An Intraday Analysis of Related Investing Vehicles Traded in the NYSE and AMEX

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Abstract

This paper investigates the trading behaviors of three related investing vehicles (American Depository Receipt, Exchange-traded Fund, and Closed-end Fund) across countries using high-frequency intraday data. First, I find that ADR trades at a relative disadvantage transaction price than ETF and CEF on average. Second, I find that the investors buy when returns and prices increase and sell when returns and prices decrease by VAR model and event study. The concurrent and past relation of order imbalances and returns of the three securities reflects and predicts future returns and order flows. Third, the trading of ADR, ETF, and CEF follows positive feedback strategies, and it can be explained by momentum traders with common information set.

1 Introduction

The questions money managers are interested in are (1) what are the trading pattern of different securities? (2) what are the best trading strategies to manage a portfolio or basket in order to maximize profits and minimize risks? There is a vast amount of literature on how investors trade. DeLong, Shleifer, Summers, and Waldmann (1990) show that passive traders and rational speculators trade on firm fundamentals and/or superior information, while positive-feedback traders simply buy when prices rise and sell when prices fall. Hong and Stein (1999) show that momentum traders can make profit by implementing simple strategies such as trendchasing. A number of large and presumably sophisticated money managers use momentum approaches. Diversification into global equity markets is one of the approaches for money managers to improve the risk/return trade-off of a stock portfolio. There are three similar trading vehicles: American depositary receipts (ADR), exchange-traded funds (ETF), and closed-end funds (CEF), which specialize in holding a portfolio of foreign equities of one country or a group of countries in a region on US stock exchanges. The purpose of this paper is to investigate what kind of trading strategies investors pick up if they choose to invest in ADR, ETF, and CEF across countries. If the trading behaviors of ADR, ETF, and CEF from one country are different from each other, does one type of security have imformation advantage over the other? If the trading activities relate to past returns, do they follow positive feedback trading strategies? Investigating those questions is important not only for us to understand the determinants of trading volume, liquidity, and stock returns but also for money managers and policymakers to devise efficient trading strategies and improve the liquidity and efficiency of financial markets.

In order to investigate the trading behaviours of the three securities, I focus on how the trading activities differ, in real time, among ADR, ETF, and CEF. First, this paper examines whether ADR, ETF, and CEF trade at different transaction prices across countries. It helps me to understand whether one type of security have an advantage of trading over the other. Second, I use the VAR model to estimate the correlations of return, volume, liquidity and volatility among the three types of securites. It shows the relative relation of trading among the three securities. Third, I examine the short-horizon dynamic relation between the order

imbalance and both past and subsequent returns by type of securities using high-frequency intraday data. The dataset with a special construction contains ADR, ETF, and CEF of 29 countries and 4 regions mostly from March 18th, 1996 to Jan. 5th, 2007.

Previous research mostly focuses on whether different clienteles of investors (foreign v.s. domestic) have advantage of information or trading one over the other. Choe, Kho, and Stulz (2005), and Hau (2001a) find that foreigners are at a disadvantage using Korean and German data respectively. Seasholes (2000), Grinblatt and Keloharju (2000), and Froot and Ramadorai (2001) show that foreigners do better than local investors using Taiwanese, Finnish, and a cross section of 25 countries data. Now I am focusing not on different types of investors but on securities. This paper first examines how the buying v.s. selling activities differ among the three types of securites, ADR, ETF, and CEF. For each country (region), I choose the ADR with the most heavily traded and highest turnover as the leading ADR of that country (region) by CRSP data. I compute the relative price ratio[1] for thethree securities in 5 minute interval in the sample. First, I find that the investors are at a disadvantage investing in ADR relative to ETF (CEF) on average. The average disadvantage of investing in leading ADR relative to ETF (CEF) is of the order of 11 (10) basis points for purchases and 12 (13) basis points for sales. This means that on a roundtrip trade the investors investing in leading ADR face greater transaction costs of the order of 23 basis points than investors investing in ETF (CEF). Second, there is no significant evidence to show whether the investors are at a disadvantage investing in ETF relative to CEF on average. From the results above, I can infer that ETF and CEF have advantages of trading over leading ADR. I can also infer that institution investors trade at a disvantageous price compared to individual investors on average. Those results might come from the difference of leading ADR, ETF, and CEF. Without the dataset of the exact information about the buys and sells, my approach has some limitation when using the classification of buys and sells by Lee and Ready (1991).

I use the VAR model to estimate the relation of return, quoted spread, volume and volatility among the three types of securites. I find that the returns of one security are positively related to the past returns of the other two securities. For example, on average,

[1]It follows the definition of Choe, Kho, and Stulz (2005) and Bailey, Mao and Sirodom (2006).

the returns of leading ADR are 2.6% related to the past returns of ETF and 2.7% related to the past returns of CEF. On average, the volatilities and liquidities (measured by quoted spreads) of one security is also positively related to the past volatilities and liquidities of the other two. The results verify our hypothesis that the trading behaviours of leading ADR, ETF, and CEF are correlated and we can forecast the future returns of one security by the past returns of the other two.

A number of earlier papers have examined the relation between past returns and trading activity. They mainly address the relation between the net trading and returns among different types of investors institution, individual, and foreign investors. Griffin, Nardari, and Stulz (2002) point out that a model with perfect information cannot explain one of the stylized facts in international finance: the positive contemporaneous relationship between net equity flows and returns. They argue that a model in which foreign investors are less informed than domestic investors can explain this stylized fact. Brennan and Cao (1997) show positive feedback trading results in that rational U.S. investors lack information about foreign securities and condition their trades on the recent return performance of individual foreign securities or national stock indexes. Bohn and Tesar (1996) and Clark and Berko (1996) show a positive contemporaneous relation between equity flows and stock returns using monthly data. Froot, O'Connell, and Scasholcs (1998) investigate the relation between equity flows and stock index returns with trades of 44 countries using State Street Bank& Trust database, and find strong evidence that flows into a market are positively correlated with lagged returns in that market.

In this paper, I investigate dynamic relation between the concurrent and past order flow-return relation of the three securities. I want to further check the trading behavior among the three securities, and two methodolgies are applied. One methodology I use is to investigate the cumulative returns around the largest and smallest buying and selling activity of leading ADR, ETF, and CEF. I find that the investors buy when returns and prices increase and sell when returns and prices decrease. The cumulative returns of CEF around the sell trades are higher than those of leading ADR and ETF. The other methodology I use is to use the VAR model and investigate the relation between the net trading and returns among leading ADR, ETF, and CEF across the countries. The results of VAR model tell us that the trading

of the three securities are positively correlated and the buy and sell trades of one security are decided not only by the net order imbalances and past returns of the certain security itself but also by the net order imbalances and past returns of the other two securities. Furthermore, the past net order imbalances and past returns of the three securities can do a good job in predicting the future returns of leading ADR, ETF, and CEF.

How can I interpret trading on leading ADR, ETF, and CEF? It may be due to the liquidity, information or behaviour reasons. Admati and Pfleiderer (1988) show that informed investors seek to execute their trades at times when the market is liquid and active to minimize market impact and to prevent other market participants inferring their information. I investigate the average quoted spreads and depths around the largest and smallest buying and selling activity of leading ADR, ETF, and CEF. I do not find persuasive evidence on the liquidity reasons to explain the trading behaviour of leading ADR, ETF, and CEF.

I want to examine how the trading of the three securities are related to market information and whether the profitability and contribution to price discovery of the trading are consistent with informed trading. Returns and order flow could move together in response to new information that is relevant for valuation. Brennan and Cao (1996) show mutual fund investors are relatively uninformed about the distribution of returns on the risky asset. Thus, after news is released, mutual fund investors are net buyers (sellers) in response to public release of good (bad) news. Although the model does not explicitly predict that flow will lag returns, Brennan (1998) argues that a lag of one or several days is consistent with information driving returns and flow, if some investors do not stay attuned to the latest news. Empirical work on international return behavior suggests that foreign stocks respond contemporaneously or with a lag to common news that they share[2]. Griffin, Harris, and Topaloglu (2003) and Bailey, Mao and Sirodom (2006) use the regression of the net order imbalances on lag net order imbalances and lag returns to explore the relation between the trading and infomation.

My hypothesis is that the trading behaviour of the three securities might come from the correlated information set. The results of VAR model tell us that the trading of the three

[2]There are related literature on trading across markets and information. See Eun and Shim (1989), Hamao, Masulis, and Ng (1990), Craig, Dravid, and Richardson (1995), Karolyi and Stulz (1996).

securities are correlated and the buy and sell trades of one security are not only decided by the net order imbalances and past returns of the certain security itself but also the net order imbalances and past returns of the other two securities. It implies that the trading on the three securities leading ADR, ETF, and CEF, selected from the same country, belong to the same information set.

This paper is also highly related to positive feedback trading. Dornbusch and Park (1995) contend that the trades of foreign investors are affected by past returns, so that they buy when prices have increased and sell when they have fallen. Such a practice is called positive feedback trading. Choe, Kho, and Stulz (1999) find strong evidence of positive feedback trading and herding by foreign investors before the period of Korea's economic crisis. Froot, O'Connell, and Scasholcs (1998) suggest that the positive feedback ttading may be evidence that some foreign investors use returns to extract information about future returns. Richards (2005) show positive feedback trading with respect to global, as well as domestic, equity returns using the dataset that contain the aggregate daily trading of all foreign investors in six Asian emerging equity markets. The results show that investors buy one security when price increases and sell when price decreases. So the trading of leading ADR, ETF, and CEF follows the positive feedback trading. If the increasing returns are observed, the buy trades of one security take place. If the decreasing returns are observed, the sell trades of one security take place. This indicates that investors tend to be momentum traders, and they use returns information from the trading of the three securities to guide the direction of their trading.

Finally, this paper also sheds light on the impact of trading on market efficiency. Lakonishok, Shleifer, and Vishny (1992) claim that positive-feedback trading and herding have potential to destabilize stock prices; however, they find little supporting evidence in their pension fund sample. Wermers (1999) finds that mutual fund herding stabilizes stock price by speeding up the price adjustment process. One might conjecture that increased trading can make stocks more volatile or riskier. The higher returns following an increase in net order imbalances may simply be compensated for the increased risk. I investigate the average return volatilities around the largest and smallest buying and selling activity of leading ADR, ETF, and CEF. The increase in volatilities observed is too small and too temporary

to explain the trading and returns I observe. So the evidence of empirical results could not reject the hypothesis that positive-feedback trading improves market efficiency.

There are two contributions of this paper to the literature: (1) This is the first paper that investigates the trading behaviors of three related securities, specifically ADR, ETF, and CEF. ETFs are desirable investment vehicles for both institutional and private investors. It helps investors and money managers to conduct efficient trading strategies. (2) This paper empirically verifies that the trading behaviors of ADR, ETF, and CEF follow positive feedback trading and are consistent with the theoretical models by DeLong, Shleifer, Summers, and Waldmann (1990) and Hong and Stein (1999).

The balance of this paper is organized as follows. Section 2 discusses the dataset and sample construction. Section 3 investigates whether the Leading ADR, ETF, and CEF trade differently and correlatedly. Section 4 analyze the dynamic relation between net individual trading and short horizon returns. Section 5 give some explanations. Section 6 is a summary and conclusion.

2 Data and Sample Construction

2.1 The Three Vehicles: ADR, ETF, and CEF

In this paper I investigate three types of securities that allow the investors to access the international markets, ETF, ADR and CEF. We take ETF as the "base" security in this paper. ETFs are bundles of foreign stocks that trade on the AMEX/NYSE and are priced in US dollars. ETFs are desirable investment vehicles for both institutional and private investors. ETFs are more accessible and more convenient trading vehicles for smaller orders or orders motivated by liquidity needs. The presence of liquidity traders may attract informed traders to take advantage of potential profit opportunities in the ETF market. They combine characteristics of individual stocks and traditional index funds. They are designed to be a low cost instrument that tracks a foreign stock index and can be traded intraday like regular stocks with stops, limits, short sales, etc. ETFs can achieve a desired portfolio position with one transaction, saving the costs of multiple trades in individual stocks. Because

international ETFs are traded in U.S. markets, and subject to the same trading rules and practices, they also avoid some of the typical problems of international stock investments such as illiquidity, changing exchange rates, and trading restrictions. Using ETFs ensures that the analysis is unaffected by the differences in market clientele, transparency, and other aspects of market structure.

Closed end funds (CEF) are typically traded on the major stock exchanges in US, such as NYSE and AMEX. New shares are rarely issued after the fund is launched; Shares are not normally redeemable for cash or securities until the fund liquidates. Typically an investor can acquire shares in a closed-end fund by buying shares on a secondary market from a broker, market maker, or other investor, as opposed to an open-end fund where all transactions eventually involve the fund company creating new shares on the fly (in exchange for either cash or securities) or redeeming shares (for cash or securities). Like their better-known open-ended cousins, closed-end funds are usually sponsored by a funds management company which will control how the money is invested. They begin by soliciting money from investors in an initial offering, which may be public or limited. The investors are given shares corresponding to their initial investment. The price of a share in a closed-end fund is determined partially by the value of the investments in the fund, and partially by the premium (or discount) placed on it by the market. Closed-end funds offer a fixed supply of shares, and as demand changes they frequently trade at appreciable discounts from (and sometimes premiums to) their net asset values (NAVs).

Closed-end funds trade on exchanges and in that respect they are like exchange-traded funds (ETFs)[3], but there are important difference between these two types of securities. The price of a closed-end fund is completely determined by the valuation of the market, and this price often diverges substantially from the NAV of the fund assets. In contrast, the market price of an ETF trades in a very close range of its net asset value, because the structure of the ETF would allow major market participants to gain arbitrage profits if the market price of the ETF were to diverge substantially from the NAV. The market prices of closed-end

[3]ETFs are open-ended in the sense that units of the ETF shares can be swapped for pre-announced portfolios of the underlying assets and a small cash component representing accumulated dividends at the end of each trading day. As the supply of the ETF can be altered at any time, arbitrage ensures that its price closely tracks the index. Managers of the ETFs may buy either all the stocks in the index or a sample of stocks to track the index.

funds are often ten to twenty percent different than the NAV while the value of an ETF would only very rarely differ from the NAV by more than one-fifth of a percent.

An American Depositary Receipt (ADR) represents ownership in the shares of a foreign company trading on US financial markets. ADRs[4] are commonly traded on all major stock exchanges (NYSE, AMEX, and NASDAQ) or Over-the-Counter (OTC) market in US dollars. ADRs enable US investors to buy shares in foreign companies without undertaking cross-border transactions. ADRs carry prices in US dollars, pay dividends in US dollars, and can be traded like the shares of US-based companies. Each ADR is issued by a US depositary bank and can represent a fraction of a share, a single share, or multiple shares of foreign stock. An owner of an ADR has the right to obtain the foreign stock it represents, but US investors usually find it more convenient simply to own the ADR. The price of an ADR is often close to the price of the foreign stock in its home market, adjusted for the ratio of ADRs to foreign company shares. Depositary banks have numerous responsibilities to an ADR holder and to the non-US company the ADR represents. The first ADR was introduced by JPMorgan in 1927, for the British retailer Selfridges & Co. The largest depositary bank is the Bank of New York. Individual shares of a foreign corporation represented by an ADR are called American Depositary Shares (ADS).

ETFs emerge in the late 1990's while the history of ADRs and CEFs are longer than that of ETFs. ETFs are desirable investment vehicles for both institutional and private investors. ETFs are more accessible and convenient trading vehicles for smaller orders or orders motivated by liquidity needs. The presence of liquidity traders may attract informed

[4]There are different types of ADR programs that a foreign company could choose, such as unsponsored share, Level I, Level II, Level III, 144-A and Regulation S. Unsponsored shares are ADRs that trade on the over-the-counter (OTC) market. These shares have no regulatory reporting requirements and are issued in accordance with market demand. Level 1 depositary receipts are the lowest sponsored shares that can be issued. Level I shares can only be traded on the OTC market and the company has minimal reporting requirements with SEC. Level II allows the firms' shares can be listed on a U.S. stock exchange, NYSE, AMEX or NASDAQ. Foreign company that issue a Level 2 program must meet full SEC disclosure requirements and meet the listing requirements of the US stock exchange on which they are listed. In addition, the company is required to file a Form 20-F annually and follow GAAP standards. A Level 3 depositary receipt program is the highest level a foreign company can have. Setting up a Level 3 program means that the foreign company is not only taking some of its shares from its home market and depositing them to be traded in the U.S. but also issuing shares to raise capital. Foreign companies with Level 3 programs will often issue materials that are more informative and are more accommodating to their U.S. shareholders because they rely on them for capital. Rule 144-A and Regulation S are the two restricted programs that foreign companies limit their stock to be traded by only certain individuals. ADR programs operating under one of these 2 rules make up approximately 30% of all issued ADRs.

traders to take advantage of potential profit opportunities in the ETF market. CEF is more likely to be dominated by behaviour bias individual investors while ADR is more likely to be dominated by institutional traders. Three securities from the same country listed in US should be correlated but different in trading. It is quite interesting to investigate the behaviour of the three securities and will provide a good guide for US investors who want to invest in foreign markets.

2.2 Sample Construction

The primary dataset I use to study the trading of the triplets, ADR, ETF, and CEF is obtained by a special construction. First, I obtain the details of all the ADRs, CEFs and ETFs of foreign equities from the website of NYSE, AMEX and NASDAQ and Center for Research in Security Prices (CRSP) dataset. I choose the countries or regions with at least two types of securities listed in US. There are 29 countries and four regions included in the dataset. For ADR, I exclude those ADRs that belong to unsponsored share, Level I, 144-A and Regulation S because they are not allowed to be traded in a stock exchange or in public. For each country, I choose the ADR with the most heavily traded and highest turnover as the leading ADR of that country. For ETF and CEF, I also use the same standard to choose the one with the highest volume and turnover. So I pair up the securities together and choose the longest overlapping period for the securies for each country. The sample period is from March 18th, 1996 to Jan. 5th, 2007 for most of the countries and regions except some cases. The sample period for each country is summarized in Table 1.

Second, I obtain the tick-by-tick trading and bid-ask dataset for the three securities of each country from the Trades and Quotes (TAQ) database. The quote data are from the NBBO (National Best Bids and Offers) quote database. To construct the sample of intra-day trading, I divide each trading day into 78 five-minute intervals from 9:30 a.m. to 16:00 p.m.. I exclude overnight intervals from my analysis. Table 2 summarize the statistics on the trading activities by type of securities and country. It lists the numbers of the trades, mean price, spread $((bid - ask)/((bid + ask)/2))$, depth $((bidsiz + asksiz)/2)$, volatility, return, volume, trading value, fraction of trading volume and fraction of trading value among the triplets of the Leading ADR, ETF, and CEF for each country and region. The average

(median) numbers of trades in the sample are 3,010,542 for leading ADR, 302,728 for ETF, and 190,040 for CEF. The mean (median) market value of all investor holdings in US is \$32,128 (\$25,143) for leading ADRs, \$31,707 (\$31,854) for ETFs, and \$13,223 (\$11,541) for CEFs. Bailey, Kumar, and Ng (2007) show that the mean (median) market value of individual investor holdings is \$16,383 (\$5,707) for international open end mutual funds, \$10,877 (\$4,849) for ADRs and other foreign-incorporated stocks, and \$11,771 (\$5,540) for closed end country funds from a database of individual investors with accounts at a major U.S. discount broker from January 1991 to November 1996. It indirectly verifies that CEF is more likely to be dominated by individual investors while ADR is more likely to be dominated by institutional traders if I assume that all investors in US mainly compose of institutional investors and individual investors. I define the fraction of trading volume as the trading volume of one security divided by the total trading volume of the three securities. The fraction of trading value is defined as the trading value of one security divided by the total trading value of the three securities. The average fraction of trading volume over all the countries and regions in the datasets is 83.07% for the leading ADR, 29.70% for the ETF, and 8.51% for the CEF. The average trading value is 75.79% for the leading ADR, 25.82% for the ETF, and 19.29% for the CEF. The fraction of trading volume (value) in the emerging Asia countries is on average 54.52% (41.14%) for ETF. It is higher than leading ADR and CEF. The trading on the leading ADR is on average heavier than on the ETF and CEF. Since I am interested in the intraday trading and behavious of the three securities, I use the midquote return and focus more on shorter horizon dynamics. The average return of the leading ADR is higher than that of the ETF but there are 14 out of 20 countries that have higher returns on ETF than the leading ADR. There are 14 out of 20 countries that have higher returns on ETF than CEF. There are 12 out of 23 countries that have higher returns on ADR than CEF. On average, the performance of ETF is better than ADR and CEF. It will be quite interesting to look at the correlations of the leading ADR, ETF, and CEF.

I conduct my analysis on two types of trades. First, I use all trades, regardless of who initiates the trade. Since I am concerned about the impact of trades by the US-based investors on returns and prices, I would like to identify those trades that are most likely to affect prices. Thus, I just consider the price-setting trades that have been used recently in

the literature. It is better to obtain a dataset that have the exact classification about buys and sells according the investor information (Choe, Kho, and Stulze (1999) and Kaniel, Saar, and Titman (2006)). Yet due to the limit access of the dataset, I use the algorithm developed by Lee and Ready (1991) to define the trade directions as a buy or a sell. This algorithm compares transaction prices to the mid-quote five seconds before the transaction took place[5]. The trade data are matched with the previous NBBO quote data and all the variables are analyzed in the 5-minute time interval. Orders are timestamped to indicate the time of arrival at the exchange while trades indicate the time the order was executed. Then I get the the matched buy and sell orders, the size and price of the trade, and other information. Table 3 summarize the statistics on trading activity by trade type and Country. It lists mean price, spread, depth, volume, trading value, volatility, and return of a buyer-initiated trade and a seller-initiated trade among the Leading ADR, ETF, and CEF for each country and region. The average trade value of ADR (ETF, CEF) is \$17,056.611 (\$16,519.517, \$6,291.625) for buys and \$13,891.317 (\$14,881.649, \$6,364.273) for sells. Kaniel, Saar, and Titman (2006) report the average (median) trade size for an individual in their sample is \$15,822 (\$13,243). And Barber and Odean (2000) report an average trade size of \$13,707 for sells and \$11,205 for buys (but much smaller medians, \$5,738 and \$4,988, respectively). In Barber and Odean (2005), the average trade size in the sample of individuals who use a full-service broker between 1997 and 1999 is \$15,209 for buys and \$21,169 for sells. The sample I construct is consistent with their report. But my sample contains ADR, ETF, and CEF from the 29 countries and 4 regions and their sample mostly covers common domestic stocks. On average, the average returns is negative for buys and positive for sells. That is the sellers do better than buyers in the three securities, ADR, ETF, and CEF.

[5]Ellis, Michaely and O'hara (2000) evaluate how well the Lee and Ready algorithm performs and find that it is 81.05% accurate.

3 Do the Leading ADR, ETF, and CEF trade Differently?

3.1 Do the Leading ADR, ETF, and CEF trade at a disadvantage price over the others?

I want to examine how the type of trade differs among the three securites. I computing relative price ratios following Choe, Kho, and Stulz (2005) and Bailey, Mao and Sirodom (2006). Relative to the average buy (sell) price for a particular stock and time, I determine which type of security typically pays (receives) a relatively low (high) price, implying a well timed and executed trade. Each security typically attracts different types of investors, institution investors and individual investors. ETFs are more accessible and more convenient trading vehicles for smaller orders or orders motivated by liquidity needs. The presence of liquidity traders may attract informed traders to take advantage of potential profit opportunities in the ETF market. The closed end fund is more likely to be dominated by behaviorally biased individual small investors while ADR is more likely to be dominated by institutional traders. If I could determine which type of security trades at a better transaction price, it is possible for me to link trades and relative transaction prices with investors and transaction prices.

Following Choe, Kho, and Stulz (2005) and Bailey, Mao and Sirodom (2006), I compute the volume-weighted average price for each security A_{it} in 5 minute interval and then then compute the volume-weighted average price for the certain type of trade for the same security over the same time interval B_{it}. The volume-weighted average price ratio is defined as B_{it}/A_{it} for the security during the certain time interval. A price ratio greater (less) than one for the purchases (sales) of a particular type of security suggests that this type of security buys (sells) on average at a price above (below) the average price on that day. Holding everything else equal, security X is at disadvantage relative to security Y for purchases (sales) if security X buys (sells) at a higher (lower) price ratio than security Y. Table 4 summarizes the ralative price ratio of the triplets (Leading ADR, ETF and CEF) for certain type of trade. The relative price ratios are multiplied by 100. Two hypothesis tests are investigated in table 4. One is whether the relative price ratio of one security is significantly different from 100

and the other is whether the relative price ratios among the three securities are significantly different from the other.

My results are quite different from Choe, Kho, and Stulz (2005) and Bailey, Mao and Sirodom (2006). They are interested in whether different types of investors trade at different transaction prices over all the securities or different trading boards. They have the dataset with the information about the buys and sells. The limitation of my approach is the classification of buys and sells by Lee and Ready (1991) might miss some important trades of the investors. Yet, I still get some interesting results from this approach. If a certain type of investors invests in a certain type of securities, will their performance be different in different countries? Leading ADR, on average, buys at a higher price except Japan, China, Belgium and Brazil and sells at a lower price than ETF except Japan, China, and Belgium. ETF buys at a lower price than CEF in 9 out of 20 countries. They are China, Italy, Spain, France, Mexico, South Africa, Canada, Europe, and Emerging market. ETF sells at a higher price relative to CEF in China, Italy, France, Mexico, South Africa, Canada, Europe, and Emerging market. Leading ADR buys at a higer price relative to CEF except Japan, China, Philippine, Italy, Russia, Turkey, Chile, Mexico. Leading ADR sells at a lower price relative to CEF except Japan, China, Philippine, and Russia.

First, I find evidence that the investors are at a disadvantage investing in ADR relative to in ETF on average. The average disadvantage of investing in ADR relative to ETF is of the order of 11 basis points for purchases and 12 basis points for sales. This means that on a roundtrip trade the investors in investing in ADR face greater transaction costs of the order of 23 basis points compared with investors in investing in ETF. Second, investors are at a disadvantage investing in ADR relative to in CEF on average. The average disadvantage of investing in ADR relative to CEF is of the order of 10 basis points for purchases and 13 basis points for sales. This means that on a roundtrip trade the investors in investing in ADR face greater transaction costs of the order of 23 basis points compared with investors in investing in CEF. Third, there are no significant evidence to show whether the investors are at a disadvantage investing in ETF relative to in CEF on average. The average disadvantage of investing in CEF relative to ETF is of the order of 1 basis points for purchases but the average disadvantage of investing in ETF relative to CEF is of the order of 1 basis points

for sales. I could also infer that institution investors trade at a disvantageous price relative to individual investors on average. Those results might come from the difference of Leading ADR, ETF, and CEF.

3.2 Correlation of the trades: Leads and Lags of the Three Securites

In my sample, the paired leading ADR, ETF, and CEF are from the same country and their trading behaviour might be corrlated by intuition. In order to investigate the trading behaviour of the three securities, the natural questions are (1) how trading differs, in real time, among the three related securities? (2) what is the relative relation of returns, quoted spread, volume and volatility among the three securities?

I use the VAR model to estimate the relation of return, quoted spread, volume and volatility among the three types of securites. Vector X_t can be expressed in terms of current and lagged innovations:

$$X_t = A_0 + \sum_{j=1}^{k} A_j X_{t-j} + u_t \tag{1}$$

Where $X_t = \{V_t^1, V_t^2, V_t^3\}$ represents return, quoted spread, volume and volatility of the leading ADR, ETF, and CEF respectively. Also I use granger-causality test to show whether the return, quoted spread, volume and volatility of one security granger cause those of the other security.

Table 5 presents the results of the VAR on the returns of the leading ADR, ETF, and CEF. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the returns of the leading ADR, ETF, and CEF. It only presents the coefficients of the returns of one security on the lag returns of the other two for last period and the past 6th period. The returns of leading ADR are significantly positively related to the past returns of ETF (except Israel, Canada and emerging market) and CEF. The returns of ETF are significantly positively related to the past returns of leading ADR (except Israel, Canada and emerging market) and CEF (except Canada). The returns of CEF are significantly positively related to the past returns of leading ADR (except China and Israel) and ETF. The granger causality

test shows that the past returns of the other two securites granger cause the current returns of one security. On average, the returns of leading ADR are 2.6% related to the past returns of ETF and 2.7% related to the past returns of CEF. The returns of ETF are 0.8% related to the past returns of leading ADR and 1.2% related to the past returns of CEF. The returns of CEF are 0.6% related to the past returns of leading ADR and 1.4% related to the past returns of ETF. The results verify our hypothesis that leading ADR, ETF, and CEF are correlated and we could forecast the future returns of one security by the past returns of the other two. That is, if we observe increasing returns of one security, we could forecast the directions of the other two.

Table 6 presents the results of the VAR on the volumes of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the volumes of the leading ADR, ETF, and CEF. It only presents the coefficients of the volumes of one security on the lag returns of the other two for last period and the past 6th period. There are not a clear relation of the current volume and the past volume among the leading ADR, ETF, and CEF across all the countries. The volume of leading ADR is positively related to the past volume of ETF except Singapore, Hongkong, India for the Asian countries, Russia, Chile, and Israel. The volume of leading ADR is negatively related to the past volume of ETF for the European countries. The volume of leading ADR is positively related to the past volume of CEF except Australia, Singapore, Spain, and Canada. The volume of ETF is negatively related to the past volume of leading ADR except Australia, Japan, China, India, Korea, Taiwan, UK, Russia, and Israel. The volume of CEF is positively related to the past volume of leading ADR except Australia, Singapore, Japan, Taiwan, and Canada. The patterns of trading volume among the different countries are diversified.

Table 7 presents the results of the VAR on the volatilities of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the volatilities of the leading ADR, ETF, and CEF. On average, the volatilities of one security is positively related to the past volatilities of the other two. There are some exceptions. The volatilities of leading ADR is negatively related to the past volatilities of ETF for South Africa and Canada and vice versa. On average, the volatilities of leading ADR

are 2.75% related to the past volatilities of ETF and 3.43% related to the past volatilities of CEF. The volatilities of ETF are 1.56% related to the past volatilities of leading ADR and 1.11% related to the past volatilities of CEF. The volatilities of CEF are 1.25% related to the past volatilities of leading ADR and 1.35% related to the past volatilities of ETF. In short, the risks associated with the trading are approaching the same direction among the three securities leading ADR, ETF, and CEF. Table 8 presents the results of the VAR on the quoted spreads of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$show the results of the Granger Causality test for the relations of the quoted spreads of the leading ADR, ETF, and CEF. On average, the spreads of one security is positive related to the past spreads of the other two securities. The spreads of leading ADR is negatively related to the past spreads of ETF for India, Belgium, Spain, Chile, Israel, South Africa, and Latin America. The spreads of ETF is negatively related to the past spreads of leading ADR for Hongkong, India, Spain, and South Africa. The spreads of CEF is negatively related to the past spreads of leading ADR for Germany.

Table 5-8 present the leads and lags of the relations about the returns, volume, volatilities, and quoted spreads among the three securities, leading ADR, ETF, and CEF. In summary, the trading behaviour of the three securities are highly correlated. The results verify our hypothesis that the three securities leading ADR, ETF, and CEF are correlated and we could forecast the future returns of one security by the past returns of the other two.

4 Dynamic Relation between Order Imbalance and Returns Among the three Securities

In last section, I get the results that the trading behaviour of the three securities are highly correlated. The main focus of this section is on the concurrent and past order flow-return relation of the three securities. Inferences about this relation are potentially affected by the time-series properties of each variable. In particular, order flow is highly predictable. If net buy-sell imbalances by one security respond systematically to past returns, VAR systems are estimated to get a more complete picture of the dynamics of the effect of returns on net

order imbalances.

4.1 Regressions of Net Buy-Sell Imbalance and Short-Horizon Returns

In section 2, I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute price-setting orrder imbalances by security type by subtracting the "price-setting" sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. A "price-setting buy" (sell) trade for one security, for example, is a trade where the buy (sell) order of that security came after the sell-side (buy-side) order that it is matched to, and hence made the trade possible.

VARs have been used by Froot et al. (2001), Karolyi (2002), Dahlquist and Robertsson (2004) to examine the correlation between inflows and returns. I use the VAR model to estimate the relation of net order imbalances and returns among the three types of securites. Vector Y_t can be expressed in terms of current and lagged innovations:

$$Y_t = A_0 + \sum_{j=1}^{k} A_j Y_{t-j} + u_t \tag{2}$$

Where $Y_t = \{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as $k = 6$ by Akaike and Schwartz-Bayes criteria. Panel A-E of table 9 summarize the average coefficients of the VARs across all the countries, the regions of the Asia and Pacific, Europe, Latin America, and Emerging Market when the dependent variables are $OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2$,and R_t^3. In Table 9, order imbalance (return) is regressed on concurrent and lagged returns (order imbalance) and lagged order imbalance (returns). The first three columns develop the relation between flow and predetermined variables-lagged returns and flow.

First, as shown in Table 9, order imbalance is correlated with past order imbalance. Second, order imbalance is strongly dependent on lagged returns. I use order imbalance of ADR as an example. Order imbalance of ADR is 15.33% related on lag order imbalance

of ADR, 4.3 basis point on ETF, and 7.3 basis point on CEF. Order imbalance of ADR is 46.16% related on lag returns of ADR, 17.24% on ETF, and 21.76% on CEF. They are both economic and statistically significant. Lagged returns and order imbalances of the three securities explain the variations of the order imbalances. There are some exceptions shown in Panel B-E. The net order imbalances of ADR are negatively related with the past returns of ADR in European and Latin American countries and with the past returns of ETF in Latin American countries.

The column 4-6 of Table 9 presents regressions of returns on concurrent and lagged order imbalances. First, returns is correlated with past order imbalance. Second, returns is strongly dependent on lagged returns. I use returns of ADR as an example. Returns of ADR is 33.47% related on lag order imbalance of ADR, 1.08% on ETF, and 1.71% on CEF. Returns of ADR is -18.56% related on lag returns of ADR, 6.0 basis point on ETF, and 3.7 basis point on CEF. They are both economic and statistically significant. Returns of one security are negatively related to Lagged returns of itself and positively related to lag returns of the other two securities.

The association between order flow and returns potentially reflects a causal relation from order flow to returns, but it could also reflect positive feedback trading by investors (returns causing flow), or a joint reaction of both returns and order flow to economic news. The results of VAR model tell us that the trading of the three securities are positively correlated and the buy and sell trades of one security are not only decided by the net order imbalances and past returns of the certain security itself but also the net order imbalances and past returns of the other two securities.

This results makes intraday feedback trading explanations somewhat more plausible. If the increasing returns are observed, the buy trades of one security take place. If the decreasing returns are observed, the sell trades of one security take place. On average, the returns of one security are positively correlated with the past net order imbalances, past returns of the other two securities and negatively correlated with the past returns of the same type of security. The results of these regressions indicate that the trading by the three securities is a powerful predictor of future returns of the three securities themselves.

4.2 Trading Strategies and Robustness Check

Most research in the literature are focusing on the relation between the net trading and returns among different type of investors institution, individual, and foreign investors.Those research above have the dataset that could classify the traders as institution, individual and foreign investors for some certain countries. They investigate stock returns around the time of trades initiated by a certain type of investors such as foreign investors. In this paper, I want to investigate the relation between the net trading and returns among the three securities leading ADR, ETF, and CEF across the countries. ETFs are more accessible and more convenient trading vehicles for smaller orders or orders motivated by liquidity needs.

The presence of liquidity traders may attract informed traders to take advantage of potential profit opportunities in the ETF market. The closed end fund is more likely to be dominated by behaviorally biased individual small investors while ADR is more likely to be dominated by institutional traders. In this sense I could infer some interesting results from the relation between the net trading and returns among the different type of securities to the different type of investors.

In the last section, I get the results that the order imbalances and returns are correlated with the past order imbalances and returns. I want to further check the trading behavior among the three securities. I examine the extent to which intense net buying or selling by one security is related to the three securities' past returns and the extent to which such intense net trading by certain type of securities predicts future returns. One methodology I use is to investigate the cumulative returns around the largest and smallest buying and selling activity of the three securities leading ADR, ETF, and CEF.

The results are summarized in table 11. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Then I calculate the average cumulative midquote returns of the three securities before and after the heaviest and lightest trading of one certain type of security. Panel B presents the cumulative midquote returns of leading ADR, ETF, and CEF around the largest and smallest buying activities of one security. I show the average cumulative midquote returns over windows $[-k,-1], 0, [1,k], [-j,0]$, and $[0,j]$, $k = 1, 5, 10, 15, 20$, and $j = 5, 10, 20$.

The intense buy trades of one security take place when the returns of that certain type of security are increasing. Associated with the largest buying activity, the returns of the other two securities are also increasing. There exists abnormal returns around the intense buy trades. Panel C presents the cumulative midquote returns of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security. The intense sell trades of one security take place when the returns of that certain type of security are decreasing. Associated with the largest selling activity, the returns of the other two securities are also decreasing. There exists abnormal returns around the intense sell trades as well. This results are very important. I find that the buy trades of one security take place after returns increase and sell trades after returns decrease.

Part (d) of Panel B and C in Table 11 present the relative difference of returns between the largest and smallest trading among the three securities. I calculate the average cumulative midquote returns over windows $[-k, 0], 0, [0, k]$ and $k = 5, 10, 20$. Panel B part (d) show that the cumulative returns are higher at smallest buying than at largest buying. ETF has always higher returns than ADR and CEF no matter when it is heavily or lightly buying. ADR has a higher return than CEF when heavily buying and a lower return than CEF when lightly buying. Panel C part (d) show that the cumulative returns are higher at largest selling than at smallest selling. ETF has always lower returns than ADR and CEF no matter when it is heavily or lightly selling. ADR has a lowher return than CEF when heavily selling and a higher return than CEF when lightly selling. The cumulative returns of CEF around the sell trades are higher than that of leading ADR and ETF. I could infer that the individual investors do better than institution investors when selling.

I also investigate the average price around the largest and smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. The results are summarized in table 12. Using the same method, I calculate the average prices of the three securities over windows $[-k, -1], 0, [1, k], [-j, 0]$, and $[0, j]$, $k = 1, 5, 10, 15, 20$, and $j = 5, 10, 20$, which presents the average prices just before and after the largest v.s. smallest trades of one security. Panel B show that the intense buy trades of one security take place when price increases. Associated with the largest buying activity, the prices of the other two securities are decreasing on the opposite. There exists abnormal prices around the intense buy trades.

Panel C show that the intense sell trades of one security take place when price decreases. Associated with the largest selling activity, the prices of the other two securities are increasing on the opposite. There exists abnormal prices around the intense sell trades as well. In short, investors buy one security when price increases and sell when price decreases. So the trading of leading ADR, ETF, and CEF follows the positive feedback trading.

4.3 Impulse Response and Predictibility of Order Imbalance and Returns

In this section, I want to investigate (1) the impulse response between order imbalances and returns; (2) the predictibility of past returns and order imbalances for future returns of three securities.

To understand the dynamic properties of order imbalance and returns, we compute impulse response functions (IRFs) for order imbalance and returns. The IRF traces the impact of a one-time, unit standard deviation, positive shock to one variable on the current and future values of order imbalances and returns of three securities. Since the innovations are correlated (as we shall show), they are orthogonalized. Specifically, the inverse of the Cholesky decomposition factor of the residual covariance matrix is used to orthogonalize the impulses. When computing the IRF, we need to choose a specific ordering of the endogenous variables since different orderings may result in different responses. Our focus is on the dynamic relation between order imbalances and returns. I choose the order imbalances as the first in the ordering then returns last[6]. The following ordering I use to compute the IRFs is $OIBADR$, $OIBETF$, $OIBCEF$, $RETURNADR$, $RETUREETF$, $RETURECEF$.

The contemporaneous and past correlations of order imbalance and return innovations, reported in Table 10, show that order imbalances and returns mostly have positive correlations with contemporaneous order imbalance and returns among three securities. However, order imbalances and returns mostly have negative correlations with past order imbalance and returns. Figure 1 illustrate the impulse response of order imbalance and returns to a unit standard deviation shock of order imbalance and returns. Monte Carlo two-standard-

[6]I don't know the theoretical guidance regarding the relative ordering of returns and order imbalances and, in any case, it doen't affect the empirical results.

error bands are provided to gauge the statistical significance of the responses. In particular, lagged returns of ADR have a coefficient of 0.4616, with a t-statistic of 18. Thus, a one-standard deviation shock to returns is associated with an 0.46 of one standard deviation shock to order imbalance of ADR on the following period. Figure 1a-1f show that the future order imbalance and returns go up if they face a positive unit standard deviation shock of order imbalance and returns. It reinforces the positive relation between order imbalance and returns. A positive correlation suggests that net flows anticipate future fund returns.

Since I use the VAR model to estimate the relation of net order imbalances and returns among three types of securites in the last section, I can use the modified model to predict future returns. Vector Y_{t+1}can be expressed in terms of current and lagged innovations:

$$Y_{t+1} = A_0 + \sum_{j=1}^{k} A_j Y_{t-j+1} + u_t \tag{3}$$

Where $Y_t = \{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}, j = 1, 2, \cdots, 6$,represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. Figure 2 show the forcasting results of order imbalances and returns. Figure 2a show the future order flow of ADR goes down. Figure 2b and 2c show the future order flow of ETF and CEF go up. Figure 2d-2f show the future returns go down first then go up again.

5 Discussion on Trading Behavior of ADR, ETF, and CEF

5.1 Liquidity as a driver of Returns and Order Flow

How can I explain the trading bahavior of ADR, ETF, and CEF? It might be due to the liquidity, information or behaviour reasons. First, I do some test on the relationship between liquidity and trading of the three securities leading ADR, ETF, and CEF. Admati and Pfleiderer (1988) show that informed investors seek to execute their trades at times when the market is liquid and active to minimize market impact and to prevent other market participants inferring their information. I hypothesize that the investors who want to invest

in foreign quities seek to execute their trades at times and places when liquidity is relatively higher, that is, the bid-ask spread is lower and depth is higher.

I investigate the average quoted spreads and depths around the largest and smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Quote spread and depth are computed as $((bid - ask)/((bid + ask)/2))$, depth $((bidsiz + asksiz)/2)$ respectively. Then I calculate the average quote spreads and depths of the three securities over windows $[-k, -1], 0, [1, k], [-j, 0]$, and $[0, j]$, $k = 1, 5, 10, 15, 20$, and $j = 5, 10, 20$, which presents the average quote spreads just before and after the largest v.s. smallest trades of one security. The results are summarized in the table 13 and 14. If our hypothesis is correct, we should find that liquidity (proxied with quoted spread and depth) is particularly high just before the heaviest trading events, and liquidity is particularly low just before the lightest trading events. The results from table 12, I don't find the strong evidence to support my hypothesis trading in investing in the leading ADR, ETF, and CEF takes place when liquidity is relatively higher. When the trading of the three securities are extremely heavy, the bid-ask spread is larger than the spread when the trading of the three securities is very light. Yet the results of table 13 support my hypothesis. When the trading of the three securities are extremely heavy, the depth is larger than the spread when the trading of the three securities is very light. So the evidence provided by table 12 and 13 are not enough or persuasive to explain the trading behaviour of the leading ADR, ETF, and CEF.

5.2 Positive Feedback Trading and Information

5.2.1 Information

Returns and order flow could move together in response to new information that is relevant for valuation. Brennan and Cao (1996) show mutual fund investors are relatively uninformed about the distribution of returns on the risky asset. Thus, after news is released, mutual fund investors are net buyers (sellers) in response to public release of good (bad) news. Although the model does not explicitly predict that flow will lag returns, Brennan (1998) argues that

a lag of one or several days is consistent with information driving returns and flow, if some investors do not stay attuned to the latest news.

There are related literature on trading across markets and information. Eun and Shim (1989) study daily data from a number of exchanges around the world and find that shocks to U.S. equity markets are transmitted to other equity markets, but not vice versa. Hamao, Masulis, and Ng (1990) use open-to-close and close-to-close data and find that both volatility and return innovation spill across markets. These lagged effects appear to be largely due to the informational efficiency of the U.S. market at incorporating information about shocks common to several markets. Craig, Dravid, and Richardson (1995) find that Japanese Nikkei index futures traded on the CME in the U.S. provide complete information about contemporaneous overnight Japanese index returns. Karolyi and Stulz (1996) use Japanese ADRs to explore whether the magnitude of the co-movement of Japanese stocks with the U.S. market can be explained via rnacroeconornic factors. They find that the contemporaneous movement between U.S. stocks and Japanese stocks is strong, but not driven by macroeconomic information. In summary, empirical work on international return behavior suggests that foreign stocks respond contemporaneously or with a lag to common news that they share.

The explanation in the last section can not best explain the trading behaviour of the investors investing in the three securities. Then I want to examine how the trading of the three securities are related to market information and whether the profitability and contribution to price discovery of the trading are consistent with informed trading. The three securities leading ADR, ETF, and CEF are selected from the same country and they may belong to the same information set. My hypothesis is the trading behaviour of the three securities might come from the correlated information set. Griffin, Harris, and Topaloglu (2003) and Bailey, Mao and Sirodom (2006) use the regression of the net order imbalances on lag net order imbalances and lag returns to explore the relation between the trading and infomation. I have already summarized the VAR model of net order imbalances and returns in table 9.

The slope coefficients on lagged net order imbalances indicate whether the current net order imbalance is correlated with the previous net order imbalances. The slope coefficients

on lagged returns reveal momentum or contrarian trading strategies. The results of VAR model tell us that the trading of the three securities are correlated and the buy and sell trades of one security are not only decided by the net order imbalances and past returns of the certain security itself but also the net order imbalances and past returns of the other two securities. The inclusion of lagged net order imbalances and lagged returns of the three securities allows us to see the trading activity on one security is related to investing on the other two securities, implying that traders use the correlated shared information set of the three securities.

5.2.2 Positive Feedback Trading

Most research in the literature are focusing on the relation between the net trading and returns among different type of investors institution, individual, and foreign investors. Dornbusch and Park (1995) contend that the trades of foreign investors are affected by past returns, so that they buy when prices have increased and sell when they have fallen. Such a practice is called positive feedback trading, Bohn and Tesar (1996) and Clark and Berko (1996), show a positive contemporaneous relation between equity flows and stock returns using monthly data. Choe, Kho, and Stulz (1999) find strong evidence of positive feedback trading and herding by foreign investors before the period of Korea's economic crisis. Froot, O'Connell, and Scasholcs (1998) investigate the relation between equity flows and stock index returns with trades of 44 countries using State Street Bank& Trust database, and find strong evidence that flows into a market are positively correlated with lagged returns in that market. They suggest that this positive feedback trading may be evidence that some foreign investors use returns to extract information about future returns. Richards (2005) show positive feedback trading with respect to global, as well as domestic, equity returns using the dataset that contain the aggregate daily trading of all foreign investors in six Asian emerging equity markets.

DeLong, Shleifer, Summers, andWaldmann (1990) show that passive traders and rational speculators trade on firm fundamentals and/or superior information, while positive-feedback traders simply buy when prices rise and sell when prices fall. They provide examples that positive feedback trading can make sense for mutual fund investors. If some stocks react

slowly to economic news, then a fund's portfolio return during the day will be positively autocorrelated. Hong and Stein (1999) show that momentum traders can make profit by implementing simple strategies such as trendchasing.

The results in section 4 show that investors buy one security when price increases and sell when price decreases. So the trading of leading ADR, ETF, and CEF follows the positive feedback trading. This indicates that investors tend to be momentum traders, and they use returns information from the trading of the three securities to guide the direction of their trading. If the increasing returns are observed, the buy trades of one security take place. If the decreasing returns are observed, the sell trades of one security take place. Positive feedback trading could be a good explanation for the trading behaviour of the investors investing in the three securities.

5.3 Trading Bahaviour and Market Efficiency

In the last section, I get the conclusion that the trading bahaviour could be explained by positive-feedback trading and momentum traders. A deeper question is whether this effect improves or hampers the market efficiency. This section investigates this question. Theoretically it is not clear whether or not positive-feedback trading improves the market efficiency. On one hand, positive-feedback trading could improve market efficiency if it speeds up the correction of stock mispricing. Specifically, if market underreact to positive (negative) news and thus underprice (overprice) the past winners (losers), then positive-feedback trading can speed up the price adjustment process by pushing the winners (losers) further to the "correct" level. On the other hand, positive-feedback trading could deteriorate market efficiency by driving stock prices further away from their fundamentals if such trading is unrelated to information on firm fundamentals or is induced by overreaction. This section is an attempt to disentangle the above two possibilities.

De Long, Shleifer, Summers and Waldmann (1990a) show one might conjecture that increased individual trading can make stocks more volatile or riskier. That is the higher returns following an increase in net order imbalances may simply be compensation for the increased risk. Lakonishok, Shleifer, and Vishny (1992) claim that positive-feedback trading and herding have potential to destabilize stock prices; however, they find little supporting

evidence in their pension fund sample. Wermers (1999) finds that mutual fund herding stabilizes stock price by speeding up the price adjustment process. I investigate the average return volatilities around the largest and smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Return volatility is computed as absolute value of the midquote return. Then I calculate the average return volatilities of the three securities over windows $[-k,-1], 0, [1,k], [-j,0]$, and $[0,j]$, $k = 1, 5, 10, 15, 20$, and $j = 5, 10, 20$, which presents the average return volatilities just before and after the largest v.s. smallest trades of one security. The results are summarized in the table15. The results from table 15 show a pattern that volatility increases prior to intense trading and subsequently decreases. However, the magnitude of the volatility shown in table 15 is quite small (about 10% of the average standard deviation), and volatility goes down back to the normal level afterwards. Therefore, it seems that the increase in volatility I observe is too small to explain the trading and returns I observe. The dataset I use is at a tick-by-tick high frequency and the increase in volatility might be temporary at this frequency. So the evidence of empirical results could not reject the hypothesis that positive-feedback trading improves market efficiency.

6 Conclusion

This paper examines the trading behaviours among the related foreign securities ADR, ETF, and CEF. A summary of the major findings in this paper is as follows. First, I find that ADR trades at a relative disadvantage transaction price in comparison to ETF and CEF on average.

Second, I use the VAR model to estimate the relation of return, volume, liquidity and volatility among the three types of securites. On average, the returns, volatilities and liquidities of one security are positively related to the past returns, volatilities and liquidities of the other two. The results verify our hypothesis that the trading behaviours of leading ADR, ETF, and CEF are correlated.

Third, I examine the short-horizon dynamic relation between the order imbalance and

both past and subsequent returns by type of securities using high-frequency intraday data. I find that the investors buy when returns and prices increase and sell when returns and prices decrease. The trading of leading ADR, ETF, and CEF follows the positive feedback trading. The results show that the trading of the three securities are positively correlated and the buy and sell trades of one security are not only decided by past order imbalances and returns of the certain security itself but also by past order imbalances and returns of the other two securities. Furthermore, the past order imbalances and returns of the three securities can do a good job in predicting future returns of leading ADR, ETF, and CEF.

Fourth, I explain the trading bahaviour of leading ADR, ETF, and CEF. I examine the average quoted spreads, depths and volatilities around the largest and smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. There is not persuasive evidence on the liquidity reasons and the compensation for the increased risk to explain the trading behaviour of three securities. Positive feedback trading bahavior indicates that investors tend to be momentum traders, and they use the correlated shared information set from the trading of the three securities to guide the direction of their trading.

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Table 1. The Sample Period for the Selected Leading ADR, ETF, and CEF

This table summarizes the Ticker of the selected Leading ADR, ETF, and CEF for each country. I obtain the details of the ADRs, CEFs and ETFs from the website of NYSE, AMEX and NASDAQ and CRSP dataset. I choose the countries or regions with at least two types of securities listed in US. There are 29 countries and four regions included in the dataset. For ADR, I exclude those ADRs that belong to unsponsored share, Level I, 144-A and Regulation S because they are not allowed to be traded in a stock exchange or in public. For each country, I choose the ADR with the most heavily traded and highest turnover as the leading ADR of that country. For ETF and CEF, I also use the same standard to choose the one with the highest volume and turnover. Since the three securities were listed in US at the different time, I choose the longest overlapping period of the three securities for every country as the sample period of the dataset. It is shown in the starting date and ending date.

Country	Leading ADR	ETF	CEF	Starting Date	Ending Date
Australia	BHP	EWA	IAF	3/18/1996	1/5/2007
Singapore	CHRT	EWS	SGF	11/1/1999	1/5/2007
Japan	SNE	EWJ	JEQ	3/18/1996	1/5/2007
China	PTR	FXI	CHN	10/8/2004	1/5/2007
HongKong	ATS	EWH		12/17/1996	1/5/2007
India	INFY		IFN	3/11/1999	1/5/2007
Korea	KTC	EWY	KF	5/12/2000	1/5/2007
Malaysia		EWM	MF	3/18/1996	1/5/2007
Taiwan	TSM	EWT	TWN	6/23/2000	1/5/2007
Indonesia	TLK		IF	11/16/1995	1/5/2007
Philippine	PHI		FPF	10/19/1994	6/18/2003
Germany	DT	EWG	GF	11/18/1996	1/5/2007
Belgium	DEG	EWK		4/26/2001	1/5/2007
Italy	E	EWI	ITA	3/18/1996	2/13/2003
Netherlands	PHG	EWN		3/18/1996	1/5/2007
Sweden	ERIC	EWD		3/18/1996	1/5/2007
Ireland	ELN		IRL	1/4/1993	1/5/2007
Spain	TEF	EWP	SNF	3/18/1996	1/5/2007
Switzerland	NVS	EWL	SWZ	5/11/2000	1/5/2007
France	ALU	EWQ	FRF	3/18/1996	6/18/2004
UK	VOD	EWU		3/18/1996	1/5/2007
Russia	VIP		TRF	11/15/1996	1/5/2007
Turkey	TKC		TKF	7/11/2000	1/5/2007
Chile	ENI		CH	1/4/1993	1/5/2007
Brazil	PBR	EWZ	BZF	8/10/2000	6/2/2006
Mexico	TMX	EWW	MXF	3/18/1996	1/5/2007
ISRAEL	TEVA		ISL	1/4/1993	1/5/2007
South Africa	AU	EZA	ASA	8/5/1998	1/5/2007
Canada	ABX	EWC	CEF	3/18/1996	1/5/2007
Asia		EPP	APF	10/26/2001	1/5/2007
Europe		IEV	CEE	7/28/2000	1/5/2007
Latin America		ILF	LDF	10/26/2001	1/5/2007
EM		EEM	TEI	4/11/2003	1/5/2007

Table 2. Summary Statistics on Trading Activity by Security Type and Origin of Country

The sample includes the 29 countries and 4 regions. The sample period for each country is the longest overlapping period of the three securities. I obtain the tick-by-tick trading and bid-ask dataset for the three securities of each country from the Trades and Quotes (TAQ) database. The quote data are from the NBBO (National Best Bids and Offers) quote database. To construct the sample of intra-day trading, I divide each trading day into 78 five-minute intervals from 9:30 a.m. to 16:00 p.m.. I exclude overnight intervals from my analysis. Table 2 lists the numbers of the trades, mean price, spread ((bid-ask)/((bid+ask)/2)), depth ((bidsize+asksize)/2), volatility, return, volume, trading value, fraction of trading volume and fraction of trading value among the triplets of the Leading ADR, ETF, and CEF for each country and region, in Panel A, B, and C respectively.

Panel A. Leading ADR

Country	#Trades	Mean Price	Mean spread	Mean Depth	Mean Volatility (10^{-4})	Mean Return (10^{-4})	Mean Volume	Mean Trading Value	Fraction of Trading Volume(%)	Fraction of Trading Value(%)
Australia	2127776	34.882	0.100	18.395	1.367	-0.0038	598.170	19645.450	92.844	69.121
Singapore	917764	21.994	0.1061	8.1974	9.330	-0.0225	730.940	19689.730	86.950	68.809
Japan	19487936	54.315	0.2468	11.4660	3.022	0.0102	637.610	34379.320	68.895	40.148
China	852099	93.305	0.2526	5.2962	2.003	0.0026	314.709	28178.670	66.363	66.733
HongKong	75305	4.621	0.2005	26.2212	62.190	-0.5646	1576.7300	8633.070	5.163	16.581
India	750675	72.523	0.2162	3.2743	5.050	0.0011	239.539	17289.370	88.790	69.170
Korea	934483	21.673	0.2064	24.4254	3.655	-0.0035	1219.350	26665.630	43.369	55.298
Malaysia										
Taiwan	4595104	10.617	0.072	140.231	3.588	0.0009	2148.210	23086.500	80.016	78.029
Indonesia	46305	20.234	0.3510	44.7850	11.629	0.0278	1310.600	17054.090	96.301	93.453
Philippine	22679	24.208	0.3214	26.4760	12.455	0.1448	2265.000	62369.560	83.291	74.995
Germany	1328952	20.771	0.1273	48.6435	5.758	-0.0015	1512.880	35142.600	78.064	68.017
Belgium	84333	56.104	0.3828	5.6135	10.215	0.0954	369.330	19510.070	83.421	73.146
Italy	149850	64.057	0.3549	10.3397	11.082	0.0771	943.670	56180.250	94.392	80.470
Netherlands	44423	37.325	0.1912	20.2450	4.890	0.0022	1061.620	43512.260	98.716	96.949
Sweden	11873790	23.784	0.0452	90.2706	7.997	0.0007	1371.660	22981.320	99.360	96.290
Ireland	6759351	18.215	0.1174	35.5389	6.981	-0.0019	1388.280	24180.780	99.203	97.015
Spain	97196	51.582	0.3202	16.0620	5.204	0.0241	1076.600	61914.390	92.218	85.338
Switzerland	1611990	48.651	0.2015	16.6570	2.077	0.0057	734.540	34281.050	97.696	88.841
France	1188823	26.163	0.219	45.672	10.338	-0.0028	2088.950	54819.640	97.312	91.247
UK	3564548	33.444	0.145	43.307	3.896	0.0007	1815.480	61587.070	97.653	92.851
Russia	1536272	52.226	0.289	7.090	4.887	0.0000	553.940	24963.640	88.651	77.278
Turkey	432133	15.258	0.234	26.679	7.023	0.0090	948.800	12461.190	79.624	67.955
Chile	429233	12.297	0.180	26.512	9.008	-0.0022	1644.610	25324.220	64.750	60.814
Brazil	1936913	54.713	0.246	11.322	2.831	0.0048	931.950	37629.050	82.803	77.830
Mexico	2862338	36.191	0.161	38.532	3.570	-0.0014	1672.240	69554.850	78.450	72.843
ISRAEL	13028675	40.558	0.054	9.100	2.303	0.0005	405.070	16963.190	99.843	96.667
South Africa	1899946	41.925	0.177	6.965	2.747	-0.0018	468.040	19151.000	87.704	81.113
Canada	5656297	24.481	0.086	33.224	3.610	0.00004	1019.100	22435.310	94.117	85.015
Asia										
Europe										
Latin America										
EM										
Mean	**3010542**	**36.290**	**0.200**	**28.591**	**7.811**	**-0.007**	**1108.844**	**32127.974**	**83.070**	**75.786**

Table 2. (Cont.)

Panel B. ETF

Country	#Trades	Mean Price	Mean spread	Mean Depth	Mean Volatility (10^{-4}))	Mean Return (10^{-4})	Mean Volume	Mean Trading Value	Fraction of Trading Volume(%)	Fraction of Trading Value(%)
Australia	248018	19.377	0.155	38.364	1.279	-0.0455	875.630	16094.170	5.982	14.704
Singapore	305436	8.845	0.0937	55.4477	9.051	0.0147	1386.540	11608.040	11.637	20.222
Japan	118455	11.399	0.0173	721.0010	0.540	0.0000	604.240	7150.640	0.285	5.957
China	470376	80.364	0.1615	13.8654	2.295	0.0270	471.826	36192.150	31.553	23.541
HongKong	502062	12.731	0.1271	51.7624	9.032	0.0603	1655.0500	20265.420	94.837	83.419
India										
Korea	529203	41.445	0.1844	22.2676	4.635	0.0196	908.880	34624.910	46.965	27.985
Malaysia	311333	7.265	0.093	82.696	13.154	-0.0168	1987.590	13715.160	80.814	57.295
Taiwan	881999	12.751	0.0646	75.5220	3.417	0.0037	1454.980	18065.740	18.446	13.503
Indonesia										
Philippine										
Germany	307419	21.149	0.1497	49.7754	7.453	0.0142	1164.200	23413.940	18.386	18.505
Belgium	47346	19.861	0.2503	40.9101	14.128	-0.4183	1131.060	21154.210	16.579	26.854
Italy	15092	21.587	0.3782	68.6187	38.429	-2.3767	2146.040	44613.970	3.204	8.635
Netherlands	86586	21.706	0.2690	50.6527	19.341	0.1749	1130.240	24186.890	1.284	3.051
Sweden	74368	24.455	0.2779	46.8127	16.133	-0.0557	909.290	20734.760	0.640	3.710
Ireland										
Spain	68976	40.066	0.2886	48.7252	13.498	0.2916	878.220	31853.500	6.198	6.656
Switzerland	60438	19.236	0.3575	60.6947	16.156	0.1279	978.820	18326.940	1.448	5.911
France	22433	20.675	0.504	56.963	34.666	0.4172	2093.540	43057.280	1.451	3.967
UK	152877	18.744	0.260	59.791	13.223	0.0620	2107.980	36347.470	2.347	7.149
Russia										
Turkey										
Chile										
Brazil	573440	33.385	0.163	53.817	5.310	-0.0098	1665.990	46537.710	14.959	15.246
Mexico	620768	38.902	0.168	20.278	4.860	0.0290	1058.730	35230.390	18.288	16.456
ISRAEL										
South Africa	77400	98.303	0.543	7.440	7.585	0.1628	476.580	45198.680	7.730	9.186
Canada	290746	21.747	0.122	82.449	6.599	0.0442	1249.830	23063.830	4.298	6.175
Asia	152779	97.109	0.359	14.494	5.009	0.1540	560.750	51697.630	92.733	49.314
Europe	147750	77.398	0.331	46.642	9.448	0.0712	875.340	63322.170	66.002	43.071
Latin America	258933	128.178	0.448	8.488	4.682	0.0657	349.140	43300.890	97.214	88.925
EM	2202285	102.707	0.126	14.172	1.175	0.0005	738.540	75011.730	99.271	85.951
Mean	**302728**	**36.204**	**0.248**	**64.464**	**11.844**	**-0.070**	**1212.937**	**31706.501**	**29.702**	**25.815**

Table 2. (Cont.)

Panel C. Closed-end Fund (CEF)

Country	#Trades	Mean Price	Mean spread	Mean Depth	Mean Volatility (10^{-4})	Mean Return (10^{-4})	Mean Volume	Mean Trading Value	Fraction of Trading Volume(%)	Fraction of Trading Value(%)
Australia	95446	9.722	0.468	23.135	0.550	-0.1523	1006.490	8883.390	1.173	16.175
Singapore	35122	9.341	0.4421	12.1009	27.377	0.1722	883.890	7492.320	1.413	10.969
Japan	1829632	7.748	0.4214	21.8610	28.688	-0.0831	1078.280	8241.940	30.821	53.896
China	84091	29.695	0.3731	5.4387	10.274	0.0151	435.915	12826.920	2.084	9.726
HongKong										
India	660237	38.148	0.4015	8.6084	6.634	0.0320	566.752	17647.770	11.210	30.830
Korea	192079	23.503	0.3035	11.8691	8.583	-0.0271	966.180	18080.120	9.667	16.717
Malaysia	68075	7.888	0.316	22.192	37.516	-0.0656	1055.100	8174.250	19.186	42.705
Taiwan	70017	13.395	0.5100	12.2710	13.563	0.1272	1046.390	13269.800	1.538	8.468
Indonesia	66725	7.527	0.2382	16.1658	45.782	0.0377	942.470	6674.770	3.699	6.547
Philippine	53857	11.062	0.2441	29.9430	37.479	-0.5781	1184.600	11746.800	16.709	25.005
Germany	114544	10.958	0.2926	33.8237	20.998	-0.0930	1290.120	14182.780	3.550	13.479
Belgium										
Italy	20046	12.195	0.3592	34.6330	33.001	-0.7133	1687.740	20934.990	2.404	10.895
Netherlands										
Sweden										
Ireland	60905	16.242	0.4009	13.6160	30.065	0.2321	674.040	9754.600	0.797	2.985
Spain	58375	12.105	0.4102	20.3860	32.786	-0.4425	883.830	11211.050	1.585	8.006
Switzerland	50050	13.733	0.3833	10.5800	15.687	-0.4017	854.400	11335.670	0.856	5.248
France	35229	11.225	0.387	46.741	29.145	-0.4539	1702.080	19116.350	1.237	4.787
UK										
Russia	233903	43.913	0.559	5.132	19.742	0.0896	485.060	17590.430	11.349	22.722
Turkey	103202	16.350	0.462	7.632	19.454	0.0311	648.060	9286.320	20.376	32.045
Chile	122753	23.410	0.407	15.061	22.813	-0.1038	908.960	17875.830	35.250	39.186
Brazil	80204	35.717	0.528	8.382	12.648	0.2512	735.700	24050.630	2.238	6.924
Mexico	239365	17.997	0.283	47.306	16.778	-0.0167	1291.400	21897.340	3.262	10.701
ISRAEL	57878	14.319	0.421	11.055	29.530	0.1091	796.720	11057.460	0.157	3.333
South Africa	237563	47.008	0.330	4.461	6.275	0.0226	347.390	15948.550	11.345	17.152
Canada	343198	6.794	0.147	31.101	12.778	-0.0586	1296.160	8205.150	1.585	8.810
Asia	90866	12.795	0.621	11.095	15.480	0.2042	844.550	9989.920	7.267	50.686
Europe	146375	40.244	0.442	6.237	11.004	0.1299	434.250	15837.710	33.998	56.929
Latin America	44121	21.557	0.327	6.194	15.065	-0.7353	576.260	10970.590	2.786	11.075
EM	127275	13.046	0.356	10.114	10.640	-0.2610	613.040	7963.860	0.729	14.049
Mean	**190040**	**18.844**	**0.387**	**17.398**	**20.369**	**-0.098**	**901.280**	**13223.118**	**8.510**	**19.287**

Table 3. Summary Statistics on Trading Activity by Security Type and Country

Table 3 lists mean price, spread ((bid-ask)/((bid+ask)/2)), depth ((bidsize+asksize)/2), volume, trading value, volatility, and return of a buyer-initiated trade and a seller-initiated trade among the Leading ADR, ETF, and CEF for each country and region, in Panel A, B, and C respectively. I use the algorithm developed by Lee and Ready (1991) to define the trade directions as a buy or a sell. This algorithm compares transaction prices to the mid-quote five seconds before the transaction took place. The trade data are matched with the previous NBBO quote data and all the variables are analyzed in the 5-minute time interval. Orders are timestamped to indicate the time of arrival at the exchange while trades indicate the time the order was executed.

Panel A. Leading ADR

	Buy Trade							Sell Trade						
Country	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10^{-4})	Mean Return (10^{-2})	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10E-4)	Mean Return (10^{-2})
Australia	18.296	0.0547	10.6694	359.400	11331.490	0.699	-0.0135	14.550	0.0487	7.2008	257.898	8207.940	0.668	0.0136
Singapore	10.750	0.0474	3.9463	365.774	9734.810	4.578	-0.0355	10.919	0.0574	4.0500	351.400	9660.760	4.752	0.0362
Japan	28.549	0.0996	6.4250	334.049	18161.820	1.452	-0.0220	24.065	0.1430	4.7080	287.178	15319.930	1.570	0.0224
China	43.638	0.0798	2.9395	250.982	19030.860	1.000	-0.0142	35.429	0.0804	2.3020	214.262	16626.230	1.003	0.0142
HongKong	2.187	0.0890	11.9416	690.496	3662.070	29.911	-0.1726	2.116	0.0986	13.3068	813.629	4432.790	32.279	0.1662
India	20.422	0.2159	1.6335	292.143	9283.970	2.5172	-0.0061	17.327	0.1818	1.5821	261.794	8108.940	2.5332	0.0062
Korea	11.544	0.0983	13.2830	673.719	14790.950	1.855	-0.0241	9.474	0.1026	10.4462	512.620	11110.040	1.800	0.0242
Malaysia														
Taiwan	5.397	0.0338	73.4082	1100.980	11954.010	1.802	-0.0221	4.414	0.0335	57.6951	878.004	9430.640	1.786	0.0223
Indonesia	10.012	0.0863	24.1892	607.364	8068.090	5.541	-0.0505	9.597	0.2535	18.0153	598.873	7792.780	6.088	0.0517
Philippine	11.700	0.1578	12.9022	1154.020	31985.590	6.316	-0.0599	9.822	0.1304	11.5967	913.029	23820.820	6.139	0.0561
Germany	10.375	0.0595	24.0471	817.856	19290.040	2.811	-0.0213	9.472	0.0618	22.3989	631.625	14255.280	2.947	0.0214
Belgium	22.336	0.1583	2.2956	156.528	7967.870	4.235	-0.0463	33.634	0.2237	3.3007	211.206	11456.570	5.981	0.0475
Italy	35.082	0.2057	5.3035	498.363	29828.940	5.708	-0.0227	27.949	0.1427	4.6547	407.117	24288.340	5.375	0.0227
Netherlands	18.817	0.0918	10.5289	537.922	21936.530	2.398	-0.0238	16.561	0.0908	8.6779	475.306	19041.670	2.492	0.0238
Sweden	11.827	0.0223	45.9775	675.840	11291.170	4.022	-0.0017	10.994	0.0212	42.9417	664.722	10996.670	3.975	0.0017
Ireland	9.293	0.0573	17.6967	694.029	12593.580	3.408	-0.0239	7.665	0.0532	15.0237	607.891	10087.630	3.574	0.0242
Spain	26.487	0.1526	8.2613	591.046	34370.170	2.532	-0.0229	23.772	0.1614	7.2720	451.231	25273.650	2.672	0.0234
Switzerland	27.096	0.0973	9.5601	412.407	19293.700	1.055	-0.0156	20.167	0.1000	6.5466	304.365	14152.4300	1.0214	0.0158
France	13.257	0.113	23.478	1147.790	30486.990	5.197	-0.0429	11.825	0.097	20.421	867.236	22292.270	5.141	0.0426
UK	16.162	0.068	20.020	909.840	31597.610	1.919	-0.0156	15.096	0.069	19.490	808.631	26321.980	1.977	0.0155
Russia	28.200	0.152	3.812	296.676	13519.680	2.457	-0.0257	23.246	0.133	3.126	243.940	10969.560	2.429	0.0256
Turkey	8.587	0.121	14.166	505.947	6796.690	3.505	-0.0688	6.339	0.110	11.446	416.016	5341.070	3.518	0.0684
Chile	6.450	0.092	15.118	857.023	13291.090	4.489	-0.0602	5.338	0.081	10.636	708.391	10390.080	4.519	0.0597
Brazil	26.851	0.083	5.870	492.001	19316.230	1.363	-0.0225	26.890	0.161	5.064	419.018	17606.300	1.468	0.0227
Mexico	17.859	0.080	15.800	894.757	37431.200	1.806	-0.0147	15.815	0.068	20.826	648.032	26491.190	1.764	0.0145
ISRAEL	19.889	0.026	4.393	199.824	8425.850	1.158	-0.0013	18.789	0.026	4.220	186.270	7831.980	1.146	0.0013
South Africa	22.302	0.091	3.740	256.407	10486.800	1.376	-0.0162	18.743	0.084	3.082	202.499	8295.680	1.372	0.0162
Canada	12.360	0.041	16.208	526.392	11657.320	1.800	-0.0128	10.551	0.039	15.028	430.368	9353.650	1.810	0.0129
Asia														
Europe														
Latin America														
EM														
Mean	**17.704**	**0.096**	**14.558**	**582.128**	**17056.611**	**3.818**	**-0.031**	**15.734**	**0.102**	**12.681**	**491.877**	**13891.317**	**3.993**	**0.031**

Table 3. (Continued)

Panel B. ETF

Country	Buy Trade							Sell Trade						
	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10^{-4})	Mean Return (10^{-2})	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10^{-4})	Mean Return (10^{-2})
Australia	10.286	0.1022	22.9024	515.894	8938.490	0.711	-0.0287	8.190	0.0888	14.5294	512.362	8772.010	0.568	0.0293
Singapore	4.461	0.0492	28.4002	685.973	5723.510	4.533	-0.0355	3.786	0.0415	23.0347	627.154	5203.920	4.517	0.0357
Japan	4.877	0.0067	302.8740	281.089	3332.820	0.267	-0.0009	4.926	0.0076	300.0270	270.071	3184.250	0.274	0.0010
China	50.271	0.1269	8.6767	174.156	15457.280	1.165	-0.0141	42.097	0.1240	4.9838	137.374	12436.680	1.131	0.0144
HongKong	6.208	0.0600	25.9577	801.381	9804.580	4.492	-0.0322	5.659	0.0636	22.1788	763.965	9270.380	4.541	0.0330
India														
Korea	20.754	0.0915	11.4237	448.905	17011.680	2.338	-0.0260	19.782	0.0913	10.3780	445.802	17024.020	2.297	0.0262
Malaysia	3.556	0.0443	41.7530	974.324	6755.520	6.532	-0.0432	3.195	0.0437	35.4529	900.894	6182.780	6.623	0.0442
Taiwan	6.003	0.0341	33.9956	694.529	8616.980	1.742	-0.0134	5.6731	0.0283	34.9588	658.248	8139.150	1.675	0.0132
Indonesia														
Philippine														
Germany	10.969	0.0761	27.6301	593.388	12007.190	3.766	-0.0230	9.481	0.0712	20.7286	545.357	10842.580	3.687	0.0230
Belgium	11.449	0.1361	24.5286	687.454	12887.660	7.410	-0.0475	8.254	0.1128	16.0502	436.561	8133.8800	6.7178	0.0429
Italy	11.394	0.1898	36.1209	1088.870	22576.920	19.029	-0.0132	9.752	0.1836	31.1491	1009.500	21095.060	19.400	0.0148
Netherlands	11.582	0.1440	27.5653	612.845	13150.510	10.529	-0.0305	9.862	0.1231	22.5355	503.280	10726.730	8.812	0.0321
Sweden	13.723	0.1537	26.8859	506.578	11555.940	8.902	-0.0345	10.482	0.1225	19.4113	395.442	9006.420	7.231	0.0337
Ireland														
Spain	23.001	0.1588	26.5555	488.161	18049.630	7.634	-0.0230	16.633	0.1281	21.6548	382.253	13528.100	5.864	0.0256
Switzerland	10.862	0.1987	34.1105	521.831	9733.490	8.702	-0.0514	8.205	0.1557	26.1085	450.242	8463.740	7.454	0.0525
France	10.983	0.255	30.810	1089.590	22626.420	17.556	-0.0460	9.397	0.245	25.470	975.782	19869.060	17.110	0.0485
UK	10.213	0.142	33.603	1111.710	19224.400	7.099	-0.0494	8.213	0.115	25.215	956.085	16414.100	6.124	0.0494
Russia														
Turkey														
Chile														
Brazil	16.951	0.078	29.296	797.742	22580.840	2.698	-0.0308	15.800	0.083	23.556	846.950	23308.040	2.611	0.0307
Mexico	18.508	0.080	9.945	506.359	16879.750	2.492	-0.0179	19.419	0.086	9.891	536.701	17792.620	2.368	0.0182
ISRAEL														
South Africa	51.132	0.271	4.186	238.381	22718.920	3.951	-0.0315	46.848	0.270	3.225	236.424	22317.890	3.634	0.0332
Canada	11.774	0.067	47.541	604.266	11517.900	3.499	-0.0154	9.559	0.054	33.601	621.718	11095.460	3.100	0.0156
Asia	55.863	0.196	9.080	297.440	27406.490	2.688	-0.0252	40.693	0.162	5.338	260.107	24007.540	2.321	0.0268
Europe	46.206	0.198	29.161	483.456	35165.310	5.252	-0.0236	30.833	0.132	17.263	387.856	27814.070	4.196	0.0241
Latin America	66.557	0.234	5.174	181.284	22091.310	2.530	-0.0188	61.212	0.213	3.295	166.848	21073.660	2.152	0.0195
EM	51.767	0.059	7.511	364.863	37174.390	0.595	-0.0057	48.263	0.065	6.356	358.567	36339.080	0.580	0.0057
Mean	**21.574**	**0.126**	**35.427**	**590.019**	**16519.517**	**5.444**	**-0.027**	**18.248**	**0.112**	**30.256**	**535.422**	**14881.649**	**5.000**	**0.028**

Table 3. (Continued)

Panel C. Closed-end Fund (CEF)

	Buy Trade							Sell Trade						
Country	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10^{-4})	Mean Return (10^{-2})	Mean Price	Mean spread	Mean Depth	Mean Volume	Mean Trading Value	Mean Volatility (10^{-4})	Mean Return (10^{-2})
Australia	5.265	0.4212	9.0933	483.597	4483.670	0.329	-0.1822	3.968	0.1214	12.3260	442.600	3705.820	0.221	0.1757
Singapore	4.817	0.2127	5.8671	415.272	3647.880	13.075	-0.1223	4.378	0.2236	5.9397	453.061	3715.930	14.302	0.1267
Japan	3.802	0.2271	10.4470	531.408	4035.450	14.271	-0.0934	3.471	0.1782	10.2070	495.231	3757.610	14.417	0.0952
China	15.208	0.1874	2.8369	222.683	6579.240	5.019	-0.0363	14.299	0.1833	2.5634	210.514	6168.460	5.255	0.0361
HongKong														
India	35.955	0.1039	4.4749	119.411	8641.260	3.2954	-0.0385	35.400	0.1109	3.8910	116.091	8392.200	3.3381	0.0389
Korea	12.039	0.1519	5.9876	457.545	8725.320	4.185	-0.0466	11.190	0.1479	5.5790	490.917	9081.420	4.397	0.0464
Malaysia	3.497	0.1387	9.8797	483.656	3820.700	17.807	-0.1181	3.775	0.1587	11.3397	512.252	3804.120	19.709	0.1194
Taiwan	6.808	0.2452	6.2929	518.320	6663.080	6.553	-0.0892	6.383	0.2592	5.6225	510.916	6371.610	7.010	0.0912
Indonesia	3.749	0.1113	8.1789	460.168	3327.030	22.488	-0.1645	3.519	0.1176	7.5210	445.380	3060.090	23.295	0.1651
Philippine	4.643	0.0947	13.2085	487.749	4866.150	18.095	-0.1055	4.811	0.1080	14.6139	564.853	5307.950	19.384	0.1049
Germany	5.217	0.1869	15.3524	585.595	6473.210	10.916	-0.1278	5.000	0.0913	17.2128	620.636	6549.940	10.082	0.1274
Belgium														
Italy	5.337	0.1433	14.5890	729.023	9205.360	16.196	-0.1247	5.951	0.1938	18.3245	836.496	10236.420	16.804	0.1209
Netherlands														
Sweden														
Ireland	7.901	0.1756	6.8503	298.023	4431.400	14.926	-0.0746	7.250	0.1966	5.7296	317.427	4595.050	15.138	0.0754
Spain	5.213	0.1366	7.2913	398.632	5131.550	14.497	-0.1491	6.340	0.2616	12.3341	440.721	5484.620	18.288	0.1455
Switzerland	6.716	0.1772	5.1662	384.028	5193.460	7.356	-0.0879	6.868	0.2027	5.2058	460.180	6002.540	8.331	0.0838
France	4.766	0.155	20.338	735.100	8330.790	13.927	-0.1155	5.522	0.210	24.027	845.550	9330.120	15.218	0.1109
UK														
Russia	23.312	0.282	2.753	248.251	9111.820	9.962	-0.0493	20.022	0.268	2.248	224.302	8148.670	9.781	0.0499
Turkey	8.527	0.233	3.970	327.966	4736.060	9.471	-0.0725	7.731	0.227	3.602	315.335	4493.210	9.983	0.0727
Chile	10.597	0.176	6.419	398.439	7919.830	10.964	-0.0658	10.113	0.196	7.721	428.090	7909.950	11.849	0.0683
Brazil	17.016	0.246	3.877	326.201	10517.540	5.775	-0.0552	18.494	0.279	4.357	403.573	13398.560	6.874	0.0587
Mexico	6.429	0.082	17.663	542.011	9109.560	7.742	-0.0503	10.366	0.181	27.409	653.747	11259.900	9.036	0.0523
ISRAEL	7.073	0.203	5.598	378.745	5316.290	14.608	-0.0810	6.561	0.199	4.981	376.036	5147.660	14.922	0.0808
South Africa	25.046	0.172	2.360	180.691	8326.750	3.128	-0.0289	21.699	0.157	2.074	164.642	7528.910	3.147	0.0290
Canada	3.724	0.107	16.528	698.968	4435.370	6.612	-0.0727	2.793	0.038	13.117	548.554	3463.010	6.167	0.0733
Asia	7.949	0.414	5.884	460.363	5688.560	8.691	-0.0858	4.753	0.202	5.098	378.352	4227.820	6.788	0.0879
Europe	21.401	0.221	3.361	218.319	8120.040	5.332	-0.0409	18.649	0.219	2.830	212.997	7632.850	5.672	0.0422
Latin America	11.497	0.159	3.323	278.140	5512.430	7.248	-0.0584	9.959	0.167	2.845	293.482	5392.520	7.818	0.0510
EM	6.537	0.178	5.091	292.536	3815.690	5.101	-0.0513	6.307	0.173	4.836	311.596	4032.670	5.539	0.0485
Mean	**10.001**	**0.191**	**7.953**	**416.459**	**6291.625**	**9.913**	**-0.085**	**9.485**	**0.181**	**8.698**	**431.198**	**6364.273**	**10.456**	**0.085**

Table 4. Relative Price Ratios of the Leading ADR, ETF, and CEF, and Buyer versus Seller

For each country and region, the triplets (Leading ADR, ETF and CEF), and type of trade (buy or sell), we compute the volume-weighted average price at which trades occur, scale by the average price for every 5-minute interval and multiply by 100.. T-statistics examine whether the ratios are significantly different from 100 or differ across the investment vehicles (the Triplets). Table 8 represents the relative price ratios of the Leading ADR, ETF, and CEF for the buy trades and sell trades. ** indicates significance at 1% level and * indicates significance at 5% level.

Country		Buyer						Seller					
		(1) Leading ADR	(2) ETF	(3) CEF	(1)Different from (2) t-statistics	(2)Different from (3) t-statistics	(1)Different from (3) t- statistics	(1) Leading ADR	(2) ETF	(3) CEF	(1)Different from (2) t- statistics	(2)Different from (3) t- statistics	(1)Different from (3) t- statistics
Australia	VWA PR	100.006	100.005	100.002	-6.16**	0.78**	-0.890	99.990	99.993	99.998	0.960	-7.75**	-2.12**
	t-test:H0=100	62.55**	24.47**	4.28**				-68.41**	-26.020	-4.480			
Singapore	VWA PR	100.036	100.017	100.004	30.95**	6.26**	28.42**	99.965	99.979	99.995	-25.61**	-6.77**	-23.74**
	t-test:H0=100	72.68**	39.75**	4.84**				-70.74**	-38.58**	-5.76**			
Japan	VWA PR	100.012	100.024	100.014	-45.77**	15.3**	-4.78**	99.986	99.973	99.983	45.02**	-13.27**	-2.73**
	t-test:H0=100	123.58**	122.96**	17.3**				-125.57**	-134.07**	-17.3**			
China	VWA PR	100.010	100.012	100.016	-9.78**	-12.02**	-11.07**	99.988	99.985	99.984	10.68**	4.71**	5.7**
	t-test:H0=100	83.25**	89.67**	25.95**				-87.46**	-94.28**	-24.7**			
HongKong	VWA PR	100.048	100.018		8.65**			99.959	99.980		-7.39**		
	t-test:H0=100	16.35**	54.0**					-17.28**	-53.04**				
India	VWA PR	100.031		100.018			33.82**	99.968		99.979			-30.34**
	t-test:H0=100	78.26**		69.56**				-76.53**		-68.72**			
Korea	VWA PR	100.015	100.013	100.009	12.05**	9.66**	18.51**	99.981	99.986	99.991	-16.35**	-12.68**	-24.3**
	t-test:H0=100	106.31**	59.97**	34.75**				-111.98**	-58.48**	-30.61**			
Malaysia	VWA PR		100.021	100.016		6.57**			99.978	99.985		-5.64**	
	t-test:H0=100		32.45**	11.38**					-32.85**	-11.68**			
Taiwan	VWA PR	100.029	100.018	100.006	20.43**	8.24**	28.19**	99.966	99.981	99.993	-27.17**	-7.07**	-28.46**
	t-test:H0=100	141.26**	70.99**	10.3**				-146.18**	-72.95**	-10.36**			
Indonesia	VWA PR	100.028		100.018			20.41**	99.973		99.979			-21.5**
	t-test:H0=100	58.53**		9.91**				-56.55**		-10.4**			
Philippine	VWA PR	100.008		100.015			-6.69**	99.991		99.985			5.27**
	t-test:H0=100	18.28**		12.34**				-17.13**		-11.52**			
Germany	VWA PR	100.019	100.010	100.009	24.84**	-2.77*	14.65**	99.979	99.988	99.991	-16.08**	-0.960	-11.34**
	t-test:H0=100	107.32**	47.35**	15.23**				-114.22**	-48.59**	-15.74**			
Belgium	VWA PR	100.005	100.006		-1.94*			99.997	99.992		6.22**		
	t-test:H0=100	14.43**	11.84**					-12.71**	-14.37**				
Italy	VWA PR	100.005	100.002	100.007	0.730	-3.12**	-2.53*	99.993	99.998	99.997	-1.86*	1.87*	0.690
	t-test:H0=100	21.11**	3.69**	4.76**				-20.52**	-2.94*	-4.04**			
Netherlands	VWA PR	100.018	100.005		23.26**			99.979	99.994		-26.53**		
	t-test:H0=100	119.63**	13.32**					-124.36**	-12.05**				
Sweden	VWA PR	100.084	100.008		96.3**			99.912	99.990		-108.68**		
	t-test:H0=100	229.98**	21.79**					-223.96**	-21.46**				

Table 4. (Continued)

Country		Buyer						Seller					
		(1) Leading ADR	(2) ETF	(3) CEF	(1)Different from (2) t-statistics	(2)Different from (3) t-statistics	(1)Different from (3) t- statistics	(1) Leading ADR	(2) ETF	(3) CEF	(1)Different from (2) t- statistics	(2)Different from (3) t- statistics	(1)Different from (3) t- statistics
Ireland	VWA PR	100.040		100.007			9.87**	99.955		99.993			-13.78**
	t-test:H0=100	148.87**		10.66**				-160.12**		-10.22**			
Spain	VWA PR	100.010	100.005	100.007	5.4**	-2.78**	0.58**	99.989	99.993	99.995	3.74**	-1.76*	-0.190
	t-test:H0=100	73.73**	20.13**	5.69**				-77.65**	-17.17**	-5.37**			
Switzerland	VWA PR	100.010	100.006	100.004	8.51**	2.68**	9.38**	99.987	99.992	99.996	-9.76**	-5.2**	-21.46**
	t-test:H0=100	110.14**	13.78**	8.97**				-124.59**	-9.91**	-9.54**			
France	VWA PR	100.030	100.001	100.007	11.13**	-4.74**	5.01**	99.963	99.997	99.996	-10.03**	2.34**	-15.37**
	t-test:H0=100	92.33**	3.34**	5.84**				-97.15**	-3.74**	-7.03**			
UK	VWA PR	100.021	100.007		25.46**			99.977	99.991		-7.01**		
	t-test:H0=100	152.38**	27.16**					-163.81**	-27.39**				
Russia	VWA PR	100.017		100.019			6.22**	99.981		99.979			-7.45**
	t-test:H0=100	50.89**		28.5**				-54.99**		-25.53**			
Turkey	VWA PR	100.014		100.016			-5.61**	99.980		99.984			2.65**
	t-test:H0=100	43.07**		18.84**				-47.37**		-18.21**			
Chile	VWA PR	100.012		100.013			-6.4**	99.986		99.990			1.16*
	t-test:H0=100	38.37**		18.3**				-30.64**		-18.37**			
Brazil	VWA PR	100.014	100.018	100.007	0.31	8.42**	9.78**	99.984	99.981	99.993	-8.24**	-13.98**	-16.89**
	t-test:H0=100	77.01**	58.66**	15.29**				-79.65**	-61.78**	-16.35**			
Mexico	VWA PR	100.016	100.012	100.026	35.17**	-19.41**	8.47**	99.979	99.988	99.983	-42.28**	16.93**	-29.06**
	t-test:H0=100	122.52**	50.7**	36.68**				-134.92**	-50.07**	-39.3**			
ISRAEL	VWA PR	100.032		100.008			32.56**	99.968		99.994			-38.45**
	t-test:H0=100	142.67**		10.42**				-146.32**		-8.36**			
South Africa	VWA PR	100.014	100.010	100.013	15.27**	-11.01**	9.56**	99.983	99.990	99.986	-19.16**	10.14**	-17.15**
	t-test:H0=100	101.85**	25.3**	48.02**				-105.94**	-23.31**	-45.2**			
Canada	VWA PR	100.033	100.015	100.018	61.64**	-0.130	59.57**	99.964	99.981	99.977	-48.14**	4.01**	-43.46**
	t-test:H0=100	175.32**	61.49**	45.74**				-187.15**	-59.45**	-45.68**			
Asia	VWA PR		100.007	100.005		1.19			99.991	99.991		1.11	
	t-test:H0=100		48.91**	12.54**					-48.04**	-13.18**			
Europe	VWA PR		100.006	100.014		-19.17**			99.991	99.985		11.44**	
	t-test:H0=100		36.7**	30.43**					-34.99**	-30.78**			
LatinAmerica	VWA PR		100.013	100.006		-2.11*			99.985	99.992		-1.68*	
	t-test:H0=100		58.18**	11.43**					-59.54**	-7.0**			
EM	VWA PR		100.010	100.017		-17.52**			99.989	99.984		10.4**	
	t-test:H0=100		97.26**	38.61**					-101.57**	-39.37**			
Mean		**100.022**	**100.011**	**100.012**				**99.976**	**99.988**	**99.989**			

Table 5. Leads and Lags and Granger Causality Test of the returns among the Triplets (Leading ADR, ETF and CEF)

Table 5 presents the results of the VAR on the returns of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the returns of the leading ADR, ETF, and CEF. It only presents the coefficients of the returns of one security on the lag returns of the other two for last period and the past 6th period. ** indicates significance at 1% level and * indicates significance at 5% level.

Country	Leading ADR						ETF						CEF					
	ETF			CEF			Leading ADR			CEF			ADR			ETF		
	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$
Australia	0.030	0.013	99.45**	0.014	0.008	116.82**	0.011	0.004	237.82**	0.002	0.006	65.48**	0.005	0.002	270.47**	0.009	0.002	100.73**
Singapore	0.015	0.013	12.28	0.006	-0.001	20.11*	-0.001	0.001	41.04**	0.007	0.002	31.17**	0.001	-0.003	28.88**	0.004	-0.002	30.35**
Japan	0.038	0.016	111.95**	0.022	-0.004	144.15**	0.013	0.003	341.51**	0.036	0.022	290.55**	0.003	-0.0002	218.430	0.011	0.002	272.34**
China	0.006	-0.001	3.81	0.021	-0.012	11.38	0.0003	-0.0001	6.57	0.008	0.012	10.53	-0.001	-0.0001	7.77	0.005	-0.001	4.6
HongKong	0.002	0.003	35.37**				0.016	-0.0003	10.29									
India	0.011	0.002	10.32				0.008	-0.003	44.36**									
Korea	0.057	0.020	176.53**	0.045	0.012	194.43**	0.005	-0.003	262.95**	0.016	-0.004	194.43**	0.015	0.001	109.42**	0.020	0.010	231.67**
Malaysia	0.013	0.005	83.89**				0.026	0.002	39.33**									
Taiwan	0.016	0.060	74.320	0.029	0.021	207.11**	0.002	0.000	321.67**	0.027	0.008	315.71**	0.007	0.003	448.63**	0.024	0.003	287.19**
Indonesia	0.004	0.005	29.41**				0.006	-0.001	20.87**									
Philippine	0.034	0.020	201.87**				0.019	0.003	87.8**									
Germany	0.058	0.014	106.61**	0.036	0.002	196.4**	0.009	0.000	196.4**	0.021	0.004	124.49**	0.009	0.000	528.46**	0.016	0.008	294.53**
Belgium	0.016	0.018	15.91**				0.004	0.005	29.18**									
Italy	0.050	0.022	98.87**	0.022	0.003	157.43**	0.015	0.004	308.96**	0.017	0.011	119.25**	0.016	0.003	308.96**	0.023	0.012	217.1**
Netherlands	0.038	0.024	17.49**				0.003	0.001	129.6**									
Sweden	0.011	0.017	12.50*				0.00002	-0.001	5.21									
Ireland	0.012	0.013	14.25**				0.003	-0.002	29.86**									
Spain	0.044	0.006	80.21**	0.030	0.003	79.06**	0.014	0.001	107.37**	0.007	0.005	79.06**	0.002	0.0001	390.28**	0.008	0.001	118.66**
Switzerland	0.027	-0.001	19.92*	0.014	0.012	29.88**	0.002	0.000	92.64**	0.006	0.005	59.48**	0.003	-0.001	105.29**	0.008	-0.001	54.62
France	0.014	0.004	41.53**	0.015	0.003	59.39**	0.002	-0.001	64.91**	0.008	0.0001	42.34**	0.012	0.003	78.00**	0.018	0.003	124.17**
UK	0.052	0.030	31.12**				0.004	0.002	158.92**									
Russia	0.052	0.006	222.79**				0.018	0.006	241.19**									
Turkey	0.028	0.001	31.19**				0.017	-0.001	172.15**									
Chile	0.024	0.006	79.37**				0.012	0.005	127.40**									
Brazil	0.063	0.034	88.8**	0.049	0.012	241.61**	0.006	-0.001	402.61**	0.017	0.008	114.96**	0.009	-0.001	402.61**	0.021	0.013	458.65**
Mexico	0.013	0.013	19.05**	0.017	0.005	142.61**	0.003	0.0004	86.64**	0.009	0.004	179.72**	0.002	0.0002	86.64**	0.026	0.016	137.82**
ISRAEL	-0.001	0.002	26.51**				-0.003	-0.002	14.38**									
South Africa	0.042	0.015	8.96	0.059	0.010	22.04*	0.002	0.001	123.28**	0.005	0.001	77.12**	-0.001	0.001	78.85**	0.014	0.005	12.17
Canada	-0.004	0.007	12.93	0.024	0.005	23.46*	-0.001	0.0002	17.57	-0.005	-0.003	14.45	0.001	0.00003	26.24**	0.001	-0.002	12.52
Asia	0.011	-0.006	15.02**				0.009	0.003	15.47**									
Europe	0.014	0.018	48.00**				0.020	0.014	73.89**									
LatinAmerica	0.073	0.032	237.76**				0.029	0.008	380.09**									
EM	-0.00571	0.00836	2.15				-0.00042	0.00066	2.82									
Mean	**0.026**	**0.013**		**0.027**	**0.005**		**0.008**	**0.002**		**0.012**	**0.005**		**0.006**	**0.001**		**0.014**	**0.005**	

Table 6. Leads and Lags and Granger Causality Test of the volumes among the Triplets (Leading ADR, ETF and CEF)

Table 6 presents the results of the VAR on the volumes of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the volumes of the leading ADR, ETF, and CEF. It only presents the coefficients of the volumes of one security on the lag returns of the other two for last period and the past 6th period. ** indicates significance at 1% level and * indicates significance at 5% level.

Country	Leading ADR						ETF						CEF					
	ETF			CEF			Leading ADR			CEF			ADR			ETF		
	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$
Australia	-0.0006	0.00004	3.55	-0.0009	-0.0008	1.28	0.0039	0.0004	1.37	-0.0005	-0.0005	0.59	-0.0029	-0.0011	1.68	-0.0020	-0.0003	3.17
Singapore	-0.0112	-0.0135	16.64*	-0.0011	0.0028	5.14	-0.0014	-0.0014	22.44*	0.0002	-0.0001	13.31	-0.0068	-0.0064	12.93	0.0116	-0.0063	15.23
Japan	0.0377	0.0807	27.47**	0.0006	0.0013	10.8*	0.0001	0.0002	33.53**	0.0001	-0.0001	40.47**	-0.0012	0.0011	5.4600	0.0991	-0.0289	28.94**
China	0.0078	0.0003	2.79	0.0064	0.0068	9.61	0.0009	0.0005	10.83	0.0062	0.0029	12.61	0.0008	0.0008	18.09	0.0174	-0.0023	12.93
HongKong	-0.0047	-0.0034	3.12				-0.0018	-0.0012	3.55									
India	-0.0024	0.0002	1.41				0.0355	0.0089	0.94									
Korea	0.0018	-0.0075	55.69**	0.0093	0.0091	48.71**	0.0019	-0.0011	70.23**	-0.0017	-0.0034	13.65	0.0062	0.0034	66.56**	-0.0010	-0.0020	15.91
Malaysia	0.0001	-0.0006	1.90				-0.0244	-0.0035	3.42									
Taiwan	0.0149	-0.0013	14.11	0.0036	0.0028	15.35	0.0007	0.0003	19.09*	-0.0001	-0.0001	8.50	-0.0007	-0.0026	15.74	0.0111	-0.0039	3.89
Indonesia	0.0002	0.0004	32.32**				-0.0281	-0.0012	6.78									
Philippine	0.0002	-0.0003	3.66				-0.0048	-0.0007	4.88									
Germany	-0.0036	-0.0020	32.91**	0.0015	0.0022	31.24**	-0.0006	-0.0012	6.91	-0.0003	-0.0009	5.51	0.0002	0.0077	5.65	0.0001	0.0067	5.89
Belgium	-0.0351	-0.0478	0.90				-0.0001	-0.0001	0.79									
Italy	-0.0011	0.00001	15.27	0.0005	0.0008	50.78**	-0.0087	-0.0007	66.74**	0.0025	0.0169	101.6**	0.0065	0.0332	45.12**	0.0030	0.0019	44.22**
Netherlands	-0.0015	-0.0014	17.63**				-0.0028	-0.0043	15.62**									
Sweden	-0.0034	-0.0020	10.84*				-0.0024	-0.0031	21.67**									
Ireland	-0.0007	0.0001	8.36				-0.0222	-0.0088	11.81*									
Spain	-0.0009	-0.0006	6.55	-0.00005	0.0001	8.51	-0.0009	0.0008	3.36	-0.0005	-0.0007	6.28	0.0010	-0.0044	1.47	-0.0006	0.0001	2.40
Switzerland	-0.0003	-0.0024	41.40**	0.0014	0.0012	41.67**	-0.0015	-0.0021	27.45**	-0.0003	0.0001	4.77	0.0094	0.0026	29.07**	0.0072	-0.0016	6.29
France	-0.0004	0.0007	4.91	0.0008	0.0005	3.06	-0.0019	0.0034	10.15	0.0029	-0.0004	7.85	0.0012	0.0041	3.83	0.0002	-0.0007	3.37
UK	-0.0004	-0.0002	3.60				0.0006	-0.0009	4.10									
Russia	0.0020	0.0037	118.58**				0.0300	0.0215	97.09**									
Turkey	-0.0003	0.0016	11.76*				-0.0010	0.0320	25.03**									
Chile	0.0001	0.0002	1.60				-0.0019	0.0096	4.15									
Brazil	-0.0029	-0.0012	2.1000	0.0002	0.0000	9.3000	-0.0015	-0.0009	1.3800	0.0000	0.0001	1.900	0.0013	-0.0025	2.4000	-0.0028	0.0034	1.94
Mexico	-0.0061	-0.0098	139.71**	0.0072	0.0081	95.86**	-0.0043	-0.0047	170.34**	-0.0035	-0.0026	39.13**	0.0087	0.0038	164.74**	-0.0004	-0.0018	76.75**
ISRAEL	0.0013	0.0031	23.35**				0.0056	0.0071	36.85**									
South Africa	-0.0244	-0.0127	76.2**	0.0064	0.0045	72.21**	-0.0003	-0.0007	91.21**	0.0000	-0.0005	12.08	0.0143	0.0144	85.01**	-0.0205	-0.0181	8.67
Canada	-0.0153	-0.0178	479.11**	-0.0089	-0.0076	484.76**	-0.0006	-0.0006	518.94**	0.0002	0.0002	37.38**	-0.0236	-0.0294	514.95**	0.0445	0.0215	16.30
Asia	-0.0014	0.0013	1.44				-0.0026	0.0037	7.93									
Europe	-0.0002	-0.0002	1.67				-0.0277	-0.0130	2.88									
LatinAmerica	-0.0060	-0.0090	88.00**				-0.0004	-0.0039	2.46									
EM	-0.000006	-0.00012	4.61				-0.0502	-0.0134	4.19									
Mean	**-0.0017**	**-0.0013**		**0.0018**	**0.0021**		**-0.0034**	**0.0006**		**0.0003**	**0.0007**		**0.0010**	**0.0016**		**0.0111**	**-0.0022**	

Table 7. Leads and Lags and Granger Causality Test of the Volatility among the Triplets (Leading ADR, ETF and CEF)

Table 7 presents the results of the VAR on the volatilities of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the volatilities of the leading ADR, ETF, and CEF. It only presents the coefficients of the volatilities of one security on the lag returns of the other two for last period and the past 6th period. ** indicates significance at 1% level and * indicates significance at 5% level.

Country	Leading ADR						ETF						CEF					
	ETF			CEF			Leading ADR			CEF			ADR			ETF		
	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$
Australia	0.0905	0.0495	1185.46**	0.0319	0.0376	1081.48**	0.0235	0.0081	1127.84**	0.0109	0.0028	548.41**	0.0318	0.0143	817.59**	0.0089	0.0027	290.97**
Singapore	0.0229	0.0161	180.37**	0.0164	0.0076	41.98**	0.0101	0.0071	216.02**	0.0041	-0.0001	201.12**	0.0052	-0.0012	80.87**	0.0046	-0.0070	192.41**
Japan	0.0477	0.0387	1871.34**	0.0392	0.0230	315.72**	0.0253	0.0114	978.21**	0.0335	0.0047	1037.37**	0.0084	0.0027	511.1**	0.0136	0.0027	1847.68**
China	0.0150	-0.0004	11.09	0.0001	0.0010	23.16**	0.0012	-0.0008	8.04	0.0092	0.0020	19.99*	0.0024	0.0003	6.46	0.0094	-0.0021	6.30
HongKong	0.0199	0.0083	269.18**				0.0277	0.0223	342.21**									
India	0.0350	0.0035	355.79**				0.0240	0.0299	742.88**									
Korea	0.0584	-0.0030	602.39**	0.0687	0.0302	560.66**	0.0085	0.0033	647.09**	0.0099	0.0064	174.64**	0.0291	0.0035	640.52**	0.0246	0.0041	136.68**
Malaysia	0.0285	0.0250	828.13**				0.0468	0.0345	1044.47**									
Taiwan	0.0399	0.1998	178.58**	0.0718	-0.0003	246.89**	0.0034	0.0005	848.16**	0.0186	0.0037	654.56**	0.0043	0.0051	658.49**	0.0340	0.0127	280.23**
Indonesia	0.0172	0.0115	195.39**				0.0150	0.0060	201.19**									
Philippine	0.0151	0.0172	310.27**				0.0248	-0.0003	21.9**									
Germany	0.0475	0.0125	678.54**	0.0535	0.0263	674.63**	0.0095	0.0032	1193.41**	0.0185	0.0087	478.17**	0.0157	0.0095	1075.79**	0.0128	0.0089	189.9**
Belgium	0.0146	0.0030	21.82**				0.0080	0.0020	20.70**									
Italy	0.0501	0.0130	205.32**	0.0183	-0.0103	187.52**	0.0223	0.0017	262.00**	0.0127	0.0090	309.86**	0.0232	-0.0017	121.51**	0.0245	0.0169	190.01**
Netherlands	0.0252	-0.0033	18.75**				0.0026	-0.0022	39.84**									
Sweden	0.0008	-0.0076	28.26**				0.0008	-0.0003	40.32**									
Ireland	0.0245	0.0147	262.8**				0.0124	0.0055	196.76**									
Spain	0.0406	0.0004	268.71**	0.0377	0.0110	182.62**	0.0164	0.0027	447.81**	0.0119	0.0019	338.11**	0.0100	0.0019	178.97**	0.0044	-0.0008	130.06**
Switzerland	0.0168	0.0006	58.92**	0.0358	0.0063	90.59**	0.0032	0.0001	177.33**	0.0046	0.0028	74.46**	0.0038	0.0022	219.35**	0.0166	0.0205	177.33**
France	0.0002	0.0010	192.36**	0.0151	0.0115	211.14**	0.0016	0.0025	321.04**	0.0027	0.0014	27.14**	0.0178	0.0094	337.55**	0.0094	-0.0004	26.29**
UK	0.0309	-0.0086	42.37**				0.0053	0.0020	84.18**									
Russia	0.0597	0.0379	1158.71**				0.0284	0.0138	1515.26**									
Turkey	0.0230	0.0027	221.02**				0.0600	0.0043	168.38**									
Chile	0.0195	0.0097	228.02**				0.0224	0.0003	106.97**									
Brazil	0.0379	0.0083	88.39**	0.0311	-0.0020	123.71**	0.0007	0.0011	156.37**	0.0150	0.0014	169.79**	0.0082	-0.0058	186.11**	0.0135	0.0218	155.69**
Mexico	0.0083	0.0116	1909.88**	0.0593	0.0469	1948.43**	0.0045	0.0008	1540.36**	0.0101	0.0026	183.54**	0.0206	0.0187	1647.91**	0.0205	0.0054	142.38**
ISRAEL	0.0149	0.0213	842.92**				0.0244	0.0227	1253.68**									
South Africa	-0.0175	-0.0482	101.98**	0.0238	0.0118	74.03**	-0.0018	-0.0011	109.32**	0.0020	-0.0018	43.30**	0.0063	0.0035	77.73**	0.0042	-0.0013	41.80**
Canada	-0.0173	-0.0162	110.90**	0.0121	-0.0020	51.18**	-0.0032	-0.0042	386.87**	0.0033	0.0057	415.12**	0.0007	-0.0007	42.68**	0.0023	0.0015	134.94**
Asia	0.0165	0.0079	45.79**				0.0132	0.0018	39.98**									
Europe	0.0243	0.0074	78.70**				0.0243	0.0090	66.34**									
LatinAmerica	0.0699	0.0236	618.27**				0.0426	0.0193	481.27**									
EM	0.02825	0.00858	76.43**				0.00843	0.00335	68.01**									
Mean	**0.0275**	**0.0141**		**0.0343**	**0.0132**		**0.0156**	**0.0064**		**0.0111**	**0.0034**		**0.0125**	**0.0041**		**0.0135**	**0.0057**	

Table 8. Leads and Lags and Granger Causality Test of the Quoted Spreads among the Triplets (Leading ADR, ETF and CEF)

Table 8 presents the results of the VAR on the quoted spreads of the leading ADR, ETF, and CEF across the countries. And $\chi^2(6)$ show the results of the Granger Causality test for the relations of the quoted spreads of the leading ADR, ETF, and CEF. It only presents the coefficients of the quoted spreads of one security on the lag returns of the other two for last period and the past 6th period. ** indicates significance at 1% level and * indicates significance at 5% level.

Country	Leading ADR						ETF						CEF					
	ETF			CEF			Leading ADR			CEF			ADR			ETF		
	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$	P=1	P=6	$\chi^2(6)$
Australia	0.1523	0.0584	276.43**	0.0242	0.0173	350.29**	0.0011	0.0012	265.8**	0.0102	0.0053	81.26**	0.0131	0.0075	330.59**	0.0042	0.0084	74.22**
Singapore	0.0038	0.0233	106.03**	0.0068	-0.0034	380.49**	0.0043	0.0027	115.34**	0.0221	0.0243	466.18**	0.0066	-0.0027	566.12**	0.0229	0.0121	626.36**
Japan	0.0031	0.0021	119.79**	-0.0009	-0.0030	66.07**	0.0412	0.0123	113.78**	0.0017	-0.0119	157.05**	0.0019	-0.0078	41.83**	0.0022	-0.0037	132.48**
China	0.0070	0.0021	116.72**	0.0044	0.0008	83.39**	0.0305	0.0139	73.34**	0.0201	0.0132	111.18**	0.0218	-0.0025	73.79**	0.0150	0.0072	122.74**
HongKong	0.0163	-0.0056	8.62				-0.0003	-0.0015	9.92									
India	-0.0002	-0.0026	24.2**				-0.0024	-0.0070	99.51**									
Korea	0.0186	0.0028	201.3**	0.0054	0.0010	88.82**	0.0203	0.0100	208.31**	0.0069	0.0061	245.3**	0.0128	-0.0129	88.42**	0.0121	0.0063	224.31**
Malaysia	0.0156	0.0078	335.03**				0.0269	0.0013	288.92**									
Taiwan	0.0041	0.0010	20.91*	0.0131	-0.0069	274.48**	0.0039	-0.0019	28.39**	0.0205	0.0154	274.19**	0.0016	-0.0013	296.63**	0.0181	0.0163	287.64**
Indonesia	0.0024	0.0014	45.13**				0.0392	-0.0040	19.89**									
Philippine	0.0067	0.0051	302.84**				0.0572	0.0389	248.43**									
Germany	0.0111	0.0050	159.22**	0.0010	-0.0043	61.99**	0.0053	0.0065	314.98**	0.0081	-0.0015	272.1**	-0.0006	-0.0051	92.39**	0.0128	-0.0009	167.77**
Belgium	-0.0004	0.0053	29.21**				0.0120	0.0204	20.13**									
Italy	0.0065	0.0041	151.14**	-0.0003	-0.0004	56.38**	0.0392	0.0206	173.53**	0.0198	0.0010	214.54**	0.0092	0.0033	81.85**	0.0124	0.0116	239.71**
Netherlands	0.0014	0.0015	53.95**				0.0143	-0.0048	58.22**									
Sweden	0.0053	-0.0101	31.65**				0.0013	-0.0002	31.12**									
Ireland	0.0021	0.0014	25.76**				0.0103	0.0019	11.95*									
Spain	-0.0018	-0.0020	49.92**	0.0050	-0.0013	85.92**	-0.0008	-0.0042	70.04**	0.0123	0.0092	64.43**	0.0158	0.0083	126.74**	0.0065	0.0027	91.91**
Switzerland	0.0033	-0.0045	18.51*	-0.0020	-0.0058	64.33**	0.0099	0.0063	31.68**	0.0136	0.0085	70.27**	0.0074	-0.0073	117.59**	0.0066	-0.0005	110.64**
France	0.0030	-0.0017	47.88**	0.0055	0.0021	136.66**	0.0063	0.0006	51.56**	0.0163	0.0052	118.62**	0.0107	0.0044	140.37**	0.0150	0.0054	114.64**
UK	0.0048	0.0058	56.70**				0.0123	0.0021	51.74**									
Russia	0.0045	0.0025	65.01**				0.0119	0.0083	40.93**									
Turkey	0.0201	0.0120	432.35**				0.0360	0.0222	503.84**									
Chile	-0.0017	-0.0047	6.47**				0.0027	0.0010	4.87**									
Brazil	0.0102	0.0057	444.88**	0.0111	0.0163	406.79**	0.0354	0.0135	369.01**	0.0189	0.0088	410.22**	0.0267	0.0069	504.23**	0.0100	0.0158	404.01**
Mexico	0.0132	0.0049	185.24**	0.0024	-0.0018	80.23**	0.0152	0.0149	310.39**	0.0069	-0.0007	340.52**	0.0053	-0.0075	63.38**	0.0120	0.0023	211.12**
ISRAEL	-0.0010	-0.0002	45.17**				0.0001	0.0038	39.77**									
South Africa	-0.0058	-0.0018	109.76**	0.0081	0.0035	118.03**	-0.0093	-0.0038	81.08**	0.0124	0.0058	66.93**	0.0331	0.0110	127.81**	0.0022	0.0089	128.17**
Canada	0.0043	-0.0007	246.90**	0.0086	0.0020	1245.52**	0.0075	0.0024	249.15**	0.0149	0.0106	1313.42**	0.0099	-0.0006	1229.23**	0.0450	0.0346	1098.42**
Asia	0.0104	0.0148	61.78**				0.0176	-0.0027	36.89**									
Europe	0.0057	0.0004	28.06**				0.0136	0.0015	13.93**									
LatinAmerica	-0.0028	0.0005	23.38**				0.0193	-0.0139	14.50**									
EM	0.01381	0.00628	138.32**				0.0201	0.01383	95.96**									
Mean	**0.0102**	**0.0043**		**0.0061**	**0.0011**		**0.0152**	**0.0053**		**0.0136**	**0.0066**		**0.0117**	**-0.0004**		**0.0131**	**0.0084**	

Table 9. Explaining the Price-setting Buy-Sell Imbalance and Short-Horizon Returns

This table presents the results of VAR model on the net order imbalances and short-horizon returns. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Panel A-F show the average coefficients of the VARs across all the countries when the dependent variables are OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF. Panel A summarizes the results of VARs on order flows and returns. Panel B-E also summarizes the coefficients of VARs in the regions of Asia and Pacific, Europe, Latin America, and Emerging Market respectively. Dependent variables are denoted by 1-6. 1 is OIBADR; 2 is OIBETF; 3 is OIBCEF; 4 is ReturnADR; 5 is ReturnETF; 6 is ReturnCEF;

		Panel A					
	Lag	1	2	3	4	5	6
OibADR	1	0.1533	0.0042	0.0061	0.3347	0.0133	0.0183
	2	0.0669	0.0028	0.0041	0.0772	0.0055	0.0110
	3	0.0525	0.0026	0.0027	0.0163	0.0135	0.0053
	4	0.0449	0.0022	0.0022	-0.0050	0.0004	0.0085
	5	0.0396	0.0017	0.0020	-0.0120	0.0100	0.0067
	6	0.0414	0.0036	0.0021	-0.0283	0.0024	0.0108
OibETF	1	0.0043	0.1573	0.0080	0.0108	0.2403	0.0248
	2	0.0037	0.0773	0.0062	0.0034	0.0772	0.0273
	3	0.0019	0.0583	0.0063	0.0027	0.0354	0.0150
	4	0.0036	0.0481	0.0029	-0.0062	0.0147	0.0181
	5	0.0031	0.0426	0.0036	0.0014	0.0071	0.0062
	6	0.0026	0.0459	0.0051	0.0067	0.0023	-0.0047
OibCEF	1	0.0073	0.0103	0.1444	0.0171	0.0130	0.4102
	2	0.0026	0.0075	0.0686	0.0006	0.0097	0.1982
	3	0.0046	0.0045	0.0467	0.0086	0.0083	0.1171
	4	0.0066	0.0056	0.0398	-0.0092	0.0046	0.0951
	5	0.0027	0.0067	0.0368	-0.0005	-0.0013	0.0560
	6	0.0057	0.0075	0.0352	-0.0103	-0.0001	0.0734
ReturnADR	1	0.4616	1.3667	1.6496	-0.1856	0.0103	0.0147
	2	0.8587	0.9914	1.4500	-0.0654	0.0113	0.0139
	3	1.3044	0.1782	1.1159	-0.0310	0.0107	0.0177
	4	1.0692	0.5584	0.7099	-0.0128	0.0106	0.0124
	5	0.7346	0.2581	0.8568	-0.0077	0.0080	0.0063
	6	1.4635	-0.1333	0.7278	-0.0047	0.0054	0.0063
ReturnETF	1	0.1724	1.2594	0.2483	0.0060	-0.1157	0.0112
	2	0.2588	1.1127	0.3553	0.0046	-0.0641	0.0162
	3	0.2647	0.9783	0.3780	0.0042	-0.0411	0.0128
	4	0.1341	0.9419	0.6550	-0.0003	-0.0259	0.0136
	5	0.1520	1.1554	0.3814	0.0005	-0.0196	0.0071
	6	0.3444	1.5092	0.6978	0.0008	-0.0125	0.0066
ReturnCEF	1	0.2176	0.3304	1.0980	0.0037	0.0051	-0.1385
	2	0.1878	0.3541	0.8153	0.0028	0.0050	-0.0935
	3	0.1600	0.2586	0.7703	0.0031	0.0050	-0.0681
	4	0.2230	0.2922	0.7522	0.0025	0.0048	-0.0489
	5	0.2028	0.2694	0.7352	0.0003	0.0025	-0.0369
	6	0.1901	0.2995	0.7681	0.0012	0.0017	-0.0272

Table 9. (Continued)

This table presents the results of VAR model on the net order imbalances and short-horizon returns. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Panel A-F show the average coefficients of the VARs across all the countries when the dependent variables are OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF. Panel A summarizes the results of VARs on order flows and returns. Panel B-E also summarizes the coefficients of VARs in the regions of Asia and Pacific, Europe, Latin America, and Emerging Market respectively. Dependent variables are denoted by 1-6. 1 is OIBADR; 2 is OIBETF; 3 is OIBCEF; 4 is ReturnADR; 5 is ReturnETF; 6 is ReturnCEF;

		Panel B						Panel C					
	Lag	1	2	3	4	5	6	1	2	3	4	5	6
OibADR	1	0.1602	0.0054	0.0035	0.1395	0.0289	0.0146	0.1503	0.0019	0.0030	0.2975	-0.0002	0.0133
	2	0.0677	0.0057	0.0039	0.0447	-0.0041	-0.0003	0.0658	0.0012	0.0022	0.0461	0.0043	-0.0008
	3	0.0530	0.0033	0.0022	0.0110	0.0061	0.0082	0.0509	0.0004	0.0019	-0.0003	0.0232	0.0172
	4	0.0456	0.0048	0.0017	-0.0145	0.0170	0.0165	0.0434	0.0015	0.0015	-0.0180	-0.0129	0.0050
	5	0.0368	0.0068	0.0020	-0.0276	0.0027	0.0115	0.0406	-0.0005	0.0010	-0.0143	0.0151	-0.0083
	6	0.0417	0.1693	0.0007	0.0127	0.0137	0.0221	0.0398	0.0023	0.0021	-0.0319	-0.0096	0.0075
OibETF	1	0.0069	0.0769	0.0101	0.0004	0.3188	0.0124	0.0024	0.1387	0.0045	0.0137	0.1994	0.0577
	2	0.0057	0.0579	0.0052	0.0062	0.0896	-0.0067	0.0033	0.0763	0.0037	0.0078	0.0805	0.0420
	3	0.0043	0.0456	0.0071	-0.0196	0.0388	0.0363	-0.0005	0.0547	0.0059	0.0001	0.0372	0.0272
	4	0.0061	0.0436	0.0035	-0.0011	0.0108	0.0059	0.0016	0.0457	0.0018	-0.0001	0.0179	-0.0009
	5	0.0043	0.0462	0.0071	0.0036	0.0001	0.0096	0.0013	0.0384	-0.0014	0.0029	0.0172	-0.0154
	6	0.0050	0.0144	0.0062	0.0084	-0.0054	0.4647	0.0014	0.0434	0.0019	0.0130	0.0111	-0.0123
OibCEF	1	0.0057	0.0108	0.1534	-0.0114	0.0103	0.2209	0.0082	0.0050	0.1316	0.0330	0.0196	0.4110
	2	0.0020	0.0061	0.0725	-0.0016	0.0043	0.1386	0.0021	0.0045	0.0643	0.0046	0.0189	0.2068
	3	0.0024	0.0088	0.0504	-0.0088	0.0202	0.1050	0.0060	0.0022	0.0433	0.0189	-0.0070	0.1203
	4	0.0061	0.0100	0.0420	-0.0036	0.0061	0.0627	0.0069	0.0028	0.0388	-0.0123	0.0058	0.1140
	5	0.0008	0.0106	0.0399	-0.0278	-0.0186	0.0942	0.0004	0.0045	0.0363	-0.0070	0.0194	0.0650
	6	0.0028	2.3630	0.0370	-0.2136	0.0082	0.0094	0.0067	0.0029	0.0338	0.0012	-0.0024	0.0712
ReturnADR	1	1.2661	1.2895	0.9072	-0.0880	0.0085	0.0050	-0.4740	0.1645	0.0953	-0.1565	0.0118	0.0127
	2	1.6798	-0.5944	0.9559	-0.0397	0.0120	0.0163	-1.2072	0.3911	0.0033	-0.0474	0.0091	0.0143
	3	1.6050	1.4784	0.7928	-0.0134	0.0104	0.0100	0.1759	0.0833	0.1320	-0.0240	0.0104	0.0121
	4	1.3392	0.1620	0.8917	-0.0093	0.0070	-0.0007	0.5323	-0.0527	0.2534	-0.0135	0.0126	0.0089
	5	0.4666	-0.8442	0.6211	-0.0097	0.0038	0.0021	0.2749	0.0187	0.2592	-0.0064	0.0104	0.0068
	6	0.4271	0.3941	0.6552	0.0090	0.0018	0.0080	1.2098	0.2992	0.2074	-0.0009	0.0059	0.0064
ReturnETF	1	0.4998	1.0670	0.3848	0.0080	-0.1741	0.0120	0.1177	1.1732	0.1874	0.0055	-0.0688	0.0173
	2	0.2328	0.2123	0.6771	0.0087	-0.0998	0.0101	0.0988	0.9757	0.3221	0.0036	-0.0418	0.0195
	3	0.3947	0.3027	0.1001	0.0004	-0.0621	0.0071	0.2298	0.8456	0.2356	0.0025	-0.0287	0.0120
	4	0.0739	1.1688	0.7039	0.0008	-0.0370	0.0031	0.1349	0.5490	0.2187	-0.0009	-0.0204	0.0139
	5	-0.0114	1.3760	0.3062	0.0022	-0.0266	0.0064	0.3844	0.6732	-0.0491	0.0002	-0.0163	0.0128
	6	0.5660	0.3659	0.6829	0.0035	-0.0164	-0.1502	0.1167	0.7412	0.0475	0.0002	-0.0117	0.0088
ReturnCEF	1	0.1914	0.4930	1.1063	0.0027	0.0056	-0.1000	0.2257	0.1960	0.8724	0.0072	0.0034	-0.0899
	2	0.4367	0.3743	0.6981	0.0026	0.0044	-0.0749	0.0479	0.0585	0.7513	0.0040	0.0025	-0.0648
	3	0.2036	0.4782	0.7909	0.0020	0.0044	-0.0529	0.2375	0.1404	0.6417	0.0036	0.0036	-0.0489
	4	0.4171	0.3573	0.8392	0.0013	0.0042	-0.0463	0.1978	0.0494	0.6373	0.0024	0.0037	-0.0394
	5	0.4613	0.4817	0.8913	0.0018	0.0026	-0.0345	-0.0113	0.2280	0.6421	0.0007	0.0019	-0.0306
	6	0.2878	0.0000	0.8368	0.0000	0.0021	0.0000	0.1139	0.0728	0.6420	-0.0001	0.0014	-0.0187

Table 9. (Continued)

This table presents the results of VAR model on the net order imbalances and short-horizon returns. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Panel A-F show the average coefficients of the VARs across all the countries when the dependent variables are OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF. Panel A summarizes the results of VARs on order flows and returns. Panel B-E also summarizes the coefficients of VARs in the regions of Asia and Pacific, Europe, Latin America, and Emerging Market respectively. Dependent variables are denoted by 1-6. 1 is OIBADR; 2 is OIBETF; 3 is OIBCEF; 4 is ReturnADR; 5 is ReturnETF; 6 is ReturnCEF;

		Panel D						Panel E					
	Lag	1	2	3	4	5	6	1	2	3	4	5	6
OibADR	1	0.1498	0.0019	0.0079	0.2666	0.0249	0.0357	0.1572	0.0057	0.0086	0.4296	0.0236	0.0276
	2	0.0745	0.0025	0.0045	0.0675	0.0408	0.0165	0.0706	0.0040	0.0055	0.1163	0.0146	0.0158
	3	0.0611	0.0026	0.0026	0.0010	-0.0013	-0.0084	0.0556	0.0038	0.0041	0.0456	-0.0013	0.0057
	4	0.0516	0.0007	0.0041	-0.0095	0.0037	0.0032	0.0485	0.0020	0.0024	-0.0014	0.0096	0.0073
	5	0.0480	0.0012	0.0028	-0.0018	0.0163	0.0153	0.0404	0.0030	0.0021	-0.0096	0.0085	0.0194
	6	0.0494	0.0011	0.0041	-0.0344	0.0170	0.0094	0.0438	0.0044	0.0025	-0.0397	0.0103	0.0088
OibETF	1	0.0088	0.1578	0.0076	0.0046	0.2322	0.0394	0.0059	0.1548	0.0098	0.0137	0.2869	0.0184
	2	-0.0019	0.0794	0.0101	-0.0021	0.0570	0.0668	0.0022	0.0743	0.0079	-0.0009	0.0903	0.0179
	3	-0.0008	0.0605	0.0052	0.0003	0.0347	0.0341	0.0019	0.0568	0.0060	0.0140	0.0396	0.0184
	4	0.0025	0.0525	0.0029	0.0017	0.0125	0.0322	0.0048	0.0471	0.0045	-0.0140	0.0152	0.0115
	5	0.0063	0.0482	0.0042	0.0017	-0.0022	0.0223	0.0023	0.0427	0.0057	0.0057	-0.0009	0.0116
	6	-0.0003	0.0492	0.0083	-0.0037	-0.0043	-0.0185	0.0024	0.0460	0.0069	0.0040	-0.0041	-0.0001
OibCEF	1	0.0078	0.0154	0.1478	0.0005	0.0286	0.3482	0.0076	0.0109	0.1527	0.0100	0.0237	0.4143
	2	0.0032	0.0074	0.0714	0.0142	0.0058	0.1771	0.0024	0.0089	0.0703	0.0083	-0.0043	0.1932
	3	0.0041	0.0088	0.0454	0.0114	0.0210	0.1088	0.0033	0.0035	0.0485	0.0136	0.0175	0.1213
	4	0.0057	0.0039	0.0379	0.0091	0.0104	0.0595	0.0045	0.0059	0.0404	-0.0106	0.0055	0.0841
	5	0.0047	0.0061	0.0334	0.0087	0.0055	0.0372	0.0033	0.0051	0.0368	0.0055	-0.0077	0.0418
	6	0.0071	0.0101	0.0355	0.0009	-0.0251	0.0450	0.0051	0.0079	0.0350	-0.0130	0.0004	0.0868
ReturnADR	1	-0.9496	1.3060	2.8440	-0.2555	0.0055	0.0275	1.6311	3.1641	2.9291	-0.2130	0.0092	0.0177
	2	1.0588	1.2435	2.3739	-0.0905	0.0134	0.0298	2.4751	1.6572	2.3950	-0.0818	0.0152	0.0145
	3	2.2817	0.2994	1.9696	-0.0455	0.0146	0.0371	2.1812	-0.0108	1.8133	-0.0383	0.0116	0.0225
	4	0.8888	-0.2286	1.8091	-0.0201	0.0182	0.0261	1.6068	1.4845	1.0413	-0.0121	0.0102	0.0155
	5	2.8036	0.2770	0.9728	-0.0125	0.0164	0.0204	0.6465	0.6648	1.3010	-0.0098	0.0080	0.0065
	6	2.9622	-0.0055	0.6480	-0.0075	0.0132	0.0187	1.0969	-0.7506	1.0358	-0.0074	0.0058	0.0071
ReturnETF	1	-0.1222	1.9910	-0.1018	0.0031	-0.0821	0.0070	0.2801	1.1938	0.2933	0.0066	-0.1798	0.0139
	2	0.2082	1.1447	-0.0747	0.0003	-0.0460	0.0241	0.5256	1.4212	0.6512	0.0069	-0.0854	0.0161
	3	-0.0206	0.9030	0.6420	0.0009	-0.0264	0.0242	0.3090	1.2978	0.6440	0.0074	-0.0506	0.0136
	4	0.4079	1.4754	0.0179	0.0001	-0.0189	0.0391	0.1716	1.3282	1.4297	0.0001	-0.0279	0.0061
	5	0.4481	1.0392	0.3042	0.0002	-0.0092	0.0223	-0.2721	1.6218	1.0144	-0.0001	-0.0192	-0.0018
	6	0.6717	2.4037	1.5288	-0.0006	-0.0089	0.0152	0.8203	2.1979	1.1174	0.0006	-0.0098	0.0018
ReturnCEF	1	0.4051	0.4487	0.8050	-0.0020	0.0087	-0.1749	0.2221	0.5296	1.4138	0.0038	0.0067	-0.1547
	2	0.0425	0.6296	0.8921	0.0024	0.0126	-0.1187	0.2549	0.5776	1.0023	0.0040	0.0065	-0.1035
	3	-0.2226	0.9131	0.4799	0.0062	0.0094	-0.0838	0.1910	0.2051	0.9931	0.0047	0.0076	-0.0760
	4	0.1640	0.5961	0.4749	0.0055	0.0107	-0.0556	0.2442	0.2913	0.8922	0.0037	0.0056	-0.0512
	5	0.2734	0.3384	0.4825	-0.0038	0.0040	-0.0264	0.3322	0.2915	0.7949	0.0006	0.0046	-0.0398
	6	0.4159	0.2146	0.6822	0.0045	0.0012	-0.0350	0.2204	0.4642	0.9111	0.0014	0.0025	-0.0303

Table 10. Contemporaneous and Past Correlation between Innovations of Order Imbalance and Returns

The table presents the correlation matrix for the VAR innovations in the time series of Order Imbalance and Return of ADR, ETF, and CEF. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Panel A-G show the Contemporaneous and Past Correlation of the Order Imbalance and Returns of ADR, ETF, and CEF.

Panel A: Contemporaneous Correlation of the Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	0	1.000000					
oibnavETF	0	0.005457	1.000000				
oibnavCEF	0	0.006706	0.007559	1.000000			
return1ADR	0	0.151451	0.003719	0.003323			
return1ETF	0	0.004138	0.158846	0.003743	0.022202	1.000000	
return1CEF	0	0.005264	0.006362	0.188220	0.017294	0.017626	1.000000

Panel B: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	1	-0.001550	-0.000239	-0.000296	-0.000049	-0.000095	-0.000018
oibnavETF	1	-0.000261	-0.001831	-0.000557	-0.000007	-0.000025	-0.000135
oibnavCEF	1	-0.000259	-0.000520	-0.001197	-0.000080	-0.000133	0.000042
return1ADR	1	-0.000055	-0.000072	-0.000059	-0.000043	0.000046	0.000034
return1ETF	1	-0.000068	0.000027	-0.000079	0.000042	-0.000210	0.000038
return1CEF	1	-0.000158	-0.000128	0.000097	0.000020	0.000039	-0.000234

Panel C: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	2	-0.003093	-0.000495	-0.000528	-0.000094	-0.000213	-0.000126
oibnavETF	2	-0.000435	-0.003618	-0.001008	-0.000046	-0.000051	-0.000241
oibnavCEF	2	-0.000519	-0.000986	-0.002451	-0.000145	-0.000308	0.000076
return1ADR	2	-0.000079	-0.000125	-0.000097	-0.000084	0.000096	0.000089
return1ETF	2	-0.000216	0.000053	-0.000190	0.000074	-0.000495	0.000138
return1CEF	2	-0.000202	-0.000066	0.000372	0.000146	0.000064	-0.000334

Panel D: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	3	-0.004853	-0.000715	-0.000887	-0.000145	-0.000339	-0.000284
oibnavETF	3	-0.000685	-0.005540	-0.001571	-0.000083	-0.000073	-0.000390
oibnavCEF	3	-0.000845	-0.001509	-0.003803	-0.000203	-0.000455	0.000127
return1ADR	3	0.000182	-0.000135	-0.000276	0.000073	0.000101	0.000656
return1ETF	3	-0.000261	0.000179	-0.000242	0.000149	-0.000774	0.000207
return1CEF	3	-0.000274	-0.000206	0.000321	0.000075	0.000153	-0.000581

Panel E: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	4	-0.006843	-0.000955	-0.001200	-0.000236	-0.000499	-0.000696
oibnavETF	4	-0.000948	-0.007891	-0.002033	-0.000127	-0.000090	-0.000578
oibnavCEF	4	-0.001148	-0.002183	-0.005423	-0.000310	-0.000613	0.000151
return1ADR	4	0.000237	-0.000180	-0.000098	-0.000064	0.000139	0.000553
return1ETF	4	-0.000349	0.000707	0.000308	0.000783	-0.002145	0.000885
return1CEF	4	-0.000398	-0.000432	0.000613	0.000126	0.000345	-0.000976

Panel F: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	5	-0.009322	-0.001289	-0.001532	-0.000365	-0.000679	-0.000816
oibnavETF	5	-0.001243	-0.010891	-0.002757	-0.000177	-0.000179	-0.000773
oibnavCEF	5	-0.001555	-0.002915	-0.007595	-0.000360	-0.000847	0.000210
return1ADR	5	0.000824	0.000190	0.000397	-0.000242	0.000840	0.000575
return1ETF	5	-0.000332	0.000764	-0.000497	0.000658	-0.001741	0.000799
return1CEF	5	-0.000306	-0.000307	0.001389	0.000245	0.000979	-0.001767

Panel F: Correlation of the Current and Past Order Imbalance and Returns

Variable	Lag	oibnavADR	oibnavETF	oibnavCEF	return1ADR	return1ETF	return1CEF
oibnavADR	6	-0.014872	-0.001871	-0.002291	-0.000561	-0.001060	-0.001168
oibnavETF	6	-0.001764	-0.016656	-0.003905	-0.000277	-0.000165	-0.001289
oibnavCEF	6	-0.002310	-0.004238	-0.012032	-0.000608	-0.001425	0.000372
return1ADR	6	0.002045	-0.000205	0.000143	-0.000732	0.001390	0.001619
return1ETF	6	-0.000384	0.001483	-0.000226	0.000341	-0.001061	0.000444
return1CEF	6	-0.000742	-0.000509	0.001555	0.000125	0.001077	-0.002528

Table 11. Returns Around the Largest versus Smallest Trades by the Triplets (Leading ADR, ETF, and CEF)

This table presents analysis of midquote returns around the largest v.s. smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Then I calculate the average cumulative midquote returns of the three securities over windows [-k,-1], 0, [1, k], k=1, 5, 10, 15, 20, which presents the cumulative returns just before and after the largest v.s. smallest trades of one security. I also show the average cumulative midquote returns over windows [-k, 0], and [0, k], k=5, 10, 20. Panel A presents the cumulative midquote returns of leading ADR, ETF, and CEF around the largest v.s smallest trades of one security. Panel B presents the cumulative midquote returns of leading ADR, ETF, and CEF around the largest v.s smallest buying activities of one security. Panel C presents the cumulative midquote returns of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security.

Panel A: The Cumulative Midquote Returns Around the Largest v.s. Smallest Trades

(a) Returns of ADR, ETF, and CEF Around the trades of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnADR	High5%	-0.0343	-0.0286	-0.0118	-0.0010	0.0047	0.0049	0.0072	-0.0007	-0.0053	-0.0169	-0.0210	-0.0509
ReturnETF	High5%	-0.0661	-0.0560	-0.0398	-0.0240	0.0164	0.0096	0.0148	0.0046	-0.0075	-0.0183	-0.0324	-0.0683
ReturnCEF	High5%	0.0085	0.0069	0.0065	0.0002	-0.0001	0.0004	0.0000	-0.0074	-0.0099	-0.0091	-0.0105	0.0031
ReturnADR	Low5%	-0.0323	-0.0248	-0.0158	-0.0070	-0.0048	-0.0031	-0.0061	0.0252	0.0268	0.0289	0.0298	-0.0673
ReturnETF	Low5%	0.0047	0.0036	0.0026	0.0014	0.0006	0.0004	0.0006	-0.0013	-0.0006	0.0002	0.0010	0.0169
ReturnCEF	Low5%	-0.0191	-0.0155	-0.0093	-0.0060	-0.0044	-0.0032	-0.0057	-0.0275	-0.0405	-0.0543	-0.0631	-0.0268

(b) Returns of ADR, ETF, and CEF Around the trades of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnETF	High5%	0.0347	0.0276	0.0180	0.0065	0.0054	0.0004	0.0006	0.0072	0.0162	0.0298	0.0431	0.0779
ReturnADR	High5%	-0.0245	-0.0244	-0.0160	-0.0099	-0.0063	-0.0015	-0.0011	-0.0005	-0.0036	0.0014	-0.0007	-0.0265
ReturnCEF	High5%	0.0261	0.0209	0.0139	0.0148	0.0059	0.0062	-0.0006	-0.0069	0.0001	0.0152	0.0146	0.0555
ReturnETF	Low5%	0.0039	0.0035	0.0025	0.0009	0.0011	0.0003	0.0008	0.0110	0.0152	0.0188	0.0219	0.0167
ReturnADR	Low5%	-0.0269	-0.0195	-0.0123	-0.0052	-0.0026	-0.0015	-0.0023	-0.0005	-0.0069	-0.0124	-0.0182	-0.0567
ReturnCEF	Low5%	-0.0031	-0.0029	-0.0037	-0.0047	-0.0021	-0.0014	-0.0018	-0.0401	-0.0496	-0.0603	-0.0668	-0.0006

(c) Returns of ADR, ETF, and CEF Around the trades of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnCEF	High5%	0.0251	0.0216	0.0102	-0.0042	0.0091	-0.0001	0.0022	0.0067	0.0117	0.0127	0.0260	0.0541
ReturnADR	High5%	0.0004	0.0061	0.0058	0.0037	-0.0054	-0.0008	0.0068	0.0053	-0.0049	-0.0136	-0.0069	-0.0074
ReturnETF	High5%	0.0236	0.0115	0.0049	0.0039	0.0013	0.0042	0.0001	0.0003	0.0029	0.0217	0.0213	0.0484
ReturnCEF	Low5%	0.0000	-0.0008	-0.0009	-0.0004	-0.0002	0.0001	-0.0001	-0.0137	-0.0162	-0.0184	-0.0217	0.0039
ReturnADR	Low5%	-0.0219	-0.0163	-0.0100	-0.0054	-0.0021	-0.0010	-0.0015	0.0049	0.0023	-0.0006	-0.0036	-0.0429
ReturnETF	Low5%	0.0087	0.0068	0.0048	0.0023	0.0007	0.0003	0.0005	-0.0002	0.0014	0.0029	0.0051	0.0187

(d) Compare returns among ADR, ETF, and CEF aroung the largest and smallest trades

Return		K=-20	-10	-5	0	5	10	20
ADR	High 5%	-0.0297	-0.0071	0.0037	0.0049	0.0042	-0.0004	-0.0161
	Low 5%	-0.0354	-0.0189	-0.0101	-0.0031	-0.0137	-0.0202	-0.0334
	Difference	0.0057	0.0118	0.0138	0.0080	0.0179	0.0198	0.0174
ETF	High 5%	0.0348	0.0181	0.0066	0.0004	0.0074	0.0164	0.0433
	Low 5%	0.0043	0.0029	0.0013	0.0003	0.0029	0.0050	0.0076
	Difference	0.0304	0.0153	0.0053	0.0000	0.0045	0.0113	0.0357
CEF	High 5%	0.0274	0.0126	-0.0026	-0.0001	0.0065	0.0116	0.0259
	Low 5%	0.0000	-0.0009	-0.0003	0.0001	-0.0004	0.0005	0.0023
	Difference	0.0274	0.0135	-0.0022	-0.0002	0.0069	0.0111	0.0236
ADR-ETF	High 5%	-0.0644	-0.0252	-0.0030	0.0045	-0.0032	-0.0168	-0.0594
	Low 5%	-0.0397	-0.0217	-0.0114	-0.0034	-0.0165	-0.0252	-0.0411
ETF-CEF	High 5%	0.0073	0.0055	0.0092	0.0005	0.0009	0.0048	0.0174
	Low 5%	0.0043	0.0037	0.0017	0.0002	0.0033	0.0045	0.0053
ADR-CEF	High 5%	-0.0571	-0.0197	0.0062	0.0050	-0.0023	-0.0120	-0.0419
	Low 5%	-0.0354	-0.0180	-0.0098	-0.0032	-0.0133	-0.0207	-0.0357

Panel B: The Cumulative Midquote Returns Around the Largest v.s. Smallest Buys

(a) Returns of ADR, ETF, and CEF Around the Buys of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnADR	High5%	-0.0787	-0.0598	-0.0401	-0.0201	-0.0127	-0.0082	-0.0096	-0.0165	-0.0364	-0.0555	-0.0748	-0.1617
ReturnETF	High5%	-0.0193	-0.0142	-0.0094	-0.0045	-0.0015	-0.0007	-0.0017	-0.0047	-0.0094	-0.0138	-0.0184	-0.0384
ReturnCEF	High5%	-0.0509	-0.0385	-0.0255	-0.0128	-0.0043	-0.0019	-0.0042	-0.0132	-0.0263	-0.0396	-0.0520	-0.1048
ReturnADR	Low5%	-0.0656	-0.0491	-0.0327	-0.0161	-0.0037	-0.0006	-0.0052	-0.0170	-0.0329	-0.0488	-0.0649	-0.1324
ReturnETF	Low5%	-0.0230	-0.0172	-0.0115	-0.0057	-0.0024	-0.0013	-0.0025	-0.0057	-0.0115	-0.0173	-0.0233	-0.0478
ReturnCEF	Low5%	-0.0501	-0.0374	-0.0249	-0.0124	-0.0056	-0.0031	-0.0056	-0.0129	-0.0252	-0.0376	-0.0502	-0.1026

(b) Returns of ADR, ETF, and CEF Around the Buys of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnETF	High5%	-0.0464	-0.0353	-0.0239	-0.0125	-0.0112	-0.0084	-0.0089	-0.0084	-0.0194	-0.0306	-0.0413	-0.0962
ReturnADR	High5%	-0.0468	-0.0349	-0.0233	-0.0115	-0.0043	-0.0020	-0.0043	-0.0117	-0.0235	-0.0355	-0.0466	-0.0955
ReturnCEF	High5%	-0.0515	-0.0387	-0.0262	-0.0136	-0.0049	-0.0018	-0.0048	-0.0136	-0.0256	-0.0381	-0.0514	-0.1047
ReturnETF	Low5%	-0.0316	-0.0236	-0.0157	-0.0077	-0.0017	-0.0002	-0.0023	-0.0085	-0.0162	-0.0239	-0.0316	-0.0637
ReturnADR	Low5%	-0.0599	-0.0449	-0.0300	-0.0150	-0.0061	-0.0031	-0.0061	-0.0146	-0.0295	-0.0444	-0.0592	-0.1228
ReturnCEF	Low5%	-0.0559	-0.0419	-0.0280	-0.0141	-0.0060	-0.0031	-0.0059	-0.0152	-0.0291	-0.0432	-0.0571	-0.1141

Table 11. (Cont.)

(c) Returns of ADR, ETF, and CEF Around the Buys of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnCEF	High5%	-0.0736	-0.0580	-0.0405	-0.0235	-0.0313	-0.0253	-0.0255	-0.0114	-0.0292	-0.0468	-0.0633	-0.1619
ReturnADR	High5%	-0.0602	-0.0446	-0.0301	-0.0145	-0.0049	-0.0022	-0.0048	-0.0158	-0.0326	-0.0481	-0.0635	-0.1259
ReturnETF	High5%	-0.0256	-0.0185	-0.0122	-0.0057	-0.0016	-0.0006	-0.0024	-0.0076	-0.0143	-0.0202	-0.0266	-0.0528
ReturnCEF	Low5%	-0.0502	-0.0375	-0.0249	-0.0123	-0.0027	-0.0004	-0.0033	-0.0136	-0.0263	-0.0389	-0.0517	-0.1016
ReturnADR	Low5%	-0.0651	-0.0488	-0.0326	-0.0163	-0.0066	-0.0033	-0.0065	-0.0160	-0.0322	-0.0484	-0.0647	-0.1334
ReturnETF	Low5%	-0.0323	-0.0243	-0.0162	-0.0081	-0.0033	-0.0017	-0.0033	-0.0079	-0.0160	-0.0240	-0.0321	-0.0663

(d) Compare returns among ADR, ETF, and CEF aroung the largest and smallest trades

ReturnBuy		K=-20	-10	-5	0	5	10	20
ADR	High 5%	-0.0869	-0.0483	-0.0283	-0.0082	-0.0247	-0.0446	-0.0830
	Low 5%	-0.0662	-0.0333	-0.0167	-0.0006	-0.0184	-0.0345	-0.0668
	Difference	-0.0207	-0.0150	-0.0116	-0.0076	-0.0063	-0.0101	-0.0162
ETF	High 5%	-0.0548	-0.0323	-0.0209	-0.0084	-0.0169	-0.0278	-0.0498
	Low 5%	-0.0318	-0.0159	-0.0079	-0.0002	-0.0089	-0.0166	-0.0321
	Difference	-0.0231	-0.0164	-0.0130	-0.0083	-0.0080	-0.0112	-0.0177
CEF	High 5%	-0.0986	-0.0656	-0.0485	-0.0253	-0.0367	-0.0545	-0.0886
	Low 5%	-0.0506	-0.0252	-0.0127	-0.0004	-0.0136	-0.0262	-0.0515
	Difference	-0.0481	-0.0403	-0.0358	-0.0249	-0.0231	-0.0282	-0.0371
ADR-ETF	High 5%	-0.0321	-0.0160	-0.0074	0.0002	-0.0078	-0.0167	-0.0333
	Low 5%	-0.0344	-0.0174	-0.0088	-0.0004	-0.0095	-0.0178	-0.0347
ETF-CEF	High 5%	0.0438	0.0333	0.0276	0.0169	0.0199	0.0266	0.0388
	Low 5%	0.0188	0.0094	0.0047	0.0002	0.0048	0.0096	0.0194
ADR-CEF	High 5%	0.0117	0.0172	0.0202	0.0171	0.0121	0.0099	0.0056
	Low 5%	-0.0156	-0.0080	-0.0040	-0.0002	-0.0047	-0.0082	-0.0153

Panel C: The Cumulative Midquote Returns Around the Largest v.s. Smallest Sells

(a) Returns of ADR, ETF, and CEF Around the Sells of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnADR	High 5%	0.0829	0.0628	0.0428	0.0224	0.0143	0.0096	0.0116	0.0196	0.0409	0.0620	0.0827	0.1753
ReturnETF	High 5%	0.0171	0.0131	0.0098	0.0050	0.0046	0.0025	0.0053	0.0065	0.0083	0.0121	0.0160	0.0358
ReturnCEF	High 5%	0.0523	0.0387	0.0262	0.0133	0.0041	0.0018	0.0042	0.0127	0.0261	0.0393	0.0521	0.1064
ReturnADR	Low 5%	0.0586	0.0437	0.0289	0.0143	0.0031	0.0004	0.0044	0.0161	0.0305	0.0451	0.0598	0.1179
ReturnETF	Low 5%	0.0235	0.0176	0.0117	0.0060	0.0025	0.0013	0.0025	0.0063	0.0122	0.0182	0.0241	0.0489
ReturnCEF	Low 5%	0.0492	0.0368	0.0245	0.0122	0.0054	0.0029	0.0054	0.0116	0.0234	0.0355	0.0476	0.1011

(b) Returns of ADR, ETF, and CEF Around the Sells of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnETF	High 5%	0.0477	0.0364	0.0251	0.0128	0.0127	0.0097	0.0105	0.0097	0.0220	0.0339	0.0460	0.1035
ReturnADR	High 5%	0.0471	0.0341	0.0231	0.0115	0.0038	0.0017	0.0042	0.0119	0.0242	0.0370	0.0484	0.0972
ReturnCEF	High 5%	0.0553	0.0417	0.0275	0.0145	0.0051	0.0025	0.0052	0.0131	0.0273	0.0412	0.0548	0.1127
ReturnETF	Low 5%	0.0322	0.0241	0.0160	0.0079	0.0016	0.0001	0.0021	0.0089	0.0171	0.0252	0.0334	0.0654
ReturnADR	Low 5%	0.0565	0.0424	0.0283	0.0142	0.0058	0.0029	0.0058	0.0143	0.0285	0.0426	0.0567	0.1159
ReturnCEF	Low 5%	0.0544	0.0407	0.0271	0.0134	0.0054	0.0028	0.0054	0.0114	0.0245	0.0376	0.0507	0.1116

(c) Returns of ADR, ETF, and CEF Around the Sells of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
ReturnCEF	High 5%	0.0805	0.0624	0.0432	0.0205	0.0326	0.0256	0.0257	0.0127	0.0314	0.0512	0.0712	0.1772
ReturnADR	High 5%	0.0610	0.0452	0.0301	0.0151	0.0046	0.0024	0.0054	0.0150	0.0291	0.0444	0.0605	0.1238
ReturnETF	High 5%	0.0280	0.0206	0.0140	0.0074	0.0028	0.0012	0.0029	0.0074	0.0145	0.0224	0.0291	0.0581
ReturnCEF	Low 5%	0.0504	0.0376	0.0250	0.0123	0.0027	0.0003	0.0032	0.0124	0.0248	0.0372	0.0497	0.1021
ReturnADR	Low 5%	0.0631	0.0473	0.0316	0.0158	0.0064	0.0032	0.0064	0.0159	0.0317	0.0475	0.0633	0.1294
ReturnETF	Low 5%	0.0337	0.0253	0.0169	0.0084	0.0034	0.0017	0.0034	0.0084	0.0168	0.0252	0.0336	0.0691

(d) Compare returns among ADR, ETF, and CEF aroung the largest and smallest trades

ReturnBuy		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.0925	0.0524	0.0319	0.0096	0.0292	0.0504	0.0923
	Low 5%	0.0589	0.0293	0.0147	0.0004	0.0160	0.0303	0.0593
	Difference	0.0336	0.0231	0.0172	0.0092	0.0132	0.0202	0.0330
ETF	High 5%	0.0574	0.0348	0.0225	0.0097	0.0194	0.0317	0.0557
	Low 5%	0.0323	0.0160	0.0079	0.0001	0.0086	0.0166	0.0328
	Difference	0.0251	0.0187	0.0146	0.0096	0.0108	0.0150	0.0230
CEF	High 5%	0.1062	0.0690	0.0461	0.0256	0.0383	0.0570	0.0968
	Low 5%	0.0507	0.0253	0.0126	0.0003	0.0136	0.0263	0.0516
	Difference	0.0555	0.0437	0.0335	0.0253	0.0247	0.0308	0.0452
ADR-ETF	High 5%	0.0351	0.0176	0.0094	-0.0001	0.0097	0.0188	0.0366
	Low 5%	0.0266	0.0133	0.0068	0.0003	0.0074	0.0136	0.0265
ETF-CEF	High 5%	-0.0488	-0.0342	-0.0235	-0.0159	-0.0188	-0.0253	-0.0411
	Low 5%	-0.0184	-0.0092	-0.0046	-0.0002	-0.0050	-0.0096	-0.0188
ADR-CEF	High 5%	-0.0137	-0.0166	-0.0141	-0.0160	-0.0091	-0.0066	-0.0045
	Low 5%	0.0082	0.0040	0.0021	0.0001	0.0024	0.0040	0.0077

Table 12. Prices Around the Largest versus Smallest Trades by the Triplets (Leading ADR, ETF, and CEF)

This table presents analysis of prices around the largest v.s. smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Then I calculate the average prices of the three securities over windows [-k,-1], 0, [1, k], k=1, 5, 10, 15, 20, which presents the average prices just before and after the largest v.s. smallest trades of one security. I also show the average prices over windows [-k, 0], and [0, k], k=5, 10, 20. Panel A presents the average prices of leading ADR, ETF, and CEF around the largest v.s smallest trades of one security. Panel B presents the average prices of leading ADR, ETF, and CEF around the largest v.s smallest buying activities of one security. Panel C presents the average prices of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security.

Panel A: Average Price Around the Largest v.s. Smallest Trades

(a) Average Price of ADR, ETF, and CEF Around the trades of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceADR	High5%	33.600	31.891	31.950	32.047	33.655	34.974	33.595	31.977	31.901	31.877	31.850	31.925
PriceETF	High5%	5.478	5.244	5.243	5.230	4.996	4.801	4.964	5.219	5.232	5.232	5.227	5.223
PriceCEF	High5%	5.025	4.838	4.842	4.815	4.367	4.000	4.359	4.816	4.823	4.819	4.813	4.800
PriceADR	Low5%	36.611	35.156	35.066	34.904	31.116	27.791	31.126	34.900	35.055	35.143	35.206	35.043
PriceETF	Low5%	8.638	8.190	8.188	8.193	8.427	8.673	8.442	8.175	8.191	8.197	8.208	8.223
PriceCEF	Low5%	6.110	5.743	5.741	5.775	6.496	7.128	6.482	5.739	5.748	5.769	5.796	5.808

(b) Average Price of ADR, ETF, and CEF Around the trades of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceETF	High5%	25.380	23.723	23.894	24.132	30.046	34.994	29.633	23.786	23.641	23.534	23.465	23.824
PriceADR	High5%	35.371	33.840	33.735	33.658	32.029	30.468	31.949	33.678	33.784	33.859	33.888	33.790
PriceCEF	High5%	7.078	6.784	6.798	6.803	6.416	6.143	6.410	6.722	6.733	6.715	6.682	6.711
PriceETF	Low5%	18.406	17.760	17.677	17.543	14.451	11.705	14.486	17.582	17.691	17.769	17.817	17.683
PriceADR	Low5%	36.795	35.005	35.017	35.039	35.513	35.923	35.510	35.037	35.013	35.001	34.995	35.022
PriceCEF	Low5%	6.095	5.777	5.778	5.791	6.064	6.298	6.069	5.801	5.798	5.801	5.806	5.805

(c) Average Price of ADR, ETF, and CEF Around the trades of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceCEF	High5%	7.407	6.759	6.853	7.047	11.091	14.563	11.033	6.979	6.793	6.705	6.646	6.855
PriceADR	High5%	36.659	35.175	35.105	34.898	31.326	28.407	31.259	34.830	35.070	35.165	35.220	35.065
PriceETF	High5%	21.253	20.378	20.335	20.227	18.547	17.185	18.594	20.229	20.292	20.336	20.348	20.304
PriceCEF	Low5%	5.492	5.357	5.310	5.229	3.509	2.004	3.512	5.237	5.317	5.363	5.398	5.312
PriceADR	Low5%	36.583	34.783	34.799	34.832	35.557	36.176	35.564	34.834	34.798	34.782	34.772	34.809
PriceETF	Low5%	27.595	26.213	26.233	26.272	27.094	27.806	27.083	26.246	26.203	26.184	26.177	26.234

(d) Compare prices among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	31.9996	32.2245	32.5349	34.9736	32.4761	32.1803	31.9984
	Low 5%	34.8676	34.4048	33.7187	27.7912	33.7339	34.4120	34.8688
	Difference	-2.8680	-2.1803	-1.1838	7.1824	-1.2578	-2.2317	-2.8704
ETF	High 5%	24.1712	24.9034	25.9425	34.9941	25.6537	24.6724	24.0138
	Low 5%	17.5300	17.1343	16.5700	11.7052	16.6128	17.1593	17.5392
	Difference	6.6413	7.7690	9.3725	23.2889	9.0409	7.5131	6.4746
CEF	High 5%	7.0545	7.5536	8.2999	14.5630	8.2427	7.4994	7.0229
	Low 5%	5.2309	5.0094	4.6917	2.0042	4.6976	5.0151	5.2362
	Difference	1.8236	2.5442	3.6082	12.5589	3.5451	2.4844	1.7867
ADR-ETF	High 5%	7.8283	7.3212	6.5924	-0.0206	6.8224	7.5079	7.9846
	Low 5%	17.3376	17.2705	17.1487	16.0860	17.1211	17.2527	17.3296
ETF-CEF	High 5%	17.1167	17.3498	17.6426	20.4311	17.4109	17.1730	16.9909
	Low 5%	12.2990	12.1249	11.8783	9.7010	11.9152	12.1442	12.3030
ADR-CEF	High 5%	24.9450	24.6710	24.2350	20.4105	24.2334	24.6809	24.9756
	Low 5%	29.6367	29.3954	29.0270	25.7870	29.0363	29.3969	29.6326

Panel B: Average Price Around the Largest v.s. Smallest Buys

(a) Average Price of ADR, ETF, and CEF Around the Buys of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceADR	High5%	18.453	17.080	17.223	17.571	23.881	29.104	23.649	17.405	17.180	17.058	16.973	17.281
PriceETF	High5%	3.340	3.192	3.189	3.181	3.064	2.972	3.040	3.180	3.180	3.184	3.184	3.183
PriceCEF	High5%	2.443	2.347	2.355	2.346	2.229	2.107	2.221	2.341	2.354	2.344	2.337	2.332
PriceADR	Low5%	16.178	15.989	15.824	15.483	7.966	1.628	7.962	15.463	15.804	15.974	16.087	15.742
PriceETF	Low5%	4.539	4.321	4.323	4.321	4.327	4.349	4.325	4.303	4.306	4.318	4.324	4.324
PriceCEF	Low5%	2.718	2.578	2.568	2.574	2.637	2.700	2.610	2.548	2.560	2.570	2.584	2.586

(b) Average Price of ADR, ETF, and CEF Around the Buys of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceETF	High5%	16.576	15.132	15.352	15.717	24.136	31.364	23.827	15.432	15.200	15.046	14.960	15.383
PriceADR	High5%	18.314	17.526	17.482	17.494	16.677	15.805	16.473	17.332	17.443	17.422	17.426	17.434
PriceCEF	High5%	3.839	3.676	3.696	3.688	3.516	3.350	3.509	3.676	3.670	3.660	3.637	3.647
PriceETF	Low5%	10.893	10.748	10.613	10.344	5.276	1.000	5.282	10.347	10.613	10.744	10.835	10.606
PriceADR	Low5%	18.930	18.019	18.020	18.025	18.130	18 15	18.126	18.031	18.030	18.028	18.029	18.030
PriceCEF	Low5%	3.166	3.001	2.995	3.001	3.116	3.214	3.115	3.005	3.003	3.004	3.007	3.011

Table 12. (Continued)

(c) Average Price of ADR, ETF, and CEF Around the Buys of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceCEF	High5%	4.540	3.915	4.036	4.269	9.715	14.348	9.518	4.141	3.937	3.837	3.782	4.059
PriceADR	High5%	18.278	17.497	17.415	17.399	15.839	14.536	15.860	17.385	17.464	17.492	17.530	17.469
PriceETF	High5%	14.017	13.431	13.395	13.383	12.186	11.361	12.165	13.286	13.340	13.371	13.402	13.380
PriceCEF	Low5%	2.870	2.830	2.792	2.725	1.414	0.296	1.417	2.725	2.792	2.829	2.854	2.792
PriceADR	Low5%	19.054	18.135	18.136	18.143	18.260	18.374	18.268	18.152	18.146	18.146	18.144	18.147
PriceETF	Low5%	16.043	15.258	15.260	15.265	15.542	15.784	15.549	15.269	15.251	15.252	15.249	15.267

(d) Compare prices among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	17.5740	18.3033	19.4936	29.1044	19.3549	18.2638	17.5504
	Low 5%	15.4079	14.5337	13.1739	1.6279	13.1612	14.5190	15.4027
	Difference	2.1661	3.7695	6.3198	27.4765	6.1936	3.7449	2.1476
ETF	High 5%	15.7871	16.8080	18.3250	31.3636	18.0868	16.6689	15.7412
	Low 5%	10.3746	9.7391	8.7867	0.9998	8.7931	9.7440	10.3727
	Difference	5.4124	7.0689	9.5383	30.3638	9.2937	6.9249	5.3684
CEF	High 5%	4.3236	4.9734	5.9486	14.3477	5.8420	4.8838	4.2851
	Low 5%	2.7335	2.5655	2.3203	0.2961	2.3203	2.5650	2.7319
	Difference	1.5901	2.4079	3.6283	14.0516	3.5217	2.3188	1.5532
ADR-ETF	High 5%	1.7870	1.4953	1.1686	-2.2593	1.2680	1.5949	1.8092
	Low 5%	5.0332	4.7946	4.3872	0.6281	4.3681	4.7749	5.0300
ETF-CEF	High 5%	11.4635	11.8346	12.3765	17.0159	12.2448	11.7851	11.4560
	Low 5%	7.6412	7.1736	6.4664	0.7037	6.4728	7.1791	7.6408
ADR-CEF	High 5%	13.2504	13.3298	13.5451	14.7566	13.5129	13.3800	13.2652
	Low 5%	12.6744	11.9682	10.8536	1.3318	10.8409	11.9540	12.6708

Panel C: Average Price Around the Largest v.s. Smallest Sells

(a) Average Price of ADR, ETF, and CEF Around the Sells of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceADR	High5%	15.946	14.673	14.527	14.145	21.802	27.346	21.527	14.932	14.658	14.544	14.469	14.835
PriceETF	High5%	2.228	2.139	2.154	2.160	2.019	1.918	2.034	2.134	2.124	2.114	2.105	2.114
PriceCEF	High5%	2.277	2.193	2.196	2.181	2.014	1.852	1.986	2.175	2.189	2.190	2.186	2.177
PriceADR	Low5%	14.130	13.977	13.826	13.514	6.774	1.083	6.776	13.502	13.823	13.970	14.064	13.755
PriceETF	Low5%	2.844	2.699	2.692	2.687	2.734	2.775	2.741	2.688	2.697	2.705	2.715	2.713
PriceCEF	Low5%	2.482	2.348	2.337	2.330	2.395	2.469	2.393	2.325	2.332	2.344	2.355	2.360

(b) Average Price of ADR, ETF, and CEF Around the Sells of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceETF	High5%	12.224	10.883	10.767	10.683	21.745	30.133	21.413	11.423	10.904	10.698	10.527	11.091
PriceADR	High5%	15.650	14.990	14.951	14.907	14.341	13.707	14.308	14.968	15.019	14.973	14.923	14.920
PriceCEF	High5%	3.270	3.125	3.132	3.162	3.001	2.837	3.036	3.162	3.115	3.095	3.088	3.102
PriceETF	Low5%	6.714	6.628	6.528	6.331	3.025	0.267	3.021	6.313	6.512	6.618	6.694	6.544
PriceADR	Low5%	15.896	15.130	15.127	15.128	15.215	15.297	15.215	15.132	15.131	15.132	15.132	15.136
PriceCEF	Low5%	2.765	2.628	2.625	2.621	2.655	2.692	2.656	2.622	2.629	2.634	2.637	2.635

(c) Average Price of ADR, ETF, and CEF Around the Sells of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
PriceCEF	High5%	3.914	3.711	3.431	3.304	8.976	13.566	8.842	3.516	3.303	3.210	3.154	3.447
PriceADR	High5%	15.952	15.346	15.326	15.367	13.822	12.586	13.782	15.143	15.195	15.243	15.279	15.235
PriceETF	High5%	7.996	7.648	7.656	7.693	7.279	6.825	7.322	7.736	7.748	7.730	7.733	7.678
PriceCEF	Low5%	2.549	2.518	2.487	2.430	1.236	0.213	1.236	2.432	2.489	2.519	2.539	2.482
PriceADR	Low5%	15.738	14.977	14.977	14.981	15.107	15.217	15.109	14.985	14.979	14.979	14.981	14.986
PriceETF	Low5%	10.833	10.302	10.295	10.291	10.402	10.507	10.396	10.283	10.284	10.287	10.290	10.305

(d) Compare prices among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	15.1869	15.9650	17.1780	27.3465	17.0010	15.8116	15.0820
	Low 5%	13.4567	12.6677	11.4418	1.0830	11.4360	12.6689	13.4492
	Difference	1.7302	3.2973	5.7362	26.2634	5.5650	3.1427	1.6327
ETF	High 5%	11.6416	12.8916	14.7578	30.1331	14.5415	12.6523	11.4606
	Low 5%	6.3943	5.9584	5.3204	0.2666	5.3085	5.9478	6.3916
	Difference	5.2473	6.9332	9.4374	29.8666	9.2330	6.7045	5.0690
CEF	High 5%	3.7273	4.3524	5.3482	13.5665	5.1911	4.2360	3.6499
	Low 5%	2.4273	2.2806	2.0601	0.2127	2.0619	2.2820	2.4284
	Difference	1.3000	2.0718	3.2880	13.3537	3.1292	1.9539	1.2215
ADR-ETF	High 5%	3.5452	3.0734	2.4202	-2.7867	2.4595	3.1593	3.6213
	Low 5%	7.0624	6.7092	6.1214	0.8164	6.1275	6.7210	7.0576
ETF-CEF	High 5%	7.9144	8.5393	9.4096	16.5667	9.3505	8.4164	7.8108
	Low 5%	3.9671	3.6779	3.2602	0.0539	3.2466	3.6658	3.9632
ADR-CEF	High 5%	11.4596	11.6126	11.8298	13.7800	11.8099	11.5756	11.4321
	Low 5%	11.0294	10.3871	9.3816	0.8703	9.3742	10.3868	11.0209

Table 13. Qspread Around the Largest versus Smallest Trades by the Triplets (Leading ADR, ETF, and CEF)

This table presents analysis of quote spreads around the largest v.s. smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Quote spread is computed as (ask – bid)/(ask + bid)/2. Then I calculate the average quote spreads of the three securities over windows [-k,-1], 0, [1, k], k=1, 5, 10, 15, 20, which presents the average quote spreads just before and after the largest v.s. smallest trades of one security. I also show the average quote spreads over windows [-k, 0], and [0, k], k=5, 10, 20. Panel A presents the average quote spreads of leading ADR, ETF, and CEF around the largest v.s smallest trades of one security. Panel B presents the average quote spreads of leading ADR, ETF, and CEF around the largest v.s smallest buying activities of one security. Panel C presents the average quote spreads of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security.

Panel A: Average Qspread Around the Largest v.s. Smallest Trades

(a) Average Qspread of ADR, ETF, and CEF Around the trades of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadADR	High5%	0.2106	0.2110	0.2115	0.2120	0.2302	0.2468	0.2344	0.2137	0.2114	0.2107	0.2102	0.4126
QspreadETF	High5%	0.0522	0.0523	0.0524	0.0519	0.0480	0.0449	0.0482	0.0523	0.0520	0.0519	0.0516	0.1010
QspreadCEF	High5%	0.0897	0.0901	0.0904	0.0905	0.0807	0.0718	0.0807	0.0906	0.0904	0.0903	0.0901	0.1747
QspreadADR	Low5%	0.2222	0.2217	0.2212	0.2208	0.1946	0.1689	0.1923	0.2185	0.2193	0.2200	0.2206	0.4297
QspreadETF	Low5%	0.0563	0.0561	0.0559	0.0563	0.0640	0.0705	0.0645	0.0558	0.0556	0.0557	0.0560	0.1104
QspreadCEF	Low5%	0.0964	0.0961	0.0961	0.0967	0.1163	0.1330	0.1160	0.0959	0.0954	0.0956	0.0960	0.1896

(b) Average Qspread of ADR, ETF, and CEF Around the trades of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadETF	High5%	0.1355	0.1371	0.1396	0.1429	0.2402	0.3253	0.2385	0.1412	0.1374	0.1353	0.1339	0.2721
QspreadADR	High5%	0.1593	0.1587	0.1589	0.1581	0.1470	0.1355	0.1463	0.1596	0.1597	0.1597	0.1599	0.3105
QspreadCEF	High5%	0.1291	0.1293	0.1295	0.1299	0.1178	0.1090	0.1175	0.1275	0.1271	0.1267	0.1264	0.2485
QspreadETF	Low5%	0.1056	0.1051	0.1044	0.1035	0.0779	0.0545	0.0783	0.1035	0.1046	0.1053	0.1057	0.2040
QspreadADR	Low5%	0.1925	0.1925	0.1926	0.1927	0.1968	0.2005	0.1968	0.1926	0.1924	0.1925	0.1925	0.3762
QspreadCEF	Low5%	0.1193	0.1192	0.1192	0.1195	0.1293	0.1380	0.1297	0.1198	0.1196	0.1196	0.1197	0.2338

(c) Average Qspread of ADR, ETF, and CEF Around the trades of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadCEF	High5%	0.1337	0.1358	0.1380	0.1434	0.2517	0.3455	0.2534	0.1439	0.1381	0.1351	0.1334	0.2707
QspreadADR	High5%	0.2318	0.2318	0.2320	0.2318	0.2008	0.1751	0.2008	0.2324	0.2332	0.2332	0.2328	0.4508
QspreadETF	High5%	0.1058	0.1061	0.1064	0.1069	0.0939	0.0820	0.0940	0.1071	0.1066	0.1064	0.1058	0.2055
QspreadCEF	Low5%	0.1009	0.1003	0.0995	0.0981	0.0623	0.0303	0.0622	0.0978	0.0992	0.1001	0.1007	0.1934
QspreadADR	Low5%	0.2117	0.2117	0.2116	0.2118	0.2186	0.2247	0.2186	0.2115	0.2114	0.2114	0.2115	0.4137
QspreadETF	Low5%	0.1189	0.1189	0.1188	0.1189	0.1242	0.1289	0.1238	0.1185	0.1185	0.1186	0.1188	0.2326

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.2124	0.2147	0.2178	0.2468	0.2192	0.2146	0.2120
	Low 5%	0.2197	0.2164	0.2121	0.1689	0.2102	0.2147	0.2181
	Difference	-0.0073	-0.0017	0.0057	0.0779	0.0090	0.0000	-0.0061
ETF	High 5%	0.1445	0.1565	0.1733	0.3253	0.1719	0.1544	0.1430
	Low 5%	0.1031	0.0999	0.0953	0.0545	0.0954	0.1001	0.1033
	Difference	0.0414	0.0566	0.0779	0.2708	0.0766	0.0544	0.0397
CEF	High 5%	0.1438	0.1569	0.1771	0.3455	0.1775	0.1570	0.1435
	Low 5%	0.0975	0.0932	0.0868	0.0303	0.0865	0.0929	0.0973
	Difference	0.0462	0.0637	0.0902	0.3153	0.0910	0.0641	0.0462
ADR-ETF	High 5%	0.0678	0.0582	0.0446	-0.0784	0.0473	0.0602	0.0690
	Low 5%	0.1166	0.1166	0.1168	0.1144	0.1148	0.1146	0.1147
ETF-CEF	High 5%	0.0008	-0.0004	-0.0038	-0.0203	-0.0056	-0.0025	-0.0005
	Low 5%	0.0056	0.0067	0.0085	0.0242	0.0089	0.0072	0.0060
ADR-CEF	High 5%	0.0686	0.0578	0.0408	-0.0987	0.0417	0.0577	0.0685
	Low 5%	0.1222	0.1232	0.1253	0.1386	0.1237	0.1218	0.1208

Panel B: Average Qspread Around the Largest v.s. Smallest Buys

(a) Average Qspread of ADR, ETF, and CEF Around the Buys of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadADR	High5%	0.1043	0.1050	0.1060	0.1086	0.1538	0.1913	0.1530	0.1078	0.1061	0.1051	0.1043	0.2078
QspreadETF	High5%	0.0276	0.0277	0.0278	0.0277	0.0261	0.0249	0.0265	0.0280	0.0277	0.0278	0.0278	0.0540
QspreadCEF	High5%	0.0424	0.0426	0.0428	0.0428	0.0394	0.0362	0.0394	0.0432	0.0431	0.0428	0.0427	0.0828
QspreadADR	Low5%	0.0948	0.0941	0.0931	0.0909	0.0462	0.0083	0.0466	0.0910	0.0929	0.0940	0.0947	0.1809
QspreadETF	Low5%	0.0298	0.0297	0.0296	0.0297	0.0318	0.0336	0.0321	0.0295	0.0295	0.0296	0.0297	0.0583
QspreadCEF	Low5%	0.0425	0.0423	0.0422	0.0422	0.0454	0.0482	0.0455	0.0421	0.0420	0.0421	0.0423	0.0830

(b) Average Qspread of ADR, ETF, and CEF Around the Buys of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadETF	High5%	0.0816	0.0831	0.0853	0.0896	0.1955	0.2906	0.1944	0.0878	0.0840	0.0821	0.0809	0.1686
QspreadADR	High5%	0.0775	0.0774	0.0777	0.0776	0.0721	0.0670	0.0716	0.0777	0.0783	0.0778	0.0778	0.1511
QspreadCEF	High5%	0.0702	0.0702	0.0703	0.0709	0.0667	0.0600	0.0650	0.0702	0.0698	0.0693	0.0692	0.1357
QspreadETF	Low5%	0.0558	0.0552	0.0544	0.0529	0.0261	0.0031	0.0263	0.0530	0.0545	0.0552	0.0557	0.1064
QspreadADR	Low5%	0.0901	0.0901	0.0901	0.0901	0.0911	0.0918	0.0910	0.0900	0.0901	0.0901	0.0901	0.1760
QspreadCEF	Low5%	0.0592	0.0591	0.0591	0.0593	0.0635	0.0672	0.0635	0.0592	0.0591	0.0592	0.0593	0.1160

Table 13. (Continued)

(c) Average Qspread of ADR, ETF, and CEF Around the Buys of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadCEF	High5%	0.0769	0.0791	0.0818	0.0866	0.2169	0.3305	0.2124	0.0831	0.0788	0.0763	0.0752	0.1606
QspreadADR	High5%	0.1060	0.1063	0.1061	0.1064	0.0937	0.0803	0.0928	0.1063	0.1066	0.1061	0.1057	0.2054
QspreadETF	High5%	0.0644	0.0642	0.0641	0.0647	0.0567	0.0487	0.0556	0.0649	0.0650	0.0650	0.0646	0.1252
QspreadCEF	Low5%	0.0523	0.0519	0.0513	0.0503	0.0266	0.0060	0.0268	0.0503	0.0514	0.0519	0.0523	0.0999
QspreadADR	Low5%	0.1003	0.1003	0.1003	0.1003	0.1014	0.1025	0.1014	0.1002	0.1002	0.1002	0.1003	0.1959
QspreadETF	Low5%	0.0659	0.0658	0.0658	0.0658	0.0673	0.0687	0.0673	0.0657	0.0658	0.0658	0.0659	0.1288

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.1084	0.1138	0.1223	0.1913	0.1217	0.1138	0.1084
	Low 5%	0.0907	0.0854	0.0772	0.0083	0.0772	0.0852	0.0906
	Difference	0.0177	0.0284	0.0452	0.1830	0.0445	0.0286	0.0179
ETF	High 5%	0.0916	0.1040	0.1231	0.2906	0.1216	0.1027	0.0909
	Low 5%	0.0533	0.0498	0.0446	0.0031	0.0447	0.0498	0.0533
	Difference	0.0383	0.0542	0.0785	0.2874	0.0769	0.0529	0.0376
CEF	High 5%	0.0889	0.1044	0.1273	0.3305	0.1243	0.1017	0.0874
	Low 5%	0.0501	0.0472	0.0429	0.0060	0.0429	0.0472	0.0501
	Difference	0.0389	0.0572	0.0844	0.3245	0.0814	0.0545	0.0373
ADR-ETF	High 5%	0.0168	0.0098	-0.0008	-0.0993	0.0001	0.0111	0.0175
	Low 5%	0.0374	0.0356	0.0325	0.0051	0.0324	0.0353	0.0373
ETF-CEF	High 5%	0.0026	-0.0004	-0.0042	-0.0400	-0.0027	0.0011	0.0035
	Low 5%	0.0032	0.0025	0.0017	-0.0028	0.0018	0.0026	0.0032
ADR-CEF	High 5%	0.0195	0.0094	-0.0049	-0.1393	-0.0026	0.0121	0.0211
	Low 5%	0.0406	0.0381	0.0343	0.0023	0.0342	0.0380	0.0405

Panel C: Average Qspread Around the Largest v.s. Smallest Sells

(a) Average Qspread of ADR, ETF, and CEF Around the Sells of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadADR	High5%	0.1041	0.1048	0.1060	0.1089	0.1640	0.2100	0.1634	0.1084	0.1053	0.1039	0.1030	0.2073
QspreadETF	High5%	0.0247	0.0247	0.0249	0.0251	0.0232	0.0214	0.0240	0.0252	0.0245	0.0245	0.0242	0.0476
QspreadCEF	High5%	0.0426	0.0427	0.0429	0.0429	0.0387	0.0345	0.0378	0.0428	0.0427	0.0427	0.0427	0.0828
QspreadADR	Low5%	0.0902	0.0894	0.0883	0.0862	0.0426	0.0058	0.0428	0.0858	0.0880	0.0891	0.0898	0.1717
QspreadETF	Low5%	0.0243	0.0242	0.0242	0.0242	0.0256	0.0267	0.0257	0.0241	0.0242	0.0242	0.0243	0.0476
QspreadCEF	Low5%	0.0422	0.0420	0.0418	0.0418	0.0447	0.0473	0.0450	0.0418	0.0418	0.0418	0.0420	0.0825

(b) Average Qspread of ADR, ETF, and CEF Around the Sells of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadETF	High5%	0.0679	0.0701	0.0730	0.0775	0.2002	0.3059	0.1965	0.0756	0.0702	0.0676	0.0658	0.1420
QspreadADR	High5%	0.0741	0.0739	0.0736	0.0729	0.0694	0.0637	0.0688	0.0748	0.0752	0.0746	0.0741	0.1442
QspreadCEF	High5%	0.0565	0.0566	0.0569	0.0578	0.0538	0.0502	0.0544	0.0569	0.0569	0.0567	0.0568	0.1103
QspreadETF	Low5%	0.0426	0.0421	0.0415	0.0403	0.0191	0.0012	0.0191	0.0401	0.0414	0.0420	0.0425	0.0811
QspreadADR	Low5%	0.0859	0.0859	0.0859	0.0859	0.0866	0.0873	0.0866	0.0859	0.0858	0.0859	0.0859	0.1678
QspreadCEF	Low5%	0.0515	0.0514	0.0513	0.0512	0.0527	0.0542	0.0526	0.0513	0.0514	0.0515	0.0516	0.1006

(c) Average Qspread of ADR, ETF, and CEF Around the Sells of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
QspreadCEF	High5%	0.0676	0.0696	0.0725	0.0792	0.2137	0.3329	0.2121	0.0751	0.0699	0.0675	0.0664	0.1432
QspreadADR	High5%	0.1057	0.1059	0.1055	0.1050	0.0927	0.0841	0.0944	0.1058	0.1058	0.1055	0.1055	0.2051
QspreadETF	High5%	0.0439	0.0443	0.0445	0.0456	0.0424	0.0389	0.0426	0.0453	0.0451	0.0451	0.0447	0.0863
QspreadCEF	Low5%	0.0461	0.0458	0.0453	0.0444	0.0229	0.0041	0.0230	0.0444	0.0452	0.0457	0.0460	0.0879
QspreadADR	Low5%	0.0980	0.0980	0.0979	0.0980	0.0992	0.1003	0.0992	0.0979	0.0979	0.0979	0.0980	0.1914
QspreadETF	Low5%	0.0504	0.0504	0.0503	0.0503	0.0511	0.0519	0.0510	0.0501	0.0502	0.0502	0.0503	0.0984

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.1091	0.1155	0.1258	0.2100	0.1253	0.1148	0.1081
	Low 5%	0.0862	0.0808	0.0728	0.0058	0.0725	0.0805	0.0858
	Difference	0.0230	0.0346	0.0530	0.2042	0.0528	0.0343	0.0224
ETF	High 5%	0.0793	0.0942	0.1155	0.3059	0.1140	0.0916	0.0773
	Low 5%	0.0406	0.0378	0.0338	0.0012	0.0336	0.0377	0.0406
	Difference	0.0387	0.0564	0.0818	0.3047	0.0804	0.0539	0.0367
CEF	High 5%	0.0802	0.0961	0.1214	0.3329	0.1180	0.0938	0.0791
	Low 5%	0.0441	0.0415	0.0376	0.0041	0.0376	0.0414	0.0440
	Difference	0.0361	0.0546	0.0838	0.3288	0.0804	0.0523	0.0351
ADR-ETF	High 5%	0.0298	0.0213	0.0102	-0.0959	0.0113	0.0232	0.0309
	Low 5%	0.0456	0.0430	0.0390	0.0046	0.0389	0.0428	0.0452
ETF-CEF	High 5%	-0.0009	-0.0020	-0.0059	-0.0270	-0.0041	-0.0022	-0.0018
	Low 5%	-0.0035	-0.0037	-0.0039	-0.0029	-0.0040	-0.0037	-0.0034
ADR-CEF	High 5%	0.0289	0.0193	0.0043	-0.1229	0.0073	0.0210	0.0291
	Low 5%	0.0421	0.0393	0.0351	0.0017	0.0349	0.0391	0.0418

Table 14. Depth Around the Largest versus Smallest Trades by the Triplets (Leading ADR, ETF, and CEF)

This table presents analysis of depths around the largest v.s. smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Depth is computed as (ask depth + bid depth)/2. Then I calculate the average depths of the three securities over windows [-k,-1], 0, [1, k], k=1, 5, 10, 15, 20, which presents the average depths just before and after the largest v.s. smallest trades of one security. I also show the average depths over windows [-k, 0], and [0, k], k=5, 10, 20. Panel A presents the average depths of leading ADR, ETF, and CEF around the largest v.s smallest trades of one security. Panel B presents the average depths of leading ADR, ETF, and CEF around the largest v.s smallest buying activities of one security. Panel C presents the average depths of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security.

Panel A: Average Depth Around the Largest v.s. Smallest Trades

(a) Average Depth of ADR, ETF, and CEF Around the trades of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthADR	High5%	49.664	49.398	48.599	45.613	59.620	61.240	56.666	52.557	52.332	52.085	51.838	52.088
DepthETF	High5%	19.739	19.402	18.725	17.015	18.892	17.592	18.891	20.317	20.455	20.523	20.519	20.540
DepthCEF	High5%	6.300	6.181	5.971	5.371	5.534	4.802	5.549	6.540	6.571	6.592	6.603	6.563
DepthADR	Low5%	25.603	25.192	24.388	22.202	23.846	21.474	24.401	27.335	27.354	27.401	27.453	26.979
DepthETF	Low5%	20.132	19.795	19.216	17.623	23.053	24.822	23.143	21.361	21.296	21.288	21.277	21.240
DepthCEF	Low5%	7.903	7.811	7.631	7.105	10.477	12.088	10.456	8.532	8.471	8.426	8.398	8.435

(b) Average Depth of ADR, ETF, and CEF Around the trades of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthETF	High5%	37.545	37.479	37.200	35.479	64.701	82.719	63.446	41.760	40.426	39.639	39.003	40.269
DepthADR	High5%	23.377	22.979	22.125	20.210	23.460	22.586	23.240	23.953	24.103	24.121	24.148	24.302
DepthCEF	High5%	5.036	4.949	4.779	4.375	4.637	4.110	4.751	5.448	5.405	5.367	5.360	5.294
DepthETF	Low5%	20.612	20.194	19.466	17.683	14.498	8.386	14.409	21.174	21.414	21.571	21.690	21.328
DepthADR	Low5%	28.818	28.371	27.523	25.244	30.536	30.754	30.525	30.344	30.343	30.348	30.346	30.285
DepthCEF	Low5%	6.016	5.924	5.754	5.290	6.687	6.977	6.681	6.347	6.337	6.334	6.332	6.337

(c) Average Depth of ADR, ETF, and CEF Around the trades of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthCEF	High5%	11.554	11.730	11.816	11.522	25.003	34.051	23.637	12.401	11.972	11.746	11.608	12.407
DepthADR	High5%	27.541	26.985	26.099	23.765	25.237	22.993	25.212	27.644	27.901	28.009	28.203	28.420
DepthETF	High5%	30.331	29.810	28.898	26.212	28.202	26.042	28.933	31.371	31.481	31.381	31.486	31.531
DepthCEF	Low5%	4.109	4.018	3.860	3.479	2.475	0.976	2.507	4.231	4.291	4.324	4.346	4.247
DepthADR	Low5%	26.108	25.712	24.948	22.899	27.979	28.392	27.987	27.557	27.545	27.534	27.521	27.469
DepthETF	Low5%	30.457	29.990	29.093	26.699	32.936	33.731	32.955	32.065	32.013	31.997	31.989	32.018

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	52.5693	54.1504	55.7979	61.2397	54.0040	53.1418	52.2855
	Low 5%	26.6252	26.3403	25.7815	21.4741	26.2826	26.7434	27.0818
	Difference	25.9441	27.8101	30.0163	39.7656	27.7214	26.3984	25.2037
ETF	High 5%	41.4831	44.7194	49.2651	82.7190	48.5878	44.2720	41.0852
	Low 5%	21.0119	20.2281	19.0808	8.3862	18.9999	20.1910	21.0186
	Difference	20.4712	24.4912	30.1843	74.3328	29.5879	24.0809	20.0666
CEF	High 5%	13.1749	14.9110	17.1976	34.0507	16.0090	13.9791	12.6767
	Low 5%	4.1558	3.9486	3.6413	0.9759	3.6876	3.9874	4.1833
	Difference	9.0191	10.9625	13.5563	33.0747	12.3215	9.9917	8.4934
ADR-ETF	High 5%	11.0862	9.4310	6.5328	-21.4793	5.4162	8.8698	11.2002
	Low 5%	5.6133	6.1122	6.7008	13.0879	7.2827	6.5523	6.0632
ETF-CEF	High 5%	28.3082	29.8083	32.0674	48.6683	32.5788	30.2929	28.4085
	Low 5%	16.8561	16.2795	15.4394	7.4103	15.3123	16.2036	16.8353
ADR-CEF	High 5%	39.3944	39.2393	38.6002	27.1890	37.9950	39.1627	39.6087
	Low 5%	22.4694	22.3918	22.1402	20.4982	22.5950	22.7559	22.8985

Panel B: Average Depth Around the Largest v.s. Smallest Buys

(a) Average Depth of ADR, ETF, and CEF Around the Buys of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthADR	High5%	22.772	22.744	22.590	21.769	38.275	46.643	36.302	24.689	24.150	23.814	23.601	24.294
DepthETF	High5%	11.154	10.947	10.562	9.709	10.892	10.304	10.985	11.581	11.548	11.634	11.713	11.673
DepthCEF	High5%	2.200	2.160	2.106	1.922	2.070	1.833	2.085	2.392	2.385	2.378	2.377	2.330
DepthADR	Low5%	12.112	11.794	11.248	9.985	5.866	1.072	5.880	12.076	12.460	12.660	12.804	12.469
DepthETF	Low5%	11.325	11.145	10.808	9.883	12.340	12.798	12.367	12.010	11.998	11.987	11.974	11.914
DepthCEF	Low5%	2.804	2.757	2.676	2.461	3.171	3.351	3.152	2.955	2.954	2.957	2.957	2.959

(b) Average Depth of ADR, ETF, and CEF Around the Buys of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthETF	High5%	24.458	24.561	24.554	23.843	53.991	75.268	53.048	27.712	26.545	25.847	25.399	26.751
DepthADR	High5%	11.622	11.433	11.005	10.015	11.390	10.979	11.251	11.909	12.015	12.060	12.092	12.120
DepthCEF	High5%	2.545	2.475	2.383	2.186	2.373	2.280	2.636	2.706	2.739	2.734	2.722	2.687
DepthETF	Low5%	12.094	11.792	11.289	10.084	5.900	0.646	5.895	12.142	12.452	12.621	12.741	12.415
DepthADR	Low5%	13.452	13.240	12.843	11.779	14.182	14.215	14.171	14.139	14.153	14.158	14.162	14.144
DepthCEF	Low5%	2.401	2.362	2.291	2.107	2.619	2.691	2.614	2.526	2.526	2.524	2.525	2.526

Table 14. (Continued)

(c) Average Depth of ADR, ETF, and CEF Around the Buys of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthCEF	High5%	5.571	5.797	6.071	6.361	22.433	33.835	20.977	6.831	6.182	5.792	5.583	6.399
DepthADR	High5%	13.094	12.889	12.491	11.392	12.141	10.927	11.630	12.668	12.736	12.720	12.785	13.210
DepthETF	High5%	19.091	18.651	18.124	16.748	17.648	16.029	17.485	19.520	19.751	19.817	19.829	19.844
DepthCEF	Low5%	1.948	1.901	1.818	1.619	0.992	0.206	0.997	1.946	2.001	2.031	2.050	2.002
DepthADR	Low5%	12.607	12.410	12.034	11.037	13.320	13.389	13.326	13.265	13.269	13.270	13.270	13.251
DepthETF	Low5%	16.910	16.650	16.148	14.806	18.014	18.226	18.013	17.784	17.766	17.758	17.757	17.762

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	24.9915	26.8300	29.5427	46.6432	28.3477	26.1945	24.6984
	Low 5%	12.1631	11.3450	10.1635	1.0716	10.2395	11.4202	12.2369
	Difference	12.8284	15.4850	19.3791	45.5716	18.1083	14.7744	12.4616
ETF	High 5%	28.0420	31.3962	36.3866	75.2677	35.6384	30.9743	27.7743
	Low 5%	12.1244	11.3479	10.1919	0.6459	10.1972	11.3538	12.1419
	Difference	15.9176	20.0483	26.1947	74.6218	25.4412	19.6206	15.6324
CEF	High 5%	7.1819	9.1468	12.0005	33.8346	11.3317	8.6959	6.9279
	Low 5%	1.9581	1.8366	1.6536	0.2060	1.6554	1.8370	1.9614
	Difference	5.2239	7.3103	10.3469	33.6286	9.6763	6.8589	4.9664
ADR-ETF	High 5%	-3.0505	-4.5662	-6.8439	-28.6245	-7.2907	-4.7798	-3.0758
	Low 5%	0.0387	-0.0029	-0.0284	0.4257	0.0422	0.0664	0.0950
ETF-CEF	High 5%	20.8601	22.2494	24.3861	41.4330	24.3067	22.2785	20.8464
	Low 5%	10.1663	9.5113	8.5383	0.4399	8.5418	9.5168	10.1804
ADR-CEF	High 5%	17.8096	17.6831	17.5422	12.8085	17.0160	17.4987	17.7706
	Low 5%	10.2050	9.5084	8.5099	0.8656	8.5841	9.5832	10.2754

Panel C: Average Depth Around the Largest v.s. Smallest Sells

(a) Average Depth of ADR, ETF, and CEF Around the Sells of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthADR	High5%	21.661	21.713	21.579	20.691	36.427	44.490	34.791	23.594	22.967	22.586	22.361	22.942
DepthETF	High5%	7.440	7.334	7.151	6.608	7.339	6.865	7.512	7.881	7.965	7.929	7.866	7.814
DepthCEF	High5%	3.276	3.233	3.144	2.820	2.861	2.379	2.847	3.424	3.469	3.460	3.462	3.424
DepthADR	Low5%	11.423	11.123	10.611	9.395	5.331	0.739	5.340	11.338	11.752	11.957	12.092	11.754
DepthETF	Low5%	7.475	7.339	7.087	6.470	7.995	8.188	7.991	7.791	7.799	7.804	7.819	7.835
DepthCEF	Low5%	3.321	3.269	3.168	2.916	3.795	4.040	3.798	3.519	3.507	3.508	3.511	3.511

(b) Average Depth of ADR, ETF, and CEF Around the Sells of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthETF	High5%	15.612	15.804	15.968	15.810	45.905	68.509	44.804	18.010	16.851	16.293	15.802	17.369
DepthADR	High5%	10.266	10.081	9.811	8.982	10.935	10.472	10.635	10.642	10.590	10.538	10.509	10.641
DepthCEF	High5%	2.170	2.159	2.113	1.963	2.056	1.765	2.169	2.451	2.378	2.333	2.312	2.282
DepthETF	Low5%	8.037	7.833	7.495	6.682	3.782	0.218	3.777	8.005	8.217	8.332	8.416	8.226
DepthADR	Low5%	12.820	12.620	12.239	11.220	13.491	13.521	13.496	13.496	13.495	13.500	13.501	13.467
DepthCEF	Low5%	2.881	2.835	2.750	2.522	3.075	3.120	3.076	3.030	3.030	3.032	3.033	3.030

(c) Average Depth of ADR, ETF, and CEF Around the Sells of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
DepthCEF	High5%	6.523	6.717	6.951	7.232	22.421	33.674	21.189	7.216	6.801	6.565	6.433	7.299
DepthADR	High5%	12.476	12.260	11.876	10.926	11.686	10.789	12.102	12.704	12.739	12.847	12.887	12.931
DepthETF	High5%	11.819	11.640	11.262	10.248	10.759	9.935	11.401	12.408	12.366	12.369	12.486	12.384
DepthCEF	Low5%	2.217	2.165	2.073	1.852	1.183	0.306	1.189	2.239	2.295	2.322	2.338	2.283
DepthADR	Low5%	11.157	10.985	10.655	9.773	11.825	11.903	11.821	11.737	11.741	11.742	11.740	11.721
DepthETF	Low5%	11.702	11.515	11.161	10.226	12.411	12.557	12.427	12.286	12.284	12.282	12.282	12.290

(d) Compare Qspreads among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	23.7650	25.6018	28.0759	44.4904	27.0770	24.9237	23.4150
	Low 5%	11.4586	10.6784	9.5183	0.7386	9.5537	10.7338	11.5310
	Difference	12.3065	14.9235	18.5576	43.7518	17.5233	14.1899	11.8839
ETF	High 5%	18.8750	22.1963	27.2278	68.5086	26.4284	21.5488	18.3131
	Low 5%	8.0474	7.5149	6.7183	0.2182	6.7042	7.4873	8.0225
	Difference	10.8276	14.6814	20.5096	68.2904	19.7243	14.0614	10.2907
CEF	High 5%	8.1261	10.0128	12.8445	33.6738	11.6254	9.2439	7.7303
	Low 5%	2.2312	2.1009	1.9027	0.3063	1.9166	2.1132	2.2406
	Difference	5.8949	7.9119	10.9418	33.3676	9.7088	7.1307	5.4897
ADR-ETF	High 5%	4.8901	3.4055	0.8481	-24.0182	0.6485	3.3749	5.1018
	Low 5%	3.4112	3.1635	2.8001	0.5204	2.8495	3.2465	3.5086
ETF-CEF	High 5%	10.7489	12.1835	14.3833	34.8347	14.8030	12.3049	10.5828
	Low 5%	5.8162	5.4140	4.8155	-0.0881	4.7876	5.3741	5.7818
ADR-CEF	High 5%	15.6390	15.5890	15.2314	10.8165	15.4516	15.6798	15.6846
	Low 5%	9.2274	8.5775	7.6156	0.4323	7.6371	8.6206	9.2904

Table 15. Return Volatility Around the Largest versus Smallest Trades by the Triplets (Leading ADR, ETF, and CEF)

This table presents analysis of return volatilities around the largest v.s. smallest buying and selling activity of the three securities leading ADR, ETF, and CEF. For each security, I select the trades with the highest 5% and lowest 5% trading volume. All the trades are time-stamped in 5-minute interval. Return volatility is computed as absolute value of the midquote return. Then I calculate the average return volatilities of the three securities over windows [-k,-1], 0, [1, k], k=1, 5, 10, 15, 20, which presents the average return volatilities just before and after the largest v.s. smallest trades of one security. I also show the average return volatilities over windows [-k, 0], and [0, k], k=5, 10, 20. Panel A presents the average return volatilities of leading ADR, ETF, and CEF around the largest v.s smallest trades of one security. Panel B presents the average return volatilities of leading ADR, ETF, and CEF around the largest v.s smallest buying activities of one security. Panel C presents the average return volatilities of leading ADR, ETF, and CEF around the largest v.s smallest selling activities of one security.

Panel A: Average Return Volatility Around the Largest v.s. Smallest Trades

(a) Average Return Volatility of ADR, ETF, and CEF Around the trades of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatADR	High5%	0.0199	0.0200	0.0203	0.0204	0.0234	0.0257	0.0238	0.0205	0.0200	0.0198	0.0197	0.0200
VolatETF	High5%	0.0067	0.0068	0.0070	0.0074	0.0070	0.0061	0.0071	0.0073	0.0071	0.0069	0.0068	0.0065
VolatCEF	High5%	0.0131	0.0132	0.0133	0.0134	0.0112	0.0095	0.0113	0.0135	0.0134	0.0133	0.0133	0.0131
VolatADR	Low5%	0.0149	0.0148	0.0147	0.0145	0.0127	0.0110	0.0130	0.0155	0.0152	0.0151	0.0152	0.0147
VolatETF	Low5%	0.0066	0.0066	0.0065	0.0065	0.0076	0.0086	0.0076	0.0066	0.0065	0.0065	0.0066	0.0066
VolatCEF	Low5%	0.0125	0.0124	0.0124	0.0124	0.0162	0.0195	0.0160	0.0125	0.0124	0.0124	0.0125	0.0125

(b) Average Return Volatility of ADR, ETF, and CEF Around the trades of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatETF	High5%	0.0118	0.0120	0.0122	0.0127	0.0242	0.0346	0.0238	0.0117	0.0115	0.0114	0.0113	0.0121
VolatADR	High5%	0.0115	0.0115	0.0115	0.0114	0.0105	0.0097	0.0110	0.0117	0.0116	0.0116	0.0115	0.0115
VolatCEF	High5%	0.0135	0.0136	0.0137	0.0139	0.0122	0.0110	0.0125	0.0137	0.0137	0.0135	0.0134	0.0134
VolatETF	Low5%	0.0084	0.0084	0.0083	0.0082	0.0057	0.0033	0.0060	0.0087	0.0086	0.0086	0.0086	0.0083
VolatADR	Low5%	0.0150	0.0150	0.0151	0.0151	0.0161	0.0170	0.0160	0.0151	0.0150	0.0150	0.0150	0.0150
VolatCEF	Low5%	0.0136	0.0135	0.0136	0.0137	0.0151	0.0163	0.0150	0.0144	0.0141	0.0140	0.0139	0.0136

(c) Average Return Volatility of ADR, ETF, and CEF Around the trades of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatCEF	High5%	0.0187	0.0190	0.0197	0.0210	0.0431	0.0622	0.0425	0.0204	0.0195	0.0190	0.0185	0.0196
VolatADR	High5%	0.0163	0.0163	0.0164	0.0167	0.0136	0.0113	0.0146	0.0170	0.0165	0.0163	0.0163	0.0162
VolatETF	High5%	0.0087	0.0088	0.0089	0.0089	0.0080	0.0069	0.0084	0.0093	0.0090	0.0089	0.0088	0.0087
VolatCEF	Low5%	0.0120	0.0119	0.0118	0.0116	0.0069	0.0028	0.0072	0.0121	0.0121	0.0121	0.0122	0.0118
VolatADR	Low5%	0.0158	0.0158	0.0158	0.0158	0.0164	0.0169	0.0162	0.0159	0.0159	0.0159	0.0159	0.0158
VolatETF	Low5%	0.0084	0.0084	0.0083	0.0084	0.0087	0.0091	0.0086	0.0084	0.0084	0.0084	0.0084	0.0084

(d) Compare Volatilitis among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.0202	0.0208	0.0213	0.0257	0.0214	0.0205	0.0200
	Low 5%	0.0147	0.0143	0.0139	0.0110	0.0141	0.0144	0.0146
	Difference	0.0055	0.0064	0.0074	0.0147	0.0073	0.0061	0.0054
ETF	High 5%	0.0129	0.0143	0.0164	0.0346	0.0155	0.0136	0.0124
	Low 5%	0.0082	0.0079	0.0074	0.0033	0.0076	0.0080	0.0082
	Difference	0.0047	0.0064	0.0090	0.0313	0.0079	0.0056	0.0042
CEF	High 5%	0.0207	0.0235	0.0278	0.0622	0.0274	0.0234	0.0206
	Low 5%	0.0115	0.0110	0.0101	0.0028	0.0103	0.0111	0.0116
	Difference	0.0092	0.0126	0.0177	0.0593	0.0171	0.0124	0.0090
ADR-ETF	High 5%	0.0073	0.0065	0.0050	-0.0089	0.0058	0.0069	0.0076
	Low 5%	0.0065	0.0065	0.0066	0.0077	0.0065	0.0064	0.0064
ETF-CEF	High 5%	-0.0078	-0.0093	-0.0115	-0.0276	-0.0119	-0.0098	-0.0082
	Low 5%	-0.0033	-0.0031	-0.0027	0.0005	-0.0027	-0.0031	-0.0033
ADR-CEF	High 5%	-0.0006	-0.0028	-0.0065	-0.0365	-0.0060	-0.0029	-0.0006
	Low 5%	0.0032	0.0034	0.0038	0.0082	0.0038	0.0033	0.0031

Panel B: Average Return Volatility Around the Largest v.s. Smallest Buys

(a) Average Return Volatility of ADR, ETF, and CEF Around the Buys of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatADR	High5%	0.0093	0.0094	0.0096	0.0099	0.0154	0.0200	0.0146	0.0092	0.0092	0.0091	0.0091	0.0095
VolatETF	High5%	0.0032	0.0032	0.0032	0.0033	0.0029	0.0026	0.0031	0.0033	0.0033	0.0033	0.0032	0.0032
VolatCEF	High5%	0.0058	0.0058	0.0058	0.0058	0.0052	0.0047	0.0053	0.0061	0.0060	0.0059	0.0059	0.0058
VolatADR	Low5%	0.0071	0.0071	0.0070	0.0069	0.0036	0.0008	0.0042	0.0074	0.0073	0.0073	0.0073	0.0070
VolatETF	Low5%	0.0034	0.0034	0.0033	0.0033	0.0036	0.0038	0.0036	0.0033	0.0033	0.0033	0.0033	0.0034
VolatCEF	Low5%	0.0053	0.0052	0.0052	0.0052	0.0058	0.0063	0.0058	0.0053	0.0052	0.0052	0.0052	0.0053

(b) Average Return Volatility of ADR, ETF, and CEF Around the Buys of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatETF	High5%	0.0064	0.0066	0.0068	0.0072	0.0186	0.0289	0.0175	0.0061	0.0061	0.0060	0.0060	0.0068
VolatADR	High5%	0.0054	0.0054	0.0054	0.0054	0.0050	0.0046	0.0051	0.0056	0.0055	0.0055	0.0055	0.0054
VolatCEF	High5%	0.0067	0.0067	0.0067	0.0067	0.0061	0.0053	0.0062	0.0068	0.0068	0.0066	0.0066	0.0066
VolatETF	Low5%	0.0043	0.0043	0.0042	0.0041	0.0021	0.0003	0.0024	0.0044	0.0044	0.0044	0.0044	0.0042
VolatADR	Low5%	0.0066	0.0066	0.0066	0.0067	0.0068	0.0069	0.0068	0.0067	0.0067	0.0067	0.0067	0.0066
VolatCEF	Low5%	0.0061	0.0061	0.0061	0.0061	0.0065	0.0068	0.0065	0.0063	0.0062	0.0062	0.0062	0.0061

Table 15. (Continued)

(c) Average Return Volatility of ADR, ETF, and CEF Around the Buys of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatCEF	High5%	0.0091	0.0094	0.0099	0.0110	0.0354	0.0569	0.0327	0.0087	0.0086	0.0085	0.0083	0.0099
VolatADR	High5%	0.0075	0.0075	0.0075	0.0076	0.0064	0.0053	0.0069	0.0078	0.0077	0.0075	0.0075	0.0074
VolatETF	High5%	0.0047	0.0047	0.0048	0.0049	0.0044	0.0039	0.0045	0.0052	0.0049	0.0048	0.0048	0.0047
VolatCEF	Low5%	0.0057	0.0056	0.0056	0.0055	0.0030	0.0008	0.0032	0.0058	0.0057	0.0058	0.0058	0.0056
VolatADR	Low5%	0.0074	0.0074	0.0074	0.0074	0.0075	0.0076	0.0075	0.0074	0.0074	0.0074	0.0074	0.0074
VolatETF	Low5%	0.0043	0.0043	0.0043	0.0043	0.0044	0.0045	0.0044	0.0043	0.0043	0.0043	0.0043	0.0043

(d) Compare Volatilitis among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.0098	0.0105	0.0116	0.0200	0.0110	0.0101	0.0096
	Low 5%	0.0068	0.0065	0.0059	0.0008	0.0061	0.0066	0.0069
	Difference	0.0030	0.0041	0.0057	0.0192	0.0049	0.0036	0.0027
ETF	High 5%	0.0075	0.0088	0.0108	0.0289	0.0099	0.0082	0.0071
	Low 5%	0.0041	0.0039	0.0035	0.0003	0.0037	0.0040	0.0042
	Difference	0.0034	0.0050	0.0073	0.0286	0.0062	0.0042	0.0029
CEF	High 5%	0.0113	0.0141	0.0186	0.0569	0.0167	0.0130	0.0106
	Low 5%	0.0054	0.0052	0.0047	0.0008	0.0049	0.0052	0.0055
	Difference	0.0059	0.0090	0.0139	0.0561	0.0119	0.0078	0.0051
ADR-ETF	High 5%	0.0023	0.0017	0.0008	-0.0088	0.0011	0.0020	0.0025
	Low 5%	0.0027	0.0026	0.0024	0.0005	0.0024	0.0026	0.0027
ETF-CEF	High 5%	-0.0038	-0.0053	-0.0078	-0.0280	-0.0068	-0.0048	-0.0036
	Low 5%	-0.0013	-0.0013	-0.0012	-0.0005	-0.0012	-0.0013	-0.0013
ADR-CEF	High 5%	-0.0015	-0.0036	-0.0070	-0.0369	-0.0057	-0.0029	-0.0010
	Low 5%	0.0014	0.0013	0.0012	0.0001	0.0012	0.0013	0.0014

Panel C: Average Return Volatility Around the Largest v.s. Smallest Sells

(a) Average Return Volatility of ADR, ETF, and CEF Around the Sells of ADR

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatADR	High5%	0.0103	0.0104	0.0106	0.0110	0.0177	0.0234	0.0169	0.0104	0.0103	0.0101	0.0100	0.0105
VolatETF	High5%	0.0032	0.0032	0.0035	0.0039	0.0051	0.0042	0.0047	0.0043	0.0039	0.0037	0.0035	0.0031
VolatCEF	High5%	0.0066	0.0066	0.0066	0.0066	0.0056	0.0048	0.0056	0.0067	0.0067	0.0067	0.0067	0.0066
VolatADR	Low5%	0.0067	0.0067	0.0066	0.0064	0.0033	0.0005	0.0037	0.0067	0.0067	0.0068	0.0068	0.0066
VolatETF	Low5%	0.0030	0.0030	0.0030	0.0030	0.0031	0.0033	0.0031	0.0030	0.0030	0.0030	0.0030	0.0030
VolatCEF	Low5%	0.0059	0.0059	0.0059	0.0059	0.0064	0.0069	0.0064	0.0059	0.0059	0.0059	0.0059	0.0059

(b) Average Return Volatility of ADR, ETF, and CEF Around the Sells of ETF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatETF	High5%	0.0060	0.0061	0.0063	0.0067	0.0209	0.0336	0.0198	0.0059	0.0057	0.0056	0.0056	0.0064
VolatADR	High5%	0.0056	0.0055	0.0055	0.0055	0.0051	0.0049	0.0056	0.0059	0.0058	0.0057	0.0057	0.0056
VolatCEF	High5%	0.0065	0.0066	0.0066	0.0067	0.0061	0.0055	0.0061	0.0067	0.0068	0.0066	0.0065	0.0065
VolatETF	Low5%	0.0037	0.0037	0.0037	0.0036	0.0017	0.0001	0.0019	0.0038	0.0038	0.0038	0.0038	0.0036
VolatADR	Low5%	0.0066	0.0066	0.0066	0.0066	0.0067	0.0069	0.0067	0.0066	0.0066	0.0066	0.0066	0.0066
VolatCEF	Low5%	0.0063	0.0063	0.0063	0.0063	0.0066	0.0068	0.0066	0.0067	0.0065	0.0065	0.0065	0.0063

(c) Average Return Volatility of ADR, ETF, and CEF Around the Sells of CEF

Variable		[-20,-1]	[-15,-1]	[-10,-1]	[-5,-1]	[-1,0]	0	[0,1]	[1,5]	[1,10]	[1.15]	[1,20]	[-20,20]
VolatCEF	High5%	0.0107	0.0111	0.0117	0.0133	0.0400	0.0641	0.0376	0.0110	0.0107	0.0104	0.0102	0.0117
VolatADR	High5%	0.0077	0.0077	0.0077	0.0078	0.0063	0.0055	0.0068	0.0078	0.0076	0.0075	0.0076	0.0076
VolatETF	High5%	0.0039	0.0039	0.0040	0.0039	0.0036	0.0032	0.0039	0.0042	0.0041	0.0041	0.0040	0.0040
VolatCEF	Low5%	0.0059	0.0058	0.0058	0.0057	0.0030	0.0006	0.0033	0.0060	0.0060	0.0060	0.0060	0.0057
VolatADR	Low5%	0.0072	0.0072	0.0072	0.0072	0.0073	0.0074	0.0073	0.0072	0.0072	0.0072	0.0072	0.0072
VolatETF	Low5%	0.0038	0.0038	0.0038	0.0037	0.0038	0.0039	0.0038	0.0037	0.0037	0.0037	0.0038	0.0038

(d) Compare Volatilitis among ADR, ETF, and CEF aroung the largest and smallest trades

Price		K=-20	-10	-5	0	5	10	20
ADR	High 5%	0.0109	0.0118	0.0130	0.0234	0.0126	0.0115	0.0107
	Low 5%	0.0064	0.0060	0.0055	0.0005	0.0056	0.0061	0.0065
	Difference	0.0045	0.0057	0.0076	0.0229	0.0070	0.0053	0.0042
ETF	High 5%	0.0073	0.0088	0.0112	0.0336	0.0105	0.0083	0.0069
	Low 5%	0.0036	0.0033	0.0030	0.0001	0.0031	0.0034	0.0036
	Difference	0.0037	0.0054	0.0082	0.0335	0.0074	0.0049	0.0033
CEF	High 5%	0.0133	0.0164	0.0217	0.0641	0.0198	0.0155	0.0128
	Low 5%	0.0056	0.0053	0.0048	0.0006	0.0050	0.0054	0.0056
	Difference	0.0076	0.0111	0.0169	0.0635	0.0149	0.0101	0.0072
ADR-ETF	High 5%	0.0036	0.0030	0.0019	-0.0102	0.0021	0.0032	0.0038
	Low 5%	0.0029	0.0027	0.0025	0.0004	0.0025	0.0027	0.0029
ETF-CEF	High 5%	-0.0060	-0.0077	-0.0106	-0.0305	-0.0094	-0.0073	-0.0059
	Low 5%	-0.0021	-0.0020	-0.0018	-0.0005	-0.0019	-0.0020	-0.0021
ADR-CEF	High 5%	-0.0023	-0.0047	-0.0087	-0.0407	-0.0073	-0.0041	-0.0021
	Low 5%	0.0008	0.0007	0.0006	-0.0001	0.0006	0.0007	0.0008

Figure 1. Impulse Response of Order flow and returns to shock of innovations

This Figure presents the Impulse Response of Order flow and returns to shock of innovations. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Figure 1a-1f show the Impulse Response of Order flow and Returns to shock of innovations when the shocks are from OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF.

Figure 1a. Impulse Response of Order flow and returns to shock of ADR Order flow

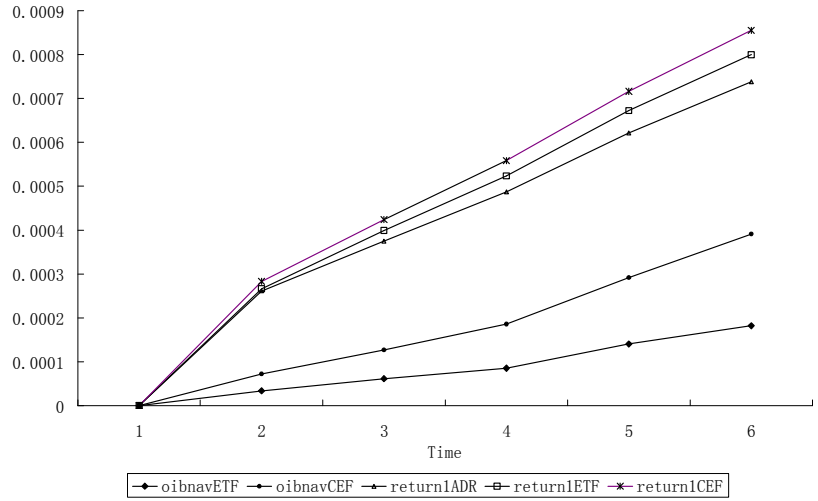

Figure 1b. Impulse Response of Order flow and returns to shock of ETF Order flow

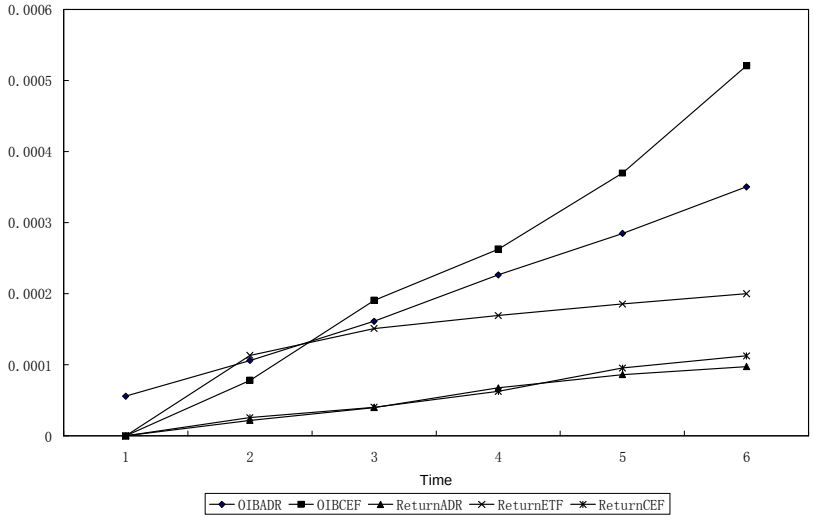

Figure 1c. Impulse Response of Order flow and returns to shock of CEF Order flow

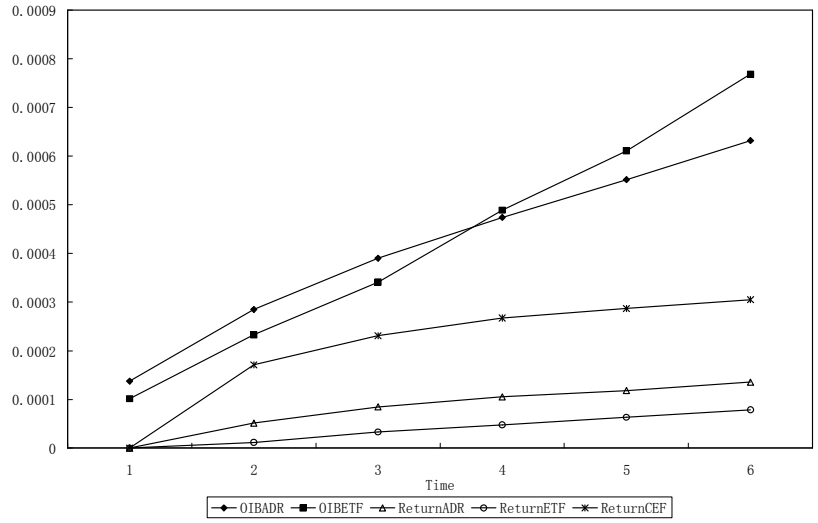

Figure 1d. Impulse Response of Order flow and returns to shock of Return ADR

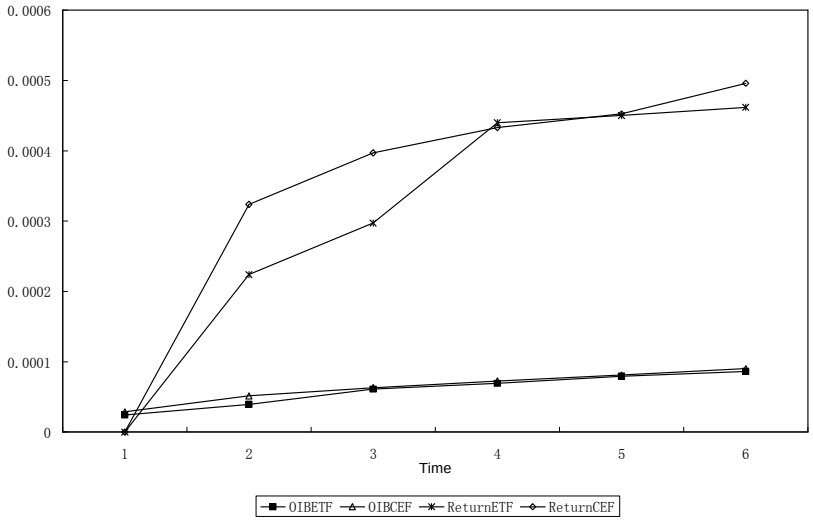

Figure 1. (Continued)

This Figure presents the Impulse Response of Order flow and returns to shock of innovations. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_t can be expressed in terms of current and lagged innovations: $Y_t=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_t=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Figure 1a-1f show the Impulse Response of Order flow and Returns to shock of innovations when the shocks are from OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF.

Figure 1e. Impulse Response of Order flow and returns to shock of Return ETF

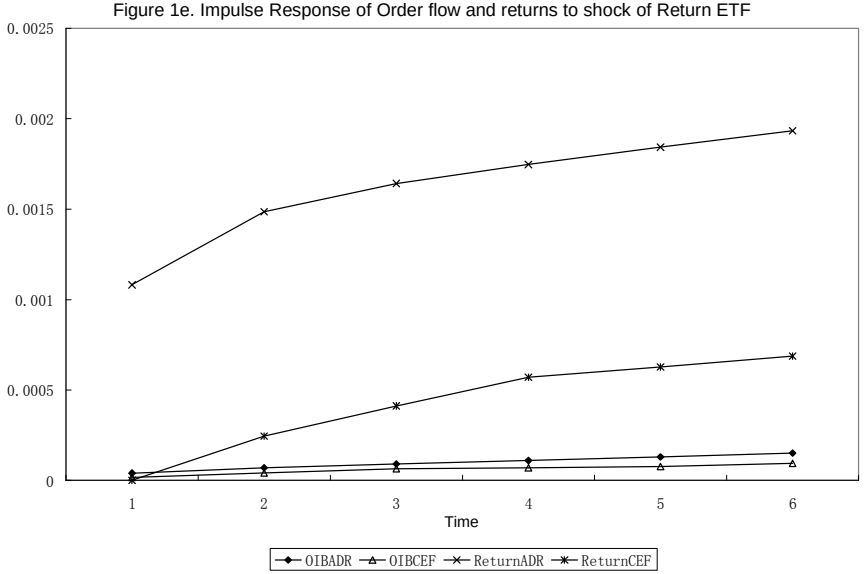

Figure 1f. Impulse Response of Order flow and returns to shock of Return CEF

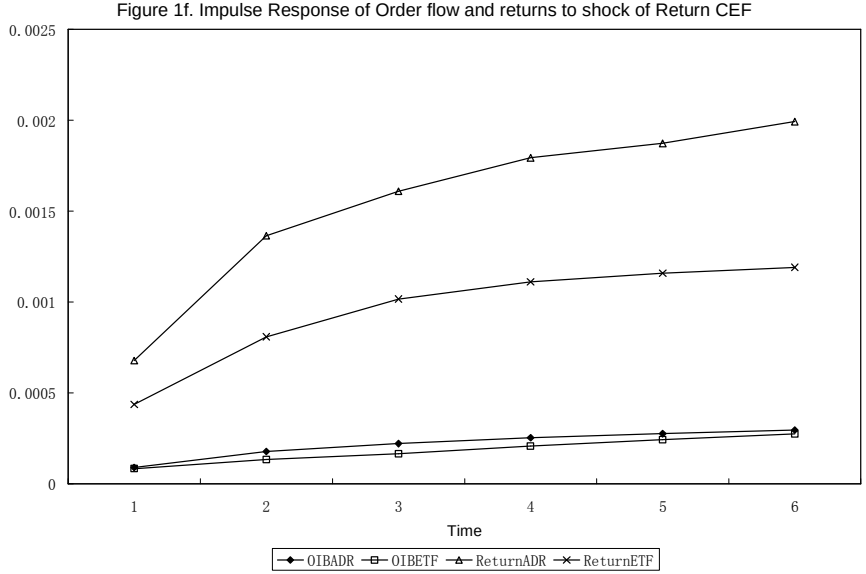

Figure 2. Forecasting the Order flow and returns of ADR, ETF, and CEF

This Figure presents the forecast of Order flow and returns of ADR, ETF, and CEF. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_{t+1} can be expressed in terms of current and lagged innovations: $Y_{t+1}=A_0+\sum A_j Y_{t-j+1}+u_t$, where $Y_{t+1}=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Figure 2a-2f forecast the Order flow and Returns of OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF.

Figure 2a. Forecast the Order Imbalance of ADR

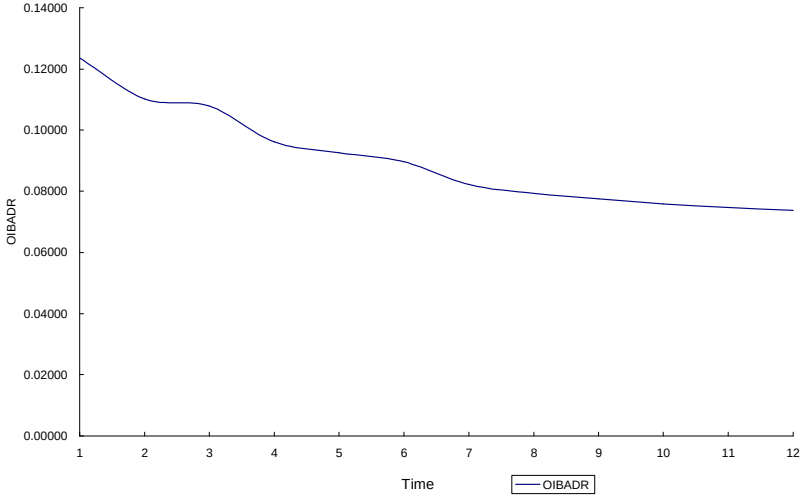

Figure 2b. Forecast the Order Imbalance of ETF

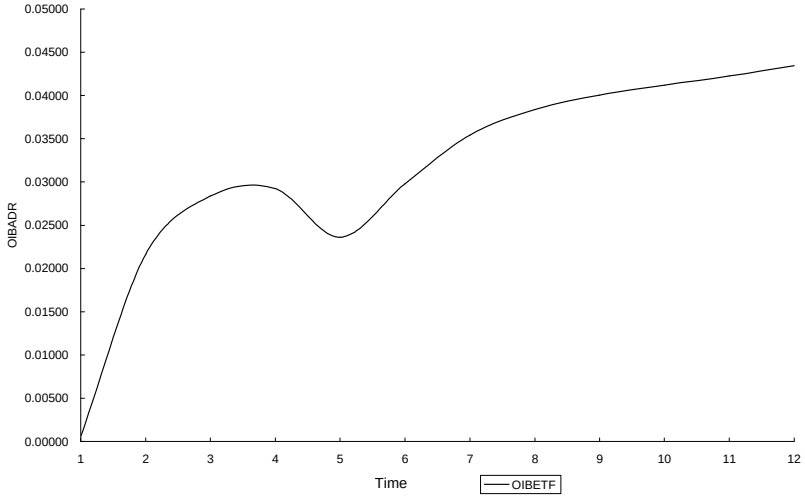

Figure 2c. Forecast the Order Imbalance of CEF

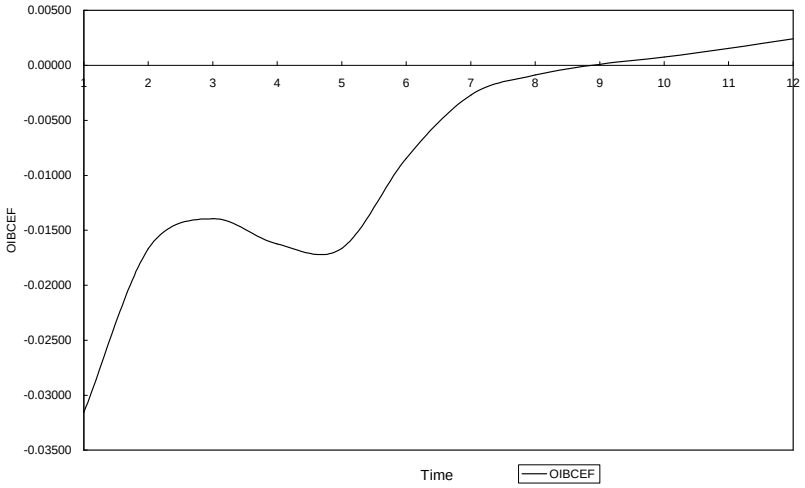

Figure 2d. Forecast the Return of ADR

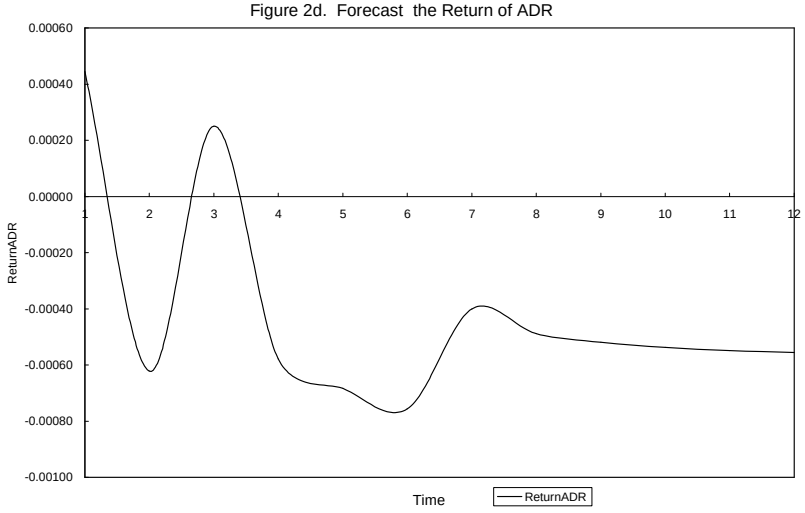

Figure 2. (Continued)

This Figure presents the forecast of Order flow and returns of ADR, ETF, and CEF. I define the price-setting buys and sells by using the algorithm developed by Lee and Ready (1991). For each 5 minute interval for all the three securities across the countries, I compute "price-setting" order imbalances by security type by subtracting the price-setting sell volume from the price-setting buy volume, and then normalizing by the stock's average 5-minute price-setting volume over the sample period. Vector Y_{t+1} can be expressed in terms of current and lagged innovations: $Y_{t+1}=A_t+\sum A_j Y_{t-j}+u_t$, where $Y_{t+1}=\{OIB_t^1, OIB_t^2, OIB_t^3, R_t^1, R_t^2, R_t^3\}$ represents net order imbalances and returns of the leading ADR, ETF, and CEF respectively. The lag length is chosen as k=6 by Akaike and Schwartz-Bayes criteria. Figure 2a-2f forecast the Order flow and Returns of OIBADR, OIBETF, OIBCEF, ReturnADR, ReturnETF, and ReturnCEF.

Figure 2e. Forecast the Return of ETF

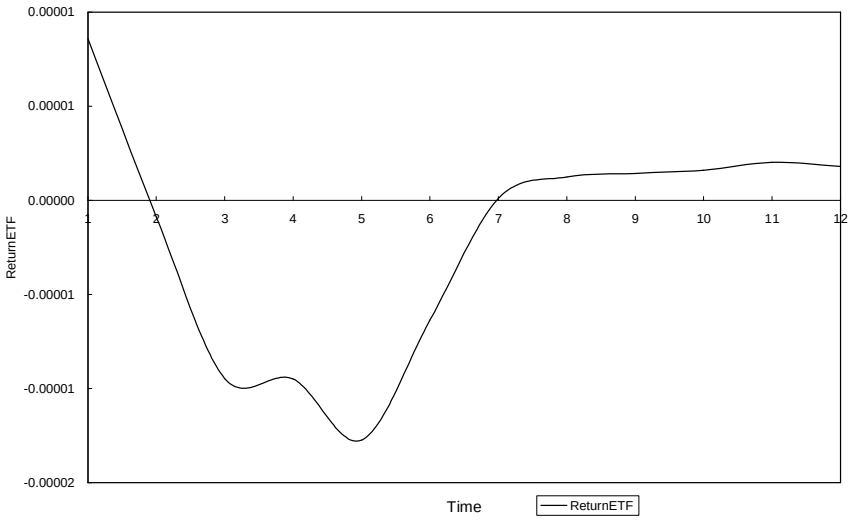

Figure 2f. Forecast the Return of CEF