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ABSTRACT

This paper examines whether capital flows by foreign institutions improve liquidity in domestic markets. I find that stocks with increased foreign institutional ownership subsequently experience higher liquidity. However, it is difficult to interpret this evidence as a causal relation because institutions tend to self-select into more liquid stocks. To solve this problem, I exploit the 2003 US dividend tax cut as a natural experiment. The results from a 2SLS (IV) regression confirm that liquidity improved more in dividend-paying stocks located in US tax-treaty countries compared to similar stocks located in non-treaty countries. These patterns are consistent with the notion that institutions improve liquidity through a variety of channels including information competition and greater liquidity trading.

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ABSTRACT

This paper examines whether capital flows by foreign institutions improve liquidity in domestic markets. I find that stocks with increased foreign institutional ownership subsequently experience higher liquidity. However, it is difficult to interpret this evidence as a causal relation because institutions tend to self-select into more liquid stocks. To solve this problem, I exploit the 2003 US dividend tax cut as a natural experiment. The results from a 2SLS (IV) regression confirm that liquidity improved more in dividend-paying stocks located in US tax-treaty countries compared to similar stocks located in non-treaty countries. These patterns are consistent with the notion that institutions improve liquidity through a variety of channels including information competition and greater liquidity trading.

1. Introduction

Do foreign capital flows impact domestic stock liquidity? This is an important question in light of the recent policy debate on the destabilizing effects of foreign investors.[1] Foreign capital flows originate predominantly from financial institutions whose trading behavior could hamper liquidity by overwhelming market maker inventories.[2] On the other hand, there are plausible reasons to believe that foreign institutions may improve liquidity. For example, they may increase uninformed order flow ('noise' trading), lower information asymmetries or use algorithmic trading systems that are optimized to mitigate market impact (Hendershott, Jones, and Menkveld (2010)). Despite the vital importance of this issue, there is little comprehensive evidence on the relationship between foreign institutions and domestic stock liquidity.[3]

In this paper, I find that international capital flows from foreign financial institutions improves liquidity in domestic markets. While it is straightforward to establish a correlation between foreign institutions and liquidity, it is challenging to show a causal relation because institutions may prefer to hold more liquid stocks.[4] For researchers, this creates an identification problem. Prior domestic (US-based) studies on the impact of institutions on stock liquidity (Agarwal (2007), Liu (2008)) rely on cross-sectional variation in institutional participation or Granger causality tests for identification. The temporal nature of these tests alleviates some of the concern that institutions self-select into more liquid stocks but leaves

[1] The World Bank ("World Bank says Asia may need capital controls", Bloomberg News, Nov. 8, 2010) and the IMF (2010) have advised international regulators to utilize capital controls to curb speculative 'hot money' inflows. Brazil, China, Hong Kong, Taiwan and Thailand recently implemented policies targeted at regulating foreign capital flows ("Hot money may overheat emerging markets," USA Today, Nov. 18, 2010). Financial regulators of developed exchanges, notably Jean-Claude Trichet, ex-governor of the Banque de France, have previously expressed similar concerns (Trichet (2001)).

[2] Institutions tend to execute larger orders (Kraus and Stoll (1972), herd into stocks and industries (Lakonishok et al (1992), Sias (1997), Grinblatt, Titman, and Wermers (1995), Wermers (1999), Choi and Sias (2010)), and destabilize prices (Dasgupta, Prat and Verardo (2010)). Cross-border portfolio flows are also known to display trend-chasing behavior (Griffin, Nardari and Stulz (2004) and Froot and Ramadorai (2008)).

[3] Prior research on financial globalization and liquidity has either concentrated on country-level liquidity (Bekaert and Harvey (2002)) or has focused in a particular country (Rhee and Wang (2009)).

[4] Institutions seek to minimize trading costs and the price impact of their trades. Gompers and Metrick (2001) find that institutions exhibit a preference for liquidity.

open the lingering possibility of an omitted variable that determines both current institutional ownership and future stock liquidity. For example, institutions have an incentive to search for stocks with high liquidity in the future when they need to exit their position. If such omitted variables exist, the endogeneity problem remains unresolved.

To disentangle the direction of causation between institutions and liquidity, I use an instrumental variables (IV) approach that exploits a provision in the 2003 United States dividend tax cut. Specifically, this provision extends the US dividend tax cut (15%) internationally but only to a subset of dividends from companies located in certain foreign countries. This incentivized a reallocation of US institutional capital towards dividend-paying stocks domiciled in tax-treaty countries but not towards stocks in non-tax treaty countries (Desai and Dharmapala (2010)). Using this quasi-natural experiment in a 2SLS (IV) framework, I find that liquidity improved more in dividend-paying stocks of treaty countries compared to non-treaty countries, suggesting that the relationship between foreign institutions and stock liquidity is causal.

My empirical approach uses an 8 year panel (2000 to 2007) of foreign institutional stock holdings from the Factset/Lionshares database to examine liquidity across 20 developed and 20 emerging countries.[5] The comprehensive nature of this database at the stock level affords more powerful tests because it captures within country variation in both foreign institutional ownership and liquidity. Using both cross-sectional and time-series empirical frameworks, I show that stocks with increased share ownership by foreign institutions subsequently experience higher liquidity, as measured using Amihud's (2002) price impact measure (ILLIQ).[6]

[5] The data are collected from country regulatory filings or directly from the exchange. The holdings in this database represent nearly 40% of the world stock market capitalization (Ferreira and Matos (2008) and Ferreira, Matos and Pereira (2009)).
[6] ILLIQ is a popular and relatively accurate measure of the price impact component of liquidity when estimated over longer time horizons (Goyenko, Holden and Trzcinka (2009)). I find similar results using the following measures: LOT transactions

The effect is incremental to the presence of domestic institutions and exists in both developed and emerging markets. Under various econometric specifications, a one standard deviation increase in foreign institutional ownership decreases price impact by 4% (7%) of a standard deviation in developed (emerging) markets.

Next, while there are numerous ways through which foreign institutions may affect liquidity, I concentrate on examining two direct liquidity channels. First, if foreign institutions are informed,[7] their entry into new markets may increase the competition over trading profits with existing informed traders. In Kyle (1985), informed agents optimally withhold information which can result in lower levels of liquidity. The arrival of new informed agents can spur a 'competition' equilibrium where information is more quickly impounded into prices leading to better informational efficiency and higher liquidity (Subrahmanyam (1991a), Foster and Viswanathan (1996)).[8] Second, foreign institutions may increase the amount of liquidity trading by acting as either classical 'noise' traders who trade for portfolio rebalancing and risk-sharing reasons. This can increase liquidity by lowering inventory costs to market makers. For example, country index and ETF funds may increase uninformed order flow towards underlying securities (Hegde and McDermott (2004), Richie and Madura (2007)).[9]

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cost measure in Lesmond, Ogden, Trzcinka (1999), percentage of zero trading days in Bekaert, Harvey and Lundblad (2007), and the high-low price spread measure created in Corwin and Schultz (2010).

[7] Financial institutions are generally regarded as informed/sophisticated traders. But the question of whether foreign investors have informational advantages remains an open debate. Grinblatt and Keloharju (2000), Seasholes (2004), Froot and Ramadorai (2008) find that foreign investor appear to be informed on their trades. Choe, Kho, Stulz (2005), Kang and Stulz (1997), and Hau (2001) find evidence in Korea, Japan and Germany that foreign investors tend to lose out on their trades. In a study of the data used in this paper, foreign-based money managers are found to outperform local-based money managers (Ferreira, Matos and Pereira (2009)).

[8] Foreign institutions may also appear informed by engaging in more sophisticated liquidity provision strategies. Mutual funds have been shown to capture liquidity premiums by providing liquidity to impatient traders (Da, Gao, Jagannathan (2010), Zhang (2010)).

[9] Yuan (2005) shows that benchmark securities improve liquidity in underlying assets because it encourages investors to acquire both security specific and systematic-factor information. In both Subrahmanyam (1991b) and Gorton and Pennachi (1993), this prediction can exist depending on the design of the security basket.

To search for evidence of these two liquidity channels, I focus solely on the sub-sample of foreign mutual funds to potentially distinguish between informed and uninformed traders. Active foreign mutual funds in this sample are shown to outperform their local counterparts (Ferreira, Matos and Pereira (2009)). Hence, it is plausible that active foreign mutual funds may be informed. On the other hand, passive index funds and ETFs trade a basket of stocks with fixed predetermined holding weights. While flows into index and ETF funds may contain country or macroeconomic information, the passive nature of these funds suggests that their individual stocks trades are likely to be uninformed. I conjecture that active foreign mutual funds are likely to improve liquidity through the competition channel while passive index funds and ETFs are likely to improve liquidity through the liquidity trading channel.

The differences in trading environments across countries allows for a sharp test of the presence of these two liquidity channels. I hypothesize that the competition liquidity channel is likely to have a larger impact in trading environments with a greater prevalence of informed trading. On the other hand, there are no strong reasons to believe that the impact of the liquidity trading channel should vary across different informed trading environments. To test for this hypothesis, I separate countries based on popular ex-ante measures of informed trading (insider trading,[10] PIN[11]) and estimate the impact of active and passive foreign mutual funds on liquidity across the different trading environments. I find that the liquidity improvement contributed by active mutual funds primarily occurs in trading environments with greater levels of informed trading. Liquidity improvements contributed by passive institutions tend to occur consistently across trading environments. The first effect provides suggestive evidence

[10] Insider trading is measured using the prevalence of insider trading measure reported from executive surveys collected by the World Economic Forum (Global Competitiveness Report). Griffin, Kelly and Hirschey (2010) find that the prevalence of insider trading can partially explain the reaction to news announcements.

[11] PIN is measured as the average probability of informed trading (Easley, Hvidkjaer, and O'Hara (2002)) across all stocks in a country (Lai, Ng and Zhang (2008)).

of the competition liquidity channel while the second effect is consistent with the idea of a liquidity trading channel.

This study makes several contributions to the growing literature on the impact of financial integration[12]. First, I provide fresh evidence of a causal effect of foreign institutions on domestic stock liquidity. Highlighting this facet of international capital flows may be useful for regulators and international policymakers. Second, unlike previous studies that focus on the market liberalization period, this study shows that the benefits of foreign investors can continue to accrue post-liberalization. Third, I show that liquidity improves not only in emerging markets but that developed markets can also benefit from foreign institutional capital flow.

The paper develops as follows. Section 2 describes the sample and data sources. Section 3 presents the main results of the relationship between foreign institutions and stock liquidity. It also provides robustness tests. Section 4 addresses endogeneity concerns. Section 5 searches for evidence of direct channels through whichh foreign institutions improve liquidity. Section 6 concludes with a discussion of the broader implications of results.

2. Data Description and Summary Statistics

2.1 *Sample Construction*

The initial sample consists of all publically traded companies with available daily volume and returns data from Datastream. The data are then filtered for outliers, data errors and misclassification following the methodology of Griffin, Kelly, Nardari (2010).[13] This sample is combined with annual accounting data from the Worldscope database. From the Lionshares

[12] Bekaert, Harvey and Lundblad (2005, 2009) and Henry (2000a) find improvements in economic growth, investment opportunities and productivity from market integration. Stulz (1999), Henry (2000b), Errunza and Miller (2000) and Bekaert and Harvey (2000) find a decrease in the cost of capital after market liberalization.

[13] The database has been kindly provided by the authors.

database (details below), I extract annual institutional holdings of ordinary equity stock and direct cross listings. I restrict the sample to those countries that have continuous reporting of stock returns and have a sizable amount of foreign institutional ownership (more than half a billion US$). Since this study focuses on local stock liquidity, I omit cross listings, American depository receipts (ADRs) and Global depository receipts (GDRs) but keep the underlying security in the home country. The final sample is an 8 year panel (2000-2007) with 111,208 firm-years and 27,918 total firms across 40 countries. The list of these countries is reported in Table 1.

The FactSet / Lionshares database compiles global institutional ownership data from national regulatory agencies, stock exchange announcements, local and offshore mutual funds, mutual fund industry directories and company proxies and annual reports. To date, the Lionshares database is the most comprehensive source of international institutional ownership. For example, for U.S. institutions, Lionshares gathers holdings information from 13F filings.[14] Ferreira and Matos (2007) provide a comprehensive analysis of this database. I perform a similar analysis by comparing the Lionshares database to official statistics reported by the IMF. The results of this analysis are in the appendix.[15]

While the database provides ample coverage of foreign institutions, it provides weaker coverage of domestic institutions especially in emerging countries. This is due to the fact that developed nations have more diligent reporting requirements for financial institutions and are primary source of foreign equity investment. Emerging countries typically have less diligent reporting requirements for their financial institutions. For the purposes of this study, I

[14] All institutions with more than $100 million in equities must report their holdings to the SEC each quarter.
[15] The appendix is available upon request.

primarily focus on foreign institutions but I also run analysis on a subset of countries with sufficient domestic institutional coverage.

2.2 *Variable Definitions*

The research on institutional ownership in the United States provides useful guidelines for the construction of ownership variables in this study. First, an institution is deemed foreign if its country of origin is different from the country where the security is listed. Next, foreign institutional ownership is measured as the percentage of shares outstanding reported in December at the end of the year (*% Foreign IO*). If the institution does not report in December, I follow prior literature and use the latest reporting record during that calendar year.

Market capitalization and stock return data are calculated from the Datastream database. Market capitalization (*Market Cap*) is equal to the natural log of the number of shares outstanding multiplied by the share price converted to US$ at the end of the year. The stock return (*Return*) is total annual stock return including dividend payments over the course of the year. The market-to-book ratio (*Market-to-Book*) is defined as market capitalization to book equity ratio at the end of the year. The % of insider ownership (*% Inside Own*) is defined as the number of shares held by corporate insiders divided by total number of shares outstanding at the end of the year. The number of stock analysts (*# of Analysts*), obtained from the I/B/E/S database, is the total number of analysts covering the stock during the year. A dummy (*MSCI Index*) is created for stocks that included in the MSCI All World index at the beginning of 2008. A dummy (*Parent dummy*) is created for companies with ADRs as identified in the Lionshares database.

2.3 *Liquidity Measures*

Liquidity is a complex notion that is difficult to capture with a single empirical proxy. My main measure of liquidity is the price impact measure, ILLIQ, developed in Amihud (2002). The ILLIQ measure is constructed by averaging a daily measure of price impact over the course of the year. For each day a stock trades, the daily measure is calculated by dividing the absolute change in the daily stock price by the total dollar volume during the day (denominated in US$ millions), $\frac{|R_t^i|}{\$VOL_t^i}$. Then for each stock, the measure is averaged over the year, ILLIQ = $\frac{1}{250}\sum_{t=1}^{250}\frac{|R_t^i|}{\$VOL_t^i}$. The annual time frame ensures that the measure is not driven by price pressure induced liquidity and minimizes the effect of outliers and data errors. Following Amihud (2002), I take the logarithmic transformation of the variable and trim the 1% extremes of the sample to eliminate outliers. A 'deep' market, where large trading volumes do not move prices, has lower ILLIQ values while shallow, less-liquid market have higher ILLIQ values. The mean ILLIQ measure for a stock in a given year for the sample period is -3.726 (inverse log transformation = 0.024). This suggests that $1 million US dollars of trading volume would move the stock 2.4%.

The ILLIQ measure is an attractive measure of liquidity as it can be interpreted as the empirical analog of the Kyle lambda parameter. This makes analysis straightforward when interpreting empirical results in relation to theoretical predictions. Furthermore, the ILLIQ measure has been shown to effectively capture price impact over monthly and annual time horizons (Goyenko, Holden, and Trzcinka (2009)). A key drawback of the ILLIQ measure is the requirement of volume data which suffers from inconsistent coverage in international markets, particularly in emerging countries. To resolve this difficulty, I supplement the analysis with additional liquidity measures that require only a time-series of daily price data. Daily price data tends to be more accurate and reliably reported in the Datastream database. Lesmond,

Ogden, Trzinkca (1999) and Bekaert, Harvey and Lundblad (2007) estimate liquidity measures based on the incidence of observed zero daily returns. Bekaert, Harvey and Lundblad (2007) emphasize that this measure is especially practical in emerging countries due to the relatively poor quality of transactions data. These return-based estimates rely on the idea that the value of the information signal must exceed transaction costs for market participants to execute a trade.[16] Hence, these measures are better geared at measuring transaction cost component of liquidity, although the correlations with the ILLIQ in this sample are still fairly high (0.68 for Zeros, 0.43 for LOT).

The Zeros measure proposed in Bekaert, Harvey and Lundblad (2007) is the ratio of the number of days with a zero return divided by the total number of stock trading days $\frac{\sum \#\text{ of 0 return days}}{\sum \#\text{ of total trading days}}$ during the calendar year. A similar measure proposed in Lesmond, Ogden, Trzinkca (1999), known as the LOT trading cost measure is calculated using maximum likelihood estimation described in Griffin, Kelly, and Nadari (2010). To ensure that the MLE procedure has enough observations for accurate estimation, the annual LOT estimate for a stock is kept only if the stock price moves on more than 30% of the trading days.

I also use a recent measure of bid-ask spread developed in Corwin and Schultz (2010). They find that the daily high and low stock price ratio can be decomposed into the daily variance and bid-ask spread while the high-low price ratio measured over two days contains twice the variance but maintains a constant bid-ask spread component. If bid-ask spreads remain constant across two subsequent days, an estimate for the bid-ask spread can be calculated by comparing the two-day high-low price with the single-day high-low price. This measure does not require volume data, but does require daily high and low stock prices which

[16] These two measures are quite similar and differ mainly in their estimation procedure. Lesmond et al (1999) uses maximum likelihood estimation while Bekeart et al (2007) use a proportion of zero trading days.

are available on Datastream. The measure is estimated using the methodology in Corwin and Schultz (2010).

2.4 *Summary Statistics*

Table 1 displays the descriptive ownership statistics for the 40 countries in this sample at the year- end 2007. There is a wide dispersion in foreign institutional ownership across countries. This reflects the actual differences in foreign institutional holdings but also potential weaknesses in data coverage. Second, the database has large differences in domestic institutional coverage. For example, Iceland, Indonesia, Israel, Lithuania, and Sri Lanka report zero domestic institutional coverage. For more details about the coverage of the database, see the appendix.

Table 2 presents a summary of stock characteristics for each country. Panel A presents developed countries and panel B presents emerging countries. The values represent the means of the respective variable at the year-end 2007. Stocks from developed countries are larger, have higher analyst following and exhibit higher liquidity.

Table 3 reports the Pearson correlation between the variables used in this paper over the full sample. The table shows a high correlation between size (market capitalization) and the key variables of interest, including % foreign ownership (0.538), Illiq (-0.721), zeros (-0.519). This suggests that market capitalization is an important determinant of stock liquidity and should be carefully considered.

3. Foreign Institutional Ownership and Liquidity

In this section, I test the main hypothesis that foreign institutional ownership improves stock liquidity. First, I perform a simple univariate analysis to examine how the patterns in the firm's foreign institutional ownership are related to firm's liquidity. Next I examine this

relationship in a panel OLS regression framework to control for firm characteristics that are known to be related to liquidity. Since the hypothesis is that foreign institutions generate improvements in liquidity, foreign institutional ownership should be related to both contemporaneously higher liquidity as well as future improvements in liquidity. Thus, the null hypothesis is that foreign institutional ownership is unrelated to *future* liquidity. Additional tests are implemented to check the robustness of the results.

3.1 *Univariate analysis*

Table 4 presents a portfolio analysis of the relationship between stock liquidity and foreign institutional ownership in the last year of the sample (2007). Firms are first partitioned into quintiles based on discrete market capitalization break-points[17] due to the high correlation of liquidity with size. Stocks in the 'micro' bin have market capitalizations less than $250 US dollars, 'small-cap' stocks have market capitalizations between $250 million and $750 million US dollars, 'mid-cap' stocks have market capitalization between $750 million and $3 billion, 'large-cap' stocks have market capitalization between $3 and $10 billion, and 'mega-cap' stocks are greater than $10 billion. Within each size quintile, firms are then dependently sorted into five additional subgroups based on foreign institutional ownership.[18] The equal weighted portfolio means of various measures of liquidity are reported in each cell of Table 4.

Table 4 indicates that controlling for size, there is a general pattern of increasing liquidity across the foreign institutional ownership levels. Panel A shows that ILLIQ (price impact per million dollar volume) declines with the level of foreign institutional ownership in all size quintiles. The differences in the average ILLIQ between the highest and lowest foreign

[17] Market capitalization is calculated as prices *shares outstanding and denominated in US dollars using the end of the year foreign exchange rate.

[18] The table includes only stocks with positive foreign institutional ownership although the patterns are similar with the inclusion of all stocks. The patterns are also similar using different size bins and different ownership bins.

institutional ownership quintiles are economically and statistically significant except for the micro-cap size group. The difference in the average price impact between the firms in the largest and smallest foreign institutional ownership quintile ranges from 3.6%*** in the small cap to 0.9%** in the mega-cap group per million US$ trading volume. Since mega-cap stocks are generally very liquid, it is not surprising that the relation between foreign institutional ownership and liquidity is much smaller. In Panel B and C of Table 4, similar patterns are obtained using alternative measures of liquidity. Panel B indicates that across all size groups the fraction of zero trades declines for higher levels of foreign institutional ownership.[19] Panel C indicates that in the large and mega-cap groups, the high-low spreads are smaller for stocks with higher foreign institutional ownership. For smaller sized stocks, the difference in high-low spreads is insignificant suggesting that estimation of spreads may be noisy. Overall, the results in Table 4 show that even after controlling for size, higher foreign institutional ownership is related to higher liquidity.

3.2 *Cross sectional regression analysis*

In this sub-section, I use a cross-sectional regression framework to analyze whether firms that have higher foreign institutional ownership subsequently experience higher stock liquidity. Given that there are episodic periods of large capital flows into a country, it is important to control for an overall level effect of foreign institutional ownership in a country during a particular year (i.e. Argentina 2001). I use a country-year fixed effect ($\gamma_{k,i}$) to capture unobservable country related factors that affect all firms in a country during a given year. The remaining within country variation allows for the identification of a cross-sectional relationship between foreign institutional ownership and liquidity.

[19] The results for the LOT transaction cost measure are similar and omitted for brevity.

The regressions include controls for firm characteristics that are expected to be related to liquidity. Liquidity is highly related to firm size (*Market Cap*) as these firms are more widely held, are more easily traded and are more visible to investors. Liquidity may also be related to turnover and stock price volatility. Firms in the MSCI All World Index (*MSCI Index*) or have American Depository Receipts (ADR) are also likely to have higher liquidity. I include the market-to-book ratio (*Market-to-Book*) and past year's stock return (*Return*) since glamour stocks and well performing stocks tend to attract the attention of additional investors.

Informational asymmetries also affect liquidity. To proxy for the adverse selection between managers and stock holders, I include the percentage of insider ownership (*% Inside Ownership*). Stocks with higher insider ownership could be more susceptible to price manipulation and insider trading and hence exhibit lower liquidity.[20] I include the number of stock analysts (*# of Analysts*) covering the stock to proxy for the transparency of the stock as analysts can act as distributors of information which may lower the informational asymmetries amongst stockholders (Roulstone (2003), Lang, Lins and Maffet (2009)). In total, there are 7 firm characteristics included as control variables.

The dependent variable is the ILLIQ (Amihud (2002)) measure of price impact measured during the year (*t*) for each firm (*i*). I also estimate additional liquidity specifications with the Zero trading cost measure. The main variable of interest, foreign institutional ownership (*% Foreign IO*), is measured at the end of the year (*t-1*) as are the other nine (*j*) firm characteristics ($Z_{j,i,t}$). This framework empirically tests whether levels of foreign institutional ownership predict future levels of liquidity.

[20] The insider ownership variable is constructed from Worldscope reported data. The variable has limited coverage and is set to 0 when there is no observation. The results hold with the exclusion of this variable.

To assess the statistical significance of these estimates, I follow Petersen (2009) and cluster standard errors at the firm level. Since the country-year fixed effects parametrically captures the correlation across stocks in a country during a given time period, the remaining correlation structure is likely to be at the firm level through time. The clustering technique controls for this possibility. To compare coefficients within each regression, I standardize both the dependent and independent variables so that each variable has mean zero and standard deviation one. The standardized regression coefficients can be interpreted as the expected change in the standard deviation of the liquidity measure given a one standard deviation change in the independent variable.

The model is specified in equation (1).

$$Illiq_{i,t} = \alpha + \beta_1 \times \%\ Foreign\ \ IO_{i,t-1} + \sum_{j=2}^{11} \beta_j \times Z_{j,i,t-1} + \gamma_{k,t} + \varepsilon_{i,t} \qquad (1)$$

The results of the cross-sectional regression specifications are presented in Table 5, columns [1]-[4]. Column 1 presents the main specification. The coefficient estimate, β_1, on the main variable of interest, *% Foreign IO*, is negative and statistically significant (-0.047, *t-stat = -15.49*). Stocks with higher liquidity have larger market capitalization, higher analyst coverage, higher visibility (MSCI Index inclusion and ADR listing), and lower insider ownership. Column [2] presents similar results using the Zeros measure of liquidity. The coefficient estimate, β_1, on *% Foreign IO* is weaker, but still negative and statistically significant (-0.005, *t-statistic = -4.72*). These results are consistent with the sort results in Table 4 which show that relationship between liquidity and foreign institutional ownership remains after including additional stock level controls. Columns [3] and [4] show that the coefficient

estimate, β_1 , on % *Foreign IO* is remains negative and statistically significant in both developed and emerging country subsamples.

A remaining concern of the cross-sectional framework is that liquidity displays serial correlation. While the clustering of standard errors at the firm level controls for serial correlation, an alternative econometric specification would be to parametrically modeling this correlation structure. A popular econometric framework that models serial correlation is the Prais-Winsten GLS estimator. The results of the Prais-Winsten estimator is presented in column [5] of Table 5 show that the coefficient estimate, β_1 , on % *Foreign IO* is remains negative and statistically significant.

3.3 *Time-series regression analysis*

The cross-sectional framework in the previous section identifies whether stocks with greater foreign institutional ownership exhibits higher future liquidity. But it should also be the case that stocks that receive increased foreign institutional ownership exhibit higher future liquidity. To empirically test this prediction, I include firm fixed effects. Firm fixed effects allows for time series identification because it parametrically models the average stock level of foreign institutional ownership and liquidity at the stock level. A first difference estimator would also provide similar identification. An added benefit of including firm fixed effects is that it sweeps out unobservable firm-specific factors that may drive both foreign institutional ownership and liquidity. The results of the firm fixed effects specification is presented in column [6] of Table 5. The coefficient estimates on foreign institutional ownership remains negative and statistically significant.

A potential concern with these results is that the liquidity effect is driven by domestic institutions, and that foreign institutional ownership is a proxy for domestic institution

ownership. To explore this possibility, I perform a similar regression including domestic institutional ownership in a subsample of countries where there is sizable amount of reporting of domestic institutional ownership (UK, Sweden, Poland, Norway, Germany, France, Finland and Denmark). The result in column [7] of Table 5 indicate that the coefficient estimate on domestic institutional ownership is negative but statistically insignificant (-0.02, *t-statistic = -5.69*) while the coefficient estimates on foreign institutional ownership remains negative and statistically significant (-0.022, *t-statistic = -4.75*).

3.4 Non linearity and Foreign Institutional Participation.

In this section, I address the issue that the relationship between foreign institutional ownership and stock liquidity is likely to be non-linear. Instead it is likely to have a concave relationship since the initial improvement to liquidity of additional institutions is large. For example, it is likely that there is a greater impact on liquidity from increasing foreign ownership from 1% to 5% than from 51% to 55%. Stocks with high foreign ownership are already likely to be quite liquid. Hence the impact of additional foreign ownership will be smaller.

To test the possibility of this type of non-linear relationship, I estimate a simple piece-wise regression. The piece-wise regression segments the regression model to allow for different slope sensitivities for different levels of foreign institutional ownership. Since it is unknown the exact parameterization of the model, I keep the estimation simple and split the slope estimation into two pieces based on the median level of foreign institutional ownership. To estimate this type of regression, I create two new variables (% below median, % above median) that measure the % of foreign ownership below and above the median level of foreign institutional ownership. If a stock has below the median level of foreign institutional ownership, then the variable % below median is equal to the total level of foreign ownership

and the variable % above median is equal to zero. If a stock has above the median level of foreign institutional ownership, then the variable % below median is equal to the median level of foreign institutional ownership and the variable % above median is equal to the total foreign institutional ownership minus the median level of foreign institutional ownership.

The regression also includes country-year fixed effects and standard errors are clustered at the firm level. In this specification, I omit firm fixed effects because the piece-wise parameterization only has one break at the median level of foreign institutional ownership although there is no reason to suspect a discontinuity or economic importance at that point. Regardless, the results are very similar with the inclusion of firm fixed effects.

The results in Table 6, columns [1]-[3] most of the improvement in liquidity occurs below the median level of foreign institutional ownership. In the first column, the coefficient estimate on % below the median is -0.104*** versus -0.004*** for % above the median. This pattern is consistent for developed markets (column [2]) and emerging markets (column [3]). It is should expected that most of the liquidity improvement comes from % foreign ownership below the median.

There are also reasons to believe that the number of foreign institutions may affect liquidity. First, the theoretical models of Kyle (1985) and Subrahmanyam (1991) relate liquidity to the number of informed agents. Second, the number of institutions may better reflect the participation of foreign institutions. A stock may have relatively low foreign ownership but still have multiple foreign institutions trading in that stock. Finally, the number of foreign institutions may capture different sources of trading or different signals.

To test whether the number of foreign institutions is important, I replace % foreign ownership with the number of foreign institutions. The regression specification includes country-year fixed effects, firm fixed effects, and standard errors are clustered by firm. The results in Table 6, column [4] indicate that the number of foreign institutions also predicts subsequent improvements in stock liquidity. Next, I test whether the number of foreign institutions predicts improvements in liquidity incremental to the % foreign institutional ownership. The results in Table 5, column [5] show that the number of foreign institutions also predicts future liquidity. This suggests that both the participation and the ownership by foreign institutions are important determinants of stock liquidity.

4. Endogeneity

A central concern of this analysis is that the relationship between foreign institutional ownership and stock liquidity is endogenous. Institutions may self select into liquid stock because the redemption demands of their clients may force them to liquidate positions quickly creating costly price impact. Also, anecdotal evidence suggests that institutions conscientiously assess the costs of trading and the price impact of their trades. Gompers and Metrick (2001) find that institutions exhibit a preference for certain stock characteristics including stocks with high turnover. Additionally, the increasing trend in foreign institutional ownership and improvements in stock liquidity could generate a spurious relationship.

To examine these alternative explanations, I propose three additional causality tests. First, I test whether recent improvements in stock liquidity predict subsequent foreign institutional ownership (*t+1*). The results (unreported) suggest that while institutions are attracted to stocks with higher *levels* of liquidity, recent *changes* in liquidity are not significant. This suggests that foreign institutions are not buying stocks for their recent liquidity

improvements. For the second test, I propose that a potential omitted variable that is associated with both increases in foreign institutional ownership and liquidity improvement is future stock returns. Foreign institutions may possess information so their stock holdings exhibit higher future returns. Higher stock returns may attract the attention of additional uninformed investors which could increase liquidity trading (Grullon, Kanatas and Weston (2004)). To test this alternative explanation, I estimate previous regression specifications on a sub-sample split on stocks with positive and negative future stock returns. In unreported results, foreign institutional ownership predicts future liquidity for both stocks that experience higher or lower future stock returns.

4.1 *2003 Dividend Tax Change*

In the final test, I exploit the 2003 United States Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) to create a quasi-natural experiment. The 2003 JGTRRA tax cut included a provision to lower dividend tax rates to a maximum of 15%[21]. The tax cut was also extended to dividends from 'qualified' foreign corporations domiciled in a subset of countries that have tax treaties with the United States. US investors can receive the entire benefit of this tax cut since foreign dividend tax withholdings are typically lower than 15%[22]. The un-qualified dividends from corporations from non-treaty countries remains taxed at the ordinary personal income tax rate (35% for the top income tax bracket after JGTRRA).

The 2003 US dividend tax cut provides a quasi-natural experiment because after the tax change, qualified stocks become relatively more attractive to US investors. This generates an exogenous shock to foreign institutional ownership by US investors for qualified, dividend-paying foreign stocks but not for similar stocks located in non-treaty countries. The impact of

[21] More precisely, after JGTRRA, dividend would be taxed at the same rate as capital gains which would be taxed at a maximum of 15%.
[22] The US tax code allows for a direct tax credit for foreign withholdings of dividends.

portfolio reallocation by US investors can be economically significant given that US institutions comprise 60% of foreign capital in this sample. The JGTRRA tax cut is a viable instrument for this study under the condition that qualified dividend paying stocks exhibit a subsequent increase in US institutional ownership and that the tax change itself did not increase liquidity in these stocks. Given that US tax law changes are unlikely to change the liquidity of foreign stocks (independent from increasing foreign institutional ownership), it can be assumed that the later condition is satisfied.

A potential concern with this experimental design is that non-treaty countries are considerably different than tax-treaty countries, in which case non-tax treaty countries would make a poor control group. The non-treaty countries[23] include Argentina, Brazil, Hong Kong, Singapore and Taiwan which are both active trading partners with the United States and a significant destination for US equity capital. Desai and Dharmapala (2010) conclude that the treaty status was chosen for its relative simplicity and administrative feasibility reasons.

To assess the validity of this instrument, I first test whether US institutions increased their holdings towards qualified dividend paying stock after the enactment of JGTRAA. If US institutional reallocation was minimal, the tax-cut would serve as a poor instrument. I use a difference-in-difference framework to test the impact of the tax cut on US institutional holdings in qualified dividend stocks. The dependant variable is the % share ownership of US mutual funds (*% US Tax*) which excludes other tax exempt institutions such as pension funds. The regression model is stated in equation 2.

[23] The entire list of non-treaty countries is: Argentina, Brazil, Chile, Colombia, Hong Kong, Jordan, Malaysia, Peru, Singapore, Sri Lanka, and Taiwan.

$$\%\ USTax_{i,t+1} = \alpha + \beta_1 \times Qualified, Div._{i,t} + \beta_2 \times PostTaxCut_{i,t} + \beta_3 \times Treatment_{i,t} + \sum_{j=2}^{7} \beta_j \times Z_{j,i,t} + \gamma_i + \varphi_t + \varepsilon_{i,t} \quad (2)$$

This difference-in-difference panel regression framework includes three additional dummy variables. A dummy variable is equal to 1 if the stock is located in a treaty country and pays a dividend (*Qualified/Dividend Dummy*). A separate dummy is equal to 1 if the observation is after 2003 and zero otherwise (*Post Tax Cut Dummy*). Finally, the *Treatment* dummy is the interaction between *Qualified * Post-Tax Cut* dummies and represents the group of firms that US investors are expected to reallocate their portfolio towards. I include determinants of institutional ownership ($Z_{j,i,t}$) that have been documented in prior literature (Gompers and Metrick (2001)). The regressions include country-fixed effects (γ_i) and year dummies (φ_t) and the standard errors are clustered at that country-year level.

Table 6 reports the results of this regression. Column [1] reports "benchmark" regression estimates without dummy variables. The results suggest that US institutions prefer large, visible, growth stocks. Column [2] includes the difference-in-difference dummy variables. The coefficient estimate β_1 on the *Qualified, Dividend* (0.107) dummy is significant (*t-statistic -3.092*) suggesting that unconditionally, qualified dividend paying foreign corporations have higher US mutual fund ownership. The coefficient estimate β_2 (0.185, *t-statistic 3.549*) on the Post-Tax-Cut is positive and statistically significant suggesting that after 2003, US institutions increased their holdings amongst all international stocks. The main coefficient estimate of interest, β_3 is positive and statistically significant (0.234, *t-statistic 4.470*), suggesting that US institutions reallocated towards qualified dividend corporations after the 2003 dividend tax cut which is consistent with the evidence presented in Desai and Dharmapala (2010). This suggests that the JGTRAA is a viable instrument for foreign institutional ownership.

Having established that the 2003 dividend tax cut created a positive shock in foreign institutional ownership in qualified dividend paying stocks, I test whether these stocks experience a similar subsequent improvement in liquidity. I estimate a difference-in-difference panel regression on illiquidity, similar to the framework in previous regression. Dummy variables are included for a dividend paying stock located in a treaty country (*Qualified/Dividend*), whether the observations is after 2003 (*Post Tax Cut Dummy*), and the interaction between *Qualified * Post-Tax Cut* (*Treatment* dummy) which represents the group of firms that US investors are expected to reallocate their portfolio towards. Stock characteristic controls ($Z_{j,i,t}$) include market capitalization, past stock return, market-to-book, % insider ownership, number of analysts, and the dividend yield. The regressions include country-fixed effects (γ_i) and year dummies (φ_t) and the standard errors are clustered at that country-year level. The regression specification is presented in equation (3).

$$Illiq_{i,t+1} = \alpha + \beta_1 \times Qualified, Div._{i,t} + \beta_2 \times Post\,Tax\,Cut_{i,t} + \beta_3 \times Treatment_{i,t} + \sum_{j=2}^{7} \beta_j \times Z_{j,i,t} + \gamma_i + \varphi_t + \varepsilon_{i,t} \quad (3)$$

The results, reported in column 4, find that the main coefficient estimate of interest, β_3 is negative and statistically significant (-0.163, *t-statistic -2.838*), suggesting that liquidity improves for qualified dividend corporations after the 2003 dividend tax cut. Interestingly, qualified dividend paying stocks have lower liquidity (0.165***). This is consistent with the evidence in Banerjee, Gatchev and Spindt (2007) that less liquid stocks pay cash dividends. Taken together, these results are consistent with the earlier result that foreign institutions improve liquidity rather than self-select into liquid stocks.

While the results in column [4] of Table 6 presents evidence consistent with foreign institutions improving liquidity, the methodology does not estimate the direct effect of US portfolio reallocation on liquidity. To estimate this treatment effect, I employ an instrumental variable approach by estimating a two-stage least squares regression using the *Treatment* dummy as an instrument for US mutual fund holdings. In the first stage, *% US Own* is regressed on the *Treatment* dummy and firm characteristics. In the second stage, I estimate the impact on liquidity using the fitted values from the first stage regression as an instrument for US institutional ownership. The results, reported in Table 6, column [5], show that the coefficient estimate on *US % Own* as instrumented by the treatment dummy is negative and statistically significant (-0.70, *t-statistic = -2.121*), which is consistent with the earlier findings that foreign institutions improve liquidity.

5. Information competition and liquidity trading

In this section, I study two of the key channels through which liquidity is improved by foreign institutions. I focus on identifying situations where foreign institutions improve liquidity through information competition and liquidity trading. To study these two effects, I limit the data sample to include only the holdings of international mutual funds. The benefit of focusing exclusively on mutual funds is that mutual funds can be separated into Index/ETF type funds and actively managed funds. I assume that Index/ETF funds trade for non-informational reasons to mimic a particular stock index or benchmark. Their trading is in response to order flow by investors looking to diversify their portfolios. To the extent that Index/ETF trading influences stock liquidity, it is likely to be a result of increased liquidity trading. On the other

hand, actively managed funds tend to trade on information[24]. If their trades influence stock liquidity, it is likely to be a result of increased informed trading. In the next two sections, I pair this distinction amongst active mutual funds and Index/ETF funds with differences in market environments to create conditional predictions on how foreign institutions influence stock liquidity.

Using this classification, I examine how each type of investor influences liquidity in different trading environments. In particular, I consider countries with a high degree of informed trading. Informed agents in these markets can earn rents by strategically withholding information as noise traders provide camouflage for their trades (Kyle (1985)). If active institutions improve liquidity in these markets, it is likely to be due to the 'rat race' effect of information competition with the existing informed agents (Subrahmanyam (1991), Foster and Viswanathan (1996)). Empirically, we should observe that in markets with a higher proportion of informed trading, the impact on liquidity will more likely be affected by active institutions than passive institutions. Similarly, markets with a relatively lower proportion of informed trading already incorporates much of the private information into prices. Thus, in those markets, the impact on liquidity by active mutual funds will be lower. This prediction allows for an empirically testable competition hypothesis stated below:

Competition hypothesis: *In markets with higher levels of informed trading, improvements in liquidity created by foreign mutual funds will be mostly generated by active mutual funds due to increasing information competition.*

To proxy for the amount of informed trading in a country, I use the average probability of informed trading (PIN) of stocks in a market. The PIN measure (Easley, Kiefer, and O'Hara

[24] Numerous studies have found evidence to suggest that mutual funds may possess information (Grinblatt, Titman, and Wermers (1995), Daniel, Grinblatt, Titman and Wermers (1997), Chen, Jegedeesh, and Wermers (2000)).

(1997)) uses tick data to estimate the composition of informed trading relative to total order flow. The measure of country PIN is obtained from estimates reported by Lai, Ng, and Zhang (2009) which is measured from 1998 to 2007 using Global TAQTIC data. Countries with high average PIN have more informed trading as a fraction of total trading. Average stock PIN estimates are available for 42 countries, of which 33 overlap with the countries used in this paper.

The regression framework follows the standardized panel regressions used in the previous section, but I replace total foreign institutional ownership with only foreign mutual fund ownership split into active foreign mutual funds (*% Active MF*) and mutual funds (*% Passive MF*). The dependent variable is the illiquidity measure (ILLIQ) as previous defined. The regression includes 9 lagged stock control variables, ($Z_{j,i,t}$), which include market capitalization, past year stock return, market-to-book ratio, turnover, stock volatility, % insider ownership, number of analysts, MSCI dummy, ADR dummy and country-year fixed effects ($\gamma_{k,i}$) and cluster the standard errors at the firm level. All variables are standardized with mean 0 and standard deviation 1 to allow for comparison across variables. The regression is stated in equation (4).

$$Illiq_{i,t} = \alpha + \beta_1 \times \%\, Active\ MF_{i,t-1} + \beta_2 \times \%\, Passive\ MF_{i,t-1} + \sum_{j=2}^{11} \beta_j \times Z_{j,i,t-1} + \gamma_{k,i} + \varepsilon_{i,t} \quad (4)$$

The first column of Table 7, panel A presents the full-sample regression results of equation (4). The stock controls and regression intercepts are omitted for brevity. The coefficient estimates on percentage holdings of active foreign institutions (β_1) and passive foreign institutions (β_2) are negative and statistically significant suggesting that both types of institutions influence liquidity.

In columns [2] through [5], I estimate separate subsample regression of equation 4 by grouping countries into quartiles by average country PIN. The first row shows that the coefficient estimate on active foreign institutions decreases monotonically across the PIN quartiles from 5.4% in the high PIN countries to 0.4% in the low PIN countries (insignificant). Column 6 reports the difference in the coefficient estimates between the high PIN quartile and low PIN quartile is 5.9% and is statistically significant (*t-statistic = -3.08).* This is consistent with the hypothesis that active foreign institutions instigate a 'rat race' over trading profits with other informed traders.

The second row of columns [2] through [5] reports the coefficient estimates on passive foreign institutions. The coefficient estimate on passive institutions is statistically significant across all PIN quartiles, but is higher in high PIN countries (8.3%) compared to low PIN countries (3.9%) but the difference is not significant. This result is consistent with the view that liquidity trading raises liquidity across all markets regardless of prevalence of informed agents.

5.1 Robustness check

A potential concern of sorting trading environments on average country PIN is that the PIN measure is highly correlated with liquidity. Duarte and Young (2009) find that liquidity component of PIN is priced, while the information asymmetry component is not. Thus, sorting trading environments on PIN could be similar to sorting on liquidity (correlation = 0.7) which casts doubt on the interpretation of the previous results. As a robustness check, I propose an alternative measure of informed trading: the prevalence of insider trading from the World Economic Forum, Global Competitiveness Report. The prevalence of insider trading measures the degree to which insiders (typically corporate insiders) trade on private information and impound information into prices. Griffin, Kelly and Hirschey (2010) find that prevalence of

insider trading can partially explain the market reaction to news announcements in different countries. Furthermore, the prevalence of insider trade is not correlated with measure of liquidity and PIN (-0.073).

As a robustness check, I sort countries into quartiles by the prevalence of insider trading. The results presented in Table 7, panel B provide additional evidence that active institutions improve liquidity more in high insider trading markets compared to low insider trading markets. The first row shows that the coefficient estimate on active foreign mutual funds decreases across Insider Trading quartiles from 4.6% in the high Insider Trading countries to 1.8% in the low Insider Trading markets.

6. Discussion and conclusion

In this paper, I examine the relationship between foreign institutions and stock liquidity. The evidence suggests that foreign institutions improve liquidity particularly in both developed and emerging markets. The results also suggest that at least part of the improvement of liquidity is due to the informed actions of foreign institutions. Their trading increases the competition with other informed agents over trading profits. This paper focuses exclusively on the implications for liquidity, but theoretically this competition should make prices more informative[25]. Although this is beyond the scope of this paper, the evidence is consistent with foreign institutions playing an important role in the price discovery process.

While this paper empirically isolates two channels of liquidity improvement, there are likely to be other channels through which foreign institutions improve domestic stock liquidity. Foreign institutions may improve liquidity indirectly. For example, foreign ownership tends to

[25] Boehmer and Kelley (2009) find evidence that on the NYSE, stocks with greater institutional ownership are priced more efficiently.

attract the attention of the news media and business press. They may also attract the attention of stock analysts who may facilitate the dissemination of public information. This could enhance recognition amongst uninformed investors who purchase the stock and increase noise trading. This attention effect may lead to higher liquidity (Grullon, Kanatas, and Weston (2004)).

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Table 1.

Summary Statistics: Institutional Ownership Coverage by Country in 2007

Description: This table presents aggregate summary statistics for each country at the end of December 2007. # of firms is the total number of screened stocks listed in the country. # of Forg,US, Dom. are the total number of foreign, US, and domestic institutions that held common stock in the country during 2007. MktCap is to aggregate market capitalization of the sample firms in that country in millions of US $. *Total* IO, forg. and dom. are the total amount of institutional ownership in millions of US $ from the Lionshares database. % IO, forg. and dom. are the total % institutional ownership as a fraction of aggregate market capitalization of firms in the sample. Market capitalization and # of firms are from the Datastream database.

Country		**Firms**	**Forg.**	**US**	**Dom.**	**MktCap**	**IO**	**Forg.**	**Dom.**	**IO**	**Forg.**	**Dom.**
		#	#	#	#	*Total*	*Total*	*Total*	*Total*	%	%	%
Argentina	EMG	67	16	3	0	48,684	135	127	7	0.3%	0.3%	0.0%
Australia	DEV	1323	294	91	21	1,201,651	137,591	105,967	31,711	11.5%	8.8%	2.6%
Austria	DEV	73	248	42	3	201,035	33,999	31,931	2,068	16.9%	15.9%	1.0%
Belgium	DEV	131	245	44	5	368,239	55,421	48,343	7,074	15.1%	13.1%	1.9%
Brazil	EMG	221	228	88	5	785,510	36,854	35,106	1,744	4.7%	4.5%	0.2%
Canada	DEV	2336	525	248	26	1,671,483	107,762	45,879	61,865	6.5%	2.7%	3.7%
Chile	EMG	153	39	12	1	182,223	7,376	2,211	5,163	4.1%	1.2%	2.8%
China	EMG	1267	70	21	0	2,652,833	27,897	24,918	2,981	1.1%	0.9%	0.1%
Czech Republic	EMG	24	104	13	1	76,705	9,163	8,732	433	12.0%	11.4%	0.6%
Denmark	DEV	149	205	40	5	230,251	51,264	29,865	21,391	22.3%	13.0%	9.3%
Egypt	EMG	81	59	20	1	90,645	4,807	4,721	85	5.3%	5.2%	0.1%
Finland	DEV	117	237	35	2	338,472	107,016	88,851	18,166	31.6%	26.3%	5.4%
France	DEV	1600	325	70	19	5,285,271	1,215,172	850,214	364,974	23.0%	16.1%	6.9%
Germany	DEV	831	369	82	29	1,951,565	454,218	335,068	119,139	23.3%	17.2%	6.1%
Greece	DEV	270	230	42	3	252,672	38,839	38,115	723	15.4%	15.1%	0.3%
Hong Kong	DEV	741	383	118	10	1,443,401	151,366	117,631	33,749	10.5%	8.2%	2.3%
Hungary	EMG	29	68	7	0	31,527	9,093	8,740	351	28.8%	27.7%	1.1%
India	EMG	904	191	51	10	1,511,087	160,638	107,834	52,799	10.6%	7.1%	3.5%
Indonesia	EMG	271	107	26	0	192,943	21,177	21,177	0	11.0%	11.0%	0.0%
Italy	EMG	242	249	46	14	1,066,769	173,407	153,171	20,231	16.3%	14.4%	1.9%
Japan	DEV	3664	308	90	22	4,193,209	575,220	394,555	180,653	13.7%	9.4%	4.3%
Lithuania	EMG	40	16	2	0	10,556	427	427	0	4.1%	4.1%	0.0%
Malaysia	EMG	858	157	32	3	324,016	25,107	23,609	1,486	7.8%	7.3%	0.5%
Mexico	EMG	62	184	71	3	167,365	11,044	10,609	437	6.6%	6.3%	0.3%
Netherlands	DEV	114	336	89	7	893,877	145,708	132,270	13,436	16.3%	14.8%	1.5%
New Zealand	DEV	104	110	38	1	42,738	3,686	3,632	53	8.6%	8.5%	0.1%
Norway	DEV	189	363	83	11	367,352	84,053	57,232	26,824	22.9%	15.6%	7.3%
Philippines	EMG	134	126	30	0	76,908	7,683	7,516	165	10.0%	9.8%	0.2%
Poland	EMG	253	116	14	16	176,609	45,879	14,520	31,362	26.0%	8.2%	17.8%
Singapore	DEV	554	307	87	12	384,117	51,831	43,516	8,304	13.5%	11.3%	2.2%
South Africa	EMG	243	191	41	5	427,053	67,338	48,528	18,813	15.8%	11.4%	4.4%
South Korea	EMG	1329	151	40	0	952,718	124,264	123,193	1,066	13.0%	12.9%	0.1%
Spain	DEV	110	262	53	9	1,034,723	170,777	149,990	20,787	16.5%	14.5%	2.0%
Sri Lanka	EMG	194	5	1	0	6,854	356	356	0	5.2%	5.2%	0.0%
Sweden	DEV	356	314	77	24	427,925	150,193	57,280	92,910	35.1%	13.4%	21.7%
Switzerland	DEV	175	369	105	34	222,957	30,999	22,328	8,667	13.9%	10.0%	3.9%
Taiwan	DEV	1104	115	26	0	622,586	78,167	77,864	309	12.6%	12.5%	0.1%
Thailand	EMG	415	126	29	3	190,474	13,653	10,568	3,090	7.2%	5.6%	1.6%
Turkey	EMG	222	116	24	0	189,008	21,700	21,619	85	11.5%	11.4%	0.0%
United Kingdom	DEV	1787	583	133	70	3,429,537	852,623	420,545	432,062	24.9%	12.3%	12.6%
Developed Avg.		786	306	80	16	1,228,153	224,795	152,554	72,243	17.7%	12.9%	4.8%
Emerging Avg		350	116	29	3	458,024	38,400	31,384	7,015	10.1%	8.3%	1.8%
World Avg		568	211	54	9	843,089	131,598	91,969	39,629	13.9%	10.6%	3.3%

Table 2.

Summary Statistics of Firm Characteristics

Description: This table contains the mean statistics for individual stocks by country at the year-end 2007. All variables are measured at the end of the year 2007. Size is the firm's market capitalization in millions of US$. MtB is market to book value of equity. Return is the total stock return over the year. Beta is the beta estimated from the local country market model. Inside % is the % of insider shares held. DY% is the annual dividend yield. # of analysts is the total number of analysts covering the stock from the I/B/E/S database. # of firms is number of securities listed on the exchange during the year. # MSCI is the number of stocks that are in the MSCI World Index. # ADR is the number of stocks that have American Depository Receipts. % of Forg. IO is the percentage of total shares held by foreign institutions. Illiq is (il)liquidity measure calculated following Amihud (2002) as the average daily ratio of |stock return|/US$ volume during the year 2007. Zeros is the percentage of daily zero returns as a proportion of total trading days over the course of the year. LOT is the trading cost measure calculated following (Lesmond, Ogden, Trzinka (1999)). Turnover is calculated as the sum of the daily shares traded divided by the total shares outstanding during the year 2007.

Panel A. Developed Countries

Country	Size	MtB	Return	Beta	Inside %	DY %	# Analysts	# Firms	# MSCI	#ADR	% Forg. IO	Illiq	Zeros	Lot	Turnover
Australia	908	3.53	1.27	0.74	25.9	1.19	5.2	1,323	215	36	2.37	0.04	0.29	0.10	0.74
Germany	2,348	2.81	1.05	0.50	12.6	1.00	7.8	831	51	29	4.86	0.16	0.24	0.07	0.25
Belgium	2,811	3.61	1.06	0.39	11.8	1.22	6.3	131	43	3	5.78	0.02	0.26	0.06	0.28
Canada	716	3.47	1.17	0.74	4.6	0.24	4.9	2,336	256	5	2.45	0.07	0.35	0.19	0.59
Denmark	1,545	3.64	0.99	0.56	16.1	1.54	6.4	149	55	5	3.76	0.01	0.26	0.03	0.96
Spain	9,407	4.81	0.96	0.81	10.9	0.89	13.3	110	83	9	6.69	0.00	0.12	0.01	1.05
Finland	2,893	2.86	1.05	0.50	15.2	3.29	9.1	117	53	6	10.49	0.01	0.18	0.02	0.75
France	3,303	3.42	1.08	0.42	9.1	0.93	7.6	1,600	386	86	4.11	0.04	0.33	0.15	0.39
Greece	936	2.22	1.21	0.95	5.4	0.42	7.1	270	89	9	3.26	0.02	0.17	0.02	0.61
Hong Kong	1,948	2.87	2.44	0.73	36.6	2.41	6.9	741	243	51	4.03	0.01	0.21	0.05	1.12
Japan	1,144	1.64	0.84	0.63	20.0	1.39	5.3	3,664	1,368	123	2.42	0.01	0.17	0.02	0.91
Netherlands	7,841	3.45	1.04	0.68	12.8	2.22	11.5	114	62	20	12.41	0.00	0.16	0.03	1.07
Norway	1,944	3.26	1.09	0.50	7.2	1.80	6.2	189	70	10	6.54	0.01	0.29	0.05	0.96
New Zealand	411	2.48	1.02	0.34	24.2	3.24	3.6	104	22	3	2.49	0.08	0.50	0.15	0.18
Austria	2,754	3.42	1.16	0.49	23.6	1.27	6.9	73	31	14	8.86	0.01	0.31	0.09	0.37
Sweden	1,205	4.98	0.94	0.61	7.4	1.68	6.7	356	89	5	4.29	0.01	0.20	0.04	0.89
Singapore	696	2.33	1.57	0.94	29.8	3.15	4.0	554	97	11	3.16	0.02	0.32	0.07	1.18
Switzerland	1,274	2.78	1.14	0.73	25.7	1.35	4.8	175	87	2	9.25	0.01	0.21	0.02	0.43
Taiwan	564	2.10	1.08	0.85	6.8	0.09	3.8	1,104	389	51	2.18	0.00	0.14	0.01	2.92
U.K	1,930	3.04	0.99	0.55	19.0	1.19	5.2	1,787	441	80	3.02	0.10	0.48	0.18	0.73
Developed Avg	2,329	3.14	1.16	0.63	16.2	1.53	6.6	786	207	28	5.12	0.03	0.26	0.07	0.82

Table 2. *continued*

Summary Statistics of Firm Characteristics

Description: This table contains the mean statistics for individual stocks by country at the year-end 2007. All variables are measured at the end of the year 2007. Size is the firm's market capitalization in millions of US$. MtB is market to book value of equity. Return is the total stock return over the year. Beta is the beta estimated from the local country market model. Inside % is the % of insider shares held. DY% is the annual dividend yield. # of analysts is the total number of analysts covering the stock from the I/B/E/S database. # of firms is number of securities listed on the exchange during the year. # MSCI is the number of stocks that are in the MSCI World Index. # ADR is the number of stocks that have American Depository Receipts. % of Forg. IO is the percentage of total shares held by foreign institutions. Illiq is (il)liquidity measure calculated following Amihud (2002) as the average daily ratio of |stock return|/US$ volume during the year 2007. Zeros is the percentage of daily zero returns as a proportion of total trading days over the course of the year. LOT is the trading cost measure calculated following Lesmond, Ogden, Trzinka (1999). Turnover is calculated as the sum of the daily shares traded divided by the total shares outstanding during the year 2007.

Panel B. Emerging Countries

Country	Size	MtB	Return	Beta	Inside %	DY %	# Analysts	# Firms	# MSCI	#ADR	% Forg. IO	Illiq	Zeros	Lot	Turnover
Argentina	727	2.14	1.49	0.56	34.8	1.35	1.6	67	23	8	0.18	0.10	0.34	0.07	0.13
Brazil	3,554	3.32	2.72	0.39	10.4	1.92	6.1	221	65	43	3.93	0.06	0.51	0.33	0.24
China	2,094	4.60	3.01	0.97	8.9	0.28	3.1	1,267	2	0	0.23	0.00	0.07	0.01	5.27
Chile	1,191	2.81	1.22	0.37	42.6	2.57	2.1	153	63	17	0.55	0.05	0.58	0.21	0.15
Sri Lanka	35	3.11	1.27	0.66	3.9	0.43	1.0	194	23	1	0.61	2.35	0.54	0.23	0.56
Czech Republic	3,196	1.50	1.09	0.20	13.2	0.38	9.3	24	12	3	4.62	0.03	0.59	0.20	0.46
Egypt	1,119	3.21	1.39	0.51	3.5	1.64	3.2	81	38	5	1.17	0.02	0.18	0.05	0.77
Hungary	1,087	1.77	1.37	0.40	15.9	0.30	5.3	29	14	5	6.84	0.04	0.21	0.02	0.92
Indonesia	712	3.11	2.06	0.59	4.3	0.35	6.8	271	90	6	2.18	0.30	0.51	0.26	0.66
India	1,672	2.77	2.01	0.69	37.0	1.21	5.4	904	243	81	2.40	0.02	0.05	0.01	0.53
Italy	4,408	2.51	0.96	0.81	13.4	1.94	8.5	242	145	15	6.27	0.00	0.05	0.00	6.23
South Korea	717	1.63	1.31	0.73	1.1	0.82	2.9	1,329	320	33	2.43	0.00	0.08	0.01	4.50
Lithuania	264	4.05	0.48	1.06	0.0	0.01	1.1	40	0	2	7.27	0.45	0.36	0.08	0.18
Mexico	2,699	3.06	1.28	0.41	0.0	1.15	4.1	62	28	15	4.21	0.05	0.33	0.07	0.28
Malaysia	378	1.39	1.30	1.10	16.4	1.20	4.6	858	170	9	1.36	0.09	0.28	0.05	0.84
Philippines	574	1.97	1.52	0.72	33.7	1.48	4.5	134	53	8	2.68	0.15	0.51	0.25	0.48
Poland	698	4.75	1.16	0.92	4.9	0.19	3.6	253	69	15	2.88	0.02	0.10	0.02	2.34
South Africa	1,757	3.23	1.46	0.43	22.2	1.83	4.5	243	103	31	3.26	0.03	0.30	0.10	0.41
Thailand	459	1.40	1.17	0.46	10.4	3.39	6.5	415	119	120	1.29	0.16	0.35	0.08	1.09
Turkey	859	2.06	1.27	0.82	11.7	1.52	5.7	222	89	14	3.96	0.00	0.18	0.02	3.94
Emerging Avg.	1,439	2.75	1.49	0.63	14.5	1.18	4.4	357	83	22	2.86	0.21	0.31	0.11	1.37

Table 3.
Correlation Table

Description: This table presents the means and correlation between the key variables used in this study. The sample includes all countries from 2000-2007. % Forg and % Dom are the total shares held divided by the shares outstanding by Foreign and Domestic institutions as reported in the Lionshares database at the end of the year. # Forg and # Dom is the total number of foreign and domestic institutions holding the stock in the year. Illiq is (il)liquidity measure calculated following Amihud (2002) as the log of the average daily ratio of |stock return|/US$ volume during the year 2007. Zeros is ratio of number of days with zero return divided by the total number of stock trading days during the year (Lundblad et al (2007)). LOT is the transaction costs measure estimated with zero return days following Lesmond, Ogden ant Trzinka (1999). HL Spread is the high-low price spread estimate created following Corwin and Schultz (2008). Turnover is the logarithmic transformation of the total number of shares traded divided by the total number of shares outstanding in a given year. Ret. Vol is the return volatility calculated as the logarithmic transformation of the standard deviation of daily stock returns over the year. Beta is estimated using the market model with domestic market return over the year. MTBV is the log market to book ratio from the Worldscope database. Size is the log of the firm's market capitalization in millions of US$ at the end of the year. Inside is the percentage share ownership of corporate insiders and blockholders. # of analysts is the total number of analyst covering the stock as reported in the I/B/E/S database. *The reported means and standard deviations for these variables are non-log transformed (actual value) means and std for easier interpretation.

	% FORG.	% DOM	# FORG.	# DOM	Illiq	Zeros	LOT	HL Spread	Turnover*	Ret. Vol	Beta	MTB*	Size	Inside %	# Analysts
MEAN	2.318	2.532	14.757	4.644	-3.726	0.267	0.073	0.029	1.147*	-3.61	0.651	2.131*	1070*	26.5	2.7
STD	5.281	6.307	51.416	11.102	2.933	0.258	0.174	0.145	15.071*	0.608	0.54	3.143*	6054*	31.3	5.3
N	105,390	105,390	105,390	105,390	103,664	105,390	104,463	89,606	103,734	105,390	104,653	102,261	105,390	105,390	105,390
% FORG.	1														
% DOM	0.26	1													
# FORG.	0.552	0.147	1												
# DOM	0.456	0.49	0.686	1											
Illiq	-0.392	-0.107	-0.487	-0.452	1										
Zeros	-0.247	-0.079	-0.226	-0.268	0.675	1									
LOT	-0.145	-0.088	-0.112	-0.149	0.434	0.706	1								
HL Spread	-0.05	-0.044	-0.034	-0.055	0.073	0.072	0.132	1							
Turnover	0.145	0.096	0.122	0.145	-0.602	-0.605	-0.407	0.056	1						
Ret. Vol	-0.131	-0.106	-0.157	-0.208	0.27	0.059	0.275	0.179	0.22	1					
Beta	0.143	-0.010	0.174	0.155	-0.491	-0.529	-0.305	0.013	0.511	0.181	1				
MTB	0.144	0.140	0.121	0.157	-0.285	-0.194	-0.102	-0.008	0.126	-0.028	0.157	1			
Size	0.438	0.181	0.550	0.528	-0.792	-0.525	-0.395	-0.130	0.162	-0.429	0.290	0.291	1		
Inside	0.036	-0.013	0.022	0.038	0.033	0.040	0.044	-0.019	-0.162	-0.082	-0.032	0.005	0.142	1	
# Analysts	0.510	0.205	0.711	0.592	-0.537	-0.313	-0.179	-0.043	0.141	-0.180	0.199	0.175	0.628	0.084	1

Table 4.

Univariate Analysis: Foreign Institutions and Stock Liquidity

Description: This table presents equal weighted portfolio means for different measures of liquidity by quintile of market capitalization and foreign institutional ownership measured at December end 2007. Portfolios are formed by first partitioning the sample into quintiles based on discrete market capitalization breakpoints. Stocks in the 'micro' bin have market capitalizations less than $250 US dollars, 'small-cap' stocks have market capitalizations between $250 million and $750 million US dollars, 'mid-cap' stocks have market capitalization between $750 million and $3 billion, 'large-cap' stocks have market capitalization between $3 and $10 billion, and 'mega-cap' stocks are greater than $10 billion. ILLIQ is defined as the natural logarithm of the average daily ratio of the absolute return divided by the US$ volume traded following Amihud (2002). Zeros is the proportion of zero daily returns over the course of the year. HL Spread is the estimated spread from daily high-low prices following Corwin and Schultz (2008). The t-statistics are reported below the differences in means. The significance levels of the differences are based on a two-tailed asymptotic t-test with different variances (Satterthwaite) a sampling frequency for each cell given by the number of distinct firms in each cell. *** p<0.01, ** p<0.05, * p<0.1

	Market Capitalization Groups				
Foreign Institutional Ownership Quintile	Micro-Cap	Small-Cap	Mid-Cap	Large-Cap	Mega-Cap
Panel A: ILLIQ (Price impact)					
Lowest < 1%	0.176	0.053	0.037	0.060	0.010
2	0.113	0.022	0.014	0.001	0.001
3	0.159	0.020	0.003	0.001	0.001
4	0.108	0.014	0.003	0.000	0.000
Highest	0.115	0.016	0.004	0.000	0.000
Difference (*Highest - Lowest*)	-0.061	-0.036***	-0.033***	-0.060***	-0.009**
	(-1.16)	(-4.57)	(-5.94)	(-2.86)	(-2.54)
Panel B: Zero Trade (%)					
Lowest < 1%	0.212	0.151	0.142	0.168	0.050
2	0.185	0.101	0.077	0.055	0.051
3	0.200	0.098	0.062	0.048	0.041
4	0.188	0.100	0.057	0.042	0.036
Highest	0.167	0.086	0.058	0.036	0.030
Difference (*Highest - Lowest*)	-0.045*	-0.065***	-0.084***	-0.132***	-0.019*
	(-1.80)	(-6.85)	(-7.13)	(-5.09)	(-1.68)
Panel C: High Low Spread (%)					
Lowest < 1%	0.010	0.008	0.008	0.009	0.008
2	0.009	0.008	0.008	0.007	0.008
3	0.010	0.008	0.007	0.007	0.006
4	0.010	0.008	0.007	0.007	0.006
Highest	0.010	0.008	0.008	0.007	0.005
Difference (*Highest - Lowest*)	0.000	0.000	0.000	-0.002***	-0.003***
	(0.02)	(-0.52)	-(0.83)	(-2.55)	(-3.38)

Table 5.
Regression of Liquidity on Foreign Institutional Ownership

Description: This table presents annual panel standardized regression estimates of stock liquidity on foreign ownership for non-U.S. firms from 2000-2007.

$$Liquidity_{firm,\,t} = a + \beta_1 * \%Foreign\ IO_{firm,\,t-1} + \Sigma_j \beta_j * Firm\ characteristics_{t-1} + \gamma_{k,t} + \varphi_{firm,\,t} + \varepsilon_{firm,\,t}$$

Liquidity is measured as: *ILLIQ* defined as the natural logarithm of the average daily ratio of the absolute return divided by the US$ volume traded following Amihud (2002). *Zeros* is the proportion of zero daily returns over the course of the year. *% Foreign IO* is measured as the % of shares outstanding held by institutions not domiciled in the country where the security is traded. *Market Cap* is the log of the market capitalization in U.S. dollars at the beginning of the year. *Market-to-book* is the logarithm of the market-to-book equity ratio. *Turnover* is the total shares traded in a year divided by the total shares outstanding. *Volatility* is the logarithm of the standard deviation of daily stock returns estimated during the year. *Return* is the total return of the stock during the year. *% Insider Ownership* is % of shares held by insiders. # of analysts is the total number of analysts covering the stock from I/B/E/S. *MSCI Index* is a dummy variable equal to 1 if the stock is included in the MSCI All World Index. *Parent (ADR)* is equal to 1 if the stock has an ADR. All regressions include country-year firm fixed effects $\gamma_{k,t}$. Specifications [7]-[8] include firm fixed effects φ_t .The regression contant is suppressed. Standard errors are robust and clustered by firm. Robust *t statistics* in brackets. *** p<0.01, ** p<0.05, * p<0.1

	ILLIQ	**ZEROS**	**ILLIQ**	**ILLIQ**	**ILLIQ**	**ILLIQ**	**ILLIQ**
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
			Developed	*Emerging*	*Prais-Winsten*	*Firm FE*	*Firm FE*
% Foreign IO (*t-1*)	-0.047***	-0.005***	-0.041***	-0.071***	-0.026***	-0.020***	-0.022***
	[-15.492]	[-4.718]	[-13.289]	[-9.212]	[-12.563]	[-7.766]	[-4.746]
% Domestic IO (*t-1*)							-0.020***
							[-5.693]
Control Variables							
Market Cap. (*t-1*)	-0.619***	-0.126***	-0.644***	-0.545***	-0.516***	-0.652***	-0.639***
	[-97.202]	[-52.172]	[-97.976]	[-41.607]	[-117.182]	[-87.991]	[-38.081]
Return (*t-1*)	-0.000	0.000***	-0.000**	-0.071	-0.000***	-0.000***	-1.447*
	[-1.259]	[7.049]	[-2.058]	[-0.935]	[-3.139]	[-2.660]	[-1.651]
Market-to-Book (*t-1*)	-0.011***	-0.003**	-0.012***	-0.006	0.018***	0.023***	0.025***
	[-4.016]	[-2.314]	[-4.192]	[-1.002]	[9.003]	[7.565]	[3.983]
Turnover (t-1)	-0.011	-0.002**	-0.004	-0.183	-0.001	-0.001	-0.036
	[-1.522]	[-2.276]	[-1.409]	[-1.591]	[-0.966]	[-0.741]	[-0.942]
Volatility (*t-1*)	-0.108***	-0.051***	-0.110***	-0.108***	-0.033***	-0.053***	0.003
	[-30.475]	[-28.389]	[-28.319]	[-12.344]	[-16.520]	[-17.180]	[0.610]
% Insider (*t-1*)	0.058***	0.006***	0.067***	0.042***	0.013**	0.014**	0.031***
	[6.178]	[3.752]	[19.670]	[2.839]	[2.319]	[2.342]	[5.338]
# of Analysts (*t-1*)	-0.125***	-0.007***	-0.112***	-0.151***	-0.095***	-0.024***	-0.020**
	[-28.426]	[-4.142]	[-23.183]	[-18.234]	[-33.116]	[-5.225]	[-2.442]
MSCI Index	-0.295***	-0.077***	-0.333***	-0.197***	-0.418***		
	[-36.342]	[-25.157]	[-36.281]	[-12.231]	[-51.909]		
Parent (ADR)	-0.087***	0.042***	-0.067***	-0.156***	-0.130***		
	[-5.609]	[6.485]	[-4.090]	[-5.257]	[-10.729]		
Observations	108846	109120	74972	33874	108846	108846	21599
Adjusted R-squared	0.827	0.558	0.834	0.823	0.601	0.927	0.919

Table 6.
Regressions of Liquidity on Foreign Institutions : Alternative Regressions

Description: This table presents annual country-fixed effect panel regression estimates of stock liquidity on foreign ownership using alternative specifications for non-U.S. firms from 2000-2007. The dependant variable is ILLIQ defined as the natural logarithm of the average daily ratio of the absolute return divided by the US$ volume traded following Amihud (2002). The dependant variables include % foreign institutional ownership below the median level of foreign ownership, % foreign institutional ownership above the median level of foreign ownership, # of foreign institutions that own a stock and % of total foreign institutional ownership. The control variables are: Market Cap. is the log of the market capitalization in U.S. dollars. Market-to-book is the logarithm of the market-to-book equity ratio. Return is the total return of the stock over the year. Turnover is the total shares traded in a year divided by the total shares outstanding. Volatility is the logarithm of the standard deviation of daily stock returns estimated during the year. % Insider Ownership is % of shares held by insiders. # of Analysts is the total number of analysts covering the stock from I/B/E/S database. MSCI Index is a dummy variable equal to 1 if the stock is included in the MSCI All World Index. Parent Dummy (ADR) is equal to 1 if the stock has an ADR. The regression constant is suppressed. Robust t statistics in brackets. *** p<0.01, ** p<0.05, * p<0.1

	[1]	[2]	[3]	[4]	[5]
	Full Sample	*Developed*	*Emerging*	*Full Sample*	*Full Sample*
% Foreign IO below median (*t-1*)	-0.104***	-0.110***	-0.122***		
	[-12.208]	[-12.594]	[-6.188]		
% Foreign IO above median (*t-1*)	-0.004***	-0.004***	-0.007***		
	[-6.397]	[-5.384]	[-4.394]		
# of Foreign Inst. (*t-1*)				-0.027***	-0.019***
				[-8.431]	[-6.037]
% Foreign IO (*t-1*)					-0.014***
					[-4.920]
Control Variables					
Market Cap. (*t-1*)	-0.604***	-0.628***	-0.529***	-0.655***	-0.652***
	[-93.213]	[-92.795]	[-39.988]	[-89.027]	[-87.916]
Return (*t-1*)	-0.000	-0.000**	-0.065	-0.000**	-0.000***
	[-1.321]	[-2.219]	[-0.817]	[-2.569]	[-2.614]
Market-to-Book (*t-1*)	-0.011***	-0.014***	-0.005	0.022***	0.023***
	[-4.240]	[-4.688]	[-0.924]	[7.529]	[7.605]
Turnover *(t-1)*	-0.011	-0.004	-0.184	-0.001	-0.001
	[-1.518]	[-1.393]	[-1.592]	[-0.738]	[-0.736]
Volatility (*t-1*)	-0.107***	-0.108***	-0.110***	-0.053***	-0.053***
	[-30.433]	[-28.025]	[-12.612]	[-17.219]	[-17.304]
% Insider Own (*t-1*)	0.060***	0.072***	0.041***	0.014**	0.014**
	[6.129]	[21.097]	[2.816]	[2.345]	[2.341]
# of Analysts (*t-1*)	-0.123***	-0.112***	-0.141***	-0.023***	-0.022***
	[-28.093]	[-23.310]	[-17.162]	[-4.974]	[-4.914]
MSCI Index	-0.280***	-0.319***	-0.178***		
	[-34.908]	[-35.148]	[-11.165]		
Parent (ADR)	-0.083***	-0.067***	-0.143***		
	[-5.338]	[-4.056]	[-4.861]		
Fixed Effects:	*Country-Year*	*Country-Year*	*Country-Year*	*Country-Year*	*Country-Year*
				Firm	*Firm*
Observations	108846	74972	33874	108846	108846
Adjusted R-squared	0.829	0.836	0.825	0.927	0.927

Table 7.
U.S. Dividend Tax Cut and U.S. Tax Sensitive Institutions

Description: This table presents annual panel and 2SLS regression estimates of the effect of the US dividend tax cut on foreign ownership for non-U.S. firms from 2000-2007. The dependant variable, US% Tax, in columns [1]-[2] is the % ownership by active US mutual funds. The dependant variable in columns [3]-[5] is the *Illiq* measure defined as the natural logarithm of the average daily ratio of the absolute return divided by the US$ volume traded. Qualifed dummy equals 1 if the stock pays dividends and is listed in a tax-treaty country. Post 2003 is equal to 1 if the year is after 2003. Treatment is equal to the interaction between the Qualified and Post 2003 dummies. Market Cap is the log of the market capitalization in U.S. dollars. Market-to-book is the logarithm of the market-to-book equity ratio. Return is the total return of the stock over the year. % Insider Own is % of shares held by insiders. # of Analysts is number of analysts covering the stock from the I/B/E/S database. MSCI Index is a dummy variable equal to 1 if the stock is included in the MSCI All World Index. Parent Dummy (ADR) is equal to 1 if the stock has an ADR. The regressions include country fixed-effects and year dummies. The regression constant is suppressed. Standard errors are clustered by country-year. Robust t statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

	US% Tax	**US% Tax**	**ILLIQ**	**ILLIQ**	**ILLIQ**
	[1]	[2]	[3]	[4]	[5]
US % Tax sensitive ownership					-0.700**
(Instrumented with Treatment)					[-2.121]
Treatment Interaction		0.234***		-0.163***	
*(Qualifed * Post 2003)*		[4.470]		[-2.838]	
Qualified (Dividend payer)		0.107***		0.165***	0.239***
		[3.092]		[3.966]	[3.061]
Post 2003		0.185***		-0.257***	-0.484***
		[3.549]		[-3.326]	[-3.180]
Control Variables					
Market Cap.	0.172***	0.159***	-0.869***	-0.873***	-0.762***
	[10.639]	[10.367]	[-44.322]	[-44.105]	[-14.290]
Return	0.000	-0.000	0.000	-0.000	-0.000
	[0.319]	[-0.534]	[0.053]	[-0.424]	[-0.849]
Market-to-Book	0.035***	0.045***	-0.217***	-0.211***	-0.179***
	[2.851]	[3.670]	[-9.741]	[-9.871]	[-6.555]
Turnover	-0.000	-0.000	-0.002	-0.002	-0.002
	[-0.852]	[-0.838]	[-1.113]	[-1.114]	[-1.100]
Volatility	0.019	0.069**	-0.476***	-0.459***	-0.411***
	[0.748]	[2.422]	[-10.018]	[-9.828]	[-7.152]
% Insider Own	-0.001***	-0.002***	0.005***	0.005***	0.004***
	[-3.194]	[-3.589]	[5.065]	[4.973]	[3.526]
# of Analysts	0.082***	0.082***	-0.100***	-0.101***	-0.044
	[12.142]	[12.155]	[-22.441]	[-22.623]	[-1.520]
Dividend Yield	-0.000	-0.000*	0.000	0.000	0.000
	[-0.768]	[-1.887]	[0.741]	[0.526]	[0.138]
MSCI	0.444***	0.455***	-0.826***	-0.820***	-0.502***
	[9.042]	[9.521]	[-16.088]	[-16.211]	[-3.134]
Parent (ADR)	0.978***	0.985***	-0.271***	-0.261***	0.428
	[8.779]	[8.887]	[-5.937]	[-5.670]	[1.299]
Observations	118838	118838	118838	118838	118838
Adjusted R-squared	0.221	0.223	0.821	0.821	0.648

Table 8.
Information Competition and Liquidity Provision

Description: This table presents annual standardized country-fixed effect panel regression estimates of stock liquidity on foreign ownership for non-U.S. firms from 2000-2007. The control variables and regression intercept are not reported. Panel A splits firms into quartiles based on the average stock PIN in their country (Lai, Ng and Zhang (2009)). Panel B splits firms into quartiles based on the prevelance of Insider Trading (World Economic Forum - Global Competitiveness Report) in their country.

$$Illiq_{i,t} = a + \beta_1 *\%\ Active\ MF_{i,t-1} + \beta_2 *\%\ Index\ MF_{i,t-1} + \Sigma\beta_j * Firm\ characteristics_{j,i,t-1} + \gamma_{k,t} + \varphi_{i,t} + \varepsilon_{i,t}$$

The dependant variable *ILLIQ* is defined as the natural logarithm of the average daily ratio of the absolute return divided by the US$ volume traded following Amihud (2002). % Active MF is measured as the % of shares outstanding held by foreign active mutual funds. % Index MF is measured as the % of shares outstanding held by foreign active mutual funds.7 lagged firm characteristics are included but not reported: 1. log of the market capitalization in U.S. dollars 2. logarithm of the market-to-book equity ratio 3. total return of the stock over the year 4. % of shares held by insiders 5. # of analysts 6. MSCI Index dummy 7. Parent dummy if the stock has an ADR. All variables are standardized with mean 0, and standard deviation 1. All regressions include country-year fixed effects $\gamma_{k,t}$; Columns [4]-[5] include firm fixed effects $\varphi_{i,t}$. The regression constant is suppressed. Standard errors are clustered at the firm level. Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Panel A. Country PIN

	World*	High PIN	(2)	(3)	Low PIN	Difference *(High minus Low)*
% Active MF	-0.017***	-0.054***	-0.034***	-0.013***	0.004	-0.059***
	[-4.757]	[-3.096]	[-4.391]	[-4.534]	[0.632]	[-3.08]
% Index MF	-0.039***	-0.083**	-0.059***	-0.027***	-0.039***	-0.044
	[-8.484]	[-2.512]	[-8.607]	[-6.394]	[-5.619]	[-1.30]
Control variables suppressed						
Observations	108092	9589	25625	45319	28313	
Adjusted R2	0.813	0.721	0.807	0.836	0.769	

Panel B. Prevalence of Insider Trading

	World*	High Insider Trading	(2)	(3)	Low Insider Trading	Difference (*Small minus Large*)
% Active MF	-0.017***	-0.046***	-0.015***	-0.017***	-0.018***	-0.028***
	[-4.728]	[-4.041]	[-4.154]	[-5.616]	[-6.073]	[-2.38]
% Index MF	-0.041***	-0.046***	-0.038***	-0.037***	-0.030***	-0.016***
	[-8.950]	[-3.168]	[-8.841]	[-8.902]	[-6.380]	[-2.82]
Control variables suppressed						
Observations	108632	21921	86506	68854	54288	
Adjusted R2	0.813	0.839	0.819	0.837	0.838	