

# Exchange Trading Rules, Governance, and Trading Location of Cross-Listed Stocks\*

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## Abstract

This paper shows stock exchange trading rules are of central importance for the trading location of cross-listed stocks. We consider various measures of sovereign governance and shareholder rights across countries to assess other legal and institutional drivers of trading activity. The data indicate that the proportion of trades that occurs on an exchange increases at a decreasing rate with the number of stock exchange trading rules. The effectiveness of stock exchange rules increases with the strength of regulatory institutions. Further, recent trading rule regulatory reforms pertaining to MIFID and RegNMS affect trading location.

**Keywords:** cross-listing, governance, trading rules, law and finance

**JEL Codes:** G15, G38, K22

# 1 Introduction

This paper analyzes the role of sovereign governance and stock exchange rules in determining the location of trade for cross-listed stocks. Stock exchanges invest considerable resources and money on technology, regulation and manpower to promote market efficiency and integrity<sup>1</sup>. Exchanges that are based in jurisdictions with superior regulation and surveillance enjoy the benefit of more active trading (Cumming and Johan, 2008; Cumming, Johan and Li, 2011). For firms resident in jurisdictions that have inferior regulation or enforcement, there is a benefit to cross-listing in the U.S. to spur on trading activity (Halling et al., 2008; Gagnon and Karolyi, 2009). But despite the central role of trading rules governing the ways in which trades can take place on an exchange, there has been a comparative dearth of attention paid to how exchanges can structure securities laws in order to promote liquidity on their own exchange, particularly for cross-listed stocks.

This paper analyzes the reasons underlying the location of trading for firms that cross-list in the U.S. Non-U.S. companies might issue shares in the U.S. in order to obtain a 'liquidity' benefit by gaining access to U.S. markets. We examine how rules, regulations, and governance in non-U.S. markets influence the trading location of non-U.S. firms issuing stock both at home and in the U.S. We show that the proportion of non-US volume to US volume increases with sovereign regulatory strength, and increases with the strength of stock exchange rules (albeit at a decreasing rate). The impact of stock exchange rules increases with the strength of regulatory institutions. We also show that recent regulatory changes, such as MIFID, have influenced the location of trade for non-US stocks that cross-list in the US.

Sovereign governance and/or regulation should influence the location of trade for non-US stocks that cross-list in the US. The amount of non-US volume should increase with the non-US country's regulatory strength. This is because stronger regulatory institutions imply stronger law enforcement and lower corruption. This creates confidence in the equity market and should promote trade.

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<sup>1</sup> See: (Bhattacharya and Daouk, 2002, 2009; Daouk et al., 2006; Jackson and Roe, 2008; La Porta et al., 2006; Merrick et al., 2005; Ni et al., 2005; O'Hara and Mandiola, 2003; Peng and Röell, 2009; Pagano et al., 2001, 2002; Pirong, 1993, 1995a,b, 1999, 2004; Röell, 1992)

Trading rules should affect the extent of trading for cross-listed stocks. Trading rules include restrictions on insider trading, market manipulation, and front running.<sup>2</sup> The policy underlying trading rules is that they increase the integrity of market prices, which gives investors confidence to rely on market prices and encourages trade.<sup>3</sup> Thus, prior studies show a clear relationship between rules and trading behavior.<sup>4</sup> However, compliance can be costly, and excessively stringent rules might deter some brokers from operating in some markets (especially in regions where there are multiple stock exchanges). Further, we expect that the impact of trading rules will increase with the strength of the country's regulatory institutions, as strong rules that are not enforced are ineffective, and may be counter-productive (Bhattacharya and Daouk, 2009).

We test these predictions using a sample of non-US stocks that cross-list in the US and by examining the implementation of MIFID as a natural experiment. Our sample comprises non-U.S. firms listed on a U.S. exchange between 1996 and 2008. Our governance proxies are the World Bank governance indices, the ICRG composite index, the S&P sovereign risk ratings, and the Spamann (2010) index. Our exchange rules variables derive from Cumming et al. (Cumming et al., 2011). We also examine the implementation of MIFID. MIFID is an attempt to harmonize and strengthen stock exchange rules in Europe. It is contemporaneous with Reg NMS in the US. MIFID has different rules from Reg NMS and has received criticism for being too stringent and/or vague in parts.<sup>5</sup>

The results show the ratio of non-US volume to US-volume for cross-listed stocks increases with sovereign regulatory strength and stock exchange rules (but at a decreasing rate). The impact of exchange rules increases with the strength of regulatory institutions. Further, trade appears to have shifted out of Europe following the implementation of MIFID in November 2008, consistent with the prediction that MIFID has not been wholly effective in promoting trade in Europe. Our

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<sup>2</sup> Cumming, Johan and Li (2011) show that trading rules comprise rules respecting insider trading, price manipulation, volume manipulation, spoofing, false disclosure and broker-agency conflicts.

<sup>3</sup> This underlies the 'fraud on the market' doctrine, which aims to deter people from issuing false statements that manipulate stock prices (Coffee, 2005; Fox, 2005; Coffee, 2006; Fox, 2006; Humphery-Jenner, 2011) .

<sup>4</sup> Prior studies suggest that trading rules influence trading behavior and drive stock market development (La Porta et al., 1998, 2006; Jackson and Roe, 2009). For example, prior studies show that markets with stronger insider trading laws are more liquid (Beny, 2005) and have less private informed trading (Durnev and Nain, 2007). Further, stronger securities laws reduce a firm's cost of capital (Lambert et al., 2007; Daske et al., 2008; Hail and Leuz, 2009). This has induced calls for tougher securities regulations (e.g. Merrick et al., 2005), and highlights why markets have expended considerable resources to improve market efficiency and limit market misconduct (Aitken and Siow, 2003; Comerton-Forde and Rydge, 2006).

<sup>5</sup> We describe MIFID and Reg NMS in Section 2.

results are also robust to controlling for firm-specific, and country-specific factors, and for controlling for factors such as the information share of the US-market relative to the non-US market.

Our main contributions are four-fold. First, we highlight the importance of sovereign governance as a determinant of the location of trade. Second, we show that stock exchange rules influence the location of trade, although excessively stringent laws can deter trade. Third, we show the joint importance of rules and regulatory institutions. Fourth, we highlight the impact of MIFID and provide insights into its effectiveness. These results are important to exchanges, regulators, and governments that might want to increase the amount of volume in the home market. They results can indicate to companies the desirability of listing abroad, and are important to traders who might want to identify the most liquid market in which to trade a stock.

Our paper is related to a number of other important papers in the literature. First, the paper is related to prior work showing the importance of regulation to economic development (for example La Porta et al., 1997, 1998). Second, the paper is related to other literature showing the importance of stock exchange rules for market integrity (Cumming and Johan, 2008) and liquidity (Cumming et al., 2011). Third, this paper tangentially relates to the bonding literature.<sup>6</sup> Non-U.S. companies sometimes list in the U.S. in order to ameliorate the effects of market segmentation and to increase liquidity (Miller, 1999; Foerster and Karolyi, 2000). This effect should work best if the U.S. market is more attractive to investors than is the non-U.S. market. That is, the benefits of bonding might be greatest if governance in the home market is the weakest.<sup>7</sup> Fourth, Halling et al. (2008) analyze the location of trade for stocks that cross-list in the U.S. They find that some firm level characteristics determine the location of trade for stocks from developed markets but not for stocks from emerging markets. The results suggest that a further analysis of the impact of exchange rules and governance might be necessary to examine some additional drivers of the location of trade. They also highlight the desirability of determining whether particular regulatory changes, such as those due to MIFID, have been effective.

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<sup>6</sup> The bonding literature is outside the scope of this article; however, it has received considerable support in the literature (Reese and Weisbach, 2002; Doidge et al., 2004, 2009a, 2009b) .

<sup>7</sup> This follows the discussion in numerous prior studies (Reese and Weisbach, 2002; Doidge et al., 2004; Hail and Leuz, 2009) .

The balance of the paper proceeds as follows. Section 2 outlines the hypotheses. Section 3 indicates the methods and sample. Section 4 contains the empirical results, and Section 5 concludes.

## 2 Hypotheses

In this section we develop three main hypotheses that are tested in the paper. The first hypothesis relates to country-level governance and risk. The second hypothesis relates to stock exchange rules. The third hypothesis examines MIFID in order to highlight the use of a natural experiment to test the impact of stock exchange rules. In all cases, our focus is on the ratio of volume in the Non-U.S. market ('Non-U.S.-Trade') to the volume in the U.S. market ('US-Trade').

### 2.1 *Home country governance*

We hypothesize that the ratio of Non-U.S.-Trade to U.S.-Trade should monotonically increase with the strength of the Non-U.S. country's legal regulation and governance. Here, regulation and governance refers to factors such as government stability, regulatory efficacy, the presence of the rule of law, and the presence of corruption. These factors do not impose a direct cost on traders or on brokers but do generate positive externalities by increasing confidence in the law.

Some literature indicates that country-level governance should improve market development. La Porta, Lopez-de-Silanes and Shleifer (1997, 2008) show that stock market development increases with regulation and governance. Halling et al. (2008) find a positive relationship between investor protection and the ratio of Non-U.S.-Trade to U.S.-Trade.<sup>8</sup> McCahery, Sautner, and Starks (2010) use survey data to show that institutional investors consider sovereign governance when making investment decisions. Further, the bonding literature, which is non-core to this paper, suggests that companies from weak governance environments benefit the most when they list in the US (Reese and Weisbach, 2002; Doidge et al., 2004; Hail and Leuz, 2009). This implies that weak governance environments are unattractive to investors; and thus, that weak

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<sup>8</sup> Technically, their Table 4 uses a 'low investor protection' dummy and they find a negative relationship between 'low investor protection' and Non-U.S.-Trade/U.S.-Trade.

governments should reduce the proportion of trade that concentrates in the non-US market. Overall this induces the following hypothesis:

**Hypothesis 1:** The ratio of Non-U.S.-Trade to U.S.-Trade should increase with the regulatory and governance strength of the Non-U.S. market.

## ***2.2 Exchange trading rules***

There should be a quadratic relationship between (a) stock exchange rules and (b) the proportion of trade in the U.S. market. We focus on ‘investor protection’ type rules rather than ‘market mechanism’ rules. We analyze rules on insider trading, price manipulation, volume manipulation, spoofing, broker-agency conflicts, and false disclosure.

The proportion of trade in the Non-U.S. market should initially increase with the strength of stock exchange rules. Brockman and Chung (2003) examine changes in the rules on the Hong Kong stock exchange. They find that stronger rules improve the liquidity of individual stocks. Hail and Luez (2006) show that strong exchange rules reduce a firm’s cost of capital. La Porta, Lopez-de-Silanes, and Shleifer (2006) show that disclosure rules backed by the threat of liability through private enforcement improve stock market development. Supporting this, Cumming, Johan, and Li (2011) show that an exchange’s liquidity increases with the strength of its trading rules. These studies do not examine the location of trade; however, they do imply that strong rules should increase the amount of trade in the Non-U.S. market.

The relationship between Non-U.S.-Trade/US-Trade should be quadratic. There is some tangential literature on point. Burkart, Gromb, and Panunzi (1997) and Boot, Gopalan and Thakor (2006) show that the costs associated with high levels of disclosure and governance may deter managers from pursuing profitable investment opportunities. Bruno and Claessens (2010) indicate that strong governance companies in legally stringent countries trade at a discount to strong governance companies in legally ‘flexible’ countries. These studies show that requiring ‘too much’ compliance can reduce firm values. By parity of reasoning, requiring too much compliance and disclosure might deter brokerage firms from trading in a particular environment. Thus, there

should be a quadratic relationship between the strength of the stock-exchange rules and the ratio of Non-U.S.-Trade to U.S.-Trade. This induces the following hypothesis.

**Hypothesis 2:** The relationship between exchange rules and the ratio of Non-U.S.-Trade to U.S.-Trade should be quadratic.

We also expect that strong exchange rules are effective only if the regulatory institutions are strong. The intuitive rationale is that if regulatory institutions are weak, then there is inadequate enforcement of securities laws. Bhattacharya and Daouk (2009) support this, concluding that no law can be superior to a good law that is not enforced. For example, Humphery-Jenner (2011) argues that securities malfeasance is prolific in China because securities laws are not enforced rather than because the law is bad. Subsequently, we expect the ratio of non-US volume to US volume to increase with the interaction of 'Rules' and 'Regulation'. The following hypothesis captures this.

**Hypothesis 3:** The ratio of non-US volume to US\_volume should increase with the interaction of 'Rules' and 'Regulation'.

## **2.3 MIFID**

The hypothesis is that MIFID discouraged trade in the Non-U.S. exchange and shifted trade to the U.S. exchange. The European Union (EU) promulgated the Directive on Markets in Financial Instruments (MIFID) in May 2005. The implementation deadline was November 2007. MIFID is one part of the EU's attempt to implement the Lamfalussy Report. The Lamfalussy Report (broadly) states that the EU should create an integrated economic market (Committee of Wise Men, 2001). Thus, one aim of the Lamfalussy-reforms is to create "a stronger, deeper, pan-European capital market" (Prodi, 2002).

MIFID has several relevant traits. First, it harmonizes laws in six areas: insider trading, price manipulation, volume manipulation, spoofing, false disclosure, and broker-agency conflicts (Cumming et al., 2011). Second, it attempts to strengthen pre-trade and post-trade disclosure obligations. Third, Article 21 imposes a best-execution obligation on firms to "take all reasonable



steps to obtain, when executing orders, the best possible result for their clients, taking into account price, costs, speed, likelihood of execution and settlement, size, nature”.

There is some evidence that the MIFID reforms have increased liquidity. Cumming, Johan, and Li (2011) use a difference in difference (DD) model to show that MIFID increased liquidity in the EU. However, most firms listed in the EU do not have U.S. listings. Thus, they do not analyze whether investors prefer the EU if they have the choice to also invest in a company that also lists in the U.S.

There are several reasons why MIFID might shift trade from EU-markets to U.S.-markets. The over-arching theme is that the EU may have lost its competitive advantage (of having relatively strong companies in relatively weakly regulated markets) by increasing compliance costs without providing an off-setting benefit.

First, the increase in disclosure might discourage brokerage firms from advising clients to invest in the EU. Table 1 of Annex 1 in MIFID contains the disclosure requirements. The requirements appear comparable to those in other developed markets. However, (a) they are more onerous than the previous regulations, and (b) there is no unified reporting system or effective way to consolidate information (Giraud, 2009). Therefore, they may have increased the cost of operating in the EU without yielding a tangible benefit to brokers. This may shift trade to markets that have similar disclosure costs but that have more tangible disclosure-related benefits.

Second, MIFID’s provisions are vague. Vagueness can be beneficial if it makes the law more flexible and adaptive to contemporary circumstances (Graham, 2002; Humphery-Jenner, 2009). However, uncertainty can impose transaction costs by creating legal uncertainty (Wagner, 2005, 2007). This legal uncertainty can deter people from undertaking particular actions (following Craswell and Calfee, 1986).

The best execution provisions in Article 21 highlight the problem of uncertainty. Here, firms must “take all reasonable steps...to obtain the best possible result for their clients...” (Article 21) is vague. Two key sources of vagueness are the definition of ‘reasonable steps’ and the definition of ‘best possible result’. It is unclear what constitutes a reasonable step in this context.<sup>9</sup> Further, while

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<sup>9</sup> A ‘reasonableness’ standard is common in law. However, its definition depends on the context in which it appears. Given that MIFID is unique in its cross-border regulation of financial markets, there is no

Article 21 does list factors the firm must consider when determining the ‘best possible result’ it does not indicate how firms should weight these factors, whether they should obtain information about the client’s preferences, or whether they should use an arbitrary ex ante prediction of what a ‘reasonable’ client might deem best.

The implementation of MIFID in the EU was contemporaneous with the implementation of Reg NMS in the US. Under Reg NMS price alone matters for best execution duty, while under MIFID investment firms must comply with best execution duty by looking at a wide array of execution characteristics such as speed, and likelihood of execution and settlement. Reg NMS and MIFID also differ in terms of the trading data disclosure of trades’ execution information. Reg NMS requires both markets and intermediaries to regularly disclose standardized information about the execution quality, and trading information is consolidated and available on a free market (Petrella, 2010). By contrast. MIFID does not require markets and intermediaries to consolidate trading information or trading venues, or to disclose execution quality (although MIFID still enables businesses to offer services that aggregate data from different trading venues). Petrella (2010) argues that MiFID was comparatively ineffective at reducing fragmentation. Aitken et al (2011) suggest that there was some post-MiFID reduction in market fragmentation, but fee reductions on Chi-X undermined this. By contrast, Harris et al (2011) indicate an increase in cointegration in the US following the introduction of Reg NMS.

The costs associated with complying with MIFID and the relative disadvantages to Reg NMS coupled with the uncertainty surrounding its implementation suggest that institutions will reduce trade in the EU. This implies the following hypothesis:

**Hypothesis 4:** MIFID reduces the proportion of trade that occurs in markets subject to MIFID obligations.

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comparable Common Law or Statute Law from which to obtain the definition of ‘reasonableness’ in this context.

## 3 Methods and Sample

### 3.1 Sample

Our sample comprises non-U.S. firms listed on a U.S. exchange between 1996 and 2008. There are 458 unique firms for a total of 3128 firm-year observations. The return and volume data comes from CRSP (for US data) and Compustat Global (for non-US data). Firm-level accounting data comes from Compustat. Data on country-governance comes from the World Bank governance indicators, International Country Risk Guide's (ICRG) composite risk ratings, Standard & Poors sovereign risk ratings, and Spamann's (2010) revised Antidirector Rights Index (ADRI). The World Bank does not report data for 1997, 1999, and 2001. For these years, we backfill data from the previous year (consistent with the approach in Gompers, Ishii, and Metrick, 2003; Masulis, Wang, and Xie, 2007; Bebchuk, Cohen, and Ferrell, 2008). The sample excludes firms that lack the required CRSP data, or Compustat company-level data.<sup>10</sup>

The variables come in four main categories: (1) dependent variables for volume, (2) governance variables, (3) trading rules variables, and (4) control variables. Table 1 provides definitions of all the variables used. The following sub-sections provide a detailed description.

--Table 1 About Here --

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<sup>10</sup> We also obtain some additional data for robustness tests (detailed in Section 4.3); however, most of these additional variables are country-level variables, which are captured through the inclusion of stock exchange and year dummies and are statistically insignificant in models that include stock dummies.

We also examine additional variables in the tests reported in Section 4.3. These explore factors including transactions costs, the correlation of the firm's stock returns with the US market and the non-US market, emerging market dummies, exchange rate liberalization, and short sale restrictions.

### ***3.2 Dependent Variables***

The dependent variable is a measure of the ratio of non-U.S. trading volume to U.S.-trading volume. We do this by examining the U.S.-dollar volume trade that occurs in the non-U.S. market divided by the U.S.-dollar volume trade that occurs in the U.S. market. The computation process is as follows: (1) for each stock and each day obtain the number of shares traded in the U.S. market and the non-U.S. market. (2) For the U.S. market, multiply the number of shares traded by the share price to obtain  $\$Volume_{i,t}^{US}$ . (3) For the non-U.S. market, multiply the non-U.S. share price on day  $t$  by the exchange rate for day  $t$  by the number of shares traded in the non-U.S. market on day  $t$  to obtain  $\$Volume_{i,t}^{Non-US}$ . (4) Compute the natural log of the ratio of non-US volume to US volume, denoted  $\ln(\$Volume\ Ratio + 1)$ . (5) Compute the average ratio over the course of the year because the control and governance variables are measured yearly.

### ***3.3 Key Independent Variables: The Regulation Variables***

The regulation variables are the key independent variables. We examine several sets of regulation, exchange rule, and governance variables.

**Exchange Rules:** We expect that volume in the non-U.S. market has a quadratic relationship with the strength of the non-U.S. market's exchange rules. The exchange rule variables come from Cumming et al. (2011). They analyze the rules of stock exchanges across seven dimensions: price manipulation, volume manipulation, spoofing, false disclosure, market manipulation, insider trading, and broker-agent conflict rules. For each dimension, they assign a score representing the strength of the exchange's investor protection. We use (a) the score reported in Cumming, Johan, and Li (2011), (b) an equally weighted index (the Rule Index) of scores across the seven rule-dimensions, and (c) the squared exchange rule score or exchange rule index. At the time of earlier directives such as the 2004 Market Abuse Directive (MAD) in 2004, there were not associated efforts for surveillance (Cumming and Johan, 2008; Cumming, Johan and Li, 2011). Hence, as in Cumming, Johan and Li (2011), we use rule measures that are time-varying with the implementation of surveillance and enforcement mechanisms alongside the introduction of MIFID in November 2007.

**MIFID:** We analyze the effects of MIFID by using a difference-in-difference (DD) method. We create an indicator,  $I(\text{MIFID})$ , that equals one if the exchange comes under MIFID. We also analyze the date of the promulgation of MIFID (i.e. 2005) and the date of the implementation of MIFID (i.e. November 2007). We analyze the promulgation date separately (from the implementation date) in order to observe whether volume shifted from the MIFID-affected exchanges in anticipation of the implementation.

**ICRG risk scores:** The ICRG reports scores for various types of sovereign risk. The ICRG scores have seen some use in the literature (Erb et al., 1996; Gradstein, 2007; Boubakri et al., 2008). A higher score indicates a less risky country. We use the composite ICRG risk scores encapsulating economic, political, and financial risks. The ICRG reports a score for each month and we compute an annual ICRG score as the equally weighted monthly ICRG risk score.

**World Bank regulation and governance scores:** The World Bank ranks countries on six dimensions of governance. The World Bank measures and ranks the government's accountability, corruption, government effectiveness, political stability, regulatory effectiveness, and the rule of law.<sup>11</sup> The details of the construction of these measures are in Kaufmann et al. (2009). We compute an equally weighted average rank, which we denote the 'WB Governance Index'. Here, regulation and governance refers to factors such as government stability, regulatory efficacy, the presence of the rule of law, and the presence of corruption. These factors do not impose a direct cost on traders or on brokers but do generate positive externalities by increasing confidence in the law.

**S&P sovereign risk rating:** Standard & Poors report a sovereign credit risk score. High levels of credit risk may connote financial and political instability. Subsequently, Kaminsky and Schmukler (2002) show that sovereign credit ratings influence stock markets in emerging economies. We take the average sovereign credit rating across the year.

### ***3.4 Control Variables***

#### **3.4.1 Firm Level Variables**

**Assets:** Larger non-U.S firms are likely to be more attractive to U.S. investors than are smaller non-U.S. firms. The most likely explanation is that of all non-U.S. firms, large firms have the least information risk for U.S. investors. This is because (1) large firms tend to attract more analysts, and

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<sup>11</sup> These variables have received some prior use in the literature (Neumayer, 2002; Dollar and Kraay, 2003; Apodaca, 2004; Braun and Di Tella, 2004; Thomas, 2010) .

the proximity to analysts improves the availability of information ; (2) large firms are more likely to be 'familiar' in nature to U.S. firms, and familiarity can increase returns (following Sarkissian and Schill, 2004); and (3) large firms are more likely to have the resources to properly over-come language barriers that would otherwise suppress returns (as in Grinblatt and Keloharju, 1999; Hau, 2001). Therefore, we expect a negative relation between assets and the \$volume ratio. Therefore, the models include the natural log of the firm's book assets:  $\ln(\text{Assets})$ .

**Debt/Assets:** Financial leverage (proxied by the ratio of long term debt to assets) most likely reduces the portion of trade that occurs in the U.S. market. There are two key reasons. First, moderately high levels of leverage suggest that the firm has access to capital in the home market, which implies that the home market is relatively sophisticated and liquid. The implied attractiveness of the home market might encourage more trade in the home market. Second, while high leverage can help to ameliorate Jensen (1986) type agency costs of free cash flows, it can also impose bankruptcy risks (following Maloney et al., 1993). To U.S. investors, perception of bankruptcy risk might be higher for non-U.S. firms due to the latent level of information asymmetry associated with non-U.S. companies. Overall, these factors imply That Debt/Assets should increase the \$volume ratio.

**Cash/Assets:** Non-U.S. firms with higher cash holdings should be less risky and should be larger. Thus, in a similar way to assets (and a converse way to Debt/Assets), higher cash holdings should ameliorate information risk to U.S.-investors, and should increase the proportion of the firm's volume that locates in the U.S. market.

**R&D, Intangibles, and being High Tech:** Firms with higher latent information asymmetry are less likely to attract interest from U.S. investors. This is because of the compounding of information

asymmetry due to (a) firm-level factors and (b) the firm being domiciled in another country. Information asymmetry is likely to increase with the firm's use of R&D, and Intangibles, and the firm's status as a high tech firm (following Gu and Wang, 2005). Given that no single variable is a good measure of innovation and technology (Kleinknecht et al., 2002), it is important to control for multiple measures in order to fully capture innovation and the information asymmetry associated therewith (Desyllas and Hughes, 2010). Therefore, the models include R&D/Sales, Intangibles/Assets, and an indicator that equals one if the firm is a High Tech firm as defined in Loughran and Ritter (2004).

**Advertising/Sales:** A high level of advertising should correlate with higher trade in the U.S. market due to the firm's enhanced visibility. Supporting this, Grullon et al (2004) find that firms who spend more on advertising tend to have more investors, a more dispersed investor base, and higher liquidity. For non-U.S. firms, the gain from advertising is likely to be highest in the U.S. market, where the firm would initially have lower liquidity. This suggests a negative relationship between Advertising/Sales and the \$volume ratio.

**FCF/Assets:** High free cash flows can induce Jensen (1986) type costs of free cash flow. Poor corporate governance can influence institutional investors' investment decisions (McCahery et al., 2010). Thus, high free cash flows might deter institutional investment in the stock, which might disproportionately reduce the amount of investment in the firm's U.S. stocks, which implies a positive relationship between FCF/Assets the \$volume ratio.

### 3.4.2 Country level variables

The characteristics of the non-U.S. market might influence the decision to (not) trade stock in that market. Thus, we control for several dimensions of home-market development.



**FDI:** Home market development should increase with the level of FDI-to-GDP (Borensztein et al., 1998). Thus, the models include the ratio FDI/GDP, sourced from the World Bank.

**Market capitalization:** The market capitalization of the home market should increase volume in the home market. Thus, the models include the market cap of all companies listed in the non-U.S. market scaled by the GDP of the non-U.S. market (MktCap/GDP).

**Turnover and market activity:** The average turnover in the home market should influence the proportion of trade that concentrates in the home market for an individual stock. Two variables capture this. First, the models include the average \$volume ratio for all firms listed on the non-U.S. market. Second, the models include the average turnover of all stocks listed in the home market.

**Taxation:** High levels of taxation in the non-U.S. market might deter investors from investing in the non-U.S. market (following Hamada, 1966; Janeba, 1995). This might shift volume to the U.S. market. The models control for the highest level of corporate tax in the non-U.S. market. The data is from the World Bank. We acknowledge that this does not fully capture the nature of bilateral treaties on investment income; however, it does provide a proxy for the impact of taxation in the non-U.S. market.

**Trade imbalance:** The trade imbalance in the non-U.S. market can influence exchange rates. This can influence the relative attractiveness of investing in the home market (Giovannini and Jorion, 1987; following Bailey and Chung, 1995). Thus, the models control for the trade imbalance in the non-U.S. market, defined as  $(\text{Imports} - \text{Exports}) / (\text{Imports} + \text{Exports})$ .

**Time zone difference:** Differences in time zones might deter US investors (say) from investing in the non-US issues of cross-listed stocks, and vice-versa (following Chen et al., 2008). This might influence the ratio of non-US volume to US volume. Subsequently, we control for the absolute value of the time zone difference between the location of the stock exchange and New York.

**Language difference and geographic distance:** Geographic distance can be a proxy for difficulties in obtaining and processing information between two locations (Ragozzino and Reuer, 2011). Thus, we control for the log-distance (in kilometers) between the non-US exchange and the US exchange. Further, language differences might make it more difficult to process information, especially for companies that trade in emerging markets, where rules and regulations might not always be available in English (MSCI, 2011). Thus, we include an indicator that equals one if the language spoken in the non-US exchange is English.<sup>12</sup>

**Institutional shareholdings:** We also control for the presence of US institutional shareholders. We obtain 13f holdings data for each firm in the sample. We control for total institutional shareholding in each firm at the beginning of the year scaled by the firm's total number of shares outstanding in the US market. The prediction is that a large institutional shareholding presence in the US will shift trade away from the non-US market because (a) the institutional shareholders typically account for a large portion of trading volume; and (b) institutional shareholders might make the US market more liquid; and thus, more attractive to non-institutional shareholders as well.

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<sup>12</sup> These exchanges are based in Australia, Canada, the United Kingdom, New Zealand, and Hong Kong.

### 3.5 Empirical Strategy

We test our core predictions: governance increases the ratio of non-US volume to US volume; rules are quadratically related to the volume ratio; and the ratio of non-US volume to US-volume fell after the implementation of MIFID in those countries that MIFID affects. We also predict that stronger stock exchange rules will be more effective if the regulatory environment is stronger (i.e. we predict that the interaction of regulation with exchange rules will increase the ratio of non-US volume to US volume). The following models capture these hypotheses. Equations (1)-(3) examine governance and exchange rules. Equation (4) is a difference-in-difference model that examines the impact of MIFID.

$$\ln(\$Volume\ Ratio+1) = f(Regulation, Controls) \quad (1)$$

$$\ln(\$Volume\ Ratio+1) = f(Rules, Rules^2, Controls) \quad (2)$$

$$\ln(\$Volume\ Ratio+1) = f(Rules, Rules \times Regulation, Controls) \quad (3)$$

$$\ln(\$Volume\ Ratio+1) = f(I(MIFID), I(Date), I(MIFID) \times I(Date), Controls) \quad (4)$$

Here, 'Rules' denotes variously one of the exchange rules variables pertaining to volume manipulation, price manipulation, broker-agent conflicts, spoofing, false disclosure, or insider trading. 'Regulation' denotes one of the measures of regulation (the WB governance index, the ICRG composite index, the Spamann (2010) ADRI, or the S&P sovereign risk rating). 'Controls' denotes the control variables. For the difference in difference model in Equation (4),  $I(MIFID)$  is an indicator that equals one if the non-U.S. exchange is subject to MIFID.  $I(Date)$  is an indicator that variously equals one if (a) the observation post-dates the November 2007 implementation deadline; (b) post-dates the May 2005 date in which the EU promulgated MIFID, or (c) post-dates

2005. Including stock-exchange dummies partially controls for the violations of the parallel trend assumption by controlling for unobserved exchange effects.

We estimate all models using Tobit with a lower bound of zero (consistent with Kayhan and Titman, 2007; Harford et al., 2009). The models also include fixed effects for year and for exchange and use robust standard errors. Our findings are robust to using standard OLS estimates, and to double-clustering standard errors by 3-digit SIC code and year (as suggested in Petersen, 2009), as we explicitly show in the tables in the next section. We report OLS results for some of our models (in Table 8 and Table 10). For brevity we do not report all OLS results. Alternative specifications are available on request.

## **4 Results**

This section presents the results for univariate tests in part A and multivariate tests in part B. To summarize the results, the ratio of non-U.S.-volume to U.S.-volume (a) increases monotonically with sovereign governance, (b) has a quadratic relationship with stock exchange rules, and (c) decreased following MIFID in countries subject to MIFID, implying that the MIFID-inspired regulations do not achieve one desired policy purpose of shifting volume away from the U.S. to the EU.

### ***4.1 Univariate Results***

The univariate results suggest that home country governance influences the ratio of non-U.S. volume to U.S.-volume for non-U.S. companies with a U.S. listing. Summary statistics are in Table 2.

They show skewness in the variables and suggest that it is necessary to winsorize the continuous variables. Table 3 contains the average governance index by year. The statistics show that the governance and exchange-rule variables are stable over time.<sup>13</sup>

--Tables 2 and 3 About Here --

The univariate results show a relation between governance, exchange-rules and the proportion of volume that trades in the non-U.S. market. Table 4 contains volume-ratio and governance variables by country. The statistics indicate that the proportion of volume traded in the home-market is higher if the various governance dimensions are higher. Table 5 contains pairwise correlations between the governance variables and the proportion of volume traded in the home market. The pairwise correlations suggest that (a) the ratio of non-U.S. volume to U.S. volume increases with governance and regulation in the home market, and (b) the various governance measures are significantly correlated with one-another.

--Tables 4 and 5 About Here --

## **4.2 *Multivariate Results***

The multivariate results yield three important conclusions briefly summarized as follows: (1) regulation, governance, and political stability monotonically increases with volume in the non-U.S. market; (2) there is a quadratic relationship between non-U.S. volume and the strength of most

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<sup>13</sup> Note that a country's exchange rule variables only change between 2007 and 2008. The changes over time before 2007 are due to changes in sample composition, which change the relative weight assigned to the rule-index of each country.

exchange-rules; and (3) MIFID has not achieved its aim of increasing liquidity and volume in the EU markets.

**Governance and trade location:** The first set of results considers the relation between measures of home-country governance and the ratio of non-U.S. to U.S. volume. Table 6 contains the regression results. There are two key results. First, the ratio of non-U.S. to U.S. volume increases with home-country governance. Columns 1-4 examine a linear relationship. The coefficient on all governance variables is positive and statistically significant, while the antidirector rights index (as measured by Spamann, 2010) is not. The economic significance is that 1 1-standard deviation change in the governance index causes an increase in the ratio of non-U.S. to U.S. volume by 40% (for the WB Governance Index), 57% (for the S&P Rating) and 34% (for the ICRG Composite Index. Thus, investors are more willing to invest in the non-U.S. market if it has better governance. Second, the relationship between governance and the volume-ratio is not quadratic. Columns 5-8 include the quadratic governance term. This term is not significant in any model and is insignificant and positive in three of four models, which implies that improving governance will not reduce volume in the non-U.S. market.

--Table 6 About Here --

**Exchange rules and trade location:** The results show a quadratic relationship between the strength of stock exchange rules and the amount of volume in the non-U.S. market. Table 7 contains the results. Column 1 examines the exchange-rule-index. In Models 1, 2, 5 and 6 for the Rules Index, Price Manipulation Index, False Disclosure Index and Market Manipulation Index, respectively, the coefficient on the linear term is positive and significant but the coefficient on the quadratic term is negative and significant. The finding regarding the squared term implies that excessively onerous

exchange-rules somewhat deter investors from the non-U.S. market. Regarding economic significance, however, the positive effect of more rules is large: a 1-standard deviation increase in the Rules Index variable gives rise to a 273% increase in the ratio of non-US volume to US-Volume, and this effect is 117% for the Price Index, 62% for the False Disclosure Index and 296% for the Market Manipulation Index. Note that while these results hold for many of the exchange-rule sub-indexes, the linear 'Broker' term is negative and significant whereas the quadratic 'Broker' term is positive and significant. An explanation could be that stringent broker-agent rules initially deter brokers from advising clients to invest in the non-U.S. market, and broker-agent rules are only beneficial after passing the initial deterrence threshold.

Table 8 contains models that control for both stock-exchange rules and sovereign governance. The first four columns contain Tobit results and the last four columns contain OLS results. The key finding is that the coefficients on the governance variable and the first-order rules variable are positive and statistically significant, whereas the quadratic rules variable is negative and statistically significant. The economic significance of these effects is very similar to that discussed above. This supports the foregoing results.<sup>14</sup>

--Tables 7 and 8 About Here --

**Governance and Exchange rules:** We also examine the interaction of sovereign governance and stock exchange rules. The prediction is that stronger stock exchange rules are effective only if there is effective regulatory enforcement. That is, we expect the interaction of 'Regulation' and 'Rules' to increase the ratio of non-US volume to US volume. The results are in Table 9. We find support for this prediction for all measures of regulation except the Spamann (2010) ADRI. This is a curious

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<sup>14</sup> The findings are likewise robust to the inclusion of other control variables, including but not limited to surveillance efforts (Cumming and Johan, 2008; Cumming et al., 2011).

result; however, a possible explanation is that the ADRI captures factors that are very similar to the stock exchange rules and has little *per se* to do with the strength of the regulatory institutions. This suggests that the interaction of the ADRI with the 'Rules Index' may behave more like the quadratic term in Table 7 and Table 8.

--Table 9 About Here--

**MIFID:** The MIFID results show that MIFID has not shifted trade to the home market. A preliminary point is that the parallel trend assumption (which is key to DD models) appears to broadly hold in the data. Figure 1 contains the ratio of non-U.S. volume to U.S. volume for countries that were subject to MIFID versus those that were not subject to MIFID. In most years, the volume ratio follows a similar trend for both countries.

--Figure 1 About Here --

The regression results are in Table 10 . The results are broadly consistent across tables. The variables of interest are the interactions of I(MIFID) with I(2008), I(2005), and I(Before or After not During 2005). The interaction term is negative in all models. The interaction 'I(MIFID)×I(2008)' is significant and negative in models that either include or exclude stock exchange dummies. However, the interactions 'I(MIFID)× I(Before or After not During 2005)' and 'I(MIFID) x I(2005)' are not statistically significant. This implies that it is the implementation of MIFID, rather than its mere announcement, that induced the shift in the location of trade. Given the foregoing result that improving exchange-rules and governance tend to increase the proportion of volume in the home market, the MIFID results imply that MIFID has not adequately improved governance in the EU.



--Table 10 About Here --

**Control variables:** The control variables are largely consistent with expectations and are stable across models. (1) Size (proxy: 'ln(Assets)') increases the proportion of trade that locates in the U.S. This finding implies that firm size increases financial stability, reduces information asymmetry, and makes companies more attractive to non-U.S. investors. (2) Debt reduces the amount of trade that occurs in the U.S. market. This suggests that the bankruptcy risk associated with high levels of debt discourages international investors. (3) Cash holdings increase the amount of trade that locates in the U.S. market. This finding implies that cash holdings connote financial stability and help to ameliorate the information asymmetry associated with non-U.S. companies. (4) The proportion of trade that locates in the U.S. decreases with R&D/Sales and Intangibles/Assets, and is lower for high-tech firms. (5) The presence of institutional shareholders in the US shifts trade away from the non-US exchange. This quadrates with the idea that institutional shareholders account for a large portion of trade; and thus, increase the relative amount of trade in the US, and that the liquidity benefit of institutional shareholders might attract non-institutional shareholders to the market. These results likely reflect the fact that these firms are riskier and have higher levels of information asymmetry.

### ***4.3 Other Robustness Checks***

We establish that our results are robust to a wide range of model specification issues. First, they hold for various forms of clustering, holding in models that cluster standard errors by firm, or by 2, 3, or 4 digit SIC codes, and to double clustering with years. They also hold in models that include or exclude year dummies.

Second, the results are robust to an alternative measure of relative trading activity computed as the ratio of non-US turnover/US turnover. The results are qualitatively the same as the ratio based on trading volumes.

Third, the results are robust to collinearity. The VIF for the variables does not exceed two, suggesting that collinearity is not a live issue in our analyses. Nonetheless, robustness tests also use principal component analysis to condense the variables into orthogonal components, which should not be collinear. The results hold in these models (unreported).

Fourth, the results are robust to time-period. The live issue is whether the results are robust to either (a) the Asian financial crisis, or (b) the tech-boom in the US during the sample period. To control for the Asian financial crisis, robustness tests exclude observations from before 1999. To control for the tech-boom, robustness tests exclude years 1999-2001. The results hold in both restricted samples.

Fifth, the results are robust to removing European firms from the sample. An issue is that the European stock exchanges consolidated over time. However, the results are qualitatively the same if we remove companies incorporated in European countries and/or remove companies that trade on an exchange that is based in Europe.

Sixth, the results are robust to controlling for an indicator,  $I(\text{Tax Treaty})$ , that equals one if there is a tax treaty between the US and the country of the non-US exchange.<sup>15</sup> We find that the presence of a tax treaty increases the proportion of trade that occurs in the non-US market. This implies that a tax treaty induces US investors to invest outside of the US.

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<sup>15</sup> A list is available here: <http://www.irs.gov/businesses/international/article/0,,id=96739,00.html>

Seventh, the results are robust to including an indicator,  $I(DJ \text{ Emerging})$ , that equals one if the firm trades on an exchange based in an emerging market.<sup>16</sup> They hold whether we include this in addition to, or instead of, the exchange dummies. We find that if we remove the exchange dummies, then emerging markets have a significantly higher ratio of non-US volume to US-volume than do other markets (specifically, the coefficient on  $I(DJ \text{ Emerging})$  is positive and significant at 1% significance). Because the models use exchange dummies, we exclude this variable from the reported analysis.

Eighth, the results are robust to controlling for the ADR ratio. The ADR ratio is number of the company's ordinary shares that are equivalent to one American Depositary Receipt. This variable does not significantly influence the ratio of non-US volume to US volume.

Ninth, the results are robust to excluding periods in which there are short selling restrictions. Chen et al (2008) indicate that the availability of short selling can influence the rate of convergence between ADRs and home-market stock. Further, one possibility is that much of the volume in non-US stocks listed in the US comes from short selling (in an attempt to take advantage of mispricing between US issues and non-US issues). We note that at some point, the trader must unwind the short position; however, this can account for some short term differences in volume ratios. Subsequently, we control for this by excluding the crisis years of 2007 and 2008 within our sample period (or any one year individually). The results are qualitatively the same when we exclude these years.

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<sup>16</sup> The Dow Jones list of 35 emerging markets comprises: Argentina, Bahrain, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Egypt, Estonia, Hungary, India, Indonesia, Jordan, Kuwait, Latvia, Lithuania, Malaysia, Mauritius, Mexico, Morocco, Oman, Peru, Philippines, Poland, Qatar, Romania, Russia, Slovakia, South Africa, Sri Lanka, Taiwan, Thailand, Turkey, and the United Arab Emirates.

Tenth, the results are robust to controlling for the degree of exchange rate liberalization and/or the degree of foreign ownership allowed. We obtain the data from MSCI (2011). We create indicators that equal one if the country of the non-US exchange receives a 'negative' rating for foreign ownership limits or foreign exchange liberalization (MSCI assigns three ratings, ++, +, and -). Here, a 'negative' indicator for foreign ownership or foreign exchange liberalization reduces the proportion of trade that occurs in the non-US market; however, these variables are not statistically significant in models that include stock exchange dummies. In all cases, the results for the country-governance variables and the stock-exchange rules variables are qualitatively the same as the results reported.

Eleventh, the results are robust to controlling for measures of transactions costs either instead of, or in addition to, stock exchange dummies. Gagnon and Karolyi (2010) find that transactions/holding costs can influence deviations from price-parity for cross-listed stocks. This implies that holding costs/transactions costs could also influence the ratio of non-US trade to US trade. Specifically, if trading costs are higher in the non-US exchange, then there is likely to be less volume in that exchange. Stock exchange dummies should capture much of the exchange-specific differences in transactions costs. Nonetheless, we also examine the average high frequency percent realized spread, percent effective spread, and percent quoted spread (as reported in Fong et al., 2011). These are typically seen as reasonable daily measures of transactions costs and liquidity (Fong et al., 2011). The results are robust to controlling for these measures of liquidity/transactions costs.

Lastly, the results are robust to controlling for the stocks relative correlation with returns in the home market and returns in the US market. Baruch et al (2007) hypothesize and find that the level of US trading volume for cross-listed stocks in part depends upon the correlation of (a) the

returns on the firm's non-US stock with (b) the returns on the domestic market and the returns on the US market. That is, amount of US volume depends on (a) the correlation of the non-US stock with non-US assets, and (b) the correlation of the non-US stock with US assets. This is called the 'information share'.

The information share has a relatively ambiguous relationship with the ratio of non-US trade to US trade. Baruch et al (2007) find that the information share increases the level of volume in the US market. That is, the higher the correlation between home returns and US returns, the greater the amount of US trade. However, they do not examine the ratio of non-US trade to US trade (focusing instead on US volumes). Arguably, the information share could actually reduce the amount of US trade relative to the amount of non-US trade (i.e. increase the ratio of non-US trade to US trade). The rationale is that if there is a higher information share, then the home assets are more correlated with US assets. If they are more correlated with US assets, then US investors might be more willing to invest in the non-US markets (by parity of reasoning to why the information share increases the amount of US trade). Supporting this, Gagnon and Karolyi (2009) find that volume 'spills over' from the US exchange to the non-US exchange on high-volume days. That is, as more information is disclosed in the US market, the level of non-US market also increases. Thus, if non-US returns are more correlated with US returns, then it might attract US investors and might increase the ratio of non-US trade to US trade.

We capture this in the similar way to Baruch et al (2007). For each year we compute an 'information share' for the stock. We compute the information share by using daily stock returns and do so as follows. First, we run a 'restricted' model that assesses the relationship between the non-US returns and the non-US market (in Equation 5). Second, we run an 'unrestricted' mode that assesses the relationship between non-US returns, the non-US market, and the US market (in

Equation 6). The goal is to assess the impact of information from the US market factor. We use lead and lag terms in Equation 5 and Equation 6 in order to control for non-synchronous trading (following Baruch et al., 2007).

$$r_{i,t} = \alpha_i + \sum_{k=-1}^{+1} \beta_{i,t+k} r_{\text{Home},t+k} + \varepsilon_{i,t} \quad (5)$$

$$r_{i,t} = \alpha_i + \sum_{k=-1}^{+1} \beta_{i,t+k} r_{\text{Home},t+k} + \sum_{k=-1}^{+1} \beta_{i,t+k} r_{\text{US},t+k} + \varepsilon_{i,t} \quad (6)$$

Third, we compute the information share for the second model. That is, we calculate how much additional explanatory power the model gains by including the US market factor. We do this using a F-statistic, as follows:

$$\text{Information Share} = \frac{\frac{[R_{UR}^2 - R_R^2]}{p_R}}{\frac{[1 - R_{UR}^2]}{n - p_{UR}}} \quad (5)$$

Where:

$R_{UR}^2$  = R-squared from Equation (6)

$R_R^2$  = R-squared from Equation (5)

$n$  = Number of observations

$p_{UR}$  = Number of parameters in Equation (6)=6

$p_R$  = Number of parameters in Equation (5)=3

The results hold after controlling for the information share measure. The summary statistics for the information share are in Table 2, and are similar to those reported in Baruch et al (2007). The results are in Table 11. The information share measure is positively related to the ratio of non-US trade to US trade. This is consistent with the prediction that a higher information share might attract US investors. The governance variables and exchange rules variables have the same signs and similar significance levels to those in Table 8.

--Table 11 about here--

## 5 Conclusion

In this paper, we examine the effect of exchange trading rules and other governance regulations on the location of trades for firms that cross-list in the U.S. Prior studies have identified cross-country variation in the location of trades for non-U.S. firms with U.S. stock-issues (Halling et al., 2010). Other studies have identified the importance of country-governance to stock market development and stock exchange liquidity, among other things (La Porta et al., 1997, 1998). In this paper we connect these strands of literature to examine whether sovereign governance *and* exchange rules drive the trading location for non-U.S. firms that cross-list in the U.S. Also, we use the implementation of MIFID as a natural experiment with which to test the importance of exchange trading rules.

The data indicate that stronger rules increase trading on non-U.S. exchanges for cross-listed stocks. However, the benefit of more rules diminishes as trading and compliance becomes more costly and the non-U.S. market loses its 'cheap compliance' competitive advantage. Our analysis of the MIFID natural experiment provides supporting evidence consistent with this view. Further, the data indicates that stronger governance monotonically increases the relative amount of trade that occurs in the non-U.S. market.

Overall, our results have implications for countries, firms, and exchanges. Countries can encourage more trade if they improve their regulation and governance, and reduce sovereign risk. This is an illuminating result given recent troubles with sovereign debt management, even in

developed economies. Moreover, exchanges can obtain a greater share of trade if they strengthen stock exchange rules, but not so much that compliance becomes excessively costly. In the specific context of the EU, the results show that the costs of compliance outweigh the (possible) benefits in exchange liquidity. For corporations, they indicate the expected location of trade should they choose to list in the U.S. Future research could focus on, among other things, how stock exchange rules and country governance influence the relative efficiency of the market's reaction to corporate events.



**Table 1: Variable definitions**

This table defines the variables. The return and volume data are from CRSP. Firm-level accounting data are from Compustat. Analysts data are from Thomson Reuter's Institutional Brokers' Estimate System (IBES). Data on country-governance comes from the World Bank. Exchange trading rules data are from Cumming, Johan and Li (2011).

Variable	Description
<b>Volume Variables</b>	
Daily \$Volume (Non-U.S.)	The daily volume of shares traded in the non-U.S. market multiplied by non-U.S. share price converted to USD at the day's exchange rate
Daily \$Volume (US)	The daily volume of shares traded in the U.S. market multiplied by the share price on the U.S. market
Yearly \$Volume Ratio	The yearly average of the ratio: Daily \$Volume (non-U.S.)/ Daily \$Volume (US)
Average \$Volume Ratio	The equally weighted average 'Yearly \$Volume Ratio' for all stocks traded on the non-U.S. market
<b>Governance Variables</b>	
WB Governance Index	The equally weighted average of the World Bank's governance 'rank' variables for political stability, government effectiveness, corruption, rule of law, regulation, and accountability
S&P Rating	The S&P sovereign risk rating
ICRG Composite Index	The composite governance index that ICRG reports
ADRI Spamann	The antidirector rights index from Spamann (2010)
<b>Trading Rules</b>	
Rule Index (2006)	The equally weighted average of the 2006-2007 exchange rule ranks for Market Manipulation, Insider Trading and Broker Agency.
Rule Index (2007)	The equally weighted average of the 2007-2008 exchange rule ranks for Market Manipulation, Insider Trading and Broker Agency.
Price Manipulation	Sum of dummy variables for Marking the Open, Marking the Close, Misleading End of the Month/Quarter/Year Trades, Intraday Ramping / Gouging, Market Setting, Pre-arranged Trades, and Domination and Control.
Volume Manipulation	Sum of dummy variables for Churning and Wash Trade.
Spoofing	Sum of dummy variables for Giving up Priority, Switch and Layering of Bids/Asks.
False Disclosure	Sum of dummy variables for Dissemination of False and Misleading Information and Parking or Warehousing.
Market Manipulation	Sum of Price Manipulation Rules Index, Volume Manipulation Rules Index, Spoofing Rules Index, and False Disclosure Rules Index
Insider Trading Rules Index	Sum of dummy variables for Front-running, Client Precedence, Trading Ahead of Research Reports, Separation of Research and Trading, Broker Ownership Limit, Restrictions on Affiliation, Restrictions on Communications, Investment Company Securities, Influencing or Rewarding the Employees of Others, and Anti-

Broker Agency Index	Intimidation / Coordination. Sum of dummy variables for Trade Through, Improper Execution, Restrictions on Member Use of Exchange Name, Restrictions on Sales Materials and Telemarketing, and Fair Dealing with Customers.
<hr/>	
Controls	
ln(Assets)	The natural log of the total assets (Compustat: at)
Debt/Assets	The long term debt (Compustat: dltt) divided by the total assets (Compustat: at)
Cash/Assets	The firm's cash holdings (Compustat: ch) divided by the total assets (Compustat: at)
US Institutional Holdings	The percentage of US shares outstanding that institutional shareholders (under 13f obligations) own. We compute this at the beginning of the year. We obtain the 13f filings pertaining to each firm in the sample. For each company, we add the shareholdings of all institutional shareholdings at the beginning of the year. We then divided by the total number of shares outstanding in the US market (as reported in CRSP).
ln(Distance from NY km)	The natural log of the distance, in kilometers, between (a) NY, and (b) the primary non-US exchange on which the firm is listed.
Home Market Cap/GDP	The ratio of the market capitalization of all firms from the firm's home country divided by the country's GDP. Source: World Bank.
Home Market Turnover	The stock turnover of firms from the present firm's home country. Source: World Bank.
FDI/GDP	The ratio of the home-country FDI to GDP, where the home country is the country in which the firm is located. Source: World Bank.
Trade Imbalance	The trade imbalance of the country in which the firm is located. The trade imbalance is (Imports-Exports)/(Imports + Exports)
abs(Time Zone Difference)	The absolute value of the time zone difference between (a) New York, and (b) the primary non-US exchange on which the firm is listed.
R&D/Sales	The firm's R&D expenditure divided by its sales (Compustat: xrd/sale). We recode missing R&D expenditure as 0, following MWX (2009)
I(Same Language)	An indicator that equals one if English is the national language of the country in which the firm's primary non-US exchange is located. Note that we also include Hong Kong as an English speaking country.
Advertising/Sales	The firm's advertising expenditure divided by its sales (Compustat: xad/sale). We recode missing advertising expenditure as 0, following MWX (2009)
Intangibles/Assets	The firm's intangible assets divided by its total assets (Compustat: intan/at). We recode missing intangibles as 0, following MWX (2009)
High Tech	A dummy that equals one if the firm is high tech, as defined in Loughran and Ritter (2002)
FCF/Assets	The firm's free cash flow (Compustat: oibdp - xint - txt-capx) divided by its total assets (Compustat: at)
Information Share	The information share computed in a similar way to in Baruch et al (2007). This is the F-statistic derived from comparing a the R-squared from a restricted regression (that regresses the firm's non-US returns on the market returns for the non-US market) and from an unrestricted regression (that also includes the returns on the US market). The restricted regression is in Equation (5) the unrestricted regression is in Equation (6). The information share is then:

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$$\text{Information Share} = \frac{\frac{[R_{UR}^2 - R_R^2]}{p_R}}{\frac{[1 - R_{UR}^2]}{n - p_{UR}}}$$

*Where:*

$R_{UR}^2$  = R-squared from Equation (6)

$R_R^2$  = R-squared from Equation (5)

$n$  = Number of observations

$p_{UR}$  = Number of parameters in Equation (6)=6

$p_R$  = Number of parameters in Equation (5)=3

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**Table 2: Summary Statistics**

This table contains summary statistics.

Table 1 contains the variable definitions.

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
ln(\$Volume Ratio +1)	2.596	2.336	2.206	0.000	7.773
<b>Governance Variables</b>					
WB Governance Index	0.806	0.857	0.158	0.294	0.994
S&P Rating	16.897	19.000	4.083	0.000	20.000
ICRG Composite Index	0.798	0.811	0.066	0.519	0.923
Spamann ADRI	3.929	4.000	0.908	2.000	5.000
Rules Index	1.446	1.429	0.742	0.000	3.286
Price Manipulation	2.607	2.000	2.131	0.000	7.000
Volume Manipulation	0.667	0.000	0.817	0.000	2.000
Spoofing	1.342	1.000	0.964	0.000	3.000
False Disclosure	0.627	1.000	0.496	0.000	2.000
Market Manipulation	3.139	2.000	2.044	0.000	9.000
Insider Trading	1.460	2.000	0.990	0.000	4.000
Broker	0.277	0.000	0.637	0.000	3.000
<b>Control Variables</b>					
Exchange ln(\$Volume Ratio +1)	0.438	0.236	0.538	0.000	2.306
ln(Assets)	8.316	8.427	2.247	1.233	14.517
Debt/Assets	0.188	0.170	0.159	0.000	1.255
Cash/Assets	0.109	0.058	0.144	0.000	0.976
R&D/Sales	1.063	0.002	38.040	0.000	2100.500
Intangibles/Assets	0.119	0.052	0.155	-0.005	0.933
Advertising/Sales	0.010	0.000	0.054	0.000	2.359
High Tech	0.266	0.000	0.442	0.000	1.000
FCF/Assets	0.005	0.028	0.146	-2.777	0.554
Information share	3.353	1.804	3.844	0.155	14.415
Trade Imbalance	-0.013	-0.011	0.070	-0.369	0.203
FDI/GDP	0.000	0.000	0.001	-0.002	0.004
MKTCAP/GDP	0.011	0.009	0.007	0.001	0.056
Home Turnover	0.882	0.784	0.560	0.022	3.803
Corporate Tax	0.312	0.310	0.069	0.125	0.480

**Table 3: Governance Indexes by Year**

The Table contains the governance indexes by year. The values are averages for each year.

Year	WB Governance Index	S&P Rating	ICRG Composite Index	Spamann ADRI	Rules Index (Pre MIFID coding )	Rules Index (Post MIFID coding)
1999	0.828	17.241	0.786	3.996	1.494	1.873
2000	0.842	17.457	0.805	4.003	1.476	1.906
2001	0.840	17.341	0.813	3.954	1.456	1.902
2002	0.819	17.054	0.800	3.938	1.432	1.888
2003	0.812	16.954	0.802	3.932	1.442	1.880
2004	0.799	16.598	0.802	3.946	1.446	1.836
2005	0.796	16.813	0.798	3.904	1.408	1.833
2006	0.794	16.813	0.795	3.890	1.355	1.781
2007	0.754	16.094	0.790	3.860	1.313	1.653
2008	0.749	16.324	0.775	3.839	1.301	1.665

#### Table 4: Governance Variables by Country

This table contains the governance index by country.

Table 1 contains the variable definitions.

Country	Country Code	ln(\$Volume Ratio +1)	WB Governance Index	S&P Rating	ICRG Composite Index	Spamann ADRI	Rules Index	Price Manipulation	Volume Manipulation	Spoofing	False Disclosure	Market Manipulation	Insider Trading	Broker
Argentina	ARG	0.910	0.45	4.35	0.68	3	1.43	2.00	0.00	1.00	0.00	3.00	3.00	1.00
Australia	AUS	3.257	0.93	19.58	0.82	4	2.00	3.00	1.00	2.00	0.00	6.00	2.00	0.00
Austria	AUT	4.958	0.93	20.00	0.85	4	0.29	1.00	0.00	0.00	0.00	1.00	0.00	0.00
Belgium	BEL	2.661	0.89	19.00	0.84	2	1.51	3.36	0.09	1.18	1.09	4.64	0.18	0.00
Brazil	BRA	3.155	0.52	8.60	0.68	5	0.45	0.05	0.00	1.00	0.00	1.05	1.05	0.03
Canada	CAN	0.010	0.93	20.00	0.86	4	2.00	3.00	1.00	2.00	0.00	6.00	2.00	0.00
Switzerland	CHE	2.679	0.97	20.00	0.90	3	1.74	2.60	0.83	1.29	0.95	4.13	1.73	0.67
Chile	CHL	1.939	0.84	14.50	0.77	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spain	ESP	2.480	0.83	19.36	0.79	5	1.23	0.88	0.05	1.09	0.60	2.11	3.46	0.40
Finland	FIN	0.013	0.99	19.61	0.88	4	1.10	1.23	0.20	1.07	0.37	2.50	1.70	0.63
France	FRA	3.578	0.85	20.00	0.79	5	1.43	3.04	0.05	1.10	0.99	4.57	0.22	0.06
United Kingdom	GBR	3.577	0.91	20.00	0.82	4	2.13	5.39	1.75	2.72	0.89	2.10	2.03	0.06
Greece	GRC	1.715	0.72	14.97	0.74	3	1.60	2.64	0.45	1.52	0.71	3.76	1.93	0.19
Hong Kong	HKG	2.392	0.84	16.31	0.83	4	1.84	2.67	1.71	1.06	0.84	6.16	0.35	0.12
India	IND	1.640	0.47	9.78	0.69	4	1.57	0.00	1.00	1.00	1.00	3.00	2.00	3.00
Ireland	IRL	1.555	0.93	19.68	0.86	4	1.34	3.36	0.85	1.90	0.45	1.90	0.95	0.00
Israel	ISR	0.996	0.67	14.17	0.71	3	1.01	1.98	0.04	0.14	0.94	2.84	1.10	0.07
Italy	ITA	3.903	0.74	17.52	0.79	2	0.83	0.51	0.04	1.07	0.88	2.10	1.11	0.12
Japan	JPN	3.892	0.84	17.92	0.84	5	0.74	0.97	0.01	1.02	0.02	1.92	1.12	0.11
Korea	KOR	2.342	0.70	13.76	0.80	4	3.29	4.00	2.00	2.00	1.00	9.00	3.00	2.00
Mexico	MEX	1.895	0.51	11.00	0.73	2	2.00	3.02	1.00	1.01	1.00	5.97	2.01	0.00
Netherlands	NLD	2.214	0.96	20.00	0.86	4	1.31	2.38	0.20	1.16	0.70	3.54	0.88	0.32

Norway	NOR	3.618	0.95	20.00	0.91	4	1.48	2.00	0.77	1.04	0.14	3.75	2.54	0.11
New Zealand	NZL	2.452	0.96	19.00	0.79	5	2.00	2.46	0.46	1.46	0.54	4.92	2.54	1.62
Philippines	PHL	0.590	0.40	8.85	0.69	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portugal	PRT	0.078	0.85	17.49	0.78	3	0.94	1.00	0.14	1.29	0.14	1.00	2.14	0.86
Singapore	SGP	2.467	0.88	20.00	0.89	4	2.57	3.00	1.00	2.00	1.00	7.00	2.00	2.00
Sweden	SWE	0.027	0.97	19.19	0.85	4	1.03	1.17	0.10	1.07	0.37	2.33	1.50	0.70
Turkey	TUR	1.556	0.48	6.92	0.61	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
South Africa	ZAF	0.009	0.63	11.82	0.71	5	1.87	3.65	1.18	2.10	0.53	3.22	2.10	0.33

**Table 5: Correlation Statistics**

The table contains pairwise correlation statistics. Brackets contain p-values.

Variable	A	B	C	D	E	F	G	H	I	J	K	L
A \$Volume Ratio												
B WB Governance Index	0.04											
	[0.02]											
C S&P Rating	0.04	0.92										
	[0.01]	[0.00]										
D ICRG Composite Index	0.06	0.84	0.81									
	[0.00]	[0.00]	[0.00]									
E Spamann ADRI	0.12	0.39	0.30	0.24								
	[0.00]	[0.00]	[0.00]	[0.00]								
F Rules Index	0.02	0.11	0.20	0.16	-0.26							
	[0.26]	[0.00]	[0.00]	[0.00]	[0.00]							
G Price Manipulation	0.04	0.25	0.33	0.18	-0.12	0.84						
	[0.03]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]						
H Volume Manipulation	0.07	0.17	0.21	0.20	-0.13	0.84	0.80					
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]					
I Spoofing	0.12	0.34	0.40	0.32	0.06	0.76	0.84	0.82				
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]				
J False Disclosure	-0.03	-0.01	0.15	-0.03	-0.39	0.61	0.61	0.44	0.31			
	[0.10]	[0.51]	[0.00]	[0.05]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]			
K Market Manipulation	-0.04	-0.09	-0.03	0.04	-0.31	0.54	0.18	0.20	-0.03	0.35		



		[0.02]	[0.00]	[0.15]	[0.01]	[0.00]	[0.00]	[0.00]	[0.00]	[0.15]	[0.00]		
L	Insider Trading	0.01	-0.11	-0.07	-0.03	-0.22	0.52	0.29	0.44	0.49	0.03	0.00	
		[0.53]	[0.00]	[0.00]	[0.10]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.14]	[0.91]	
M	Broker	-0.10	-0.18	-0.21	-0.08	-0.01	0.11	-0.26	-0.02	-0.07	-0.03	0.11	0.37
		[0.00]	[0.00]	[0.00]	[0.00]	[0.73]	[0.00]	[0.00]	[0.32]	[0.00]	[0.05]	[0.00]	[0.00]

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**Table 6: Governance Analysis**

This table analyzes the relationship between sovereign governance and the ratio of non-U.S. volume to U.S.-volume.

Table 1 contains the variable definitions. All models include year and exchange dummies and cluster standard errors by firm. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable Model Column	ln(\$Volume Ratio +1) Tobit, Year Dummies, Exchange Dummies, Firm Clustering			
	[1]	[2]	[3]	[4]
WB Governance Index	2.513*			
	[0.054]			
S&P Rating		0.140***		
		[0.002]		
ICRG Composite Index			5.189**	
			[0.010]	
ADRI (Spamann)				-0.053
				[0.795]
Exchange ln(\$Volume Ratio +1)	0.12	0.118	0.115	0.137
	[0.605]	[0.614]	[0.624]	[0.557]
US Institutional Holdings	-3.195***	-3.126***	-3.187***	-3.255***
	[0.000]	[0.000]	[0.000]	[0.000]
ln(Assets)	-0.102**	-0.118***	-0.105**	-0.089**
	[0.020]	[0.008]	[0.017]	[0.045]
Debt/Assets	1.135***	1.120***	1.151***	1.142***
	[0.006]	[0.006]	[0.005]	[0.005]
Cash/Assets	-1.124**	-1.309***	-1.167**	-1.024**
	[0.025]	[0.009]	[0.020]	[0.042]
R&D/Sales	0.083	0.074	0.091	0.099
	[0.275]	[0.338]	[0.240]	[0.207]
Intangibles/Assets	0.404	0.304	0.386	0.396
	[0.399]	[0.523]	[0.422]	[0.411]
Advertising/Sales	1.303	1.272	1.261	1.359
	[0.158]	[0.168]	[0.175]	[0.140]
I(High Tech)	0.124	0.144	0.14	0.143
	[0.530]	[0.461]	[0.475]	[0.463]
FCF/Assets	0.908**	0.889**	0.931**	0.946**
	[0.025]	[0.030]	[0.023]	[0.018]
Trade Imbalance	0.45	-0.602	1.276	0.285
	[0.758]	[0.688]	[0.376]	[0.847]
FDI/GDP	104.53	120.259	101.65	121.393
	[0.351]	[0.281]	[0.376]	[0.298]
Home Market Cap/GDP	-36.605*	-32.709	-38.941*	-33.117
	[0.082]	[0.106]	[0.067]	[0.114]
Home Market Turnover	-0.309**	-0.339**	-0.21	-0.127
	[0.030]	[0.017]	[0.150]	[0.426]
ln(Distance from NY km)	0.581	0.753	0.385	0.354
	[0.780]	[0.731]	[0.867]	[0.864]
abs(Time Zone Difference)	-0.624	-0.682	-0.506	-0.554
	[0.320]	[0.286]	[0.454]	[0.377]
I(Same Language)	2.502	2.652	1.666	2.121
	[0.353]	[0.338]	[0.547]	[0.432]
Corp Tax Rate	0.533	0.802	0.282	-1.008
	[0.811]	[0.722]	[0.901]	[0.693]
Constant	0.552	-1.211	-0.482	4.55
	[0.972]	[0.942]	[0.978]	[0.768]

Observations	3,128	3,128	3,128	3,128
Pseudo R-squared	13.02%	13.27%	13.08%	12.88%
F-statistic	3578	3728	3605	3689

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**Table 7: Exchange Rule Analysis**

This table contains tobit regressions that analyze the relationship between stock-exchange rules and the ratio of non-U.S. volume to U.S. volume.

Table 1 contains the variable definitions. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	ln(\$Volume Ratio+1)							
Model	Tobit, Year Dummies, Exchange Dummies, Firm Clustering							
Rules Variable	Rules Index	Price Manipulation	Volume Manipulation	Spoofing	False Disclosure	Market Manipulation	Insider Trading	Broker
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Rules Variable	4.747*** [0.000]	0.744*** [0.000]	-1.737 [0.580]	0.568 [0.647]	1.498*** [0.000]	2.136*** [0.000]	0.185 [0.377]	-4.85 [0.123]
Rules Variable Squared	-1.430*** [0.000]	-0.092*** [0.000]	2.229 [0.473]	-0.098 [0.754]	-0.492*** [0.000]	-0.336*** [0.000]	-0.119* [0.068]	3.789 [0.226]
Exchange ln(\$Volume Ratio+1)	0.109 [0.638]	0.102 [0.661]	0.119 [0.610]	0.12 [0.606]	0.109 [0.639]	0.095 [0.687]	0.128 [0.584]	0.116 [0.619]
US Institutional Holdings	-3.301*** [0.000]	-3.284*** [0.000]	-3.263*** [0.000]	-3.260*** [0.000]	-3.301*** [0.000]	-3.252*** [0.000]	-3.233*** [0.000]	-3.295*** [0.000]
ln(Assets)	-0.089** [0.042]	-0.090** [0.041]	-0.090** [0.041]	-0.090** [0.040]	-0.089** [0.042]	-0.091** [0.038]	-0.091** [0.038]	-0.089** [0.043]
Debt/Assets	1.109*** [0.006]	1.117*** [0.006]	1.137*** [0.005]	1.141*** [0.005]	1.125*** [0.006]	1.158*** [0.004]	1.148*** [0.005]	1.128*** [0.005]
Cash/Assets	-1.014** [0.044]	-1.024** [0.042]	-1.020** [0.044]	-1.026** [0.043]	-1.014** [0.045]	-1.033** [0.041]	-1.048** [0.038]	-1.011** [0.045]
R&D/Sales	0.095 [0.228]	0.095 [0.227]	0.099 [0.213]	0.099 [0.211]	0.097 [0.222]	0.097 [0.207]	0.099 [0.203]	0.097 [0.220]
Intangibles/Assets	0.394 [0.410]	0.389 [0.418]	0.394 [0.413]	0.396 [0.410]	0.396 [0.409]	0.398 [0.408]	0.402 [0.404]	0.387 [0.420]
Advertising/Sales	1.369 [0.141]	1.358 [0.144]	1.355 [0.142]	1.355 [0.142]	1.37 [0.140]	1.354 [0.140]	1.35 [0.141]	1.369 [0.141]
I(High Tech)	0.142 [0.465]	0.143 [0.460]	0.14 [0.472]	0.141 [0.468]	0.143 [0.461]	0.143 [0.462]	0.142 [0.466]	0.142 [0.463]
FCF/Assets	0.920** [0.020]	0.922** [0.020]	0.926** [0.021]	0.930** [0.020]	0.910** [0.023]	0.963** [0.015]	0.958** [0.016]	0.912** [0.022]
Trade Imbalance	0.197 [0.894]	0.158 [0.915]	0.251 [0.865]	0.27 [0.855]	0.209 [0.887]	0.115 [0.938]	0.265 [0.858]	0.183 [0.902]

FDI/GDP	142.649	120.245	142.288	138.54	149.284	88.206	111.221	135.304
	[0.212]	[0.299]	[0.216]	[0.227]	[0.195]	[0.447]	[0.332]	[0.243]
Home Market Cap/GDP	-34.418	-34.481	-33.098	-33.133	-33.267	-35.198*	-34.265	-33.047
	[0.101]	[0.101]	[0.115]	[0.115]	[0.113]	[0.094]	[0.103]	[0.116]
Home Market Turnover	-0.124	-0.112	-0.14	-0.14	-0.135	-0.066	-0.107	-0.13
	[0.425]	[0.475]	[0.367]	[0.367]	[0.382]	[0.677]	[0.499]	[0.403]
ln(Distance from NY km)	0.828	0.561	0.494	0.253	0.456	0.451	0.541	0.45
	[0.745]	[0.807]	[0.820]	[0.898]	[0.834]	[0.835]	[0.808]	[0.835]
abs(Time Zone Difference)	-0.482	-0.529	-0.558	-0.601	-0.554	-0.536	-0.535	-0.56
	[0.520]	[0.446]	[0.390]	[0.329]	[0.399]	[0.416]	[0.423]	[0.392]
I(Same Language)	2.341	1.776	1.546	2.242	2.024	5.743*	1.95	-3.376
	[0.502]	[0.571]	[0.587]	[0.374]	[0.483]	[0.053]	[0.515]	[0.380]
Corp Tax Rate	-0.996	-1.062	-1.011	-1.078	-0.993	-1.353	-1.319	-1.006
	[0.700]	[0.682]	[0.699]	[0.679]	[0.702]	[0.598]	[0.611]	[0.698]
Constant	-4.079	1.043	3.005	4.925	2.283	1.44	2.809	3.39
	[0.834]	[0.952]	[0.854]	[0.742]	[0.890]	[0.929]	[0.868]	[0.835]
Observations	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128
F test	12.96%	12.95%	12.90%	12.89%	12.94%	12.98%	12.89%	12.94%
Pseudo R-squared	3593	3614	3667	3667	3558	3553	3604	3574

**Table 8: Rules and Governance**

This table contains tobit regressions that analyze both the level of sovereign governance and the stock exchange rules. The tobit regression has a lower bound of zero and includes year and stock-exchange fixed-effects and cluster standard errors by firm. The column title contains the governance variable. The rules variable in each model is the time-varying rules index. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable Model Column	ln(\$Volume Ratio +1)			
	Tobit, Year Dummies, Exchange Dummies, Firm Clustering			
	[1]	[2]	[3]	[4]
WB Governance Index	2.567** [0.049]			
WB Governance Index x Rules Index		0.145*** [0.001]		
S&P Rating			5.279*** [0.009]	
S&P Rating x Rules Index				-0.044 [0.825]
Rules Index	4.534*** [0.000]	4.200*** [0.000]	4.233*** [0.000]	4.728*** [0.000]
Squared Rules Index	-1.332*** [0.000]	-1.186*** [0.000]	-1.222*** [0.000]	-1.425*** [0.000]
Exchange ln(\$Volume Ratio +1)	0.091 [0.695]	0.084 [0.719]	0.084 [0.719]	0.111 [0.633]
US Institutional Holdings	-3.247*** [0.000]	-3.178*** [0.000]	-3.239*** [0.000]	-3.305*** [0.000]
ln(Assets)	-0.101** [0.021]	-0.117*** [0.008]	-0.104** [0.018]	-0.088** [0.047]
Debt/Assets	1.105*** [0.007]	1.088*** [0.008]	1.122*** [0.006]	1.111*** [0.006]
Cash/Assets	-1.097** [0.028]	-1.284** [0.010]	-1.139** [0.022]	-1.002** [0.045]
R&D/Sales	0.079 [0.304]	0.069 [0.374]	0.087 [0.265]	0.095 [0.228]
Intangibles/Assets	0.403 [0.398]	0.299 [0.528]	0.384 [0.422]	0.394 [0.410]
Advertising/Sales	1.313 [0.159]	1.28 [0.170]	1.27 [0.177]	1.371 [0.141]
I(High Tech)	0.124 [0.531]	0.144 [0.461]	0.14 [0.475]	0.143 [0.462]
FCF/Assets	0.882** [0.029]	0.857** [0.036]	0.904** [0.027]	0.925** [0.020]
Trade Imbalance	0.351 [0.810]	-0.738 [0.621]	1.191 [0.407]	0.189 [0.898]
FDI/GDP	125.766 [0.261]	147.71 [0.184]	125.029 [0.274]	139.131 [0.232]
Home Market Cap/GDP	-37.444* [0.075]	-33.21 [0.100]	-39.666* [0.062]	-34.115 [0.103]
Home Market Turnover	-0.307** [0.031]	-0.345** [0.015]	-0.208 [0.151]	-0.118 [0.458]
ln(Distance from NY km)	0.981 [0.692]	1.103 [0.663]	0.742 [0.776]	0.795 [0.751]
abs(Time Zone Difference)	-0.543 [0.451]	-0.616 [0.388]	-0.431 [0.554]	-0.466 [0.525]
I(Same Language)	2.53 [0.449]	2.539 [0.443]	1.608 [0.622]	2.266 [0.508]
Corp Tax Rate	0.83 [0.708]	1.183 [0.599]	0.587 [0.795]	-0.829 [0.745]
Constant	-7.333	-8.497	-7.8	-3.732



	[0.699]	[0.663]	[0.696]	[0.845]
Observations	3,128	3,128	3,128	3,128
Pseudo R-squared	13.11%	13.37%	13.17%	12.96%
F test	3453	3600	3479	3584

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**Table 9: Interaction of Rules and Governance**

This table focuses on the interaction of the country-level governance variables with the stock exchange variables. The models are Tobit models (with a lower bound of zero) that include year and exchange dummies and cluster standard errors by firm.

Table 1 contains the variable definitions. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

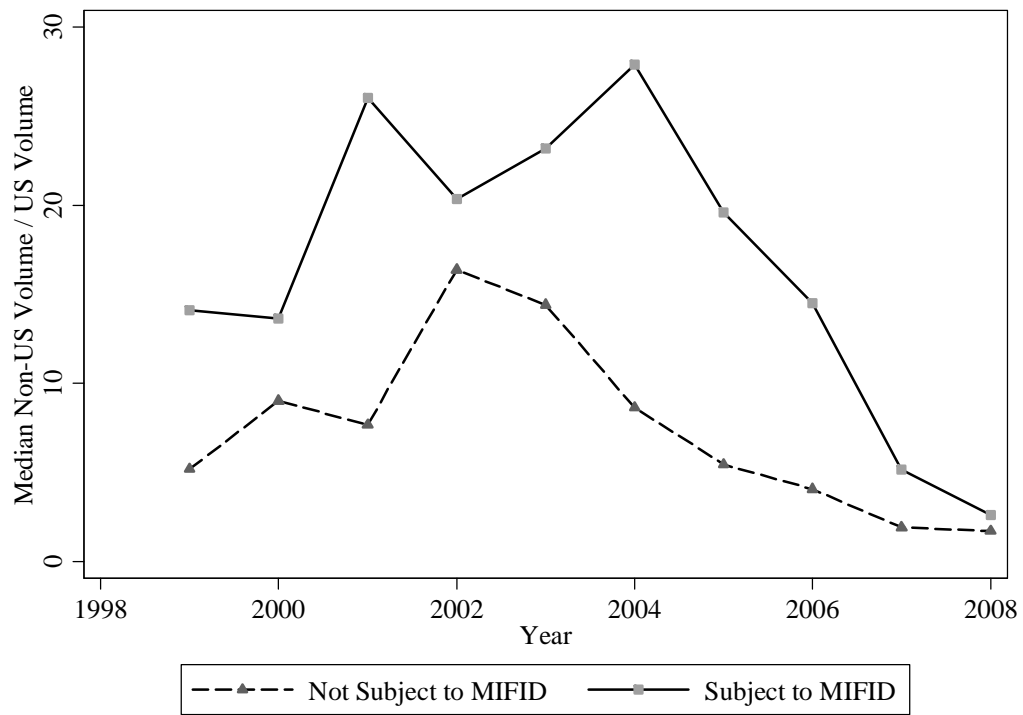
Dependent Variable Model Column	ln(\$Volume Ratio +1) Tobit, Year Dummies, Exchange Dummies, Firm Clustering			
	[1]	[2]	[3]	[4]
WB Governance Index	-6.087*** [0.000]			
WB Governance Index x Rules Index	5.498*** [0.000]			
S&P Rating		-0.173** [0.031]		
S&P Rating x Rules Index		0.211*** [0.000]		
ICRG Composite Index			-4.124 [0.195]	
ICRG Composite Index x Rules Index			6.679*** [0.005]	
ADRI (Spamann)				0.666* [0.055]
ADRI (Spamann) x Rules Index				-0.509* [0.074]
Rules Index	-4.248*** [0.000]	-3.363*** [0.001]	-4.920** [0.010]	2.284** [0.038]
Exchange ln(\$Volume Ratio +1)	0.079 [0.731]	-0.006 [0.980]	0.042 [0.855]	0.122 [0.597]
US Institutional Holdings	-3.209*** [0.000]	-3.135*** [0.000]	-3.228*** [0.000]	-3.243*** [0.000]
ln(Assets)	-0.110** [0.013]	-0.123*** [0.005]	-0.112** [0.011]	-0.090** [0.043]
Debt/Assets	1.195*** [0.004]	1.189*** [0.004]	1.201*** [0.003]	1.132*** [0.005]
Cash/Assets	-1.204** [0.017]	-1.345*** [0.007]	-1.185** [0.017]	-1.055** [0.034]
R&D/Sales	0.076 [0.319]	0.069 [0.368]	0.084 [0.273]	0.092 [0.249]
Intangibles/Assets	0.38 [0.424]	0.325 [0.490]	0.35 [0.463]	0.34 [0.479]
Advertising/Sales	1.21 [0.207]	1.205 [0.202]	1.238 [0.186]	1.329 [0.157]
I(High Tech)	0.099 [0.615]	0.111 [0.567]	0.126 [0.515]	0.165 [0.399]
FCF/Assets	0.805* [0.056]	0.778* [0.067]	0.866** [0.039]	0.935** [0.017]
Trade Imbalance	0.281 [0.842]	-1.006 [0.495]	0.809 [0.561]	0.328 [0.824]
FDI/GDP	132.678 [0.242]	127.315 [0.251]	134.801 [0.243]	153.893 [0.183]
Home Market Cap/GDP	-28.03 [0.137]	-28.187 [0.125]	-32.934* [0.099]	-33.523 [0.104]
Home Market Turnover	-0.251* [0.080]	-0.347** [0.019]	-0.207 [0.157]	-0.145 [0.347]
ln(Distance from NY km)	0.294	0.556	0.075	0.094

	[0.877]	[0.790]	[0.972]	[0.960]
abs(Time Zone Difference)	-0.665	-0.694	-0.523	-0.597
	[0.266]	[0.265]	[0.430]	[0.320]
I(Same Language)	2.439	2.138	1.09	2.259
	[0.307]	[0.396]	[0.667]	[0.358]
Corp Tax Rate	0.917	2.084	2.003	-0.503
	[0.664]	[0.316]	[0.352]	[0.835]
Constant	9.686	5.113	8.555	3.624
	[0.487]	[0.743]	[0.590]	[0.793]
Observations	3,128	3,128	3,128	3,128
Pseudo R-squared	13.44%	13.67%	13.32%	13.02%
F test	3569	4690	3722	3785

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**Figure 1**

Figure 1 contains the median  $\$Volume_{i,t}^{Non-US} / \$Volume_{i,t}^{US}$  for the sub-set of firms subject to MIFID and the sub-set of firms that are not subject to MIFID.



**Table 10: MIFID Analysis**

This table contains an analysis of the impact of MIFID on the reaction of non-U.S. volume to U.S. volume.

Table 1 contains the variable definitions. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	ln(\$Volume Ratio +1)					
	I(2008) = 1 if 2008 or later; 0 otherwise		I(2005) = 1 if 2005 or later; 0 otherwise		I(Before or After not During 2005) = 1 if 2006 or later; 0 if 2004 or earlier	
Exchange Dummies	NO	YES	NO	YES	NO	YES
Column	[1]	[2]	[3]	[4]	[5]	[6]
I(MIFID)	-0.168 [0.537]	-7.06 [0.211]	-0.235 [0.409]	-8.462 [0.133]	-0.222 [0.435]	-9.518* [0.099]
I(2008)	-0.330* [0.066]	-0.563*** [0.003]				
I(2008) * I(MIFID)	-0.547** [0.015]	-0.342* [0.099]				
I(2005)			-0.313** [0.012]	-0.282* [0.050]		
I(MIFID) * I(2005)			-0.02 [0.914]	0.085 [0.638]		
I(Before or After not During 2005)					-0.293** [0.026]	-0.288* [0.063]
I*(MIFID) * I(Before or After not During 2005)					-0.162 [0.419]	-0.01 [0.960]
Exchange ln(\$Volume Ratio +1)	1.027*** [0.000]	0.194 [0.395]	1.036*** [0.000]	0.301 [0.182]	1.055*** [0.000]	0.351 [0.126]
US Institutional Holdings	-4.535*** [0.000]	-3.342*** [0.000]	-4.447*** [0.000]	-3.328*** [0.000]	-4.398*** [0.000]	-3.349*** [0.000]
ln(Assets)	-0.002 [0.967]	-0.088** [0.045]	-0.002 [0.960]	-0.084* [0.059]	-0.018 [0.720]	-0.098** [0.031]
Debt/Assets	1.519*** [0.001]	1.113*** [0.006]	1.528*** [0.001]	1.147*** [0.005]	1.584*** [0.000]	1.191*** [0.004]
Cash/Assets	-1.025* [0.054]	-1.061** [0.036]	-0.986* [0.060]	-1.029** [0.040]	-1.163** [0.030]	-1.212** [0.018]
R&D/Sales	0.087 [0.281]	0.108 [0.160]	0.101 [0.207]	0.119 [0.118]	0.122 [0.139]	0.138* [0.082]

Intangibles/Assets	0.475	0.46	0.519	0.485	0.504	0.5
	[0.357]	[0.334]	[0.316]	[0.310]	[0.326]	[0.291]
Advertising/Sales	2.313**	1.363	2.215**	1.332	2.247**	1.421
	[0.030]	[0.148]	[0.036]	[0.157]	[0.028]	[0.120]
I(High Tech)	-0.022	0.151	-0.025	0.143	-0.065	0.093
	[0.915]	[0.438]	[0.904]	[0.466]	[0.756]	[0.641]
FCF/Assets	0.991**	1.029**	1.038**	1.090***	1.134**	1.197***
	[0.030]	[0.011]	[0.026]	[0.008]	[0.014]	[0.004]
Trade Imbalance	-1.062	0.11	-1.167	-0.294	-1.273	-0.27
	[0.405]	[0.941]	[0.355]	[0.839]	[0.310]	[0.852]
FDI/GDP	-86.214	13.794	-92.154	9.888	-156.099	-29.528
	[0.477]	[0.903]	[0.447]	[0.930]	[0.237]	[0.812]
Home Market Cap/GDP	-23.321	-46.163**	-16.724	-30.609*	-14.685	-28.772*
	[0.114]	[0.014]	[0.228]	[0.078]	[0.282]	[0.086]
Home Market Turnover	-0.069	-0.104	-0.04	-0.094	-0.001	-0.06
	[0.644]	[0.452]	[0.801]	[0.520]	[0.993]	[0.684]
ln(Distance from NY km)	-1.559***	0.229	-1.522***	0.456	-1.490***	0.94
	[0.001]	[0.902]	[0.001]	[0.808]	[0.001]	[0.636]
abs(Time Zone Difference)	0.189***	-0.531	0.184***	-0.673	0.188***	-0.791
	[0.000]	[0.374]	[0.000]	[0.266]	[0.000]	[0.205]
I(Same Language)	0.429	-4.734	0.397	-5.408	0.397	-6.104
	[0.107]	[0.174]	[0.139]	[0.132]	[0.136]	[0.103]
Corp Tax Rate	-1.823	-1.797	-1.581	-1.053	-1.691	-1.35
	[0.296]	[0.440]	[0.355]	[0.656]	[0.321]	[0.570]
Constant	15.641***	13.325	15.279***	13.089	15.104***	10.819
	[0.000]	[0.269]	[0.000]	[0.242]	[0.000]	[0.358]
Observations	3,128	3,128	3,128	3,128	2,805	2,805
Pseudo R-squared	7.42%	12.70%	7.40%	12.57%	7.73%	12.69%
F test	24	4198	20	4493	21	3013



**Table 11: Controlling for the information share**

This table focuses on the controlling for the ‘information share’ of the US market. Section 4.3 describes the computation of the information share in detail. The models are Tobit models (with a lower bound of zero) that include year and exchange dummies and cluster standard errors by firm.

Table 1 contains the variable definitions. Brackets contain p-values. Superscripts \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Dependent Variable	ln(\$Volume Ratio +1)			
Model	Tobit, Year Dummies, Exchange Dummies, Firm Clustering			
Column	[1]	[2]	[3]	[4]
WB Governance Index	2.256*			
	[0.075]			
S&P Rating		0.131***		
		[0.003]		
ICRG Composite Index			4.775**	
			[0.016]	
ADRI (Spamann)				-0.061
				[0.762]
Rules Index	4.462***	4.157***	4.194***	4.625***
	[0.000]	[0.000]	[0.000]	[0.000]
Squared Rules Index	-1.310***	-1.177***	-1.210***	-1.389***
	[0.000]	[0.000]	[0.000]	[0.000]
Information Share	0.020	0.017	0.019	0.020
	[0.179]	[0.245]	[0.202]	[0.176]
Exchange ln(\$Volume Ratio +1)	0.072	0.063	0.064	0.088
	[0.752]	[0.784]	[0.781]	[0.701]
US Institutional Holdings	-3.195***	-3.135***	-3.186***	-3.245***
	[0.000]	[0.000]	[0.000]	[0.000]
ln(Assets)	-0.107**	-0.120***	-0.109**	-0.095**
	[0.015]	[0.007]	[0.013]	[0.032]
Debt/Assets	1.145***	1.127***	1.157***	1.156***
	[0.005]	[0.005]	[0.004]	[0.004]
Cash/Assets	-1.118**	-1.283***	-1.153**	-1.032**
	[0.024]	[0.010]	[0.020]	[0.037]
R&D/Sales	0.075	0.066	0.081	0.088
	[0.334]	[0.401]	[0.299]	[0.264]
Intangibles/Assets	0.382	0.289	0.366	0.371
	[0.420]	[0.539]	[0.441]	[0.436]
Advertising/Sales	1.186	1.164	1.147	1.235
	[0.198]	[0.208]	[0.216]	[0.179]
I(High Tech)	0.147	0.165	0.161	0.164
	[0.441]	[0.381]	[0.393]	[0.381]
FCF/Assets	0.841**	0.818**	0.860**	0.878**
	[0.033]	[0.040]	[0.031]	[0.024]
Trade Imbalance	0.654	-0.368	1.426	0.539
	[0.653]	[0.806]	[0.318]	[0.714]
FDI/GDP	118.637	137.968	117.558	126.956
	[0.277]	[0.205]	[0.291]	[0.264]

Home Market Cap/GDP	-30.834	-27.325	-33.01	-27.424
	[0.135]	[0.169]	[0.112]	[0.179]
Home Market Turnover	-0.354**	-0.386***	-0.268*	-0.189
	[0.013]	[0.006]	[0.056]	[0.208]
ln(Distance from NY km)	1.222	1.284	0.991	1.048
	[0.629]	[0.618]	[0.708]	[0.681]
abs(Time Zone Difference)	-0.623	-0.676	-0.519	-0.548
	[0.388]	[0.345]	[0.477]	[0.455]
I(Same Language)	2.786	2.759	1.944	2.511
	[0.405]	[0.405]	[0.553]	[0.462]
Corp Tax Rate	1.754	2.061	1.557	0.43
	[0.418]	[0.351]	[0.482]	[0.862]
Constant	-8.945	-9.707	-9.321	-5.669
	[0.646]	[0.624]	[0.646]	[0.771]
Observations	3,081	3,081	3,081	3,081
Pseudo R-squared	13.20%	13.42%	13.26%	13.09%
F-Statistic	41.5063	41.2771	36.3531	39.94

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