Do Cross-Border Mergers and Acquisitions Import More Aggressive Insider Trading?*

Lixiong Guo[a]
University of Alabama

Xueting Zhang[b]
University of New South Wales

January 13, 2020

Abstract

Foreign acquirers possess private information about domestic targets in cross-border M&As. Has this led to more aggressive insider trading by foreigners in target firm securities on domestic markets due to barriers to cross-border law enforcement? Using a sample of 10,600 M&As around the world between 1990 and 2017, we find that the answer is yes. Abnormal trading in target firm securities before the announcements of cross-border deals, in which foreigners are known to possess inside information, is systematically more prevalent than that before the announcements of domestic deals, in which foreigners are less likely to possess inside information. The difference is mainly driven by cross-border deals in which the acquirer is from a country with high corruption and low social norms, and where the target is in a country with stricter insider trading law enforcement. Using the staggered entering into the Multilateral Memorandum of Understanding (MMoU) of 2002 by securities regulators around the world as a shock to the degree of coordination among securities regulators, we find that entering into the MMoU by a country pair significantly reduces abnormal trading before cross-border deals between the country pair relative to other country pairs. Our evidence reveals a new development in insider trading and suggests that the divergence in the speed of economic and legal integration presents a thorny challenge for maintaining economic order around the world.

Keywords: Insider Trading, Informed Trading, Cross-border, Mergers and Acquisitions, Globalization, Law, Culture.

JEL Classification: G34, G38, K22, K4

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[a] Lixiong Guo (Corresponding Author) is with the Culverhouse College of Business, University of Alabama. Email: lguo@cba.ua.edu.
[b] Xueting Zhang is with the School of Banking and Finance, University of New South Wales, Sydney, Australia.

1. Introduction

Globalization in the past three decades has greatly increased the cross-border flow of capital, goods, services and information around the world. While country borders are no longer major barriers to many economic activities around the world, they still play an important role in defining the effective reach of each country's laws. This combination of fast economic integration and slow legal integration can increase the likelihood of economic agents in one country profiting from illegal activities in another. However, the prevalence, effects and determinants of such activities have gone largely unexplored in existing literature. In this paper, we shed lights on these activities by investigating a fast-growing area of globalization, cross-border mergers and acquisitions (M&As), and examine whether the growth of cross-border M&As results in more prevalent and aggressive insider trading in target securities before merger announcements around the world.

Insider trading undermines investor confidence in the fairness and integrity of securities markets and is illegal in most countries since 1990s.[3] M&A deals are especially prone to insider trading because acquirers typically pay a large premium for target stocks. Traders who purchase target stocks or call options before the public announcement of a deal stand to earn an enormous return upon the announcement. Target country regulators are in general the first to detect and prosecute insider trading in M&As. For convenience of discussion, we set the target firm's headquarters country as the domestic country. When the acquirer is headquartered in the target country, the deal is a domestic deal. Enforcing target country insider trading laws is mainly a

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[3] SEC Fast Answers for Insider Trading: "Because insider trading undermines investor confidence in the fairness and integrity of the securities markets, the SEC has treated the detection and prosecution of insider trading violations as one of its enforcement priorities."

matter of enforcing domestic laws on domestic residents. When the acquirer is headquartered in a foreign country, the deal is cross-border. While insiders associated with the target firm are still mainly domestic residents, insiders associated with the acquirer are mostly residents of foreign countries.[4] Globalization has greatly lowered the barriers to purchasing domestic securities by foreign investors but domestic regulators still face significantly greater challenges in investigating and prosecuting insider trading by foreigner traders than by domestic traders.[5] The former Chairman of Australian Securities and Investments Commission (ASIC), Tony D'Aloisio, once said: "(These) evidentiary difficulties can become even more pronounced when the alleged offender, or some aspect of the conduct, is located in a foreign jurisdiction …" A special agent in charge of the New York office of the FBI once said: "it's always a challenge for us to get records that are in the control of countries other than the U.S." In a SEC case against a trader in Spain, the SEC lost the case because the trader wiped his hard drive clean and trashed a laptop. Daniel Hawke, director of the SEC's Market Abuse Unit at the time, said: "He was in Spain and there were limitations on what we could do." Besides the difficulty of obtaining records from foreign jurisdictions, it is also difficult to bring foreign offenders to justice when they reside outside the domestic jurisdiction. For example, U.S. lawyers often recommend foreign defendants facing insider trading charges in the U.S. not to come to the U.S. to avoid the risk of incarnation. These barriers to cross-border law enforcement can significantly lower the legal risk faced by foreign insider traders relative to their domestic counterparts.[6] According to Becker (1968), the optimal

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[4] Insiders we refer to here include corporate insiders, such as directors, officers, controlling shareholders and even employee that are privy to material nonpublic information resulting from their position as a corporate insider, and "constructive insiders", such as investment bankers, lawyers, accountants, etc. hired by the target or acquirer to work on the deal, and people who are tipped by the above two groups of people, the tippees.

[5] As a practical example, U.S. authorities used court-authorized wiretaps to implicate the billionaire hedge fund manager Raj Rajaratnam of Galleon Group in the largest hedge fund insider trading case in US history. Such techniques are not usually available when collecting evidence from a foreign country.

[6] The lower risk is not so much in detection but mainly in proving the case and the punishment. For example, the

level of crime depends on the marginal costs (punishment) of the illegal activity and its marginal benefits. We thus expect that foreign insiders are more aggressive in pre-bid insider trading than domestic insiders, which will result in a higher level of insider trading in target securities on the target country's markets before the announcement of a cross-border deal than an otherwise similar domestic deal. In this paper, we provide systematic evidence on this issue in a global setting of 10,600 M&As involving 33 target countries and 65 acquirer countries announced between 1990 and 2017.

Despite cross-country differences in insider trading laws and enforcements, all countries in general prohibit trading on material non-public information by corporate insiders and others who have acquired the non-public information in certain ways. Given the variety of people who can be in possession of and trade on insider information, it is impossible to study the pervasiveness of insider trading before takeover announcements using actual trades of all insider traders because such data are simply not available. Although in some countries, like the U.S., corporate insiders in target firms are required to disclose their transactions in their own firm securities, the data is of very limited value to this study. First, target corporate insiders are unlikely to trade before takeover announcements exactly because of the disclosure requirement. Even if they trade, they would most likely refrain from reporting these transactions. Second, acquirer corporate insiders are not required to report their transactions in the target firm's securities. To overcome this challenge, we follow Acharya and Johnson (2010) and rely on broader statistics that are indicative of suspicious activities in target firm securities to measure the likelihood and the amount of insider trading. Specifically, we employ two measures of abnormal stock returns over two pre-bid windows, (-5

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regulator is more likely to drop a charge and less likely to pursue criminal charges against foreign insider traders, because of the difficult of obtaining implicating evidence from a foreign country. An ex-assistant U.S. attorney once said that the SEC requested the government consider charges against overseas traders less frequently.

day, -1 day) and (-10 day, -1 day), where day 0 is the announcement day. Like Acharya and Johnson (2010), we postulate that these statistics are monotonically related with the intensity of insider trading given that a bid does occur.

Our empirical strategy is to compare the level of pre-bid abnormal stock returns in target stocks between cross-border deals and otherwise similar domestic deals in the same country-year. In each M&A deal, there are two centers of material nonpublic information, the target and the acquirer. Insiders associated with either center can trade on insider information and thus contribute to our measures of abnormal trading. However, in a given target country, the main difference in insider composition between a cross-border deal and a domestic deal is on the acquirer side, with the former being associated with mainly foreign insiders and the latter domestic insiders. As a result, the different levels of abnormal trading should be mainly driven by insider trading done by acquirer side insiders. If foreign insiders perceive lower legal risk of insider trading than domestic insiders do, then we expect a higher level of abnormal trading before the announcement of a cross-border deal than that of a domestic deal ceteris paribus.

We focus on suspicious trading in target firms' stocks because it is a basic venue for insider trading and stock markets are easily accessible to both sophisticated and unsophisticated investors. As a practical constraint, in our international sample, only a small fraction of target firms has exchange-traded options (most of them are in the US). This leaves the stock market as the main venue to examine for evidence of insider trading.

We start with a comprehensive sample of announced mergers and acquisitions around the world on the Thomson Reuters SDC database from 1990 to 2017. Our final sample consists of 10,600 M&As where target firms are from 33 countries and acquirers are from 65 countries. Since most of the insider trading we examine is done by traders who are not required by law to disclose

their trades, we follow Acharya and Johnson (2010) and rely on broader statistics that are indicative of suspicious activities in target firm securities to measure insider trading activity.

On stock markets, we expect target firms to exhibit unusually larger abnormal stock returns on insider trading days compared to non-insider trading days. Since we do not observe when insiders trade, we examine two pre-bid event windows, (-5 day, -1 day) and (-10 day, -1 day) windows, where day 0 is the announcement day. The two measures are constructed as follows. First, a benchmark daily return or volume model is estimated. Second, the daily residuals are aggregated over the pre-bid window to obtain a *Max* measure, which equals the maximum daily standardized residual over the pre-bid window, and a *Sum* mesure, which equals the sum of the positive daily standardized residuals over the pre-bid window. The two measures complement each other in capturing different types of insider trading strategies. The first measure might miss trades by strategic insiders who split and spread their trades over several days to minimize price impact, while the second measure might miss trades by competitive insiders whose trades tend to cluster on a single day.

Our baseline results show that both the *Max* and *Sum* measures of abnormal stock returns are significantly higher for cross-border deals than domestic deals over the two pre-bid windows, though the results are in general stronger in the shorter winow that begins closer to deal announcement date. The results hold in regressions in which we control for target country by year fixed effects, industry fixed effects and other variables that can affect the level of inside trading in the pre-bid windows.

One concern over the baseline result is that foreign acquirers may target different types of firms than domestic acquirers. For example, target firms in cross-border deals may be larger and concentraded in particular industries. Even though we control for target size and industry in our

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regression analysis, it may not completely eliminate the effect of firm size and industry. Other unobservable factors may also contaminate the results. To address these concerns, we conduct a series of robustness tests. We first match each cross-border deal with a similar domestic deal along a few key target firm and deal charateristics. Our results remain the same. To confirm that the higher levels of abnormal trading before cross-border deals are due to the barriers to enforcing domestic laws on foreign traders, we exploit staggered exogenous shocks to the degree of coordination between securities regulators across country pairs caused by the staggered entry into the first Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU) by securities regulators around the world in 2002 to establish a relation between the strengthening of coordination between financial regulators in two countries and the prevalence of pre-bid insider trading in cross-border deals between two countries. We find that cross-border deals between MMoU signatories are associated with significantly less prevalent suspicious pre-announcement trading activities.

To further validate our measures of insider trading, we perform a validity test to examine whether the measures differ with different levels of insider trading restriction across countries and confirm these measures to be reasonable proxies of insider trading. We also directly gauge the concern that cross-border deals endogenously exhibit a different level of pre-announcement insider trading by performing a falsification test. We look at annual earnings announcements, which also convey important corporate information and often lead to large price movement that potentially induce insider trading and find no difference in the level of insider trading depending on earnings news before earnings announcements between cross-border deals and domestic deals. Overall, we find overwhelming evidence that the level of informed trading is significantly higher before cross-border deals than before domestic deals.

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To provide more evidence on the insider trading activities before merger announcements, we further investigate factors that influence the incentives of insiders linked to foreign acquirers to trade or tip others to trade on the confidential information they have and its effect on insider trading in target firm securities before cross-border M&As. The key channel we explore is that the greater level of informed trading before the announcement of cross-border deals than domestic deals is driven by information leaked from the foreign acquirer side of the deal. However, this difference could also be driven by the leakage of non-public material information by insiders associated with the target firm. For example, cross-border deals may involve more lawyers, investment bankers, or other professionals in the target country than domestic deals and these insiders can trade or tip others to trade on the confidential information but they are located in the target country.[7] In addition, it may take a longer time to negotiate cross-border deals than domestic deals because of the complexity of cross-border deals, which increases the likelihood of information leakage and the number of people in the target country with non-public material information about the forthcoming bids. All of this could result in a higher level of inside trading before the announcement of cross-border deals compared to domestic deals. To answer this question, ideally, we would like to know the source of all trades in the pre-announcement window and then show that these informed trades mainly come from foreign insiders or their tippees. However, such information is not available. With this data constraint in mind, we try to answer this question by examining the cross-sectional relation between the level of informed trading in the pre-bid window and acquirer- and target-country characteristics.

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[7] This concern is partially addressed in our regression analysis because we control for the total number of advisors for both the bidder and the target. However, the control may not be perfect because the number of advisors may not be perfectly correlated with the number of other professionals involved.

Specifically, we first explore how insider trading law and cultural norms in the acquirer country could affect the level of pre-bid insider trading in the target's stock market. In terms of the strictness of insider trading law, countries with weak law and institutions are less likely to or not able to participate in international cooperation. Moreover, citizens in these countries are probably used to the lax regulation environment with respect to insider trading. Consequently, M&A transactions initiated by acquirers from weak-governance countries may provide a breeding ground for information leakage and cross-border insider trading. In terms of social and cultural norms, an emerging literature on the role of culture suggests that cultural norms have significant influence on a person's intrinsic motivation to engage in illicit activities (see for example Cooter (2000), Fisman and Miguel (2007), DeBacker, Heim, and Tran (2012)). Thus, cultural norms may affect insider trading in the target firm securities by acquirer insiders, especially considering that insider trading is a secret individual activity so personal values and social norms are likely to be important determinants of individuals' actions. These insiders are not restricted to top executives and board members in the acquiring firm. Instead, they include everyone who gets access to the confidential information, such as lawyers, investment bankers, financiers, or even financial printers, the so called "constructive insiders". This circle expands quickly as the deal announcement date draws closer and the chance of a leakage increases geometrically. Hence, cultural norms can also have a greater impact on the likelihood of insider trading than internal governance of the acquiring firm. Using a sample of cross-border deals and proxies for country-level insider trading law and cultural norms, we find that cross-boder deals involving acquirers from countries with weak law, poor tax morale, and strong corruption are associated with greater intensity of insider trading. This provides further evidence that some of the trades on the target country's financial market are driven by inside information leaked from foreign acquirers.

On the target side, we also examine how the difference in the level of insider trading between cross-border and domestic deals varies with the legal institutions that restrict insider trading in the target country. In target countries with strong insider trading law enforcement, the law is likely to be strictly binding for domestic insiders but less so for foreign insiders due to barriers to cross-border enforcement. This creates a clear gap in the incentives of domestic and foreign insiders to trade on their inside information, making the difference between cross-border and domestic deals easier to detect and statistically more significant. Consistent with this conjecture, we find that the difference in informed trading is significantly larger when the target firm is in a country with stricter inside trading law.

As robustness checks, we compare the level of insider trading in cross-border deals between countries that have close relations, specifically the U.S. and Canada, we find that cross-border deals between the U.S. and Canada are not associated with higher levels of insider trading, while cross-border deals involving acquirers from other parts of the world exhibit a significantly higher level of insider trading. We also estimate the difference in the pre-announcement run-up ratio between cross-border deals and domestic deals and find that the average fraction of the total event impact that is realized in the stock price in advance of the merger announcement is significantly larger in cross-border deals than in domestic deals.

Lastly, we examine the difference in insider trading on the options markets. An important advantage of examining option trading is that insider trading can be more precisely detected because insiders are likely to trade in certain series of stock options among all the series which are traded at the same time. Suspicious trading in these particular series relative to other series provides strong evidence that traders have inside information. Due to the lack of data on equity options in countries other than the U.S., we focus on the subsample of cross-border and domestic deals

involving US targets with traded equity options. We construct a *Max* and a *Sum* measure of unusual call volume in a similar way to our stock market measures. Since a target firm can have multiple series of traded options which differ in maturities and strike prices, we aggregate the number of calls traded each day into a single daily volume. Then, we construct the *Max* and *Sum* measures. We only consider calls because buying calls generate higher returns than selling puts when the underlying stock prices go up. If a trader has accurate inforamtion about the announcement date of a deal, then short-dated options that expire shortly after the announcement date should be preferred to long-dated options. Hence, we only include options that expire within 60 days of the deal announcement date. Consistent with the stock market finginds, we find that abnormal call option volume is significnatly higher in the preannouncement periods of cross-border deals than domestic deals.

Overall, these patterns suggest that the difference in the level of insider trading is at least partially driven by information leakage from the acquirer side due to the barriers to enforcement of target country laws on insiders located in foreign acquirer countries. Although we do not have direct evidence on foreign insiders trading before merger announcements and thus have to rely on circumstantial evidence, it would be difficult to reconcile these cross-sectional variations with alternative explanations we illustrate above. The cross-sectional variations are also important on their own because they help us better understand the determinants of insider trading before the announcements of cross-border deals and such information can help regulators to focus on deals that are most prone to insider trading.

Our study relates to several strands of literature. First, it is linked to a large insider trading literature that documents significant abnormal trading before major corporate announcements. Most of these studies focus on insider trading in the U.S. We contribute to this literature by

providing evidence of abnormal trading in target firm securities in 52 countries. Similar to our study, Griffin, Hirschey, and Kelly (2011) also examine insider trading using an international sample of takeovers but they focus on the cross-country differences in domestic inside trading. To the best of our knowledge, we are the first study to examine how the level of abnormal trading is different before cross-border deals and domestic deals. Although barriers to cross-border law enforcement have the potential to lead to more aggressive insider trading before the announcements of cross-border deals than before domestic deals as we argue in the paper, foreign insiders may face other constraints in cross-border trading or cross-border tipping. Hence, it is an empirical question as to whether this is actually happening systematically in practice. Our evidence suggests that it is, which raises an important red flag for regulators and policy makers. In addition, most of the existing studies of trading on inside information use U.S. data and have focused on various U.S. insiders, such as registered corporate insiders, wealthy individuals, and institutional investors (Bodnaruk, Massa, and Simonov (2009), Agrawal and Nasser (2012), Cohen, Frazzini, and Malloy (2008), Griffin, Shu, and Topaloglu (2012)). Although we do not have data on the identity of all traders who trade before the acquisition announcement, our evidence suggests that in cross-border deals a significant number of insider trades could potentially be traced to foreign insiders and their tippees.

Second, our paper is related to the stream of research that examine the effectiveness of insider trading law and enforcement actions in the U.S. (Seyhun (1992), Agrawal and Jaffe (1995), Bhattacharya et al. (2000), Del Guercio, White, and Ready (2015)). In general, these studies find both public and private enforcement of insider trading laws have some deterrence effects on insider trading. Del Guercio, White, and Ready (2015) find that more aggressive SEC public enforcement of insider trading laws in recent time periods in the U.S. has significantly reduced the prevalence

of insider trading prior to earnings and takeover announcements relative to the 1980s. These studies either focus on trades by registered insiders in U.S. firms or implicitly assume that the deterrence effect of insider trading law in the U.S. is the same for domestic and foreign insiders. In contrast, our evidence suggests that insider trading law and enforcement actions have a weaker deterrence effect on foreign insiders than domestic insiders.

Third, this paper is related to the literature on cross-country spillovers. A number of papers show that cross-listing on foreign exchanges with stricter corporate governance and disclosure requirements bond a firm to higher governance standards and thus causes a positive governance spillover to the cross-listing firm (Reese and Weisbach (2002), Doidge (2004)). In parallel, some studies document a positive corporate governance spillover through cross-border mergers and acquisitions (e.g. Rossi and Volpin (2004), Bris, Brisley, and Cabolis (2008), Martynova and Renneboog (2008)). Overall, these papers document a positive impact of cross-border transactions on the internal governance of firms. In contrast, we show that, in terms of financial markets, cross-border mergers and acquisitions can have a negative effect on the integrity of financial markets globally and the negative effect varies with the social and cultural norms of the acquirer country.

Fourth, we contribute to an emerging literature on how social and cultural norms affect economic behaviour. Fisman and Miguel (2007) show that corruption norms are positively related to parking violations by UN diplomats in New York City. DeBacker, Heim, and Tran (2012) find U.S. firms with foreign owners from countries with higher corruption norms evade more taxes. We show that social and cultural norms that are more tolerant of illicit activities and corruption are also related to more exploitation and leakage of inside information about forthcoming mergers.

The rest of our paper is organized as follows: Section 2 describes the data and sample; Section 3 presents the baseline results and robustness tests; Section 4 provides additional analyses; and Section 5 concludes.

2. Data and Sample

2.1. Constructing the Sample

Our international M&A sample is extracted from Thomson Reuters Securities Data Corporation (SDC) database. We begin with all deals announced between 1991 and 2017 and then apply a series of filters. First, we require the percentage of shares sought by the acquirer in the target to be greater than 50% and the deal value paid by the acquirer, excluding fees and expenses, to be greater than US$1 million. Then, we exclude LBOs, spinoffs, recapitalizations, self-tender offers, exchange offers, repurchases, partial equity stake purchases, acquisitions of remaining interest, and privatizations. Lastly, since we examine trading in target firm securities, we require target firms to be publicly listed and have stock trading data available in the Datastream database. To capture the idea that it is more difficult for target country regulators to investigate insider trading by traders located in a foreign country, we define acquirer country by the geographic location of its headquarters rather than the acquirer's stock listing country. Acquisition decisions are made at the acquirer's headquarters, hence the acquirer headquarters country should be where most people with inside information from the acquirer side reside. Besides acquirer employees, this group also includes the professional class of people who are hired by the acquirer to work on the deal, such as investment bankers and lawyers and anyone who are tipped by these insiders. Since insider trading is a violation of the laws of the country where the trading takes place, the regulators of the trading market are usually the first to discover and investigate it. Hence, we define

target country to be the target firm's stock listing country rather than its headquarters country. For most target firms, this distinction is unimportant because most firms have its main stock listing in its headquarters country. However, a small number of target firms, mostly headquartered in emerging markets, have no listings in their headquarters country. When such a firm is acquired by another firm in its headquarters country, although it is a domestic deal by headquarters countries, the incentives of insiders to trade illegally are more similar to that of foreign insiders in a cross-border deal because insider trading is monitored by regulators outside the insiders' residence country where most of the incriminating evidence lies. Our definition of target country has the benefit of classifying these deals as cross-border deals, which aligns with the spirit of distinguishing cross-border and domestic deals in this paper. Of course, when such a firm is acquired by a firm from its stock listing country, our definition would classify the deal as a domestic deal despite the fact that insiders in the target firm have incentives similar to that of insiders in a foreign acquirer to trade illegally in the target firm's listing country. However, this misclassification should bias against finding a significant difference between insider trading before cross-border and domestic deals.

Some target firms are the target of multiple bids within a short period of time. This occurs either because of the emergence of competing bids or sequential bids by the same bidder with different terms. Because these events may contaminate our insider trading measures, we exclude M&A deals that are preceded by other M&A announcements made for the same target firm within the prior 12 months. We also exclude deals with less than 60 non-zero trading days in the target stocks before the announcement. As the main focus of our analyses is on the pre-announcement trading activities in a target's stock market, we need to make sure there are enough number of both

domestic and cross-border deals within a target country for comparison. We therefore exclude

target countries with fewer than five domestic and five cross-border deals in our sample period.

The final sample consists of 10,600 mergers and acquisitions covering 14,510 firms across

33 target countries and 65 acquirer countries. We obtain firm financial statement data from

Datastream and Worldscope. Table 1 describes the total number and value of cross-border deals

in our sample by year. About a quarter of M&As in our sample are cross-border deals by either

deal number or deal value. There is a clear increasing trend in the number and value of cross-

border deals over time. Between 1991 and 2017, the percentage of cross-border deals increased

from 11.11% to 34.7% in number and from 9.46% to 34.54% in value. Table 2 reports the

distribution of cross-border deals by target and acquirer country. The U.S., Canada, and the U.K.

are the top three acquirer countries as well as the most popular target countries. Thirty-two

countries, including China, Ireland, have fewer than 5 public firms being targeted by foreign

acquirers over our sample period. However, they are active bidders of foreign firms.

2.2. Measuring Insider Trading Activity

Since the insider trading we study can be done by a wide range of people with private

information, most of whom are not required to disclose their trades to the public, we can only rely

on indirect measures that are based on abnormally large stock returns and trading volumes in the

days leading up to the deal announcements to assess the level of insider trading activities. We

follow Acharya and Johnson (2010)[8] and construct two return-based measures of suspicious

trading in a target firm's stock. The data for the calculation is from Datastream International.

Specifically, we first estimate a regression model to establish the normal level of a target firm's

daily stock return using daily data 90 days prior to the deal announcement. The independent

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[8] We have also constructed abnormal trading measures using the CAR model and the constant model with similar results.

variables of the model include a constant, lagged daily return of the target firm stock, day-of-week dummies, and contemporaneous daily return of the target firm's Datastream local country stock market index. The daily residuals from the regression is then standardized by the sample standard deviation of the residuals. We then use the standardized daily residuals to construct two measures of abnormal stock trading activities over each of the two event windows, [-5 day, -1 day], and [-10 day, -1 day] relative to the deal announcement date (event data 0). Two event windows are used to increase the likelihood of detecting insider trading. If there are systematic differences in the timing of insider trades by foreign and domestic insiders, then using a longer window increase the chance to capture all of them but at the expense of greater noises in the measure. The first measure, *Sum*, equals the sum of all positive daily standardized residuals in the event window. The second measure, *Max*, equals the maximum daily standardized residuals over the event window. The *Sum* measure is designed to detect insider trades by traders who break up their trades over days in order to minimize their price impacts. The *Max* measure is designed to detect aggressive trading by insiders with short-lived information or facing strong competition from other insiders who concentrate their trades in one day. The two measures complement each other in detecting different strategies of insider trading. Since we do not have information on which trading strategy is employed by insider traders in each deal, using both measures increase the likelihood of detecting insider trading. Although on average these measures should be positively correlated with the existence of insider trading, it should be noted that we use these measures to identify cross-sectional variation in the likelihood of suspicious trading across deals, not to assess the occurrence of insider trading before any particular deal.

2.3. Measuring Country-level Law and Institutions against Insider Trading

To identify the effect of country-level insider trading law on the level of insider trading activity in domestic and cross-border deals, we use three main indexes to proxy for the strictness of a nation's insider trading law. All the three measures have been widely adopted in both law and finance literature. The first measure is the insider trading restriction index (*IT Restriction*) from the 1996, 1998 and 1999 Global Competitiveness Report based on the following question: "Insider trading is not common in the domestic market (1 = strongly disagree, 7 = strongly agree)". Following Denis and Xu (2013), we take the average of all executive responses in a given country as the country's index value. Larger values of the index indicate greater insider trading restriction within the country. The second measure is the insider trading law index (*IT Law*) obtained from Beny (2005) which ranges from 0 to 4. It measures the strictness of insider trading laws in a country. This index is calculated by summing one for each of the four statements which is true: 1) insiders are prohibited from tipping outsiders about material non-public information and/or encouraging them to trade on such information for private gain; 2) tippees are prohibited from trading on material non-public information they have received from corporate insiders; 3) monetary penalties are expected to be greater than the insiders' trading profits; and 4) violation of the insider trading law is a criminal offence[9].

The third measure we use is Rule of Law. We extract this measure from the Worldwide Governance Indicators (WGI) constructed and updated annually by the World Bank. It measures, as described in the WGI dataset, "perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence". Rule of Law measures

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[9] Detailed definition and construction of the public enforcement index are described in Beny (2005).

the power of legal institutions in a country that restricts insider trading in general. Higher values of this index indicate greater strength. Unlike the first two measures which are time-invariant, the Rule of Law index allows for time-varying changes in the scores of each country and is more up-to-date. The values of these indexes for each country are presented in Appendix A2.

2.4. Measuring Acquirer Country Cultural and Social Norms

We employ two measures to capture individuals' tendency to participate in unethical activities in a country. The first measure is the annual Corruption Perception Index (CPI) published by Transparency International. It is computed annually based on the informed views of analysts, business people and experts from different countries. Countries with higher levels of corruption have lower CPI values. To make interpretation easier, we reverse the CPI scale. In our analyses, a higher corruption index corresponds to a higher level of corruption.

The second measure uses a dataset, the World Values Survey (WVS), which provides detailed survey responses from representative national samples of at least 1000 individuals within a country across more than 80 countries and over several years. The survey collects comparative data on values and belief systems among peoples around the world. All surveys are conducted through face-to-face interviews at the respondents' homes and in their respective national languages. Survey data from the WVS have been widely used in the finance and economic literature (e.g. La Porta et al. (1997), Dyck and Zingales (2004), Alm and Torgler (2006), Pevzner, Xie, and Xin (2015)).

We measure the tendency of people to disobey rules and laws based on the following question from the WVS:

Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between (on a ten-point scale where 1 = never and 10 = always): Cheating on taxes if you have a chance.

Survey respondents are asked to choose a score from a ten-point scale. Due to the qualitative nature of this question, the natural cut-off would be at the value of one. Thus, we recode the responses to the question to one if a survey participant reports that the action can never be justifiable and zero otherwise. We then calculate a country-level measure by aggregating and averaging the recoded responses within each country.

A summary of index values for each country is reported in Appendix A2.

2.5. Other Variable Definitions

In our multivariate analyses, we control for other determinants of daily abnormal stock return identified by prior studies. We control for target firm size, leverage, book-to-market ratio, stock volatility, stock liquidity measured by turnover and the Amihud (2002) illiquidity measure, and target firm beta. We also control for several deal characteristics including bid premium, an indicator for cash deals, the number of advisors, and an indicator for rumoured deals. A larger bid premium implies greater potential benefits to be made from trading on private information and hence increases the incentive of insiders and their tippees to trade on inside information. Augustin, Brenner, and Subrahmanyam (2019) find that informed trading in equity options is more pervasive in cash offers. Acharya and Johnson (2010) show that the more insiders involved in a deal, the more insider trading activities in private buyout deals. We therefore control for the number of advisors involved on both sides (acquirer and target) of the deal to make sure that the difference is not due to a larger number of advisors involved in cross-border deals than domestic deals. Price run-up can also be driven by rumours about a forthcoming deal. Trading on rumours is not in

general considered insider trading. If cross-border deals are more likely to be preceded by rumours, then higher price run-up for cross-border deals merely reflects higher level of insider trading based on legitimate information. We expect at least some of these variables to be associated with the level of insider trading activity. All variables are winsorized at the 1% and 99% level.

We present the summary statistics of all control variables in Table 3 by cross-border and domestic deals. The table shows some systematic differences between cross-border and domestic deals in target firm and deal characteristics. For example, cross-border deals are on average more likely to be financed by cash. On average, 63.6% of cross-border deals have the majority (greater than 50%) of the transaction value paid in cash, compared to 51.2% of domestic deals. Moreover, cross-border deals in general involve larger target firms and pay a higher premium compared to domestic deals. Cross-border deals on average also have more advisors than domestic deals. The log of number of advisors is 4.012 for cross-border deals compared to 3.341 for domestic deals. Cross-border deals, as we expected, are highly different from domestic deals in terms of almost all target and deal characteristics. These differences highlight the importance of controlling for target and deal characteristics in multivariate regressions.

Panel B of Table 3 reports univariate comparisons of levels of abnormal stock returns in event windows [-5, -1] and [-10, -1] respectively between domestic deals and cross-border deals. On average, the abnormal stock returns for both domestic and cross-border M&A announcements are significantly positive, suggesting that both types of deals are on average preceded by abnormal trading. The difference in means between domestic and cross-border deals is significant at the 1% level for both *Sum* and *Max* measures of abnormal return in both windows. For instance, the first column of the table shows that the mean *Sum* over the (-5 day, -1 day) event window is 4.7% higher for cross-border deals than domestic deals (2.375 vs. 2.268). The difference is consistent

with our hypothesis that cross-border M&A deals are associated with a higher level of insider trading activity compared to domestic deals.

3. Empirical Results

In this section, we present the empirical tests for our hypotheses. We first report the baseline relation between our measure of pre-bid abnormal trading and a cross-border M&A indicator in the full sample in a multivariate regression framework. We then conduct several robustness checks to attribute the relation to the presence of foreign insiders in cross-border M&As.

3.1. Baseline Analyses

Although the univariate results are supportive of our hypothesis, the difference in insider trading between cross-border and domestic deals can be due to systematic differences in country-, firm-, or deal-level differences between the two types of deals. To control for these differences, we estimate multivariate regressions to better isolate the effect of cross-border deals on the level of insider trading. Table 4 reports the regression results. The dependent variables are our SUM and MAX measures of insider trading. The key independent variable, *Cross*, is a dummy variable which equals one if the deal is cross-border and zero if the deal is domestic. We control for target firm size, deal premium, method of payment, target firm book-to-market ratio, target firm leverage, target stock volatility, target firm beta, target stock liquidity, number of advisors, toehold dummy, and rumour dummy as control variables. In all specifications, we include target country by year interaction fixed effects to control for time-varying macroeconomic and target country specific factors. We also include Fama-French 48 industry fixed effects to control for time-invariant industry unobservable variables that may correlate with insider trading activity and cross-border deal. We cluster standard errors by target country and year in all specifications to account for

within-country-year correlation. If cross-border deals are associated with greater level of insider trading, we expect the coefficient of the cross-border deal indicator to be positive and significant.

We find that the coefficients on the cross-border deal indicator are positive and statistically significant for both the *Sum* and *Max* measures of abnormal return in both event windows. Consistent with the univariate test results, these findings indicate that cross-border deals are associated with a higher level of suspicious stock trading, and they support our hypothesis that cross-border deals are more prone to insider trading activity. In terms of control variables, pre-announcement abnormal trading is significantly positively related to target size. Stock volatility is associated with significantly lower abnormal return which is consistent with Acharya and Johnson (2010). Greater level of suspicious trading is also significantly associated with higher deal premium. Moreover, in all specifications, rumoured deals are associated with significantly higher *Sum* and *Max*. The relation between these controls and trading activity prior to deal announcements is generally consistent with insider trading behaviors. This lends additional confidence that our measures of suspicious trading have the power to capture trading by informed agents. Later in the paper, we provide other evidence to further validate our measures of insider trading.

3.2. Robustness Checks

Although our baseline results are consistent with foreign insiders being more aggressive in inside trading than domestic insiders, the results have to be interpreted with caution because the difference can be driven by other unobserved differences between domestic and cross-border deals. We conduct several robustness checks to address this concern. Results from these robustness tests are summarized below.

3.2.1. Matched Sample Tests

It is possible that firms being targeted in cross-border deals are systematically different from those in domestic deals and our results are driven by these differences. To mitigate this concern, we matched each cross-border deal in our sample with a similar domestic deal. Specifically, we use the propensity score matching (PSM) procedure, where matching is based on all target- and deal-characteristics controlled in the baseline model. Within the same industry and trading country of the target firm, we match each cross-border deal with a domestic deal that has a difference in propensity scores no larger than 0.1. Cross-border deals without matched domestic deals are excluded from the sample. Summary statistics of the matched sample are presented in the Appendix A3. Most of the target and deal characteristics are similar with low difference in means and median after matching except target size, book-to-market ratio and volatility.

Table 5 presents the baseline regression results using the matched sample.[10] In both windows, the relation between cross-border deals and suspicious stock trading activity is positive and statistically significant. Comparing cross-border deals with matched domestic deals, on average there is a significantly higher level of abnormal stock trading before the announcements of cross-border deals. These results are consistent with our baseline results, showing that our results are robust to matched sample tests.

3.2.2. The Effect of Improved Cross-border Coordination among Financial Regulators

Foreign traders face lower legal risk than domestic traders because of two barriers to cross-border law enforcement. The first is collecting evidence which can only be accessed by foreign authorities. The second is extraditing the foreign offender to the domestic country to face trial.

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[10] All our regression results presented in the reminder of the paper are based on the matched sample. We repeated all the tests using the full sample and the results are similar.

Closer cooperation between the foreign and the domestic authorities should help to level the legal risk faced by foreign and domestic insiders. In this section, we explore a change in the level of cooperation among securities regulators to address the concern that the higher level of abnormal trading before the announcements of cross-border deals can be driven by trading on legitimate information rather than illegal insider trading.

In 2002, the International Organization of Securities Commissions (IOSCO) initiated a move for its member countries to enter a multilateral memorandum of understanding, the official name of which is Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU). It is the first global multilateral arrangement for improving enforcement cooperation among securities regulators. This MMoU sets a standardized process for cross-border cooperation and facilitates information exchange between signatories in the process of investigating offences relating to illegal activities in the securities markets.[11] According to MMoU, signatories can make requests to one another for information and documents held in files or transaction records in bank and brokerage accounts to be used in civil or administrative proceedings. A person's statement or testimony could also be taken if required. Distinct from earlier bilateral arrangements, the MMoU rigorously reviews the ability of a legal authority to cooperate before it can officially become a signatory, which creates incentives for jurisdictions that are unable to engage in effective information sharing to change domestic legislation to gain the ability. The entry into the MMoU is not mandatory and the actual entry year varies across countries.

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[11] Information requests can be made in the process of investigating a list of offences relating to insider dealing, market manipulation, the issuance and sale of securities and derivatives, market intermediaries and exchanges. A full list of the specific types of offences is set out in Paragraph 4 of the MMoU.

The MMoU should strengthen the ability of securities regulator in one signatory country to enforce its domestic insider trading laws on residents of another signatory country. According to the IOSCO website, the number of information requests made under the MMoU has increased dramatically from only 56 requests in 2003 to 4,803 requests in 2017. This suggests that MMoU does have some effects on the information exchange and cooperation among securities regulators. However, since memorandums of understanding are not mandatory, whether the MMoU is effective at raising the legal risk faced by foreign insiders is still an empirical question. To the extent that it does, then the MMoU offers a good empirical setting to test whether the higher level pre-bid insider trading in cross-border deals we document is driven by the differential legal risk faced by domestic and foreign insiders. First, entering into the MMoU by a country pair should only affect illegal insider trading. This provides a sharp test of whether our baseline finding is driven by illegal insider trading or informed trading based on legitimate information because entering into the MMoU by a country pair should only affect illegal insider trading. If we Second, countries entered the MMoU in a staggered fashion after its initiation in 2002. For example, the U.S. Securities and Exchange Commission (SEC) and the Australian Securities and Investments Commission (ASIC) were among the first to enter the MMoU in 2002, while the U.K. Financial Conduct Authority (FCA) signed the MMoU in 2003, the China Securities Regulatory Commission (CSRC) in 2007 and the Japanese Financial Services Agency (FSA) in 2011[12]. This allows us to construct powerful counterfactuals. The MMoU affects cross-border deals in which both the acquirer and target countries are signatories of the MMoU but does not affect cross-border deals in which one or neither country is a signatory of the MMoU. Furthermore, since target firms in a country can be acquired by firms from different countries, we can fully control for any time-

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[12] See a full list of IOSCO MMoU signatories and their formal signing dates here, and the MMoU document here.

varying omitted variables that are related to changes in insider trading in a target country's market while still identify the MMoU effect from variations in the years in which both the acquirer and target countries entered the MMoU across deals involving target firms from the same country. The MMoU effect is identified from changes in insider trading in cross-border deals between an acquirer country and a target country from before to after both countries entered the MMoU relative to that in other deals (both cross-border and domestic) involving target firms from the same country. Lastly, because the decisions to enter the MMoU are made by governments, they are exogenous to decisions to trade illegally by insiders except through the change in legal risk faced by insiders.

We estimate the effect of MMoU in a regression that exploits the staggered treatments of acquirer-target country pairs by the entry into MMoU by both countries as follows:

$$y_k = \gamma Cross_k * MMoU_{ijt} + \theta X_k + \alpha_{ij} + \beta_{jt} + \varepsilon_k$$

where k indexes deals, i indexes acquirer countries, j indexes target countries, and t indexes years. The dependent variable y_k equals to the level of abnormal trading in a preannouncement window for deal k. $Cross_k$ equals 1 when the deal is a cross-border deal and 0 otherwise. $MMoU_{ijt}$ equals 1 if both country i and j have entered the MMoU by year t and 0 otherwise. X_k is a vector of target firm and deal characteristics. α_{ij} terms are acquirer country by target country fixed effects. They control for time-invariant differences in the level of abnormal trading in the preannouncement period for domestic deals in different countries and cross-border deals between different acquirer-target country pairs. β_{jt} terms are target country by year fixed effects. They control for any unobserved time-varying changes in target country j, for example, changes in the strictness of insider trading law enforcement by domestic regulators, that are correlated with the level of abnormal trading in the preannouncement period for all both types of

deals. The coefficient of interest is γ. It measures the average change in y_k from before to after both country i and j entered the MMoU relative to other cross-border deals between country pairs that did not experience a change in their compliance with the MMoU in year $t - 1$ and all domestic deals. If the MMoU is effective at deterring insider trading by foreign insiders and the higher level of abnormal trading before the announcement of cross-border deals is partially driven by illegal insider trading by foreign insiders, then we expect γ to be negative and statistically significant.

Table 7 report the regression results. The dependent variable in column 1 and 2 is the SUM and MAX measure of abnormal stock returns over the preannouncement window (-5 day, -1 day) respectively. In both columns, the coefficient estimate of γ is negative. The coefficient is statistically at 10% level for the SUM measure and at the 5% level for the MAX measure. In unreported results, we find that coefficient estimate of γ is also negative for the SUM and MAX measure over the (-10 day, -1 day) preannouncement window but the estimate is not statistically significant at conventional levels. This is probably due to the larger noises in the dependent variable for the10-day window and the difficulty of detecting the effect of the MMoU. Ex ante, we do not expect the MMoU to have a very large effect on insider trading because cooperation under memorandums of understanding is not mandatory. However, the fact that we are still able to detect some significant effect of MMoU over the 5-day event window provides strong support to our hypothesis that barriers to cross-border law enforcement is a driver of the higher level of pre-bid insider trading in cross-border deals than domestic deals.

3.2.3. Price Run-up Ratio before M&A Announcements

Our current measures of insider trading are based on abnormal price run-ups during the preannouncement periods. An alternative way to measure insider trading is to look at the fraction

of the total price increase of target stock that is realized before the public announcement of the deal. Insider trading during the preannouncement period should cause a greater fraction of the total event impact to be realized prior to the takeover announcement. This suggests that the simple run-up ratio, calculated as the ratio of the abnormal return in the preannouncement period to the total abnormal return from both the preannouncement and announcement periods, can be use a measure of insider trading. Unfortunately, this simple ratio has undesirable properties as discussed in Schwert (1996). The main issue is that measurement errors in the total return can cause the denominator of the ratio to be 0 or flip its sign. To address this measurement error problem, we follow Del Guercio, Odders-White, and Ready (2017) and use a two-stage regression approach to estimate the run-up ratio and test if the average run-up ratio for cross-border deals is significantly greatr than that for domestic deals.

In the first stage, we estimate the expected value of the total return impact of a deal as the fitted value from the following regression model:

$$\tilde{r}_{ijt}^{tot} = \sum_{m=1}^{M} d_m Z_{im} d_j + d_t + +\varepsilon_{ijt}$$

where $\tilde{r}_{ijt}^{tot}$ is the total market-adjusted return from deal i targeting firm in country j in year t. It is calculated as the sum of daily residuals from a market model over event days -20 through +1. The market model parameters are estimated using daily returns over event days -146 through -21 and the market index is the target country's market index in the Datastream database. Following Del Guercio, Odders-White, and Ready (2017), we require positive volume on both the trading day and the previous trading day for a trading day to be included in the estimation, and we exclude trading days with an absolute return exceeding 25%. If the number of trading days after applying these filters is fewer than 100, we calculate the residuals over the next 22 days by subtracting the

daily market index return directly from the target firm's daily stock return. Otherwise, we sum the daily residuals from the market model over the next 22 trading days. Z_{im} terms are observable characteristics of the target firm and the deal. d_j and d_t are target country and year fixed effects respectively.

The second-stage regression gives the estimate of interest and is specified as follows:

$$\tilde{r}_{ijt}^{pre} = a\big[\theta_1 \tilde{r}_{ijt}^{tot} + (1 - \theta_1)E[\tilde{I}_i]\big] + b\big\{Cross_i\big[\theta_1 \tilde{r}_{ijt}^{tot} + (1 - \theta_1)E[\tilde{I}_i]\big]\big\}$$
$$+ \sum_{k=1}^{K} c_k\big\{X_{ik}\big[\theta_1 \tilde{r}_{ijt}^{tot} + (1 - \theta_1)E[\tilde{I}_i]\big]\big\} + \theta_2(\tilde{r}_{ijt}^{tot} - E[\tilde{I}_i]) + d_j + d_t + \varepsilon_{ijt}$$

where $\tilde{r}_{ijt}^{pre}$ is the total market-adjusted pre-announcement returns over event days -20 to -1 for deal i targeting firm in country j in year t. It is calculated in the same way as $\tilde{r}_{ijt}^{tot}$ except the daily residuals are summed over days -20 to -1. d_j and d_t are target country and year fixed effects respectively. The first independent variable in this regression is the weighted average event impact, $\theta_1 \tilde{r}_{ijt}^{tot} + (1 - \theta_1)E(\tilde{I}_i)$, where $E(\tilde{I}_i)$ is the expected total event return estimated from the first-stage regression and the weighing factor, θ_1 ,equals to the ratio of the variance of announcement impacts to the variance in the total returns over the 20-day pre-announcement period and the 2-day announcement period. Its coefficient, a, equals to the average price run-up ratio for domestic deals. The second independent variable is the interaction between the weighted average event impact with a cross-border deal indicator, $Cross_i$. The coefficient of this second term, b, is our variable of interest. It measures the average incremental price run-up ratio for cross-border deals above domestic deals. A positive b indicates that cross-border deals are preceded with more insider trading than domestic deals. The next k independent variables are constructed by interacting the weighted average event impact with each of the control variables, X_{ik}, which are demeaned so that the coefficient estimate of a can be interpreted as the average run-up ratio for

domestic deals in the sample. The last independent variable is the difference between the realized total return impact and the expected total return impact for the event.

Table 7 reports the estimates from the second-stage regression for the full sample and the matched sample of cross-border and domestics deals. In the full sample (Column 1), the coefficient estimate for a is 0.462, which means that the average run-up ratio is 46.2% for domestic deals in our international sample of M&As. What we are interested in is the coefficient estimate for b. Consistent with more insider trading before the announcements of cross-border deals than domestic deals, this coefficient is positive and statistically significant at the 1% level in column 1. The magnitude of the coefficient estimate suggests that the average run-up ratio for cross-border deals is about 53%, which is 6.5% higher (0.038/0.462=.065) than domestic deals. Column 2 reports the estimates from the matched sample of cross-border and domestic deals. The sample size is reduced by 60% due to the drop of unmatched deals, which reduces the power of the test. Nevertheless, we continue to find that cross-border deals are associated with a higher average run-up ratio than domestic deals. The average run-up ratio for cross-border deals is 4.4% higher and the difference is statistically significant at the 10% level.

3.2.4. Validity of our Insider trading Measures

To further validate our measures of insider trading, we examine whether the measures differ with different levels of insider trading restriction across countries. In countries with stronger insider trading laws that curtail insider trading activities, proxies for insider trading should be lower to reflect less intensity of illegal insider trading prior to merger announcements. We conduct the validity test by estimating regressions of the Sum and Max measures of returns and volume on three insider trading law indexes, IT restriction, IT law and Rule of Law, and a series of control variables as well as target country-year fixed effect and industry fixed effects. We use a sample of

only domestic deals to test for cross-country differences in these measures. A higher value of insider trading law indexes should be associated with a lower level of insider trading proxies. For brevity, we only report the results for window [-5, -1][13]. The regression results in Table 8 show a negative and significant relation between our measures of insider trading and country-level insider trading law indexes in most specifications, indicating that our Sum and Max measures of returns and volume are valid proxies for insider trading activities.

3.2.5. Falsification Test

Although we try to account for the difference in target firms between cross-border deals and domestic deals by including a series of target characteristics as controls and fixed effects, our results may still be driven by certain unobservable factors that affect both the choice of target firms by foreign acquirers and pre-announcement abnormal stock trading in these target firms. In this sub-section, we directly gauge this concern by performing a falsification test. If target firms of cross-border deals endogenously exhibit a different level of pre-announcement insider trading, we would observe such pattern before not only merger announcements but also the other corporate announcements.

To test this, we look at annual earnings announcements, which also convey important corporate information and often lead to large price movement that potentially induce insider trading. Specifically, for each target company in our sample, we construct our insider trading proxies in advance of its annual earnings announcements one-year prior to the merger announcements. Unlike merger announcements which are mostly positive news for the target, price reaction to earnings announcements could be either positive or negative depending on good

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[13] To save space, we only present test results for the [-5, -1] window in the reminder of the paper. Results for the [-10, -1] window are materially indifferent.

or bad earnings news. Insider trading would mostly occur according to how much unexpected information the earnings figures contain, i.e. earnings news unanticipated by the market. Therefore, we regress our insider trading measure with the interaction of the cross-border dummy and proxy for earnings surprise to compare the levels of insider trading activities corresponding to earnings surprise before public earnings announcements. Earnings surprise is measured as the difference between the median of analysts' earnings forecast and the actual annual earnings per share (EPS), scaled by the closing price on the announcement day. We control for the same set of target characteristics and fixed effects as in the baseline model as well as variables commonly used in the earnings announcement literature, including the inverse of the closing stock price one-month before the earnings announcement, the number of analyst forecasts for annual EPS before the earnings announcement, negative earnings indicator, and the number of days between the fiscal year end and the earnings announcement date. Data on analyst forecasts and earnings announcements are obtained from the I/B/E/S database.

Table 9 reports the results of the falsification test. Columns 1 and 2 shows the results using the Sum and Max measures of insider trading as the dependent variables. The coefficients of Cross×Surprise in all specifications are statistically insignificant and their magnitude are close to zero. In Column 3, we perform the two-stage regression model for price run-up in advance of earnings announcements and report the second-stage regression results. The coefficient on *Cross* remains statistically insignificant, suggesting that target firms of cross-border deals do not show significantly different level of insider trading depending on earnings news before earnings announcements compared to domestic deals. Therefore, our baseline finding is unlikely driven by potential unobservable features in cross-border targets that endogenously affect the level of insider trading.

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4. Additional Analyses

After establishing robust evidence that the level of pre-announcement insider trading is significantly higher in cross-border deals than domestic deals, we perform additional analyses to explore the key channels behind this finding and provide additional evidence that further support our results. We first examine the cross-sectional relation between the level of insider trading in the pre-bid period and acquirer- and target-country characteristics. We compare the level of insider trading activity in countries with strong and weak insider trading law. We also test how acquirer country social and cultural norms may affect insider trading activities in cross-border deals. We then compare the level of insider trading activity in US-Canada cross-border deals and that in cross-border deals between US/Canada and other countries. Lastly, we examines informed option trading activity prior to the announcement of cross-border deals in the U.S. option market before M&A announcements.

4.1. Acquirer Country Insider Trading Law

Cross-border prosecution puts a host country's regulator in a passive position as it has to rely heavily on international cooperation; however such cooperation is likely to be particularly difficult to achieve in relation to countries with weak regulatory framework. As many emerging economies may suffer from a poor legal environment as well as weak enforcement of existing laws, it is likely that they have either very weak or no insider trading laws, thus making international cooperation less feasible. Consequently, M&A transactions initiated by acquirers from weak-governance countries may provide a breeding ground for information leakage and cross-border insider trading. Furthermore, although insider trading mostly take place in the target trading market, which is outside the acquiror regulator' jurisdiction, strong insider trading law and frequent enforcement in a country generally promote legal awareness and autonomy regarding insider

trading among its citizens. Therefore, we expect cross-border deals with acquirers from countries with strong insider trading law to have a significantly lower level of insider trading compared to those with acquirers from weak-governance countries.

Using a sample of cross-border M&A deals around the world, we regress each insider trading measure as the dependent variable on three acquirer country law indexes extensively used in the literature. The first measure is the Insider Trading Restriction Index (*IT Restriction*) constructed based on the survey responses from the 1996, 1998 and 1999 Global Competitiveness Report. The second is the Insider Trading Law Index (*IT Law*) from Beny (2005). Unfortunately, up-to-date data for both indexes are not available. Thus, the two indexes may not correctly reflect the strictness of insider trading law for the recent years, especially for countries that introduced legislative reform regarding insider trading. To address this concern, we limit our sample period up to 2006 for the tests. For robustness, we use a third measure of country-level law quality, the Rule of Law as reported by the World Bank. The Rule of Law is frequently updated until recently which allow us to use the whole period of our sample for the analyses. We include target-country-year fixed effects and industry fixed effects in all specifications.

As reported in Table 10, the coefficients of all indexes are negative and statistically significant, which are consistent with our conjecture. Among cross-border M&As targeting firms in a country, those involving acquirers from strong-governance countries are associated with a lower level of pre-announcement insider trading, compared to those involving acquirers with weaker country-level insider trading law.

4.2. Acquirer Country Social Norms

We further examine whether differences in value, social norms, and attitudes across acquirer countries affect the frequency and intensity of insider trading among cross-border M&A

deals within the same legal environment of the target country. Besides legal considerations, the incentives of foreign acquirer insiders to trade or tip others to trade on the confidential information they have are also influenced by social or cultural factors. As related parties in the acquirer country, either corporate insiders or other agents such as lawyers, consultants, and investment bankers, start to possess confidential information, the decision of whether to profit out of the non-public information is usually bounded by the behavioural standards that their society adopts and follows as a whole. According to the theory of norms and the law proposed by Cooter (2000), violations of laws are not only legal and economic decisions but also involve social and ethical considerations. Within a society, social norms basically take the form of approval or disapproval from the other members from the society, and it usually guide an individual's feelings of pride or shame. When a social norm has been internalized in an individual's own value system, behaviour following or against the norm will also result in feelings of self-respect or guilt. Therefore, norms can impact individuals' decisions on whether to comply with the law, especially legal requirements that are not consistent with norms. In the case of insider trading, although it is illegal, norms may fail to consider insider trader to be unethical. Societies that collectively place less importance on stopping insider trading behaviour can simultaneously have weak anti-insider-trading social norms. If market participants' values are influenced by cultural norms, then cross-cultural differences may be an important determinant of market participants' compliance with the insider trading law and other forms of behaviour even in the same legal environment.

Therefore, market participants from countries where insider trading behaviour are collectively considered acceptable may exhibit lower level of compliance with the insider trading law in a foreign country. All though we don't have a direct measure of a country's attitudes towards insider trading, we adopt two measures that capture individuals' tendency to disobey rules and

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laws in a country from different perspectives. The first measure is the annual Corruption Perception Index (*CPI*) published by Transparency International. It measures the corruption level of a country. We reverse the CPI scale so a higher corruption index corresponds to higher levels of corruption. Corruption social norms can also reflect individuals' tendency to participate in illicit or unethical activities. Fisman and Miguel (2007) study parking violations among United Nations diplomats living in New York City and show that diplomats from countries with high level of corruption accumulated significantly more unpaid parking violations. DeBacker, Heim, and Tran (2012) find that corporations with owners from high corruption countries evade more tax in the U.S. The *CPI* is one of the most commonly used indicator of corruption worldwide and has been employed in several academic studies (e.g. Djankov et al. (2002), Barth et al. (2009), DeBacker, Heim, and Tran (2015)).

The second measure, *Cheat on Tax*, is from the World Values Survey (WVS). It measures the tendency of people in a country to disobey rules and laws based on their attitude toward cheating on tax. We choose this cultural value because it is closely related to the behaviour of insider trading. Similar to insider trading, illegal tax evasion is not universally accepted as highly unethical. Tax morale generally reflect individual's social norm of compliance in a country. Alm, Sanchez, and De Juan (1995) use experimental methods and find that higher tax compliance can be attributable to higher "social norm" of compliance. Dyck and Zingales (2004) use this question to measure a country's rate of tax compliance and establish a negative association between tax compliance and private benefits of control. Therefore, the level of tax morale in a society should to some extent be positively correlated with the extent to which insiders linked to foreign acquirers obey their fiduciary duty to the shareholders in their firm. We expect that, among all cross-border deals targeting firms in a given country, the intensity of insider trading prior to the deal

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announcement should be higher if the acquirer is from a country with social and cultural norms that are more tolerant of illicit activities.

We estimate the same regression model as in the previous section but replace the main explanatory variable with our culture indexes and present the regression results in Table 11. Columns 1and 2 report the results using CPI as the key independent variable, while Columns 3 and 4 show the results for Cheat on Tax. As shown in the table, the coefficients on both *CPI* and *Cheat on Tax* are positive and significant, suggesting that the level of insider trading prior to the announcements of cross-border deals is significantly negatively related to the acquirer country's level of corruption and tax morale.

4.3. Target Country Law and Institutions against Insider Trading

We next examine how difference in the level of insider trading between cross-border and domestic deals varies with legal institutions that restrict insider trading in the target country. Insider trading before takeover announcements mainly occur in target firm securities because a large rise in target stock price is an almost sure event. Since firms typically list stock in their headquarters country, the target country regulators provide the main oversight of insider trading in target securities. If barriers to cross-border law enforcement drive the difference in insider trading between cross-border and domestic deals, we expect the difference to vary with the strictness of insider trading law in the target country. In target countries with strong insider trading law enforcement, insider trading law is likely to be binding for domestic insiders. The barriers to cross-border law enforcement creates a clear wedge in legal risks faced by foreign and domestic insiders in this setting, making the difference in the level of insider trading between cross-border and domestics deals stand out more sharply. In contrast, in target countries with weak insider trading law enforcement, regulators either lack incentives or the necessary power, means, and tools

to effectively deter insider trading even by domestic insiders. As a result, the barrier to cross-border law enforcement is a much less important factor in determining the level of insider trading. Hence, we expect that the difference between cross-border and domestic deals is likely to be more difficult to detect and statistically less significant.

To test this prediction, we interact our cross-border dummy with our country-level insider trading law proxies and present the regression results in Table 12. Each cross-border deal in our sample is matched with a domestic deal by target- and deal-characteristics using the propensity score matching (PSM) procedure. Cross-border deals with no matched domestic deals are excluded from the sample. Columns 1 through 4 report the results for IT Restriction and IT Law for the sample period from 1990-2006, while Columns 5 and 6 for the Rule of Law using the full sample period from 1990-2017. We obtain consistently positive and significant coefficients on the interaction terms of *Cross* and the three law proxies, suggesting that the difference in the level of insider trading between cross-border and domestic deals is significantly positively related to the strictness of insider trading law in the target country. These results are consistent with our hypothesis that the wedge in the legal risk faced by domestic and foreign insiders is greater in target countries with stricter insider trading laws.

4.4. Insider trading activity within and outside the US-Canada Group

In this section, we examine the level of insider trading in cross-border deals between countries that are closely connected, specifically the United States (US) and Canada. Due to geographic and historical conditions, the US and Canada share not only the longest international border, but also deeply integrated economies in the world. They enjoy the largest bilateral trade and the closest investment relationship in the world. For example, there is no tariff on most goods passed between the two countries since 1987. More than $1.8 billion bilateral trade a day in goods

and services take place cross the border of US and Canada. The two countries also work closely from federal level to local level in security and law enforcement. Given the close relations and thus cooperation between the two counties, our hypothesis suggests that cross-border deals between these two countries should not display significantly higher insider trading activity compared to domestic deals.

To test this conjecture, we limit our sample to deals with targets only in these two countries while no restrictions are imposed on the acquirer country. We create two indicator variables to represent deals within and outside the US-Canada group. Specifically, *US_CA_Group* is a dummy variable that equal to one if a deal is a cross-border deal and the foreign acquirer is from US or Canada, and zero otherwise. *Non_US_CA_Cross* equals one if a deal is a cross-border deal but the foreign acquirer is from neither the U.S. nor Canada, and zero otherwise. We estimate a regression where the dependent variable is a measure of abnormal trading activity and the key independent variables are these two dummies. Table 13 shows the regression results of this analysis. Consistent with our prediction, the results show that cross-border deals between US and Canada are not associated with higher abnormal trading activity than domestic deals, while cross-border deals involving acquirers from outside the U.S. and Canada exhibit significantly higher level of insider trading than domestic deals. This finding provides further evidence that closer legal integration between two countries reduces the difference in the level of insider trading between cross-border and domestic deals.

4.5. Informed Option Trading in U.S. Target Firms

Prior to M&A announcements, insider trading may also exist in the equity option market. We lastly examine if cross-border deals are associated with a higher level of suspicious option trading prior to the deal announcement. We obtain daily option trading data from the

OptionMetrics database, which is only available for U.S. firms. We match this data with all deals in which the target firm is a U.S. public firms. Of the 4,466 M&A deals targeting U.S. firms in our sample, only 1,209 deals have available option trading data. Thus, the subsample for this analysis covers 1, 209 deals with available option trading data from 1990 - 2017. We focus on the daily trading volume of all call options because buying calls generate higher returns than selling puts when the underlying stock price goes up. If a trader has accurate inforamtion about the timing of the public announcement of the deal, then short-dated options that expire shortly after the announcement date should be preferred to long-dated options. Hence, we only include options that expire within sixty days[14]. Following Acharya and Johnson (2010), we estimate the benchmark level of daily call volume using a regression that includes a constant, lagged option volume, lagged volume and returns of the underlying stock, and contemporaneous market volume using daily data 90 days prior to the announcement date. Similar to the stock data, we calculate *Sum*, the summation of the estimated daily standardized residuals, and *Max*, the maximum of the standardized residuals in windows [-5, -1]. We also employ a second measure that scales option volume by delta. We calculate *Sum* and *Max* for delta scaled option volume. The data for delta is obtained from the OptionMetrics database using end-of-day pricing and implied volatilities based on a binomial model.

Table 14 reports the regression results for evidence of informed option trading. The results are similar to those on the stock markets. Cross-border deals are preceded by significantly higher level of suspicious option trading activity compared to domestic deals, controlling for a number of

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[14] We have also investigated trading activities for options with maturity less than 30 days, 90 days, one year, and all types of options. We obtain very similar results.

control variables and fixed effects. This indicates that foreign informed traders also take advantage of their private information by trading call options in the option market.

4. Conclusions

The combination of cross-border M&As and barriers to cross-border law enforcement creates a situation where insiders linked to a foreign acquirer can trade on insider information in target firm securities without the same level of fear as insiders linked to a domestic acquirer. In this paper, we examine whether this has led to more aggressive insider trading before the announcement of cross-border deals than that of domestic deals. Using a sample of 10,600 mergers and acquisitions covering 14,510 firms across 33 target countries and 65 acquirer countries from 1990 to 2017, we find that the level of abnormal trading in target firm stocks is significantly higher before cross-border deal announcements than domestic deals. This finding is robust to a batch of robustness tests. We argue that this is driven by the insiders linked to foreign acquirers exploiting the barriers to cross-border law enforcement to either trade on the non-public information directly or to tip others to trade on it in the target firm securities.

To trace the higher level of insider trading to trading or tipping by insiders linked to foreign acquirers, we exploit staggered exogenous increases in cooperation between regulators in different country pairs and find that pre-bid insider trading in target stocks significantly fall for cross-border deals between country-pairs after both countries signed the multilateral memorandum of understanding sponsored by International Organization of Securities Commissions to cooperate on information exchange and assistance. We also examine cross-sectional variations in the level of insider trading between cross-border and domestic deals with target and acquirer country characteristics. Consistent with law and culture affecting the incentives of insiders to conduct illicit trading activities, we find that among cross-border M&As targeting firms in a country, those

involving acquirers from strong-governance countries and from countries with social and cultural norms that are more tolerant of tax avoidance and corruption are associated with a significantly lower level of pre-announcement insider trading.

When looking at the strength of insider trading law governing the target trading markets, we argue that in target countries with strict insider trading law enforcements, the insider trading law is likely to be strictly binding for domestic insiders but clearly less so for foreign insiders due to barriers to cross-border law enforcement. This creates a clear gap in the incentives of domestic and foreign insiders to trade on their inside information, making the difference between cross-border and domestics deals easier to detect and statistically more significant. Consistent with this, we find the difference in level of insider trading between cross-border and domestic deals is more significant when the target country has stricter insider trading law enforcement or stronger rule of law.

When comparing the level of insider trading in cross-border deals between the U.S. and Canada. We find that cross-border deals between the two closely connected countries does not show significantly more insider trading compared to domestic deals given the extensive regulatory cooperation between them, while cross-border deals between the US-Canada group and the rest of the world exhibit more frequent insider trading activities.

We finally test whether such difference also exists in the option market using a smaller sample of M&A deals with target companies from the U.S. where detailed option trading data is available. Similar to the stock markets, we find evidence that cross-border deals are linked to significantly higher level of suspicious call option trading activity compared to domestic deals. This indicates that insider market participants also take advantage of their inside information by

trading call options in the option market and they trade heavier before the announcements of cross-border deals.

Overall, our results are consistent with an equilibrium outcome where foreign insiders have greater incentives than domestic insiders to trade directly or tip others to trade on inside information before the announcement of M&A deals due to barriers to cross-border law enforcement. Our evidence shows an important way in which cross-border M&As have negatively affected the integrity of the financial markets around the world and raises an important question for regulators to address in the era of globalization.

To our knowledge, we are the first to explicitly study the consequences of a divergence between fast economic integration and slow progress in legal cooperation in the globalization process. Insider trading before the announcement of cross-border M&As is just one manifestation of potentially many other negative consequences that have not been systematically known yet. Future research can expand on our framework and identify other activities that regulators and policy makers should pay close attention to and devise ways to solve in the process of globalization.

References

Acharya, Viral V., and Timothy C. Johnson, 2010, More insiders, more insider trading: Evidence from private-equity buyouts, *Journal of Financial Economics* 98, 500–523.

Agrawal, Anup, and Jeffrey F. Jaffe, 1995, Does Section 16b deter insider trading by target managers?, *Journal of Financial Economics* 39, 295–319.

Agrawal, Anup, and Tareque Nasser, 2012, Insider trading in takeover targets, *Journal of Corporate Finance* 18, 598–625.

Alm, James, Isabel Sanchez, and Ana DE Juan, 1995, Economic and Noneconomic Factors in Tax Compliance, *Kyklos* 48, 1–18.

Alm, James, and Benno Torgler, 2006, Culture differences and tax morale in the United States and in Europe, *Journal of Economic Psychology* 27, 224–246.

Augustin, Patrick, Menachem Brenner, and Marti G. Subrahmanyam, 2019, Informed Options Trading Prior to Takeover Announcements: Insider Trading?, *Management Science*, mnsc.2018.3122.

Barth, James R., Chen Lin, Ping Lin, and Frank M. Song, 2009, Corruption in bank lending to firms: Cross-country micro evidence on the beneficial role of competition and information sharing, *Journal of Financial Economics* 91, 361–388.

Beny, Laura Nyantung, 2005, Do insider trading laws matter? Some preliminary comparative evidence, *American Law and Economics Review* 7, 144–183.

Bhattacharya, U, Hazem Daouka, Brian Jorgensonb, and Carl-Heinrich Kehrc, 2000, When an event is not an event: the curious case of an emerging market, *Journal of Financial Economics* 55, 69–101.

Bodnaruk, Andriy, Massimo Massa, and Andrei Simonov, 2009, Investment banks as insiders and the market for corporate control, *Review of Financial Studies* 22, 4989–5026.

Bris, Arturo, Neil Brisley, and Christos Cabolis, 2008, Adopting better corporate governance: Evidence from cross-border mergers, *Journal of Corporate Finance* 14, 224–240.

Bris, Arturo, and Christos Cabolis, 2008, The value of investor protection: Firm evidence from cross-border mergers, *Review of Financial Studies* 21, 605–648.

Cohen, Lauren, Andrea Frazzini, and Christopher Malloy, 2008, The Small World of Investing: Board Connections and Mutual Fund Returns, *Journal of Political Economy* 116, 951–979.

Cooter, Robert D., 2000, Three Effects of Social Norms on Law: Expression, Deterrence, and Internalization, *Oregon Law Review* 79, 1–22.

DeBacker, Jason, Bradley T. Heim, and Anh Tran, 2012, Importing corruption culture from overseas: Evidence from corporate tax evasion in the United States, *Journal of Financial Economics* 117, 122–138.

Del Guercio, Diane, Elizabeth R. Odders-White, and Mark J. Ready, 2017, The Deterrent Effect of the Securities and Exchange Commission's Enforcement Intensity on Illegal Insider Trading: Evidence from Run-up before News Events, *The Journal of Law and Economics* 60, 269–307.

Denis, David J., and Jin Xu, 2013, Insider trading restrictions and top executive compensation, *Journal of Accounting and Economics* 56, 91–112.

Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer, 2002, The Regulation of Entry, *The Quarterly Journal of Economics* 117, 1–37.

Doidge, Craig, 2004, U.S. cross-listings and the private benefits of control: evidence from dual-class firms, *Journal of Financial Economics* 72, 519–553.

Dyck, Alexander, and Luigi Zingales, 2004, Private Benefits of Control: An International Comparison, *Journal of Finance* 59, 537–600.

Fisman, Raymond, and Edward Miguel, 2007, Corruption, Norms, and Legal Enforcement: Evidence from Diplomatic Parking Tickets, *Journal of Political Economy* 115, 1020–48.

Griffin, John M., Nicholas H. Hirschey, and Patrick J. Kelly, 2011, How important is the financial media in global markets?, *Review of Financial Studies* 24, 3941–3992.

Griffin, John M., Tao Shu, and Selim Topaloglu, 2012, Examining the dark side of financial markets: Do institutions trade on information from investment bank connections?, *Review of Financial Studies* 25, 2155–2188.

Guercio, Diane Del, Elizabeth R Odders White, and Mark J Ready, 2015, An analysis of the price and liquidity effects of illegal insider trading, *SSRN Working Paper Series*.

Jarrell, Ga, and Ab Poulsen, 1989, Stock Trading before the Announcement of Tender Offers: Insider Trading or Market Anticipation ?, *Journal of Law, Economics, & Organization* 5, 225–248.

Keown, A, and J Pinkerton, 1981, Merger Announcements and Insider Trading Activity: An Emprical Investigation, *Journal of Finance* 36, 855–869.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1997, Trust in large Organizations, *AEA Papers and Proceedings* 87, 333–338.

Martynova, Marina, and Luc Renneboog, 2008, A century of corporate takeovers: What have we learned and where do we stand?, *Journal of Banking & Finance* 32, 2148–2177.

Meulbroek, Lisa K, 1992, An empirical analysis of insider trading, *Journal of Finance* 47, 1661–1699.

Pevzner, Mikhail, Fei Xie, and Xiangang Xin, 2015, When firms talk, do investors listen? The role of trust in stock market reactions to corporate earnings announcements, *Journal of Financial Economics* 117, 190–223.

Reese, William A, and Michael S Weisbach, 2002, Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings, *Journal of Financial Economics* 66, 65–104.

Rossi, Stefano, and Paolo F. Volpin, 2004, Cross-country determinants of mergers and acquisitions, *Journal of Financial Economics* 74, 277–304.

Seyhun, H. Nejat, 1992, The Effectiveness of The Insider-Trading Sanctions, *Journal of Law & Economics* 35, 149–182.

Table 1: Distribution of Cross-border Deals by Year

This table presents the number and total value (in millions of US$) of cross-border deals and their proportions in the total number and value of both domestic and cross-border deals by year. The data are obtained from the SDC database from 1990 to 2017. Cross-border deals are defined as M&A deals where the bidder and the target are from different countries, while domestic deals are defined as those where the bidder and the target are in the same country.

| Year | Number of Deals | | | Deal Value | | |
	All	Cross-border Deals	% Cross-border Deals	All	Cross-border Deals	% Cross-border Deals
1990	53	13	24.53%	13,426.90	3,866.40	28.80%
1991	72	8	11.11%	14,827.77	1,402.61	9.46%
1992	61	6	9.84%	15,064.59	1,204.19	7.99%
1993	60	7	11.67%	12,308.15	671.58	5.46%
1994	72	9	12.50%	14,768.85	2,080.65	14.09%
1995	154	24	15.58%	34,342.45	5,771.02	16.80%
1996	138	13	9.42%	32,612.40	3,205.04	9.83%
1997	246	39	15.85%	83,559.72	13,220.42	15.82%
1998	445	63	14.16%	104,730.16	17,251.86	16.47%
1999	661	101	15.28%	151,888.60	23,114.38	15.22%
2000	552	113	20.47%	118,247.59	23,678.20	20.02%
2001	448	92	20.54%	74,074.30	22,178.79	29.94%
2002	368	67	18.21%	59,335.96	14,612.49	24.63%
2003	451	68	15.08%	75,229.23	11,496.88	15.28%
2004	418	74	17.70%	83,747.53	17,995.99	21.49%
2005	518	110	21.24%	101,809.61	26,049.50	25.59%
2006	609	137	22.50%	131,097.89	29,833.64	22.76%
2007	645	179	27.75%	151,756.55	49,184.07	32.41%
2008	565	151	26.73%	103,177.40	34,447.27	33.39%
2009	515	116	22.52%	69,917.23	18,116.72	25.91%
2010	530	140	26.42%	96,993.78	22,326.57	23.02%
2011	491	133	27.09%	97,649.43	33,184.10	33.98%
2012	465	124	26.67%	87,340.43	24,256.35	27.77%
2013	408	116	28.43%	69,516.58	22,597.52	32.51%
2014	418	123	29.43%	85,408.76	31,839.59	37.28%
2015	453	155	34.22%	81,976.05	31,046.56	37.87%
2016	398	141	35.43%	87,375.12	28,989.96	33.18%
2017	386	132	34.20%	83,614.49	28,882.40	34.54%
Total	10,600	2,454	23.15%	2,135,797.50	542,504.75	25.40%

Table 2: Sample Distribution by Country

This table presents the number of targets (bidders) of all deals (i.e. domestic and cross-border combined) and the number of targets (bidders) of only cross-border deals by country in our sample. The sample covers the period 1990-2017. M&A deals data are obtained from SDC.

Country	Targets		Bidders	
	N of All	N of Cross-Border	N of All	N of Cross-Border
United States	4,466	726	4,240	500
Canada	866	382	846	362
United Kingdom	1,022	299	957	234
Australia	685	209	547	71
Germany	187	83	188	84
France	228	79	232	83
Singapore	197	71	195	69
Sweden	195	69	179	53
Hong Kong	242	65	286	109
Norway	128	57	87	16
Japan	942	36	971	65
Malaysia	188	35	177	24
Netherlands	88	34	149	95
Denmark	63	30	52	19
Poland	75	29	49	3
Switzerland	53	27	74	48
India	144	26	142	24
New Zealand	53	23	40	10
South Africa	100	20	104	24
Belgium	34	16	52	34
Finland	34	16	35	17
Taiwan	108	15	103	10
Thailand	92	15	78	1
Israel	20	14	50	44
Italy	69	13	82	26
South Korea	158	13	155	10
Indonesia	18	11	17	10
Spain	34	10	52	28
Greece	26	9	19	2
Brazil	24	7	28	11
Austria	15	5	22	12
Chile	17	5	13	1
Philippines	29	5	30	6
China			150	150
Ireland			41	41
Luxembourg			36	36
Mexico			16	16
United Arab Emirates			15	15
Iceland			12	12
Cyprus			11	11
Mauritius			11	11
Russia			11	11
Bahamas			5	5
Colombia			5	5
Qatar			5	5

Argentina	3	3
Turkey	3	3
Bahrain	2	2
Kazakhstan	2	2
Lithuania	2	2
Malta	2	2
Papua New Guinea	2	2
Saudi Arabia	2	2
Vietnam	2	2
Bulgaria	1	1
Egypt	1	1
Estonia	1	1
Ghana	1	1
Jamaica	1	1
Morocco	1	1
Nigeria	1	1
Peru	1	1
Portugal	1	1
Romania	1	1
Slovak	1	1

Table 3: Summary Statistics

This table reports summary of target and deal characteristics by domestic and cross-border deals (Panel A) and univariate comparisons of insider trading metrics between domestic and cross-border deals (Panel B). For each deal, the target country is chosen to be the domestic country. If the bidder is from the target firm's country, the deal is defined as a domestic deal. Otherwise the deal is defined as a cross-border deal. All variables are defined in the Appendix. The last two columns show results from t-tests for differences in means and Wilcoxon rank-sum tests for differences in medians between domestic and cross-border deals. The sample period is 1990-2017. M&A data are obtained from the SDC database. Firm-level financial data are obtained from Datastream and Worldscope. All variables are defined in the Appendix.

Panel A: Target and Deal Characteristics

	Domestic Deals				Cross-border Deals				Domestic minus Cross	
	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median
Target Characteristics										
Size ($US Million)	174.671	82.63	231.397	8102	207.546	102.616	280.37	2443	-32.875***	-5.429***
Leverage	0.217	0.16	0.224	8146	0.189	0.119	0.223	2454	0.028***	7.348***
BM	1.865	1.292	3.396	8146	2.157	1.429	3.373	2454	-0.292***	-4.618***
Volatility	0.005	0.002	0.008	8146	0.006	0.003	0.01	2454	-0.001***	-9.254***
Turnover	1.259	0.714	1.846	8145	1.174	0.635	2.034	2454	0.085*	4.989***
Amihud	0.007	0	0.035	8146	0.009	0	0.044	2454	-6.690***	-1.686*
Beta	0.515	0.412	0.472	8146	0.554	0.449	0.499	2454	-0.039***	-3.742***
Deal Characteristics										
Premium	34.032	27.39	47.995	8146	40.721	32.065	56.101	2454	-0.125***	-6.13***
Cash	0.512	1	0.5	8146	0.636	1	0.481	2454	-0.002***	-10.854***
Advisors	3.341	3	2.309	8146	4.012	4	2.748	2454	-0.671***	-9.904***
Rumor	0.033	0	0.178	8146	0.037	0	0.189	2454	-0.004	-1.004
Toehold	0.232	0	0.422	8146	0.235	0	0.424	2454	-0.003	-0.345

Panel B: Univariate Comparisons of Insider Trading Metrics between Cross-Border and Domestic Deals

	(-5 day, -1 day)		(-10 day, -1 day)	
	Sum	Max	Sum	Max
Domestic	2.268***	1.466***	4.081***	1.918***
Cross-border	2.375***	1.518***	4.248***	1.992***
Dom. - Cross.	-0.107***	-0.052*	-0.167***	-0.075***
T-stats for Difference	-2.339	-1.717	-2.879	-2.402

Table 4: Abnormal Trading Prior to Deal Announcement

This table presents results from regression analyses of the difference in level of pre-bid insider trading between domestic and cross-border deals. The sample period is 1990-2017. M&A data are obtained from the SDC database. Firm-level financial data are obtained from Datastream and Worldscope. We construct two metrics of insider trading over two preannouncement event windows following Acharya and Johnson (2010). All variables are defined in the Appendix. In all columns, we include target country by year fixed effects and industry fixed effects. Standard errors are two-way clustered by target country and year. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

	(-5 day, -1 day)		(-10 day, -1 day)	
	Sum	Max	Sum	Max
	(1)	(2)	(5)	(6)
Cross	0.173***	0.080**	0.240***	0.095**
	(2.828)	(1.988)	(3.258)	(2.407)
Size	0.106***	0.057***	0.133***	0.044***
	(5.362)	(4.453)	(4.792)	(3.188)
Leverage	0.076	0.024	0.201*	0.067
	(0.763)	(0.344)	(1.732)	(0.940)
BM	-0.007	-0.006	-0.007	-0.008*
	(-0.944)	(-1.165)	(-1.044)	(-1.778)
Volatility	-11.839***	-5.450***	-20.653***	-4.537*
	(-3.570)	(-2.686)	(-4.878)	(-1.943)
Turnover	-0.004	-0.010	-0.007	-0.010
	(-0.293)	(-1.138)	(-0.434)	(-1.238)
Amihud	1.104*	1.011**	1.394	0.920*
	(1.717)	(2.220)	(1.603)	(1.885)
Beta	-0.051	-0.062**	0.068	-0.031
	(-1.186)	(-2.297)	(1.169)	(-1.002)
Premium	0.005***	0.003***	0.009***	0.003***
	(9.000)	(7.432)	(11.977)	(8.862)
Cash	-0.034	-0.013	-0.077	-0.032
	(-0.709)	(-0.409)	(-1.419)	(-1.005)
Advisers	-0.010	-0.009	-0.026**	-0.016**
	(-0.970)	(-1.343)	(-2.116)	(-2.277)
Rumor	0.535***	0.441***	0.598***	0.484***
	(3.588)	(3.935)	(3.609)	(4.552)
Toehold	-0.172***	-0.100***	-0.166**	-0.083**
	(-3.391)	(-3.055)	(-2.319)	(-2.321)
Observations	10,464	10,464	10,464	10,464
Adj. R-squared	0.051	0.039	0.063	0.044

Table 5: Matched Sample Results

This table reports the results for the baseline tests using the matched sample. We match each cross-border deal in our sample with a domestic deal using a propensity score matching (PSM) procedure, where matching is based on all target- and deal-characteristics controlled in the baseline model. Specifically, within the same industry and trading country of the target firm, we match each cross-border deal with all domestic deals that have a propensity score within a radius of 0.1 of the cross-border target. Cross-border deals with no matched domestic deals are excluded from the sample. The sample covers the period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. The dependent variables are measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010). Detailed definitions of all variables are included in the Appendix. All regression specifications include target country-year fixed effects and industry fixed effects. Standard errors are two-way clustered by country and year. All specifications include target-country-year fixed effects. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

	(-5 day, -1 day)		(-10 day, -1 day)	
	Sum	Max	Sum	Max
	(1)	(2)	(3)	(4)
Cross	0.274***	0.150***	0.334***	0.158***
	(4.340)	(3.541)	(4.275)	(3.596)
Size	0.116***	0.052**	0.165***	0.040*
	(3.597)	(2.411)	(4.125)	(1.760)
Leverage	-0.080	-0.086	0.123	-0.039
	(-0.494)	(-0.790)	(0.613)	(-0.341)
BM	-0.008	-0.001	0.007	-0.002
	(-0.874)	(-0.105)	(0.562)	(-0.258)
Volatility	-7.016	-2.436	-18.837***	-0.937
	(-1.310)	(-0.678)	(-2.844)	(-0.251)
Turnover	-0.005	-0.007	-0.021	-0.001
	(-0.208)	(-0.420)	(-0.712)	(-0.061)
Amihud	2.620**	2.469***	2.730*	1.464*
	(2.116)	(2.974)	(1.783)	(1.694)
Beta	-0.039	-0.013	0.017	-0.031
	(-0.518)	(-0.268)	(0.188)	(-0.606)
Premium	0.005***	0.003***	0.009***	0.004***
	(7.692)	(6.149)	(11.740)	(8.121)
Cash	-0.057	-0.016	-0.196**	-0.049
	(-0.769)	(-0.316)	(-2.144)	(-0.952)
Advisers	0.008	-0.002	-0.027	-0.008
	(0.496)	(-0.160)	(-1.370)	(-0.754)
Rumor	0.458**	0.443***	0.438*	0.452***
	(2.514)	(3.623)	(1.946)	(3.552)
Toehold	-0.087	-0.052	0.111	0.026
	(-1.034)	(-0.927)	(1.070)	(0.451)
Observations	4,147	4,147	4,147	4,147
Adj. R-squared	0.070	0.061	0.091	0.070

Table 6: The effect of MMoU on preannouncement insider trading in cross-border deals

This table examines how an increase in cross-border cooperation among regulators after the entry into the IOSCO Multilateral Memorandum of Understanding Concerning Consultation and Cooperation and the Exchange of Information (MMoU) affects the level of insider trading before cross-border M&A announcements. The MMoU is a global multilateral arrangement that facilitates information exchange between signatories in the process of investigating offences relating to illegal activities for the purpose of regulatory enforcement in the securities markets. The sample covers the period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. The dependent variables are the SUM and MAX measure of insider trading over the event window (-5 day, -1 day) constructed following Acharya and Johnson (2010). MMoU is an indicator for the post period that both the target and acquirer country officially became signatories of the IOSCO MMoU. All other variables are defined in the Appendix. All models include acquirer country*target country fixed effects and target country*year fixed effects. Standard errors are two-way clustered by target country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	Sum	Max
	(1)	(2)
Cross*MMoU	-0.236*	-0.133**
	(-1.818)	(-2.563)
Size	0.081**	0.044
	(2.239)	(1.700)
Leverage	0.034	-0.006
	(0.318)	(-0.167)
BM	-0.004	-0.002
	(-0.374)	(-0.382)
Volatility	-16.323***	-8.137***
	(-5.282)	(-3.235)
Turnover	0.008	-0.001
	(0.465)	(-0.111)
Amihud	1.484**	1.334***
	(2.205)	(3.346)
Beta	-0.102	-0.094*
	(-1.138)	(-1.756)
Premium	0.005***	0.003***
	(5.190)	(3.761)
Cash	-0.042	-0.017
	(-0.411)	(-0.335)
Advisors	-0.002	-0.005
	(-0.209)	(-0.613)
Rumor	0.446	0.379*
	(1.589)	(1.991)
Toehold	-0.168**	-0.089
	(-2.208)	(-1.707)
N	9,290	9,290
Adj. R-squared	0.044	0.033

Table 7: Price Run-up Ratio Results

This table reports the results of the second-stage regression for price run-up following Del Guercio, Odders-White, and Ready (2017) using the full sample and the matched sample. The dependent variable is the cumulative market-adjusted pre-announcement returns over the 20 days to 1 day prior to the announcement. Run-up Ratio is the coefficient of a factor weighted average of the realized total event return and the expected total event return (the expected total return impact) estimated from the first-stage regression. The weighting factor is calculated as the ratio of the residual variance from the pre-announcement market-model regressions to the sum of residual variance in returns over the 20-day pre-announcement period and the 2-day announcement period from the first-stage regression. All variables in the regression are interacted with the weighted average total event return. Unexpected Total Return is the difference between the realized total event return and the expected total event return estimated using the residuals from the first-stage regression. The sample covers the period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. Detailed definitions of all variables are included in the Appendix. All regression specifications include target-country and year fixed effects. Standard errors are two-way clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

	Full Sample	Matched Sample
	(1)	(2)
Cross	0.065***	0.084***
	(5.249)	(5.686)
Weighted Average Total Event Return (Run-up Ratio)	0.416***	0.495***
	(8.402)	(6.355)
Size	-0.031***	-0.041***
	(-6.681)	(-5.841)
Leverage	0.101***	0.163***
	(4.443)	(4.499)
BM	-0.001	0.002
	(-0.627)	(0.880)
Turnover	0.021***	0.018***
	(7.335)	(4.504)
Amihud	0.713***	1.945***
	(5.649)	(9.201)
Beta	0.091***	0.111***
	(7.524)	(6.723)
Volatility	-0.599	-6.348***
	(-1.642)	(-9.861)
Premium	0.000	0.000***
	(0.008)	(9.189)
Cash	-0.116***	-0.101***
	(-9.848)	(-5.582)
Advisors	-0.023***	-0.012***
	(-8.612)	(-3.302)
Rumor	0.286***	0.330***
	(7.501)	(6.878)
Toehold	-0.038**	-0.055**
	(-2.361)	(-2.484)
Unexpected Total Return	0.446***	0.398***
	(35.774)	(22.557)
Observations	10,009	4,031
Adj. R-squared	0.385	0.447

Table 8: Validation of the Insider Trading Measures

This table reports the regression results of the insider trading measures on country-level insider trading law indexes. The sample includes only domestic deals and covers the period 1990-2017. Data on M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. The dependent variables are measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010). Detailed definitions of all variables are included in the Appendix. All regression specifications include target country-year fixed effects and industry fixed effects. Standard errors are two-way clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	(-5 day, -1 day)		(-5 day, -1 day)		(-5 day, -1 day)	
	Sum	Max	Sum	Max	Sum	Max
	(1)	(2)	(5)	(6)	(9)	(10)
Rule of Law	-0.311***	-0.134***				
	(-4.795)	(-3.251)				
IT Restriction			-0.226***	-0.098*		
			(-2.801)	(-1.806)		
IT Law					-0.089*	-0.082**
					(-1.679)	(-2.307)
Size	0.095***	0.051***	0.128***	0.064***	0.128***	0.062***
	(4.704)	(4.102)	(4.172)	(3.113)	(4.158)	(2.994)
Leverage	0.070	0.011	-0.041	-0.078	-0.035	-0.081
	(0.668)	(0.150)	(-0.276)	(-0.773)	(-0.236)	(-0.805)
BM	-0.005	-0.005	-0.005	-0.003	-0.005	-0.003
	(-0.660)	(-0.866)	(-0.568)	(-0.568)	(-0.578)	(-0.555)
Volatility	-16.012***	-8.410***	-11.972*	-7.526*	-12.561**	-7.295*
	(-4.265)	(-3.772)	(-1.886)	(-1.765)	(-1.972)	(-1.710)
Turnover	-0.002	-0.009	0.006	-0.005	0.017	0.002
	(-0.129)	(-1.157)	(0.257)	(-0.293)	(0.681)	(0.142)
Amihud	1.762***	1.374***	2.663	1.664	3.162	1.822
	(2.939)	(3.426)	(1.307)	(1.216)	(1.558)	(1.340)
Beta	-0.093*	-0.086***	-0.153*	-0.122**	-0.130	-0.115**
	(-1.948)	(-2.853)	(-1.814)	(-2.154)	(-1.556)	(-2.062)
Premium	0.005***	0.003***	0.006***	0.003***	0.006***	0.003***
	(10.491)	(9.130)	(7.911)	(6.425)	(7.989)	(6.562)
Cash	-0.058	-0.028	-0.164**	-0.085*	-0.149**	-0.069
	(-1.195)	(-0.899)	(-2.480)	(-1.913)	(-2.224)	(-1.542)
Advisors	-0.021*	-0.016**	-0.005	-0.001	-0.010	0.001
	(-1.935)	(-2.237)	(-0.285)	(-0.102)	(-0.565)	(0.101)
Rumor	0.339***	0.394***	0.210	0.362***	0.155	0.315***
	(2.782)	(4.176)	(1.186)	(3.034)	(0.866)	(2.622)
Toehold	-0.139***	-0.078**	-0.112	-0.030	-0.140	-0.071
	(-2.586)	(-2.242)	(-1.327)	(-0.528)	(-1.623)	(-1.220)
Observations	8,145	8,145	4,381	4,381	4,363	4,363
Adj. R-squared	0.040	0.031	0.035	0.025	0.034	0.026

Table 9: Falsification Tests using Earnings Surprises

This table reports the results from a falsification test. The sample covers the period 1990-2017. Each cross-border deal in our sample is matched with a domestic deal using a propensity score matching (PSM) procedure. Earnings announcement and forecast data are from the I/B/E/S database. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. We construct measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010) and price run-up following Del Guercio, Odders-White, and Ready (2017). All specifications include target country by year interaction fixed effects and industry fixed effects. Standard errors are two-way clustered by target country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	(-5 day, -1 day)		Runup
	Sum	Max	
	(1)	(2)	(3)
Cross × Surprise	-0.007	-0.002	
	(-1.139)	(-0.763)	
Cross	0.155	0.060	0.004
	(1.062)	(1.189)	(0.064)
Run-up Ratio			1.289*
			(1.951)
Unexpected Total Return			0.955***
			(20.465)
Surprise	-0.000***	-0.000***	0.005
	(-14.522)	(-24.171)	(1.167)
Size	-0.142*	-0.042	0.068
	(-1.949)	(-1.306)	(1.290)
Leverage	0.494	0.134	0.463**
	(1.497)	(0.951)	(2.092)
BM	-0.002	0.004	0.007
	(-0.121)	(0.672)	(1.183)
Volatility	0.112	-0.214	0.618*
	(0.173)	(-0.826)	(1.731)
Turnover	-0.009	-0.010**	-0.019
	(-1.226)	(-2.120)	(-0.913)
Amihud	-19.594	-11.736*	12.296
	(-1.371)	(-1.745)	(0.668)
Price	0.013**	0.001	-0.005
	(2.070)	(0.136)	(-1.168)
Beta	-0.087	0.029	-0.021
	(-0.659)	(0.506)	(-0.265)
Estimates	0.049*	-0.002	-0.007
	(1.968)	(-0.142)	(-0.653)
Loss	-0.325*	-0.142*	0.187**
	(-1.801)	(-1.943)	(2.334)
Reporting Lag	-0.005*	-0.000	0.000
	(-1.700)	(-0.037)	(0.129)
Observations	2,785	2,785	2,498
Adj. R-squared	0.126	0.114	0.753

Table 10: Abnormal Trading Activities and Acquirer Country Legal Institutions

This table reports the regression results of insider trading measures on acquirer country law indexes including Rule of Law, Insider Trading Restriction Index constructed based on the survey responses from the Global Competitiveness Report, and the Insider Trading Law Index from Beny (2005). The sample includes only cross-border M&A deals. Columns (1)-(8) use sample for the period 1990-2006, while Columns (9)-(12) cover the full sample period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. We construct measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010). All regression specifications include target-country-year fixed effects and industry fixed effects. Standard errors are two-way clustered by country and year. Standard errors are two-way clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	(-5 day, -1 day)		(-5 day, -1 day)		(-5 day, -1 day)	
	Sum	Max	Sum	Max	Sum	Max
	(1)	(2)	(5)	(6)	(9)	(10)
IT Restriction	-0.290**	-0.184**				
	(-2.276)	(-2.219)				
IT Law			-0.281***	-0.188***		
			(-3.366)	(-4.380)		
Rule of Law					-0.184***	-0.148***
					(-3.721)	(-3.619)
Size	0.228***	0.113***	0.218**	0.097**	0.135***	0.065*
	(2.981)	(3.108)	(2.515)	(2.447)	(2.887)	(2.017)
Leverage	-0.026	-0.072	-0.185	-0.144	0.024	-0.032
	(-0.093)	(-0.381)	(-0.652)	(-0.760)	(0.113)	(-0.224)
BM	0.017	0.003	0.016	0.002	-0.003	-0.003
	(0.685)	(0.215)	(0.637)	(0.165)	(-0.284)	(-0.442)
Volatility	-32.435***	-10.454	-33.968***	-11.984	-10.312*	-2.723
	(-3.147)	(-1.595)	(-2.992)	(-1.688)	(-2.048)	(-0.781)
Turnover	-0.004	-0.014	-0.002	-0.010	-0.026	-0.022
	(-0.074)	(-0.449)	(-0.028)	(-0.304)	(-0.835)	(-1.600)
Amihud	2.241	3.044	2.095	2.967	-0.321	-0.101
	(0.333)	(1.160)	(0.305)	(0.983)	(-0.605)	(-0.250)
Beta	-0.078	-0.092	-0.098	-0.100	0.019	-0.004
	(-0.447)	(-0.751)	(-0.563)	(-0.788)	(0.183)	(-0.049)
Premium	0.011***	0.006***	0.011***	0.006***	0.004***	0.002***
	(8.113)	(6.189)	(7.188)	(5.442)	(7.760)	(5.269)
Cash	0.213	0.119	0.177	0.088	-0.025	-0.051
	(1.297)	(1.361)	(0.920)	(0.869)	(-0.297)	(-0.884)
Advisors	-0.040	-0.010	-0.019	0.006	-0.021	-0.015
	(-0.918)	(-0.376)	(-0.465)	(0.233)	(-1.003)	(-1.328)
Rumor	1.095***	0.738*	1.101***	0.740**	0.617	0.501
	(3.014)	(2.033)	(3.110)	(2.097)	(1.653)	(1.572)
Toehold	-0.373	-0.138	-0.379*	-0.158	-0.143	-0.077
	(-1.586)	(-1.072)	(-1.849)	(-1.366)	(-1.339)	(-1.141)
Observations	819	819	774	774	2,253	2,253
Adj. R-squared	0.095	0.080	0.101	0.084	0.072	0.072

Table 11: Abnormal Trading Activities before Cross-border Deal Announcement and Acquirer Country Social Norms

This table reports the regression results of insider trading measures on two measures of social norms: tax morale value and Corruption Perception Index (CPI) in acquirer country. The sample covers the period 1990-2017 and includes only cross-border M&A deals. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. We construct measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010). All regression specifications include target-country-year fixed effects and industry fixed effects. Standard errors are two-way clustered by country and year. Standard errors are two-way clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	(-5 day, -1 day)		(-5 day, -1 day)	
	Sum	Max	Sum	Max
	(1)	(2)	(3)	(4)
CPI	0.005***	0.004***		
	(3.193)	(3.178)		
Cheat on Tax			0.996*	0.753*
			(1.802)	(1.946)
Size	0.135***	0.065*	0.144***	0.069**
	(2.918)	(2.043)	(2.899)	(2.168)
Leverage	0.030	-0.027	-0.077	-0.072
	(0.143)	(-0.187)	(-0.358)	(-0.493)
BM	-0.003	-0.003	-0.005	-0.006
	(-0.246)	(-0.399)	(-0.477)	(-0.819)
Volatility	-10.284**	-2.696	-10.176	-2.267
	(-2.053)	(-0.781)	(-1.655)	(-0.559)
Turnover	-0.027	-0.023	-0.042	-0.030***
	(-0.845)	(-1.612)	(-1.492)	(-2.877)
Amihud	-0.326	-0.106	-0.570	-0.190
	(-0.614)	(-0.264)	(-1.049)	(-0.428)
Beta	0.020	-0.003	0.033	-0.003
	(0.191)	(-0.040)	(0.320)	(-0.035)
Premium	0.004***	0.002***	0.004***	0.002***
	(7.699)	(5.271)	(7.493)	(5.386)
Cash	-0.021	-0.048	0.024	-0.020
	(-0.258)	(-0.832)	(0.261)	(-0.333)
Advisors	-0.020	-0.015	-0.017	-0.012
	(-1.003)	(-1.334)	(-0.798)	(-1.030)
Rumor	0.618	0.502	0.597	0.480
	(1.637)	(1.555)	(1.624)	(1.542)
Toehold	-0.139	-0.073	-0.147	-0.084
	(-1.320)	(-1.109)	(-1.373)	(-1.192)
Observations	2,253	2,253	2,168	2,168
Adj. R-squared	0.072	0.072	0.070	0.064

Table 12: Variation by Target Country Insider Trading Law

This table reports the regression results of interacting cross-border dummy with different proxies of target country insider trading law indexes using the matched sample. We match each cross-border deal in our sample with a domestic deal using a propensity score matching (PSM) procedure which matches firms on all target- and deal-characteristics controlled in the baseline model. Specifically, within the same industry and trading country, we match each cross-border deal with a domestic deal that has the smallest difference in propensity score from the cross-border deal among those with a difference less than 0.1. We drop cross-border deals for which a domestic deal cannot be found using the above procedure. Columns (1)-(4) use sample for the period 1990-2006, while Columns (5)-(6) cover the full sample period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. All variables are defined in the Appendix. All models include target country by year fixed effects and industry fixed effects. Standard errors are two-way clustered by target country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	(-5 day, -1 day)		(-5 day, -1 day)		(-5 day, -1 day)	
	Sum	Max	Sum	Max	Sum	Max
	(1)	(2)	(3)	(4)	(5)	(6)
Cross × IT Restriction	0.098***	0.077**				
	(2.884)	(2.818)				
Cross × IT Law			0.148***	0.104***		
			(3.352)	(2.982)		
Cross × Rule of Law					0.094**	0.043*
					(2.611)	(2.027)
Cross	0.188	0.098	-0.012	-0.115	-0.033	-0.088
	(1.136)	(1.163)	(-0.050)	(-0.639)	(-0.155)	(-0.610)
Size	0.116***	0.052***	0.198***	0.095***	0.198***	0.096***
	(4.961)	(3.179)	(4.363)	(3.216)	(4.353)	(3.221)
Leverage	-0.085	-0.089	0.266	0.173	0.263	0.175
	(-0.508)	(-0.848)	(1.212)	(0.934)	(1.203)	(0.938)
BM	-0.008	-0.001	0.016	0.011	0.016	0.011
	(-0.932)	(-0.094)	(1.445)	(1.020)	(1.449)	(1.026)
Volatility	-7.001	-2.427	-15.187*	-0.444	-14.792*	-0.256
	(-0.997)	(-0.484)	(-2.055)	(-0.111)	(-1.963)	(-0.063)
Turnover	-0.005	-0.007	0.005	0.016	0.004	0.015
	(-0.191)	(-0.405)	(0.291)	(1.340)	(0.217)	(1.245)
Amihud	2.604*	2.460***	5.409	2.463	5.333	2.424
	(1.722)	(2.819)	(1.442)	(1.486)	(1.425)	(1.449)
Beta	-0.038	-0.013	-0.035	-0.089	-0.037	-0.089
	(-0.258)	(-0.144)	(-0.330)	(-1.128)	(-0.340)	(-1.138)
Premium	0.005***	0.003***	0.007***	0.003***	0.007***	0.003***
	(6.470)	(3.790)	(7.603)	(4.729)	(7.637)	(4.770)
Cash	-0.062	-0.019	-0.054	-0.034	-0.051	-0.030
	(-1.168)	(-0.651)	(-0.701)	(-0.784)	(-0.680)	(-0.704)
Advisors	0.008	-0.002	0.008	0.022	0.008	0.022
	(0.331)	(-0.193)	(0.252)	(0.983)	(0.245)	(0.977)
Rumor	0.459	0.443	0.544	0.516*	0.544	0.514*
	(0.998)	(1.105)	(1.639)	(1.798)	(1.649)	(1.803)
Toehold	-0.088	-0.053	0.104	0.234**	0.100	0.231*
	(-1.128)	(-0.837)	(0.642)	(2.105)	(0.608)	(2.063)
Observations	4,147	4,147	1,359	1,359	1,355	1,355
Adj. R-squared	0.070	0.061	0.060	0.039	0.061	0.040

Table 13: Insider trading activity within and outside the US-Canada Group

This table reports the results comparing US-Canada cross-border deals and the other cross-border deals with US and Canada targets. The sample includes all deals with targets from either the US or Canada. Each cross-border deal is matched with a domestic deal using the propensity score matching (PSM) procedure. *US_CA_Group* equals to one if a deal is a cross-border deal between the US and Canada, and zero otherwise. *Non_US_CA_Cross* equals one if a deal is a cross-border deal between a US or Canada target and non-US non-Canada foreign acquirer, and zero otherwise. The sample covers the period 1990-2017. International M&A deals are obtained from SDC. Firm-level financial data are from Datastream and Worldscope. We construct measures of suspicious heavy trade or unusually large positive price movement following Acharya and Johnson (2010). All specifications include interacted target country-year fixed effects and industry fixed effects. Standard errors are two-way clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

VARIABLES	Return	
	Sum	Max
	(1)	(2)
US_CA_Group	0.235*	0.145
	(1.700)	(1.654)
Non_US_CA_Cross	0.483***	0.258***
	(4.738)	(4.491)
Size	0.076	0.020
	(1.228)	(0.514)
Leverage	-0.118	-0.143
	(-0.603)	(-1.107)
BM	-0.002	0.001
	(-0.128)	(0.121)
Volatility	-13.921*	-7.126
	(-1.733)	(-1.221)
Turnover	-0.034	-0.020
	(-1.251)	(-1.017)
Amihud	3.618*	3.190**
	(1.773)	(2.015)
Beta	0.159	0.117*
	(1.598)	(1.796)
Premium	0.004***	0.002***
	(3.818)	(3.217)
Cash	-0.143	-0.054
	(-1.196)	(-0.730)
Advisors	-0.003	-0.001
	(-0.116)	(-0.051)
Rumor	-0.283	-0.165
	(-1.078)	(-0.979)
Toehold	-0.041	0.016
	(-0.300)	(0.201)
Observations	2,126	2,126
Adj. R-squared	0.073	0.061

Table 14: Abnormal Option Trading Activities

This table reports the regression results for abnormal option trading activity. The sample covers deals where the target firm is a US firm with traded equity options data available from the OptionMetrics for the period 1996-2017. M&A deal data are obtained from SDC database. Firm-level financial data are from Datastream and Worldscope. The dependent variables in this table are different measures of abnormal option volume over the (-5 day, -1 day) event window for call options written on a target firm's stock with an expiration date which is within 60 days after the actual deal announcement date. We construct two measures of abnormal option volume: *Sum* equals to the sum of daily residuals from a benchmark model, and *Max* equals to the maximum of the daily residuals from the benchmark model. We estimate a benchmark call option volume for each deal where the dependent variable is daily aggregate volume of call options which expire within 60 days of the deal announcement date and independent variables are a constant, lagged option volume, lagged volume and returns of the underlying stock, and contemporaneous market volume. The benchmark model is estimated using daily stock and option data 90 days prior to the deal announcement date. In columns 3 and 4, we weight each call option series by its delta when calculating the aggregate daily trading volume, where the data for delta is obtained from the OptionMetrics database which calculates it using end-of-day pricing and implied volatilities based on a binomial model. All models include industry and year fixed effects where industries are defined by Fama and French 48 industry definition. Standard errors are two-way clustered by industry and year. T-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels using two-tailed tests, respectively.

	Window (-5, -1)			
	Option Volume		Option Volume Delta	
VARIABLES	Sum	Max	Sum	Max
	(1)	(2)	(3)	(4)
Cross	0.270**	0.220*	0.220*	0.175
	(2.265)	(1.923)	(1.886)	(1.582)
Size	0.298***	0.207***	0.212***	0.139**
	(5.124)	(4.515)	(3.079)	(2.487)
Leverage	-0.290**	-0.252**	-0.178	-0.114
	(-2.304)	(-2.440)	(-1.471)	(-1.309)
BM	0.000**	0.000**	0.000**	0.000*
	(2.300)	(2.226)	(2.497)	(2.045)
Turnover	0.016	0.013	0.009	0.008
	(1.182)	(1.161)	(0.721)	(0.947)
Amihud	-0.007	-0.008	-0.679*	-0.604*
	(-0.294)	(-0.402)	(-1.885)	(-2.078)
Beta	0.238*	0.192**	0.197	0.147
	(1.941)	(2.153)	(1.526)	(1.582)
Volatility	-7.596	-7.369	-7.420	-7.252
	(-1.264)	(-1.486)	(-0.852)	(-1.063)
Premium	0.002**	0.001*	0.003	0.002
	(2.325)	(1.796)	(1.507)	(1.303)
Cash	-0.093	-0.066	-0.030	-0.027
	(-0.631)	(-0.585)	(-0.205)	(-0.243)
Advisors	0.006	0.016	0.008	0.015
	(0.208)	(0.687)	(0.307)	(0.689)
Rumor	0.692**	0.542**	0.543**	0.376
	(2.477)	(2.181)	(2.146)	(1.439)
Toehold	-0.173	-0.092	-0.114	-0.022
	(-1.179)	(-0.773)	(-0.724)	(-0.159)
Observations	1,209	1,209	1,113	1,113
Adj. R-squared	0.134	0.103	0.140	0.122

Appendix

A1: Variable Definitions

Variable Name	Definition
Insider trading Measures	
Sum	The summation of the daily standardized residuals obtained from a regression specification with a constant, lagged volume and returns, day-of-week dummies, and contemporaneous market volume and returns index using daily data 90 days prior to the merger announcement date following Acharya and Johnson (2010).
Max	The maximum of the standardized residuals from the same regression specification.
Target Firm Characteristics	
Size	The natural logarithm of market capitalization in US dollars.
Leverage	Total debts relative to total assets.
BM	The book value of assets divided by market capitalization.
Volatility	The standard deviation of monthly returns during the previous 12 months before the announcement.
Turnover	The cumulative monthly trading volume during the year divided by the total number of shares outstanding at the beginning of the corresponding period.
Amihud	Log of the average of the Amihud (2002) illiquidity ratio over a one-year period 90 days prior to the M&A announcement.
Beta	The firm beta with respect to country index estimated using daily stock returns over a one-year period 90 days prior to the M&A announcement.
Deal Characteristics	
Cross	A dummy variable equal to one if the acquirer and target of a deal come from different countries, and zero otherwise.
Premium	The bid premium defined as the percentage difference between bid price and the target's stock price four weeks prior to announcement.
Cash	A dummy variable indicating whether the majority (greater than 50%) of the deal proceeds are paid by cash.
Advisor	The total number of advisors worked for the target and acquirer firms in a deal.
Rumor	A dummy variable indicating whether there are rumours about the deal prior to the announcement.
Toehold	A dummy variable equal to one if the acquire has a toehold in the target prior to the announcement of the deal, and zero otherwise.
Country Indexes	
Insider Trading Restriction Index	Insider trading restriction index from the 1996, 1998 and 1999 Global Competitiveness Report based on the following question: "Insider trading is not common in the domestic market (1 = strongly disagree, 7 = strongly agree)".
Insider Trading Law Index	Insider trading law index from Beny (2005).
Rule of Law	Time-varying measure of the power of legal institutions in a country that restricts insider trading in general extracted from the Worldwide Governance Indicators (WGI) constructed by the World Bank last updated in 2013.
Cheat on Tax	The tendency of people to evade tax in a country based on the following question from the World Values Survey (WVS): "Please tell me for each of the following actions whether you think it can always be justified, never be justified, or something in between (on a scale from 1 to 10): Cheating on taxes if you have a chance".

CPI	The annual Corruption Perception Index published by Transparency International.
Other Variables	
Surprise	The earnings announcement surprise defined as the absolute value of the deviation between the most recent median analysts' earnings forecast and the actual annual earnings per share (EPS), scaled by the most recent closing price.
Price	The inverse of the closing stock price one-month before the earnings announcement.
Estimates	The number of analyst forecasts for annual EPS before the earnings announcement.
Loss	A dummy variable equal to one if annual EPS for the company is negative, and zero otherwise.
Reporting Lag	The number of days between the fiscal year end and the earnings announcement date as reported by the I/B/E/S.

A2: Country Indexes

Country Index	Insider Trading Restriction	Insider Trading Law Index	Rule of Law	Corruption Perceptions Index	Tax Morale Level
Argentina	3.71	NA	-0.30	95	0.23
Australia	5.30	3	1.77	11	0.33
Austria	4.71	2	1.87	23	0.41
Bahamas	NA	NA	1.01	24	NA
Bahrain	NA	NA	0.30	52	NA
Belgium	4.92	3	1.33	16	0.60
Brazil	3.55	2	-0.19	66	0.48
Bulgaria	3.47	NA	-0.07	66	0.37
Canada	5.01	4	1.79	10	0.31
Chile	4.43	NA	1.37	22	0.34
China	3.41	NA	-0.37	89	0.42
Colombia	3.58	NA	-0.42	85	0.23
Cyprus	NA	NA	1.05	31	0.29
Denmark	5.69	3	1.91	1	0.33
Egypt	3.67	NA	-0.18	85	0.26
Estonia	NA	NA	1.36	27	0.49
Finland	5.12	3	1.98	3	0.43
France	4.58	4	1.41	27	0.50
Germany	5.13	3	1.67	13	0.41
Ghana	NA	NA	-0.34	56	0.16
Greece	3.46	2	0.73	66	0.52
Hong Kong	4.14	3	1.51	19	0.38
Iceland	4.14	NA	1.88	13	0.41
India	3.15	2	0.02	78	0.48
Indonesia	3.24	2	-0.59	95	0.21
Ireland	5.06	3	1.70	19	0.42
Israel	3.98	NA	0.96	36	NA
Italy	3.73	3	0.56	66	0.41
Jamaica	NA	NA	-0.48	78	NA
Japan	5.05	2	1.34	16	0.17
Kazakhstan	NA	NA	-0.55	109	0.45
Lithuania	NA	NA	0.79	38	0.62
Luxembourg	5.74	3	1.83	9	0.51
Malaysia	3.59	2	0.53	47	0.59
Malta	NA	NA	1.21	41	0.19
Mauritius	3.68	NA	0.92	44	NA
Mexico	3.39	1	-0.57	92	0.34
Morocco	NA	NA	0.24	72	0.17
Netherlands	4.82	3	1.80	8	0.42
New Zealand	5.41	NA	1.87	2	0.38
Nigeria	NA	NA	-1.08	115	0.47
Norway	4.33	1	1.92	6	0.50
Papua New Guinea	NA	NA	-0.92	120	NA
Peru	3.80	NA	-0.66	78	0.40
Philippines	3.20	2	-0.40	78	0.59
Poland	3.94	NA	0.72	34	0.47
Portugal	4.20	3	1.17	31	0.43

Qatar	NA	NA	0.91	27	NA
Romania	NA	NA	-0.01	66	0.38
Russia	3.03	NA	-0.89	115	0.56
Saudi Arabia	NA	NA	0.20	52	NA
Singapore	5.41	3	1.66	7	0.42
Slovak	NA	NA	0.47	49	0.45
South Africa	3.79	2	0.11	62	0.52
South Korea	3.88	4	0.96	41	0.28
Spain	4.25	3	1.15	36	0.41
Sweden	5.14	3	1.88	4	0.46
Switzerland	4.92	3	1.88	6	0.42
Taiwan	3.23	3	1.02	34	0.37
Thailand	3.59	3	-0.01	78	0.53
Turkey	3.61	NA	-0.03	59	0.13
United Kingdom	5.32	3	1.69	14	0.38
United States	5.13	4	1.55	19	0.32
United Arab Emirates	NA	NA	0.48	25	NA
Vietnam	6.35	NA	-0.42	103	0.19
Mean	4.29	2.73	0.71	46	0.39
Standard deviation	0.84	0.76	0.92	33	0.12

A3: Descriptive Statistics of the Matched Sample

| | Domestic Deals | | | | Cross-border Deals | | | | Domestic minus Cross | |
	Mean	Median	Stdev	N	Mean	Median	Stdev	N	Diff. in Mean	Diff. in Median Rank Test
Target Characteristics										
Size ($USMillions)	175.412	85.943	219.113	2136	196.146	99.033	262.89	2138	-20.734***	-2.539**
Leverage	0.176	0.104	0.205	2143	0.182	0.112	0.215	2143	-0.007	-0.373
BM	2.369	1.537	3.696	2143	2.11	1.425	3.121	2143	0.258**	2.699***
Volatility	0.006	0.003	0.009	2143	0.006	0.003	0.008	2143	0.000*	-1.833*
Turnover	1.12	0.738	1.335	2143	1.15	0.651	1.697	2143	-0.03	3.198***
Amihud	0.009	0	0.034	2143	0.008	0	0.031	2143	-0.414	-0.26
Beta	0.541	0.427	0.517	2143	0.557	0.448	0.506	2143	-0.016	-1.219
Deal Characteristics										
Premium	40.107	30.43	52.31	2143	40.522	31.73	55.785	2143	-0.034**	-0.799
Cash	0.595	1	0.491	2143	0.629	1	0.483	2143	0.001	-2.257**
Advisors	3.845	4	2.453	2143	3.929	4	2.632	2143	-0.084	-0.473
Rumor	0.039	0	0.194	2143	0.038	0	0.191	2143	0.001	0.238
Toehold	0.229	0	0.42	2143	0.23	0	0.421	2143	-0.001	-0.073