Working Paper (August 2021)

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Does the institutional environment affect the value of analyst recommendations around the world?

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Abstract

This paper investigates whether the value of analyst recommendations varies across countries and whether this difference is associated with a country's institutional environment. Using recommendations from a sample of 32 countries from 1994 to 2015, we found that stock prices react to analysts significantly differently across countries. In particular, recommendation announcements in countries with higher accounting standards, more effective security law enforcement, better earnings quality, common law origins, and better protection of private property are associated with significantly higher price reactions. The results are robust using alternative research settings. The institutional environment affects the value of recommendation revisions across countries as well.

JEL Classification: F00; F30; G15; G24

Keywords: Cross-country event study; analyst recommendation; institutional environment

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1. Introduction

Previous studies have found that the value of analyst recommendations varies across firm and analyst characteristics. [1] However, these studies are mainly US-centric at the micro-level. We know relatively little about the cross-country difference and how the country's institutional environment affects the value of analyst recommendations. Some studies provide international evidence of the value of recommendations at the firm-level and present minor differences across their sample countries (Jegadeesh and Kim, 2006; Moshirian, Ng, and Wu, 2009). This result is not surprising as the sample countries in either study have similar efficiency levels and regulatory environments.[2] Morck, Yeung, and Yu (2000) found that stock prices in emerging markets are significantly different from developed markets due to country-level characteristics. Thus, if the country character is an essential feature of investor reaction to analyst recommendation, the inclusion of both developed and developing markets should find a significant cross-country difference and valuable independent evidence. To fill the gap, in this paper, we evaluate the value of recommendation at the country level across the world and further investigates how countries' institutional factors affect the information content of analyst recommendations.

Existing theories provide competing hypotheses for the impact of the institutional environment on the value of recommendations. The skill-based hypothesis predicts a negative relationship as investors in a bad institutional environment are less sophisticated and rely more on analyst skills to convert noisy public signals to more accurate information (Kim and Verrecchia, 1994; Lin, Massa, and Zhang, 2014). In comparison, the information-based

[1] For example, recommendations issued by the independent broker (Michaely and Womack, 1999), recommendation revisions in the week before an earnings announcement (Ivković and Jegadeesh, 2004), recommendations from local analysts (Malloy, 2005) and from analysts with related industry experience (Bradley, Gokkaya, and Liu, 2017) are more informative.

[2] Jegadeesh and Kim (2006) analyzed recommendations for G7 countries. Moshirian, Ng, and Wu (2009) examined the value of recommendation by analyzing 13 emerging markets.

hypothesis indicates a positive relationship between the institutional environment and the value of recommendations. Stock prices tend to incorporate less firm-specific information in a bad institutional environment. Additionally, the low quality of financial market regulation could also induce more insider trading before the information is available to the public, making analyst reports less attractive when issued in these markets.

We examined the average stock price reactions to recommendation announcements in a sample of 32 countries using event study methodology and identified the institutional determinants of the value of recommendations for countries worldwide. We constructed a proxy of investors' reactions to analyst recommendation announcements by calculating the difference in the average price reactions to strong buy and strong sell recommendations for each country each year. We then regressed this investor reaction measure on country-level proxies for the institutional environment to answer our research question. The institutional environment proxies we considered are the quality of accounting standards, the country's legal origin, the enforcement of insider trading laws, the effectiveness of security laws, earnings quality, and the protection of private property. A more extensive discussion of these institutional environment proxies is conducted in Section 4.

Our results provide evidence that stock prices react differently across countries. In general, developed markets experience stronger price reactions in response to recommendation announcements compared to emerging markets. Recommendation announcements experience significantly higher price reactions in countries with higher accounting standards, more efficient security enforcement, better earnings quality, common law origins, and better protection of private property. The enforcement of insider trading laws does not affect the value of recommendations. Moreover, this effect is more associated with negative recommendations. After excluding recommendations announced within three days

of earnings announcements, four out of six institutional environment proxies are still significantly related to the cumulative abnormal return over the event window (0, +1) in response to recommendation announcements. Additional tests show that the institutional environment similarly affects the value of recommendation revisions.

This study contributes to two strands of literature. First, it contributes to studies that examine how institutional factors affect financial markets and market participants around the world. For example, La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1997) examined the impact of legal rules on capital markets and showed that countries with weaker investor protection have smaller capital markets. Khorana, Servaes, and Tufano (2005) examined the determinants of mutual fund sizes worldwide and found that the mutual fund industry is more extensive in countries with stronger judicial systems, particularly with stringent disclosure requirements for funds.[3] Using annual earnings announcements from 26 countries, DeFond, Hung and Trezevant (2007) found that annual earnings announcements are more useful in countries with higher quality earnings or better-enforced insider trading laws.

Second, it contributes to the literature on the information role of analyst recommendations. Differing from existing studies investigating firm characteristics and analyst characteristics,[4] this study extends the analysis to the macro level and examines how the institutional environment affects the value of analyst recommendations across countries. Such an understanding helps to evaluate the role of analysts in generating information about firms in different environments.

[3] Ferreira, Keswani, Miguel, and Ramos (2013) examined the country factors that affect mutual fund performance around the world.
[4] See Stickel (1995), Sorescu and Subrahmanyam (2006), Loh and Stulz (2011) and Muslu and Xue (2013), for example.

The remainder of this study is organized as follows. Section 2 conducts a literature review and the hypothesis development. Section 3 discusses data sources and methodology. Section 4 discusses the institutional environment proxies, and Section 5 presents the results of the analysis. Section 6 provides several additional tests, and Section 7 concludes.

2. Literature Review and Hypothesis Development

2.1 Literature review

Several studies provide empirical evidence on investor reactions to recommendations or recommendation revisions in the U.S. and international stock markets. Using event study methodology, these studies have found that recommendations or recommendation revisions are helpful and lead to significant stock price reactions (Ivković and Jegadeesh, 2004; Womack, 1996). Some studies have investigated whether specific types of recommendations drive this significant price reaction. For example, Ivković and Jegadeesh (2004) found that the abnormal returns around recommendation revisions are significantly larger for small firms than large firms.[5] As opposed to other studies focusing on the average effects, Loh and Stulz (2011) focused on the question of when individual recommendations are influential. Using two alternative definitions of influential recommendation changes, namely significant cumulative abnormal return (CAR) in the direction of the recommendation change and a significant increase in abnormal turnover, they showed that only 12% of recommendation revisions were influential in the U.S. They found that star analysts and previously influential and bold analysts were more likely to issue influential recommendation revisions.[6] However, their analysis only focused on the U.S. market and did not consider the influences of the institutional environment on the usefulness of stock recommendations across countries.

[5] Frankel, Kothari, and Weber (2006) examined whether firm characteristics affect the impact of earnings forecast revisions, but they did not consider analyst characteristics or stock recommendations.
[6] Also see Stickel (1995), Gintschel and Markov (2004).

Jegadeesh and Kim (2006) took an international perspective and evaluated recommendation revisions in G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States). They found that the U.S. exhibited the most significant stock price reaction to revision announcements and there's no significant difference among other sample countries.

Another important strand of literature for our study examines the effects of the institutional environment on the availability of firm-specific information, firm value, and the development of equity markets. For example, Morck et al. (2000) investigated stock price comovements in international markets and found that stock prices move together more in low-income countries than in high-income countries. Market sizes and other fundamental economic factors cannot explain this negative relation between stock price comovement and market development, whereas property rights protection can. The information collection cost for risk arbitrageurs is higher in weak property rights protection economies, and stock prices are more likely to be affected by market-wide political events and rumors. Along similar lines, Wurgler (2000) showed that countries with solid minority investor rights have a better allocation of capital due to reduced overinvestment in declining industries. La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2002) have provided evidence that firms in countries with more robust investor protection and more efficient legal systems enjoy higher equity valuations.

Ball, Kothari, and Robin (2000) examined the timeliness and conservatism of accounting income under different institutional contexts and found that accounting income in common law countries presents significantly higher timeliness than civil law countries.[7] They

[7] Ball, Robin, and Wu (2003) showed that although the accounting standards of four East Asian countries (Hong Kong, Malaysia, Singapore, and Thailand) are derived from common law sources, their financial reporting

argue that this timely incorporation of negative news reduces the agency cost of monitoring managers. Moreover, Lin et al. (2014) concluded that countries with weak governance usually have low-quality public information. Their paper is in line with DeFond et al. (2007), arguing that firms' publicly released financial reports are less accurate in countries with weak governance.[8]

2.2 Hypothesis development

As discussed above, previous research shows that the institutional environment affects the availability of firm-specific information and the development of equity markets. Less attention has been given to how the institutional environment affects analyst behavior and investor reaction to the information provided by financial analysts. We aim to fill this gap in the literature and address the following research question: How do institutional differences across countries affect the value of recommendations? The existing literature suggests two opposing viewpoints.

The skill-based hypothesis implies that stock prices react more to analyst recommendations in countries with a bad institutional environment and less developed financial markets. As indicated in Lin et al. (2014), public information quality is low when the institutional environment is bad. Thus, investors struggle to obtain helpful information in a country with a bad institutional environment. Moreover, Kim and Verrecchia (1994) have indicated that savvy market participants, such as asset managers and analysts, can process information better than the market by converting a firm's noisy public signals (e.g., earnings

quality is not higher than countries under civil law. They explain this situation by claiming that the preparer's incentives in these four countries mainly depend on the government instead of the market since there exists substantial political influence on financial reporting, and information is disclosed more through private communication instead of public announcements.

[8] Jin and Myers (2006), and Bartram, Brown, and Stulz (2012) have also provided evidence that firms are less transparent in countries with weak governance.

announcements) into more accurate information (semi-public information). Analysts contribute to price efficiency with their superior ability to process public and are thus potentially more critical in countries with a bad institutional environment. In addition, because the financial industry tends to be more developed in countries with a good institutional environment, other skilled investors, such as mutual funds, help enhance the market efficiency, thereby reducing the value of analyst reports.

The information-based hypothesis indicates that stock prices react more to recommendations in countries with a good institutional environment. Morch et al. (2000) find that stock prices incorporate less firm-specific information in emerging markets than in developed markets with the evidence of high stock price comovement. Chan and Hameed (2006) further provide evidence that greater analyst coverage increases stock price synchronicity in emerging markets, indicating their recommendations in these markets incorporate greater market-wide information compared to firm specific signals. Furthermore, countries with a bad institutional environment typically have low-quality financial market regulations. For example, insider trading might be rampant or corporate insiders might be corrupt. As discussed in Bhattacharya, Daouk, Jorgenson, and Kehr (2000), in countries with poor regulation, it is more likely that corporate insiders with superior information will disclose their information to their associates or trade themselves before announcement releases. Hence, prices already reflect forthcoming news that incorporated in analyst reports. Moreover, as discussed in Ball et al. (2000), analysts receive timely accounting information that can produce more informative reports in countries with better regulation.

3. Data and Summary Statistics

3.1 Data sources and description

We obtained data on recommendation announcements for all domestically listed shares in 32 countries between January 1994 and June 2015 from the I/B/E/S U.S. Detail File and International Detail File.[9] The recommendations range from one (strong buy) to five (strong sell) initially, and we reversed the ratings so that higher scores indicate more optimistic views (one represents strong sell, and five represents strong buy). Ljungqvist, Malloy, and Marston (2009) documented that the matched records in the I/B/E/S recommendations data were altered between downloads from 2000 to 2007. In response to their paper, Thomson Financial fixed the problems in the history recommendation file as of February 12, 2007. The dataset in this study is dated January 2016 and hence reflects these corrections by Thomson.

We required that daily stock price information around the recommendation announcement date was available in the WRDS Event study.[10] For example, we required that daily stock prices be available on the recommendation announcement day and the day after the recommendation announcement in the primary analysis. We also deleted recommendations that were stopped by the same analyst in the following twelve months (Loh and Stulz, 2011). Finally, to identify revisions by the same analyst, we also deleted observations without an analyst identification code.

We gathered data on institutional factors from established studies and international sources. In Section 4, we discuss these country-level variables in more detail. We gathered

[9] To ensure sufficient analyst activities per country, we required at least 10,000 recommendation announcements within the sample period. This requirement gave us 33 countries. However, after combining with the WRDS Event studies tool, the sample was reduced to 32 countries. Data on Russia's daily stock market was not available for use in the WRDS Event study. For 31 of the 32 countries in our sample, the 1994 calendar year is the first full year with recommendations in the I/B/E/S database. The coverage for Poland starts in June, 1995.

[10] We used WRDS Analytics Event studies to calculate the cumulative abnormal returns (CARs). WRDS provides users with this tool for running event studies. For the U.S. daily event study, it used the CRSP database, and for the international event study, it used the Compustat Global database. For more details, see https://wrds-www.wharton.upenn.edu/pages/support/event-study-research-application/.

the financial development data from the World Bank Database (including annual GDP growth, GDP per capita, and the stock market capitalization to GDP from 1993 to 2015).

We obtained 1,532,179 eligible recommendation announcements from 32 countries between January 1994 and June 2015. Countries were identified according to the two-digit country code obtained in the I/B/E/S Recommendation Detail File. Panel A in Table 1 reports the number of valid recommendations and the number of firms covered for each developed country, while Panel B presents the statistics for each of the emerging countries in our sample. This table shows that the developed markets have more extensive analyst coverage compared to emerging markets. The U.S. has the most extensive analyst coverage and accounts for 36% of all recommendation announcements, whereas the Philippines has the smallest coverage with 5,304 valid recommendation announcements during the sample period (comprising about 0.4% of the whole sample). Table 1 Column (3) shows that, on average, U.S. analysts cover more than 3,000 firms per year, whereas analysts in the Philippines cover 40 firms per year.

[Table 1]

3.2 Measure of average reaction to recommendations at the country level

Following Jegadeesh and Kim (2006), we calculated the two-day cumulative abnormal return for a recommendation for stock *i* at time *t* over event window (0, +1) using the Market Adjusted Model:

$$CAR_{i,t} = \prod_{t=0}^{1}(1 + R_{i,t}) - \prod_{t=0}^{1}(1 + R_t^M) \quad (1)$$

where $R_{i,t}$ represents the raw return of the stock *i* on day *t*, and R_t^M is the return on market portfolio on the same trading day. Day 0 is the recommendation announcement date.

For recommendations announced on non-trading days or during the non-trading hours on trading days, day 0 is the next trading day.

Second, for each country, we calculated the average reaction to recommendation announcements each year using the following formula,

$$CAR_{c,y,rec} = \frac{1}{n}\sum_{i=1}^{n} CAR_{i,y,rec} \quad (2)$$

where $CAR_{c,y,rec}$ is the equal-weighted average reaction to recommendation announcements of all *n* firms in year *y* for country *c* for each recommendation level *rec* (where *rec* equals 1, 2, 3, 4, or 5). By averaging across a large number of firms within each country, we eliminate the influence of heterogeneous firm effects and get an estimate of the "pure" recommendation effect at the country level.

Although optimistic (adverse) recommendation announcements are typically accompanied by a positive (adverse) stock price reaction, the market may form expectations differently across markets. For example, if analysts from two different countries issue a "Hold" recommendation, investors from one country may view this recommendation more pessimistically than the other country's investors. To control for structural differences in the perception of analyst recommendations across countries, we focused on the differences in the annual average of cumulative abnormal returns for the strong buy group (*rec* = 5) and the strong sell group (*rec* = 1) in each country, and used this difference in *CAR*,$Spread\_CAR_{c,y}$, as an indication of the price reaction to analyst recommendation announcements for each country. We calculated the spread in price reaction for country *c* during year *y*, $Spread\_CAR_{c,y}$, using the following formula,

$$Spread\_CAR_{c,y} = \sum_{rec=5} CAR_{c,y,rec} - \sum_{rec=1} CAR_{c,y,rec}$$

(3)

3.3 Events summary statistics

Figure 1 presents the evolution of average cumulative abnormal returns in event time for developed countries and emerging countries from 15 trading days before to 15 trading days after recommendation announcements. On each day around recommendation announcements, we calculated $Spread\_CAR_{c,y}$ for each country each year using the methods discussed above. Then we took the equal-weighted country average within the developed and emerging country group.

[Figure 1]

As indicated in Figure 1, there is an increasing trend of the cumulative abnormal return for both developed and emerging countries. Moreover, the developed countries show higher price reactions to the recommendation announcements compared to the emerging markets.

Table 2 presents the annual average of daily abnormal return differences for the strong buy group of stocks and the strong sell group of stocks for developed and emerging countries. As shown in Table 2, the absolute abnormal stock return has a sharp spike on event day zero of about 1.5% for developed markets and 0.7% for emerging markets.[11] The difference in daily abnormal returns between developed and emerging countries is

[11] Since the cumulative abnormal returns for emerging countries start from January 2000 in the WRDS Analytics Event Studies, the sample size in Table 2 Column (5), decreases to 198 months, which is 17 annual observations.

significantly positive on the announcement day and remains positive until one day after the announcement.[12]

[Table 2]

To obtain an indication of the impact of the recommendation announcement on stock returns for different countries, we plotted the distribution of the cumulative abnormal return spread over the recommendation announcement window (0, 1) in Figure 2. Consistent with Figure 1, this figure shows that most developed countries reside on the right side of the chart, indicating a more substantial stock price reaction to recommendation announcements.

[Figure 2]

Table 3 presents a more detailed analysis of the summary statistics depicted in Figure 2. It shows the cumulative abnormal return spread by country over different event windows, including 0 to +1, -1 to 0, -2 to +2, -5 to +5, and -15 to +15, and confirms the indications from Figure 2 discussed above. There is significant variation in abnormal returns across countries immediately following recommendation announcements, and developed countries show a higher price reaction on average compared to emerging countries (for example, over event window 0 to +1 the average price reaction spread is 2.41% for developed countries and 1.50% for emerging countries).[13] A significant portion of price drift concentrates on the announcement day and the trading day immediately after the announcement.[14]

[12] However, exceptions are on ten trading days after recommendation announcements where the difference of daily abnormal returns between developed countries and emerging countries is significantly negative, and on 15, 8, 4 days before recommendation announcements when the difference of daily abnormal returns between developed and emerging markets are significantly positive.

[13] The average statistic here is calculated slightly different from the sum of the daily abnormal return on day 0 and day 1 presented in Table 2. The reason is that when calculating the cumulative abnormal return over event window (0, +1), the daily stock prices on day 0 and day 1 were both required. However, for the daily abnormal return statistic presented in Table 2, we did not have this requirement.

[14] Unreported results show that more than 60% abnormal returns over event window (-2, +2) obtained on the announcement day and the trading day immediately after the announcement.

[Table 3]

4. Why are Recommendations more Influential in Some Countries than in others?

The results above indicate that stock prices, on average, react differently across countries. In this section, we try to identify institutional factors that affect the value of recommendations at the country level. A country's quality of accounting standards and security laws (including mandatory disclosure, liability standards, and public enforcement) could potentially influence analyst activity and how the information is incorporated into prices. The law and finance literature also argues that capital markets function properly only when good security laws exist and are enforced (La Porta et al., 1997; La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998). A more robust legal system might promote investment in response to analyst recommendations, but it could also encourage investors to explore investment opportunities themselves. To get an understanding of how the institutional environment affects the value of analyst recommendations, we considered a range of standard institutional factors, including the accounting standards, the country's legal origin, earnings quality, the effectiveness of security laws, the protection of private property, and the enforcement of insider trading laws.

4.1 Institutional environment proxies

The first proxy for the institutional environment is a dummy variable, ***ComLaw***, which takes the value of one if the country's legal origin is common law and zero if the legal origin is civil law. In general, investors in common law countries have more substantial legal rights than in civil laws countries (La Porta et al., 1998). Based on the legal origin information discussed in Dang, Moshirian, and Zhang (2015) and La Porta et al. (1998), 11

countries in our sample are common law origin countries, and 21 countries are civil law origin countries.

The second proxy we consider is earnings quality, as discussed in Leuz, Nanda and Wysocki (2003). They found that managers in countries with strong investor protection are less likely to manage earnings due to their limited ability to accumulate private information. Analysts from countries with lower earnings management have access to more accurate information about the firm. One would expect recommendation announcements to be more informative in these countries. We started with the country-level aggregate earnings quality score calculated by Leuz et al. (2003), which averages two earnings smoothing measures and two earnings discretion measures. Consistent with DeFond et al. (2007), we multiplied the earnings quality score with -1 and got the ***Earnings_Quality*** variable, where a higher value indicates better earnings quality.

The third institutional proxy, ***GGOV***, is based on Morck et al. (2000) and captures how well a country protects private property rights. It is defined as the sum of the following three indices from La Porta et al. (1997): government corruption, the risk of expropriation of private property by the government, and government repudiating contracts. Each index measures government attitude towards firms and ranges from 0 to 10, where lower scores indicate less private property protection.[15]

The fourth proxy, ***ACCTG***, measures the quality of accounting standards and is based on La Porta et al. (1998). This measure assesses the detailed level and usefulness of disclosure requirements. The authors argue that accounting plays a vital role in corporate

[15] Dang et al. (2015) also employed this institutional environment proxy and viewed it as a good government index. They tested whether a good institutional environment correlates with news co-movement and found that firm-level news co-moves more with market news in weak institutional environment countries. Also see Fernandes and Ferreira (2008).

governance, given its importance in understanding company disclosures. Accounting information may be particularly useful when investor protection is weak.

Prior studies suggest that regulation rules alone are unlikely to be effective without proper enforcement. The fifth proxy is from Bhattacharya and Daouk (2002) and measures the existence and the enforcement of insider trading laws. As Fernandes and Ferreira (2008) discussed, enforcement of insider trading laws improves price informativeness, especially in developed markets and countries with strong legal institutions. Following their study, we included a dummy variable, ***ENFORCE***, which equals one from the year of the country's first insider trading enforcement case and zero otherwise.

Finally, we included the sixth institutional variable, ***SEC_EFF***, which captures the effectiveness of a country's securities regulation. We followed Hail and Leuz (2006) and constructed this variable by computing the arithmetic mean of the three indices provided by La Porta, Lopez-De-Silanes, and Shleifer (2006). Based on answers to a questionnaire distributed to security law attorneys in 49 countries, La Porta et al. (2006) calculated quantitative indices for each country, capturing the current status of rules and regulations governing security issuance as of December 2000. This database includes three indices: the disclosure requirements index, the liability standard index, and the public enforcement index. Each index ranges from zero to one, with higher values indicating more extensive requirements or stricter enforcement.

4.2 Trading market characteristics

In addition to institutional variables, we also considered the level of a country's economic and financial development because economic and financial development are correlated with institutional characteristics. Following Morck et al. (2000) and Dang et al.

(2015), we included the log of gross domestic product per capita (***GDP_PC***), the ratio of stock market capitalization to GDP (***MTG***), and annual GDP growth (Δ***GDP***) in our analysis.[16]

Table 4 shows the means of institutional and control variables for each of the 32 sample countries, where Panel A presents the statistics of developed countries, and Panel B presents the statistics of emerging countries. The first six columns report the proxies for the institutional environment that we discussed above. Table 4 Column (5) shows the first year of enforcing insider trading laws in each country in the sample; a blank in this column indicates that insider trading laws have not yet been efficiently enforced. Table 4 Columns (7) to (9) present the average annual GDP growth (Δ***GDP***), annual GDP per capita (***GDP_PC***), and the average ratio of the stock market capitalization to GDP (***MTG***).

[Table 4]

As shown in the table, developed countries have higher GDP per capita and higher ratios of market capitalization to GDP. Emerging countries are associated with higher annual GDP growth. Unreported cross-country averages show that the annual GDP growth in emerging countries is almost twice as high as in developed countries. In contrast, the ratio of market capitalization to GDP in emerging countries is only about half of the ratio across developed countries.

Table 5 presents the correlation matrix of the country-level variables that are considered in this study. Countries with higher stock market development (with higher ratios of stock market capitalization to GDP) are more likely to have better-quality institutions. As expected, countries with higher accounting standards tend to have better earnings quality.

[16] Data are end of year values. Aggregates are based on constant 2010 U.S. dollars.

Moreover, common law countries tend to have a better institutional environment as indicated by higher accounting standards, more efficient security law enforcement, and better earnings quality.[17]

[Table 5]

5. Results

This section addresses whether the quality of a country's institutional environment is associated with the value of analyst recommendations. First, we present a preliminary comparison between different country groups based on the value of institutional environment proxies. Second, we use regression analysis and control for country development variables.

5.1 Univariate analysis

Here we provide a preliminary univariate comparison of the market reaction to analyst recommendations between country groups with different institutional environments. We divided the sample countries into two groups based on the sample median of each proxy for country-level institutional characteristics. If a country has a value of institutional environment proxy higher than the median, we view this country as a good institutional environment country. If a country has a value of institutional environment proxy smaller than or equal to the median of that proxy, we view this country as a bad institutional environment country. The institutional environment proxies include accounting standards (***ACCTG***), the country's legal origin (***ComLaw*** is equal to 1 if the country is a common law country; otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to one from the year of the country's first insider trading enforcement case and zero otherwise), the effectiveness

[17] The p-value of the negative Spearman and Pearson correlations between the legal origin and the enforcement of insider trading laws are not significantly different from zero.

of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). The average price reaction spread to analyst recommendations for each country, $Spread\_CAR_{c,y}$, is calculated as discussed in Section 3.2.

As shown in Table 6, stock prices react more to analyst recommendations in countries with a better institutional environment. If we take the accounting standard, as an illustration, the average price reaction over the event window (0, +1) is about 0.59% higher in countries with high-quality accounting standards than countries with low-quality accounting standards. Among the six institutional environment proxies employed in this study, the country's legal origin, the earnings quality, the enforcement of insider trading laws, and the protection of private property show similar results. However, price reaction spreads do not show any significant differences when considering the effectiveness of security laws.

[Table 6]

The results in Table 6 provide initial evidence in favor of the notion that, on average, stock prices react more in countries with a relatively better institutional environment. However, the relation between the institutional environment and the price reaction to analyst recommendations may be driven by other country-level or firm-level factors. Thus, we carried out more formal statistical tests of this hypothesis in a multivariate regression setting.

5.2 Multivariate regression results

This section used a regression model that allowed us to control a range of country-level factors that could affect the relationship between the value of analyst recommendations and a country's institutional environment. We began with a panel regression of the country-

average price reaction spread to recommendations on the institutional environment proxies, controlling for the country-level variables measuring economic and stock market development. In particular, we ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{c,y-1} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} ,$$

(4)

where $Spread\_CAR_{c,y}$ is the spread in average price reaction to recommendation announcements for the strong buy and strong sell groups over event window (0, +1) for country *c* in year *y*. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* in year *y*, as discussed in Section 4.1. $\Delta GDP_{c,y-1}$ is the lagged-one-year annual GDP growth for country *c*. $MTG_{c,y-1}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $GDP\_PC_{c,y-1}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. In addition to these country-level variables, we also included year-fixed effects.

Table 7 shows the results of the multivariate regression analysis. The results show that stock prices react more in countries with better accounting standards, common law origins, more efficient security law enforcement, stronger protection of private property rights, and better earnings quality. The coefficient on ***ACCTG*** *(0.044 with t-statistic of 3.80)*, ***ComLaw*** *(0.936 with t-statistic of 4.93)*, ***SEC_EFF*** *(2.519 with t-statistic of 4.53)*, and ***Earnings_Quality*** *(0.821 with t-statistic of 3.51)*, ***GGOV*** *(0.066 with t-statistic of 1.83)* are all positively significant at 10% or better. However, the coefficient on ***ENFORCE*** is not significant from zero, indicating that the value of recommendations across countries is not significantly associated with the enforcement of insider trading laws after the inclusion of the

control variables. This result might reflect a lack of variation in this variable since cumulative abnormal returns for emerging countries only start from January 2000, by which time most countries in the sample have enforced insider trading laws. Table 7 Column (7) shows that countries with solid security law enforcement and good governance show higher recommendation spreads when considering all the institutional environment proxies simultaneously.

[Table 7]

5.3 Asymmetric impact of recommendations

In addition to focusing on the relation between the institutional environment and the price reaction spread in each country, we also examined whether the impact of the institutional environment on stock price reactions is asymmetric between strong buy and strong sell recommendations. Table 8 presents the results of the multivariate regressions of the cumulative abnormal returns over event window (0, +1) for strong buy and strong sell stocks separately. Panel A shows results for strong buy recommendations, and Panel B shows results for strong sell recommendations. The results show that the institutional environment affects both the value of favorable and unfavorable recommendations.[18] To formally test whether this effect is asymmetric between strong sell and strong buy recommendations, we ran the following regression:

$$CAR\_Sign_{c,y}=\alpha + \beta_1 * IE_{c,y}+\beta_2 * Sell_{c,y}+ \beta_3 * Sell_{c,y} * IE_{c,y} + \beta_4 * \Delta GDP_{c,y-1} + \beta_5 * MTG_{c,y-1} + \beta_6 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} ,$$

(5)

[18] Similar results are obtained if the focus is on strong buy plus buy, versus strong sell plus sell.

where $CAR\_Sign_{c,y}$ is the cumulative abnormal return multiplied by -1 if the cumulative abnormal return is calculated for strong sell recommendations and multiplied by +1 otherwise. $Sell_{c,y}$ is a dummy variable equal to 1 if the recommendation is a strong sell recommendation and 0 if the recommendation is a strong buy recommendation. If there exists an asymmetric effect of the institutional environment on the value of positive and negative recommendations, one would expect the coefficient of the interaction variable $Sell_{c,y} * IE_{c,y}$, β_3 to be significantly different from 0.

Table 8, Panel C shows that the institutional environment affects the value of strong buy and strong sell recommendations differently. Each column shows the results of using the corresponding institutional environment proxy indicated as the column name. The coefficients on five out of six interaction variables, $Sell_{c,y} * IE_{c,y}$, are significantly positive, indicating that the institutional environment affects the value of strong sell recommendations more than the value of strong buy recommendations.

[Table 8]

6. Potential Problems

6.1 Potential time stamp errors

Loh and Stulz (2011) constructed a First Call-I/B/E/S augmented sample by manually matching broker names. They then looked seven days on either side of the I/B/E/S recommendation date to find a First Call observation that matched with broker, firm, and recommendation level. They found about 77% of these had recommendation dates unchanged, 21% had dates brought back by one day, and 2% had dates brought forward by one day.[19]

[19] However, First Call data was discontinued from the beginning of 2012. See http://www.whartonwrds.com/news/first-call-data-to-be-discontinued/

Thus, our results could be biased because of systematic I/B/E/S time stamp errors for certain countries. For example, if I/B/E/S recorded the recommendation announcement dates in developed countries correctly, but it recorded the recommendation announcement dates in emerging countries with a delay, we would miss the initial impact of the recommendation announcements in emerging markets. In particular, if the actual announcement dates were earlier than the date recorded in the database, we would not capture the impact of the announcement on day 0; the impact of the recommendation announcement would be included in the cumulative returns over periods before the recorded announcement date.[20]

If systematic date-coding errors in emerging countries are the reason for the differences in analyst recommendations between developed and emerging countries, we should see pre-revision price run-ups in emerging countries that offset the lower post-revision price run-up. In this situation, we would see the results disappear when extending the event window.

To test whether potential dating errors drive the results, we extended the event windows and checked the results using both a three-day event window over (-1, +1), a five-day event window over (-2, +2), as well as (-5, +5) and (-15, +15).

Table 9 shows the results of the panel regression for these alternative event windows. Note that as before, we have only included one institutional environment proxy each time, and every column in Table 9 summarizes the results of six regressions using the same event window. The institutional environment proxies affect the value of analyst recommendations significantly at the country level when extending the event window. Even when using a very

[20] For example, if the actual date was 10/02/1999 but I/B/E/S recorded it as 12/02/1999, then day 0 return would mistakenly exclude the impact of the announcement, but the impact would be included in the cumulative returns over intervals smaller than or equal to negative three days.

long event window (-15, +15), three institutional environment proxies remain significantly positive. Hence, potential errors in recommendation dates do not affect the conclusion that recommendations in countries with better institutional environments have a higher value to investors.

[Table 9]

6.2 Recommendations around earnings announcements

When determining whether analyst recommendations contain any material information, we should be careful to remove recommendations that merely repeat the information contained in firm-specific news releases. Existing studies have found that a large number of recommendations or recommendation revisions happen following earnings announcements. For example, Altınkılıç and Hansen (2009) found that about 80% of recommendation revisions are announced within a few hours of earnings announcements, and documented that the average recommendation revision does not provide an economically meaningful reaction after removing recommendations that piggyback on the firm news, such as earnings announcements.[21] On the other hand, Bradley, Clarke, Lee, and Ornthanalai (2014) showed that analyst recommendations are more influential than earnings announcements. Yezegel (2015) provided an alternative perspective and showed that analysts tend to increase their activity just after earnings announcements to meet the higher demand of investors.

To control for potential clustering of recommendation announcements and contamination from earnings announcements, we required that at least three days pass between a recommendation announcement and an earnings announcement for the same firm.

[21] Similarly, Loh and Stulz (2011) argued that only 12% of analyst recommendations have significant impact on stock prices after excluding recommendations announced within three days around the release of confounding firm-specific news.

It reduced the sample size by 16% to 1,280,381 eligible recommendation announcements from 32 countries.

Table 10 reports the results of the panel regressions of the cumulative abnormal return spread over recommendation announcement window (0, +1) and institutional environment proxies at the country level after excluding recommendations announced within three days of an earnings announcement. The coefficients on the proxies of the institutional environment are in the same direction and have a similar significance level compared with the coefficients without excluding recommendations announced within three days of the earnings announcement. Thus, the confounding earnings announcements do not drive the results.

[Table 10]

6.3 Value of recommendation changes and the institutional environment

In addition to examining the effect of the institutional environment on the value of recommendation announcements, we also extended the tests to recommendation revisions. If the same analyst announced a recommendation for the same firm within twelve months, we viewed that as a recommendation revision. We then split the recommendation revisions into upgrades and downgrades. Consistent with recommendation level studies, we focused on the stock price reaction differences between recommendation upgrades and downgrades and ran the following regression,

$$SCh\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} \quad (6)$$

where the $SCh\_CAR_{c,y}$ is the difference in the annual average price reaction to recommendation upgrades and downgrades over event window (0, +1) for country *c* in year *y*.

Table 11 shows the results of the multivariate regression analysis using recommendation revisions. Like the recommendation announcement results presented in Table 7, the results show that stock prices react more in countries with better accounting standards, common law origins, more effective security law enforcement, and better earnings quality. The coefficients on ***ACCTG*** *(0.018 with t-statistic of 2.35)*, ***ComLaw*** *(0.708 with t-statistic of 4.13)*, ***SEC_EFF*** *(1.363 with t-statistic of 4.26),* and ***Earnings_Quality*** *(0.741 with t-statistic of 3.85*) are significantly different from zero. As opposed to the level results, the coefficient on ***ENFORCE*** is now significantly different from zero (*0.280 with t-statistic of 2.03*), indicating that the enforcement of insider trading laws affects the value of recommendation revisions across countries. However, the protection of private property, ***GGOV*** *(-0.010 with t-statistic of -0.38),* does not show a significant impact on the value of recommendation revisions.

[Table 11]

6.4 Favorable recommendations versus unfavorable recommendations

Since only a small percentage of recommendations were strong sell, we also extended the tests to all favorable recommendations (strong buy and buy) and all unfavorable recommendations (strong sell and sell) to ensure that the results were not driven by extreme recommendations. We ran the following regression,

$$ALL\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} \quad (7)$$

where $ALL\_CAR_{c,y}$ is the difference of the annual average price reaction to positive recommendations (buy and strong buy) and negative recommendations (sell and strong sell) over event window (0, +1). Table 12 shows the results of the multivariate regression analysis using all favorable and unfavorable recommendations. The results show that each of six

proxies affects the stock price reactions to recommendations significantly. Recommendations in countries with higher accounting standards, common law origins, effective security law enforcement, insider trading law enforcement, better earnings quality, and better protection of private property have a significantly larger impact on stock price movements.

[Table 12]

6.5 Post-regulation period

The brokerage industry faced significant regulatory changes in 2002 in the United States and 2003 in Europe. The positive bias in analyst recommendations declined after regulation (Dubois, Fresard, and Dumontier, 2013; Kadan, Madureira, Wang, and Zach, 2009). To ensure the results were not driven by price reactions to biased recommendations before regulatory changes, we only conducted tests using the post-regulation period. Table 13 shows the results of the value of recommendations and the institutional environment at the country level after the industry's regulatory change. The sample period starts from January 2004 and ends in June 2015. Similar to the full sample results presented in Table 7, recommendations in countries with better institutional environments have a larger impact on stock prices. Moreover, the enforcement of insider trading laws now shows a marginally significant coefficient in the post-regulation period. Since the calculation of cumulative abnormal returns for most emerging countries starts from January 2000 in the WRDS Analytics Event Study, we did not conduct the tests for the pre-regulation period due to limited data.

[Table 13]

7. Conclusion

In this paper, we investigated whether investors react differently to analyst recommendations across countries, and how the institutional environment affects the value of analyst recommendations across countries. Using a sample of 32 countries from 1994 to 2015, we found that stock price reactions in response to analyst recommendations vary across countries and that these differences are associated with proxies for the quality of the institutional environment. Recommendations in countries with higher quality accounting standards, more efficient security enforcement, better earnings quality, common law origins, and better protection of private property display significantly higher price reactions. Additional tests show that the institutional environment has a greater effect on the value of pessimistic recommendations than positive recommendations. The results remain robust when extending the event window to (-15, +15), excluding confounding earnings announcements, using all positive and negative recommendations, and conducting the analysis in the post-regulation period only. The results are similar when we examine the impact of institutional environments on the value of recommendation revisions.

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Table 1: Summary Statistics of Recommendation Announcements

Table 1 presents a summary of the sample countries where the event firms reside and reports the number of valid recommendations and number of firms covered in this study. Countries are identified according to the two-digit country code obtained in the I/B/E/S Recommendation Detail File. Panel A shows the number of valid recommendations and the number of firms covered for each of the developed countries, while Panel B presents statistics for each of the emerging countries.

Country	Number of Recommendations (1)	Percentage of Sample (2)	Number of Firms (3)
Panel A: Developed Countries			
Australia	56,167	3.67%	428.65
Belgium	10,557	0.69%	79.53
Canada	41,656	2.72%	151.86
Denmark	10,409	0.68%	63.94
Finland	18,438	1.20%	88.53
France	57,144	3.73%	345.82
Germany	60,715	3.96%	326.24
Hong Kong	21,979	1.43%	83.00
Italy	25,518	1.67%	160.71
Japan	101,858	6.65%	1,139.00
Netherlands	22,994	1.50%	98.35
New Zealand	5,864	0.38%	58.12
Norway	16,414	1.07%	110.59
Singapore	21,241	1.39%	149.53
Spain	23,547	1.54%	98.12
Sweden	26,821	1.75%	163.88
Switzerland	19,919	1.30%	133.41
United Kingdom	116,566	7.61%	799.35
United States	548,937	35.83%	3,689.23
Total of Developed Markets	1,206,744	78.76%	-
Panel B: Emerging Countries			
Brazil	11,333	0.74%	73.29
China	47,357	3.09%	662.82
India	58,337	3.81%	400.06
Indonesia	12,018	0.78%	84.41
Korea	58,241	3.80%	395.88
Malaysia	28,244	1.84%	224.47
Mexico	7,000	0.46%	50.65
Philippines	5,304	0.35%	44.82
Poland	8,998	0.59%	80.00
South Africa	12,484	0.81%	123.57
Taiwan	39,727	2.59%	350.06
Thailand	26,614	1.74%	167.00
Turkey	9,778	0.64%	108.60
Total of Emerging Markets	325,435	21.24%	-
Total	1,532,179	100.00%	-

Figure 1: Cumulative Abnormal Return around Recommendation Announcements

Figure 1 presents the evolution of average cumulative abnormal returns for developed countries and emerging countries in event time from 15 trading days before, to 15 trading days after the recommendation announcements. Day 0 is the recommendation announcement date. For the recommendations announced on non-trading days or during the non-trading hours on trading day, day 0 is the next trading day. The green dashed line is the reference line on day 0. These cumulative abnormal returns are first calculated as the differences in cumulative abnormal returns for strong buy stocks and strong sell stocks in each country each year on each trading day around the recommendation announcement. Then we take the equal-weight annual country average cumulative abnormal return within developed and emerging country group.

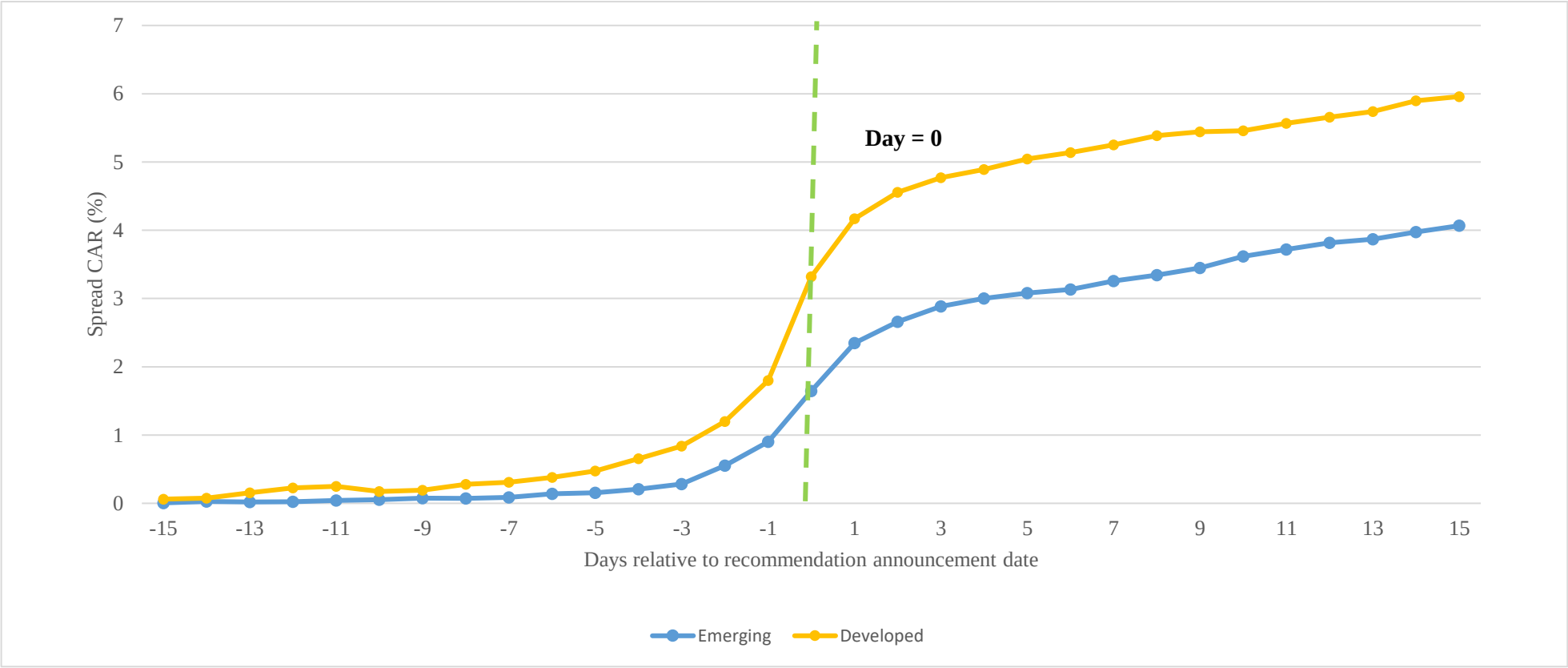

Table 2: Daily Abnormal Return Spread

Table 2 presents the annual average of daily abnormal return differences for the most recommended group of stocks and the least recommended group of stocks for developing and emerging countries. We calculate the daily abnormal return by taking the difference between the total return of a stock and the value-weighted return on the market index on the same trading day. Day 0 is the recommendation announcement date. For the recommendations announced on a non-trading day or during the non-trading hours of a trading day, day 0 is the next trading day. The t-statistic is in **bold** if the difference is significant at 10% level or higher.

Trading Days Relative to Recommendation Announcement (1)	Number of Years (2)	Developed (Return in %) (3)	Emerging (Return in %) (4)	Develop-Emerging (5)	Develop-Emerging (t-stat.) (6)
-15	17	0.058	-0.011	0.068	**2.41**
-14	17	0.001	0.016	-0.015	-0.21
-13	17	0.067	0.024	0.043	1.02
-12	17	0.055	0.020	0.035	0.65
-11	17	0.043	0.010	0.032	0.63
-10	17	-0.029	0.031	-0.060	-1.14
-9	17	0.031	0.021	0.010	0.17
-8	17	0.085	0.002	0.083	**1.69**
-7	17	0.035	0.037	-0.002	-0.03
-6	17	0.066	0.047	0.019	0.36
-5	17	0.019	0.029	-0.010	-0.13
-4	17	0.180	0.065	0.115	**2.70**
-3	17	0.137	0.100	0.037	0.75
-2	17	0.307	0.285	0.023	0.51
-1	17	0.504	0.331	0.173	1.56
0	17	1.551	0.704	0.847	**8.49**
1	17	0.841	0.648	0.194	**3.80**
2	17	0.386	0.345	0.041	0.78
3	17	0.234	0.122	0.112	1.43
4	17	0.085	0.092	-0.008	-0.13
5	17	0.126	0.077	0.050	0.97
6	17	0.099	0.107	-0.008	-0.14
7	17	0.154	0.116	0.038	0.48
8	17	0.129	0.094	0.035	0.78
9	17	0.036	0.048	-0.013	-0.24
10	17	0.009	0.130	-0.120	**-2.88**
11	17	0.083	0.102	-0.019	-0.30
12	17	0.069	0.096	-0.027	-0.74
13	17	0.049	0.069	-0.020	-0.33
14	17	0.119	0.063	0.056	1.13
15	17	0.047	0.078	-0.031	-0.62

Figure 2: Cumulative Abnormal Return Spread by Country over the Window (0, 1)

Figure 2 plots the distribution of the cumulative abnormal return spread over the recommendation announcement window (0, 1) for each country in the sample. Day 0 is the recommendation announcement date. For the recommendations announced on a non-trading day or during the non-trading hours of a trading day, day 0 is the next trading day. The cumulative abnormal return spread over is calculated using the following regression, $Spread\_CAR_{c,y} = \sum_{rec=5} CAR_{c,y,rec} - \sum_{rec=1} CAR_{c,y,rec}$

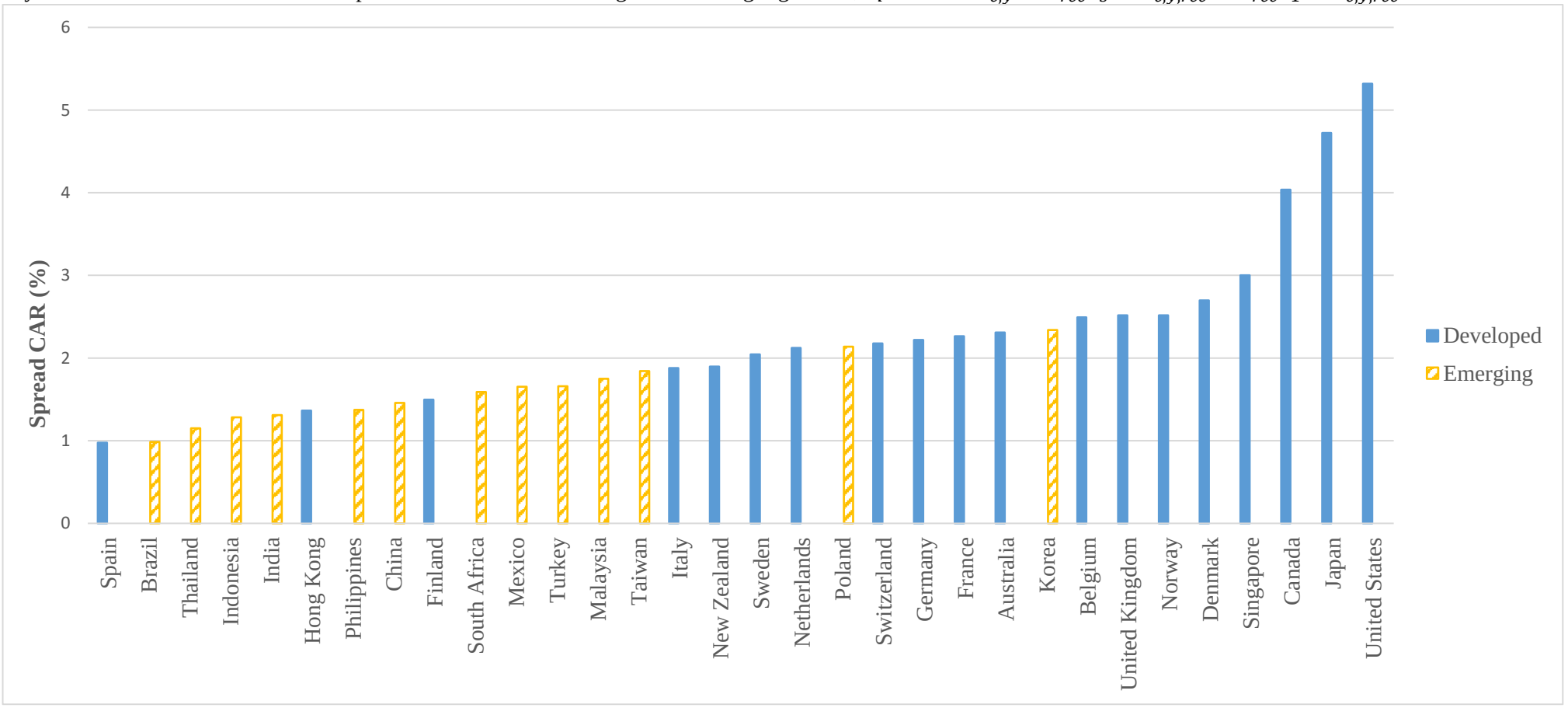

Table 3: Cumulative Abnormal Return Spread by Country

Table 3 presents a more detailed analysis of the summary statistics depicted in Figure 2. It shows the cumulative abnormal return spread by country over different event windows, including (0, 1), (-1, 0), (-2, +2), (-5, +5), and (-15, +15). Day 0 is the recommendation announcement date. For the recommendations announced on a non-trading day or during the non-trading hours of a trading day, day 0 is the next trading day. Cumulative abnormal returns highlighted in **bold** are significant at the 10% level or better.

	Event Window				
Country	(0, 1)	(-1, 0)	(-2, +2)	(-5, +5)	(-15, +15)
Panel A: Developed Countries					
Australia	**2.352**	**1.690**	**3.881**	**5.210**	**6.568**
Belgium	**2.215**	**1.736**	**3.352**	**4.797**	**5.700**
Canada	**4.357**	**4.294**	**5.903**	**5.658**	**7.254**
Denmark	**2.703**	**2.631**	**3.827**	**4.951**	**5.734**
Finland	**1.487**	**1.936**	**3.251**	**3.800**	**4.288**
France	**2.083**	**2.379**	**3.255**	**4.088**	**4.798**
Germany	**2.256**	**2.681**	**3.988**	**4.904**	**5.745**
Hong Kong	**1.415**	**1.245**	**2.754**	**3.368**	**4.561**
Italy	**2.019**	**1.846**	**2.862**	**3.597**	**4.595**
Japan	**4.541**	**2.495**	**6.855**	**8.010**	**9.650**
Netherlands	**1.770**	0.944	**2.358**	**3.439**	**4.580**
New Zealand	**1.505**	**1.527**	**2.885**	**2.768**	**3.691**
Norway	**2.789**	**2.386**	**3.814**	**5.220**	**6.481**
Singapore	**2.876**	**1.917**	**4.155**	**5.098**	**6.401**
Spain	**0.795**	**0.763**	**1.064**	**1.143**	0.926
Sweden	**1.900**	**1.589**	**2.510**	**2.749**	**3.092**
Switzerland	**2.135**	**2.299**	**3.652**	**4.829**	**6.446**
United Kingdom	**2.443**	**2.608**	**3.762**	**4.709**	**5.170**
United States	**5.162**	**4.805**	**6.091**	**6.354**	**6.653**
Average of Developed Markets	**2.414**	**2.264**	**3.593**	**4.199**	**5.078**
Panel B: Emerging Countries					
Brazil	**1.200**	**1.047**	**2.226**	**2.926**	2.083
China	**1.116**	**0.612**	**1.510**	**2.325**	**3.278**
India	**1.318**	**1.432**	**2.514**	**3.557**	**5.489**
Indonesia	**1.395**	**0.819**	**2.084**	**2.715**	**4.447**
Korea	**2.094**	**1.412**	**3.440**	**4.078**	**5.926**
Malaysia	**1.847**	**1.103**	**2.833**	**3.714**	**5.322**
Mexico	**1.663**	**1.284**	**2.606**	**2.674**	**1.984**
Philippines	**1.311**	0.430	**2.144**	**2.042**	**3.491**
Poland	**1.914**	**1.553**	**3.229**	**3.791**	**4.092**
South Africa	**1.581**	**1.139**	**2.294**	**2.202**	**1.913**
Taiwan	**1.840**	**1.485**	**3.713**	**5.186**	**7.191**
Thailand	**1.128**	**1.046**	**1.823**	**2.531**	**3.552**
Turkey	**1.713**	**1.127**	**2.146**	**1.917**	1.757
Average of Emerging Markets	**1.496**	**1.104**	**2.488**	**3.066**	**4.004**

Table 4: Summary Statistics of Country-level Variables

This table summarizes the means of variables for each of the 32 sample countries. Panel A presents the statistics of the developed countries, and Panel B presents the statistics of the emerging countries. The institutional environment proxies include accounting standard (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). All the institutional variables discussed in this table are drawn from the existing literature. The sample period for annual GDP growth (Δ***GDP***), GDP per capita (***GDP_PC***), and stock market capitalization to GDP (***MTG***) is from 1993 to 2015.

Country	***ComLaw*** (1)	***Earnings_Quality*** (2)	***GGOV*** (3)	***ACCTG*** (4)	***ENFORCE Year*** (5)	***SEC_EFF*** (6)	Δ***GDP*** (7)	***GDP_PC*** (8)	***MTG*** (9)
Panel A: Developed Countries									
Australia	1	-0.443	26.500	75.000	1996	0.770	3.242	4.687	107.887
Belgium	0	-0.986	27.930	61.000	1994	0.337	1.688	4.630	65.314
Canada	1	-0.677	28.630	74.000	1976	0.907	2.664	4.644	122.744
Denmark	0	-0.730	28.980	62.000	1996	0.500	1.222	4.761	55.619
Finland	0	-0.722	28.820	77.000	1993	0.493	1.875	4.647	152.761
France	0	-0.666	27.890	69.000	1975	0.580	1.525	4.603	77.162
Germany	0	-0.874	28.600	62.000	1995	0.213	1.338	4.602	46.085
Hong Kong	1	-0.924	25.630	69.000	1994	0.817	3.473	4.445	714.843
Italy	0	-1.090	24.650	62.000	1996	0.457	0.336	4.559	38.528
Japan	0	-1.055	27.880	65.000	1990	0.470	0.712	4.641	72.602
Netherlands	0	-0.856	29.330	64.000	1994	0.620	1.737	4.685	95.864
New Zealand	1		28.980	70.000		0.480	2.653	4.513	35.387
Norway	0	-0.445	29.590	74.000	1990	0.430	1.908	4.932	49.978
Singapore	1	-0.800	26.380	78.000	1978	0.843	5.410	4.600	203.743
Spain	0	-1.547	25.300	64.000	1998	0.497	1.825	4.477	81.300
Sweden	0	-0.723	28.980	83.000	1990	0.453	2.411	4.690	103.766

Switzerland	0	-1.435	29.960	68.000	1995	0.480	1.992	4.850	217.523
United Kingdom	1	-0.492	28.440	78.000	1981	0.723	1.975	4.580	127.890

Table 4 Continued

Country	*ComLaw* (1)	*Earnings_Quality* (2)	*GGOV* (3)	*ACCTG* (4)	*ENFORCE Year* (5)	*SEC_EFF* (6)	*ΔGDP* (7)	*GDP_PC* (8)	*MTG* (9)
United States	1	-0.492	27.610	71.000	1961		2.525	4.656	118.523
Panel B: Emerging Countries									
Brazil	0		20.240	54.000	1978	0.387	3.115	3.998	50.927
China	0						10.000	3.551	50.103
India	1	-1.541	18.440	57.000	1998	0.750	7.067	3.017	77.082
Indonesia	0	-1.841	15.400		1996	0.593	4.043	3.424	32.918
Korea	0	-0.864	22.200	62.000	1988	0.553	4.268	4.272	68.895
Malaysia	1	-0.737	22.760	76.000	1996	0.783	4.474	3.910	139.533
Mexico	0		18.610	60.000		0.347	2.500	3.947	29.124
Philippines	0	-0.732	12.940	65.000		0.887	4.590	3.276	52.070
Poland	0				1993		3.802	4.022	27.393
South Africa	1	-0.442	23.070	70.000		0.580	3.248	3.848	216.752
Taiwan	0	-0.736	25.130	65.000	1989	0.643			
Thailand	1	-0.885	20.170	64.000	1993	0.620	3.612	3.638	60.863
Turkey	0		18.130	51.000	1996	0.450	5.457	4.044	29.969

Table 5: Correlations of Country-level Variables

This table reports Spearman (upper-right part) and Pearson (lower-left part) correlations among the country level variables used in this study. The institutional environment proxies include accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). All the institutional variables discussed in this table are drawn from the established literature. The sample period for annual GDP growth (Δ**GDP**), GDP per capita (***GDP_PC***), and stock market capitalization to GDP (***MTG***) is from 1993 to 2015.

Variable	***ACCTG***	***GGOV***	***SEC_EFF***	***ComLaw***	***Earnings_Quality***	***ENFORCE***	Δ***GDP***	***MTG***	***GDP_PC***
ACCTG	1.000	0.432	0.450	0.456	0.648	0.074	0.014	0.593	0.377
GGOV	0.510	1.000	-0.191	-0.083	0.315	0.226	-0.361	0.295	0.859
SEC_EFF	0.409	-0.189	1.000	0.657	0.230	0.035	0.291	0.500	-0.203
ComLaw	0.404	0.060	0.667	1.000	0.348	-0.007	0.159	0.512	-0.093
Earnings_Quality	0.580	0.383	0.191	0.333	1.000	-0.252	-0.058	0.280	0.345
ENFORCE	0.084	0.357	0.017	-0.007	-0.218	1.000	-0.182	0.229	0.432
Δ***GDP***	-0.042	-0.307	0.262	0.127	-0.087	-0.194	1.000	0.069	-0.430
MTG	0.247	0.160	0.343	0.358	0.057	0.108	0.076	1.000	0.340
GDP_PC	0.421	0.913	-0.257	-0.062	0.384	0.412	-0.400	0.173	1.000

Table 6: Univariate Analysis for Price Reaction to Recommendations and Institutional Environments

This table reports the average price reaction to analyst recommendations of the two groups of countries. According to the different institutional environment proxies used in this paper, we divided all the countries in the sample into two groups. If a country has a value of institutional environment proxy higher than the median of the proxy in interest, we viewed this country as a good institutional environment country (Good I.E.). If a country has a value of institutional environment proxy smaller than or equal to the median of the proxy in interest, we viewed this country as a bad institutional environment country (Bad I.E.). The institutional environment proxies include accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case, and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). All the institutional variables discussed in this table are drawn from the existing literature. The average price reaction to analyst recommendations for each country is calculated as the annual average of the cumulative abnormal return to the recommendation announcement over event window (0, +1). Differences between two groups (Good-Bad) highlighted in **bold** are significant at the 10% level or better.

	ACCTG	***ComLaw***	***ENFORCE***	***SEC_EFF***	***Earnings_Quality***	***GGOV***
Good IE	2.540	2.528	2.819	2.082	2.605	2.297
Bad IE	1.950	1.987	1.632	2.064	2.030	1.596
Good-Bad	**0.590**	**0.541**	**1.187**	0.018	**0.575**	**0.701**
(t-stats)	3.49	3.10	7.39	0.12	3.19	3.55

Table 7: Value of Recommendations and the Institutional Environment at the Country Level

This table reports the results of the panel regressions of the cumulative abnormal returns over recommendation announcement window (0, +1) and institutional environment proxies at the country level. Specifically, we ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{c,y-1} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y},$$

where $Spread\_CAR_{c,y}$ is the difference in average price reaction to recommendation announcements for the most recommended and least recommended groups over event window (0, +1) for country *c* in year *y*. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta GDP_{c,y-1}$ is the lagged-one-year annual GDP growth for country *c*. $MTG_{c,y-1}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $GDP\_PC_{c,y-1}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ACCTG	**0.044**						**-0.047**
	3.80						-2.47
ComLaw		**0.936**					-0.004
		4.93					-0.01
ENFORCE			0.184				-0.244
			0.96				-0.77
SEC_EFF				**2.519**			**3.622**
				4.53			4.10
Earnings_Quality					**0.821**		0.351
					3.51		1.00
GGOV						**0.066**	**0.170**
						1.83	2.92
$\Delta GDP_{c,y-1}$	0.004	0.007	0.023	-0.004	0.046	0.033	0.011
	0.14	0.27	0.88	-0.13	1.63	1.15	0.40
$MTG_{c,y-1}$	**-0.002**	**-0.003**	**-0.001**	**-0.003**	**-0.002**	**-0.002**	**-0.003**
	-3.69	-4.76	-3.14	-4.52	-4.09	-3.30	-4.31
$GDP\_PC_{c,y-1}$	**1.141**	**1.467**	**1.360**	**1.406**	**1.200**	**0.839**	0.535
	6.22	8.47	8.10	7.98	6.88	2.83	1.25
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y

Table 8: Value of Recommendations and the Institutional Environment at the Country Level

Panel A and Panel B of Table 8 report the results of the impact of the institutional environment on cumulative abnormal returns for strong buy (Panel A) and strong sell recommendations (Panel B) over event window (0, +1). Specifically, we ran the following regression:

$CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{c,y-1} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}$,

where $CAR_{c,y}$ represents the average price reaction to recommendation announcements for the strong buy and strong sell groups separately over event window (0, +1) for country *c* in year *y*.

Panel C shows the results testing whether the institutional environment affects the value of strong buy and strong sell recommendations differently. Each column shows the results of using the corresponding institutional environment proxy indicated as by the column name. Specifically, we ran the following regression:

$CAR\_Sign_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * Sell_{c,y} + \beta_3 * Sell_{c,y} * IE_{c,y} + \beta_4 * \Delta GDP_{c,y-1} + \beta_5 * MTG_{c,y-1} + \beta_6 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}$,

where $CAR\_Sign_{c,y}$ represents the average price reaction to recommendation announcements for the strong buy and strong sell groups separately over event window (0, +1) for country *c* in year *y*. We multiplied the cumulative abnormal return by -1 if the cumulative abnormal return was calculated for strong sell recommendations, and by +1 otherwise. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta GDP_{c,y-1}$ is the lagged-one-year annual GDP growth for country *c*. $MTG_{c,y-1}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $GDP\_PC_{c,y-1}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Panel A: Recommendation = 5 (Strong Buy)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ACCTG	**0.010**						-0.002
	2.21						-0.25
ComLaw		**0.149**					**-0.199**
		2.15					-1.86
ENFORCE			0.115				0.038
			1.36				0.33
SEC_EFF				**0.424**			**0.659**
				2.65			2.28
Earnings_Quality					0.120		0.063
					1.42		0.48
GGOV						0.016	**0.041**
						1.14	1.92
$\Delta GDP_{c,y-1}$	-0.019	-0.015	-0.012	**-0.019**	-0.009	-0.012	-00018
	-1.51	-1.45	-1.11	-1.78	-0.80	-1.01	-1.37
$MTG_{c,y-1}$	**-0.001**	**-0.001**	**-0.001**	**-0.001**	**0.001**	**-0.001**	**-0.001**
	-3.30	-3.69	-3.24	-3.72	-3.81	-3.13	-2.77
$GDP\_PC_{c,y-1}$	**0.384**	**0.415**	**0.372**	**0.366**	**0.350**	**0.271**	0.019
	5.71	6.73	5.61	6.16	5.76	2.19	0.11

Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y
Panel B: Recommendation = 1 (Strong Sell)							
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ACCTG	**-0.036**						**0.044**
	-3.79						2.75
ComLaw		**-0.733**					-0.115
		-4.76					-0.49
ENFORCE			-0.111				0.346
			-0.69				1.26
SEC_EFF				**-2.218**			**-3.159**
				-4.42			-4.04
Earnings_Quality					**-0.722**		-0.287
					-3.86		-1.01
GGOV						-0.034	**-0.131**
						-1.12	-2.59
$\Delta GDP_{c,y-1}$	-0.025	-0.023	**-0.036**	-0.016	-0.057	**-0.047**	-0.030
	-1.06	-1.09	-1.65	-0.69	-2.43	-1.98	-1.24
$MTG_{c,y-1}$	**0.001**	**0.002**	**0.001**	**0.002**	**0.001**	**0.001**	**0.002**
	3.36	4.35	2.58	4.35	3.68	2.78	4.36
$GDP\_PC_{c,y-1}$	**-0.707**	**-1.004**	**-0.930**	**-1.005**	**-0.804**	**-0.664**	-0.480
	-4.66	-6.74	-6.39	-6.33	-5.40	-2.69	-1.31
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y

Panel C: Pooled Regression						
Variables	***ACCTG***	***ComLaw***	***ENFORCE***	***SEC_EFF***	***Earnings_Quality***	***GGOV***
$IE_{c,y}$	**0.010**	**0.203**	0.022	**0.726**	0.071	0.006
	2.13	2.83	0.25	3.85	0.77	0.43
$Sell_{c,y}$	**-1.446**	0.011	0.044	**-0.533**	**0.883**	**-0.686**
	-2.32	0.15	0.28	-2.25	4.28	-1.83
$IE_{c,y} * Sell_{c,y}$	**0.025**	**0.477**	0.182	**1.191**	**0.700**	**0.037**
	2.65	3.37	1.03	2.91	3.62	2.35

Table 9: Alternative Event Window Analysis

This table reports the results of the panel regressions of the cumulative abnormal returns over alternative recommendation announcement windows (0, +1), (-1, +1), (-2, +2), (-5, +5), and (-15, +15), and institutional environment proxies at the country level. Specifically, we ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}\ ,$$

where $Spread\_CAR_{c,y}$ is the difference in average price reaction to recommendation announcements for the most recommended and least recommended groups over the event window for country *c* in year *y*. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta\boldsymbol{GDP_{c,y-1}}$ is the lagged-one-year annual GDP growth for country *c*. $\boldsymbol{MTG_{c,y-1}}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $\boldsymbol{GDP\_PC_{c,y-1}}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(0, +1)	(-1, +1)	(-2, +2)	(-5, +5)	(-15, +15)
ACCTG	**0.044**	**0.037**	**0.035**	0.017	0.047
	3.80	2.79	2.27	0.78	1.30
ComLaw	**0.936**	**1.006**	**0.948**	**0.675**	**0.951**
	4.93	4.83	4.07	2.47	2.29
ENFORCE	0.184	0.290	0.069	**0.753**	**1.278**
	0.96	1.11	0.23	2.21	2.29
SEC_EFF	**2.519**	**2.446**	**2.529**	**2.607**	**6.000**
	4.53	4.22	3.92	3.20	4.28
Earnings_Quality	**0.821**	**0.704**	**0.762**	**0.650**	0.714
	3.51	2.77	2.69	1.81	1.23
GGOV	**0.066**	**0.151**	**0.143**	**0.135**	0.139
	1.83	3.53	2.79	2.10	1.32

Table 10: Value of Recommendations and Institutional Environment at the Country Level

This table reports the results of the panel regressions of the cumulative abnormal returns over recommendation announcement window (0, +1), and institutional environment proxies at the country level. Specifically, we ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} ,$$

where $Spread\_CAR_{c,y}$ is the average price reaction to recommendation announcements over event window (0, +1) across stocks with recommendation announcements for country *c* in year *y*. To control for the possible confounding effects of earnings announcements, we also excluded recommendations announced within three days of earnings announcements. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta\boldsymbol{GDP_{c,y-1}}$ is the lagged-one-year annual GDP growth for country *c*. $\boldsymbol{MTG_{c,y-1}}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $\boldsymbol{GDP\_PC_{c,y-1}}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
ACCTG	**0.029**					
	2.40					
ComLaw		**0.715**				
		4.08				
ENFORCE			0.104			
			0.52			
SEC_EFF				**1.446**		
				2.59		
Earnings_Quality					**0.671**	
					3.04	
GGOV						0.050
						1.40
$\Delta\boldsymbol{GDP_{c,y-1}}$	-0.002	0.008	0.020	0.007	0.037	0.029
	-0.06	0.29	0.72	0.22	1.28	0.95
$\boldsymbol{MTG_{c,y-1}}$	**-0.002**	**-0.003**	**-0.002**	**-0.002**	**-0.002**	**-0.002**
	-4.25	-5.26	-3.99	-4.65	-4.41	-4.14
$\boldsymbol{GDP\_PC_{c,y-1}}$	**1.101**	**1.344**	**1.273**	**1.246**	**1.152**	**0.872**
	6.14	7.88	7.51	6.96	6.69	2.96
Year Fixed Effect	Y	Y	Y	Y	Y	Y

Table 11: Value of Recommendation Revisions and the Institutional Environment at the Country Level

This table reports the results of the panel regressions of the cumulative abnormal returns over recommendation announcement window (0, +1) and institutional environment proxies at the country level. Specifically, we ran the following regression:

$$SCh\_CAR_{c,y}=\alpha + \beta_1 * IE_{c,y}+\beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}$$

where $SCh\_CAR_{c,y}$ is the differences in annual average price reaction to upgrades and downgrades over event window (0, +1) for country *c* in year *y*. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta\boldsymbol{GDP_{c,y-1}}$ is the lagged-one-year annual GDP growth for country *c*. $\boldsymbol{MTG_{c,y-1}}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $\boldsymbol{GDP\_PC_{c,y-1}}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ACCTG	**0.018**						**-0.042**
	2.35						-3.77
ComLaw		**0.708**					**-0.268**
		4.13					-1.66
ENFORCE			**0.280**				-0.024
			2.03				-0.14
SEC_EFF				**1.363**			**3.072**
				4.26			5.93
Earnings_Quality					**0.741**		**0.368**
					3.85		1.97
GGOV						-0.010	**0.151**
						-0.38	4.06
$\Delta\boldsymbol{GDP_{c,y-1}}$	-0.009	**-0.037**	-0.024	**-0.039**	-0.015	-0.001	**-0.029**
	-0.35	-1.88	-1.18	-2.49	-0.56	-0.41	-1.66
$\boldsymbol{MTG_{c,y-1}}$	**-0.000**	**-0.001**	-0.000	**-0.001**	**-0.001**	-0.000	**-0.001**
	-2.22	-3.39	-1.01	-3.51	-3.31	-1.33	-3.99
$\boldsymbol{GDP\_PC_{c,y-1}}$	**1.087**	**1.175**	**1.052**	**0.947**	**0.983**	**1.222**	0.208
	8.53	9.21	8.39	9.97	8.41	4.59	0.76
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y

Table 12: Value of Positive and Negative Recommendations and the Institutional Environment at the Country Level

This table reports the results of the panel regressions of the cumulative abnormal returns over recommendation announcement window (0, +1) and institutional environment proxies at the country level. Specifically, we ran the following regression:

$$ALL\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}$$

where $ALL\_CAR_{c,y}$ is the difference in annual average price reaction to positive recommendations (strong buy plus buy) and negative recommendations (strong sell plus sell) over event window (0, +1) for country *c* in year *y*. To control for the possible confounding effects of earnings announcements, we also excluded recommendations announced within three days of earnings announcements. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standard (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), the earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta\boldsymbol{GDP_{c,y-1}}$ is the lagged-one-year annual GDP growth for country *c*. $\boldsymbol{MTG_{c,y-1}}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $\boldsymbol{GDP\_PC_{c,y-1}}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ACCTG	**0.071**						**-0.061**
	3.82						-2.30
ComLaw		**1.725**					0.203
		6.02					0.51
ENFORCE			**0.626**				0.114
			2.23				0.26
SEC_EFF				**4.004**			**5.632**
				5.01			4.58
Earnings_Quality					**1.188**		0.381
					3.24		0.82
GGOV						**0.093**	**0.251**
						1.66	3.08
$\Delta\boldsymbol{GDP_{c,y-1}}$	-0.011	-0.058	-0.027	-0.057	0.016	-0.001	-0.020
	-0.24	-1.46	-0.68	-1.33	0.32	-0.02	-0.49
$\boldsymbol{MTG_{c,y-1}}$	**-0.002**	**-0.004**	**-0.002**	**-0.003**	**-0.002**	**-0.002**	**-0.004**
	-3.71	-5.14	-2.68	-4.64	-3.73	-2.89	-4.82
$\boldsymbol{GDP\_PC_{c,y-1}}$	**1.976**	**2.370**	**2.075**	**2.225**	**1.954**	**1.451**	0.969
	6.83	8.92	8.12	8.71	6.91	3.05	1.61
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y

Table 13: Value of Recommendations and the Institutional Environment after Regulatory Change

This table reports the results of the panel regressions of the cumulative abnormal returns over recommendation announcement window (0, +1) and institutional environment proxies at the country level after regulatory changes in the analyst industry in 2002 and 2003. Specifically, we ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{\boldsymbol{c,y-1}} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} ,$$

where $Spread\_CAR_{c,y}$ is the average price reaction to recommendation announcements over event window (0, +1) across stocks with recommendation announcements for country *c* in year *y*. $IE_{c,y}$ represents each of the six institutional environment proxies for country *c* including accounting standards (***ACCTG***), the country's law origin (***ComLaw*** is equal to 1 if the country is a common law country, otherwise it is equal to 0), the enforcement of insider trading laws (***ENFORCE*** is equal to 1 from the year of the country's first insider trading enforcement case and 0 otherwise), the effectiveness of security laws (***SEC_EFF***), earnings quality (***Earnings_Quality***), and the protection of private property rights (***GGOV***). $\Delta\boldsymbol{GDP_{c,y-1}}$ is the lagged-one-year annual GDP growth for country *c*. $\boldsymbol{MTG_{c,y-1}}$ is the ratio of stock market capitalization relative to GDP for country *c* in year *y-1*. $\boldsymbol{GDP\_PC_{c,y-1}}$ is the log of GDP per capita for country *c* in year *y-1* measured in U.S. dollars. Apart from these country-level variables discussed above, we also included year fixed effects in the regression above. The sample period for this regression ranges from 2004 to 2015. Coefficients highlighted in **bold** are significant at the 10% level or better.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
ACCTG	**0.051**					
	3.68					
ComLaw		**0.850**				
		3.97				
ENFORCE			**0.317**			
			1.65			
SEC_EFF				**2.716**		
				3.91		
Earnings_Quality						
					0.700	
GGOV					2.69	**0.082**
						2.15
$\Delta\boldsymbol{GDP_{c,y-1}}$	0.025	0.009	0.031	-0.006	**0.088**	0.058
	0.61	0.29	0.90	-0.15	2.00	1.44
$\boldsymbol{MTG_{c,y-1}}$	**-0.002**	**-0.003**	**-0.002**	**-0.003**	**-0.002**	**-0.002**
	-3.90	-4.54	-3.46	-4.39	-4.44	-3.61
$\boldsymbol{GDP\_PC_{c,y-1}}$	**1.245**	**1.519**	**1.416**	**1.476**	**1.423**	**0.875**
	5.25	7.02	6.70	6.88	5.90	2.85
Year Fixed Effect	Y	Y	Y	Y	Y	Y