

Foreign Investors' Trading Disadvantage in U.S. Stock Markets

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Abstract

We examine the equity prices realized on United States exchanges by domestic institutional investors compared to foreign domiciled money managers. The average equally weighted disadvantage of foreign investors for purchases (sales) is 3.6 (5.1) basis points on a daily interval, and 19.1 (20.5) basis points weekly. The disadvantage persists across different stock types and exchanges. Foreign investors pay approximately three cents per share less than local institutions in brokerage commissions, a seemingly sufficient edge to offset their disadvantage in realized prices. However, relating explicit costs to realized prices, we show that local investors benefit more from their brokerage commissions than foreigners.

I. Introduction

The costs of executing security trades are significant in the assessment of an investment's performance. Comparing the transaction costs incurred by one group of investors to another is an issue of perennial interest to academics, investors and policy makers. Hence, there is now a large and growing literature investigating whether foreign investors incur greater equity trade execution costs than domestic traders. For example, Hau (2001), and Dvořák (2005) examine foreign investor's comparative transaction-level trading performance. Both studies concur with Choe, Kho, and Stulz's (2005) findings, based on Korean data, that local investors have an informational advantage over foreign traders. This explanation relies on models such as Brennan, Cao, Strong, and Xu (2005), in which domestic investors are more knowledgeable about the returns on local investments than foreign investors.

In this article, we provide additional evidence on the issue through an empirical comparison of the realized prices and explicit equity execution costs incurred by foreign institutional investors compared to domestic trades in United States' stock markets. Using a proprietary institutional trading data set provided by Abel/Noser Corporation, U.S., that discloses the home country of the initiator of a trade, we match foreign investors' trades by stock with their domestic equivalents and then estimate differences in realized prices and explicit costs between the two samples.

Apart from being the first empirical analysis of the comparative performance of foreign investors' equity trades in the U.S., this study offers two important additions to the existing literature. First, our empirical approach allows results to be confirmed on different trading exchanges (NYSE and Nasdaq). We also report on the validity of our

findings across the main types of equity securities common stocks and American Depository Receipts (ADRs). These two attributes of the study confirm that the disadvantage experienced by foreign investors in papers such as Bonser-Neal, Linnan, and Neal (1999), Choe, Kho and Stulz (2005, hereafter CKS), Dvořák (2005), Richards (2005) and Kalev, Nguyen and Oh (2008) are not due simply to idiosyncratic non-U.S. market factors. There are significant differences in trading mechanisms and risk characteristics affecting transactions executed across U.S. exchanges and stock types, which suggest finding stable results in line with the previous literature offers an important out-of-sample contribution to the literature.

A second advantage offered by this paper is that our analysis accounts for differences in explicit transaction costs incurred by foreign investors compared to local money managers. This issue, to the best of our knowledge, has not been examined before, a surprising gap in the existing literature as commissions and fees can reasonably be expected to contain information about the agency relationship between brokers and their clients. Portfolio managers are concerned with whether there is a tradeoff between brokerage commissions and the quality of trade execution as reflected in the execution price (Block, French and McInish (1994)). The end of fixed brokerage commissions in the U.S. on May 1, 1975 led to lower negotiated commissions which have since been further reduced by technological improvements and increased competition from nontraditional service providers such as discount brokerages. However, these developments have not diminished the importance of commissions in the relationship between investors and stockbrokers. Traders must know how well their brokers work on their behalf for a given direct trading cost to decide which brokers should receive their

orders now and in the future (Harris (2003)). Similarly brokers can use commissions to discriminate between clients in quality of service offered. For instance, Reuter (2006) finds a strong positive correlation between past commissions paid by fund managers and the initial public offerings allocated to them by lead underwriters. Citing anecdotal market practice Goldstein, Irvine, Kandel, and Wiener (2006), observe that discrimination among clients is a common feature of the brokerage industry. Some customers are given disproportionately better service on the basis of their long term relationship with the broker. Goldstein, Irvine, Kandel, and Wiener (2006), suggest per share commissions are in effect a fixed fee which, when paid, entitles a client to premium services, not a marginal cost of trade execution as generally assumed in the literature (see, for example, Bertsimas and Lo (1993) and Conrad, Johnson, and Wahal (2001)). Block, French, and McInish (1994) allow for a variable component in commissions that is used to pay for particularly difficult trades.

Understanding the institutional arrangements pertaining to investing abroad is critical for interpreting the findings of this study. A foreign money manager intending to invest in U.S. stocks typically appoints a full service brokerage in their home market that maintains relationships with banks and brokers in the U.S. Banks enter the process to facilitate currency transactions, effect international financial transfers, and arrange for the custody of securities in the U.S. Securities and Exchange Commission (SEC) regulations require that U.S. brokers facilitate the actual equity trades, even where a foreign broker dealer is involved.¹ Overall commission costs are therefore likely to be higher than the

¹ In June 2007, the SEC published proposals to amend rule 15a-6 of the 1934 Securities Exchange Act to allow foreign broker-dealers to directly solicit more investors and rely less on U.S. broker-dealers acting as intermediaries. However, a U.S. broker-dealer will still be required to effect transactions involving an U.S. exchange.

trader's routine local trades, since two brokerages are involved, and currency exchange fees and local taxes are charged. On selling securities the reverse of these steps is followed until capital is repatriated to the foreign institution. By investing from a distance and mostly through more than one (home market) stockbroker, we expect foreign investors to have different agency arrangements with U.S. brokerage houses than domestic traders. This difference could manifest itself in the quality of brokerage service delivered to the two investor types. We examine whether the nature of international money managers' relations with U.S.-based brokers affects the explicit trading costs they are charged. We also compare the sensitivity of brokerage commissions paid by foreign and domestic investors, respectively, to their realized stock prices.

Our results are summarized as follows. On realized prices, we find that foreign investors experience an average daily equally weighted disadvantage of 3.6 basis points (bps) for stock purchases and 5.1 bps for sales. To illustrate the economic significance of this evidence, a foreign institutional investor incurring this round trip cost of 8.7 bps needs to trade just 12 times in a year to reduce annual returns by one percentage point. This drag on performance is non-trivial given that foreign investors earn an average 3.5% per annum from U.S. financial assets (Gourinchas and Rey (2006)). The results generally hold after we partition our sample according to trade sizes, stock types and trading exchanges. For example, after we remove tax haven countries from the sample of investors' countries of origin, the buy (sell) disadvantage is 5.4 (6.2) bps. For common stock trades executed on NYSE and Nasdaq exchanges only, foreign investors face a 6.7 (6.7) bps price differential relative to locals. For ADR trades the differential decreases to 4.7 (5.8) bps for buys and sells, respectively. The full impact of our headline daily

foreigner disadvantage estimate is more apparent when one considers investors' repeated trades over long periods. Translated to weekly measures, the equally weighted buy (sell) disadvantage to foreign investors is 19.1 (20.5) bps. Our findings show that even in the U.S., a well established and highly competitive market, the "burden of foreignness" affects international investors' realized prices.

We ask whether there is any evidence that foreign traders shun those U.S. stockbrokers who deliver poor trading performance. Controlling for broker identity and therefore limiting the analysis to trades where domestic and foreign investors use the same brokers, we find that the disadvantage persists for stock purchases but not for sales. This finding suggests that a potential economic explanation for at least part of the difference in trading performance between foreigners and locals can be attributed to an external money managers' relationship with the U.S.-based broker.

We examine whether relations between brokers and investors, symbolized by explicit transaction costs, affect implicit transaction cost outcomes differently between foreigners and locals. Foreign investors pay approximately six cents per share less in total explicit costs than local money managers, equivalent to 19 basis points on an average share price of \$32. This difference is split equally between brokerage commissions and trading fees, although fees are subject to wider, trade specific variations. Relating brokerage commissions to realized equity prices, the evidence suggests domestic investors' trades have a greater sensitivity to the quality of service provided by brokers. For example, we find that if domestic investors increase the fixed component of their brokerage commissions by one percent, they reduce the market impact of stock purchases by 0.19%. In comparison, foreign investors' commissions have a negligible bearing on

their implicit costs. The transaction cost savings due to foreign investors paying lower explicit costs are sufficient to make up for their disadvantage in realized prices, but seem to be insufficient to give foreign institutions the ability to negotiate difficult trades through their brokers.

While unique in its focus on explaining the role played by broker client relations in the burden faced by foreign investors, this paper naturally contributes to the literature contrasting the performance of foreign and domestic investors' portfolio flows. Some studies find superior performance by domestic investors (e.g. Shukla and van Inwegen (1995) and Dvořák (2005)) while others show contrary findings (e.g. Grinblatt and Keloharju (2000) and Seasholes (2000)). Of particular interest to this study, Dvořák (2005) examines the special case of Indonesia's separately licensed local and global brokerages and finds clients of the former earn higher short term stock returns while those of the latter are better long term performers. Our findings call for an extension of empirical assessments of foreign investors' return performance to the U.S. and for the inclusion of brokerage arrangements in studies comparing foreign and domestic investors. Finally, this paper has implications for our understanding of the home bias in investors' portfolios (see, for example, French and Poterba (1991) and Tesar and Werner (1995)) and the pace of the globalization of investment flows. Investors' transaction costs incurred abroad and their relations with brokers are important additions to the home bias phenomenon.

The rest of the paper is organized as follows. In the second section we describe the transactions data, the sample selection process, and institutional details underpinning this study. The third section quantifies the extent of foreign trader disadvantage in

implicit costs. We investigate differences in explicit costs and relate commissions to implicit costs in the fourth section. The last section summarizes and concludes.

II. Data

The trade-level data we use in this paper are from Abel/Noser Corporation, an agency only brokerage firm located in New York. The data consist of U.S. equity trades initiated by institutional traders based in over 65 countries for the period 1 July 1999 to 30 September 2004. This data set has been intermittently released to academic researchers over the past two decades and has spawned studies starting with Berkowitz, Logue, and Noser (1988). The data include the transactions of institutional brokers who subscribe to Abel/Noser's trade execution analysis services. It is worth noting that the investors represented in our sample are likely to be better informed about trading costs than the average trader. The trading costs we measure using this database could therefore understate the average trading costs of all institutional investors, as Blume (1993) noted.

Each observation in the database includes information relating to: (1) date and time stamps for the order at various points, including decision, entry, placement and execution (2) the stock symbol, (3) the number of shares, (4) an Abel/Noser identifier of the brokerage firm that executed the trade, (5) and the broker's commission and fee charges. The critical attribute of the data set from the perspective of our study is that it contains identifiers for the country of origin of each trade initiator. This characteristic has not been used in the literature to date. Another unique quality of the database is that the

trade direction is explicitly given, removing the need to devise a separate method of distinguishing buy from sell transactions.

We identify all instances when local investors initiate trades in the same securities as foreigners. We begin with trades recorded on the same day, then, separately, over the Monday to Friday week window when financial markets are open, excluding holidays. We now have daily and weekly samples for the two classes of trades, domestic and foreign initiated, that form the basis of our analysis. We describe the samples in Table 1. For ease of data handling, we restrict our sample of investors' country of origin to those with no less than 100 trades and where each stock is traded at least five times over our sample period. Several common stocks and ADRs moved from one exchange to another during the sample period. We account for these changes to avoid double counting. We also exclude two NYSE listed closed-end funds and a Nasdaq share of beneficial interest (SBI) stock. Our procedure identifies 426 stocks that are traded by both locals and foreigners based in 52 countries. There are 3,869,765 trades in the matched set. Of these trades domestic (U.S.) investors initiate 3,335,162 and foreigners 534,603 trades, about 16 percent of the sample. The exchange foreign investors use most is NYSE. The average stock price per trade is approximately \$32.00 based on all sample trades. Foreigners and domestic institutions tend to purchase and sell similarly priced stocks, regardless of trading exchange.

[Table 1 around here]

A potential concern about the representativeness of our equity trades data needs to be addressed. How similar are Abel/Noser's client trades to those of other international investors? We compare Abel/Noser flows with monthly cross border aggregates of U.S.

bound equity portfolio flows from the U.S. Treasury International Capital System (TIC). We find that the aggregate inflows and outflows are highly correlated at the monthly level with Abel/Noser flows. The correlation coefficients for this comparison are 0.63 and 0.61 for buys and sells, respectively, showing our data substantially capture the actual patterns of U.S. bound institutional money flows. These high correlations occur despite the fact that the TIC data include trading activity not in the Abel/Noser data, such as, individual investor transactions and trades in unlisted stocks.

We enrich the transactions database using information from the Center for Research in Security Prices (CRSP) database. Specifically, we obtain individual stock characteristics requiring time series data, including, shares outstanding, volume, opening and closing prices, daily high and low prices, CUSIPs, company name, ticker, PERMNO, share codes, and stock exchange codes.

For data quality assurance we carried out a number of standard cross checks for variables contained in our base data set with other sources. For example, when matching stocks with other databases, we used ticker codes together with codes provided by Abel/Noser, and also cross referenced them with CUSIP identifiers. The two-letter country codes in the Abel/Noser data set were cross-referenced to United Nations data for validation. As a result, we excluded the few ambiguously referenced or coded country identifiers we find, including single letter or other symbol codes in obtaining our final sample of 52 countries.

III. Differences between Foreign and Domestic Investors' Trading Prices

In this section we examine differences between the prices realized by foreign investors and those reported for the matched daily sample of domestic trades.

A. Approach

We follow CKS (2005) in calculating the volume-weighted average price (VWAP) as in Eq. (1).

$$A_i^d = \frac{\sum_t P_i^{dt} V_i^{dt}}{\sum_t V_i^{dt}}. \quad (1)$$

In the specification, P_i^{dt} is the price of stock i on day d for trade t . V_i^{dt} is the number of shares of the trade for stock i on day d for trade t .

Next, the VWAP for purchases and sales measured separately for domestic and foreign investor classes, denoted j , is given by Eq. (2).

$$B_{i,j}^d = \frac{\sum_t P_{i,j}^{dt} V_{i,j}^{dt}}{\sum_t V_{i,j}^{dt}}. \quad (2)$$

Finally, we compute the price ratio, $B_{i,j}^d / A_i^d$, for all purchases (and sales) by institutional investors of type j for stock i on a given day d . A price ratio of more than one for buys for a particular institutional investor implies that this investor has a buy trade above the mean price on that day. This gives us a measure in percentage terms that we can relate in basis points, results of which we show in tables where the column is headed “D-F x 100” (i.e., Domestic minus Foreign times 100).² Since any advantage or

² From the trade data we cannot determine if foreign institutional investors are trading U.S. stocks from inside the U.S. or whether subsidiaries of U.S.-based institutional investors are trading U.S. stocks from

otherwise faced by foreign investors can persist beyond the CKS (2005) daily perspective, as Dvořák, (2005) notes, we also implement the analysis on a weekly basis. Obtaining the weekly measures in our subsequent analysis is analogous to the daily trades approach.

The main advantage of using price ratios in comparing the price performance of different investor types is that the method does not rely on deviations from model driven expected price estimates that require arbitrary assumptions on the price formation process. In later tests, we use measures of realized prices that rely on independent or “unperturbed” benchmarks and are increasingly popular with practitioners and financial economists.

Following CKS (2005) we split our sample by trade sizes to take into account that prices could be determined differently for large versus small trades, for example. We therefore apply the execution performance measures described above on the full sample, and separately on samples representing large (over \$150,000), medium (between \$20,000 and \$150,000) and small (below \$20,000) trades.³ In line with CKS (2005), our arbitrary break points in the three size samples are in dollar value as opposed to shares, which

outside the U.S. However, if such investors exist in our database, we treat them as foreigners and locals, respectively, and their effect would likely be to reduce the magnitude of our disadvantage measure. We thank Hui Zheng for raising this point.

³ We adopt these trade size cutoff points to achieve sub-samples that each represent approximately one third of the full sample. For comparison, the Choe, Kho, and Stulz (2005) small trade sample cutoff is equivalent to approximately US\$4,200.

enables us to control for the wide variation in stock prices across the U.S. exchanges for common stocks and ADRs.

To provide new evidence on the relative performance of investors conditioned on whether they are local or not, we measure differences in prices across various trading exchanges NYSE, Nasdaq and Amex. We also consider each of the main stock types, common stocks, and ADRs separately.

B. Results

We begin by summarizing the results of univariate tests of differences in implicit transaction costs between the foreign and domestic samples in Table 2. The mean differences, *t*-statistics and *p*-values are in the last three columns. We arrange the table into nine panels starting with the results for the full sample and followed by sub samples sorted by countries that “exclude flag of convenience” (EXFOC) countries, security type and stock exchange. “Flag of convenience” (FOC) countries include tax havens and U.S. territories such as, Bermuda, Cayman Islands, Netherlands Antilles, British Virgin Islands and U.S. Virgin Islands, Marshall Islands, Bahamas, Barbados, and Puerto Rico. Sample size restrictions preclude us from separating ADRs from common stocks in the case of Amex. Within each panel, we summarize results for the sample as a whole without considering trade size, followed by the findings based on our trade size categories. Throughout the table buys and sells are reported separately to facilitate comparison of this paper’s findings with those of prior studies.

[Table 2 around here]

The results in Table 2 in the column headed “D-F x 100” confirm that foreigners trade at a disadvantage most of the time they buy or sell stocks in the U.S. In Panel A we

see that the average daily equally weighted disadvantage for the total sample of foreign institutional investors (i.e., Domestic minus Foreign) for purchases is 3.6 bps and 5.1 bps for sales. The disadvantage experienced by foreign institutional investors in the U.S. is higher than in Korea where CKS (2005) show a equally weighted buy (sell) disadvantage of 2.4 (1.6) bps. To put the economic significance of our evidence in context, consider a foreign investor who trades U.S. stocks regularly. In a year, she needs to make only 12 round trip trades before incurring a one percentage point drag on her equity portfolio returns relative to locals.

Our tests of foreign trader disadvantage in Panel A include FOC countries. These countries can confound our results as the motives of their U.S. bound portfolio flows are likely related to factors such as taxation considerations that do not apply to other countries. Moreover, making a clean distinction between investors based in FOC countries and purely domestic traders can be problematic. Domestic (U.S.) money managers do invest through FOC countries for tax minimization purposes or to achieve anonymity. For example, the U.S. Congress, summarizing committee hearings on international securities fraud stated that “witnesses testified that some U.S. and foreign investors avoid SEC scrutiny of their transactions in U.S. markets by executing their transactions through financial institutions in foreign countries that have bank secrecy and blocking statutes” (U.S. Congress (1992, p.157)). When we remove tax haven countries from the sample of investors’ countries of origin, the buy (sell) disadvantage is even higher at 5.4 (6.2) bps.

The rest of the results in Table 2 generally attest to the robustness of the measures of the disadvantage experienced by foreign traders. The differences in prices realized

persist regardless of type of security, trade size and stock exchange. Based on the extent of their disadvantage relative to locals, foreign institutional investors are worse off when trading either common stocks or ADRs on NYSE, rather than on Nasdaq.

The evidence on the foreigner disadvantage in trading ADRs requires further scrutiny. It is reasonable to expect that when foreign investors are trading in ADRs from their own home market they have better “firm specific” information relative to domestic U.S. investors. This opens up the opportunity for a potentially powerful test of whether information asymmetry is the main contributor to the foreigner disadvantage. We isolate all those foreign-originated trades that involve ADRs outside the investor’s head share home market. However, we find that these trades constitute only 3.4% (2.4%) of buys (sells) in our sample. Removing them from our ADR based tests of differences in trade prices does not alter our findings of a foreigner disadvantage. It appears from these findings that even in a context where information asymmetry is not a major distinguishing factor between domestic and foreign institutional investors the latter still remain at a trading disadvantage.

Looking at the foreign disadvantage from the perspective of trade direction yields a potentially interesting trend. It appears that the extent to which foreign investors “overpay” on buying stocks is less than how much they are “undercut” on selling stocks. Could it be that this finding is a result of foreign investors being more impatient when selling or choosing to sell when markets are illiquid? CKS (2005) test for this possibility and do not find evidence supporting the conjecture.

[Table 3 around here]

The trade weighted price ratios and differences across stocks over the 1,320-day study period are summarized in Table 3. Our headline trade weighted buy (sell) result of 2.3 (3.5) bps is similar to our equally weighted buy (sell) result of 3.6 (5.1) bps. This finding differs from CKS (2005) who report a much larger buy (sell) trade weighted disadvantage of 21.2 (16.3) bps for foreign institutional money managers in Korea.

Price difference estimates based on FOC data are not tabulated for sake of brevity. There are too few FOC specific ADR trades on either NYSE or Nasdaq to enable meaningful statistical analysis. However, results for the full sample of trades originating from FOC countries, and those executed on NYSE and Nasdaq common stocks show that the burden of being foreign is considerably lower in magnitude, though statistically significant, in a number of buy samples. However, many of the coefficients have opposite signs to those reflected in Table 2. A likely cause of these mixed findings is the ambiguity of U.S. bound investment flows described above. Hence, in further tests we exclude FOC countries. We also exclude Amex based trades because of restrictions of the data noted above.

The results from our weekly analysis confirm our findings of foreign disadvantage with even more significance in economic terms than the daily results (see Appendix A, for a selection of results based on equally weighted price ratios). For example, at the total sample level, the foreign disadvantage for buys (sells) is 19.1 (20.5) bps. Comparing the weekly disadvantage with our findings from a daily analysis highlights the foreign trader long-term disadvantage is not just intra-day (Dvořák (2005)). The results reflect the disadvantage accumulated over time. The weekly results show that the foreigner disadvantage is larger for worked trades. One implication of the findings is that, wherever

possible, foreign traders should not work orders for longer than a day. To be conservative in our analysis, and for brevity, we base the remainder of our price ratio tests on daily observations.

In summary, foreigners clearly suffer from a “burden of foreignness” in economic and statistically significant terms in most instances. Daily differences are narrower than weekly differences, suggesting that difficulty in trade (inability of foreigners to fill trades in a short time) is an important issue requiring further analysis. Our univariate analysis of differences in average prices paid between foreign and domestic traders strongly suggests that splitting trades by country of origin has a significant bearing on execution quality, specifically price impact.

C. Robustness and Further Tests

In this section we address several outstanding questions relating to our main findings. First, we confirm our findings using alternative measures of realized prices. We define ITC_d , ITC_e , ITC_p , ITC_c and ITC_m as implicit transaction costs or the difference between transaction costs and benchmarks based on decision, entry, placement, closing and the mean of the high and low price for the day, respectively.⁴ Hence, ITC equals execution price minus the benchmark, for buy trades, and ITC equals the benchmark minus the execution price for sells, with the subscripts denoting the basis for determining the benchmark price. Both pre-trade (ITC_d , ITC_e , ITC_p) and post-trade (ITC_c and ITC_m)

⁴ Note that the Abel/Noser database contains two types of transaction costs against each trade – the average trade price for trades making up a given order and the specific trade price. Given investors’ concern with the overall cost of trading, in this section and subsequently we utilize the former cost. Results based on specific trade prices are qualitatively similar to those reported here and are available from the authors upon request.

metrics are represented in our choice of benchmarks for estimating implementation shortfall. The benchmarks used in measuring implicit transaction costs are variations of price impact, a popular measure of execution quality among practitioners and financial economists (see, for example, (Beebower and Priest (1980), Perold (1988), Blume (1993) and Kissell, Glantz and Malamut (2004)). Using this approach to measuring implicit cost provides a robustness check of the CKS (2005) foreigner disadvantage we have used so far in this study.

The evidence presented in Table 4 is consistent with our findings based on price ratios. Domestic investors tend to buy at prices closer to our pre-trade and post-trade benchmarks than foreigners. In other words local investors buy stocks at lower prices. When it comes to selling, domestic investors sell at prices statistically higher than our benchmarks (in all but one case) than prices realized by foreigners. On the basis of prices relative to benchmarks, the domestic-foreign differential is higher by a factor of three on average for sells than buys. From a price impact perspective, it appears local investors exercise greater stealth over foreigners when buying and then realize favorable sale prices at the risk of higher indirect transaction costs.

[Table 4 around here]

The second issue we target is whether our findings on price ratios are uniformly applicable throughout our sample period. We split the sample period into three sub-samples of 440 trade-days each and repeat our price ratio analysis. We report the results in Panels A-C of Appendix B. The patterns of foreign investor disadvantage we report above generally hold. Only in the third sub-period is the disadvantage experienced on buys not statistically significant. Generally, though, it is apparent in the results that the

disadvantage in latter stages of our sample period is significantly lower than at the height of the technology bubble (c 1999-2000) and subsequent to its bursting (c 2001). Our results also cover times of significant institutional changes in the U.S. markets. Our second sub-sample period of 440 trade-days, for example, broadly coincides with decimalization on NYSE and Nasdaq markets in early 2001.⁵

We also target another significant date in our sample period, September 11, 2001. It is possible that investors' perceptions of the U.S. stock markets, and potentially, our results, were affected by the major disruptions to financial markets caused by the attacks on the U.S. and more specifically New York, the world's most influential financial center for equities. We therefore split our analysis between the periods prior to and post September 11, 2001. We report the results in Panels D and E of Appendix B. The buy and sell disadvantage applies to both sub-samples. However, it is clear that the magnitude has fallen, by 5.16 (5.24) bps for buys (sells). There are at least two possible reasons for the decline in foreign trade disadvantage after September 11 2001. The reduced market impact costs resulting from the fall in tick size following decimalization and subsequent competition for order flow in the U.S. equity markets could have resulted in the lowering of the magnitude of the foreigner disadvantage. Further, it could be that advances in information technology have reduced information asymmetry between domestic and foreign investors.

⁵ NYSE changed its stock prices from fractions to decimals effective from the 29th of January 2001. On Nasdaq decimalization took place in phases starting on the 12th of March 2001 (14 stocks), through 26 March 2001 (197 stocks), to 9 April 2001 for the rest of the stocks.

The third and fourth issues requiring further investigation are linked to the potential that investors' relative economic power explains the observed foreign trader disadvantage. Are the results driven by trade size? Market microstructure theory suggests that if one of our investor types systematically initiates larger trades than the other, that investor type should incur greater market impact costs, and a greater disadvantage, than the other. Conrad, Johnson, and Wahal (2001) argue that large trades, compared to normal trading volume, generally have higher execution costs due to liquidity or adverse selection effects. We have already shown that foreign investors are at a disadvantage across large, medium and small trade sizes. Further, we carry out simple difference in means tests on the trade volumes and values between domestic and foreign investors.⁶ Local investors trade in larger parcels of common stocks, for both buys and sells, than foreigners at statistically significant levels. Similar patterns characterize trades in ADRs; only the difference in sell volumes is statistically indistinguishable from zero.

If trade size is not responsible for domestic investors' trading advantage, do foreign investors shun those brokers that deliver poor prices? If such brokers cannot be avoided then they could be wielding market power to extract rents from foreign investors for prior investments in the security trading infrastructure.⁷ They could also be indirectly rewarding local clients that offer more and sustained deal flow than foreign investors. We restrict our matched domestic and foreigner trades sample to only those instances where locals and foreign money managers use the same brokers. Applying this filter gives us a sub-sample of 534,603 foreign trades and 462,794 domestic trades involving 402 stocks.

⁶ The results are available from the authors upon request.

⁷ We thank Avner Kalay for suggesting this explanation.

We repeat our comparative analysis of price ratios on this sub-sample. We find that the foreign investor disadvantage persists for buys, even though, at 2.6 bps, the difference is somewhat lower in magnitude than our headline results. The disadvantage reverses in the case of sells, with foreigners selling at prices that are 9.7 bps better than domestic money managers when using the same brokers. It appears that, at least in the case of sells, part of the reason why foreign investors attain inferior prices lies in their choice of broker. On the other hand, the persistence of the disadvantage in the case of buys conforms to the market power argument.

Finally, we compare our results with those derived from alternative trade size cutoffs. Instead of the trade value sample partitioning procedure outlined above, we separate the total sample by alternative trade value cutoffs and by trade volume. The trade value cutoffs are less than US\$32,000; US\$32,000-320,000; and above US\$320,000. These trade values are derived as the average price of US\$32 (see Table 1) multiplied by volumes of 1,000 and 10,000 stocks per trade. The trade volume cutoffs are 1,000 stocks; 1,000 to 9,999 stocks; and 10,000 or more stocks per trade. Trades over 10,000 shares constitute about 17% of trades in our sample and proxy for block trades. The trade size cutoff of 1,000 versus 5,000 was selected because trade sizes in the U.S. have been decreasing over time (in our sample trades less than 1,000 represented about 45% of total trades). We find that the results (available from the authors upon request) between the three sub samples are qualitatively similar to our earlier findings.

IV. Explicit Transaction Costs and the Foreigner Disadvantage

We now turn to examining the differences in explicit costs between domestic and foreign investors. The relationship between each of these investor groups and U.S.-based

brokerages is subject to unique institutional arrangements. Foreigners are more distant from their U.S. brokerages physically and by virtue of their usage of additional home-based brokers. This setting provides an apt laboratory to examine the role of agency arrangements, effected through commissions and fees, among determinants of differences in trade execution quality afforded the two investor types.

A. Magnitude of Differences in Explicit Transaction Costs

First we show differences in the level of explicit transaction costs paid by our two investor groups. Our findings so far suggest that if the hypothesis developed by Block, French, and McInish (1994) that brokerage commission is inversely related to indirect transaction costs is correct, then foreign investors must pay lower commissions. That foreign investors pay two sets of explicit transaction costs (to their home-market and U.S.-based brokers) would suggest a strong incentive for them to negotiate lower commissions and fees with their U.S. brokers. In addition, if “premium services” (Goldstein, Irvine, Kandel, and Wiener (2006)), for example receiving the first call when brokers discover new price sensitive information, are not within ready reach of foreign investors, their commissions should be lower. The prediction of lower explicit costs for foreign investors is contradicted by findings of higher implicit transaction costs for international institutional investment (see, for example, Perold and Sirri (1994) and Livingston and O’Neal (1996)). It would also be reasonable to expect that, faced with the burden of trading from a distance, foreign investors would wish to pay more for the services offered by U.S. brokers.

[Table 5 around here]

We present the results of difference in means tests for commissions and fees in Table 5. We consider total explicit costs and then commissions and fees separately. Panel A of Table 5 shows that on average domestic investors pay approximately six cents more per share than foreign investors in total explicit costs. This difference is split equally between commissions and fees. In Panel B we look at equity purchases alone. The difference is four cents per share in favor of foreign investors, and is slightly more in the case of commissions (three cents per share) than fees (two cents per share). When selling, the total explicit transaction cost advantage for foreign investors is even more pronounced, at eight cents per share. Domestic share market participants pay three cents more per share in commissions than foreign investors and five cents more per share in fees. Undoubtedly, and as demonstrated below by the relevance of commissions to quality of execution, the explicit transaction costs we report here are economically significant. However, equally significant is the fact that the saving on explicit costs, equivalent to approximately 19 basis points on an average share price of \$32, is sufficient to compensate foreign investors for the disadvantage they experience on implicit costs relative to local investors.

Note that we report the differences in commissions on the basis of cents per share as Goldstein, Irvine, Kandel, and Wiener (2006) suggest this is the most appropriate representation of U.S. institutional commissions. This is due to the fact that, unlike in Europe and Japan, for example, variation in the distribution of U.S. commissions is driven by price changes rather than commission level variations. The descriptive statistics presented in Table 5 seem to support the contention that commissions are fixed fees related to services provided by brokers to customers rather than a mechanism to pass on

marginal costs of trading. The main determinant of the difference in total explicit costs levied foreigners and locals are fees per share. The standard deviation on fees shows a variability which far outstrips that for commissions. It appears from the magnitude of the variability that individually determined fees for specific services are responsible for the extremes in explicit cost levels. In further tests, we use commissions as our unit of analysis. We also truncate commissions and taxes above \$0.30 per share, resulting in fewer than 0.5 percent of the observations being deleted.

B. Do Explicit Transaction Costs Explain Differences in Execution Quality?

Our second objective in this section is to relate explicit transaction costs to execution quality, measured by realized trading prices relative to pre- and post-trade benchmarks as described in Table 4. This analysis is similar in spirit to that of Block, French, and McNish (1994), and Berkowitz, Logue, and Noser (1988). We take into account previous theoretical and empirical patterns of relations between transaction costs and execution quality. Easley and O'Hara (1987) predict a positive relationship between execution costs and trade size as a result of adverse selection cost. Keim and Madhavan (1997; 1998), and Domowitz, Glen, and Madhavan (2001) find a positive correlation between implicit and explicit costs. They suggest the correlation can be explained by the fact that the more difficult trades, which tend to have higher price impacts, are given to full service brokers, who charge higher commissions. The nature of the tradeoffs between explicit and implicit transaction costs we hypothesize conforms to recent propositions by Goldstein, Irvine, Kandel, and Wiener (2006) that a fixed component dominates commissions. We allow for a variable component in commissions per Block, French, and

McInish (1994) to take into account the fact that at least a component of commissions is tied to trade characteristics.

Our base model explains the proportion of implicit costs in transaction prices in terms of commissions and market conditions following Block, French, and McInish (1994) and Berkowitz, Logue, and Noser (1988). Commissions per share (commissions in dollars divided by number of shares) incorporate the fixed component of explicit costs. The variable component is given by commissions per share times execution price times 100 as in Block, French, and McInish (1994). We use measures of market volatility (daily high stock price minus daily low stock price divided by daily low stock price) and trade difficulty (trade quantity divided by trade-day share volume) to represent the impact of market conditions on ease of execution. We do not utilize bid-ask spread, one of the traditionally utilized determinants of implicit transaction costs to avoid the econometric problems associated with including the measure together with commissions in the same regression. Li, Mooradian, and Zhang (2007) provide compelling long-run evidence that commissions are a proxy for liquidity as they are highly correlated with bid-ask spreads.

[Table 6 around here]

The results reported in Table 6 show that both the fixed and variable components of commissions explain implicit transaction costs at a high level of statistical significance in the presence of proxies for market conditions. For buy trades, the fixed portion of commissions has a negative coefficient, suggesting it is utilized to minimize the costs of purchasing stocks. The variable component carries a negative coefficient. That the coefficient on fixed commissions is much higher than that on variable commissions is consistent with the existence of a tradeoff between commissions and implicit transaction

costs at very high stock prices. In line with Block, French, and McInish (1994), the evidence suggests that considerations of the cost of executing trades become subordinate to the time and effort required to complete a transaction for complex buys with high implicit costs. For sells, the role of fixed and variable components reverses, as seen in the reversal of signs between coefficients on the two in Panel B. We interpret this evidence to mean that as sells become harder to sustain above certain prices, the fixed component used to secure superior service under normal circumstances becomes insufficient to pay for considerations such as time and effort.

There is an asymmetry in the effects of commissions on buy and sell trades. Buys are associated with significantly larger coefficients than sells. For example, a coefficient on fixed commissions of -15.9818 suggests that an increase in the commission cost of one cent per share lowers the impact cost by 0.16%. However, the lower coefficients on sells suggest weaker links between commissions and implicit costs. This evidence is consistent with the view that investors' relations with brokers are complicated by brokers charging for non-execution related items such as research via soft dollar payments (Domowitz and Madhavan (2001)).

It is notable that in instances where it is statistically significant, trade difficulty increases implicit transaction costs. The coefficient on volatility is significant in the case of only one post-trade measure of implicit transaction costs but gives counterintuitive results. On balance, it appears brokers are successful in managing most difficult trades although for some large trades there is some slippage of value due to difficulty of execution. Another critical finding in Table 6 is whether the foreigner dummy variable has a positive sign. Generally, there is a positive and highly statistically significant

relationship between implicit transaction costs and the foreign investor indicator, lending support to our main findings on price differences.

[Table 7 around here]

Table 7 reports the results of our modification of the baseline regression to include interaction terms composed of the foreigner dummy variable and commissions. In the table we present side by side, two models run for domestic and foreign investor trades respectively. If U.S.-based brokers use commissions in more or less the same manner between local investors and foreigners, we would expect the distribution of coefficients to be similar between domestic investors and foreigners. The columns labeled “Foreign Investor Interaction Terms” show that the fixed component of commissions paid by foreigners is largely insignificant in explaining implicit transaction costs. However, the majority of pre-trade and post-trade measures of implicit transaction costs are associated with increasing variable commissions paid by foreigners. For both buys and sells, foreigners increase their commissions when faced with difficult trades. Under the columns labeled “Domestic Investor Interaction Terms” we see that the fixed component of commissions secures better buying and selling prices for domestic investors. For example, on stock purchases, the coefficients on the fixed commissions paid by domestic investors range between -17.05 and -21.70 in magnitude, suggesting that a one percentage point increase in commissions potentially delivers savings averaging 0.19% on implicit costs to local investors. We conclude from this evidence that, through commissions, domestic investors have the ability to affect the quality of execution they receive from brokers. The absence of such a relationship in the case of foreign investors as reported in

Table 7 explains a significant part of the foreigner disadvantage in implicit costs reported above.

In summary, our findings on the role of explicit transaction costs in foreign investors' trading disadvantage, while potentially interesting in their own right, tie in with our findings on implicit costs that point to the relevance of agency relationships. Two examples stand out. First, we show that when foreign investors use the same brokers as locals, part of their disadvantage disappears. Second, in the special case of ADRs, for example, we have demonstrated that the foreigner disadvantage persists even when the analysis is restricted to ADRs originating from the foreign investor's home market. If information asymmetry does not completely explain the foreigner disadvantage, then it is reasonable to suspect agency conflicts at the U.S. end of foreign originated trades. Our findings on the tradeoff between commissions and implicit costs lend credence to the hypothesis that agency arrangements determine at least part of the execution quality outcomes of the broker investor relationship.

V. Conclusion

This paper uses proprietary daily and weekly transaction costs data for U.S.-based trades by foreign investors from 52 countries to measure the extent of their disadvantage compared with domestic money managers when buying and selling the same equity securities. The findings show that foreign institutional investors pay higher prices and sell at lower prices relative to domestic investors. We find an equally weighted buy (sell) disadvantage when foreign investors trade across the main U.S. stock exchanges of about 3.6 (5.1) basis points, equivalent to a roundtrip foreign disadvantage of 8.7 basis points.

The trade weighted buy (sell) disadvantage is approximately 2.3 (3.5) bps. Our measures of foreign disadvantage are broadly consistent across trade sizes. The disadvantage is higher for trades executed on NYSE than those initiated on the Nasdaq market. Translated to repeated trades, this disadvantage is a considerable drag on returns earned by foreign investors in U.S. stock trades. On a weekly basis, our equally weighted analysis shows that the foreign disadvantage for buys (sells) is 19.1 (20.5) basis points. The significance of the implicit transaction cost disadvantage should also be looked at in light of the fact that international investors are often represented by two brokers, at home and abroad, to whom, in addition, they pay explicit brokerage costs, commissions and taxes and fees.

We show a significant difference in the explicit transaction costs paid by foreign investors relative to local institutions. This difference is split equally between commissions and fees. For buys, the difference is four cents per share in favor of foreign investors, and is slightly more in the case of commissions (three cents per share) than fees (two cents per share). When selling, the total explicit transaction cost advantage for foreign investors is even higher, at eight cents per share. Domestic share market participants pay three cents more per share in commissions than foreign investors and five cents more per share in fees. The difference in explicit costs is sufficient to compensate foreign investors for the disadvantage they experience on implicit costs relative to local investors.

We trace the economic rationale of commissions to their link with realized prices. Following suggestions that there are tradeoffs between the various components of transaction costs, we examine recent propositions by Goldstein, Irvine, Kandel, and

Wiener (2006), that a fixed component dominates commissions to pay for superior brokerage services. The evidence suggests that, through commissions, domestic investors can affect the quality of execution they receive from brokers, especially when buying stocks. Paying considerably less in explicit costs than domestic investors seems to deny international money managers the ability to negotiate difficult trades through their U.S.-based brokers.

The main findings of this paper should interest financial economists and policy makers. First, the foreign investor disadvantage in transaction costs is not entirely an artifact of idiosyncratic factors such as the trading environment faced by foreign investors in emerging markets, the subject of most studies on this issue to date. Second, future research should consider investors' arrangements with their stockbrokers when examining transaction cost and portfolio performance outcomes for foreign investors. Explicit transaction costs still have a meaningful bearing on securities trading. When addressing frictions affecting international financial markets, policy makers should take into account the nature of agency relations, not just market structures.

There are a number of related research questions we plan for future research. We list three of them here. We hope to expand on our understanding of the role of foreign investors' home background among determinants of their disadvantage when trading abroad. Further, our current analysis concentrates on immediate price impact. What is the effect of differences in agency relationships between brokerages and domestic/foreign investors on long run trading outcomes? Finally, faced with specific instances of potential information asymmetry, do brokers favor domestic investors over foreign investors?

APPENDIX A

Comparison of domestic and foreign investors' equally weighted weekly price ratios

The following table reports the prices incurred by domestic and foreign institutional investors trading stocks in the U.S. calculated using Eq. (1) and Eq. (2). The sample period is July 1999-September 2004. The number of observations is shown in parentheses. Panels B-G are based on sub-samples of the full sample used in Panel A. The first four columns are the mean and standard deviations for domestic (D) and foreign (F), respectively. The difference between domestic and foreign investors' trade price ratios is given by D-F x 100 where one percent corresponds to 100 basis points (bps). The *t*-statistics and *p*-values are based on difference in means *t*-tests.

Sample/Market (number of trades)	Domestic Trades (D)		Foreign Trades (F)		<i>H</i> ₀ : D - F = 0		
	Mean	Std. Dev.	Mean	Std. Dev.	D-F x100	<i>t</i> - Statistic	<i>p</i> -value
<i>Panel A: Full sample</i>							
Weekly_All Buy (25,730)	1.0007	0.0231	1.0026	0.0252	-0.1910	-8.94	0.00
Weekly_All Sell (23,283)	1.0000	0.0254	0.9980	0.0281	0.2051	8.02	0.00
<i>Panel B: Common stock</i>							
Weekly_All Buy (12,103)	1.0011	0.0237	1.0025	0.0276	-0.1354	-4.07	0.00
Weekly_All Sell (11,034)	0.9996	0.0232	0.9981	0.0302	0.1530	4.08	0.00
<i>Panel C: American Depositary Receipts (ADRs)</i>							
Weekly_All Buy (13,627)	1.0004	0.0225	1.0028	0.0229	-0.2404	-8.75	0.00
Weekly_All Sell (12,249)	1.0003	0.0273	0.9978	0.0261	0.2520	7.20	0.00
<i>Panel D: NYSE Common stocks</i>							
Weekly_All Buy (7,531)	1.0005	0.0181	1.0026	0.0235	-0.2090	-5.91	0.00
Weekly_All Sell (6,786)	0.9998	0.0166	0.9984	0.0253	0.1372	3.67	0.00
<i>Panel E: NYSE ADRs</i>							
Weekly_All Buy (11,402)	1.0000	0.0193	1.0027	0.0214	-0.2628	-9.86	0.00
Weekly_All Sell (10,270)	1.0002	0.0216	0.9978	0.0226	0.2493	8.02	0.00
<i>Panel F: Nasdaq Common stocks</i>							
Weekly_All Buy (3,915)	1.0015	0.0282	1.0022	0.0322	-0.0636	-0.89	0.37
Weekly_All Sell (3,655)	0.9994	0.0308	0.9976	0.0348	0.1793	2.24	0.03
<i>Panel G: Nasdaq ADRs</i>							
Weekly_All Buy (2,168)	1.0021	0.0348	1.0032	0.0289	-0.1075	-1.08	0.28
Weekly_All Sell (1,960)	1.0010	0.0463	0.9981	0.0394	0.2894	2.01	0.04

APPENDIX B

Domestic and foreign investors' equally weighted daily price ratios separated by time

The following table reports the prices incurred by domestic and foreign institutional investors trading stocks in the U.S. calculated using Eq. (1) and Eq. (2). The number of observations is shown in parentheses. Panels A-C are based on three equal sub-samples of 440 trade-days and panels D and E are pre and post September 11, 2001 respectively of the full 1,320 trade-day sample. The first four columns are the mean and standard deviations for domestic (D) and foreign (F), respectively. The difference between domestic and foreign investors' trade price ratios is given by D-F x100 where one percent corresponds to 100 basis points (bps). The *t*-statistics and p-values are based on difference in means tests.

Sample/Market	Domestic Trades (D)		Foreign Trades (F)		D-F x100	$H_0: D - F = 0$	
	Mean	Std. Dev.	Mean	Std. Dev.		<i>t</i> -Statistic	<i>p</i> -value
<i>Panel A: Period 1</i>							
Daily_All Buy	1.0000	0.0120	1.0009	0.0123	-0.0947	-4.78	0.00
Daily_All Sell	1.0004	0.0129	0.9996	0.0121	0.0818	3.82	0.00
<i>Panel B: Period 2</i>							
Daily_All Buy	1.0001	0.0102	1.0006	0.0099	-0.0499	-4.10	0.00
Daily_All Sell	1.0001	0.0098	0.9996	0.0120	0.0532	3.81	0.00
<i>Panel C: Period 3</i>							
Daily_All Buy	1.0002	0.0062	1.0002	0.0062	0.0010	0.17	0.87
Daily_All Sell	0.9999	0.0069	0.9997	0.0078	0.0171	2.22	0.03
<i>Panel D: Pre-September 11, 2001</i>							
Daily_All Buy	1.0000	0.0112	1.0007	0.0115	-0.0715	-4.54	0.00
Daily_All Sell	1.0004	0.0123	0.9996	0.0116	0.0799	4.53	0.00
<i>Panel E: Post-September 11, 2001</i>							
Daily_All Buy	1.0002	0.0080	1.0004	0.0078	-0.0199	-3.19	0.00
Daily_All Sell	0.9999	0.0080	0.9996	0.0095	0.0275	3.72	0.00

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TABLE 1
Institutional Trading in United States (U.S.) Domiciled Equities by Foreign Countries

Table 1 contains summary data on institutional trading in equities and American Depositary Receipts (ADRs) by both domestic and foreign investors on the New York Stock Exchange (NYSE), American Stock Exchange (Amex), and the National Association of Securities Dealers Automated Quotation (Nasdaq) markets. The sample period is from July 1, 1999 to September 30, 2004. Buy and sell indicators are given in the database. Foreign investors' home countries are restricted to 100 trades or more.

	All	NYSE		Nasdaq		Amex	
	Trades	Common Stock	ADRs	Common Stock	ADRs	Common Stock	ADRs
<i>Panel A: Full Sample</i>							
Number of Securities	426	113	176	85	44	7	1
Number of Executed Trades	3,869,765	1,661,755	1,257,201	640,140	231,430	78,598	641
Ave Number of Trades per Security	1,938	3,676	1,786	1,883	1,315	2,807	160
Average Price per Trade	32.15	37.15	33.41	28.52	33.99	37.41	22.41
<i>Panel B: U.S. (Domestic) – Buys</i>							
Number of Executed Trades	1,746,837	792,669	510,720	307,149	101,243	34,663	393
Ave Number of Trades per Security	3,530	7,015	2,902	3,614	2,301	4,952	393
Average Price per Trade	31.40	35.90	34.57	26.74	30.92	34.49	25.77
<i>Panel C: U.S. (Domestic) – Sells</i>							
Number of Executed Trades	1,588,325	696,117	513,210	254,532	88,767	35,557	142
Ave Number of Trades per Security	3,218	6,160	2,916	2,994	2,017	5,080	142
Average Price per Trade	32.12	35.36	36.59	26.04	31.44	39.65	23.61
<i>Panel D: Foreign - Buys</i>							
Number of Countries of Origin	52	33	39	24	25	5	1
Number of Executed Trades	276,823	95,082	110,709	43,515	22,672	4,764	81
Ave Number of Trades per Security	543	841	629	512	515	681	81
Average Price per Trade	33.00	39.03	31.83	30.55	38.57	36.33	22.44
<i>Panel E: Foreign – Sells</i>							
Number of Countries of Origin	52	32	40	24	25	5	1
Number of Executed Trades	257,780	77,887	122,562	34,944	18,748	3,614	25
Ave Number of Trades per Security	461	689	696	411	426	516	25
Average Price per Trade	32.00	38.31	30.67	30.74	35.01	39.15	17.81

TABLE 2
Comparison of domestic and foreign investors' equally weighted daily price ratios

Table 2 reports the prices incurred by domestic and foreign institutional investors trading stocks in the U.S. calculated using Eq. (1) and Eq. (2). The sample period is July 1999-September 2004. The number of observations is shown in parentheses. Panels B-I are based on sub-samples of the full sample used in Panel A. The first four columns are the mean and standard deviations for domestic (D) and foreign (F), respectively. The difference between domestic and foreign investors' trade price ratios is given by D-F x100 where one percent corresponds to 100 basis points (bps). The *t*-statistics and *p*-values are based on simple difference in means tests.

Sample/Market	Domestic Trades (D)		Foreign Trades (F)		D-F x100	<i>H</i> ₀ : D - F = 0	
	Mean	Std. Dev.	Mean	Std. Dev.		<i>t</i> -Statistic	<i>p</i> -value
<i>Panel A: Full sample</i>							
Daily_All Buy (44,124)	1.0001	0.0082	1.0005	0.0088	-0.0356	-5.95	0.00
Daily_All Sell (37,843)	1.0001	0.0088	0.9996	0.0093	0.0508	7.36	0.00
Daily_Large Buy (19,672)	1.0003	0.0081	1.0004	0.0084	-0.0149	-1.62	0.11
Daily_Large Sell (17,521)	1.0000	0.0087	0.9996	0.0091	0.0449	4.29	0.00
Daily_Medium Buy (18,693)	1.0000	0.0083	1.0004	0.0095	-0.0346	-3.90	0.00
Daily_Medium Sell (15,496)	1.0002	0.0092	0.9996	0.0101	0.0593	5.92	0.00
Daily_Small Buy (14,537)	1.0000	0.0094	1.0001	0.0109	-0.0115	-1.09	0.28
Daily_Small Sell (10,744)	1.0002	0.0097	1.0000	0.0106	0.0218	1.80	0.07
<i>Panel B: Full Sample Excluding 'Flag of Convenience' (FOC) Countries</i>							
Daily_All Buy (31,463)	1.0001	0.0084	1.0006	0.0089	-0.0542	-7.53	0.00
Daily_All Sell (27,867)	1.0001	0.0090	0.9995	0.0092	0.0619	7.65	0.00
Daily_Large Buy (13,533)	1.0002	0.0082	1.0006	0.0087	-0.0481	-4.22	0.00
Daily_Large Sell (12,173)	1.0001	0.0088	0.9994	0.0090	0.0624	4.95	0.00
Daily_Medium Buy (12,577)	1.0000	0.0084	1.0005	0.0097	-0.0451	-4.11	0.00
Daily_Medium Sell (10,861)	1.0002	0.0093	0.9995	0.0100	0.0714	5.91	0.00
Daily_Small Buy (9,379)	0.9999	0.0095	1.0001	0.0111	-0.0107	-0.83	0.41
Daily_Small Sell (7,642)	1.0002	0.0096	0.9998	0.0104	0.0352	2.55	0.01
<i>Panel C: Common Stocks Only (NYSE & Nasdaq)</i>							
Daily_All Buy (13,115)	1.0000	0.0095	1.0007	0.0110	-0.0665	-4.94	0.00
Daily_All Sell (11,616)	1.0002	0.0102	0.9995	0.0111	0.0673	4.49	0.00
Daily_Large Buy (5,358)	1.0001	0.0092	1.0007	0.0111	-0.0519	-2.32	0.02
Daily_Large Sell (4,876)	1.0000	0.0104	0.9994	0.0112	0.0607	2.52	0.01
Daily_Medium Buy (5,253)	0.9998	0.0097	1.0005	0.0117	-0.0728	-3.53	0.00
Daily_Medium Sell (4,360)	1.0003	0.0112	0.9993	0.0125	0.0998	4.24	0.00
Daily_Small Buy (4,119)	0.9998	0.0111	1.0000	0.0135	-0.0121	-0.50	0.62
Daily_Small Sell (3,103)	1.0007	0.0115	0.9997	0.0122	0.0948	3.57	0.00
<i>Panel D: ADRs Only (NYSE & Nasdaq)</i>							
Daily_All Buy (18,125)	1.0002	0.0075	1.0006	0.0071	-0.0469	-6.03	0.00
Daily_All Sell (16,065)	1.0001	0.0079	0.9995	0.0075	0.0576	6.51	0.00
Daily_Large Buy (8,109)	1.0002	0.0074	1.0006	0.0068	-0.0462	-3.89	0.00
Daily_Large Sell (7,217)	1.0001	0.0075	0.9994	0.0073	0.0616	4.53	0.00
Daily_Medium Buy (7,255)	1.0002	0.0073	1.0005	0.0080	-0.0273	-2.33	0.02
Daily_Medium Sell (6,436)	1.0001	0.0078	0.9996	0.0078	0.0530	4.18	0.00
Daily_Small Buy (5,218)	1.0000	0.0080	1.0001	0.0087	-0.0112	-0.84	0.40
Daily_Small Sell (4,504)	0.9999	0.0081	0.9999	0.0090	-0.0026	-0.18	0.86

Table 2 (Continued)

<i>Panel E: NYSE Common Stocks Only</i>							
Daily_All Buy (8,027)	1.0001	0.0072	1.0007	0.0082	-0.0599	-4.81	0.00
Daily_All Sell (7,160)	1.0003	0.0079	0.9994	0.0083	0.0866	6.25	0.00
Daily_Large Buy (3,221)	1.0002	0.0071	1.0008	0.0086	-0.0583	-2.72	0.01
Daily_Large Sell (2,827)	1.0002	0.0079	0.9993	0.0083	0.0928	4.04	0.00
Daily_Medium Buy (3,393)	0.9999	0.0080	1.0005	0.0089	-0.0579	-2.87	0.00
Daily_Medium Sell (2,911)	1.0001	0.0088	0.9994	0.0102	0.0658	2.98	0.00
Daily_Small Buy (2,630)	1.0001	0.0095	1.0002	0.0095	-0.0174	-0.76	0.45
Daily_Small Sell (2,107)	1.0003	0.0090	0.9999	0.0107	0.0410	1.54	0.12
<i>Panel F: NYSE ADRs Only</i>							
Daily_All Buy (14,787)	1.0002	0.0065	1.0006	0.0064	-0.0434	-5.77	0.00
Daily_All Sell (13,210)	1.0000	0.0069	0.9995	0.0068	0.0503	5.93	0.00
Daily_Large Buy (6,545)	1.0001	0.0067	1.0007	0.0061	-0.0531	-4.41	0.00
Daily_Large Sell (5,832)	1.0001	0.0069	0.9995	0.0067	0.0609	4.43	0.00
Daily_Medium Buy (6,100)	1.0002	0.0067	1.0005	0.0075	-0.0213	-1.88	0.06
Daily_Medium Sell (5,461)	1.0001	0.0071	0.9997	0.0074	0.0458	3.77	0.00
Daily_Small Buy (4,320)	1.0001	0.0070	1.0000	0.0082	0.0123	0.92	0.36
Daily_Small Sell (3,755)	0.9999	0.0072	0.9998	0.0083	0.0092	0.68	0.49
<i>Panel G: Nasdaq Common Stocks Only</i>							
Daily_All Buy (5,088)	0.9998	0.0122	1.0006	0.0143	-0.0769	-2.69	0.01
Daily_All Sell (4,456)	1.0000	0.0131	0.9996	0.0146	0.0363	1.13	0.26
Daily_Large Buy (2,137)	1.0000	0.0116	1.0005	0.0140	-0.0424	-0.92	0.36
Daily_Large Sell (2,049)	0.9998	0.0131	0.9996	0.0142	0.0163	0.34	0.73
Daily_Medium Buy (1,860)	0.9995	0.0123	1.0005	0.0155	-0.0999	-2.21	0.03
Daily_Medium Sell (1,449)	1.0008	0.0149	0.9991	0.0162	0.1681	3.05	0.00
Daily_Small Buy (1,489)	0.9995	0.0134	0.9995	0.0186	-0.0026	-0.05	0.96
Daily_Small Sell (996)	1.0015	0.0154	0.9994	0.0148	0.2086	3.45	0.00
<i>Panel H: Nasdaq ADRs Only</i>							
Daily_All Buy (3,330)	1.0001	0.0108	1.0008	0.0097	-0.0624	-2.41	0.02
Daily_All Sell (2,842)	1.0004	0.0115	0.9995	0.0100	0.0917	2.97	0.00
Daily_Large Buy (1,562)	1.0004	0.0097	1.0006	0.0091	-0.0174	-0.49	0.62
Daily_Large Sell (1,378)	1.0000	0.0096	0.9994	0.0094	0.0639	1.56	0.12
Daily_Medium Buy (1,152)	1.0002	0.0096	1.0008	0.0100	-0.0590	-1.39	0.17
Daily_Medium Sell (968)	1.0002	0.0112	0.9993	0.0095	0.0949	1.94	0.05
Daily_Small Buy (895)	0.9995	0.0118	1.0007	0.0109	-0.1244	-2.84	0.01
Daily_Small Sell (751)	0.9997	0.0117	1.0003	0.0117	-0.0617	-1.11	0.27
<i>Panel I: Amex Stocks</i>							
Daily_All Buy (209)	1.0000	0.0077	0.9989	0.0070	0.1138	1.53	0.13
Daily_All Sell (193)	1.0011	0.0076	1.0002	0.0092	0.0910	1.00	0.32
Daily_Large Buy (68)	0.9998	0.0079	0.9995	0.0066	0.0315	-0.24	0.81
Daily_Large Sell (86)	1.0023	0.0106	1.0001	0.0070	0.2198	1.40	0.17
Daily_Medium Buy (67)	1.0009	0.0084	0.9993	0.0074	0.1537	1.38	0.17
Daily_Medium Sell (71)	0.9991	0.0059	0.9992	0.0074	-0.0140	-0.10	0.92
Daily_Small Buy (40)	1.0017	0.0074	0.9987	0.0071	0.3001	1.75	0.09
Daily_Small Sell (33)	1.0004	0.0081	1.0041	0.0126	-0.3734	-1.83	0.08

TABLE 3
Comparison of Domestic and Foreign Investors' Trade Weighted Price Ratios

Table 3 reports the prices incurred by domestic and foreign institutional investors trading stocks in the U.S. calculated using Eq. (1) and Eq. (2) modified to a trade weighted basis. The sample period is July 1999-September 2004. The number of observations is shown in parentheses. Panels B-D is based on sub-samples of the full sample used in Panel A. The first four columns are the mean and standard deviations for domestic (D) and foreign (F) investors, respectively. The difference between domestic and foreign investors' trade price ratios is given by D-F x100 where one percent corresponds to 100 basis points (bps). The *t*-statistics and *p*-values are based on simple difference in means.

Sample/Market	Domestic Trades (D)		Foreign Trades (F)		<i>H0</i> : D - F = 0		
	Mean	Std. Dev.	Mean	Std. Dev.	D-F x100	<i>t</i> - value	<i>p</i> -value
<i>Panel A: Full Sample</i>							
Daily_All Buy (1,320)	1.0001	0.0025	1.0004	0.0025	-0.0228	-2.09	0.04
Daily_All Sell (1,320)	1.0000	0.0024	0.9997	0.0026	0.0352	3.01	0.00
Daily_Large Buy (1,319)	1.0002	0.0030	1.0004	0.0029	-0.0204	-1.58	0.12
Daily_Large Sell (1319)	1.0000	0.0028	0.9997	0.0030	0.0286	2.11	0.04
Daily_Medium Buy (1,318)	0.9998	0.0040	1.0002	0.0044	-0.0429	-2.64	0.01
Daily_Medium Sell (1,312)	1.0004	0.0045	0.9996	0.0051	0.0713	4.01	0.00
Daily_Small Buy (1,293)	0.9999	0.0061	1.0003	0.0061	-0.0444	-1.97	0.05
Daily_Small Sell (1,264)	1.0005	0.0071	1.0001	0.0077	0.0362	1.37	0.17
<i>Panel B: Full Sample excluding 'FOC'</i>							
Daily_All Buy (1,320)	1.0002	0.0028	1.0005	0.0023	-0.0304	-2.76	0.01
Daily_All Sell (1,320)	1.0000	0.0026	0.9995	0.0026	0.0467	4.08	0.00
Daily_Large Buy (1,314)	1.0002	0.0034	1.0006	0.0028	-0.0358	-2.66	0.01
Daily_Large Sell (1,316)	0.9999	0.0030	0.9995	0.0036	0.0441	3.12	0.00
Daily_Medium Buy (1,308)	0.9999	0.0046	1.0003	0.0052	-0.0407	-2.15	0.03
Daily_Medium Sell (1,302)	1.0002	0.0052	0.9996	0.0057	0.0601	3.26	0.00
Daily_Small Buy (1,241)	0.9999	0.0076	1.0003	0.0080	-0.0362	-1.32	0.19
Daily_Small Sell (1,208)	1.0004	0.0074	1.0000	0.0080	0.0475	1.78	0.08
<i>Panel C: Common Stocks Only (NYSE & Nasdaq)</i>							
Daily_All Buy (1,312)	1.0002	0.0042	1.0006	0.0044	-0.0440	-2.32	0.02
Daily_All Sell (1,312)	1.0001	0.0050	0.9994	0.0044	0.0707	3.47	0.00
Daily_Large Buy (1,270)	1.0003	0.0053	1.0008	0.0061	-0.0503	-1.97	0.05
Daily_Large Sell (1,241)	1.0000	0.0058	0.9993	0.0056	0.0671	2.62	0.01
Daily_Medium Buy (1,235)	0.9996	0.0066	1.0005	0.0092	-0.0850	-2.56	0.01
Daily_Medium Sell (1,194)	1.0002	0.0079	0.9996	0.0098	0.0614	1.93	0.05
Daily_Small Buy (1,119)	0.9996	0.0097	1.0003	0.0110	-0.0664	-1.70	0.09
Daily_Small Sell (1,047)	1.0007	0.0104	0.9997	0.0101	0.1044	2.59	0.01
<i>Panel D: ADRs Only (NYSE & Nasdaq)</i>							
Daily_All Buy (1,314)	1.0003	0.0071	1.0005	0.0029	-0.0162	-0.73	0.46
Daily_All Sell (1,317)	0.9999	0.0027	0.9996	0.0031	0.0366	2.92	0.00
Daily_Large Buy (1,292)	1.0002	0.0042	1.0005	0.0033	-0.0290	-1.75	0.08
Daily_Large Sell (1,301)	1.0000	0.0033	0.9996	0.0038	0.0369	2.44	0.01
Daily_Medium Buy (1,268)	1.0001	0.0049	1.0004	0.0052	-0.0312	-1.71	0.09
Daily_Medium Sell (1,240)	1.0003	0.0055	0.9996	0.0052	0.0725	3.66	0.00
Daily_Small Buy (1,133)	1.0001	0.0063	1.0002	0.0073	-0.0093	-0.37	0.71
Daily_Small Sell (1,092)	1.0001	0.0063	0.9999	0.0066	0.0224	1.00	0.32

Table 3 (Continued)

<i>Panel E: NYSE Common Stocks Only</i>							
Daily_All Buy (1,297)	1.0002	0.0044	1.0008	0.0056	-0.0572	-2.72	0.01
Daily_All Sell (1,290)	1.0001	0.0044	0.9993	0.0048	0.0813	4.03	0.00
Daily_Large Buy (1,168)	1.0003	0.0053	1.0009	0.0072	-0.0620	-2.19	0.03
Daily_Large Sell (1,136)	1.0001	0.0056	0.9992	0.0063	0.0904	3.28	0.00
Daily_Medium Buy (1,117)	0.9997	0.0062	1.0005	0.0079	-0.0794	-2.66	0.01
Daily_Medium Sell (1,092)	1.0001	0.0069	0.9995	0.0087	0.0577	2.01	0.05
Daily_Small Buy (971)	0.9999	0.0082	1.0003	0.0081	-0.0345	-1.01	0.31
Daily_Small Sell (908)	1.0001	0.0073	1.0000	0.0086	0.0138	0.41	0.68
<i>Panel F: NYSE ADRs only</i>							
Daily_All Buy (1,310)	1.0001	0.0038	1.0004	0.0031	-0.0310	-2.15	0.03
Daily_All Sell (1,315)	1.0000	0.0028	0.9995	0.0033	0.0467	3.53	0.00
Daily_Large Buy (1,276)	1.0001	0.0045	1.0005	0.0036	-0.0371	-2.07	0.04
Daily_Large Sell (1,284)	1.0000	0.0034	0.9995	0.0040	0.0472	2.89	0.00
Daily_Medium Buy (1,233)	1.0002	0.0045	1.0003	0.0052	-0.0145	-0.78	0.44
Daily_Medium Sell (1,207)	1.0004	0.0055	0.9996	0.0054	0.0741	3.45	0.00
Daily_Small Buy (1,077)	1.0003	0.0058	1.0001	0.0069	0.0227	0.94	0.35
Daily_Small Sell (1,025)	1.0001	0.0057	0.9998	0.0065	0.0366	1.75	0.08
<i>Panel G: Nasdaq Common Stocks Only</i>							
Daily_All Buy (1,263)	0.9999	0.0070	1.0007	0.0073	-0.0754	-2.37	0.02
Daily_All Sell (1,228)	1.0001	0.0083	0.9992	0.0087	0.0906	2.42	0.02
Daily_Large Buy (1,068)	1.0000	0.0090	1.0005	0.0096	-0.0459	-0.99	0.32
Daily_Large Sell (989)	0.9998	0.0093	0.9997	0.0103	0.0086	0.17	0.86
Daily_Medium Buy (981)	0.9995	0.0102	1.0005	0.0135	-0.1017	-1.87	0.06
Daily_Medium Sell (835)	1.0010	0.0140	0.9989	0.0155	0.2057	3.14	0.00
Daily_Small Buy (870)	0.9995	0.0122	0.9994	0.0156	0.0138	0.24	0.81
Daily_Small Sell (656)	1.0016	0.0152	0.9990	0.0146	0.2644	3.61	0.00
<i>Panel H: Nasdaq ADRs Only</i>							
Daily_All Buy (1,215)	1.0005	0.0089	1.0006	0.0070	-0.0057	-0.17	0.87
Daily_All Sell (1,189)	1.0001	0.0075	0.9997	0.0068	0.0443	1.34	0.18
Daily_Large Buy (931)	1.0004	0.0067	1.0005	0.0076	-0.0104	-0.29	0.77
Daily_Large Sell (911)	0.9999	0.0085	0.9996	0.0071	0.0284	0.70	0.48
Daily_Medium Buy (765)	1.0003	0.0081	1.0007	0.0095	-0.0405	-0.89	0.38
Daily_Medium Sell (692)	1.0005	0.0108	0.9994	0.0093	0.1095	1.88	0.06
Daily_Small Buy (618)	0.9995	0.0110	1.0007	0.0107	-0.1139	-2.38	0.02
Daily_Small Sell (529)	0.9995	0.0105	0.9999	0.0099	-0.0372	-0.62	0.54

Table 4
Comparison of Domestic and Foreign Investors' Realized Prices Relative to Benchmarks

Table 4 compares the indirect trading costs incurred by U.S.-based and foreign investors. ITC_d , ITC_e , ITC_p , ITC_c and ITC_m are indirect transaction costs or the difference between transaction prices and benchmarks based on decision, entry, placement, closing and the mean of the high and low price for the day, respectively. The difference between domestic and foreign investors' explicit transaction costs is given by D-F. The t -statistics and p -values are based on simple difference in means tests.

	Domestic (D)	Foreign (F)	D-F	$HO: D-F=0$ t -value	p -value
<i>Panel A: Buys</i>					
Pre-trade measures					
ITC_d	-0.0105	0.0106	-0.0211	-28.96	0.00
ITC_e	0.0001	0.0094	-0.0092	-14.26	0.00
ITC_p	0.0012	0.0079	-0.0066	-10.46	0.00
Post-trade measures					
ITC_c	-0.0339	-0.0078	-0.0261	-43.33	0.00
ITC_g	-0.0297	0.0294	-0.0591	-43.98	0.00
<i>Panel B: Sells</i>					
Pre-trade measures					
ITC_d	0.0387	0.0189	0.0198	27.61	0.00
ITC_e	0.0442	0.0110	0.0333	53.52	0.00
ITC_p	0.0435	0.0103	0.0332	54.72	0.00
Post-trade measures					
ITC_c	-0.0085	-0.0026	-0.0060	-10.67	0.00
ITC_g	0.0456	0.0383	0.0073	5.44	0.00

Table 5
Comparison of Domestic and Foreign Investors' Explicit Transaction Costs

Table 5 reports the explicit costs in dollars per share incurred by domestic and foreign institutional investors trading stocks in the U.S. The sample period is July 1999-September 2004. The first four columns are the mean and standard deviations for domestic (D) and foreign (F) investors, respectively. The difference between domestic and foreign investors' explicit transaction costs is given by D-F. The t -statistics and p -values are based on simple difference in means tests.

Domestic Trades (D)		Foreign Trades (F)		D-F	$H_0: D - F = 0$	
Mean	Std. Dev.	Mean	Std. Dev.		t - Statistic	p -value
<i>Panel A: Full Sample</i>						
Total Explicit Costs Per Share						
0.07	13.19	0.01	0.04	0.06	9.09	0.00
Commissions Per Share						
0.04	0.23	0.01	0.04	0.03	255.08	0.00
Fees Per Share						
0.03	13.18	0.00	0.00	0.03	4.56	0.00
<i>Panel B: Buys</i>						
Total Explicit Costs Per Share						
0.05	8.72	0.00	0.01	0.04	7.22	0.00
Commissions Per Share						
0.03	0.21	0.00	0.01	0.03	199.69	0.00
Fees Per Share						
0.02	8.71	0.00	0.00	0.02	2.48	0.01
<i>Panel C: Sells</i>						
Total Explicit Costs Per Share						
0.08	16.77	0.01	0.06	0.08	6.42	0.00
Commissions Per Share						
0.04	0.25	0.01	0.06	0.03	165.81	0.00
Fees Per Share						
0.05	16.77	0.00	0.00	0.05	3.84	0.00

TABLE 6
Determinants of Realized Prices

Table 6 reports the regression results of models explaining indirect transaction costs (ITC). The dependent variables, ITC_d , ITC_e , ITC_p , ITC_c and ITC_m , are measures of indirect transaction costs or the difference between transaction prices and benchmarks based on decision, entry, placement, closing and the mean of the high and low price for the day, respectively. Commission Fixed denotes commission per share. Commission Variable is measured as commission per share times execution price times 100. Volatility is measured as daily high stock price minus daily low stock price divided by daily low stock price. Trade Difficulty is calculated as trade quantity divided by trade-day share volume. *t*-statistics in italics are based on White's (1980) heteroskedasticity consistent standard errors. ***, **, and * denote significance at 1%, 5% and 10% statistical significance levels, respectively.

Dependent variable	Independent variables							Adj. R^2	
	Intercept	Commission Fixed		Commission Variable		Volatility	Difficulty		Foreigner Dummy
<i>Panel A: Buys</i>									
ITC_d /price	0.0721 <i>17.97</i> ***	-15.9818 <i>-129.48</i> ***		0.0040 <i>191.43</i> ***		-0.0009 <i>-1.67</i> *	0.0069 <i>1.72</i> *	0.0926 <i>15.27</i> ***	0.0180
ITC_e /price	0.0868 <i>21.89</i> ***	-15.8033 <i>-129.66</i> ***		0.0040 <i>190.45</i> ***		-0.0003 <i>-0.54</i>	0.0065 <i>1.63</i>	0.0713 <i>11.91</i> ***	0.0177
ITC_p /price	0.0877 <i>22.18</i> ***	-15.7726 <i>-129.66</i> ***		0.0040 <i>190.53</i> ***		-0.0001 <i>-0.26</i>	0.0069 <i>1.74</i> *	0.0592 <i>9.91</i> ***	0.0177
Post-trade measures									
ITC_c /price	0.0416 <i>10.58</i> ***	-15.0527 <i>-124.49</i> ***		0.0038 <i>183.35</i> ***		-0.0003 <i>-0.52</i>	0.0071 <i>1.80</i> *	-0.0152 <i>-2.57</i> ***	0.0164
ITC_m /price	0.0762 <i>12.40</i> ***	-18.7047 <i>-98.97</i> ***		0.0046 <i>141.96</i> ***		-0.0042 <i>-5.10</i> ***	0.0090 <i>1.47</i>	0.2581 <i>27.81</i> ***	0.0103
<i>Panel B: Sells</i>									
ITC_d /price	0.0455 <i>6.30</i> ***	0.8261 <i>4.05</i> ***		-0.0003 <i>-7.72</i> ***		0.0010 <i>1.09</i>	-0.0008 <i>-0.12</i>	0.0918 <i>8.46</i> ***	0.0001
ITC_e /price	0.0476 <i>6.62</i> ***	0.5810 <i>2.86</i> ***		-0.0002 <i>-4.85</i> ***		0.0010 <i>1.05</i>	-0.0003 <i>-0.04</i>	0.0295 <i>2.73</i> ***	0.0000
ITC_p /price	0.0461 <i>6.41</i> ***	0.6184 <i>3.05</i> ***		-0.0002 <i>-4.99</i> ***		0.0010 <i>1.07</i>	-0.0006 <i>-0.09</i>	0.0259 <i>2.40</i> ***	0.0000
ITC_c /price	-0.0161 <i>-2.24</i> **	1.3930 <i>6.89</i> ***		-0.0004 <i>-11.18</i> ***		0.0005 <i>0.55</i>	0.0004 <i>0.07</i>	-0.0073 <i>-0.67</i>	0.0001
ITC_m /price	0.0530 <i>5.78</i> ***	4.1307 <i>15.96</i> ***		-0.0012 <i>-26.18</i> ***		0.0035 <i>2.94</i> ***	-0.0036 <i>-0.43</i>	0.2094 <i>15.17</i> ***	0.0005

TABLE 7
Determinants of Realized Prices: Domestic versus Foreign Investors

Table 7 reports the regression results of models explaining indirect transaction costs (ITC). The dependent variables, ITC_d , ITC_e , ITC_p , ITC_c and ITC_m , are measures of indirect transaction costs or the difference between transaction prices and benchmarks based on decision, entry, placement, closing and the mean of the high and low price for the day, respectively. Commission Fixed denotes commission per share. Commission Variable is measured as commission per share times execution price times 100. Volatility is measured as daily high stock price minus daily low stock price divided by daily low stock price. Trade Difficulty is calculated as trade quantity divided by trade-day share volume. The intercept is not tabulated for brevity. *t*-statistics in italics are based on White's (1980) heteroskedasticity consistent standard errors. ***, **, and * denote significance at 1%, 5% and 10% statistical significance levels, respectively.

	Domestic Investor Interaction Terms					Foreign Investor Interaction Terms					
	Domestic X	Domestic X	Volatility	Difficulty	Adj. R^2	Foreigner X	Foreigner X	Volatility	Difficulty	Adj. R^2	
	Commission Fixed	Commission Variable				Commission Fixed	Commission Variable				
<i>Panel A: Buys</i>											
ITC_d /price	-18.5078 <i>-153.59</i> ***	0.0046 <i>203.74</i> ***	-0.0009 <i>-1.61</i>	0.0048 <i>1.21</i>	0.0202	0.2091 <i>0.87</i>	0.0005 <i>9.41</i> ***	-0.0009 <i>-1.69</i> *	0.0012 <i>0.31</i>	0.0001	
ITC_e /price	-18.074 <i>-151.91</i> ***	0.0045 <i>203</i> ***	-0.0003 <i>-0.48</i>	0.0042 <i>0.23</i>	0.0201	-0.1907 <i>-0.80</i>	0.0004 <i>7.91</i> ***	-0.0003 <i>-0.59</i>	0.0009 <i>0.23</i>	0.0001	
ITC_p /price	-17.9957 <i>-151.55</i> ***	0.0045 <i>203.47</i> ***	-0.0001 <i>-0.20</i>	0.0045 <i>1.14</i>	0.0202	-0.2174 <i>-0.92</i>	0.0004 <i>6.78</i> ***	-0.0002 <i>-0.31</i>	0.0012 <i>0.31</i>	0.0000	
ITC_c /price	-17.0543 <i>-144.47</i> ***	0.0044 <i>199.79</i> ***	-0.0003 <i>-0.48</i>	0.004 <i>1.03</i>	0.0194	0.367 <i>1.56</i>	-0.0002 <i>-4.37</i> ***	-0.0003 <i>-0.63</i>	0.0009 <i>0.24</i>	0.0000	
ITC_m /price	-21.6917 <i>-117.40</i> ***	0.005 <i>144.19</i> ***	-0.0042 <i>-5.02</i> ***	0.008 <i>1.31</i>	0.0104	-1.6705 <i>-4.56</i> ***	0.00216 <i>25.32</i> ***	-0.0042 <i>-5.00</i> ***	0.0041 <i>0.66</i>	0.0006	
<i>Panel B: Sells</i>											
ITC_d /price	0.7386 <i>3.74</i> ***	-0.0004 <i>-9.62</i> ***	0.0010 <i>1.08</i>	0.0000 <i>0.00</i>	0.0001	-0.0561 <i>-0.13</i>	0.0004 <i>4.32</i> ***	0.001 <i>1.07</i>	0.0003 <i>0.05</i>	0.0000	
ITC_e /price	0.6684 <i>3.40</i> ***	-0.0002 <i>-5.98</i> ***	0.0010 <i>1.04</i>	0.0001 <i>0.01</i>	0.0000	-0.4422 <i>-1.04</i>	0.0002 <i>2.36</i> ***	0.001 <i>1.03</i>	0.0003 <i>0.04</i>	0.0000	
ITC_p /price	0.7086 <i>3.61</i>	-0.0002 <i>-5.95</i> *	0.0010 <i>1.06</i>	-0.0003 <i>-0.04</i>	0.0000	-0.3516 <i>-0.83</i>	0.0002 <i>1.81</i> *	0.001 <i>1.05</i>	-0.0001 <i>-0.01</i>	0.0000	
ITC_c /price	1.5915 <i>8.13</i> ***	-0.0004 <i>-11.39</i> ***	0.0005 <i>0.54</i>	0.0006 <i>0.09</i>	0.0001	0.2457 <i>0.58</i>	-0.0002 <i>-1.55</i>	0.0005 <i>0.52</i>	0.0009 <i>0.14</i>	0.0000	
ITC_m /price	3.7361 <i>14.90</i> ***	-0.0014 <i>-28.79</i> ***	0.0034 <i>2.91</i> ***	-0.0014 <i>-0.16</i>	0.0005	2.0616 <i>3.81</i> ***	0.0005 <i>3.68</i> ***	0.0034 <i>2.87</i> ***	-0.0007 <i>-0.09</i>	0.0001	