/VWAP (4)

VWAP is the volume weighted average price of trading throughout the day.

4.3 Proportion of zero returns

Stocks with lower liquidity are bound to have more zero volume, or some volume, but no information revelation and thus zero return days. Bekaert et al. (2007) uses the proportion of zero returns as measurement of liquidity risk in emerging markets. We define the proportion of zero return days as

Zeros = Number of days with zero returns/Number of trading days in a month

4.4 LOT (1999) measure for liquidity

The Lesmond, Ogden, and Trzcinka (1999) or LOT measure is based on the premise that a security with high transaction costs will have less frequent price movement or more incidence of zero returns.

Starting with a common market model regression

$$R_{j,t} = \alpha_{ij} + \beta_j Rm_t + \varepsilon_{j,t}$$

where $R_{j,t}$ is the return on firm j and Rm_t is the market return. In a market devoid of transaction costs, only market wide information and firm specific information is reflected in stock price, and thus the investors desired return in absence of transaction costs should be $R^*_{j,t}$, which can be re-stated as,

$$R_{j,t} = R^*_{j,t} - \alpha_{ij}$$

Combining the liquidity costs and market model, the effect of liquidity on stock return can be stated as,

$$R^*_{j,t} = \beta_j Rm_t + \varepsilon_{j,t}$$

where

$R_{j,t} = R^*_{j,t} - \alpha_{ij}$ if $R^*_{j,t} < \alpha_{1,j}$ and $\alpha_{1,j} < 0$

$R_{j,t} = 0$ if $\alpha_{1,j} \le R^*_{j,t} \le \alpha_{2,j}$

$$R_{j,t} = R^*_{j,t} - \alpha_{ij} \quad \text{if} \quad R^*_{j,t} > \alpha_{2,j} \quad \text{and} \quad \alpha_{2,j} < 0$$

LOT describes $\alpha_{1,j}$ as the threshold for trades on negative information and $\alpha_{2,j}$ for positive information. Based on this model, a likelihood function containing three regions, one for negative returns, one for zeros, and one for positive returns.

$$\ln(\alpha_{1j}, \alpha_{2j}, \beta_j, \sigma_j \mid R_{jt}, R_{mt}) = \prod_1 \frac{1}{\sigma_j} \phi\left[\frac{R_{jt} + \alpha_{1j} - \beta_j \cdot R_{mt}}{\sigma_j}\right] \tag{5}$$

$$\times \prod_0 \frac{1}{\sigma_j}\left[\Phi_2\left(\frac{\alpha_{2j} - \beta_j \cdot R_{mt}}{\sigma_j}\right) - \Phi_1\left(\frac{\alpha_{2j} - \beta_j \cdot R_{mt}}{\sigma_j}\right)\right]$$

$$\times \prod_2 \frac{1}{\sigma_j} \phi\left[\frac{R_{jt} + \alpha_{2j} - \beta_j \cdot R_{mt}}{\sigma_j}\right]$$

where Φ is the standard normal distribution function. Once the parameters are solved, the difference between the intercept terms is an approximate measure of buying cost and selling cost.

$$LOT = \alpha_{2j} - \alpha_{1j} \tag{6}$$

4.2.2 Liu (2006) measure

The turnover measure can provide a mislead on liquidity as it cannot differentiate the liquidity of a stock that trades every other day and a stock that trades in the first half the month and not trade in the second half of the month. Liu (2006) suggests a measurement that combines various aspects of liquidity, ie. trading speed, trading quantity, and trading costs into a standardized turnover adjusted number of zero daily trading volumes over the prior *x* months, *LMx*, that is,

$$LMx = NZEROx + \left[\frac{1/TURNx}{Deflator}\right] \bullet \frac{21x}{NTD} \tag{7}$$

where *NZERO* is the number of zero trading daily volumes in prior 12 months, *TURNx* is the sum of daily turnover in the past *x* months *NTD* is the total number of trading days in the market over the previous *x* months. For each market, the deflator is chosen such that, $0 < \left((1/TURNx)/Deflator\right) < 1$ for all stocks in the sample. The first term of the equation measures the number of zero trading days over the previous 12 months adjusted by a turnover adjustment in the second term. The ratio $(21x/NTD)$ standardizes the number of trading days in each month to 21 so that the *LMx* measure is comparable across countries.

5. Cross country comparisons of liquidity and transaction costs

Tables 2a and 2b reports univariate measures of liquidity ie. turnover and trade frequency. The evidence reveals that in some Asian markets, notably, SSE, SZX, HKSE, and KRX stocks in the lowest price decile may exhibit higher liquidity than those in the market median price range or even top price decile. Stocks with lower price denominations, however, tend to have larger spreads and larger daily and intraday price impact (see Tables 3 and 4). These characteristics is likely to discourage institutional investors from investing, but encourage participation from smaller day traders as the spreads and large price impact provides necessary margins for profitable day trade.

In Tables 5a, 5b, and 5c other multidimensional measures of liquidity are reported. In Panel A of Table 5, we show the proportion of days with zero returns in a month. Here we find that proportion of days with zero return in the lowest and highest price deciles are not significantly different in SSE, SZX, NZX, and TSEC. Relating to this measure, the LOT (1999) measure, measures on average how much investors demand higher liquidity premium for informed trading in stocks on days with no information (zero returns) and days with information (non-zero returns) shows that in all markets except SSE and SZX that investors demand such premium from stocks in the lowest price deciles. In Panel C of Table 5, the Liu (2006), which is an adjusted measure of zero volume days shows that there is no significant difference between top price deciles and bottom price deciles in SSE, SZX, HKSE, SGX, and SET. Since, the Liu measure is considered a measure of adjusted turnover that can set apart stocks with consistently high turnover throughout all trading days and those with turnover clustering, the result indicates that despite the high turnover observed in the lowest price decile groups, particularly in SSE, SZX, and HKSE, there is tendency for liquidity to cluster at certain periods.

Next we run multivariate regressions to better understand the determinants of cross-sectional differences between spreads, turnover, and volatility and report the results in Table 6. The 2SLS method is used to account for endogeneity between alternative liquidity *L* measures and turnover. The set of regressions are described below.

$$L_i = a_0 + a_1 \cdot \%RTICK_i + a_1 \cdot STD_i + a_3 \cdot \ln TURN_i + a_4 \cdot S_i + \varepsilon_i \quad (8)$$

$$\ln TURN_i = b_0 + b_1 \cdot L_i + b_2 \cdot STD_i + b_3 \cdot \ln MV_i + b_4 \cdot S_i + \varepsilon_i \quad (9)$$

The endogeneity among the variables BAS, trading activities has been addressed in Harris (1994) and similar forms of estimation are used in Ahn et al. (2002). The residuals in each equation are derived from regressions of the dependent variables on the fitted values of endogenous variables and other variables. In equation (8), the percentage spread is determined by relative tick size since tick size forms the lower bound for spreads. The next variable, standard deviation measures idiosyncratic risk and the degree of asymmetric information is expected to move together with spread whereas turnover should have an inverse relationship as higher trading interest should close the bid-ask price difference. In equation (9) turnover is endogeneously determined by spread. At the same time return volatility and market capitalization are control variables for or firm size and trading activities.

The first set of regressions and second set of regressions in Table 6 separates emerging market and developed markets sample from each other as we expect each group may feature different clientele concentration which may impact relations between alternative liquidity and turnover differently. We model the relationship between bid-ask spread and turnover in Panel A and the relationship between ILLIQ and turnover in Panel B.

In Panel A, the 2SLS regressions indicates that spreads are positively related to return volatility and inversely related to turnover in all samples (emerging and developed. The notable differences between emerging and developed market is that stocks below market median price tends to have higher turnover controlling for tick size, volatility, and turnover. This is confirmed by the positive coefficients on the dummy variable S in the Panel A regression. We find a strong negative relationship between spread and turnover such that a 1% reduction in spreads leads to approximately 2% increase in turnover in emerging and 1% in developed markets. A 1% increase in volatility also enhances turnover levels 0.56% and 0.38% in emerging and developed markets respectively. In regressions using separate emerging and developed markets, stocks below market median price tend to have higher turnover. Furthermore, it

becomes most clear in the last combined sample excluding TSE that stocks below market median in emerging markets tend to have higher turnover velocity.

In Panel B, we find that the daily price impact too is positively associated with daily return volatility and negatively related with turnover. Once again, stocks below median market price in emerging market sample tend to have statistically higher turnover.

6. Conclusion

A large number of listings in Asia Pacific markets have low price denomination with the median stock price in many markets are below USD 5 and stocks in the lowest price decile are below USD 1. Existing literature based on US markets tend to generalize penny stocks as stocks that lack liquidity and visibility. In Asia Pacific, we find that this may not necessarily be the case. In our study of 12 Asia Pacific markets and NASDAQ, only on TSE and NASDAQ that we find that all measures of liquidity monotonically declining in price. In other markets, we find that this generalization may not hold as stocks with lowest price denominations have liquidity that are not significantly different than those in the median price and range and by some liquidity benchmarks have higher liquidity than in those in the top price decile. However, stocks with lower price denominations also exhibit traits of larger intraday volatility and clustering of liquidity at certain time periods. Future extension of our research can explore the implications of pennies on market quality and explore the cause of popularity of pennies in Asia.

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Figure 1: Median price of fifth decile stocks by exchange
This figure plots the median price of stocks in USD for by exchange. The end of year 2007 exchange rate is used.

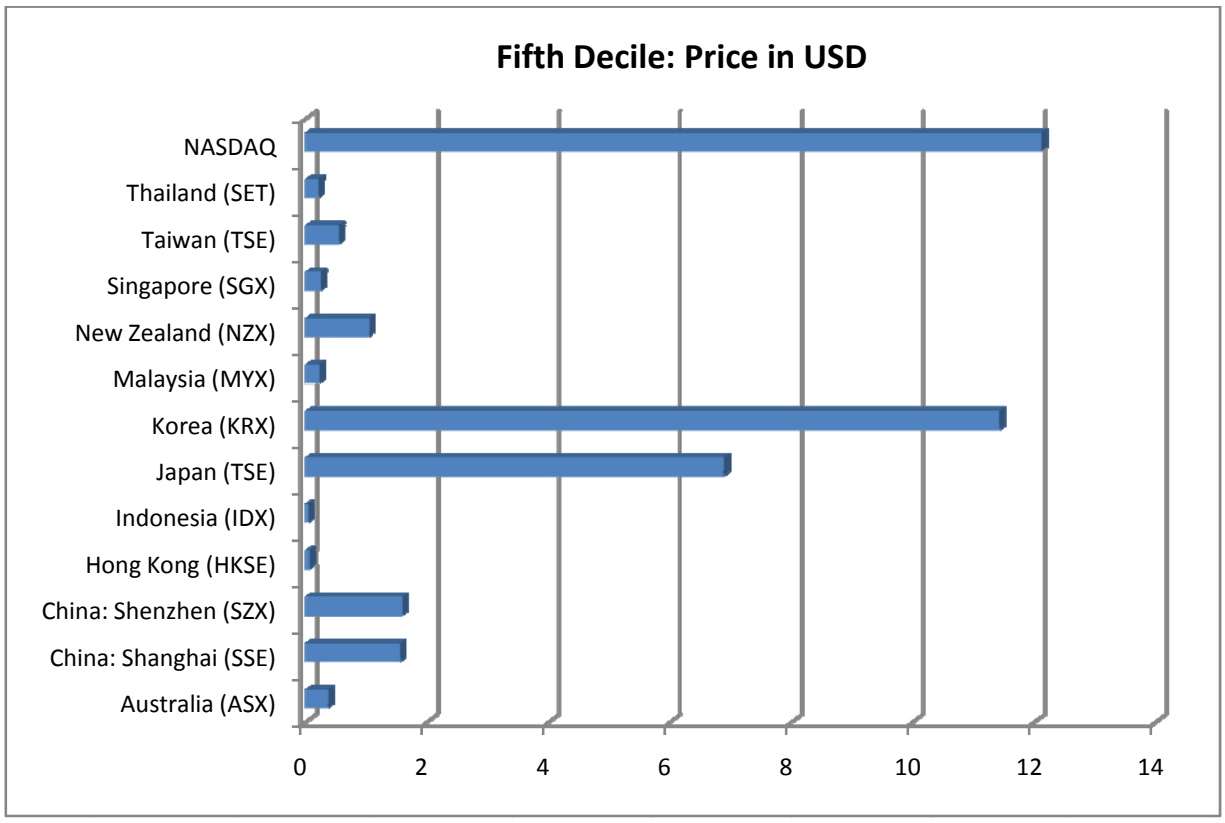


Figure 2: Market capitalization of stocks in lowest decile

This figure plots the market capitalization of stocks in the first decile in USD millions. End of year 2007 exchange rate is applied.

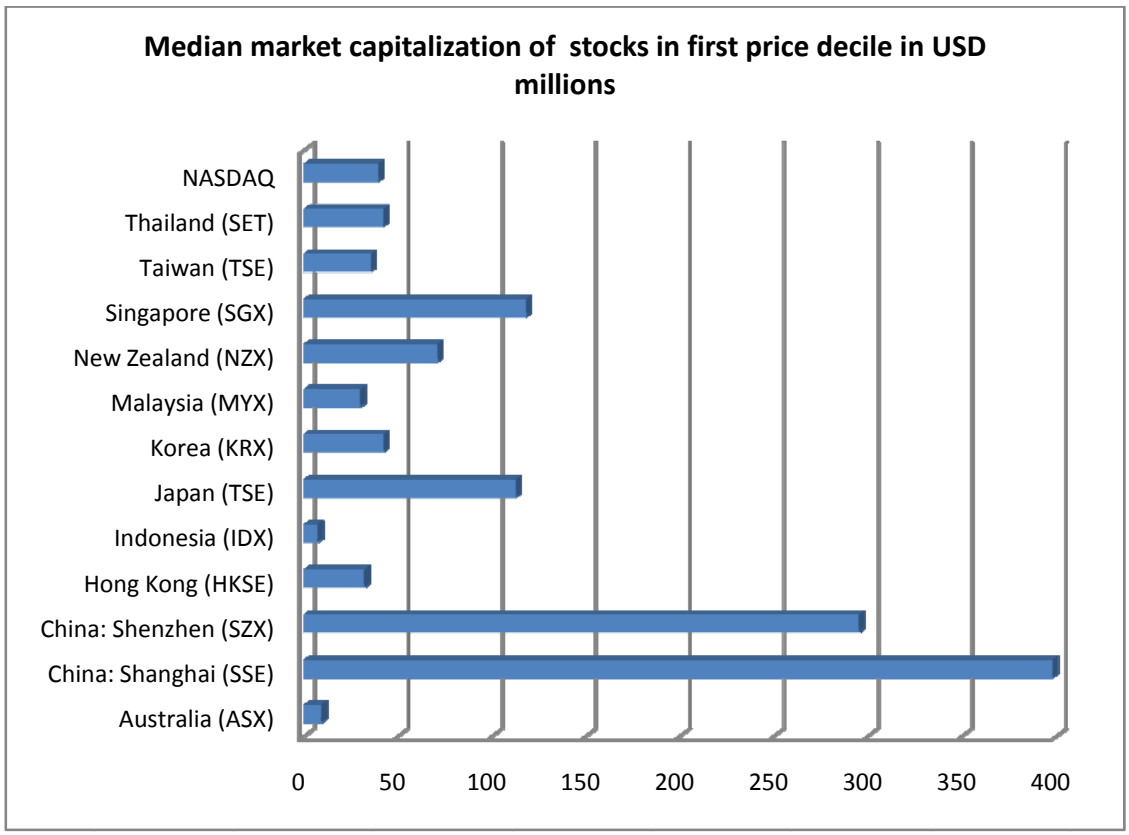
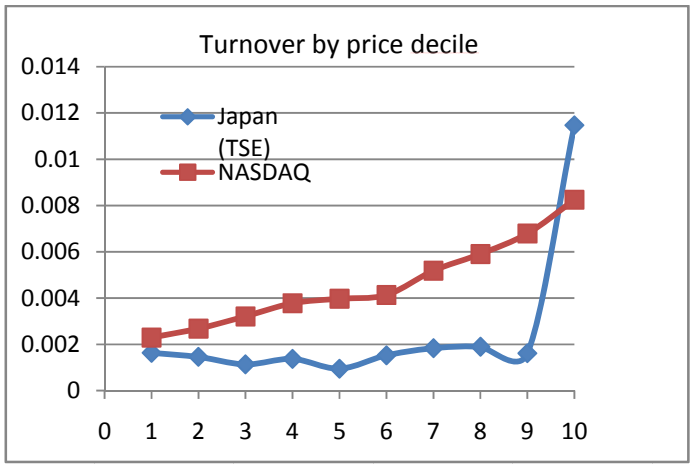
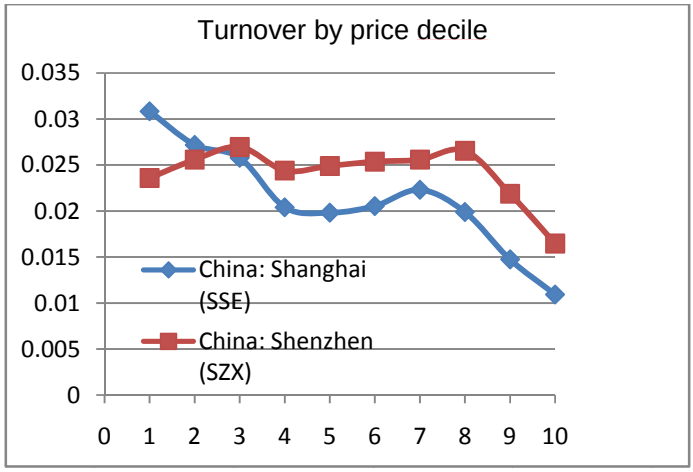


Figure 3: Turnover patterns by price deciles





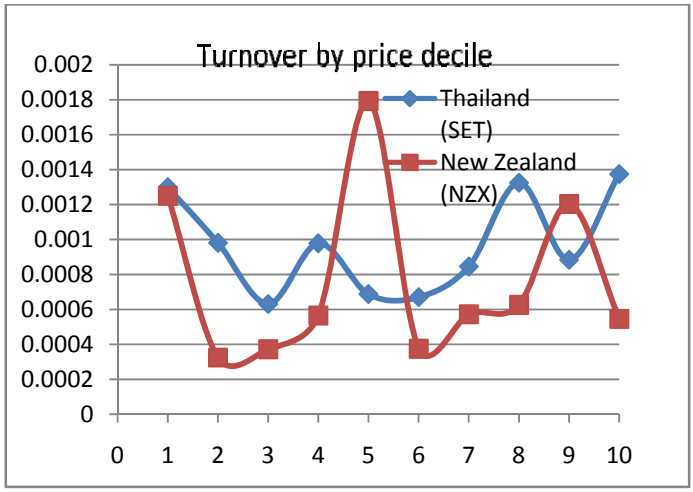


Table 1A: Retail client participation and sample price and size profile by market

This table reports the break down between institutional and retail cllient composition in each exchange. The data is provided directly from exchanges as of 2007. This table reports the price distributions and market capitalization of stocks in the sample in USD. The end of year exchange rate local currency/USD is applied in each market.

Panel A: Client break-down

Exchange	Institutions	Retail	Others
ASX	0.8	0.2	
HKSE	0.65	0.35	
TSE	0.74	0.15	0.11
NZX	na	na	na
SGX	0.57	0.43	
NASDAQ	na	na	na
SSE	0.46	0.54	
SZX	na	na	na
IDX	na	na	na
KRX	0.43	0.57	
MYX	0.63	0.36	
TSEC	0.33	0.67	
SET	0.47	0.53	

Panel B: Median price by decile

											Wilcoxon p-value for difference			
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5	No. of firms
Price (USD)														
Australia (ASX)	0.03	0.08	0.14	0.23	0.36	0.60	1.02	1.78	3.39	9.70	<0.0001	<0.0001	<0.0001	1,343
China: Shanghai (SSE)	0.86	1.03	1.17	1.37	1.56	1.79	2.11	2.56	3.40	5.44	<0.0001	<0.0001	<0.0001	758
China: Shenzhen (SZX)	0.82	1.00	1.15	1.34	1.59	1.85	2.15	2.57	3.51	5.39	<0.0001	<0.0001	<0.0001	526
Hong Kong (HKSE)	0.01	0.02	0.04	0.05	0.07	0.10	0.15	0.25	0.53	2.22	<0.0001	<0.0001	<0.0001	793
Indonesia (IDX)	0.01	0.01	0.02	0.03	0.04	0.06	0.09	0.13	0.26	0.91	<0.0001	<0.0001	<0.0001	304
Japan (TSE)	1.44	2.59	3.72	5.19	6.89	9.15	13.02	18.57	31.50	818.04	<0.0001	<0.0001	<0.0001	2,811
Korea (KRX)	1.33	3.05	4.92	7.41	11.44	16.73	24.79	38.05	59.96	137.33	<0.0001	<0.0001	<0.0001	687
Malaysia (MYX)	0.04	0.08	0.12	0.17	0.22	0.29	0.39	0.54	0.87	1.86	<0.0001	<0.0001	<0.0001	594
New Zealand (NZX)	0.04	0.21	0.53	0.78	1.04	1.54	2.03	2.92	4.22	6.76	<0.0001	<0.0001	<0.0001	106
Singapore (SGX)	0.05	0.09	0.13	0.18	0.24	0.33	0.47	0.77	1.44	3.14	<0.0001	<0.0001	<0.0001	443
Taiwan (TSE)	0.19	0.29	0.38	0.47	0.54	0.43	0.59	0.87	1.33	2.56	<0.0001	<0.0001	<0.0001	425
Thailand (SET)	0.03	0.06	0.10	0.14	0.21	0.30	0.49	0.79	1.42	3.45	<0.0001	<0.0001	<0.0001	661
NASDAQ	1.49	3.74	6.25	9.16	12.12	15.31	19.25	24.74	32.48	50.61	<0.0001	<0.0001	<0.0001	2,585

Panel C: Median market capitalization by price decile

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Market cap (USD mn)													
Australia (ASX)	9	15	17	27	39	67	138	241	434	2205	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	398	366	371	365	424	477	545	684	779	1195	<0.0001	<0.0001	0.0979
China: Shenzhen (SZX)	296	271	301	363	409	466	496	701	1071	2722	<0.0001	<0.0001	<0.0001
Hong Kong (HKSE)	32	35	40	44	49	71	95	179	386	2444	<0.0001	<0.0001	<0.0001
Indonesia (IDX)	7	11	34	32	36	62	172	193	494	2899	<0.0001	<0.0001	<0.0001
Japan (TSE)	113	152	238	321	354	328	489	565	1147	298	<0.0001	<0.0001	<0.0001
Korea (KRX)	42	64	55	101	104	146	198	281	620	1312	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	30	30	28	26	30	41	59	91	216	686	<0.0001	<0.0001	<0.0001
New Zealand (NZX)	71	76	63	34	42	25	63	67	107	28	0.21392	<0.0001	<0.0001
Singapore (SGX)	118	118	151	94	82	68	99	100	112	340	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	36	77	96	135	109	119	184	232	323	643	<0.0001	<0.0001	<0.0001
Thailand (SET)	42	66	71	83	45	55	36	67	94	77	<0.0001	<0.0001	<0.0001
NASDAQ	**40**	**83**	**134**	**180**	**239**	**301**	**385**	**565**	**780**	**1381**	<0.0001	<0.0001	<0.0001

Table 2: Turnover and trading frequency by price decile

This table plots the median turnover (trading value divided by total market capitalization) and trading frequency within each half hour by price decile.

Panel A: Turnover

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Turnover (%)													
Australia (ASX)	0.147	0.140	0.133	0.143	0.124	0.106	0.112	0.145	0.149	0.252	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	3.084	2.718	2.578	2.041	1.982	2.054	2.230	1.989	1.475	1.093	<0.0001	<0.0001	<0.0001
China: Shenzhen (SZX)	2.360	2.559	2.696	2.440	2.490	2.537	2.559	2.655	2.188	1.647	<0.0001	<0.0001	0.007
Hong Kong (HKSE)	0.224	0.259	0.216	0.237	0.228	0.235	0.189	0.174	0.154	0.149	0.091	<0.0001	<0.0001
Indonesia (IDX)	0.081	0.047	0.060	0.071	0.060	0.059	0.069	0.062	0.110	0.087	0.13106	<0.0001	<0.0001
Japan (TSE)	0.163	0.146	0.114	0.137	0.095	0.153	0.184	0.190	0.162	1.147	<0.0001	<0.0001	<0.0001
Korea (KRX)	0.998	0.674	0.347	0.440	0.497	0.482	0.361	0.418	0.382	0.290	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	0.191	0.158	0.109	0.089	0.078	0.080	0.096	0.096	0.077	0.086	<0.0001	0.14138	<0.0001
New Zealand (NZX)	0.125	0.032	0.037	0.057	0.179	0.038	0.057	0.063	0.120	0.055	0.21392	<0.0001	<0.0001
Singapore (SGX)	0.120	0.185	0.229	0.173	0.172	0.150	0.175	0.116	0.133	0.133	0.091305	<0.0001	<0.0001
Taiwan (TSE)	0.171	0.321	0.388	0.440	0.415	0.435	0.479	0.608	0.757	0.772	<0.0001	<0.0001	<0.0001
Thailand (SET)	0.130	0.098	0.063	0.098	0.069	0.067	0.085	0.133	0.088	0.137	<0.0001	<0.0001	<0.0001
NASDAQ	0.229	0.268	0.321	0.378	0.397	0.414	0.519	0.591	0.679	0.825	<0.0001	<0.0001	<0.0001

Panel B: Trading frequency in each half hour

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Trade frequency													
Australia (ASX)	2	2	2	2	3	3	5	9	17	68	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	660	533	494	435	457	474	476	456	399	292	<0.0001	<0.0001	<0.0001
China: Shenzhen (SZX)	171	163	160	163	155	158	159	165	170	147	<0.0001	<0.0001	<0.0001
Hong Kong (HKSE)	12	9	6	6	6	6	7	9	11	26	<0.0001	<0.0001	<0.0001
Indonesia (IDX)	6	5	7	6	6	6	7	7	15	21	<0.0001	<0.0001	<0.0001
Japan (TSE)	7	6	8	14	16	19	32	28	39	30	<0.0001	<0.0001	<0.0001
Korea (KRX)	29	24	19	22	23	29	23	41	76	75	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	4	4	4	3	4	4	4	5	4	5	<0.0001	<0.0001	0.003
New Zealand (NZX)	1	1	1	2	2	2	2	3	2	3	<0.0001	<0.0001	<0.0001
Singapore (SGX)	2	2	2	2	3	3	4	5	7	8	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	5	8	10	11	10	10	13	18	22	27	<0.0001	<0.0001	<0.0001
Thailand (SET)	5	5	4	4	5	3	4	5	3	8	<0.0001	<0.0001	<0.0001
NASDAQ	7	12	16	22	26	28	34	45	53	74	<0.0001	<0.0001	<0.0001

Table 3: Percentage spreads

This table reports the median quoted and effective spreads by price deciles.

Panel A: Percentage bid-ask spread

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Percentage bid-ask spread													
Australia (ASX)	5.13%	3.92%	3.75%	2.67%	2.20%	1.55%	0.89%	0.60%	0.40%	0.17%	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	0.20%	0.18%	0.17%	0.17%	0.16%	0.15%	0.14%	0.13%	0.13%	0.15%	<0.0001	<0.0001	<0.0001
China: Shenzhen (SZX)	0.21%	0.19%	0.18%	0.17%	0.16%	0.15%	0.14%	0.13%	0.12%	0.13%	<0.0001	<0.0001	<0.0001
Hong Kong (HKSE)	2.06%	1.95%	2.03%	1.99%	1.91%	1.76%	1.43%	0.94%	0.65%	0.28%	<0.0001	<0.0001	0.0092
Indonesia (IDX)	2.23%	2.17%	2.20%	2.11%	1.89%	1.80%	1.31%	1.06%	0.98%	0.69%	<0.0001	<0.0001	<0.0001
Japan (TSE)	0.83%	0.52%	0.42%	0.31%	0.28%	0.26%	0.19%	0.25%	0.29%	0.40%	<0.0001	<0.0001	<0.0001
Korea (KRX)	0.64%	0.51%	0.62%	0.49%	0.57%	0.50%	0.48%	0.35%	0.25%	0.35%	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	3.64%	2.25%	1.64%	1.32%	1.19%	1.03%	0.95%	0.71%	0.64%	0.81%	<0.0001	<0.0001	<0.0001
New Zealand (NZX)	5.68%	2.82%	1.68%	1.08%	0.74%	0.70%	0.56%	0.50%	0.46%	0.42%	<0.0001	<0.0001	<0.0001
Singapore (SGX)	8.61%	4.44%	3.08%	2.20%	1.62%	1.25%	0.86%	0.87%	0.62%	0.64%	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	0.63%	0.50%	0.47%	0.41%	0.37%	0.39%	0.34%	0.26%	0.21%	0.23%	<0.0001	<0.0001	<0.0001
Thailand (SET)	1.18%	0.79%	0.75%	0.56%	0.85%	0.77%	0.75%	0.74%	0.81%	0.81%	<0.0001	<0.0001	<0.0001
NASDAQ	2.94%	1.83%	1.33%	1.06%	0.90%	0.82%	0.67%	0.54%	0.43%	0.33%	<0.0001	<0.0001	<0.0001

Panel B: Percentage effective spread

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Percentage effective													
Australia (ASX)	2.15%	1.73%	1.66%	1.10%	0.82%	0.61%	0.35%	0.24%	0.16%	0.07%	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	0.12%	0.11%	0.10%	0.10%	0.09%	0.09%	0.09%	0.09%	0.08%	0.09%	<0.0001	<0.0001	<0.0001
China: Shenzhen (SZX)	0.12%	0.11%	0.10%	0.10%	0.09%	0.09%	0.08%	0.08%	0.08%	0.08%	<0.0001	<0.0001	<0.0001
Hong Kong (HKSE)	0.84%	0.76%	0.81%	0.88%	0.81%	0.77%	0.59%	0.37%	0.25%	0.11%	<0.0001	<0.0001	0.0006
Indonesia (IDX)	0.76%	0.53%	0.97%	0.85%	0.79%	0.81%	0.59%	0.44%	0.41%	0.28%	<0.0001	<0.0001	0.0482
Japan (TSE)	0.36%	0.20%	0.15%	0.11%	0.09%	0.08%	0.07%	0.11%	0.13%	0.16%	<0.0001	<0.0001	<0.0001
Korea (KRX)	0.32%	0.26%	0.27%	0.23%	0.26%	0.23%	0.21%	0.15%	0.12%	0.17%	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	1.75%	1.05%	0.73%	0.51%	0.40%	0.46%	0.41%	0.31%	0.28%	0.37%	<0.0001	<0.0001	<0.0001
New Zealand (NZX)	2.60%	1.37%	0.80%	0.52%	0.38%	0.34%	0.24%	0.22%	0.21%	0.18%	<0.0001	<0.0001	<0.0001
Singapore (SGX)	3.70%	1.94%	1.37%	0.97%	0.71%	0.53%	0.36%	0.37%	0.25%	0.28%	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	0.30%	0.25%	0.24%	0.21%	0.20%	0.20%	0.18%	0.14%	0.11%	0.13%	<0.0001	<0.0001	<0.0001
Thailand (SET)	0.55%	0.35%	0.34%	0.25%	0.39%	0.31%	0.35%	0.28%	0.34%	0.37%	<0.0001	<0.0001	<0.0001
NASDAQ	1.12%	0.58%	0.39%	0.30%	0.25%	0.22%	0.19%	0.16%	0.13%	0.10%	<0.0001	<0.0001	<0.0001

Table 4: Daily and intraday price impact measures

This table provides the median of daily and intraday price impact measures by price deciles.

Panel A: ILLIQ

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
ILLIQ													
Australia (ASX)	0.012	0.052	0.043	0.059	0.064	0.059	0.029	0.019	0.022	0.004	< 0.0001	< 0.0001	< 0.0001
China: Shanghai (SSE)	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	< 0.0001	< 0.0001	< 0.0001
China: Shenzhen (SZX)	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	< 0.0001	< 0.0001	< 0.0001
Hong Kong (HKSE)	0.102	0.131	0.154	0.130	0.106	0.070	0.060	0.032	0.017	0.003	< 0.0001	< 0.0001	< 0.0001
Indonesia (IDX)	1.501	1.816	0.279	0.265	0.181	0.090	0.039	0.039	0.010	0.004	< 0.0001	< 0.0001	< 0.0001
Japan (TSE)	0.034	0.022	0.021	0.014	0.016	0.011	0.009	0.007	0.004	0.001	< 0.0001	< 0.0001	< 0.0001
Korea (KRX)	0.026	0.032	0.044	0.027	0.023	0.015	0.020	0.008	0.004	0.003	< 0.0001	< 0.0001	0.3313
Malaysia (MYX)	0.050	0.091	0.131	0.230	0.231	0.175	0.109	0.058	0.037	0.008	< 0.0001	< 0.0001	< 0.0001
New Zealand (NZX)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	< 0.0001	< 0.0001	0.4311
Singapore (SGX)	0.034	0.015	0.013	0.021	0.021	0.058	0.025	0.030	0.021	0.011	< 0.0001	< 0.0001	0.0001
Taiwan (TSE)	0.179	0.050	0.025	0.018	0.020	0.017	0.009	0.006	0.004	0.002	< 0.0001	< 0.0001	< 0.0001
Thailand (SET)	0.074	0.041	0.062	0.047	0.062	0.065	0.062	0.033	0.029	0.029	< 0.0001	< 0.0001	0.7232
NASDAQ	0.215	0.072	0.031	0.018	0.012	0.009	0.006	0.003	0.002	0.001	<0.0001	<0.0001	<0.0001

Panel B % VWAP change

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Price impact													
Australia (ASX)	1.60%	1.30%	1.44%	1.25%	1.11%	0.86%	0.62%	0.54%	0.45%	0.37%	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	0.93%	1.01%	1.01%	1.01%	0.99%	0.97%	0.98%	0.99%	0.97%	0.95%	<0.0001	<0.0001	<0.0001
China: Shenzhen (SZX)	0.90%	0.96%	1.01%	0.99%	1.01%	1.00%	0.96%	0.97%	0.98%	0.97%	<0.0001	<0.0001	<0.0001
Hong Kong (HKSE)	1.46%	1.40%	1.31%	1.33%	1.24%	1.16%	0.98%	0.76%	0.60%	0.46%	<0.0001	<0.0001	<0.0001
Indonesia (IDX)	1.09%	0.99%	0.93%	1.07%	0.99%	0.96%	0.78%	0.68%	0.66%	0.54%	<0.0001	<0.0001	<0.0001
Japan (TSE)	0.64%	0.46%	0.42%	0.39%	0.37%	0.35%	0.34%	0.35%	0.39%	0.51%	<0.0001	<0.0001	<0.0001
Korea (KRX)	0.72%	0.71%	0.63%	0.65%	0.70%	0.69%	0.68%	0.64%	0.62%	0.59%	<0.0001	<0.0001	<0.0001
Malaysia (MYX)	1.79%	1.43%	1.16%	0.95%	0.83%	0.80%	0.72%	0.60%	0.48%	0.48%	<0.0001	<0.0001	<0.0001
New Zealand (NZX)	0.46%	0.27%	0.40%	0.34%	0.31%	0.27%	0.27%	0.24%	0.20%	0.20%	<0.0001	<0.0001	<0.0001
Singapore (SGX)	0.89%	1.01%	0.79%	0.80%	0.79%	0.74%	0.59%	0.53%	0.50%	0.45%	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	0.30%	0.35%	0.36%	0.35%	0.29%	0.29%	0.28%	0.27%	0.26%	0.26%	<0.0001	<0.0001	<0.0001
Thailand (SET)	0.62%	0.64%	0.52%	0.38%	0.49%	0.40%	0.38%	0.39%	0.36%	0.37%	<0.0001	<0.0001	<0.0001
NASDAQ	1.14%	0.84%	0.67%	0.60%	0.54%	0.52%	0.50%	0.49%	0.45%	0.41%	<0.0001	<0.0001	<0.0001

Table 5 Number of zero return and zero volume days

This table reports the median of zero returns and zero volume days. Panel A is the proportion of days with zero returns within a month. Panel B is the LOT (1999) measure of liquidity costs based on zero return, and non- zero return days, and Panel C is the Liu (2006) is a composite measure of turnover and number of days with zero volume.

Panel A: Proportion of zero returns

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Proportion of zero return													
Australia (ASX)	34.78%	30.44%	31.58%	30.00%	27.78%	27.78%	27.27%	25.00%	22.22%	25.00%	< 0.0001	0.0022	0.0001
China: Shanghai (SSE)	4.73%	6.24%	6.52%	6.37%	5.45%	5.66%	6.35%	5.27%	4.67%	4.73%	0.8995	0.6966	0.6247
China: Shenzhen (SZX)	9.52%	5.00%	9.09%	5.00%	5.00%	8.70%	5.00%	8.70%	5.00%	8.70%	0.2678	0.5061	0.0494
Hong Kong (HKSE)	27.78%	22.48%	22.73%	27.78%	27.78%	28.57%	27.27%	21.74%	16.67%	11.11%	< 0.0001	< 0.0001	0.7249
Indonesia (IDX)	45.46%	50.00%	45.00%	45.00%	63.64%	52.38%	47.62%	45.46%	36.36%	25.00%	< 0.0001	< 0.0001	< 0.0001
Japan (TSE)	19.05%	15.79%	14.29%	11.11%	10.53%	10.53%	9.52%	10.53%	11.11%	10.53%	< 0.0001	0.5507	< 0.0001
Korea (KRX)	14.29%	10.00%	22.22%	10.53%	14.29%	14.29%	13.64%	10.53%	10.00%	13.64%	< 0.0001	0.0219	0.0119
Malaysia (MYX)	62.77%	50.00%	45.00%	38.10%	35.83%	31.82%	28.57%	23.81%	25.00%	28.57%	< 0.0001	< 0.0001	< 0.0001
New Zealand (NZX)	60.87%	52.38%	52.51%	47.83%	51.19%	60.00%	51.09%	55.56%	54.55%	64.43%	0.8003	0.652	0.8069
Singapore (SGX)	31.82%	33.33%	27.78%	34.06%	36.60%	36.36%	33.33%	36.36%	30.00%	25.00%	< 0.0001	< 0.0001	0.0689
Taiwan (TSE)	13.64%	13.04%	9.52%	9.52%	13.04%	13.64%	14.29%	13.64%	10.00%	10.53%	0.3566	0.3217	0.5976
Thailand (SET)	38.10%	38.10%	40.91%	40.00%	43.65%	35.29%	40.00%	36.36%	35.00%	36.36%	0.2573	0.0026	0.0693
NASDAQ	8.70%	4.76%	4.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	<0.0001	<0.0001	<0.0001

Panel B LOT measure

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
LOT measure													
Australia (ASX)	0.2271	0.1826	0.1497	0.1304	0.1360	0.0735	0.0521	0.0442	0.0286	0.0185	<0.0001	<0.0001	<0.0001
China: Shanghai (SSE)	0.0282	0.0276	0.0300	0.0260	0.0257	0.0260	0.0247	0.0236	0.0226	0.0246	0.0600	0.7381	0.1023
China: Shenzhen (SZX)	0.0253	0.0205	0.0193	0.0213	0.0200	0.0197	0.0207	0.0252	0.0225	0.0252	0.3385	0.0354	0.0023
Hong Kong (HKSE)	0.1641	0.1609	0.1321	0.1133	0.0938	0.0845	0.0687	0.0440	0.0313	0.0187	<0.0001	<0.0001	<0.0001
Indonesia (IDX)	0.2002	0.2471	0.1557	0.1849	0.1462	0.1144	0.1317	0.1184	0.0547	0.0423	0.0002	0.0041	0.1218
Japan (TSE)	0.0442	0.0242	0.0197	0.0201	0.0190	0.0204	0.0198	0.0182	0.0205	0.0237	<0.0001	0.0007	<0.0001
Korea (KRX)	0.0350	0.0347	0.0257	0.0316	0.0348	0.0323	0.0316	0.0301	0.0264	0.0291	0.0005	0.0110	0.4847
Malaysia (MYX)	0.1563	0.0927	0.0710	0.0646	0.0501	0.0580	0.0341	0.0311	0.0309	0.0245	<0.0001	<0.0001	<0.0001
New Zealand (NZX)	0.4902	0.3739	0.0898	0.0339	0.0913	0.0371	0.0276	0.0186	0.0267	0.0093	0.0005	0.0021	0.0118
Singapore (SGX)	0.2041	0.1215	0.0744	0.0515	0.0538	0.0562	0.0507	0.0309	0.0246	0.0225	<0.0001	<0.0001	<0.0001
Taiwan (TSE)	0.0159	0.0157	0.0163	0.0151	0.0149	0.0151	0.0144	0.0146	0.0153	0.0144	0.0341	0.2613	0.2878
Thailand (SET)	0.0588	0.0506	0.0481	0.0544	0.0451	0.0378	0.0440	0.0346	0.0405	0.0332	0.0026	0.0720	0.1981
NASDAQ	0.0821	0.0515	0.0436	0.0365	0.0319	0.0281	0.0305	0.0250	0.0224	0.0241	<0.0001	0.0011	<0.0001

Panel C: Liu measure

											Wilcoxon p-value for difference		
Market	1	2	3	4	5	6	7	8	9	10	1 and 10	5 and 10	1 and 5
Liu measure													
Australia (ASX)	45.8	38.1	40.3	20.9	19.9	15.9	12.5	10.0	9.0	8.0	< 0.0001	< 0.0001	0.0013
China: Shanghai (SSE)	24.0	22.9	22.9	24.0	24.0	24.0	24.0	24.0	24.0	22.9	0.4474	0.8542	0.2943
China: Shenzhen (SZX)	24.0	26.0	24.0	24.0	26.0	24.0	25.0	26.0	26.0	25.0	0.118	0.5461	0.0179
Hong Kong (HKSE)	12.8	19.0	21.5	27.7	24.1	20.0	17.4	15.4	12.3	11.3	0.5135	< 0.0001	0.0163
Indonesia (IDX)	77.9	99.4	63.5	91.2	62.0	67.2	84.0	54.8	28.7	16.4	0.0189	0.0462	0.8616
Japan (TSE)	25.9	25.9	28.2	31.5	29.8	28.5	26.4	25.1	30.0	31.5	0.0076	0	0.0266
Korea (KRX)	15.4	15.4	21.5	15.4	15.4	15.4	15.4	15.4	15.4	15.4	< 0.0001	0.0009	0.0002
Malaysia (MYX)	13.2	14.2	14.8	17.3	16.8	17.8	14.2	15.2	14.3	14.2	0	0.3328	0.0009
New Zealand (NZX)	101.9	119.5	78.8	20.1	10.0	53.2	25.1	11.0	10.0	11.0	0.0577	0.5613	0.0235
Singapore (SGX)	12.6	14.1	11.1	13.1	15.6	16.1	14.1	15.1	14.6	12.1	0.8517	0.6729	0.7051
Taiwan (TSE)	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	0.0002	0.8991	0.0002
Thailand (SET)	18.0	17.5	18.5	17.5	36.0	17.0	19.5	21.6	17.0	18.5	0.7805	0.0308	0.0463
NASDAQ	0.0027	0.0017	0.0014	0.0012	0.0012	0.0013	0.0007	0.0007	0.0006	0.0005	<0.0001	<0.0001	<0.0001

Table 6: Two-stage least square regressions

The table represents estimates from 2SLS panel regressions using annual average variables. The dependent variables are percentage bid-ask spreads (BAS), natural log of turnover (lnTURN), and daily price impact (ILLIQ). Independent variables include relative tick size (RTICK), natural log of market capitalization in millions of USD (lnMV), dummy variable S take value of 1 if the stock monthly average price over the entire year is below median price in that market.

Panel A

Dependent var	Emerging only		Developed only	
BAS	Estimate	t stat	Estimate	t stat
RTICK	-0.03	-0.13	3.15	1.32
stdp	1.41	14.75***	1.24	7.77***
lnturn	-2.51	-23.8***	-7.73	-13.42***
S	1.28	7.48***	-1.56	-2.05***
Adj Rsq	0.168		0.061	
lnTURN	Estimate	t stat	Estimate	t stat
BAS	-1.85	-17.86***	-0.90	-11.99***
stdp	0.56	7.46***	0.38	6.99***
lnmv	0.00	-0.05	0.00	0.04
S	1.14	6.08***	0.25	1.04
Adj Rsq	0.131		0.056	

****, **, * denotes significance at 1%, 5%, and 10% respectively.*

Panel B

Dependent var	Emerging only		Developed only	
ILLIQ	Estimate	t stat	Estimate	t stat
RTICK	-0.003	-0.66	3.30	0.62
Std	0.040	19.13***	0.30	4.24***
lnturn	-0.053	-23.26***	-2.32	-4.78***
S	0.023	6.12***	-0.75	-2.81***
Adj Rsq	0.169		0.006	
lnTURN				
ILLIQ	-89.49	-15.93***	-47.15	-2.54**
std	1.44	14.13***	1.92	2.38**
lnmv	-0.01	-0.16	-0.06	-0.16
S	0.76	3.55***	-2.89	-1.38
Adj Rsq	0.106		0.0085	

****, **, * denotes significance at 1%, 5%, and 10% respectively.*