THE VALUE OF ANALYST RECOMMENDATIONS: AN INTERNATIONAL PERSPECTIVE

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A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy in Finance

The University of Auckland, 2018

ABSTRACT

This thesis comprises three separate empirical studies which examine different aspects of analyst stock recommendations in international stock markets. The first study focuses on the information content of analyst recommendations at the country level. It shows that analyst recommendations aggregated at the country level predict international stock market returns. A trading strategy based on country-level recommendations yields an abnormal return of around 1% per month. Additional tests indicate that analyst recommendations aggregated at the country level provide useful information to predict future aggregate cash flows and associated market returns across different countries. The second study shifts the focus towards the standard deviation of analyst recommendations. In particular, it takes a closer look at Miller's theory (1977) and tests whether the relationship between differences of opinion and stock returns exists at the country level. This study shows that country level disagreement measured from single stock recommendation dispersion is negatively related to future realized market returns. This study also provides evidence that growth stocks show a higher level of overpricing compared to value stocks. The aggregate difference of opinion remains significantly negatively related to market returns after allowing time-varying risk exposure. However, countries with more binding short-sales constraints do not show lower future market returns. Finally, the third study takes a broader perspective and investigates whether the short-term value impact of analyst recommendations varies across countries, and whether these differences are related to countries' institutional environments. The results show that stock price reactions are systematically different across countries. In particular, stock prices react significantly stronger to recommendation announcements in countries with higher accounting standards, more effective security enforcement, better earnings quality, common law origins, and better protection of private property. However, the enforcement of insider trading laws does not significantly affect the value of recommendations at the country level. The results are robust

after extending the event window to (-15, +15) and excluding confounding earnings announcements. Moreover, the institutional environment affects the value of recommendation revisions across countries as well.

ACKNOWLEDGEMENTS

First of all, I would like to thank my main supervisor, Professor Henk Berkman, for his expert guidance and continuous support through my Ph.D. study. I am very grateful to him for sharing his knowledge with me, guiding me during my research, discussing research, and life. I very much enjoyed the close relationship with Henk during the last four years, and I am fortunate to have had such an excellent supervisor during my Ph.D. study.

I would also like to thank my co-supervisor, Dr. Alastair Marsden, for his assistance and help with my research. I would like to thank the faculty of the Department of Accounting and Finance, especially Professor Norman Wong, Professor Dimitris Margaritis, Mr. Graeme Treasure, Dr. Lily Chen, and Ms. Herena Newall for their support in different ways during my time working on this thesis. I would like to thank Ms. Elena Tang for her support during my Ph.D. study and the Business School for providing me the Ph.D. Conference Fund in 2016 and 2018. I also want to extend my thanks to the Chinese Scholarship Council for providing me with financial support for my Ph.D. study.

I am grateful for the comments I received from the members of the Department of Accounting and Finance during my presentation at The University of Auckland in 2015. I thank participants of the AFAANZ Doctoral Symposium held in Hobart, Australia in 2015. I also thank participants of the SIRCA Young Researcher Workshop at the University of Technology Sydney in 2016. I also thank the participants of 2017 American Finance Association Annual Meeting PhD Poster Session held in Chicago, United States. I thank participants of the 2017 New Zealand Finance Colloquium and Ph.D. Symposium held in Auckland, New Zealand for their comments, and I thank the INFINZ for the Best Paper award for investments.

Last but not least, my special thanks go to my parents and my friends, especially my beloved Jun Ma, for their greatest love and support. They comprise an essential part of my life

and enlighten me in different ways, and encouraged me to take on the challenges that I had during the completion of this thesis. This thesis is dedicated to them.

Wanyi Yang

April, 2018

Auckland, New Zealand

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Nature of contribution by PhD candidate	Empirial Analysis. all writing.
Extent of contribution by PhD candidate (%)	80%

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Certification by Co-Authors

The undersigned hereby certify that:

- the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- that the candidate wrote all or the majority of the text.

Name	Signature	Date
Henk Berkman		23 April 2018

INTRODUCTION

Financial analysts provide information through their analyst reports. An analyst report covers the process of collection, evaluation, and dissemination of firm-related information and contains three essential elements, namely the earnings forecast, the stock recommendation, and the price target (Asquith, Mikhail, & Au, 2005). The stock recommendation, as a direct output that conveys information about the analysts' expertise and analysis of the stock, is widely disseminated among investors, both individuals and institutions. Having a good understanding of the information content of analyst recommendations will help investors make better decisions. Recommendations reflect the opinions of savvy market participants, which can affect asset prices and improve market efficiency.

This thesis contributes to our understanding of analyst recommendations in international stock markets. It consists of three empirical studies; each of them investigates a separate aspect of analyst stock recommendations in international stock markets. Each study is presented as a standalone chapter. In accordance with the University of Auckland Graduate Centre's guidelines for the thesis formatting, the related appendices for each chapter are presented at the end of the thesis. A comprehensive literature review is provided separately in Appendix F.

The first study, presented in Chapter 1, examines whether analyst recommendations aggregated at the country level have predictive value for stock market returns. By averaging individual stock recommendations across firms for each country in the sample, I eliminate firm-specific information contained in analyst recommendations and obtain a measure that potentially provides unique insight into the aggregate company outlook. Buying the MSCI market index (in U.S. dollars) of countries in the quartile with the highest average recommendations and selling the MSCI market index of countries in the quartile with the

lowest average recommendations yields an abnormal return that ranges from 0.93% to 1.10% per month based on different international asset pricing models.

The study further explores possible channels for this country-level recommendation prediction. I first examine whether the predictive ability stems from a cash flow channel. Since private communication with management is the most critical input to analysts' earnings forecasts and stock recommendations, I obtain a unique aggregate outlook for the corporate sector for each of the countries in the sample by averaging stock recommendations across all stocks (Brown, Call, Clement, & Sharp, 2015). I find a highly significant relation between country-level analyst recommendations and the next quarter's GDP growth, suggesting that the ability of country-level analyst recommendations to predict the cross-section of international stock returns stems from a cash flow channel.

I also test if country-level recommendations have predictive power for future discount rates using changes in short-term interest rates and term spread as proxies for discount rate news (Kothari, Lewellen, & Warner, 2006). I find that country-level analyst recommendations do not predict future changes in interest rates, indicating that the predictability of country returns does not work through a discount rate channel.

Overall, this study makes two contributions which extend our understanding of the role of analyst recommendations around the world. First, it shows that aggregate analyst recommendations for individual countries contain information about the cross-section of future international stock market returns and the cross-section of future GDP growth, which supports the idea that aggregating firm-level information provides useful information that is not yet reflected in expectations and prices. In addition, with the development of financial markets, a growing number of equity funds starts to get involved in global equity markets. Compared to a single country study, a cross-country examination enables us to test the top-down country selection ability of fund managers in a global setting. While existing studies show it's very hard for fund managers to make profits simply from country selection, this study proposes a

simple trading strategy based on aggregate analyst recommendations, which could potentially improve the performance of global equity funds.

The second study, presented in Chapter 2, turns the focus towards the second moment of analyst recommendations and examines the asset pricing implications of aggregate analyst dispersion at the country level, extending Yu (2011). I construct a measure of monthly average country-specific analyst recommendation dispersion using three-month outstanding recommendations. A trading strategy of buying market indices of countries in the lowest analyst dispersion quintile and selling market indices of countries in the highest analyst dispersion quintile yields a monthly abnormal return of 0.78% (*t*-statistic = 2.53) based on the international asset pricing model of Brusa, Ramadorai, and Verdelhan (2014).

Based on Miller's theory (1977), a stock simultaneously experiencing differences of opinion and short selling restrictions will be overpriced. To test whether this theory applies in the international stock market setting as well, I further consider country-level short-sales constraints in a panel setting. The coefficients of the interaction between short-sales constraints and analysts' dispersion are not significant, indicating that the existence of short-sales constraints is not a necessary condition for a country's stock market to be overvalued. One possible explanation could be that rational traders are uncertain about when their peers will exploit arbitrage opportunities, so they prefer not to immediately correct mispricing because of the possible substantial holding cost. Without synchronized shorting of the overpriced markets, pessimistic views about the stock markets will therefore not necessarily be reflected in prices, despite the ability to short (Abreu & Brunnermeier, 2002).

This paper contributes to our understanding of Miller's theory (1977) in international stock markets and introduces a new measure of differences of opinion based on analyst stock recommendations. Results show that aggregate analyst recommendation dispersion is negatively related to cross-sectional future stock market returns, whereas short-sales

constraints are not a necessary condition for a stock market to be overpriced. Additional tests show that Yu's findings do not apply for countries in general as only seven out of 33 countries show a significant negative relation between analyst dispersion and future stock market returns.

The third study, presented in Chapter 3, examines average short-term stock price reactions to recommendation announcements in 32 different countries using event study methodology. The study examines whether differences in country-level share price reactions are related to differences in the institutional environment determinants. I construct a proxy of investors' reactions to analyst recommendation announcements by calculating the differences in the average price reaction to strong buy and strong sell recommendations for each country, each year. Results show that stock prices react to recommendation announcements differently across countries. Developed markets in general experience stronger price reactions in response to recommendations compared to emerging markets. Recommendation announcements in countries with higher accounting standards, more efficient security enforcement, better earnings quality, common law origins, and better protection of private property experience significantly higher price reactions, whereas the enforcement of insider trading laws does not affect the value of recommendations. Additional tests show this effect is more associated with negative recommendations and is stronger in the post-regulation period. Moreover, the institutional environment also affects the value of recommendation revisions.

Overall, this study contributes to our understanding of the impact of the institutional environment on the global financial analyst industry. First, it contributes to studies that examine how institutional factors affect financial markets and market participants around the world (Defond, Hung, & Trezevant, 2007; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997). Second, this study contributes to our understanding of the role analysts play in generating information about firms, and extends the analysis to a large sample of countries.

CHAPTER 1

Aggregate Analyst Recommendations and International Stock Market Returns

1. Introduction

This study examines whether analyst recommendations aggregated at the country-level have predictive value. I define the aggregate recommendation for a country as the value-weighted average of all outstanding recommendations for shares of firms incorporated in that country. By averaging across firms, I eliminate firm-specific information contained in analyst recommendations and obtain a measure that potentially provides unique insight into the aggregate company outlook for each of the 33 countries in the sample. These country-level recommendations are used in the trading strategy, which consists of buying the MSCI market index (in US dollars) of countries in the quartile with the highest average recommendations and selling the MSCI market index of countries in the quartile with the lowest average recommendations. Depending on the international asset pricing model, this strategy yields an abnormal return that ranges from 0.93% to 1.10% per month. Moreover, consistent with the idea that aggregate analyst recommendations provide a unique insight into a country's corporate outlook, these results suggest that the ability of country-level analyst recommendations to predict the cross-section of international stock returns stems from a cash flow channel.

Prior studies show that analyst recommendations provide valuable information at the firm level. For example, Barber, Lehavy, Mcnichols, and Trueman (2001) find that buying stocks with the most favorable consensus analyst recommendations and short-selling stocks with the least favorable consensus recommendations yields annual abnormal returns of more than 4%. Jegadeesh, Kim, Krische, and Lee (2004) show that changes in consensus recommendations over the previous quarter also predict the future returns of individual firms.[1] A small number of studies adopt an international perspective. For example, Jegadeesh and Kim (2006) evaluate the value of analyst recommendations in the G7 countries. They show that

[1] See also Davies and Canes (1978), Beneish (1991), Stickel (1995), Green (2006), and Irvine, Lipson, and Puckett (2007).

calendar time trading strategies that buy upgraded stocks and sell downgraded stocks are profitable in six of the seven countries.

This study extends the literature on analyst recommendations by examining the information content of analyst recommendations at the country-level. This study is related to that of Howe, Unlu, and Yan (2009) and Boni and Womack (2006). Howe et al. (2009) show that changes in aggregate analyst recommendations for US stocks forecast future excess returns for the US stock market. However, their evidence with regard to the ability of industry-aggregated analyst recommendations to predict industry returns is substantially weaker. Examining the same issue, Boni and Womack (2006) conclude there is no predictive value in industry-aggregated analyst recommendations.

I use Institutional Brokers' Estimate System (I/B/E/S) analyst recommendations for stocks from 33 different countries for the period from January 1994 to June 2015 to construct monthly average country-specific recommendations. In the base case, I focus on the value-weighted average consensus forecast using one-month outstanding recommendations and one-month-ahead stock market returns. Buying the market index of the quartile of countries with the highest average recommendations and selling the market index of the quartile of countries with the lowest average recommendations yields a monthly abnormal return of 1.04% (*t*-statistic = 3.74) based on the international asset pricing model of Brusa et al. (2014), and a monthly abnormal return of 1.10% (*t*-statistic = 3.75) based on the international five-factor asset pricing model of Fama and French (2017). Similar results are obtained in a panel setting that allows for time variation in the risk exposures of international stock markets. Additional tests show these results are robust to changes in research design and also hold in the more recent period following the regulatory changes affecting the brokerage industry around the world in 2002 and 2003.

Why do country-level recommendations predict international stock market returns? I first examine whether this predictive ability stems from a cash flow channel. Brown et al. (2015)

report that private communication with management is the most important input to analysts' earnings forecasts and stock recommendations. Averaging stock recommendations across all stocks in a country eliminates stock-specific information and could thus provide unique insight into the aggregate outlook for the corporate sector for each of the countries in the sample. To test this conjecture, I examine whether country-level recommendations predict future growth in the gross domestic product (GDP). I find a highly significant relation between country-level analyst recommendations and next quarter's GDP growth in a model that includes country fixed effects, quarter fixed effects, and current quarter GDP growth. Country-level recommendations still have predictive power for GDP growth two-quarters later, but not after that. Consistent with the claim that country-level recommendations provide additional and unique insight into the outlook for the corporate sector across different countries, the results do not change when, for each country–quarter pair, I include the average score from the World Economic Survey (WES) regarding the expected state of the economy by the end of the next six months.

I also test if country-level recommendations have predictive power for future discount rates, using changes in the short term interest rate and term spread as proxies for discount rate news (Kothari et al., 2006). I find that country-level analyst recommendations do not predict future changes in interest rates. The results, therefore, indicate that the predictability of country returns works through a cash flow channel.

This research should be of interest to global equity managers. For example, Busse, Goyal, and Wahal (2014) find little evidence of superior performance by actively managed global equity funds. Similarly, Gallagher, Harman, Schmidt, and Warren (2017) report that country selection does not contribute significantly to the excess returns of global equity managers. In contrast, the simple trading strategy proposed in this study provides an effective guide to country selection and has the potential to substantially contribute to the performance of global equity funds. Moreover, the finding that country-level recommendations help to predict future GDP growth for a broad cross section of countries should be of interest to several

economic actors, given the importance of macroeconomic predictions for policy decisions at the national and international levels.

I contribute to the literature by showing that aggregate analyst recommendations for individual countries contain information about the cross section of future international stock market returns and the cross section of future GDP growth. I thus contribute to an emerging literature that focuses on the information content of firm-specific variables that are aggregated at the market level (e.g. Anilowski, Feng, and Skinner, 2007 for earnings guidance; Kothari, Lewellen, and Warner, 2006 for aggregate earnings surprises; Hirshleifer, Hou, and Teoh, 2009 for aggregate accruals and aggregate cash flows; and Rapach, Ringgenberg, and Zhou, 2016 for aggregate short interest). In line with these studies, I show that aggregating firm-level information provides useful information that is not yet reflected in expectations and prices.

The remainder of this paper is organized as follows. Section 2 discusses data and the construction of the aggregate country-level recommendation measure. Section 3 examines whether country-level recommendations predict the cross-section of international stock market returns using calendar time portfolio strategies and panel regressions. In Section 4, I test whether country-level recommendations contain useful information about future macro-economic conditions. Section 5 contains additional tests related to the calendar time portfolio strategies and considers portfolio turnover, the contribution to the overall return by individual countries and a battery of robustness tests.

2. Data, Variable Definitions, and Descriptive Statistics

In this section, I first discuss data sources and sample selection. Next, I discuss the construction of the aggregate analyst recommendation measure. Finally, I present descriptive statistics.

2.1 Data sources and sample selection

I obtain analyst recommendations from the I/B/E/S Recommendation Detail files for US stocks and international stocks for the period from January 1994 to June 2015.[2] I select the 33 countries that have more than 10,000 recommendations in I/B/E/S for stocks listed on their domestic stock exchanges and for which data are available from Compustat.[3] Analysts may have individual recommendation scales, but I/B/E/S standardizes recommendations as one (strong buy), two (buy), three (hold), four (sell), and five (strong sell). Following previous studies, I reverse the ordering of the recommendation labels so that large (small) numbers represent positive (negative) recommendations. Recommendations can be upgrades, downgrades, reiterations, or initial recommendations. Since I focus on the information content of aggregate recommendations across all firms in a country, the sample consists of all types of recommendations.

Following Jegadeesh and Kim (2006) and Howe et al. (2009), I construct the final sample of recommendations using the following criteria:

1) The recommended stock must have a CUSIP or SEDOL identifier.

2) The recommendation must be from an analyst with a non-missing analyst code.

3) The recommendation must range from one to five.

4) The announcement date should not be later than the activation date.[4]

[2] For 31 of the 33 countries in the sample, calendar year 1994 is the first full year with recommendations in the I/B/E/S database. Coverage for Russia and Poland starts in July 1997 and June 1995, respectively.
[3] The I/B/E/S recommendations database contains data for stocks from 110 different countries. The 33 countries in the sample represent 95% of all recommendations in the database.
[4] The announcement date is the date on which the analyst originally published the recommendation. The activation date is the date the recommendation was recorded by Thomson Reuters. Hoechle, Schaub, and Schmid (2012) compare the activation date and announcement date. They find that there is no systematic difference between the recommendation announcement date and activation date recorded in I/B/E/S. After 2002, the time lag fluctuates between 0 and 1 trading day.

5) The country domicile code for the firm is available.[5]

I merge the recommendation data with company information from Compustat and require that the GVKEY, issue ID, stock prices, the number of shares outstanding, incorporation country codes, and exchange country codes are available from Compustat. For each firm, I retain only share issues with the same exchange and incorporation country codes, to exclude recommendations for cross-listed issues from the sample.[6]

I obtain monthly value-weighted gross total return indices for each of the individual countries and the world market from the MSCI website.[7] I use country returns based on the MSCI index expressed in US dollars in the main tests. For country *i* and month *t*, this return is denoted as $MSCI\_Ret\_USD_{i,t}$. One particularly attractive feature of MSCI country indices is the availability of exchange-traded funds (ETFs) on these indices, so that the strategies can easily be replicated in practice.[8] I also present the results of robustness tests based on value-weighted market returns (expressed in US dollars) that are strictly based on the stocks used in the calculation of the corresponding aggregate recommendation for that country–month.

I use the one-month US Treasury bill rate as the risk-free rate and obtain global factor returns from Kenneth French's website.[9] Finally, I get the monthly currency risk factors—the carry factor and the dollar factor—from Adrien Verdelhan's website.[10]

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[5] For each company, I obtain the country domicile code from the I/B/E/S Summary History–Company Identification file and match it with the corresponding country name using the I/B/E/S Summary History Manual.
[6] Because of this requirement, the country-level recommendation is more likely to be based on recommendations from local analysts. For a sample of 32 countries, Bae, Stulz, and Tan (2008) find that local analysts typically have a significant information advantage over foreign analysts. When I include recommendations for cross-listed stocks, the results are marginally weaker but the conclusions do not change.
[7] See https://www.msci.com/end-of-day-data-search. In particular, I use MSCI China A in this analysis.
[8] Since the introduction of an ETF on MSCI China A in June 2016, all of the countries in the sample have ETFs on their market's MSCI index in the form of *iShares* offered by BlackRock. Based on BlackRock's website, the average expense ratio for MSCI country index ETFs is 0.48% per annum. For more details, see Appendix A in this thesis.
[9] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. The global factors are expressed in US dollar values and are based on 23 developed markets.
[10] See http://web.mit.edu/adrienv/www/Data.html. Specifically, I download the data from the Monthly Currency Excess Returns file, where the RX variable is the dollar factor and the HML variable is the carry factor (Lustig, Roussanov, & Verdelhan, 2011).

2.2 Country-level aggregate analyst recommendations

The country-specific measure of aggregate analyst recommendations used in the main test is the value-weighted average of all outstanding recommendations in that country. More specifically, for each firm *j*, I first calculate the consensus recommendation at the end of each calendar month *t*, $Rec_{j,t}$, based on all outstanding recommendations issued in that month but at least two days before month-end.[11] Therefore, $Rec_{j,t}$ is the average recommendation across all analysts with an outstanding recommendation for stock *j*, where I only use the most recent recommendation for each analyst. Next, for each country *i*, I weight the consensus recommendations for all stocks *j* based on the previous month's market capitalization, $Mkt\_Cap_{j,t-1}$. This value-weighted average recommendation across all *n* stocks in country *i* is defined as follows:

$$Value\_Rec_{i,t} = \sum_{j=1}^{n} Rec_{j,t} * \frac{Mkt\_Cap_{j,t-1}}{\sum_{j=1}^{n} Mkt\_Cap_{j,t-1}} \quad (1)$$

By calculating the average recommendation across all stocks in each country, idiosyncratic firm-specific information contained in these recommendations is averaged out. To ensure a reasonable amount of diversification, I follow Bae et al. (2008) and only include country–months if there are at least 50 firms with outstanding recommendations. [12]

2.3 Descriptive statistics

After imposing the criteria discussed above, I obtain a sample of 1,881,953 analyst recommendations from 33 countries for the period January 1994 to June 2015.[13] Following Howe et al. (2009), I separate these recommendations into initial and revised recommendations.

[11] I use a similar method as Jegadeesh et al. (2004) when constructing the consensus recommendation. Note also that, using the I/B/E/S Stop Recommendations file, I make sure that the outstanding recommendations have not been stopped by the broker (Loh & Stulz, 2011).

[12] I also construct two alternative measures of aggregate analyst recommendations. See Appendix D for more details.

[13] There are 34 countries have more than 10,000 recommendations during these 20 years. However, I exclude the Cayman Islands as it is an offshore financial haven for multinational firms.

An initial recommendation is a recommendation by an analyst without a recommendation for the same stock in the past 12 months. A revised recommendation is a recommendation by an analyst on a stock for which the analyst issued at least one recommendation in the previous 12 months.

Using this definition, I have a sample of 896,706 initial recommendations and 985,247 revised recommendations. Table 1 presents the distribution of all recommendations across the five tiers of the revised I/B/E/S rating scale. Panel A of Table 1 provides the distribution of initial recommendations, and Panel B provides the distribution of revised recommendations. Panel B also gives information about the direction of revised recommendation changes, with each cell showing the number of recommendations changes from the rating of the row index to the rating of the column index.

Table 1 shows that more than 80% of all recommendations are neutral or favorable, regardless of whether they are initial or revised recommendations. Panel B indicates that analysts are more likely to make no changes or only small changes in their recommendations. About 23% of the recommendation updates are unchanged, and 47% of the changes are one step up or one step down (e.g. from buy to strong buy or hold).

Table 1: Descriptive Statistics for Analyst Recommendations

This table presents the distribution of all recommendations across the five I/B/E/S rating scale tiers. The sample consists of 33 countries with at least 10,000 individual recommendations for domestic stocks in the period from January 1994 to June 2015. I reverse the ordering of analyst recommendations, with one representing a strong sell and five representing a strong buy. Panel A provides the distribution of initial recommendations, and Panel B provides the distribution of revised recommendations. Each cell in Panel B shows the number of recommendation changes from the rating of the row index to the rating of the column index.

Panel A: Distribution of Initial Recommendations						
Recommendation level	1	2	3	4	5	Total
	38,948	63,796	312,259	267,350	214,353	896,706
% of initial recommendation	4.34	7.11	34.82	29.81	23.90	-
Panel B: Transition Matrix of Analyst Recommendations						
	To Recommendation					
From Recommendation	1	2	3	4	5	Total
1	7,585	6,098	28,371	3,765	9,538	55,357
2	6,876	18,589	47,161	18,623	5,146	96,395
3	28,851	50,363	90,109	116,958	78,194	364,475
4	3,912	19,707	129,419	69,520	50,911	273,469
5	9,734	5,735	84,200	51,232	44,650	195,551
Subtotal	56,958	100,492	379,260	260,098	188,439	985,247
% of subtotal	5.78	10.20	38.49	26.40	19.13	-
Total	95,906	164,288	691,519	527,448	402,792	1,881,953
% of total	5.10	8.73	36.74	28.03	21.40	100.00

Table 2 shows the descriptive statistics of all recommendations in the sample for each year between 1994 and 2015. Column (1) indicates that the number of firms covered more than doubles during the sample period and column (2) shows that the number of analysts who issue recommendations almost triples. As shown in column (3) in the last row, the mean number of analysts per firm is seven and column (5) in the last row shows that the average number of companies covered per analyst is eight. These statistics are similar to those of Howe et al. (2009) for the United States. The last column shows that, for each year in the sample period, the average recommendation is somewhere between buy and hold (greater than three), which is also consistent with the findings of previous studies.

Table 2: Descriptive Statistics of Analyst Recommendations, by Year

Column (1) reports the number of firms with at least one valid recommendation for each year. Column (2) shows the number of analysts that can be identified by the analyst masked code for each year. The mean and median numbers of analysts issuing recommendations for each covered firm are shown in columns (3) and (4), respectively, followed by the average and median numbers of firms each analyst covers. The annual average recommendation is the arithmetic mean of all the available recommendations across all countries in each year.

Year	No. of Firms (1)	No. of Analysts (2)	Analysts per Firm		Firms per Analyst		Average Recommendation (7)
			Mean (3)	Median (4)	Mean (5)	Median (6)	
1994	6,030	3,620	6.30	3	10.49	4	3.45
1995	6,156	4,666	5.99	3	7.90	4	3.33
1996	8,033	6,588	6.46	3	7.87	4	3.42
1997	10,288	8,147	6.22	3	7.86	5	3.51
1998	12,249	9,276	6.41	3	8.47	6	3.56
1999	12,065	10,007	6.91	4	8.33	5	3.69
2000	11,848	10,388	6.35	3	7.24	5	3.73
2001	11,203	10,719	7.29	4	7.62	5	3.56
2002	11,106	10,850	9.89	5	10.12	7	3.48
2003	11,127	10,408	8.92	5	9.53	7	3.37
2004	12,442	10,272	7.47	4	9.05	7	3.46
2005	13,497	10,559	6.96	4	8.90	6	3.45
2006	14,242	11,367	6.89	4	8.63	6	3.49
2007	15,169	12,187	7.03	4	8.74	6	3.55
2008	14,106	12,129	7.90	4	9.19	6	3.41
2009	13,290	12,074	8.56	4	9.42	7	3.45
2010	13,934	12,830	7.35	4	7.98	6	3.61
2011	14,456	13,714	7.49	4	7.90	5	3.62
2012	14,340	13,239	7.30	4	7.90	5	3.53
2013	14,189	12,275	6.62	4	7.65	5	3.53
2014	15,027	12,242	5.94	3	7.29	5	3.58
2015	12,052	10,256	3.97	2	4.66	3	3.50
Average	12,130	10,355	7.01	3.68	8.31	5.41	3.51

Table 3 shows descriptive statistics for the recommendations for domestic stocks for each country in the sample. Panel A reports the descriptive statistics for developed countries and Panel B reports the descriptive statistics for emerging countries.[14] The average number of recommendations for developed countries is more than twice the average number of recommendations for emerging countries. Similar observations can be made for the number of

[14] Countries are classified based on the MSCI classification (see https://www.msci.com/market-classification).

analysts in column (3) and the number of firms covered in column (6). Analyst coverage in I/B/E/S is most extensive for the United States, making up more than 25% of all recommendations. The average number of firms per analyst in developed countries is five, less than the average number of companies per analyst in emerging countries, which is seven. The average number of analysts per firm in developed countries, however, is higher, at nine.

Columns (9) and (10) of Table 3 report the average and median recommendation scores for each country based on the time series of monthly value-weighted country-level recommendations. The highest average recommendation is for Korea (3.79), and the lowest average recommendation is for Poland (3.29). To illustrate the evolution of country-level recommendations over time, Figure 1 plots the annual averages of the monthly value-weighted country-level recommendations for the G7 countries during the sample period.

Table 3: Descriptive Statistics of Analyst Recommendations, by Country

This table shows the descriptive statistics for analyst recommendations for each country throughout the sample period. Analysts are identified using the I/B/E/S analyst masked code. The recommendation statistics for each country are the means across the sample years. Columns (9) and (10) report the average and median recommendation scores for each country based on the time series of monthly value-weighted country-level recommendations. The sample period is from January 1994 to June 2015. Panel A reports descriptive statistics for developed countries and Panel B reports descriptive statistics for emerging economies (based on the MSCI country classification).

Panel A: Developed Countries

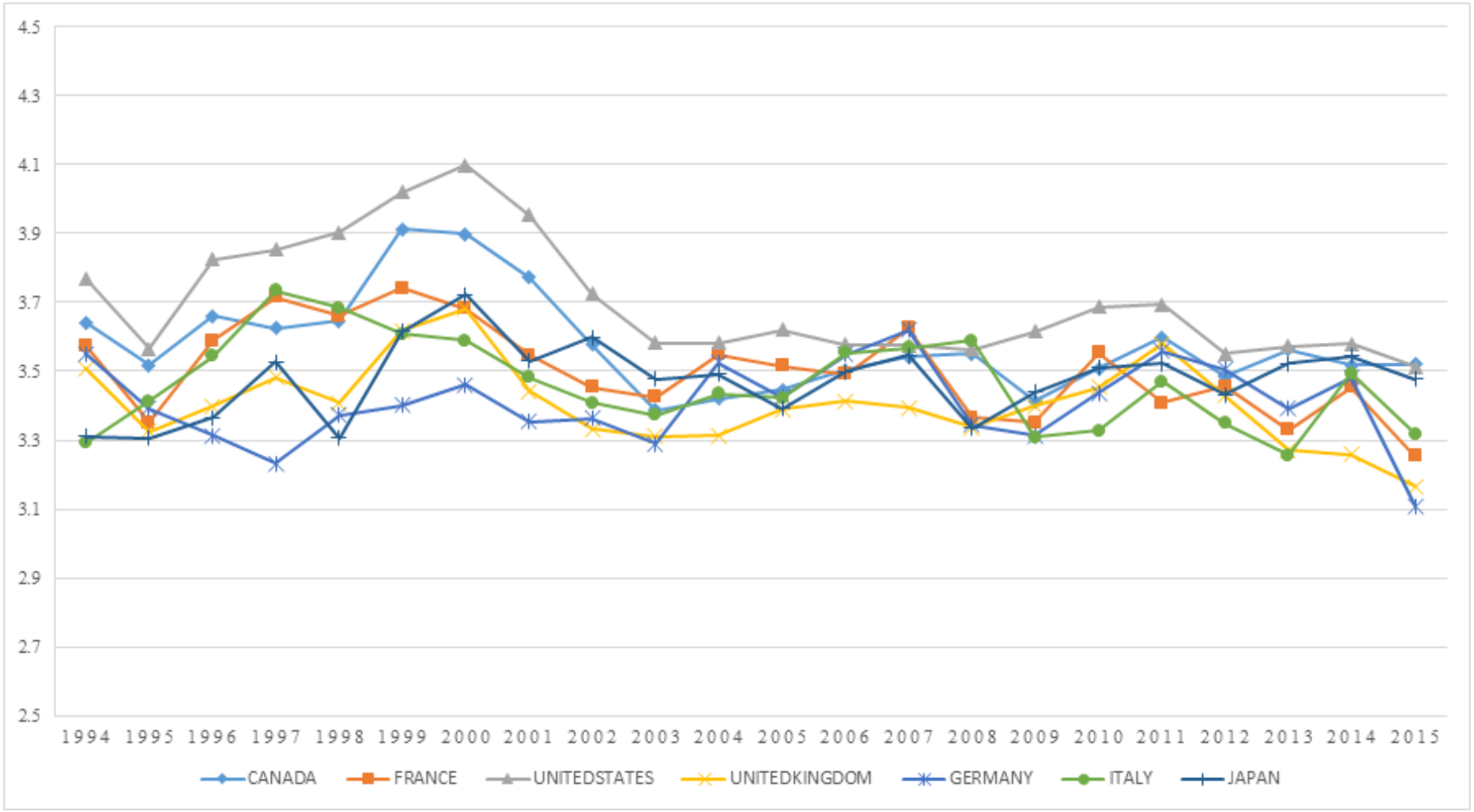
			Firms per Analyst			Analysts per Firm		Recommendation	
Country	Number of Recommendations/Year	Number of Analysts/Year	Mean	Median	Number of Firms/Year	Mean	Median	Mean	Median
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Australia	3,577.18	407.55	8.93	8.65	469.14	7.71	7.64	3.47	3.45
Belgium	629.23	188.64	3.54	3.39	83.73	7.50	7.34	3.39	3.39
Canada	4,637.77	580.41	8.00	8.19	697.91	7.29	6.32	3.58	3.56
Denmark	618.00	179.32	3.58	3.74	79.86	7.90	8.12	3.36	3.37
Finland	992.27	218.18	4.42	4.39	93.73	10.23	10.39	3.43	3.38
France	3,723.77	823.41	4.84	4.06	381.82	9.78	9.71	3.51	3.50
Germany	3,547.18	758.77	4.86	4.53	349.95	10.10	10.14	3.41	3.41
Hong Kong	1,510.09	359.50	4.47	3.87	93.55	16.78	14.34	3.47	3.45
Italy	1,483.59	346.14	4.33	4.12	174.68	8.33	8.10	3.47	3.44
Japan	5,826.95	557.59	10.33	10.87	1,210.36	4.79	4.85	3.48	3.47
Netherlands	1,576.73	398.09	4.06	3.74	126.23	12.55	12.49	3.51	3.49
New Zealand	397.27	57.64	6.92	6.71	68.86	5.80	5.92	3.33	3.32
Norway	902.50	221.86	4.01	3.80	123.68	7.14	6.89	3.37	3.38
Singapore	1,481.41	250.41	5.93	6.01	177.36	8.83	7.75	3.44	3.45
Spain	1,436.91	336.91	4.44	4.30	111.27	13.00	14.34	3.43	3.42
Sweden	1,464.86	371.45	3.92	3.95	170.86	8.48	8.22	3.31	3.28
Switzerland	1,233.82	386.32	3.43	3.20	151.41	8.13	7.82	3.56	3.54
United Kingdom	6,898.45	1,112.41	6.51	6.26	988.86	6.95	6.91	3.41	3.41
United States	22,483.45	2,748.95	7.71	8.01	3,460.68	6.53	6.56	3.70	3.65
Average	3,390.60	542.29	5.48	5.36	474.42	8.83	8.62	3.45	3.44

Table 3 Continued
Panel B: Emerging Countries

Country	Number of Recommendations/Year	Number of Analysts/Year	Firms per Analyst		Number of Firms/Year	Analysts per Firm		Recommendation	
			Mean	Median		Mean	Median	Mean	Median
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Brazil	1,313.45	195.41	7.23	6.76	147.36	8.64	8.54	3.56	3.56
China	2,689.91	412.00	5.39	5.84	650.91	3.75	3.93	3.56	3.72
India	3,091.05	424.50	6.71	6.71	394.95	6.93	6.49	3.60	3.62
Indonesia	857.41	135.36	6.59	6.04	107.50	8.07	8.06	3.49	3.53
Korea	3,166.41	527.73	6.16	6.15	396.27	7.31	7.51	3.79	3.81
Malaysia	1,956.27	247.82	8.00	8.21	250.91	8.49	7.39	3.36	3.34
Mexico	506.05	117.59	4.31	4.32	67.18	7.50	7.64	3.61	3.59
Philippines	453.23	74.91	6.06	5.81	63.95	7.04	5.79	3.55	3.57
Poland	502.10	91.67	5.61	5.50	84.38	5.69	5.43	3.29	3.29
Russia	555.63	106.32	4.61	4.60	103.11	5.12	5.30	3.60	3.62
South Africa	1,326.64	148.68	8.73	7.43	182.64	7.01	7.22	3.42	3.37
Taiwan	2,272.00	291.50	7.66	7.75	347.95	6.58	6.67	3.48	3.50
Thailand	1,710.64	188.32	9.21	9.16	217.00	8.26	9.05	3.44	3.45
Turkey	819.68	109.59	7.81	7.10	123.27	6.64	6.31	3.37	3.36
Average	1,515.75	219.39	6.72	6.53	224.10	6.93	6.81	3.51	3.52

Figure 1: Average Recommendation Levels in G7 Countries

This figure shows the annual averages of the monthly value-weighted average recommendation across all firms for the G7 countries. Recommendations range from one (strong sell) to five (strong buy). The calculation of the country level recommendations is discussed in Section 2.2. The sample period is from January 1994 to June 2015.



Panel A (B) of Table 4 presents descriptive statistics for the monthly stock market returns in US dollars for each of the developed (emerging) countries in the sample. The highest average return across all countries is for Russia, at 1.99% per month, and the lowest average return is for Japan, at 0.27% per month. The results also indicate that emerging markets have higher average monthly returns and are more volatile (the mean return is 1.02% per month, with an average standard deviation of 10.32% per month) compared to developed markets (a mean return of 0.86% per month with an average standard deviation of 6.33% per month).

Table 4: Descriptive Statistics for Stock Market Returns

This table presents descriptive statistics for the monthly MSCI stock market returns in US dollars. I use the MSCI Gross Index from the MSCI website. The sample period is from January 1994 to June 2015. All the numbers in the table are percentages. Panel A reports descriptive statistics for developed countries and Panel B reports descriptive statistics for emerging countries (based on the MSCI country classification).

Panel A: Developed Countries

Country	Mean	Median	Max	Min	Std.	No. of Obs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Australia	0.92	1.19	17.79	-25.51	6.05	258
Belgium	0.82	1.45	18.19	-36.56	6.05	258
Canada	0.94	1.51	21.26	-26.94	5.85	258
Denmark	1.20	1.80	18.34	-25.67	5.75	258
Finland	1.37	1.16	33.26	-31.76	9.38	258
France	0.75	1.13	15.74	-22.41	5.90	258
Germany	0.84	1.26	23.69	-24.35	6.61	258
Hong Kong	0.76	0.85	33.23	-28.86	7.22	258
Italy	0.68	0.56	19.67	-23.60	6.99	258
Japan	0.27	0.22	16.79	-14.78	5.25	258
Netherlands	0.85	1.39	14.39	-25.11	5.84	258
New Zealand	0.71	1.29	18.04	-22.44	6.29	258
Norway	1.00	1.34	21.47	-33.36	7.66	258
Singapore	0.67	0.80	25.84	-28.99	7.25	258
Spain	1.02	1.29	22.09	-25.27	6.99	258
Sweden	1.22	0.88	25.49	-26.66	7.44	258
Switzerland	0.91	1.30	14.56	-15.63	4.79	258
United Kingdom	0.65	0.70	13.87	-18.96	4.59	258
United States	0.84	1.32	10.99	-17.10	4.32	258
Average	0.86	1.13	20.25	-24.95	6.33	-

Table 4 Continued
Panel B: Emerging Countries

Country	Mean	Median	Max	Min	Std.	No. of Obs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Brazil	1.45	1.88	36.78	-37.63	11.05	258
China	1.18	0.99	28.59	-25.08	8.56	174
India	1.02	1.17	36.68	-28.48	8.66	258
Indonesia	1.05	1.19	55.58	-40.54	12.57	258
Korea	1.07	0.25	70.60	-31.25	10.98	258
Malaysia	0.51	0.82	50.04	-30.20	8.23	258
Mexico	0.95	1.77	19.14	-34.25	8.28	258
Philippines	0.50	0.59	43.39	-29.22	8.54	258
Poland	0.76	0.92	40.21	-34.82	10.96	258
Russia	1.99	2.05	61.13	-60.57	15.16	246
South Africa	1.02	1.17	19.45	-30.51	7.67	258
Taiwan	0.58	0.73	29.24	-21.73	8.00	258
Thailand	0.65	0.70	43.24	-34.01	10.87	258
Turkey	1.56	1.59	72.30	-41.24	14.89	258
Average	1.02	1.13	43.31	-34.25	10.32	-

3. Information Content of Country-level Analyst Recommendations for Stock Market Returns

I test if the information content of the average analyst recommendation across stocks in a country is fully incorporated in that country's stock market index. The tests involve a simple strategy that buys 'winner' countries (countries with a relatively high average recommendation) and sells 'loser' countries (countries with a relatively low average recommendation). I first present the results based on two alternative calendar time portfolio strategies.[15] In the second set of tests, I examine whether country-level recommendations predict future stock market returns in a panel setting that allows for time-varying risk exposure for the individual countries and also controls for country-specific momentum, year fixed effects, and country fixed effects.

3.1 Calendar time portfolio strategies

The first calendar time portfolio strategy is based on dollar neutral long-short portfolios where the weight for each country index in each month is based on that country's recommendation ranking in the previous month (Asness, Moskowitz, & Pedersen, 2013). Specifically, the weight for each country *i* in month *t* is given by:

$$w_{i,t} = z_t \ (Rank\ (C_{i,t-1}) - 0.5 * (N_{t-1} + 1)) \quad (2)$$

Where $C_{i,t-1,}$ is country *i*'s ranking at the end of month *t* - 1and N_{t-1} is the number of countries with a valid average recommendation at the end of month *t* - 1. The scalar z_t ensures that the sum of the long and short positions equals 1 and −1, respectively. With these portfolio weights, the month *t* return on the first hedge portfolio, $HP1_{t,}$ is calculated as the weighted sum of the returns on the individual countries:

$$HP1_t = \sum w_{i,t}\ MSCI\_Ret\_USD_{i,t} \quad (3)$$

[15] The calendar time portfolio strategies are easy to replicate, since the country returns used in the tests are based on value-weighted gross total return MSCI indices (expressed in US dollars), which are exactly replicated by tradable ETFs. These ETFs trade on a continuous basis and can be sold short.

The second portfolio strategy I employ provides more detail on the source of the hedge portfolio return. Now, for each month *t*, I split all countries in the sample into quartile portfolios based on the relative position of the aggregate country recommendation observed at the end of month *t* - 1.[16] For each portfolio, I then calculate the return for month *t* as the equally weighted average market return across all countries in that portfolio.[17] The main focus of this paper is on a zero-cost hedge portfolio that takes a long position in the quartile of countries with the most favorable recommendations and a short position in the quartile of countries with the least favorable recommendations. The month *t* return on this hedge portfolio is indicated as $HP2_t$.

I use four different international asset pricing models to examine the profitability of the trading strategy. First, I use a simple world capital asset pricing model (CAPM) that incorporates the global market return (in US dollars) but does not account for currency risk (Lintner, 1965; Sharpe, 1964). Second, I use the international CAPM redux model presented by Brusa et al. (2014), which, in addition to the global market return denominated in local currencies, includes a carry factor and a dollar factor to capture the exchange rate risk faced by US-based investors (Lustig et al., 2011; Verdelhan, 2017). Third, I use the international five-factor asset pricing model presented by Fama and French (2017). Finally, I present the results for an extension of global three-factor model in Fama and French (2012), which also includes a global momentum factor.[18]

More specifically, I estimate the following four time series models for $PR_{i,t}$, the return (in US dollars) in month *t* on each quartile portfolio *i*. The first model is the world CAPM:

[16] Similar results can be obtained using deciles or quintiles.

[17] I also form a value-weighted portfolio, where for each cluster, I weighted by each country's market capitalization at the beginning of each calendar year to get the value-weighted group return. Market capitalization data is obtained from World Development Indicator.

[18] Brusa et al. (2014) compare the performance of several international asset pricing models and find that the international CAPM redux model outperforms the world CAPM and the Fama–French three-factor model. While they do not examine the Fama–French five-factor model, evidence from Fama and French (2017) suggests that the five-factor model displays the same limited ability to explain variation in international stock market returns as the international Fama–French three-factor model.

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \varepsilon_{i,t} \quad (4)$$

Where RF_t is the 30-day US T-bill rate in month *t* and $WMKT_t$ is the excess return on the world market portfolio in month *t*, denominated in US dollars.

The second model is the international CAPM redux:

$$PR_{i,t} - RF_t = \alpha + \beta_1 * LWMKT_t + \beta_2 * Dollar_t + \beta_3 * Carry_t + \varepsilon_{i,t} \quad (5)$$

Where $LWMKT_t$ is the month *t* excess return on the world market portfolio denominated in local currencies. The dollar factor, $Dollar_t$, is defined as the average change in the exchange rate between the US dollar and all the other currencies and the carry factor, $Carry_t$, is defined as the difference in exchange rates between baskets of high- and low-interest rate currencies (Lustig et al., 2011).

The third model is the five-factor international asset pricing model proposed by Fama and French (2017):

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * RMW_t + \beta_5 * CMA_t + \varepsilon_{i,t} \quad (6)$$

Where SMB_t is the return on a value-weighted portfolio that is long small-cap stocks and short large-cap stocks, HML_t is the return on a value-weighted portfolio that is long value stocks and short growth stocks, RMW_t (robust minus weak), is the return on a value-weighted portfolio that is long robust operating profitability stocks and short weak operating profitability stocks, and CMA_t (conservative minus aggressive), is the average return on a value-weighted portfolio that is long conservative investment stocks and short aggressive investment stocks.

The final model is an extension of the global Fama–French three-factor model which also includes the global momentum factor:

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * MOM_t + \varepsilon_{i,t} \quad (7)$$

I estimate analogous time series models for $HP1_t$ and $HP2_t$, the return (in US dollars) in month *t* on the two hedge portfolios.

3.1.1 Calendar time portfolio strategies: unadjusted returns

Panel A of Table 5 reports descriptive statistics for the unadjusted returns of the first hedge portfolio, *HP1*. The average return on *HP1* equals 0.62% per month, which is significantly larger than zero at the 1% level (*t*-statistic = 2.87). The monthly return ranges from a low of -11.32% to a high of 11.63%, and the annualized Sharpe ratio equals 0.62. Based on standard normality tests, I cannot reject the null hypothesis that the hedge portfolio returns are normally distributed (not tabulated).

The first four rows in Panel B of Table 5 present the descriptive statistics for the unadjusted returns for the four quartile portfolios. Group 1 represents the quartile of countries with the least favorable recommendations and group 4 represents the quartile of countries with the most favorable recommendations. The lowest quartile portfolio generates an average monthly return of 0.35%. The second and third quartile portfolios yield average returns of 0.89% and 0.77% per month, respectively. The highest quartile portfolio generates the highest average return of 1.24% per month. The second hedge portfolio, *HP2*, has an average return of 0.90% per month (*t*-statistic = 3.32). Similar to *HP1*, I cannot reject the null hypothesis that the returns on *HP2* are normally distributed based on standard normality tests.

Table 5: Descriptive Statistics for the Unadjusted Returns of the Hedge and Quartile Portfolios

Panel A of Table 5 shows descriptive statistics for the unadjusted returns of the first hedge portfolio, *HP1*. Panel B reports the unadjusted returns for the four quartile portfolios and the second hedge portfolio, *HP2*. The mean, minimum and maximum are percentages per month. Group 1 represents the quartile of countries with the least favorable recommendations and group 4 represents the quartile of countries with the most favorable recommendations.

Panel A: Descriptive Statistics Hedge Portfolio 1 (*HP1*)

	Mean	T-value	N	Min	Max	Kurtosis	Skewness	Sharpe Ratio
HP1	0.621	2.87	253	-11.317	11.625	0.976	-0.236	0.624

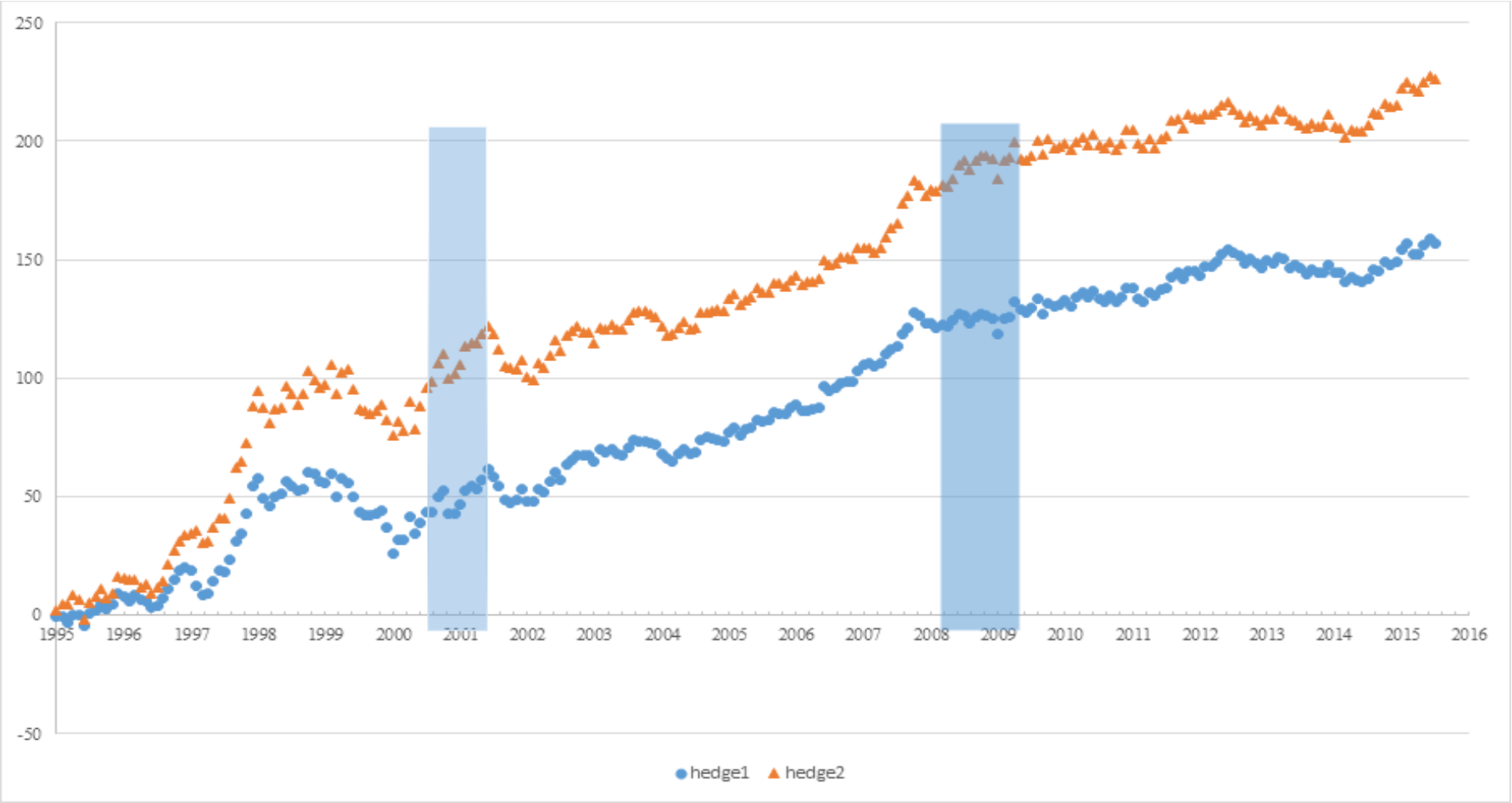
Panel B: Descriptive Statistics Hedge Portfolio 2 (*HP2*)

	Mean	T-value	N	Min	Max	Kurtosis	Skewness	Sharpe Ratio
1(least fav)	0.347	0.86	253	-26.180	17.969	1.553	-0.550	0.188
2	0.888	2.43	253	-23.843	24.589	2.098	-0.072	0.528
3	0.774	2.20	253	-22.981	16.940	1.671	-0.604	0.479
4(most fav)	1.242	3.40	253	-25.769	14.343	1.736	-0.677	0.741
HP2	0.895	3.32	253	-12.130	15.888	0.617	-0.001	0.722

Figure 2 plots the cumulative returns on *HP1* and *HP2* through time. While the hedge portfolios have a substantial risk, *HP1* (*HP2*) exhibits negative average returns in only five (four) years out of the 22 calendar years in the sample. It is notable that the portfolio returns in the first one-third of the sample period are more volatile than during the remainder of the sample period. A possible reason for this higher volatility is the relatively low number of countries that are included in the sample earlier in the sample period. This number ranges from a low of 19 for 1994, the first year of the sample period, to a high of 30 in 2014. The shaded areas in Figure 2 depict global recessions (from peak to trough) based on dates in Fushing, Chen, Berge, and Jordà (2010). There is no evidence that the returns on the hedge portfolio can be explained by their sensitivity to global recessions.

Figure 2: Cumulative Returns on Hedge Portfolios

Figure 2 plots the cumulative returns (in percentage) on *HP1* and *HP2* through time. *HP1* is the hedge portfolio based on weighted recommendation ranks and *HP2* is the hedge portfolio that goes long the quartile of countries with the most favorable recommendations and short the quartile of countries with the least favorable recommendations. The shaded areas in Figure 2 depict global recessions (from peak to trough) based on dates in Fushing et al. (2010).



3.1.2 Calendar time portfolio strategies: risk-adjusted returns

Table 6 reports the average monthly risk-adjusted returns (alphas) for the various portfolios based on each of the four international asset pricing models. Panel A of Table 6 presents the results for *HP1* and Panel B of Table 6 presents the results for the quartile portfolios and *HP2*.

Table 6: Calendar Time Portfolio Alphas

Panel A presents the monthly percentage abnormal returns (alphas) earned by a zero-cost long short portfolio where the weight for each country index in each month is based on that country's recommendation ranking in the previous month. Panel B presents the monthly percentage abnormal returns (alphas) earned by quartile portfolios based on ranks of country-level aggregate analyst recommendations. I require at least 50 firms with an outstanding recommendation for each month–country to be included in the sample. The world CAPM alpha is the estimated alpha from a time series regression of the portfolio excess return on the global market excess return, denominated in US dollars (WMKT). The alpha for the international CAPM redux is the estimated alpha from a time series regression of the portfolio excess return on the world market excess return, denominated in local currencies (LWMKT) and two currency risk factors, Dollar and Carry. The global Fama–French four-factor (FF4) alpha is the estimated alpha from a time series regression of the portfolio excess return on WMKT, SMB, HML, and momentum MOM. The global Fama–French five-factor (FF5) alpha is the estimated alpha from a time series regression of the portfolio excess return on WMKT, SMB, HML, and two additional factors: RMW (robust minus weak), and CMA (conservative minus aggressive). The sample period is from January 1994 to June 2015. Coefficients highlighted in **bold** are significant at the 10% level or better.

Panel A: Hedge Portfolio 1 Alphas

	World CAPM (1)	CAPM Redux (2)	Global FF 4 (3)	Global FF 5 (4)
Hedge Portfolio 1	**0.647**	**0.736**	**0.726**	**0.826**
	2.97	3.28	3.19	3.50

Panel B: Quartile Portfolios and Hedge Portfolio 2 Alphas

	World CAPM (1)	CAPM Redux (2)	Global FF 4 (3)	Global FF 5 (4)
1 (least favorable)	**-0.426**	**-0.638**	-0.342	**-0.645**
	-1.73	-2.63	-1.34	-2.43
2	0.126	0.055	-0.014	-0.106
	0.66	0.29	-0.07	-0.56
3	0.006	-0.017	-0.031	-0.123
	0.04	-0.11	-0.20	-0.78
4 (most favorable)	**0.502**	**0.405**	**0.652**	**0.456**
	2.43	1.95	3.08	2.07
Hedge Portfolio 2	**0.928**	**1.044**	**0.993**	**1.101**
	3.42	3.74	3.50	3.75

For each pricing model, I find that countries with more favorable recommendations have significantly higher average abnormal returns than countries with less favorable recommendations. For example, for the international CAPM redux, *HP1*, the hedge portfolio based on weighted recommendation ranks, yields an abnormal return of 0.74% per month (*t*-statistic= 3.28*).* Similarly, Panel B of Table 6 shows that alpha for the international CAPM redux increases from -0.64% per month (*t*-statistic = -2.63) for group 1 to 0.41% per month (*t*-statistic = 1.95) for group 4. The second hedge portfolio, *HP2*, has a CAPM redux-alpha of 1.04% per month (*t*-statistic = 3.74).

The results for the world CAPM, the CAPM redux, the global Fama–French four-factor model, and the global Fama–French five-factor model all show that the returns on the proposed trading strategy of buying winner countries and selling loser countries cannot be explained by global factors or currency risk factors. Hence, analyst recommendations aggregated at the country-level provide valuable information regarding the future cross section of international stock market returns. In Section 5, I present a battery of robustness tests that show that this conclusion is not sensitive to alternative ways of defining country-level recommendations or stock market returns. I also show that the results hold for the most recent sub-period, following the regulation changes that affected the brokerage industry in 2002 and 2003.

3.2. Panel regressions and time-varying risk exposure

Brusa et al. (2014) show significant differences across international stock markets in both the magnitude of risk exposure and the degree to which these risk exposures vary over time (Dumas & Solnik, 1995). To account for this time variation in risk exposure in the empirical tests, I use the following procedure to calculate the abnormal return of the stock market of each country *i* in month *t*. First, for each country *i* and each month *t*, I use the previous 60 months and run a time series regression to estimate the relevant factor loadings for each of

the four international asset pricing models discussed before.[19] For each of these four models, I then multiply the relevant factor loadings with the corresponding factor realization in month *t* to obtain $Expect\_Ret_{i,t}$, the predicted stock market return for country *i* in month *t*. Finally, I subtract this predicted return from the realized return and obtain the unexpected market return for country *i* in month *t*. This unexpected market return, $Unexpect\_Ret_{i,t}$, is the dependent variable in the following panel regression:

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_Value\_Rec_{i,t-1} + \beta_2 * Momentum_{i,t-1,t-6} + C_i + M_t + \varepsilon_{i,t} \quad (8)$$

Where $Rank\_Value\_Rec_{i,t-1}$ is each country's cross sectional rank in month *t* divided by the total number of countries in month *t*.[20] The variable $Momentum_{i,t-1,t-6}$ measures the abnormal return for country *i* over the previous six months (*t* - 1, *t* - 6).[21] The vector C_i indicates country fixed effects and M_t indicates month fixed effects.

Table 7 presents the results for equation (8) based on each of the four international asset pricing models with and without fixed effects. The *t*-statistics reported in Table 7 are based on standard errors clustered by country.

For all four asset pricing models, the results in Table 7 show that aggregate analyst recommendations at the country-level predict next month's stock market returns. The coefficient of $Rank\_Value\_Rec_{i,t-1}$ is consistent with the results in Table 6. For example, based on the international CAPM redux, the recommendation-rank weighted hedge portfolio yields an abnormal return of 1.02% per month (*t*-statistic = 2.69). When I include country and

[19] Because the international Fama–French factors are only available since July 1990, the first observation used in the panel regressions in this section are for July 1995, allowing for a 60-month period to estimate the factor loadings.

[20] The use of ranks instead of the actual average recommendations mitigates the impact of possible structural changes in the level of average recommendations through time. For example, there is evidence for the United States that, since the regulation changes around 2002, analysts, on average, are issuing fewer optimistic recommendations than before (Barber, Lehavy, Mcnichols, & Trueman, 2006; Kadan, Madureira, Wang, & Zach, 2009). The conclusions do not change when I base the measure on the unadjusted values of the country-level recommendations.

[21] Cross-sectional momentum in global equity markets is shown in Bhojraj and Swaminathan (2006). Time series momentum in stock market indices is documented in Moskowitz, Ooi, and Pedersen (2012).

month fixed effects, this abnormal return increases to 1.06% per month (*t*-statistic = 3.18), which suggests that the findings are not the result of exceptional or persistent outperformance of only some of the countries in the sample (an issue I return to in section 5).[22] Overall, based on the results in Tables 5, 6 and 7, I conclude that country-level recommendations predict one-month-ahead international stock market returns.

The results in this paper seem conflicting with Boni and Womack (2006) at first glance where they show that analyst recommendation information is not valuable for predicting future relative industry returns. However, my research design is different from Boni and Womack (2006) from following angles. First of all, I focus on recommendation levels while Boni and Womack (2006) examine the information content of recommendation changes. Second, they show that analysts' upgrades and downgrades can provide investment value for ranking future winner and loser stocks within industries. So the industry aggregate will be an average number of upgrades less the number of downgrades. If analysts can pick winners/losers within industry successfully so that they are industry specialized, then it is not surprising they have no results for industry-neutral portfolios. Different from the industry perspective, this thesis analyzes from the perspective of aggregating information across stocks giving us insight into the economy.

Table 7: Regression Results Using Unexpected Stock Market Returns and Country-level Aggregate Recommendations

This table presents the results for equation (8). The dependent variable is the monthly unexpected return for each country based on four different international asset pricing models. The variable $Rank\_Value\_Rec_{i,t-1}$ refers to the lagged relative rank of the country-level recommendation each month, where the value for each country is the cross sectional rank divided by the total number of countries in that month. The sample period is from July 1995 to June 2015. The six-month country momentum is the lagged six-month cumulative market

[22] The results in Tables 5, 6 and 7 are based on cross-sectional strategies that only use on past information. Taking a time-series perspective, I also test if the strategy is effective for each of the countries separately. For this test I regress excess returns (according to the international CAPM redux) on the lagged recommendation rank, for each country separately. The average of the coefficients for the lagged recommendation rank across the 27 countries with more than 24 observations is 0.785% (*t*-statistic = 2.4) and the average of these coefficients across all 33 countries is 0.901% (*t*-statistic = 1.7). I also test if global stock market returns are predictable based on country-level recommendations aggregated to the global level but cannot reject the null hypothesis of no predictability.

excess return for each country. The *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	World CAPM		CAPM Redux		Global FF 4		Global FF 5	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Rank\_Value\_Rec_{i,t-1}$	**1.046**	**0.960**	**1.018**	**1.059**	**1.057**	**0.986**	**1.215**	**1.214**
	3.25	2.86	2.69	3.18	3.46	3.03	3.05	3.70
$Momentum$	-0.001	0.009	-0.001	0.004	-0.007	0.004	-0.009	0.000
	-0.18	0.77	-0.18	0.34	-1.00	0.36	-1.22	0.03
Country FE	N	Y	N	Y	N	Y	N	Y
Month FE	N	Y	N	Y	N	Y	N	Y

4. Do Country-level Recommendations Contain Information about the Macroeconomy?

In this section I test the conjecture that the trading strategy is successful because average country-level recommendations contain useful information about future macroeconomic conditions. I examine both the aggregate cash flow channel and the discount rate channel. I use changes in GDP to proxy for aggregate cash flow news and changes in the short-term interest rate and term spread as proxies for discount rate news.[23]

4.1. Cash flow news

Analyst recommendations reflect information from private communications with managers (Brown et al., 2015). Averaging stock recommendations across all stocks in a country eliminates stock-specific information and could, therefore, provide unique insight into the outlook for the corporate sector of that country. To test this conjecture, I examine whether country-level recommendations predict future GDP growth for the countries in the sample. [24]

I obtain the quarterly GDP growth for the countries in the sample from the Organization for Economic Co-operation and Development (OECD) database.[25] I define GDP growth as the

[23] Alternative measures of cash flow news and discount rate news based on predictive regressions involving aggregate price dividend ratios are sensitive to the choice of sub period, predictive variables, assumptions about the dividend reinvestment rate and dividend smoothing (Binsbergen, Jules, & Koijen, 2010; Chen, Da, & Priestley, 2012; Goyal & Welch, 2003). It is likely that these issues are exacerbated in the multi-country setting.

[24] In Appendix C, I also did a robust test using two alternative proxies as indicator for the growth in countries' aggregate cash flows, namely growth in industrial production (IP) and growth in aggregate earnings.

[25] See https://data.oecd.org. Quarterly GDP data are available for 27 countries. The database does not include GDP data for Hong Kong, Malaysia, the Philippines, Singapore, Thailand, and Taiwan. GDP data are internationally comparable by following the System of National Accounts. This indicator is measured in USD per capita (GDP per capita) and in million USD at current prices and PPPs.

percentage change in GDP relative to the same quarter in the previous year (seasonally differenced). To examine whether aggregate analyst recommendations can predict future GDP changes, I estimate the following panel regression:

$$\Delta GDP_{i,q} = \alpha_0 + \alpha_1 Rec_{i,q-1} + \alpha_2 \Delta GDP_{i,q-1} + \alpha_3 WES_{i,q-1} + C_i + QRT_q + \varepsilon_{i,q} \quad (9)$$

where $\Delta GDP_{i,q}$ is the percentage change in GDP for country *i* from quarter q - 4 to quarter q; $Rec_{i,q-1}$ is the average value-weighted analyst recommendation for country *i* at the end of the previous quarter, q - 1; $WES_{i,q-1}$ is the average score from the WES on country *i*'s expected situation regarding the overall economy at the end of the next six months, measured in the previous quarter, q - 1.[26] Since growth in GDP is highly auto correlated, I also include lagged GDP growth, $\Delta GDP_{i,q-1}$, in the model. Finally, to allow for systematic differences in growth rates across countries and quarters, I include country fixed effects, C_i, and quarter fixed effects, QRT_q , a unique dummy for each of the 84 quarters in the sample.

The first column in Table 8 reports the results for equation (9) without country fixed effects. The results in the second column are based on the panel regression including country fixed effects. In both cases, the results show that the average country-level analyst recommendation is a significant predictor of next quarter's GDP growth.

In column (3) of Table 8, I present the results for the Anderson–Hsiao estimator of equation (9) (Anderson & Hsiao, 1982). I include these results to deal with the well-known problem that using fixed effects in a model that includes lagged values of the dependent variable results in biased estimates. The use of the Anderson–Hsiao estimator involves differencing equation (9) to remove the country and quarter fixed effects and replacing $\Delta GDP_{i,q-1} - \Delta GDP_{i,q-2}$ by $\Delta GDP_{i,q-2}$ as an instrument. Columns (3) to (6) report the coefficients using the Anderson–Hsiao estimator, where the dependent variable is the change

[26] Appendix B provides background information on the WES. The Pearson correlation between $Rec_{i,q-1}$ and $WES_{i,q-1}$ is 0.07, which is significant at the 1% level.

in GDP for each of the next four quarters. Consider the result in column (3) for next quarter's GDP growth, I find that the coefficient estimate for last quarter's country-level recommendation based on the Anderson–Hsiao estimator is significant and similar to the previous results in columns (1) and (2), confirming that aggregate analyst recommendations predict next quarter's GDP growth. The results in columns (4) to (6) show that the average country recommendation also predicts GDP growth two quarters ahead but has no predictive ability for the next two quarters. Based on the Anderson–Hsiao estimator, the coefficients for the WES forecasts are positive for each of the next four quarters but only significant for the next quarter and marginally significant for the next two quarters.

Table 8: GDP Growth and Country-level Analyst Recommendations

This table shows the regression results of GDP growth on lagged country-level aggregate analyst recommendations, lagged GDP growth and lagged GDP forecasts by a panel of experts (WES). The sample period is from 1995Q1 to 2015Q3. All variables are quarterly. The analysis is based on 27 countries due to data availability. For each country, the lagged aggregate analyst recommendation is the aggregate analyst recommendation for the previous quarter-end. I require at least 50 firms with an outstanding recommendation. The variable $WES_{i,q-1}$ is the average score from the WES for country *i*'s expected situation regarding the overall economy at the end of the next six months as measured in the first month of the previous quarter q - 1. The first column reports the results for panel regression (9) without country fixed effects. The results in the second column are based on the panel regression including country fixed effects. In column (3), I present the results from the Anderson–Hsiao estimator of equation (9). Columns (4) to (6) test whether the average country recommendation helps to predict economic growth in the next two, three, or four quarters, based on the Anderson–Hsiao estimator. All *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	$\Delta GDP_{i,q}$ (1)	$\Delta GDP_{i,q}$ (2)	Anderson–Hsiao $\Delta GDP_{i,q}$ (3)	Anderson–Hsiao $\Delta GDP_{i,q+1}$ (4)	Anderson–Hsiao $\Delta GDP_{i,q+2}$ (5)	Anderson–Hsiao $\Delta GDP_{i,q+3}$ (6)
$Rec_{i,q-1}$	**0.521**	**0.529**	**0.582**	**0.623**	0.091	-0.216
	2.65	2.09	3.76	3.96	0.57	-1.32
$WES_{i,q-1}$	**0.031**	**0.043**	**0.025**	0.017	**0.020**	0.014
	2.52	3.31	2.13	1.41	1.69	1.13
Quarter FE	Y	Y	N	N	N	N
Country FE	N	Y	N	N	N	N

4.2. Discount rate news

This section examines whether country-level recommendations have predictive power for future discount rates. Several studies use changes in the short-term interest rate and term spread as proxies for discount rate news (Kothari et al., 2006). I obtain short-term interest rates and long-term interest rates from the OECD[27] and estimate the following panel regressions:

$$\Delta ST_{i,m} = \alpha_0 + \alpha_1 Rec_{i,m-1} + \alpha_2 \Delta ST_{i,m-1} + C_i + MTH_m + \varepsilon_{i,m} \quad (10)$$

$$\Delta TERM_{i,m} = \alpha_0 + \alpha_1 Rec_{i,m-1} + \alpha_2 \Delta TERM_{i,m-1} + C_i + MTH_m + \varepsilon_{i,m} \quad (11)$$

[27] See https://data.oecd.org. Short-term interest rates are the rates at which short-term borrowings are effected between financial institutions or the rate at which short-term government paper is issued or traded in the market. Short-term interest rates are based on three-month money market rates where available. Long-term interest rates refer to government bonds maturing in ten years. See also Hjalmarsson (2010).

where $\Delta ST_{i,m}$ is the change in the short term interest rate for country *i* from month *m* - 1 to month *m*, and $\Delta TERM_{i,m}$ is the change in the difference between the long term and short term interest rate in country *i* from month *m*-1 to month *m*. $Rec_{i,m-1}$ is the average value-weighted analyst recommendation for country *i* at the end of the previous month, *m* - 1. Since both the change in short term interest rate and term spread display significant autocorrelation, I also include the lagged change in short term interest rate and term spread in equation (10) and (11), respectively. Finally, to allow for systematic differences across countries and months, I include country fixed effects, C_i, and month fixed effects, MTH_m.

The first column in Panel A of Table 9 reports the results for equation (10) without country fixed effects. The results in the second column are based on the panel regression including country fixed effects. In both cases, the results show that country-level analyst recommendations are not related to changes in next month's short-term interest rate. The results for the Anderson–Hsiao estimator in column (3) again show that country-level analyst recommendations do not predict changes in short-term interest rates.

Table 9: Changes in Short-term Interest Rate and Term Spread and Country-level Analyst Recommendations

This table shows the regression results for changes in the short term interest rate (Panel A) and term spread (Panel B) on lagged country-level aggregate analyst recommendations and lagged changes in the short term interest rate and term spread. The sample period is from 1995M1 to 2015M6. All variables are monthly. The analysis is based on 25 countries due to data availability. For each country, the lagged aggregate analyst recommendation is the aggregate analyst recommendation in the previous month. I require at least 50 firms with an outstanding recommendation for each country. The first column reports the results for panel regression (10) and (11) without country fixed effects. The results in the second column are based on the panel regressions including country fixed effects. In column (3), I present the results from the Anderson–Hsiao estimator of equation (10) and (11). All *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at 10% level or better.

Panel A: Changes in Short-Term Interest Rates

	$\Delta ST_{i,m}$ (1)	$\Delta ST_{i,m}$ (2)	Anderson–Hsiao $\Delta ST_{i,m}$ (3)
$Rec_{i,m-1}$	-0.002	-0.003	0.002
	-0.14	-0.12	0.08
Month FE	Y	Y	N
Country FE	N	Y	N

Table 9 Continued
Panel B: Changes in Term Spread

	$\Delta TERM_{i,m}$ (1)	$\Delta TERM_{i,m}$ (2)	Anderson–Hsiao $\Delta TERM_{i,m}$ (3)
$Rec_{i,m-1}$	-0.013	-0.017	0.000
	-1.02	-0.90	0.02
Month FE	Y	Y	N
Country FE	N	Y	N

Panel B in Table 9 reports the results for equation (11). Consistent with the evidence for changes in short-term interest rates, the results indicate that country-level analyst recommendations do not predict changes in the term spread.[28]

Overall, based on the results in this section, I conclude that aggregate analyst recommendations help to predict changes in the gross domestic product (cash flow news) but not changes in interest rates (discount rate news).

5. Additional Tests

This section presents the results of additional tests related to the calendar time portfolio strategy. I first present evidence on portfolio rebalancing and examine the extent to which different countries contribute to the overall hedge portfolio return. I then present the results of several robustness tests.

5.1 Portfolio rebalancing and portfolio return contribution

The trading strategy in section 3 requires monthly rebalancing. To help understand the migration of countries across the four quartile portfolios, Panel A of Table 10 presents the transition matrix for the monthly strategy. The transition matrix shows that more than half of the countries migrate across the four portfolios after the first month. Focusing on the most extreme quartiles, I see that 37% of the countries in the least favorable group in a given month

[28] I find no significant results if I estimate these models for short term interest changes and term spread changes two, three or four months ahead.

are still in that group one month later, whereas 48% of the countries in the most favorable group in a given month are still in that group in the next month.

The results in Panel A of Table 10 show a substantial level of portfolio turnover, suggesting that the returns on the trading strategy are not due to a few specific countries. To further examine this issue, Panel B of Table 10 reports the contribution of individual countries to the average portfolio return for *HP1*, the hedge portfolio based on the rank of the country-level recommendations of all countries in the sample. Following Koijen, Schmeling, and Vrugt (2015), I compute the return contribution for country *i* as

$$RC_i = \sum_1^T w_{i,t} * MSCI\_Ret\_USD_{i,t} \quad (12)$$

Where T represents the total number of months country *i* was included in the hedge portfolio, $w_{i,t}$ is the weight for country *i* in month *t* given by equation (2), $MSCI\_Ret\_USD_{i,t}$ is the market return for country *i* in month *t* denoted in US dollars.

Panel B of Table 10 shows that 20 out of 33 countries have positive return contributions and that the overall strategy return is not dominated by just a few countries. [29]

Table 10: Portfolio Rebalancing and Return Contribution

Panel A presents the transition matrix based on monthly rebalancing. Each cell in the transition matrix shows the percentage of countries that change from the quartile group in the previous month (the rows) to the quartile group in the current month (the columns). Panel B reports the contribution of individual countries to the total portfolio return for *HP1*, the hedge portfolio based on the rank of the country-level recommendations of all countries in the sample. See section 5.1 for details.

Panel A: Transition Matrix

	Current Month's Quartile			
Last Month's Quartile	1	2	3	4
1	36.86	30.80	21.05	11.3
2	23.39	33.08	28.05	15.47
3	15.92	26.26	35.28	22.55
4	9.92	16.23	25.55	48.30

[29] Because not all countries are included in the portfolio throughout the whole sample period, the average excess return on the strategy reported in Panel A of Table 5 is slightly different from the sum of the return contributions across the countries divided by 253 (the number of months in the sample).

Table 10 Continued
Panel B: Contribution per Country to the Return of Hedge Portfolio *HP1*

Country	Total Contribution (%)
Australia	3.85
Belgium	-0.21
Brazil	-3.32
Canada	10.76
China	46.64
Denmark	0.96
Finland	15.53
France	12.04
Germany	2.21
Hong Kong	1.08
India	23.51
Indonesia	18.98
Italy	-6.41
Japan	-18.80
Korea	5.09
Malaysia	9.53
Mexico	4.61
Netherlands	17.75
New Zealand	-0.98
Norway	-1.01
Philippines	2.22
Poland	2.25
Russia	-4.58
Singapore	16.70
South Africa	-12.37
Spain	-4.18
Sweden	-17.74
Switzerland	-1.64
Taiwan	6.70
Thailand	19.89
Turkey	-6.74
United Kingdom	-9.60
United States	24.41

5.2 Robustness tests

In this section I examine the robustness of the results in Table 6. I focus on the results for *HP1*, the hedge portfolio based on the rank of the country-level recommendations of all countries in the sample.[30] The results of these tests are presented in Table 11. The first row in

[30] The results for *HP2*, the hedge portfolio that goes long the quartile of countries with the most favorable recommendations and short the quartile of countries with the least favorable recommendations, are similar and lead to the same conclusions.

Table 11 presents the base case results for each international asset pricing model (repeating the results from Panel A of Table 6).

5.2.1 Alternative constructions of aggregate analyst recommendation

The base case results in the first row of Table 11 are based on outstanding recommendations that were announced in the previous month. Panels A1 to A3 of Table 11 present the results when I consider outstanding recommendations announced within the last quarter, the last half year, and the last year, respectively. For all four asset pricing models, I find that the results are stronger if country-level recommendations are based on more recent forecasts. For the international CAPM redux, for the base case based on last month's recommendations, the abnormal return is 0.74% per month (*t*-statistic = 3.28). The average abnormal return is 0.69% (*t*-statistic = 3.18) if the consensus recommendation is based on all outstanding recommendations announced in the last quarter; 0.34% (*t*-statistic = 1.70) if the consensus recommendation is based on all outstanding recommendations in the last two quarters; and 0.30% (*t*-statistic = 1.48) if the consensus recommendation is based on all outstanding recommendations announced in the last year. [31]

5.2.2 Impact of the prediction period

Panel B1 to B3 of Table 11 show that country-level recommendations have some predictive ability for international stock market returns two, three and four months ahead. Again focusing on the results for CAPM redux, the hedge portfolio yields a significant abnormal return of 0.45% per month if I skip one month (*t*-statistic = 2.12). The monthly return on the hedge portfolio three months after portfolio formation is also positive 0.32% per month but insignificant (*t*-statistic = 1.40), and is positive and significant four months after portfolio

[31] Note that the consensus forecasts only use the most recent recommendation for each analyst for each stock. By extending the window back to 12 months, there are approximately 85% more recommendations in the sample compared to the one-month window (covering more stocks but also potentially including more stale forecasts). With the 12-month window, 37% of the outstanding recommendations were announced within the last three months, 28% were announced within the last four to six months, and 35% of the recommendations are more than six months old.

formation (0.67% per month, *t*-statistic = 2.94). For periods more than four months after portfolio formation, the strategy no longer yields significant abnormal returns (not tabulated).

5.2.3 Developed markets only

Panel C of Table 11 presents the results if the hedge portfolio is restricted to developed markets only (based on the MSCI classification, see footnote 13). The abnormal returns are lower than for the full sample, but for each of the international asset pricing models the abnormal return is significant and around 0.5% per month. For example, based on CAPM redux the abnormal return is 0.51% per month (*t*-statistic = 3.26).

5.2.4 Regulation changes in the brokerage industry

The brokerage industry faced significant regulatory changes in 2002 in the United States and 2003 in Europe. I expect recommendations to be more comparable across countries since the regulatory changes, potentially enhancing the returns of the trading strategy. However, the regulatory changes also resulted in a decline in the informativeness of recommendations in the United States (Kadan et al., 2009) and possibly other countries, which could result in lower returns on the trading strategy.

Panel D shows the results for the period starting November 2004 and ending June 2015 (Dubois & Dumontier, 2008). [32] The average abnormal returns are slightly lower in the post-regulation period, but they are still economically and statistically significant. For example, focusing on the international CAPM redux, I see a lower abnormal return of 0.65% per month (*t*-statistic = 2.65) in the post-regulation period, compared to 0.74% per month over the whole sample period.

5.2.5 Informativeness of aggregate analyst recommendation changes

Many studies of the information content of analyst recommendations focus on recommendation changes rather than recommendation levels. Panel E in Table 11 presents the

[32] October 2004 was the deadline for European countries to adopt the new European rules into their national laws.

results for a strategy based on dollar neutral long-short portfolios where the weight in each country index in each month is based on the ranking of that country's recommendation change relative to the previous month instead of the country's recommendation level.

The results for this strategy in Panel E, indicate that analyst recommendation changes provide some information, but the abnormal returns are not as high as the strategy based on recommendation levels and never significant. For example, for the international CAPM redux, the average monthly abnormal return is 0.30% (*t*-statistic = 1.44). This finding that the strategy based on recommendation changes results in lower abnormal returns than the strategy based on recommendation levels, contradicts studies of analyst recommendations at the firm level, which tend to find that analyst recommendation revisions provide more useful information to investors (Jegadeesh et al., 2004; Womack, 1996).

5.2.6 Alternative definition of the stock market index

In the next robustness test, I replace the MSCI index returns used in the main tests with a value-weighted market return for each country that is based only on stocks with outstanding recommendations, resulting in a closer match between the return measures and the country-level recommendations.[33] To calculate the monthly value-weighted stock market returns for country *i* in month *t*, I weight the return of each stock *j* (in US dollars), $Month\_Return_{j,t}$, by its market capitalization in month *t* - 1, $Mkt\_Cap_{j,t-1}$:

$$Value\_Ret_{i,t} = \sum_{j=1}^{n} Month\_Return_{j,t} * \frac{Mkt\_Cap_{j,t-1}}{\sum_{j=1}^{n} Mkt\_Cap_{j,t-1}} \quad (13)$$

Panel F in Table 11 shows that, with a closer match between a country's market return and the aggregate analyst recommendation, the abnormal return of the trading strategy is slightly higher and more significant than for the base case. For example, based on the

[33] Daily stock price for international stocks while monthly stock price for North America stocks. Number of shares outstanding may be absent for certain North American stocks in the beginning of the sample period, but results remain if the sample period starts from 1998, when more North American stocks have shares outstanding data.

international CAPM redux, the average abnormal return equals 0.86% per month (*t*-statistic = 3.85).

5.2.7 Market return in local currency

To show that the exchange rates do not drive our results, I use the market returns denoted in local currency in the final robustness test. Panel G presents the results. I find that the abnormal return of the trading strategy is slightly lower and less significant than for the base case. For example, based on the international CAPM redux, the average abnormal return equals 0.64% per month (*t*-statistic = 2.98).

Table 11: Robustness Tests

This table presents the results of additional tests for *HP1*, the hedge portfolio based on the rank of the country-level recommendations of all countries in the sample. Panel A presents the intercept (alpha) from different asset pricing models using alternative windows to calculate consensus recommendations (three months, six months, and 12 months). Panel B shows the results for different prediction periods. Panel C reports the portfolio performance for developed markets only. Panel D shows the results after the regulation changes, from November 2004 to June 2015. Panel E shows the hedge returns based on recommendation changes. Panel F shows the results when using only stocks with recommendations to calculate the stock market return. Panel G provides the results when the market returns are denoted in local currency. Coefficients highlighted in **bold** are significant at the 10% level or better.

Portfolio	World CAPM (1)	CAPM Redux (2)	Global FF 4 (3)	Global FF 5 (4)
Hedge Return	**0.647**	**0.736**	**0.726**	**0.826**
	2.97	3.28	3.19	3.50
Panel A1: Alternative Construction of Aggregate Analyst Recommendations: Last Three Months Outstanding				
Hedge Return	**0.511**	**0.686**	**0.452**	**0.628**
	2.38	3.18	2.03	2.70
Panel A2: Alternative Construction of Aggregate Analyst Recommendations: Last Six Months Outstanding				
Hedge Return	0.232	**0.344**	0.181	0.323
	1.16	1.70	0.87	1.49
Panel A3: Alternative Construction of Aggregate Analyst Recommendations: Last Twelve Months Outstanding				
Hedge Return	0.201	0.298	0.162	0.238
	1.02	1.48	0.79	1.12
Panel B1: Two Month Ahead Market Return				
Hedge Return	**0.444**	**0.454**	**0.417**	**0.519**
	2.14	2.12	1.92	2.30
Panel B2: Three Month Ahead Market Return				
Hedge Return	0.366	0.324	0.315	0.263
	1.64	1.40	1.36	1.09
Panel B3: Four Month Ahead Market Return				
Hedge Return	**0.500**	**0.672**	0.346	0.399
	2.21	2.94	1.49	1.64
Panel C: Developed Markets Only				
Hedge Return	**0.491**	**0.505**	**0.530**	**0.618**
	3.20	3.26	3.39	3.81
Panel D: Post Regulation Changes (November 2004 to June 2015)				
Hedge Return	**0.687**	**0.650**	**0.675**	**0.873**
	2.83	2.65	2.75	3.42
Panel E: Recommendation Changes				
Hedge Return	0.308	0.297	**0.369**	0.280
	1.52	1.44	1.74	1.27
Panel F: Alternative Definition of Stock Market Return				
Hedge Return	**0.736**	**0.861**	**0.786**	**0.907**
	3.37	3.85	3.44	3.84

Table 11 Continued

Panel G: Market Return in Local Currency				
Hedge Return	**0.561**	**0.641**	**0.632**	**0.677**
	2.68	2.98	2.90	2.98

6. Conclusion

This study shows that analyst recommendations aggregated at the country-level predict one-month-ahead stock market returns across countries. A self-financing hedge portfolio that buys the stock market indices of the countries with the most favorable recommendations and sells the stock market indices of the countries with the least favorable recommendations yields a return of around 1% per month. The results are robust to different international asset pricing models, portfolio construction rules, and measurement windows. I also show that country-level analyst recommendations predict next quarter's GDP growth, even when I control for survey-based forecasts by a panel of economists. However, there is no evidence that country-level recommendations help to predict discount rates.

CHAPTER 2

Dispersion in Analysts' Recommendations and International Stock Markets

1. Introduction

Miller (1977) argues that if short-sales restrictions are binding, stocks can become overpriced when investors have different opinions. This overpricing result is because pessimistic investors are constrained when they want to sell more shares than they hold, and the security price is therefore set by the most optimistic investors.

Several empirical studies test Miller's theory (1977) from different perspectives and show mixed support. In the next section, a brief literature review is conducted. Among these studies, Yu (2011) takes an aggregate perspective and finds a negative relationship between lagged aggregate analyst forecast dispersion and stock market returns.[34] After controlling for variables correlated with the market return, the effect of disagreement is still robust.[35] Yu's study is the first to look at the role of dispersion aggregated at the country level. However, this study is limited to the U.S. stock market.

This study extends Yu's paper by examining the asset pricing implications of aggregate analyst dispersion at the country level. Unlike Yu (2011) focusing on U.S. stock market and using analyst earnings forecast, I look at the cross-country dispersion differences and use Institutional Brokers' Estimate System (I/B/E/S) analyst recommendations for stocks from 33 countries for the period from January 1994 to June 2015 to construct a measure of monthly average country-specific analyst recommendation dispersion. In the base case, I focus on the value-weighted average analyst dispersion using three-month outstanding recommendations and one-month-ahead stock market returns.[36] A trading strategy of buying market indices of countries in the lowest analyst dispersion quintile and selling market indices of countries in the

[34] Goetzmann and Massa (2002) use the different choices among S&P 500 Index Fund investors as a direct proxy of differences of opinion and show that heterogeneous beliefs act as a robust risk factor and can explain part of the returns that are not accounted for by the standard asset pricing factors.
[35] For the variables that correlated with the market, see Campbell and Thompson (2008) and Goyal and Welch (2008).
[36] I do not use the earnings per share long-term growth forecasts in the main test because of limited availability of international data.

highest analyst dispersion quintile yields a monthly abnormal return of 0.78% (*t*-statistic = 2.53) based on the international asset pricing model of Brusa et al. (2014) and a monthly abnormal return of 0.72% (*t*-statistic = 2.14) based on the international five-factor asset pricing model of Fama and French (2017). However, when including the global momentum factor, abnormal returns are not significant. I also present results in a panel setting that allows for time variation in the risk exposures of international stock markets.

Based on Miller's theory (1977), a stock simultaneously experiencing differences of opinion and short selling restrictions will be overpriced. To test whether this story applies to the stock market as well, I consider country-level short-sales constraints in the next set of tests. Specifically, I start by treating the legality of short selling activities in the stock market as a measure of country-level short-sales constraints. I also discuss other forms of restriction, including the feasibility of short selling activity and the availability of stock market index derivatives. The coefficients of the interaction between short-sales constraint and analysts' dispersion are not significant, indicating that the existence of short-sales constraints is not a necessary condition for a country's stock market to be overvalued. One possible explanation would be that the rational traders are uncertain about when their peers will exploit this arbitrage opportunity, so they prefer not to correct the mispricing immediately because of the possible substantial holding cost. Without synchronized shorting of the overpriced markets, pessimistic views about the stock markets will therefore not necessarily be reflected in prices despite the ability to short (Abreu & Brunnermeier, 2002).

This paper contributes to the literature by demonstrating that aggregate analyst recommendation dispersions are negatively related to cross-sectional future stock market returns. I also introduce a new measure of differences of opinion in analyst stock recommendations, which are directly linked to analyst views of future stock price movements. Also, stock recommendations are more comparable across different companies compared to the earnings forecasts since recommendations are standard ratings ranging from one to five. I

also investigate whether the negative relationship between the dispersion and future stock market return discussed by Yu (2011) exists in other countries. I do this by using an extensive sample of 33 countries. My results show that Yu's findings do not apply for countries in general as only seven countries show a significant negative relation and the United Kingdom and China show a significant positive relation at the 90% confidence level. In particular, the United States does not show the significant negative relation between my recommendation level measure of analyst dispersion and future stock market return. Finally, I provide further evidence that when investors have different opinions, growth stocks show higher levels of overpricing than value stocks.

2. Literature Review

In an influential paper, Miller (1977) argues that as long as the supply of shares is smaller than the demand, the share price will be higher than the average price determined by the whole population. Only when short selling is allowed, can the supply of securities increase in such a way that adverse views are also reflected in the market price.

Diether, Malloy, and Scherbina (2002) are among the first to empirically examine the effect of heterogeneous beliefs on prices. They examine the role of dispersion in analysts' earnings forecasts in predicting the cross-section of future stock returns and show that stocks with higher analysts' earnings forecast dispersions tend to underperform in the future.

Chen, Hong, and Stein (2002) use the breadth of mutual fund ownership as a measure of the extent to which short-sales constraints are binding. By defining 'breadth' as the proportion of mutual funds with a long position for each stock in each quarter, they devise a novel proxy for how tightly short-sales constraints bind. In Miller's theory, the extent to which short-sales constraints bind reflects the amount of negative information withheld from the market. When "breadth" is low, many investors are sitting on the sideline without showing their pessimistic views about the stock price. Thus low 'breadth' indicates short-sales

constraints are tightly binding. Chen et al. (2002) find that reductions (increases) in the breadth of ownership forecast lower (higher) future returns as Miller would predict. However, as they argue themselves, their study fails to entirely control for mutual fund stock picking ability since they focus only on the mutual fund sector and ignore position changes of individual investors.

Boehme, Danielsen, and Sorescu (2006) is the first study that simultaneously considers the two necessary conditions for overvaluation discussed by Miller (1977). They employ three different proxies for differences of opinion, namely dispersion of analysts' forecasts, idiosyncratic volatility, and turnover.[37] They find that firms with short-sales constraints and a high level of different views among investors experience a significant negative abnormal return of 21% per year on average.

Several studies propose an alternative explanation for the negative relation between dispersion and the future return. For example, Johnson (2004) suggests that dispersion is a proxy for unpriced risk and argues that financial leverage can explain the findings of Diether et al. (2002). Avramov, Chordia, Jostova, and Philipov (2009) however find that dispersion effects are about the same across levered and unlevered companies. Using credit rating downgrades as a proxy of financial distress, they find that the negative relationship between dispersion and future returns only exists in non-investment grade firms and is most pronounced during the credit rating downgrade period. Chen and Jiambalvo (2004) show that the results of Diether et al. (2002) can be explained away by the well-known post-earnings announcement drift phenomenon. Doukas, Kim, and Pantzalis (2006) remove analyst uncertainty factors from the forecast dispersion. They even find a positive relationship between stock returns and

[37] However, using analyst information to construct the proxy of differences of opinion may fail to capture the average investors' opinion discussed in the theoretical studies. Goetzmann and Massa (2005) construct an investor-based dispersion measurement using investors' account information directly and find that analyst dispersion reflects the investor-based dispersion contemporaneously, which supports the idea that analysts' dispersion is a good proxy for investors' differences of opinion.

differences of opinion. Verardo (2009) tests this issue in a setting of momentum strategy and reports that momentum profits are higher for portfolios with larger dispersion.

However, most of these studies employ monthly returns and assume that differences of opinion are reduced over several months. Using long-term returns, these studies suffer from the "bad-model" problem discussed in Fama (1998) and might confuse mispricing and risk. Berkman, Dimitrov, Jain, Koch, and Tice (2009) use earnings announcements as events that reduce differences of opinion among investors and calculate three-day excess returns around earnings announcements to capture the effect of dispersion reduction on stock prices.[38] Focusing on short event windows, they show that the negative relationship between analyst dispersion and future returns cannot be accounted for by other factors such as financial leverage, price momentum, and post-earnings announcement drift.

A critical issue in this line of research is whether the differences of opinion measure uncertainty (risk) or different beliefs. A strand of literature tries to disentangle this issue using unique market settings. For example, Beber, Breedon, and Buraschi (2010) focus on the foreign exchange market where short-sales constraints are absent, and differences of opinion regarding the underlying assets are measured directly using currency forecasts. Their results indicate a positive relationship between differences of opinion and subsequent underlying currency returns, suggesting that differences of opinion represent another risk factor. Likewise, Carlin, Longstaff, and Matoba (2014) analyze similar issues in mortgage-based security markets where they can measure the dispersions of the prepayment speed directly. They also find a positive relationship between disagreement and future returns. These papers contribute to the literature by showing that, at least in their particular settings, disagreement measures uncertainty and is priced as a risk factor.

[38] Bamber, Barron, and Stober (1997) show that dispersion of analysts' forecasts of earnings declines after earnings announcements.

Jiang and Sun (2014) look into this issue from a new perspective and construct the dispersion for a given stock as the distance between the weight in mutual funds' active holdings and that in the benchmark index. They find a positive relationship between dispersion and future stock returns. The mutual fund managers have different levels of information for a given stock. When managers with information advantages receive positive signals, they tend to increase their holdings for this stock relative to other uninformed managers, driving up the dispersion level in the fund industry. In contrast, when informed managers receive negative messages about the stock, they may not be able to sell short due to the binding short-sales constraints. So when bad news arrives in the market, the dispersion is smaller. Jiang and Sun (2014) provide a novel explanation for this positive relationship, arguing that the relationship is not conflicting with Miller's prediction since dispersion among mutual fund managers reflects information differences, whereas in Miller's theory investors have the same information set and hold different opinions for exogenous reasons.

As discussed in the introduction, Yu (2011) tests Miller's theory (1977) at an aggregate level and finds a negative relationship between dispersion and future stock market returns. However, he fails to consider short selling restrictions. As one of the two necessary conditions of Miller's theory, country-level short-sales restrictions are discussed in several studies, but none of them is connected with the differences of opinion literature. For example, Bris, Goetzmann, and Zhu (2007) analyze cross-sectional and time-series information from 46 equity markets around the world and test whether short-sales constraints affect market returns. They find that prices incorporate negative information faster in countries without short-sales constraints, whereas in countries where short selling is prohibited or not employed, market returns display less negative skewness. However, these measures do not capture other omitted country-level factors. To alleviate this issue, Saffi and Sigurdsson (2010) examine stock level short-sales constraints for more than 12,600 stocks across 26 countries and show that short-sales constraints reduce the speed with which information is incorporated into prices.

3. Data, Variable Definitions, and Descriptive Statistics

This section discusses the data sources and sample selection as well as the construction of aggregate analyst recommendation dispersion measure. It also presents descriptive statistics and the distribution of the analyst dispersion across countries through time.

3.1 Data and sample selection

I obtain analyst recommendations from the I/B/E/S Recommendation Detail files for US stocks and international stocks for the period from January 1994 to June 2015.[39] I select the 33 countries that have more than 10,000 recommendations in I/B/E/S for stocks listed on their domestic stock exchanges and for which data are available from Compustat.[40] Analysts may have individual recommendation scales, but I/B/E/S standardizes recommendations as one (strong buy), two (buy), three (hold), four (sell), and five (strong sell). Following previous studies, I reverse the ordering of the recommendation labels, so that large (small) numbers represent positive (negative) recommendations.[41] Recommendations can be upgrades, downgrades, reiterations, or initial recommendations. Since I focus on the aggregate recommendation dispersions across all firms in a country, the sample consists of all types of recommendations.

To be included in the calculation of aggregate dispersion, a stock must have a CUSIP or SEDOL identifier and is covered by an analyst with a non-missing analyst code. Also, the country domicile code for this firm is available.[42] To calculate the standard deviation of the

[39] For 31 of the 33 countries in our sample, calendar year 1994 is the first full year with recommendations in the I/B/E/S database. Coverage for Russia and Poland starts in July 1997 and June 1995, respectively.
[40] The I/B/E/S recommendations database contains data for stocks from 110 different countries. The 33 countries in our sample represent 95% of all recommendations in the database.
[41] The recommendation must range from one to five.
[42] The announcement date should not be later than the activation date. The activation date is the date the recommendation was recorded by Thomson Reuters. For each company, I obtain the country domicile code from the I/B/E/S Summary History–Company Identification file and match it with the corresponding country name using the I/B/E/S Summary History Manual.

recommendation, the recommended stock must have at least two outstanding recommendations available. [43]

I then merge the recommendation data with stock information in Compustat and require that the Gvkey, issue ID, stock prices, the number of shares outstanding, incorporation country code, and exchange country code are available from Compustat. For each firm, I exclude recommendations for the cross-listed issues and retain only share issues with the same exchange and incorporation country codes.[44]

I obtain monthly value-weighted gross total return indices for each of the individual countries and the world market from the MSCI website.[45] I use country returns based on the MSCI index expressed in US dollars in the main tests. For country *i* and month *t*, this return is denoted as $MSCI\_Ret\_USD_{i,t}$. I use the one-month US Treasury bill rate as the risk-free rate and obtain global factor returns from Kenneth French's website.[46] Finally, I obtain the monthly currency risk factors, namely the carry factor and the dollar factor, from Adrien Verdelhan's website.[47]

3.2 Proxies for dispersion of opinion

The main variable used in this study is the country-level analyst recommendation dispersion. I focus on the recommendation dispersion for several reasons. First, analysts issue recommendations mainly based on the long-term earnings growth rate (Bradshaw, 2004) and this long-term earnings growth rate has been used in several studies as the proxy of differences

[43] With the three-month outstanding window, on average, about 55% analyst covered stocks are covered by at least two analysts. The average market capitalization increase from 15.7 billion U.S. dollar for all analysts covered stocks to 21.8 billion U.S. dollar for stocks covered by at least two analysts. This trend is consistent with Diether et al. (2002) and Danielsen and Sorescu (2001) arguing that large firms are covered by more analysts on average.
[44] Because of this requirement, the country-level recommendation dispersion is more likely to be based on recommendations from local analysts. For a sample of 32 countries, Bae et al. (2008) find that local analysts typically have a significant information advantage over foreign analysts.
[45] See https://www.msci.com/end-of-day-data-search.
[46] See http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. The global factors are expressed in US dollar values and are based on 23 developed markets.
[47] See http://web.mit.edu/adrienv/www/Data.html. Specifically, I download our data from the Monthly Currency Excess Returns file, where the RX variable is the dollar factor and the HML variable is the carry factor (Lustig et al., 2011).

of opinion (Moeller, Schlingemann, & Stulz, 2007; Yu, 2011). However, for most countries, there is a relatively low coverage of this variable relative to analyst recommendations. Besides, in contrast to earnings forecasts, stock recommendations all range from one to five and thus are comparable across different firms and countries. Moreover, stock recommendations also reflect analyst views on future stock performance directly. Hence, I calculate the value-weighted average of analyst recommendation dispersion across all stocks within each country.

For each firm *j*, I first calculate the dispersion of recommendations at the end of each calendar month *t*, $DIS_{j,t}$. In the main tests, this dispersion of recommendations at the stock level is defined as the standard deviation of all outstanding recommendations across analysts for a firm *j*, issued a minimum of two days and a maximum of 3 months prior to the end of calendar month *t*, where for each analyst I only use the most recent recommendation. Next, for each country *i*, I weigh the dispersion of recommendations for each firm *j* based on the previous month's market capitalization, $Mkt\_Cap_{j,t-1}$, to obtain the aggregate value-weighted average recommendation dispersion for country *i* at the end of month *t*.[48]

$$DIS\_Rec_{i,t} = \sum_{j=1}^{n} DIS_{j,t} * \frac{Mkt\_Cap_{j,t-1}}{\sum_{j=1}^{n} Mkt\_Cap_{j,t-1}} \quad (1)$$

Consistent with Loh and Stulz (2011), I also merge the recommendations with the I/B/E/S Stop Recommendation file to make sure that the outstanding recommendations have not been stopped by the broker. By calculating the value-weighted average recommendation dispersion across all stocks in each country, idiosyncratic shocks in individual stock disagreements will largely cancel out.

[48] To ensure enough diversification in each country, I require at least 50 firms for each month-country to be included in the sample.

3.3 Descriptive statistics

After imposing the criteria discussed above, I obtain a sample of 1,803,571 analyst recommendations from 33 countries for the period January 1994 to June 2015. Table 1 shows the descriptive statistics for each year between 1994 and 2015. Column (1) shows that the number of firms covered each year increases more than 100% on average during the sample period. Columns (2) and (3) show the mean and median of the average recommendations for individual stocks. For each year in the sample period, the average recommendation is somewhere between buy and hold (higher than three), which is consistent with the findings of previous studies. Column (4) shows that recommendation dispersions are relatively stable through years and are relatively high at the beginning of the sample period. The last two columns present the average number of analysts issuing recommendations during the previous three months and show that there were on average more than three analysts covering one firm in the same quarter. [49]

[49] Following Howe et al. (2009), I also split the sample into initial recommendations and revised recommendations The dispersion level through time for the initial recommendation is slightly lower than the dispersion of average recommendation revision whereas the average of initial recommendations is higher than the average of revised recommendations, which indicates analysts are more optimistic on average than when they start covering a stock.

Table 1: Descriptive Statistics of Analyst Recommendations, by Year

Column (1) reports the number of firms covered by at least two analysts each year under the three-month outstanding recommendation dispersions construction period. Column (2) shows the annual average recommendation, which is the arithmetic mean of the average recommendation of different stocks across all countries in our sample in each year. Column (3) presents the median of the average recommendations of different stocks across all countries. Column (4) and (5) show the average and the median of the standard deviation of the recommendation for each stock from all the sample countries. Column (6) and (7) present the mean and median of the number of analysts issuing recommendations for each covered firm in my sample.

		Average Recommendations		Recommendation Dispersion		Analysts per Firm	
Year	No. of Firms (1)	Mean (2)	Median (3)	Mean (4)	Median (5)	Mean (6)	Median (7)
1994	3,036	3.47	3.50	1.03	1.00	3.49	3.00
1995	3,543	3.35	3.40	1.04	1.05	3.44	3.00
1996	4,762	3.42	3.50	0.97	0.98	3.65	3.00
1997	6,224	3.55	3.60	0.88	0.82	3.49	3.00
1998	7,327	3.60	3.67	0.79	0.71	3.54	3.00
1999	7,495	3.75	3.83	0.77	0.71	3.76	3.00
2000	7,162	3.83	4.00	0.73	0.71	3.63	3.00
2001	7,065	3.59	3.60	0.77	0.71	3.81	3.00
2002	7,330	3.53	3.50	0.78	0.71	4.43	3.00
2003	7,129	3.38	3.43	0.80	0.71	4.19	3.00
2004	7,764	3.49	3.50	0.78	0.71	3.81	3.00
2005	8,329	3.48	3.50	0.79	0.71	3.62	3.00
2006	8,753	3.51	3.50	0.78	0.71	3.63	3.00
2007	9,391	3.57	3.50	0.78	0.71	3.62	3.00
2008	8,962	3.48	3.50	0.80	0.71	3.79	3.00
2009	8,562	3.46	3.50	0.84	0.82	4.12	3.00
2010	8,896	3.65	3.67	0.77	0.71	3.82	3.00
2011	9,266	3.66	3.67	0.75	0.71	3.92	3.00
2012	9,172	3.56	3.50	0.74	0.71	3.89	3.00
2013	8,986	3.55	3.50	0.73	0.71	3.68	3.00
2014	9,162	3.60	3.60	0.71	0.71	3.56	3.00
2015	7,662	3.52	3.50	0.71	0.71	3.70	3.00
Average	7,544	3.55	3.57	0.81	0.76	3.75	3.00

Table 2 shows descriptive statistics for the recommendations for domestic stocks for each country in our sample. Panel A reports the descriptive statistics for the G7 and other developed countries, and Panel B reports the descriptive statistics for 14 emerging countries.[50] The average number of firms for developed countries is more than twice the average number

[50] Countries are classified based on the MSCI classification (see https://www.msci.com/market-classification).

of firms for emerging countries. Analyst coverage by the I/B/E/S is most extensive for the United States, making up more than 25% of all recommendations. The average number of analysts per firm in developed countries is slightly higher than the average number of firms per analyst in emerging countries.

Columns (4) to (6) of Table 2 report the averages, medians and standard deviations of recommendation scores for each country based on the three-month outstanding construction window. The highest average recommendation is for China (4.10), and the lowest average recommendations are for Finland and New Zealand (3.29). The recommendations are skewed to the left, with a relatively higher median than the average.

To calculate the standard deviation of recommendations per stock, I require that at least two analysts follow the firm. This requirement reduces the total number of observations to around 58% based on the three-month outstanding dispersion formation period. The mean of dispersion in column (7) is the monthly equal-weighted average analyst recommendation dispersion for individual stocks within that country over the whole sample period and varies from 0.62 for China to 1.08 for Thailand. There exists a wide range in the analyst recommendation dispersion across countries. In general, the emerging countries show a more substantial difference, between the 25^{th} and 75^{th} percentile of dispersion range compared to the developed countries. For Korea, the gap between the 25^{th} and 75^{th} percentile is 0.45, whereas the Philippines presents the largest dispersion range of 0.83. To illustrate the evolution of country-level recommendation dispersion over time, Figure 1 plots the monthly average recommendation dispersion for the G7 countries over the sample period. It shows that there are structural differences in the analyst recommendation dispersion among G7 countries over the sample period suggesting that the dispersion difference is not driven by a specific period or unexpected events.

Table 2: Descriptive Statistics of Analyst Recommendations, by Country

This table shows the descriptive statistics for analyst recommendations for each country throughout the sample period. Analysts are identified using the I/B/E/S analyst masked code. Column (1) reports the annual average of the number of firms that covered by at least two analysts under the assumption that one recommendation remains valid up to three months if the analyst does not update or issue a new recommendation. Column (2) and (3) present the mean and median of the number of analysts issuing recommendations for each covered firm in my sample. Column (4) to (6) report the averages, medians and standard deviations of recommendation scores for each country based on the three-month outstanding construction window. Column (7) to (11) show the statistics of analyst dispersion constructed in this paper. The sample period is from January 1994 to June 2015. Panel A reports descriptive statistics for developed countries and Panel B reports descriptive statistics for emerging countries (based on the MSCI country classification).

Panel A: Developed Countries

Country	No. of Firms/Year	Analysts per Firm		Recommendation			Dispersion				
		Mean	Median	Mean	Median	Std.	Mean	Median	Std.	25th	75th
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
G7 countries											
Canada	443	3.43	3.00	3.62	3.67	0.64	0.67	0.71	0.46	0.50	0.96
France	245	4.55	4.00	3.43	3.50	0.70	0.90	0.84	0.49	0.58	1.19
Germany	208	5.09	4.00	3.38	3.43	0.75	0.92	0.94	0.49	0.69	1.21
Italy	112	4.17	3.00	3.40	3.50	0.69	0.81	0.75	0.47	0.58	1.10
Japan	659	3.20	3.00	3.44	3.50	0.66	0.68	0.71	0.50	0.50	0.96
United Kingdom	541	3.91	3.00	3.50	3.50	0.70	0.86	0.83	0.52	0.58	1.15
United States	2,348	3.49	3.00	3.66	3.67	0.66	0.69	0.71	0.48	0.50	1.00
Other developed countries											
Australia	295	3.48	3.00	3.43	3.50	0.72	0.84	0.82	0.53	0.58	1.15
Belgium	56	3.72	3.00	3.40	3.50	0.72	0.81	0.71	0.52	0.58	1.15
Denmark	52	3.84	3.00	3.30	3.33	0.75	0.91	0.89	0.53	0.58	1.26
Finland	67	4.35	3.00	3.29	3.33	0.70	0.89	0.89	0.49	0.58	1.17
Hong Kong	73	5.47	5.00	3.43	3.50	0.75	1.03	1.00	0.51	0.71	1.41
Netherlands	94	4.91	4.00	3.41	3.50	0.73	0.90	0.90	0.48	0.58	1.15
New Zealand	48	2.75	2.00	3.29	3.33	0.73	0.80	0.71	0.59	0.55	1.15
Norway	75	3.88	3.00	3.45	3.50	0.71	0.85	0.76	0.53	0.58	1.15
Singapore	104	4.34	3.00	3.44	3.50	0.84	0.96	0.98	0.57	0.58	1.41

Table 2 Continued

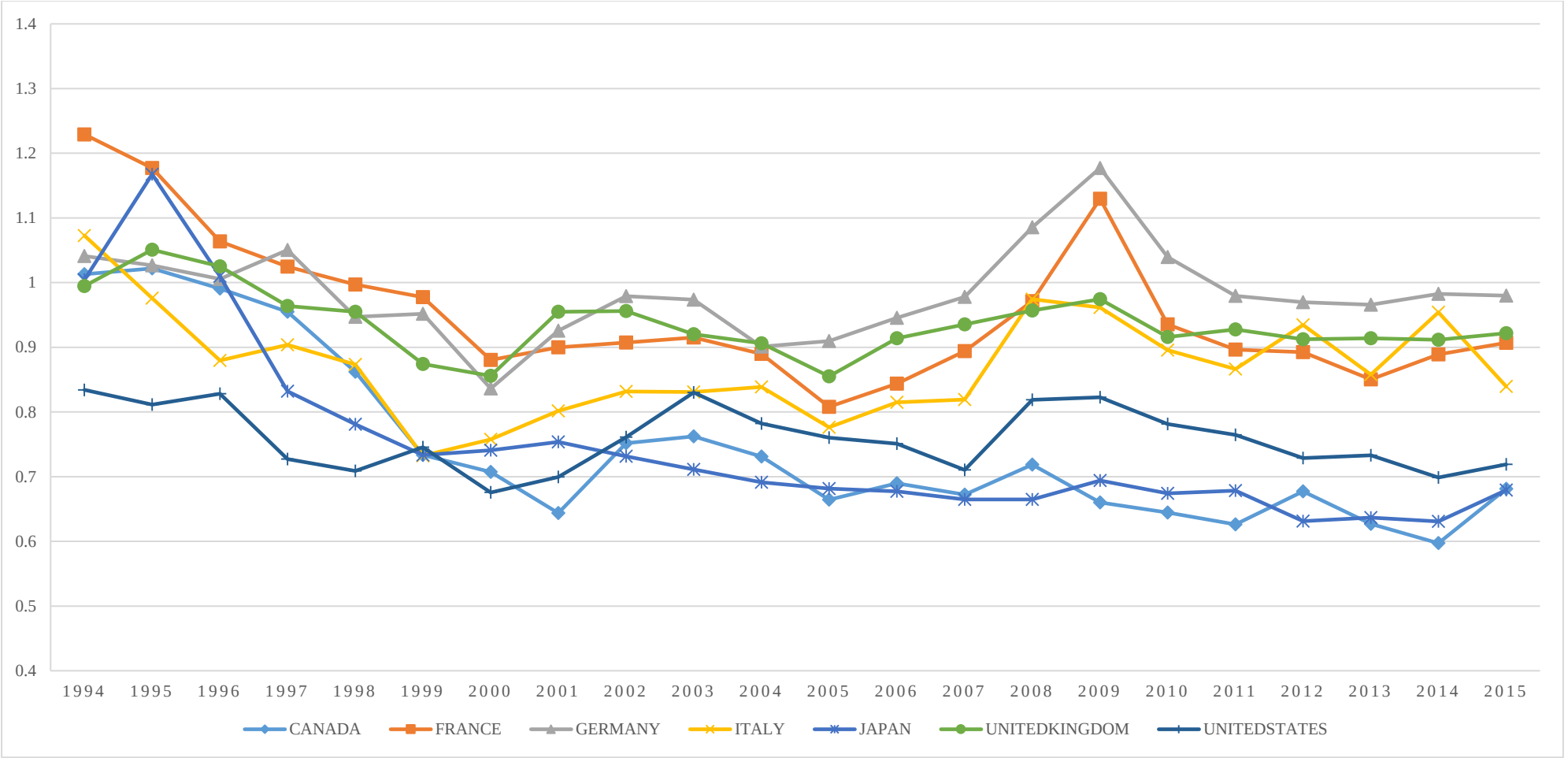
Spain	85	4.78	4.00	3.32	3.40	0.77	0.97	0.96	0.51	0.71	1.27
Sweden	108	4.27	3.00	3.33	3.33	0.69	0.89	0.84	0.50	0.58	1.17
Switzerland	99	4.12	3.00	3.35	3.38	0.65	0.80	0.75	0.50	0.58	1.13
Average	301	4.09	3.26	3.41	3.47	0.71	0.85	0.83	0.51	0.59	1.17

Panel B: Emerging Countries

Country	No. of Firms/Year	Analysts per Firm		Recommendation			Dispersion				
		Mean	Median	Mean	Median	Std.	Mean	Median	Std.	25^{th}	75^{th}
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Brazil	111	3.67	3.00	3.50	3.50	0.66	0.77	0.71	0.50	0.55	1.00
China	358	2.95	2.00	4.10	4.20	0.64	0.62	0.58	0.49	0.00	0.82
India	221	4.69	4.00	3.65	3.70	0.82	0.96	0.96	0.56	0.58	1.33
Indonesia	66	3.75	3.00	3.43	3.50	0.91	1.01	1.00	0.60	0.69	1.41
Korea	230	4.49	4.00	3.79	4.00	0.64	0.74	0.71	0.46	0.55	1.00
Malaysia	143	4.13	3.00	3.38	3.50	0.86	0.99	1.00	0.58	0.71	1.41
Mexico	49	3.27	3.00	3.55	3.63	0.77	0.81	0.71	0.53	0.58	1.15
Philippines	43	3.28	3.00	3.48	3.50	0.89	0.98	0.96	0.64	0.58	1.41
Poland	46	3.50	3.00	3.30	3.33	0.77	0.91	0.89	0.56	0.58	1.29
Russia	62	3.18	3.00	3.50	3.50	0.76	0.83	0.71	0.54	0.58	1.15
South Africa	110	3.13	3.00	3.38	3.50	0.78	0.88	0.82	0.59	0.58	1.29
Taiwan	204	3.78	3.00	3.53	3.50	0.77	0.86	0.82	0.55	0.58	1.15
Thailand	126	3.87	3.00	3.35	3.50	0.94	1.08	1.05	0.64	0.71	1.41
Turkey	75	3.55	3.00	3.49	3.50	0.69	0.79	0.71	0.51	0.58	1.14
Average	132	3.66	3.07	3.53	3.60	0.78	0.87	0.83	0.55	0.56	1.21

Figure 1: Analyst Dispersion in G7 Countries

This figure shows the annual average value-weighted analyst recommendation dispersions in G7 countries. The calculation of the country level dispersion is the bottom up value-weighted recommendation dispersions across all firms based on all outstanding recommendations that were not stopped and were issued a minimum of two days and a maximum of three months before the end of each calendar month. The sample period is from January 1994 to June 2015, and the recommendations range from one (strong sell) to five (strong buy).



Panel A (B) of Table 3 presents descriptive statistics for monthly stock market returns in US dollars for each of the developed (emerging) countries in our sample. The highest average return across all countries is for Russia, at 1.99% per month, and the lowest average return is for Japan, at 0.27% per month. The results also show that emerging markets have higher average monthly returns and are more volatile (the mean return is 1.02% per month, with an average standard deviation of 10.32% per month) compared to developed markets (a mean return of 0.86% per month with an average standard deviation of 6.33% per month).

Table 3: Descriptive Statistics for Stock Market Returns

This table presents descriptive statistics for monthly MSCI stock market returns in US dollars. I use the MSCI Gross Index from the MSCI website. The sample period is from January 1994 to June 2015. All the numbers in the table are percentages. Panel A reports descriptive statistics for developed countries and Panel B reports descriptive statistics for emerging countries (based on the MSCI country classification).

Panel A: Developed Countries

Country	Mean	Median	Max	Min	Std.	Num. of Obs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Australia	0.92	1.19	17.79	-25.51	6.05	258
Belgium	0.82	1.45	18.19	-36.56	6.05	258
Canada	0.94	1.51	21.26	-26.94	5.85	258
Denmark	1.20	1.80	18.34	-25.67	5.75	258
Finland	1.37	1.16	33.26	-31.76	9.38	258
France	0.75	1.13	15.74	-22.41	5.90	258
Germany	0.84	1.26	23.69	-24.35	6.61	258
Hong Kong	0.76	0.85	33.23	-28.86	7.22	258
Italy	0.68	0.56	19.67	-23.60	6.99	258
Japan	0.27	0.22	16.79	-14.78	5.25	258
Netherlands	0.85	1.39	14.39	-25.11	5.84	258
New Zealand	0.71	1.29	18.04	-22.44	6.29	258
Norway	1.00	1.34	21.47	-33.36	7.66	258
Singapore	0.67	0.80	25.84	-28.99	7.25	258
Spain	1.02	1.29	22.09	-25.27	6.99	258
Sweden	1.22	0.88	25.49	-26.66	7.44	258
Switzerland	0.91	1.30	14.56	-15.63	4.79	258
United Kingdom	0.65	0.70	13.87	-18.96	4.59	258
United States	0.84	1.32	10.99	-17.10	4.32	258
Average	0.86	1.13	20.25	-24.95	6.33	-

Table 3 Continued
Panel B: Emerging Countries

Country	Mean	Median	Max	Min	Std.	Num. of Obs.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Brazil	1.45	1.88	36.78	-37.63	11.05	258
China	1.18	0.99	28.59	-25.08	8.56	174
India	1.02	1.17	36.68	-28.48	8.66	258
Indonesia	1.05	1.19	55.58	-40.54	12.57	258
Korea	1.07	0.25	70.60	-31.25	10.98	258
Malaysia	0.51	0.82	50.04	-30.20	8.23	258
Mexico	0.95	1.77	19.14	-34.25	8.28	258
Philippines	0.50	0.59	43.39	-29.22	8.54	258
Poland	0.76	0.92	40.21	-34.82	10.96	258
Russia	1.99	2.05	61.13	-60.57	15.16	246
South Africa	1.02	1.17	19.45	-30.51	7.67	258
Taiwan	0.58	0.73	29.24	-21.73	8.00	258
Thailand	0.65	0.70	43.24	-34.01	10.87	258
Turkey	1.56	1.59	72.30	-41.24	14.89	258
Average	1.02	1.13	43.31	-34.25	10.32	-

4. Empirical Setting

4.1 Calendar time portfolio strategy

The primary hypothesis is based on Miller (1977) but in an international setting. I test whether the difference in the level of analyst dispersion across countries helps to predict stock market performance in the future. I expect that if the degree of analyst dispersion is relatively high in one country, that country will perform worse than others in next period. To test this idea, I implement a simple strategy that buys 'winners' (countries with a relatively low analyst dispersion) and sells 'losers' (countries with a relatively high analyst dispersion).

Following earlier papers that examine individual stock recommendations within a country (Barber et al., 2001; Jegadeesh et al., 2004), I split all countries into quintile portfolios based on the relative position of the average country recommendation dispersion observed at the end of month *t-1*. For each portfolio, I then calculate the return for month *t* as the equally-

weighted average market return across all countries in the portfolio.[51] My main test is based on a zero-cost portfolio that takes a long position in the quintile of countries with the lowest dispersion and a short position in the quintile of countries with the highest dispersion.

To examine the profitability of the trading strategy I use four different international asset pricing models. First, I use a simple world-CAPM, which incorporates the global market return (in USD) but does not account for currency risk (Lintner, 1975; Sharpe, 1964). Second, I use the International CAPM Redux model presented in Brusa et al. (2014), which in addition to the global market return includes a carry factor and a dollar factor to capture the exchange rate risk faced by US-based investors.[52] Third, I use the international three-factor asset pricing model plus the global momentum factor. Finally, I use international five-factor asset pricing model presented in Fama and French (2017).[53]

More specifically, for each portfolio, I estimate the following four time-series models for $PR_{i,t}$, the quintile portfolio return (in USD) in month *t*:

Model 1 is the world-CAPM. RF_t is the 30 days U.S. T-bill rate in month *t*, and $WMKT_t$ is the excess return on the world market portfolio in month *t*, denominated in USD.

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \varepsilon_{i,t} \quad (2)$$

Model 2 is the International CAPM Redux. $LWMKT_t$ is the month *t* excess return on the world market portfolio denominated in local currencies. The dollar factor is defined as the average change in the exchange rate between the U.S. dollar and all other currencies, and the

[51] The results of value-weighted country portfolio are similar but weaker. The portfolio returns are robust to CAPM Redux model only.
[52] See also Lustig et al. (2011) and Verdelhan (2017).
[53] Brusa et al. (2014) compare the performance of several international asset pricing models and find that International CAPM Redux model outperforms the World CAPM and the Fama-French three factor model. While they do not examine the Fama French five factor model, evidence in Fama and French (2017) suggests that the five factor model displays the same (limited) ability to explain variation in international stock market returns as the international three factor model.

carry factor is defined as the difference in exchange rates between baskets of high and low-interest rate currencies (Lustig et al., 2011).

$$PR_{i,t} - RF_t = \alpha + \beta_1 * LWMKT_t + \beta_2 * Dollar_t + \beta_3 * Carry_t + \varepsilon_{i,t} \quad (3)$$

The third model is an extension of the global Fama-French three-factor model which also includes the global momentum factor. SMB_t is the return on a value-weighted portfolio that contains long position of small-cap stocks and short position of large-cap stocks; HML_t is the return on a value-weighted portfolio that buying value stocks and selling growth stocks; MOM_t is the cumulative stock market return over the past 12 months.

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * MOM_t + \varepsilon_{i,t} \quad (4)$$

Model 4 is the five-factor international asset pricing model proposed in Fama and French (2017). Apart from the three Fama-French factors discussed above, RMW_t (Robust Minus Weak) is the return on a value-weighted portfolio, that has long positions in robust operating profitability stocks and short positions in weak operating profitability stocks; CMA_t (Conservative Minus Aggressive) is the average return on a value-weighted portfolio that buying conservative investment stocks and selling aggressive investment stocks (Fama & French, 2017).

$$PR_{i,t} - RF_t = \alpha + \beta_1 * WMKT_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * RMW_t + \beta_5 * CMA_t + \varepsilon_{i,t} \quad (5)$$

4.1.1 Portfolio strategy results

Panel A in Table 4 reports the monthly abnormal returns (alphas) for the various portfolios, for each of the four international asset pricing models. Group 5 represents the group of countries with the highest analyst dispersion, and Group 1 accounts for the group of countries with the lowest analyst dispersion. As discussed, the self-financing hedge portfolio buys Group 1 countries and sells Group 5 countries.

For each pricing model, I find that countries with the highest level of analyst dispersion tend to perform worse than other countries. For example, for the International CAPM Redux, Group 5 obtains a significant negative alpha of -0.63% per month. The zero-cost hedge portfolio alpha from the CAPM Redux is 0.78% per month, indicating a substantial outperformance of our simple trading strategy based on country-level analyst dispersion. However, the alpha from Groups 1 to 5 does not show a monotonically decreasing trend. Instead, the total portfolio return mainly comes from taking a short position in the most dispersed group of countries.[54] The results based on the global Fama-French five-factor model provide similar evidence that the global five factors can not explain the gross returns on our proposed trading strategy of buying winner countries and selling loser countries and that the returns are mainly coming from the short side. However, the abnormal returns can be explained mostly by the global momentum factor. Hence, I conclude that analyst dispersions aggregated at the country level only provide limited information regarding the future cross-section of international stock market returns. This finding provides weak support for Miller's theory and is inconsistent with Yu (2011).[55]

Panel B of Table 4 presents the monthly summary statistics for each group. To get the average dispersion, I first calculate the average dispersion for each group in each month and then take the monthly average of those dispersions for each group. The average market capitalization is calculated similarly. Panel B of Table 4 shows that the raw market returns are negatively related to the dispersion level. Moreover, the average market size also decreases with the increase of the dispersion level, which is consistent with firm-level evidence that small companies are more likely to have a higher level of dispersions (Diether et al., 2002).

[54] Equal weighted analyst dispersion provides much weaker results and abnormal returns are not significant with each of the four asset pricing models.

[55] The hedge returns based on dollar neutral long-short portfolios where the weight for each country index in each month is based on that country's recommendation ranking in the previous month (Asness et al., 2013) are similar. For details of this method, see Chapter 1 Section 3.

Table 4: Monthly Abnormal Returns for Long–short Recommendation Portfolios

This table presents the monthly percentage abnormal returns (alphas) earned by the portfolios formed based on the rank of country-level aggregate analyst dispersions. I require at least 50 firms for each month–country to be included in the sample. The world CAPM alpha is the estimated alpha from a time series regression of the portfolio excess return (PR–RF) on the global market excess return, denominated in US dollars (WMKT). The alpha for the international CAPM redux is the estimated alpha from a time series regression of the portfolio excess return on the world market excess return, denominated in local currencies (LWMKT) and two currency risk factors, Dollar and Carry. The global FF3 plus MOM alpha is estimated alpha from a time series regression of the portfolio excess return on WMKT, SMB, HML and momentum factor. The global Fama–French five-factor (FF5) alpha is the estimated alpha from a time series regression of the portfolio excess return on WMKT, SMB, HML, and two additional factors: the variables RMW (robust minus weak), and CMA (conservative minus aggressive). The sample period is from January 1994 to June 2015. Panel B shows the monthly average summary statistic for each group. To get the average dispersion, I first calculate the average dispersion value for each group in each month and then calculate the monthly average of the value of dispersion. The average market capitalization is calculated similarly. Coefficients highlighted in **bold** are significant at the 10% level or better.

Panel A: Calendar Time Portfolio Returns

Portfolio	World CAPM (1)	CAPM Redux (2)	Global FF 3+Mom (3)	Global FF5 (4)
1 (lowest dispersion)	0.213	0.154	0.242	0.182
	1.13	0.82	1.24	0.91
2	0.143	0.102	0.119	-0.022
	0.83	0.59	0.69	-0.12
3	0.012	-0.026	-0.05	-0.059
	0.07	-0.15	-0.28	-0.32
4	0.254	0.080	0.296	0.176
	1.24	0.41	1.50	0.85
5 (highest dispersion)	-0.250	**-0.629**	-0.221	**-0.540**
	-0.83	-2.26	-0.72	-1.69
P1-P5	0.463	**0.783**	0.463	**0.722**
	1.49	2.53	1.43	2.14

Panel B: Portfolio Characteristics

	Low	2	3	4	High
Average dispersion	0.691	0.828	0.914	0.998	1.137
#of countries	5	6	6	6	5
Average market capitalization (in 10^{12} $US)	5.133	2.8613	1.255	1.201	1.783
Average stock market return (%)	0.909	0.872	0.797	1.065	0.545

4.1.2 Portfolio rebalancing

The trading strategy in the previous section requires monthly rebalancing. To show how the countries move across different quintile groups, Table 5 presents the transition matrix based on monthly rebalancing. Each cell in the transition matrix shows the percentage of countries that

change from the quintile group in the previous month (the rows) to the quintile group in the current month (the columns). If focusing on the most extreme group, I see that around 60% of the countries in the group of highest (lowest) analyst dispersion in a month are still in the same group in the following month. There is still a reasonable level of portfolio turnover indicating the hedge portfolio returns are not mainly driven by a few countries.

Table 5: Portfolio Rebalancing

Table 5 presents the transition matrix based on monthly rebalancing. Each cell in the transition matrix shows the percentage of countries that change from the quintile group in the previous month (the rows) to the quintile group in the current month (the columns).

	Current Month's Quintile				
Last Month's Quintile	1	2	3	4	5
1	65.46	21.68	8.00	3.22	1.65
2	18.97	40.91	24.84	11.59	3.69
3	6.79	25.14	34.47	24.42	9.18
4	2.96	11.12	24.77	38.19	22.96
5	1.77	3.93	9.39	24.71	60.20

4.2 Analyst dispersion and time-varying returns

4.2.1 Dispersion and cross-sectional future market returns

Yu (2011) documents that in the United States aggregate disagreement is negatively related to the ex-post excess stock market return. I test whether this prediction holds in other markets as well as in the cross-section of different countries globally. In this section, I start with a panel regression that considers the cross-sectional predictability of aggregate differences of opinion on future market returns and then bring the country-level short-sales constraints into my analysis.

Brusa et al. (2014) show that there are significant differences across international stock markets in both the magnitude of risk exposure and the degree to which these risk exposures vary over time (Dumas & Solnik, 1995). To account for this time-variation in risk exposures in empirical tests, I use the following procedure to calculate the abnormal return of the stock market of each country *i* in month *t*. First, for each country *i* and each month *t*, I use the previous

60 months and run a time-series regression to estimate the relevant factor loadings for the CAPM Redux model discussed previously.[56] I then multiply the relevant factor loadings with the corresponding factor realization in month *t* to obtain, $Expect\_Ret_{i,t}$, the predicted stock market return for country *i* in month *t*. Finally, I subtract this predicted return from the realized return and obtain the unexpected market return. This unexpected market return in month *t* for country *i*, $Unexpect\_Ret_{i,t}$, is then used as the dependent variable in the subsequent panel regression. Figure 2 shows the scatter plot of next period's unexpected market return (based on CAPM Redux) against aggregate dispersion.[57] I present the results for different varieties of the following base panel regression:

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_DIS_{i,t-1} + \beta_2 * \ Momentum_{i,t} + C_i \ + M_t \ + \varepsilon_{i,t} \qquad (6)$$

where $Rank\_DIS_{i,t-1}$ indicates the relative position of the country-level dispersion of recommendations in the previous month *t-1*. To obtain this rank value, I sort countries into five groups based on this dispersion in recommendations and allocate a value that ranges from -0.5 for the smallest quintile to +0.5 for the largest quintile.[58] $Momentum_{i,t}$ measures the stock market return for country *i* over the previous 6 months (*t-1*, *t-6*). To alleviate the concern that there may exist some time-invariant variables that relate to future returns, I include country fixed effects in the analysis. The variables C_i indicates country fixed effects and M_t indicates month fixed effects.

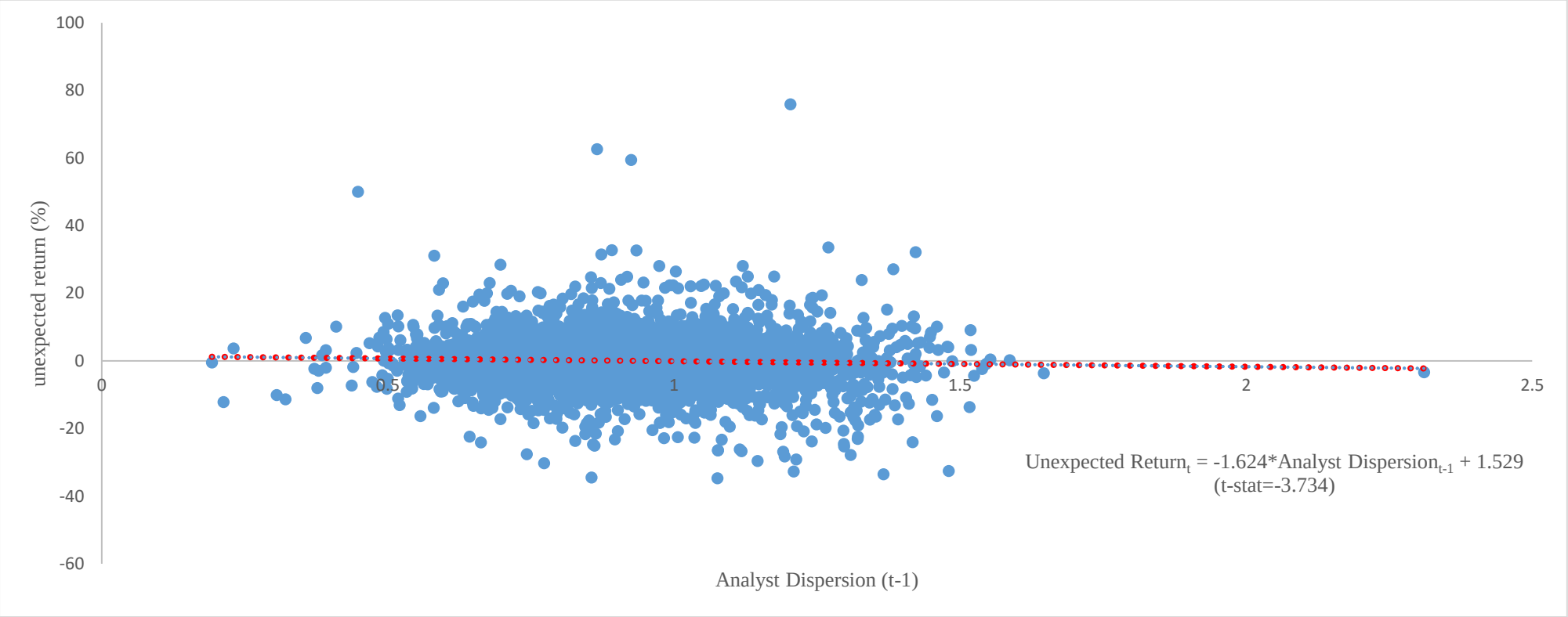
[56] As the Fama-French Five factors are available from July 1990, in order to get enough data for estimation, our sample period for this part is from July 1995 to June 2015.

[57] I only show the CAPM Redux results from now. The Fama-French Five Factor model shows similar results. However, the World CAPM and Global Fama-French Three Factor plus Momentum do not work. For details, see Table A.1 to Table A.3 at the end of this chapter.

[58] I use ranks instead of the actual average recommendation dispersion to be consistent with the portfolio construction criteria. Similar results are obtained if I use the actual average recommendation dispersion itself independent of whether or not I winsorize the actual dispersion level at 1% and 99%.

Figure 2: Analyst Dispersion and Ex-post Unexpected Market Return

This figure shows the scatterplot of dispersion and ex-post one-month unexpected (based on CAPM Redux) stock market return. To account for this time-variation in risk exposures in our empirical tests, I use the following procedure to calculate the abnormal return of the stock market of each country *i* in month *t*. First, for each country *i* and each month *t*, I use the previous 60-months and run a time-series regression to estimate the relative factor loadings for the international CAPM Redux model. I then multiply the relevant factor loadings with the corresponding factor realization in month *t* to obtain, $Expect\_Ret_{i,t}$, the predicted stock market return for country *i* in month *t*. Finally, I subtract this predicted return from the realized return and obtain the unexpected market return.



The results in the first two columns of Table 6 indicate that aggregate analyst dispersion is negatively related to the next month's unexpected stock market return (t-value=-2.39 based on standard errors clustered by country).

Next, the regression controls for the country-level average recommendation from the previous month as Chapter 1 finds that aggregate analyst recommendation can predict next month stock market unexpected return. So it is useful to see whether the analyst dispersion provides additional predictability in addition to the average recommendation,

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_DIS_{i,t-1} + \beta_2 * Rank\_REC_{i,t-1} + \beta_3 * Momentum_{i,t} + C_i + M_t + \varepsilon_{i,t} \quad (7)$$

The result is shown in the third and fourth columns of Table 6. Dispersion remains significantly negatively related to the future unexpected stock market returns, whereas the aggregate analyst recommendation is a strong predictor of the next month's unexpected stock market return. One potential concern with the dispersion variable is that it may be correlated with some unknown country characteristics that are related to the stock market returns. Thus, the results based on analysts' dispersion may be due to several omitted variables. Table 6 Column (4) shows that the negative coefficient on analysts' dispersion becomes more significant after the inclusion of country fixed effect. This result indicates the negative relationship between analysts' dispersion and future market returns are not contaminated by other omitted variables.

Miller (1977) hypothesizes that the dispersion of investor opinions in the presence of short-sales constraints leads to stock price overvaluation. Jarrow (1980) also claims that market-wide short-sales constraints may lead to the overpricing of the entire stock market. I therefore include short-selling restrictions around the world as the second condition of my analysis. I first use the legality of the short selling activity in the stock market as a measure of country-level short-sales constraints. If Miller's theory holds at the country level, the return

differences between low and high dispersed country portfolios will be higher when short-sales constraints are binding tightly.

To test this hypothesis, I introduce $Illegal_{i,t}$ and $Illegal_{i,t} * Rank_{DIS_{i,t-1}}$ variable in the panel regression. $Illegal_{i,t}$ is a dummy variable, which equals one if short selling is legally prohibited in the stock market and zero otherwise. Moreover, since Boehme et al. (2006) find systematic overvaluation for stocks that are subject to both conditions simultaneously whereas stocks are not consistently overpriced when they subject to only one condition, I examine the valuation effects of the interaction between differences of opinion and short-sales constraints.[59]

Following Jain, Jain, Mcinish, and Mckenzie (2013), I allow $Illegal_{i,t}$ to vary across time for countries that changed their short selling rules during the sample period (eight countries changed their short selling bans during the sample period).[60] Because I use monthly data, I assume such countries have short selling constraints for the whole month if they have short-selling bans for several days in a month. Specifically, I run the following regression:

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_DIS_{i,t-1} + \beta_2 * Rank\_REC_{i,t-1} + \beta_3 * Momentum_{i,t} + \beta_4 * Illegal_{i,t} + \beta_5 * Illegal_{i,t} * Rank\_DIS_{i,t-1} + C_i + M_t + \varepsilon_{i,t} \quad (8)$$

The results are shown in Table 6 Column (5). The analyst dispersion coefficient remains significantly negatively related to the unexpected stock market returns with a coefficient of -0.39 (*t*-statistics is -1.82). However, the coefficient of interaction variable is negative but not significantly different from zero, indicating that there is no evidence to support the hypothesis that having the same high dispersion level, countries with short-sales constraints go down more than countries without short-sales restrictions.

[59] Table A.4 provides the monthly average dispersion for each country depending on whether short-sale activity is illegal.

[60] Jain et al. (2013) provide a timeline of the legality of short selling activities around the world, including the dates of bans implemented during the 2008 financial crisis.

Table 4 Panel A shows the overpricing effects mainly come from the group with highest analyst dispersion. Thus, I run the following regression to capture the effect within the most dispersed group 5,

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_REC_{i,t-1} + \beta_2 * Momentum_{i,t} + \beta_3 * Illegal_{i,t} + \beta_4 * Illegal_{i,t} * Q5 + \beta_5 * Q5 + C_i + M_t + \varepsilon_{i,t} \quad (9)$$

Where $Q5$ is a dummy variable, which equals one if a country is in the most dispersed quintile (Group 5) but otherwise equals zero. The results in columns (7) and (8) in Table 6 show that the countries with the highest aggregate dispersions show significantly negative market returns in the following month and that the coefficient of the interaction variable again is not significantly different from zero. This result indicates that the extent of the average decrease in stock market indices of high dispersion countries does not depend on whether the countries are short-sales constrained or not.

Apart from legal bans, other forms of shorting restrictions include specific trading mechanisms (uptick rules), pre-borrowing requirements (ban on naked short selling), and bans on shorting of selected stocks (typically financial stocks) discussed by Jain et al. (2013). In the panel regression, I create a *Ban* variable ranging from zero to three indicating the feasibility of short selling activities, where zero indicates short selling is feasible in the particular country and three means short selling is banned within that country, a value of one and two indicate intermediate levels of short selling feasibility. In particular, I run the following regression:

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_DIS_{i,t-1} + \beta_2 * Rank\_REC_{i,t-1} + \beta_3 * Momentum_{i,t} + \beta_4 * Ban_{i,t} + \beta_5 * Ban_{i,t} * Rank\_DIS_{i,t-1} + C_i + M_t + \varepsilon_{i,t} \quad (10)$$

Table 6 Columns (9) and (10) show that when including $Ban_{i,t}$, the coefficient of analyst dispersion is still negatively related to the unexpected return but becomes insignificant whereas the aggregate analyst recommendation remains a strong predictor of the next month's market return. Similar to the results of using the $Illegal_{i,t}$ variable, the coefficient of the

interaction between the short selling restrictions and analyst dispersions is not significantly different from zero.

The third way in which I proxy country level short selling restrictions is the availability of stock market index derivatives, such as index futures (Daouk & Charoenrook, 2005). Index futures allow investors to take short positions in the country indices without short selling directly. If there are stock index futures available in a particular country, I regard that country as one where short selling activity is feasible. I obtain the start date of country index futures trading from *Investing.com*, which provides the real-time CFD futures price of different countries. I treat the earliest available date as the listing date of the stock indices futures, and I obtain the information of 27 countries' stock indices futures.[61]

Columns (11) and (12) in Table 6 provide the results using this alternative short selling binding variable. Under this measure of short-sales restrictions, I find that although dispersion is still negatively related to the next period's unexpected stock market return, the relationship is no longer significant.

The above results show that analyst dispersion, when aggregated at the country level, is negatively related to the ex-post unexpected stock market return. However, short-sales constraints are not a necessary condition for a country's stock market to display overpricing. A possible explanation could be that rational traders are uncertain about when their peers will exploit this arbitrage opportunity, so they are limited in their ability to correct the mispricing immediately and completely because of the possible large holding cost. Without synchronized shorting of the overvalued markets, pessimistic views about stock markets might not be fully reflected in the prices.

[61] For India, Indonesia, Malaysia, New Zealand, Philippines and Thailand, I cannot get information about country index futures.

4.2.2 Earnings announcement month

Miller's (1977) model suggests that if a group of investors is facing short-sales constraints, higher dispersion results in overvaluation. Since differences of opinion among investors will be narrowed if new information arrives, overvaluation is predicted to decrease during the earnings announcement months. In this section, I define the earnings announcement month as the most common month for firms to issue earnings announcements in each country each year, enabling capture of the average effect of the annual earnings announcement. [62] I then run the following regression with a dummy variable Ea_Month that equals to one if the observation is from the most typical earnings announcement month and an interaction variable $Ea\_Month * Rank\_Dis_{i,t-1}$ to measure the effect of earnings announcement on the relationship between analyst dispersion and future stock market returns,

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Rank\_DIS_{i,t-1} + \beta_2 * Rank\_REC_{i,t-1} + \beta_3 * Momentum_{i,t} + \beta_4 * Ea\_Month + \beta_5 * Ea\_Month * Rank\_Dis_{i,t-1} + C_i + M_t + \varepsilon_{i,t} \quad (11)$$

The last column of Table 6 shows that the coefficient of the interaction variable is 0.454 (*t*-statistic equals 0.76), which means that on average there is no difference in the extent of market-wide correction of overvaluation between the most typical earnings announcement month and other months.

[62] The most common earnings announcement month is stable through time for most countries in my sample. However, several countries do present a different earnings announcement month across years.

Table 6: Regression Results Using Unexpected Stock Market Returns and Country-level Aggregate Dispersion

This table presents the results for equations (6) to (11) in the text. The dependent variable is the unexpected return based on CAPM Redux model. The variable $Rank\_DIS_{i,t-1}$ refers to the relative position of the country-level recommendation dispersion each month, where all aggregate dispersions are sorted into five groups. I assign ranks ranging from -0.5 for the smallest quintile to +0.5 for the largest quintile. $Rank\_REC_{i,t-1}$ is also calculated in the similar way but with average recommendation. $Momentum_{i,t}$ measures the abnormal return for country *i* over the previous 6 months. $Illegal_{i,t-1}$ from column (5) to (8) is the dummy variable where equals one if the short selling is illegal in a particular month for a particular country. $Ban_{i,t}$ is the variable considering the feasibility of short selling activity. Apart from legally banned or not, uptick rules, pre-borrowing requirements (ban on naked short selling), and bans on shorting selected stocks (typically financial stocks) are also considered. $Futures_{i,t-1}$ is the dummy variable where equals zero if there is stock market index futures available for the country in that month. *Q5* is the dummy variable that equals 1 if the countries are in the highest dispersed group and equals 0 otherwise. *Ea_Month* is the dummy variable that equals one if it is the most typical earnings announcement month. The sample period is from July 1995 to June 2015. The *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	-0.643	**-0.665**	**-0.501**	**-0.526**	**-0.390**	**-0.602**			-0.111	-0.441	-0.462		**-0.566** -2.13
$Rank\_DIS_{i,t-1}$	-2.79	-2.39	-2.08	-1.87	-1.82	-2.51			-0.29	-1.00	-1.09		
			0.530	**0.805**	**0.613**	**0.854**	**0.595**	**0.807**	**0.693**	**0.854**	**0.887**	**0.852**	**0.806**
$Rank\_REC_{i,t-1}$			1.91	3.09	2.28	3.32	2.28	3.30	2.65	3.29	3.37	3.37	**3.09**
					-0.092	-1.125	0.020	-1.122					
$Illegal_{i,t-1}$					-0.19	-1.20	0.04	-1.07					
$Illegal_{i,t-1}$					-0.717	1.216							
$* Rank\_DIS_{i,t-1}$					-0.80	0.86							
									-0.190	-0.435			
$Ban_{i,t-1}$									-1.73	-0.95			
$Ban_{i,t-1}$									-0.330	-0.043			
$* Rank\_DIS_{i,t-1}$									-1.01	-0.08			
							-0.304	0.633					
$Illegal_{i,t-1} * Q5$							-0.63	0.82					
							-0.665	**-0.699**				**-0.568**	
Q5							-3.25	-3.11				-1.95	
											0.784	0.793	
$Futures_{i,t-1}$											0.16	1.57	
$Futures_{i,t-1}$											-0.202		
$* Rank\_DIS_{i,t-1}$											-0.35		

Table 6 Continued

$Futures_{i,t-1}$* *Q5*												-0.262 -0.57	
Ea_Month													-0.016 -0.06
Ea_Month $* Rank\_Dis_{i,t-1}$													0.454 0.76
$Momentum_{i,t}$	0.008 0.64	0.004 0.36	0.007 0.59	0.003 0.27	0.008 0.62	0.003 0.25	0.008 0.65	0.004 0.28	0.008 0.65	0.004 0.32	0.002 0.16	0.002 0.19	0.002 0.18
Country fixed effect	N	Y	N	Y	N	Y	N	Y	N	Y	Y	Y	Y
Month fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

4.2.3 Dispersion and ex-post market return in other countries

Yu (2011) shows that in the United States aggregate disagreement is negatively related to the following month's stock market return. In this section, I investigate whether this negative relationship exists for other countries. For each country in my sample, I run the following regression.

$$Unexpect\_Ret_{i,t} = \alpha + \beta_1 * Dis\_Rec_{i,t-1} + \beta_2 * \ Momentum_{i,t} + \varepsilon_{i,t} \quad (12)$$

Table 7 shows that seven out of these thirty-three countries show a significant negative relationship between dispersions and future stock market returns at a 90% confidence level and that on average this negative relationship is higher in emerging countries than in developed countries. In particular, the negative relation between dispersions and future stock market returns in the United States is not significantly different from zero. One possible reason could be that whereas Yu (2011) examines only the U.S. market and uses merely the excess raw market returns, I control for the world market performance and test the unexpected market return. To eliminate the effect of using different measures of market return, I also use the market excess return and run the following regression.

$$Excess\_Ret_{i,t} = \alpha + \beta_1 * Dis\_Rec_{i,t-1} + \beta_2 * \ Momentum_{i,t} + \varepsilon_{i,t} \quad (12.A)$$

Where $Excess\_Ret_{i,t}$ is calculated as MSCI country return in U.S dollar minus the risk-free interest rate. Table 8 reports the results of using market excess return and only Belgium, Finland, and Hong Kong show significant negative relation between market excess return and last month's analyst dispersion. This negative dispersion-market return relationship discovered by Yu (2011) is not applicable to all of the other major international markets.[63]

[63] The results are still different from Yu (2011). One possible reason is this study uses different measure of differences of opinion. I also use the earnings per share long term growth rate to test the cross-country predictability and the relationship between analysts' dispersions and future market returns. More details are discussed in section 5.2.

Table 7: Time Series Regression for Different Countries Using Unexpected Return

This table presents the results of equation (12) in the text. The dependent variable is the unexpected return based on CAPM Redux model. The variable $Dis\_Rec_{i,t-1}$ refers to the country-level recommendation dispersion each month. Panel A shows the results for developed countries whereas Panel B shows the results for emerging countries. Coefficients highlighted in **bold** are significant at the 10% level or better.

Panel A: Developed Markets

Country (1)	Dis_Rec_i (2)	T-value (3)	Num. of Obs. (4)
Australia	0.51	0.29	233
Belgium	**-4.37**	-2.18	156
Canada	-1.56	-0.92	217
Denmark	2.28	0.85	112
Finland	**-8.18**	-1.89	206
France	0.96	0.56	233
Germany	1.55	0.74	233
Hong Kong	**-3.31**	-1.85	233
Italy	3.10	1.16	233
Japan	-2.64	-1.12	233
Netherlands	1.56	0.79	220
New Zealand	-0.64	-0.21	50
Norway	3.99	1.35	198
Singapore	-1.75	-1.09	233
Spain	0.22	0.08	233
Sweden	0.78	0.28	233
Switzerland	1.18	0.73	231
United Kingdom	**4.57**	2.29	233
United States	-0.68	-0.52	233
Average	-0.128	-0.18	-

Panel B: Emerging Markets

Country (1)	$Dis\_Rec_{i,t-}$ (2)	T-value (3)	Num. of Obs. (4)
Brazil	0.32	0.10	217
China	**8.89**	2.50	132
India	-1.16	-0.36	233
Indonesia	**-11.30**	-2.95	153
Korea	3.88	1.06	233
Malaysia	-3.90	-1.38	233
Mexico	**-13.53**	-3.15	73
Philippines	**-7.47**	-1.80	56
Poland	3.00	0.73	94
Russia	-0.84	-0.23	106
South Africa	**-5.46**	-2.03	233
Taiwan	-2.62	-1.12	233
Thailand	-5.15	-1.46	233
Turkey	-0.90	-0.12	198
Average	-2.588	-1.63	-

Table 8: Time Series Regression for Different Countries Using Excess Return

This table presents the results of equation (12.A) in the text. The dependent variable is $Excess\_Ret_{i,t}$ is calculated as MSCI country return in U.S dollar minus the risk-free interest rate. The variable $Dis\_Rec_{i,t-1}$ refers to the country-level recommendation dispersion each month. Panel A shows the results for developed countries whereas Panel B shows the results for emerging countries. Coefficients highlighted in **bold** are significant at the 10% level or better.

Panel A: Developed Markets

Country (1)	Dis_Rec_i (2)	T-value (3)	Num. of Obs. (4)
Australia	-0.973	-0.65	235
Belgium	**-3.916**	-2.50	158
Canada	-3.679	-1.61	235
Denmark	1.723	1.08	114
Finland	**-4.272**	-1.79	208
France	-0.461	-0.28	235
Germany	1.120	0.67	235
Hong Kong	**-3.779**	-2.36	235
Italy	0.284	0.19	235
Japan	-2.737	-1.22	235
Netherlands	-0.170	-0.12	222
New Zealand	1.252	0.53	52
Norway	0.703	0.35	200
Singapore	-0.616	-0.43	235
Spain	1.404	0.88	235
Sweden	2.302	1.20	235
Switzerland	**2.202**	1.99	233
United Kingdom	1.891	1.44	235
United States	-0.428	-0.21	235
Average	-0.429	-0.15	-

Panel B: Emerging Markets

Country (1)	$Dis\_Rec_{i,t}$ (2)	T-value (3)	Num. of Obs. (4)
Brazil	1.216	0.50	219
China	3.135	1.53	134
India	-2.073	-0.95	235
Indonesia	-2.774	-1.04	155
Korea	-2.502	-1.05	235
Malaysia	0.587	0.30	235
Mexico	-4.716	-1.44	75
Philippines	-4.899	-1.05	58
Poland	2.822	0.73	96
Russia	-1.212	-0.39	108
South Africa	1.484	0.80	235
Taiwan	0.858	0.48	235
Thailand	2.167	0.38	235
Turkey	0.713	0.19	200
Average	-0.371	0.072	-

5. Robustness Tests

This section provides additional robustness tests. I construct several alternative aggregate analyst dispersion measures and test whether they produce abnormal returns. I also test return prediction using longer horizons. Moreover, I split the sample into value stocks and growth stocks since prices of growth stocks increase more contemporaneously with a high level of dispersion compared to value stocks (Yu, 2011). So I expect the growth stocks show a more significant negative relationship between analyst dispersion and future stock returns. In addition, I present results after the regulation change in analyst industry as well as using dispersion changes.

5.1 Alternative constructions of aggregate analyst recommendation dispersion

The base case results are based on the average analyst dispersion using outstanding recommendations that were announced within the last quarter. I focus on the performance of the portfolio of countries in the lowest and highest dispersion quintiles and the hedge portfolio that buys the former and sells the latter. The first row in Table 9 presents the base case results for each international asset pricing model (repeating the results in Table 4).

Panels A1 to A3 of Table 9 present the results when I consider outstanding recommendations within the last half year, the last year, and the last month, respectively. For all the four asset pricing models, the results are weaker if country-level dispersions are based on a longer window to measure recommendations. When the difference of opinion is based on last six month's recommendations only, two models provide an abnormal return significant at the 90% confidence level, whereas no model generates a significant abnormal return if the dispersion relies on all recommendations outstanding in the last year. Surprisingly, the dispersion based on the last month does not show any predictive ability. A possible reason could be that when using the one-month dispersion construction window compared to the three-month window, the sample size drops by about 45%.

5.2 Alternative proxy for differences of opinion using long-term growth rate

Existing studies argue that long-term growth rate forecast has several advantages when used to calculate differences of opinion. Firstly, the long-term expected growth rate is highly relevant for firm value and is comparable across firms over time (Moeller et al., 2007; Yu, 2011). Secondly, the long-term growth rate might provide a cleaner measure compared to the quarterly earnings forecast, in the sense that low quarterly earnings forecast dispersion may be due to earnings guidance instead of a low level of differences of opinion. Thus, I use the long-term growth rate as an alternative proxy for the opinion differences regarding the prospects of individual stocks.

For each firm in each month, the standard deviation of the earnings-per-share (EPS) long-term growth rate (LTG) forecast can be obtained from the unadjusted I/B/E/S summary file. After following the data cleaning criteria discussed in section two, 1,150,845 EPS LTG forecasts are used. However, the sample is heavily tilted toward U.S. sample (the U.S. data makes up about 60% of all the observations) while the remaining 40% is for the other 32 countries. When using the EPS long-term growth rate to calculate the aggregate analyst dispersion, I find limited evidence of abnormal return with this long-short trading strategy. Similar results are obtained if I allow the time-varying risk exposures.

5.3 Aggregate idiosyncratic volatility

Apart from using the analyst forecast dispersion as a proxy of heterogeneity, several studies use a volatility based measure of divergence of opinion. For example, Ang, Hodrick, Xing, and Zhang (2006) find a negative relationship between the idiosyncratic volatility and stock returns. After controlling for the degree of analyst forecast dispersion, they find that idiosyncratic volatility is still significantly negatively related to future returns, which indicates that the forecast dispersion cannot fully explain the relation between idiosyncratic volatility and future stock returns. Ang, Hodrick, Xing, and Zhang (2009) also extend their sample to 23 developed markets and find that the negative return difference between high idiosyncratic volatility and low idiosyncratic volatility exists in other countries.

It is beyond the scope of this study to determine to what extent aggregate idiosyncratic volatility captures uncertainty, asymmetric information, or differences of opinion. The focus is instead to see whether idiosyncratic volatility aggregated at the country level can provide useful information about the cross-section of stock market returns.

Following Ang et al. (2009), I calculate the idiosyncratic volatility for each country based on the Global Fama-French Five-Factor model. Specifically, I compute the standard

deviation of the residuals ($\varepsilon_{c,t}$) after running the following regression using daily MSCI market excess return (expressed in U.S. dollars) from 33 countries in my sample[64]:

$$Msci\_Ret\_USD_{c,t} = \alpha + \beta_1 * WMKT_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * RMW_t + \beta_5 * CMA_t + \varepsilon_{c,t} \quad (13)$$

Panel C in Table 9 shows that the relative position of lagged aggregate idiosyncratic volatility does not provide useful information for the cross-section of international stock markets. A partial explanation might be that Ang et al. (2009) find that the negative spreads between high and low idiosyncratic volatility stocks in other countries commove with the negative spread in the U.S. As a result, the relative level of volatility across different countries might not provide useful information for the stock market performance in the future. Hence, while aggregate idiosyncratic volatility can provide useful information about market returns within most of the countries, it does not contain useful information for asset allocation across countries.

5.4 Long-horizon return prediction

In unreported tests I find that the aggregate dispersion difference between the most dispersed quintile and the least dispersed quintile is positively auto correlated. At the one-month lag, the autocorrelation is significant and about 0.71. This autocorrelation coefficient decreases gradually over time. At the twelve-month lag, the autocorrelation coefficient is down to 0.49, consistent with Yu (2011), indicating half of any shock will decay within one year, and about 80% of a shock will be reversed in four years' time. This evidence suggests that the relative position of the aggregate analyst dispersion could have predictive power over periods longer than one month.

[64] The daily MSCI market indices for 33 countries are obtained from Datastream. The correlation between recommendation dispersion and idiosyncratic volatility is 0.08 and significant at 1% level in my sample.

However, using long-horizon returns that are overlapping introduces econometric issues regarding hypothesis testing and increase the possibility of falsely rejecting the null hypothesis.

When the return horizon is *h*, a direct way to solve the problem of overlapping observations is to employ the observations at each horizon *h* interval. However, using these non-overlapping interval observations, one would lose all in-between information. Thus, I follow Hodrick (1992) and calculate average analyst dispersion based on several past-months and run the following regression with the one-month market indices as dependent variable. The intuition of using the alternative estimation procedure is that for stationary series, the coefficient of regressing a *h*-horizon return on last month disagreement is equivalent to the coefficient of regressing a *h*-horizon disagreement measure on next month's return.

$$Msci\_Ret\_USD_{c,t} = \alpha + \beta_1 * \frac{1}{N_t} \sum Rank\_Dis_{\,i,t-1} + \varepsilon_{c,t} \quad (14)$$

Panel D in Table 9 shows the portfolio returns based on the average of analyst dispersion over the last six months. There is a negative relationship between analysts' dispersion and future market returns using the past half year's difference of opinion measure. Unreported results show that returns are similar if portfolios are formed based on the past one and two years' average analyst dispersion and weaker if they are based on the past 36 or 48 months' average dispersion.

5.5 Value versus growth stocks sample

Yu (2011) shows that shocks to disagreement correlate more with discount-rate news than with cash-flow news (Campbell & Shiller, 1988) and finds that the returns of growth stocks are more significantly related to the contemporaneous market returns compared to the returns of the value stocks and thus have a higher beta. If the contemporaneous positive relationships between disagreement and market returns can explain the negative relationship between disagreement and future market returns, a more significant negative relationship is expected between dispersion and future market returns for growth stocks than for value stocks

since the growth stocks go up more contemporaneously. Thus, in this section, I consider the difference between value stocks and growth stocks and split my sample into two parts based on stocks' book to market ratio in each country as explained below.

I get the annual book value per share of each stock for the United States and Canada from Compustat North America Monthly Updates-Fundamentals Annual and the market to book value for the stocks from the other 31 countries in the sample from DataStream. Following previous studies (Campbell & Vuolteenaho, 2004; Yu, 2011), I exclude stocks with non-positive book values. Growth stocks are defined as those with the highest 30% market to book values whereas value stocks are defined as those with lowest 30% market to book values. Based on this definition, I split the sample into two parts and run the portfolio analysis on value stocks and growth stocks only. If the value versus growth effect exists at a cross-country level, a higher abnormal portfolio return will be obtained using the sample of growth stocks.[65]

Table 9 Panel E1 and Panel E2 show that growth stocks have higher abnormal returns than value stocks, which is in line with the theory that growth stocks on average show a higher level of overpricing compared to the value stocks.

5.6 Post-regulation changes period

The brokerage industry experienced significant regulatory changes in 2002 in the United States and 2003 in Europe. I have shown that recommendations are less informative for the post-regulation period in the first chapter. After the regulation, analyst recommendations are more comparable among different stocks across different countries, so the standard deviation of analyst recommendations may decrease which potentially decreasing the portfolio returns. Panel F of Table 9 shows that the trading strategy of buying the countries with the lowest dispersion and selling the countries with the highest dispersion cannot obtain abnormal returns.

[65] I require a country to have at least 10 firms in one months to be included in the sample considering the sample size drops if split into value and growth groups.

5.7 Developed countries only

Table 9 Panel G presents the results if the investment is limited to developed countries only. The abnormal returns are much lower than that obtained when investing in the full sample of countries and not significantly different from zero. This result indicates that the hedge return mainly comes from dispersion differences between developed countries and emerging countries.

5.8 Aggregate dispersion changes

Panel H of Table 9 shows the results for a strategy based on the ranking of that country's aggregate analyst dispersion change relative to the previous month aggregate analyst dispersion. The results in Panel H suggests that analyst recommendation dispersion changes provide little information and the abnormal returns are never significant when using analyst dispersion changes as investment criteria. For example, for Fama-French three factors plus Momentum, the average monthly abnormal return is 0.125% (*t*-statistic=0.39).

Table 9: Robustness Tests

This table presents the results of additional tests. Panel A presents the intercept from different asset pricing models using alternative definitions of the analyst recommendation dispersion. Panel B shows the results using earnings per share long-term growth forecast. Panel C shows the results using idiosyncratic volatility as a proxy of differences of opinion. Panel D shows the long-horizon portfolio returns using the non-overlapping specification. Panel E shows the results using growth and value stocks only. Panel F shows the results in the post-regulation period. Panel G presents the results using developed countries only. Panel H shows the hedge returns when using the relative position of dispersion changes. Coefficients highlighted in **bold** are significant at the 10% level or better.

Portfolio	World CAPM (1)	CAPM Redux (2)	Global FF 3+Mom (3)	Global FF5 (4)
Baseline Results: P1-P5	0.463	**0.783**	0.463	**0.722**
	1.49	2.53	1.43	2.14
Panel A1: Alternative Constructions of Aggregate Analyst Dispersion (six-month outstanding)				
1 (lowest dispersion)	0.279	0.209	0.279	0.198
	1.28	0.93	1.22	0.85
5 (highest dispersion)	-0.077	-0.481	-0.114	-0.497
	-0.24	-1.64	-0.35	-1.49
P1-P5	0.356	**0.690**	0.393	**0.695**
	1.00	1.95	1.07	1.82
Panel A2: Alternative Constructions of Aggregate Analyst Dispersion (twelve-month outstanding)				
1 (lowest dispersion)	0.006	-0.050	-0.082	-0.059
	0.03	-0.26	-0.43	-0.30
5 (highest dispersion)	-0.145	-0.570	-0.147	-0.501
	-0.44	-1.88	-0.44	-1.44
P1-P5	0.151	0.519	0.066	0.442
	0.43	1.53	0.182	1.17
Panel A3: Alternative constructions of aggregate analyst dispersion (one-month outstanding)				
1 (lowest dispersion)	0.207	0.179	0.227	0.062
	1.05	0.91	1.13	0.30
5 (highest dispersion)	0.292	0.132	0.292	0.164
	1.08	0.49	1.05	0.57
P1-P5	-0.084	0.047	-0.065	-0.10
	-0.27	0.15	-0.20	-0.30
Panel B: Alternative proxy for differences of opinion (earnings per share long-term growth rate)				
1 (lowest dispersion)	0.149	0.013	0.150	0.032
	0.83	0.08	0.84	0.17
5 (highest dispersion)	-0.023	-0.285	-0.122	-0.341
	-0.10	-1.32	-0.52	-1.47
P1-P5	0.172	0.299	0.272	0.373
	0.70	1.18	1.06	1.41

Table 9 Continued

Panel C: Alternative proxy for differences of opinion (idiosyncratic volatility)				
1 (lowest dispersion)	0.174	0.126	0.082	-0.006
	1.60	1.16	0.75	-0.05
5 (highest dispersion)	0.45	0.115	0.511	0.511
	1.53	0.41	**1.70**	1.63
P1-P5	-0.276	0.011	-0.429	-0.517
	-0.91	0.04	-1.38	-1.58
Panel D: Non-overlapping results based on last six-month dispersion average				
1 (lowest dispersion)	0.149	0.100	0.155	0.125
	0.99	0.66	1.04	0.84
5 (highest dispersion)	-0.100	**-0.468**	-0.121	-0.459
	-0.36	-1.89	-0.43	-1.58
P1-P5	0.249	**0.568**	0.276	**0.584**
	0.93	2.21	0.99	2.036
Panel E1: Using growth stocks only (equal-weighted return)				
1 (lowest dispersion)	0.242	0.158	0.205	0.263
	0.96	0.64	0.90	1.12
5 (highest dispersion)	-0.224	**-0.527**	-0.204	**-0.459**
	-0.81	-2.03	-0.78	-1.70
P1-P5	0.466	**0.685**	0.41	**0.722**
	1.64	2.37	1.39	2.35
Panel E2: Using Value Stocks Only (equal-weighted return)				
1 (lowest dispersion)	0.416	0.147	0.438	0.341
	1.25	0.45	1.33	0.99
5 (highest dispersion)	**0.949**	0.383	**1.018**	0.563
	2.15	0.94	2.39	1.24
P1-P5	-0.534	-0.236	-0.58	-0.222
	-1.18	-0.52	-1.24	-0.46
Panel F: Post-Regulation Period (November 2004 to June 2015)				
1 (lowest dispersion)	0.023	0.055	-0.004	-0.055
	0.11	0.28	-0.02	-0.28
5 (highest dispersion)	0	0.068	0.065	-0.039
	0.00	0.31	0.29	-0.17
P1-P5	0.023	-0.013	-0.069	-0.016
	0.09	-0.05	-0.27	-0.06

Table 9 Continued

Panel G: Developed Countries Only				
1 (lowest dispersion)	0.125	0.112	0.04	-0.043
	1.08	0.94	0.34	-0.36
5 (highest dispersion)	0.019	-0.144	-0.053	-0.076
	0.09	-0.73	-0.25	-0.35
P1-P5	0.106	0.256	0.093	0.033
	0.48	1.17	0.41	0.14
Panel H: Dispersion Changes				
1 (lowest dispersion)	0.244	0.071	0.372	0.112
	1.01	0.31	1.53	0.44
5 (highest dispersion)	0.281	0.064	0.247	0.119
	1.16	0.27	1.01	0.48
P1-P5	-0.037	0.007	0.125	-0.007
	-0.12	0.02	0.39	-0.02

6. Conclusion

This study shows weak evidence that recommendation dispersion aggregated at the country level is negatively related to future stock market returns. For two out of the four asset pricing models, the portfolio performance of a self-financing hedge portfolio that buys the stock market indices of countries with the lowest analyst dispersion and sells the stock market indices of countries with the highest analyst dispersion yields significant returns. In contrast to the evidence at the firm level, I also show that short selling constraints are not a necessary condition for a stock market to be overpriced. Moreover, this study shows that aggregate idiosyncratic volatility does not provide useful cross-country information even though it predicts the stock market performance within each country.

Table A. 1: Regression Results Using Unexpected Stock Market Returns and Country-level Aggregate Dispersion Based on Fama-French Five Factor Model

This table presents the results for equations (6) to (11) in the text. The dependent variable is the unexpected return based on Fama-French Five Factor model. The variable $Rank\_DIS_{i,t-1}$ refers to the relative position of the country-level recommendation dispersion each month, where all aggregate dispersions are sorted into five groups. I assign ranks ranging from -0.5 for the smallest quintile to +0.5 for the largest quintile. $Rank\_REC_{i,t-1}$ is also calculated in the similar way but with average recommendation. $Illegal_{i,t-1}$ from column (5) to (8) is the dummy variable where equals one if the short selling is illegal in a particular month for a particular country. $Ban_{i,t}$ is the variable considering the feasibility of short selling activity. Apart from legally banned or not, uptick rules, pre-borrowing requirements (ban on naked short selling), and bans on shorting selected stocks (typically financial stocks) are also considered. $Futures_{i,t-1}$ is the dummy variable where equals zero if there is stock market index futures available for the country in that month. *Q5* is the dummy variable that equals 1 if the countries are in the highest dispersed group and equals 0 otherwise. The sample period is from July 1995 to June 2015. The *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	-0.688	**-0.683**	**-0.515**	**-0.527**	**-0.456**	**-0.637**			-0.174	-0.453	-0.444	
$Rank\_DIS_{i,t-1}$	-3.18	-2.35	-2.18	-1.75	-1.86	-2.33			-0.45	-1.00	-1.04	
			0.646	**0.904**	**0.709**	**0.928**	**0.717**	**0.894**	**0.699**	**0.932**	**0.984**	**0.959**
$Rank\_REC_{i,t-1}$			2.09	3.09	2.29	3.24	2.39	3.20	2.22	3.13	3.15	3.14
					-0.023	-1.463	0.117	-1.375				
$Illegal_{i,t-1}$					-0.04	-1.40	0.21	-1.23				
					-0.424	1.373						
$Illegal_{i,t-1} * Rank\_DIS_{i,t-1}$					-0.53	1.08						
									0.023	-0.571		
$Ban_{i,t-1}$									0.21	-1.12		
									-0.326	-0.050		
$Ban_{i,t-1} * Rank\_DIS_{i,t-1}$									-0.96	-0.09		
							-0.378	0.528				
$Illegal_{i,t-1}$* *Q5*							-0.80	0.75				
							-0.541	**-0.616**				**-0.537**
Q5							-2.65	-2.76				-1.84
											0.640	0.662
$Futures_{i,t-1}$											1.40	1.42
											-0.341	
$Futures_{i,t-1} * Rank\_DIS_{i,t-1}$											-0.57	

Table A.1 Continued

$Futures_{i,t-1}$* *Q5*												-0.302 -0.74
$Momentum_{i,t}$	0.005 0.36	0.001 0.06	0.004 0.30	-0.001 -0.04	0.004 0.28	-0.002 -0.14	0.004 0.03	-0.002 -0.12	0.004 0.30	-0.001 -0.07	-0.003 -0.21	-0.003 -0.18
Country fixed effect	N	Y	N	Y	N	Y	N	Y	N	Y	Y	Y
Month fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A. 2: Regression Results Using Unexpected Stock Market Returns and Country-level Aggregate Dispersion Based on World CAPM Model

This table presents the results for equations (6) to (11) in the text. The dependent variable is the unexpected return based on World CAPM model. The variable $Rank\_DIS_{i,t-1}$ refers to the relative position of the country-level recommendation dispersion each month, where all aggregate dispersions are sorted into five groups. I assign ranks ranging from -0.5 for the smallest quintile to +0.5 for the largest quintile. $Rank\_REC_{i,t-1}$ is also calculated in the similar way but with average recommendation $Illegal_{i,t-1}$ from column (5) to (8) is the dummy variable where equals one if the short selling is illegal in a particular month for a particular country. $Ban_{i,t}$ is the variable considering the feasibility of short selling activity. Apart from legally banned or not, uptick rules, pre-borrowing requirements (ban on naked short selling), and bans on shorting selected stocks (typically financial stocks) are also considered. $Futures_{i,t-1}$ is the dummy variable where equals zero if there is stock market index futures available for the country in that month. *Q5* is the dummy variable that equals 1 if the countries are in the highest dispersed group and equals 0 otherwise. The sample period is from July 1995 to June 2015. The *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$Rank\_DIS_{i,t-1}$	-0.261 -1.55	-0.323 -1.28	-0.093 -0.48	-0.193 -0.75	-0.092 -0.45	-0.287 -1.33			-0.033 -0.1	-0.224 -0.56	-0.225 -0.55	
$Rank\_REC_{i,t-1}$			**0.633** 2.68	**0.757** 3.12	**0.681** 3.05	**0.806** 3.26	**0.655** 2.98	**0.77** 3.18	**0.659** 2.92	**0.806** 3.26	**0.816** 3.25	**0.793** 3.23
$Illegal_{i,t-1}$					0.216 0.55	-0.788 -0.82	0.209 0.45	-0.821 -0.75				
$Illegal_{i,t-1} * Rank\_DIS_{i,t-1}$					-0.015 -0.02	1.333 1.12						
$Ban_{i,t-1}$									0.093 1.39	-0.181 -0.36		
$Ban_{i,t-1} * Rank\_DIS_{i,t-1}$									-0.05 -0.18	0.079 0.17		

Table A.2 Continued

							0.140	0.752				
$Illegal_{i,t-1}$* *Q5*							0.33	1.16				
							-0.272	**-0.375**				-0.359
Q5							-1.39	-1.81				-1.26
											0.379	0.346
$Futures_{i,t-1}$											0.98	0.86
											0.020	
$Futures_{i,t-1} * Rank\_DIS_{i,t-1}$											0.04	
												0.111
$Futures_{i,t-1}$* *Q5*												0.28
	0.010	0.007	0.009	0.006	0.010	0.006	0.010	0.006	0.010	0.007	0.005	0.005
$Momentum_{i,t}$	0.81	0.56	0.76	0.49	0.82	0.47	0.83	0.48	0.82	0.53	0.41	0.42
Country fixed effect	N	Y	N	Y	N	Y	N	Y	N	Y	Y	Y
Month fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A. 3: Regression Results Using Unexpected Stock Market Returns and Country-level Aggregate Dispersion Based on Global Three Factor plus Momentum Model

This table presents the results for equations (6) to (11) in the text. The dependent variable is the unexpected return based on Global Three Factor plus Momentum model. The variable $Rank\_DIS_{i,t-1}$ refers to the relative position of the country-level recommendation dispersion each month, where all aggregate dispersions are sorted into five groups. I assign ranks ranging from -0.5 for the smallest quintile to +0.5 for the largest quintile. $Rank_REC_{i,t-1}$is also calculated in the similar way but with average recommendation. $Illegal_{i,t-1}$ from column (5) to (8) is the dummy variable where equals one if the short selling is illegal in a particular month for a particular country. $Ban_{i,t}$ is the variable considering the feasibility of short selling activity. Apart from legally banned or not, uptick rules, pre-borrowing requirements (ban on naked short selling), and bans on shorting selected stocks (typically financial stocks) are also considered. $Futures_{i,t-1}$ is the dummy variable where equals zero if there is stock market index futures available for the country in that month. *Q5* is the dummy variable that equals 1 if the countries are in the highest dispersed group and equals 0 otherwise. The sample period is from July 1995 to June 2015. The *t*-statistics are based on standard errors clustered by country. Coefficients highlighted in **bold** are significant at the 10% level or better.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	-0.161	-0.144	0.01	-0.013	-0.056	-0.204			-0.095	-0.225	0.136	
$Rank\_DIS_{i,t-1}$	-0.79	-0.54	0.04	-0.05	-0.25	-0.85			-0.26	-0.54	0.32	
			0.641	**0.76**	**0.727**	**0.802**	**0.686**	**0.75**	**0.647**	**0.795**	**0.834**	**0.797**
$Rank\_REC_{i,t-1}$			2.98	3.07	3.33	3.11	3.38	2.89	2.94	3.10	3.31	3.14

Table A.3 Continued

					-0.031	-1.251	-0.208	-1.407				
$Illegal_{i,t-1}$					-0.08	-1.35	-0.38	-1.2				
					1.016	**2.392**						
$Illegal_{i,t-1} * Rank\_DIS_{i,t-1}$					1.83	2.37						
									0.145	-0.39		
$Ban_{i,t-1}$									2.14	-0.86		
									0.114	0.298		
$Ban_{i,t-1} * Rank\_DIS_{i,t-1}$									0.37	0.67		
							0.934	1.537				
$Illegal_{i,t-1}$* *Q5*							1.32	1.64				
							-0.253	**-0.38**				-0.107
Q5							-1.21	1.69				-0.35
											0.307	0.362
$Futures_{i,t-1}$											0.81	0.9
											-0.384	
$Futures_{i,t-1} * Rank\_DIS_{i,t-1}$											-0.66	
												-0.340
$Futures_{i,t-1}$* *Q5*												-0.75
	0.003	-0.000	0.002	-0.001	0.002	-0.003	0.002	-0.002	0.002	-0.002	-0.004	-0.003
$Momentum_{i,t}$	0.22	-0.02	0.15	-0.11	0.18	-0.18	0.18	-0.17	0.17	-0.13	-0.26	-0.24-
Country fixed effect	N	Y	N	Y	N	Y	N	Y	N	Y	Y	Y
Month fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table A. 4: Descriptive Statistics for Analyst Dispersions, by Country and Short-sale Constraints

This table presents the monthly average analyst dispersions for each sample country based on the condition of short-sale constraints. *Illegal* is the dummy variable where equals one if the short selling is illegal in a particular month for a particular country. Column (3) shows the number of observations when calculating monthly averages of analyst dispersion. Column (4) shows the simple averages of analyst dispersion for each country conditional on the status of short-sale constraints.

Country (1)	Illegal (2)	Num of Dispersion (3)	Avg_Dis (4)
Australia	0	232	0.873
Australia	1	3	0.904
Belgium	0	158	0.900
Brazil	0	219	0.802
Canada	0	235	0.724
China	1	134	0.774
Denmark	0	114	0.965
Finland	0	198	0.984
Finland	1	10	0.998
France	0	235	0.932
Germany	0	235	0.979
Hong Kong	0	235	1.043
India	0	90	1.015
India	1	145	1.005
Indonesia	0	149	0.983
Indonesia	1	6	0.907
Italy	0	235	0.860
Japan	0	235	0.718
Korea	0	226	0.826
Korea	1	9	0.822
Malaysia	0	123	0.992
Malaysia	1	112	1.075
Mexico	0	75	0.825
Netherland	0	222	0.933
New Zealand	0	52	0.827
Norway	0	200	0.919
Philippines	0	33	0.946
Philippines	1	25	1.259
Poland	0	96	0.944
Russia	0	98	0.795
Russia	1	10	1.028
Singapore	0	235	0.996
South Africa	0	235	0.879
Spain	0	235	0.930
Sweden	0	235	0.946
Switzerland	0	233	0.883
Taiwan	0	233	0.927
Taiwan	1	2	0.830
Thailand	0	174	1.024
Thailand	1	61	1.227
Turkey	0	200	0.812
United Kingdom	0	235	0.929
United States	0	235	0.753

CHAPTER 3

Value of Analyst Recommendations around the World:

Does the Institutional Environment Matter?

1. Introduction

Previous studies have examined the value of analysts' stock recommendations at the firm level and have found that certain types of recommendations are more informative to investors. For example, Michaely and Womack (1999) found that recommendations issued by independent brokers are more useful to investors compared to recommendations issued by analysts from the lead underwriter. Ivković and Jegadeesh (2004) argued that the timing of recommendation changes relative to earnings announcements also affects the informativeness of recommendations, and that the market reaction is greater to recommendations issued before earnings announcements. Malloy (2005) found that geographic proximity provides an information advantage to U.S. analysts, and that local analysts' reports have a more significant effect on stock prices.

Jegadeesh and Kim (2006) analyzed recommendations for G7 countries and found that the U.S. exhibits the most significant stock price reaction to recommendation revisions. However, no study has examined why the value of recommendations varies across countries. This study fills this gap and extends the analysis in Jegadeesh and Kim (2006) to 33 countries. In a closely related study, Defond et al. (2007) examined institutional factors that affect investors' reaction to earnings announcements. This paper complements Defond et al. (2007) in the sense that the institutional factors that affect the financial reporting environment are likely to affect the information content of stock recommendations.

I examined the average stock price reactions to recommendation announcements in each country using event study methodology and identified the institutional determinants of the value of recommendations for countries worldwide. I 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. To answer my research question, I regressed this investor reaction measure on country-

level proxies for the institutional environment. The proxies I 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.

My results show 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 in countries with higher accounting standards, more efficient security enforcement, better earnings quality, common law origins, and better protection of private property experience significantly higher price reactions, whereas 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 et al. (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 around the world and found that the mutual fund industry is larger in countries with stronger judicial systems, particularly with stringent disclosure requirements for funds.[66] Fan, Titman, and Twite (2011) examined how the institutional environment affects the capital structure and debt

[66] Ferreira, Keswani, Miguel, and Ramos (2013) examined the country factors that affect mutual fund performance around the world.

maturity choices of firms in 39 countries and found that firms in countries with weaker laws tend to use more short-term debt.[67] Using annual earnings announcements from 26 countries, Defond et al. (2007) found that annual earnings announcements are more useful in countries with higher quality earnings or better-enforced insider trading laws. Finally, Leuz, Nanda, and Wysocki (2003) found that the level of earnings management is lower in countries with more reliable investor protection.

Second, it contributes to the literature on the information role of analyst recommendations. Differing from existing studies investigating firm characteristics and analyst characteristics,[68] this study extends the analysis to a large sample of countries 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.

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 both in the U.S. and in international stock markets. Using event study methodology, these studies have found that recommendations or recommendation revisions are useful and lead to significant stock price reactions (Ivković & Jegadeesh, 2004; Womack, 1996). Some studies have investigated whether specific types of recommendations

[67] Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001), and Giannetti (2003) also examined the effect of the institutional environment on capital structure choices.
[68] See Stickel (1995), Sorescu and Subrahmanyam (2006), and Muslu and Xue (2013), for example.

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.[69] As opposed to other studies focusing on the average effects of analyst recommendation or recommendation revisions, 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. 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.[70]

Jegadeesh and Kim (2006) took an international perspective and evaluated the performance of 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 among G7 countries. In line with Gintschel and Markov (2004), they also found that Top Ten Brokers added more value, which indicates that an analyst's skill may dominate the conflicts of interest problems in large brokerage firms.[71]

Another important strand of literature for my 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, Yeung, and Yu (2000) investigated stock

[69] 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.
[70] Fang and Yasuda (2014) examined the effects of reputation on the value of recommendations and found the impact is different between the tech-sector and non-tech sector. Specifically, reputable analysts significantly outperform less reputable analysts at a personal and institutional level in the tech-sector, whereas in the non-tech sector, an analyst's reputation only makes a difference at the institutional level.
[71] Stickel (1995) found that stock prices react more to recommendation changes issued by star analysts.

price co-movements 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 co-movement and market development, whereas property rights protection can. Specifically, they argue that reliable protection of property rights encourages informed arbitrage, which enables firm-specific information to be incorporated into stock prices in a timelier manner in developed countries. 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 strong minority investor rights have a better allocation of capital, which is due to reduced overinvestment in declining industries. La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2002) have provided evidence that firms in countries with stronger 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 compared to civil law countries.[72] However, this higher timeliness of accounting income is mainly because of the timely incorporation of economic losses, which is measured by the conservatism of accounting income. They argue that this timely incorporation of negative news reduces the agency cost of monitoring managers.

Djankov, La Porta, Lopez-De-Silanes, and Shleifer (2008) found that the protection of minority shareholders, as measured by the anti-self-dealing index, is statistically and

[72] 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 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.

economically associated with stock market development across 72 countries. Countries with better corporate governance tend to have larger stock market capitalization scaled by their gross domestic product (GDP). Bushman, Piotroski, and Smith (2004) showed that governance transparency is better in common law countries. Moreover, Lin, Massa, and Zhang (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.[73]

2.2 Hypothesis development

As discussed above, previous research shows that the institutional environment affects the availability of firm-specific information, as well as the development of equity markets. Less attention has been given to the question of how the institutional environment affects analyst behavior and investor reaction to the product of financial analysts. I 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.

As indicated in Lin et al. (2014), public information quality is low when the institutional environment is bad. Thus, investors struggle to obtain useful 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 announcements) into more accurate information (semi-public information). Analysts contribute to price efficiency with their superior ability to create information by processing public information, and are thus potentially more important in countries with a bad institutional environment. In addition, because the financial industry tends to be more developed in countries with a good institutional

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

environment, other sophisticated investors, such as mutual funds, help to enhance market efficiency, thereby reducing the value of analyst reports. Thus, we expect stock prices to react more to analyst recommendations in countries with a bad institutional environment and less advanced financial markets.

On the other hand, 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 the forthcoming news. Moreover, as discussed in Ball et al. (2000), in countries with better regulation, analysts receive timely accounting information that can be used in their analysis. Thus, we would expect stock prices to react more to recommendations in countries with a good institutional environment.

Based on the arguments above, I posit the following hypothesis:

H0: The institutional environment is not related to the strength of market reactions to analyst recommendations.

3. Data and Summary Statistics

3.1 Data sources and description

I 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.[74] The recommendations range from one (strong buy) to five (strong

[74] To ensure sufficient analyst activities per country, I required at least 10,000 recommendation announcements within the sample period. This requirement gave me 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 my 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.

sell) initially, and I 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.

I required that daily stock price information around the recommendation announcement date was available in the WRDS Event study.[75] For example, I required that daily stock prices were available both on the recommendation announcement day and on the day after the recommendation announcement in the primary analysis. I also deleted recommendations that were stopped by the same analyst in the following twelve months (Loh & Stulz, 2011). Finally, to be able to identify revisions by the same analyst, I also deleted observations without an analyst identification code.

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

I 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 of the developed countries, while Panel B presents the statistics for each of the emerging countries in my sample. This table shows that the developed markets have more extensive analyst coverage

[75] I 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/.

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: 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%	-

3.2 Measure of average reaction to recommendations at the country level

Following Jegadeesh and Kim (2006), I 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, I 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, I 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, I 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. I calculated the spread in price reaction for country c during year y, $Spread\_CAR_{c,y}$, using the following formula,

$$Spread\_CAR_{c,y} = \sum_{rec=5} CAR_{c,y,rec} - \sum_{rec=1} CAR_{c,y,rec} \quad (3)$$

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, I calculated $Spread\_CAR_{c,y}$ for each country each year using the methods discussed above. Then I took the equal-weighted country average within the developed and emerging country group.

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 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.[76] The difference in daily abnormal returns between developed countries and emerging countries is significantly positive on the announcement day and remains positive until one day after the announcement.[77]

[76] 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.
[77] 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.

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 I take the equal-weight annual country average cumulative abnormal return within developed and emerging country group.

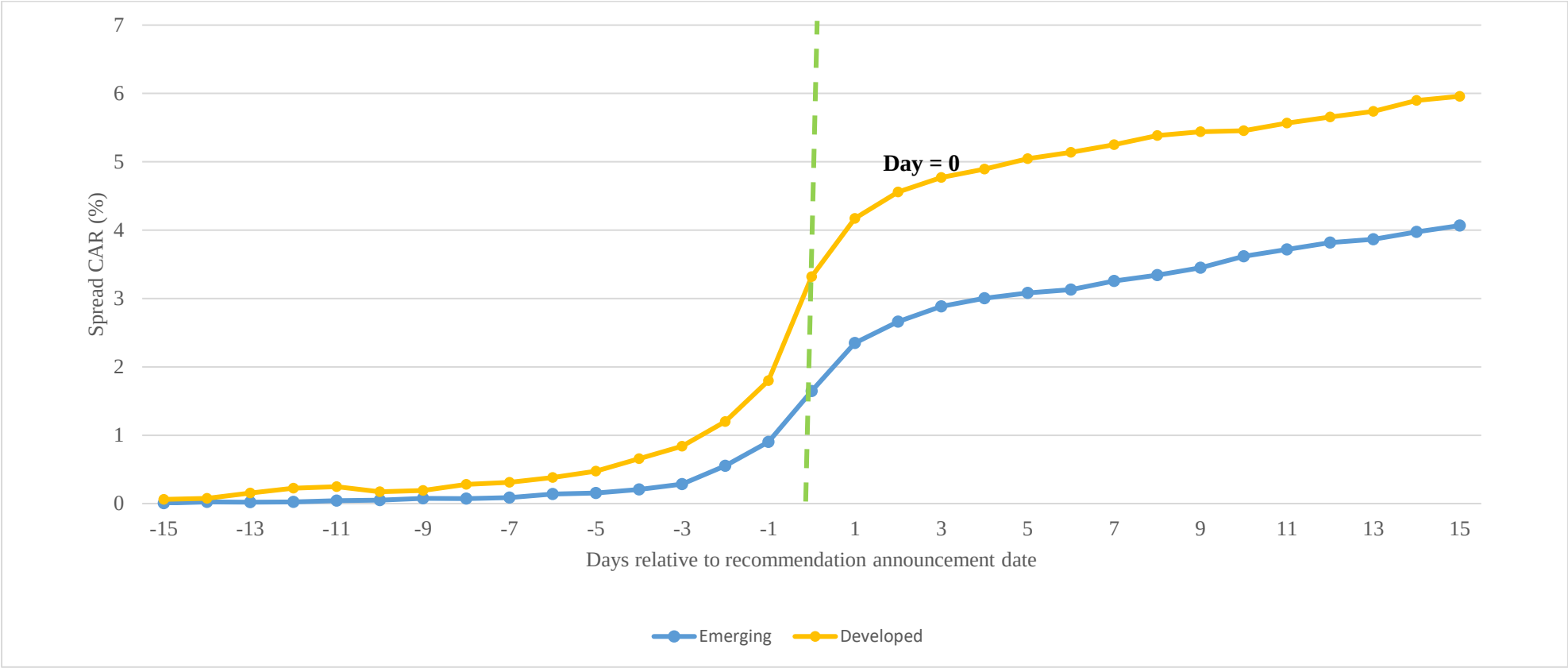


Table 2: Daily Abnormal Return Spread

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. I 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

To obtain an indication of the impact of the recommendation announcement on stock returns for different countries, I 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 of the developed countries reside in the right side of the chart, indicating a more substantial stock price reaction to recommendation announcements.

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

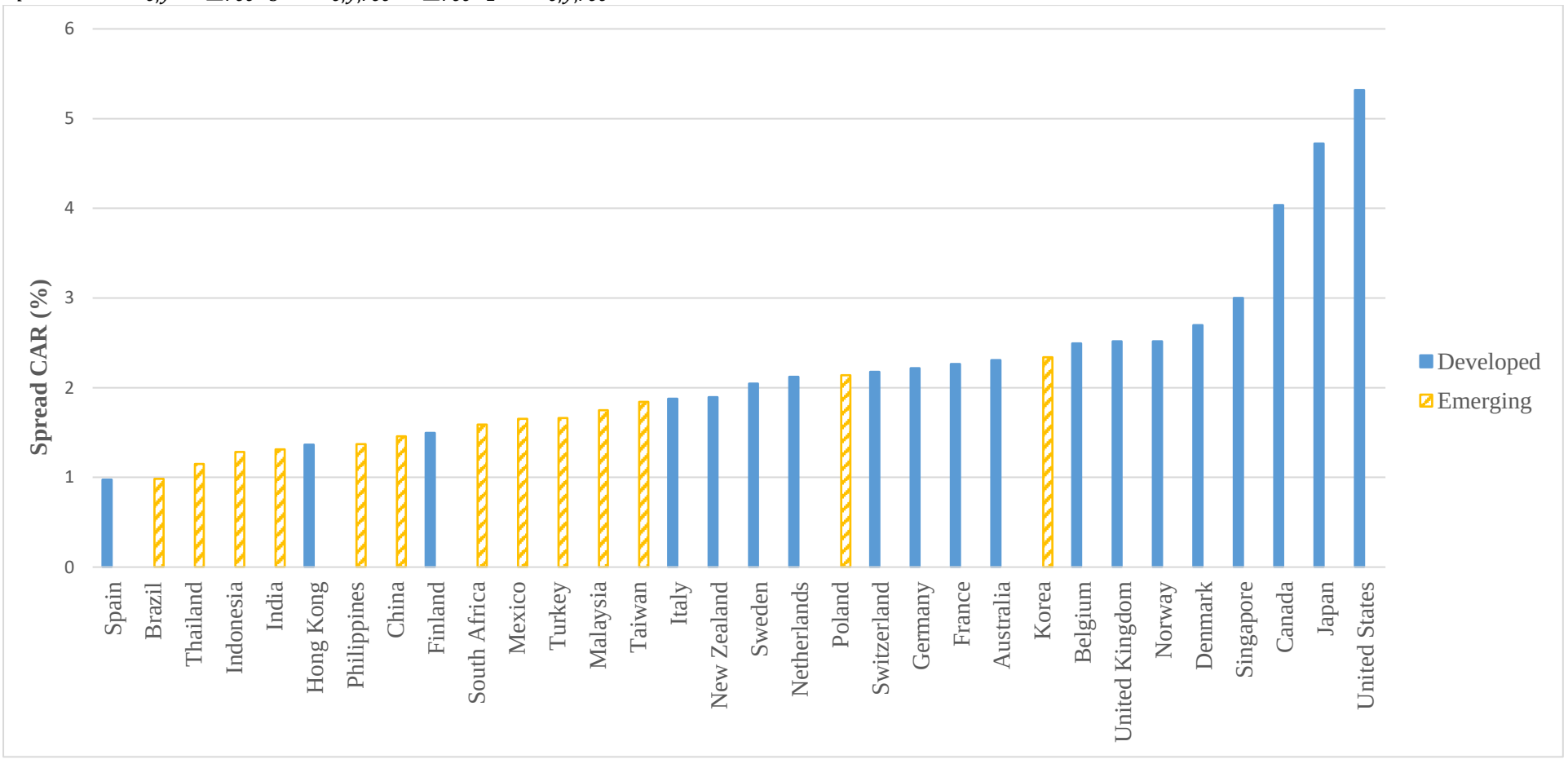


Table 3 presents a more detailed analysis of the summary statistics depicted in Figure 2. It shows the cumulative abnormal return spread by country over different event windows, including 0 to +1, -1 to 0, -2 to +2, -5 to +5, and -15 to +15, and confirms the indications from Figure 2 discussed above. 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).[78] A significant portion of price drift concentrates on the announcement day and the trading day immediately after the announcement.[79]

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

[78] 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, I did not have this requirement.

[79] 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 Continued

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**

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, I 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 the way 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, & Vishny, 1998). A stronger 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, I took a range of standard institutional factors into consideration, 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 stronger 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 my sample are common law origin countries, and 21 countries are civil law origin countries.

The second proxy I consider is earnings quality, as discussed in Leuz et al. (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. I 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), I 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 the risk of the government repudiating contracts. Each index measures government attitude towards firms and ranges from 0 to 10, where lower scores indicate less private property protection.[80]

[80] Dang et al. (2015) also employed this institutional environment proxy and view 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).

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. La Porta et al. (1998) argue that accounting plays a vital role in corporate governance given its importance in understanding company disclosures. Accounting information may be particularly useful when investor protection is weak.

The fifth proxy is from Bhattacharya and Daouk (2002), and measures the existence and the enforcement of insider trading laws. As discussed in Fernandes and Ferreira (2008), enforcement of insider trading laws improves price informativeness, especially in developed markets and countries with strong legal institutions. Following their study, I included a dummy variable, ***ENFORCE***, which equals one from the year of the country's first insider trading enforcement case and zero otherwise.

Prior studies suggest that regulation rules alone are unlikely to be effective without proper enforcement (Bhattacharya & Daouk, 2002). I thus included the sixth institutional variable, ***SEC_EFF***, which captures the effectiveness of a country's securities regulation. I 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, namely 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, I also considered the level of a country's economic and financial development because economic and financial development is correlated with the

development of institutional characteristics. Following Morck et al. (2000) and Dang et al. (2015), I 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 my analysis.[81]

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 I discussed above. Table 4 Column (5) shows the first year of the enforcement of 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***).

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, whereas the ratio of market capitalization to GDP in emerging countries is only about half of the ratio across developed countries.

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

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

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 Kingdom	1	-0.492	28.440	78.000	1981	0.723	1.975	4.580	127.890
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 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. 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.[82]

[82] 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.

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

5. Results

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

5.1 Univariate analysis

Here I provide a preliminary univariate comparison of the market reaction to analyst recommendations between country groups with different institutional environments. I 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, I 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, I 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 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, the 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 event window (0, +1) is about 0.59% higher in countries with high-quality accounting standards compared to 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: 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 chapter, I 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, I viewed this country as a good institutional environment country (Good IE). If a country has a value of institutional environment proxy smaller than or equal to the median of the proxy in interest, I viewed this country as a bad institutional environment country (Bad IE). 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

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, I carried out more formal statistical tests of this hypothesis in a multivariate regression setting.

5.2 Multivariate regression results

In this section, I used a regression model which allowed me to control for a range of country-level factors that could affect the relationship between the value of analyst recommendations and a country's institutional environment. I 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, I ran the following regression:

$$Spread\_CAR_{c,y} = \alpha + \beta_1 * IE_{c,y} + \beta_2 * \Delta GDP_{c,y-1} + \beta_3 * MTG_{c,y-1} + \beta_4 * GDP\_PC_{c,y-1} + \varepsilon_{c,y}\ , \quad (4)$$

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, I 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 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 when taking all the institutional environment proxies into consideration at the same time, countries with strong security law enforcement and good governance show higher recommendation spreads.

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, I 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***). $\Delta\boldsymbol{GDP_{c,y-1}}$ 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, I 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
$\Delta\boldsymbol{GDP_{c,y-1}}$	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
$\boldsymbol{MTG_{c,y-1}}$	**-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
$\boldsymbol{GDP\_PC_{c,y-1}}$	**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

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, I 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.[83] To formally test whether this effect is asymmetric between strong sell and strong buy recommendations, I ran the following regression:

$$CAR\_Sign_{c,y}=\alpha + \beta_1 * IE_{c,y}+\beta_2 * Sell_{c,y}+ \beta_3 * Sell_{c,y} * IE_{c,y} + \beta_4 * \Delta GDP_{c,y-1} + \beta_5 * MTG_{c,y-1} + \beta_6 * GDP\_PC_{c,y-1} + \varepsilon_{c,y} , \quad (5)$$

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 that is 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, which indicates that the institutional environment affects the value of strong sell recommendations more compared to the value of strong buy recommendations.

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

Table 8: Asymmetric Impact 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, I 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, I 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*. I 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***). $\Delta\boldsymbol{GDP_{c,y-1}}$ 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, I 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

Table 8 Continued

$\Delta GDP_{c,y-1}$	-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

6. Potential Problems

6.1 Potential time stamp errors

The results so far 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, then 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.[84]

If systematic date-coding errors in emerging countries are the reason for the differences in the value of analyst recommendations between the developed and emerging countries, then 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 the results are driven by potential dating errors, I 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). An extensive review of studies discussing the time-stamp errors in I/B/E/S is in Appendix E of this thesis.

Table 9 shows the results of the panel regression for these alternative event windows. Note that as before, I 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 long event window (-15, +15), three institutional environment proxies remain significantly positive. Hence, potential errors in recommendation dates do not affect the conclusion that

[84] 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.

recommendations in countries with better institutional environments have higher value to investors.

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, I 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, I 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

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 document 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.[85] 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, I required that at least three days must pass between a recommendation announcement and an earnings announcement for the same firm. This 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.

[85] 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. For more details, please refer to the literature review in this thesis.

Table 10: Value of Recommendations and Institutional Environment at the Country Level after Excluding Contemporaneous Earnings Announcements

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, I 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, I 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, I 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

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, I also extended the tests to recommendation revisions. If there was a recommendation announced by the same analyst for the same firm within twelve months, I viewed that as a recommendation revision. I then split the recommendation revisions into upgrades and downgrades. Consistent with recommendation level studies, I 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. Similar to 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: 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, I 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, I 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

6.4 Favorable recommendations versus unfavorable recommendations

Since only a small percentage of recommendations were strong sell, I 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 a small group of observations. I 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, and 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: 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, I 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, I 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, I 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

6.5 Post-regulation period

The brokerage industry faced significant regulatory changes in 2002 in the United States, and in 2003 in Europe. The positive bias in analyst recommendations declined after regulation (Dubois, Fresard, & Dumontier, 2013; Kadan et al., 2009). To make sure the results were not driven by price reactions to biased recommendations before regulatory changes, I conducted tests using the post-regulation period only. 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 whole sample results presented in Table 7, recommendations in countries with better institutional environments have a larger impact on stock prices. And even 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 of the emerging countries starts from January 2000 in the WRDS Analytics Event Study, I did not conduct the tests for the pre-regulation period due to limited data.

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, I 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, I 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

7. Conclusion

In this chapter, I investigated whether and how the institutional environment affects the value of analyst recommendations across countries. Using a sample of 32 countries from 1994 to 2015, I 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. However, the enforcement of insider trading laws does not show a significant impact on the value of recommendations at the country level. 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, as well as conducting the analysis in the post-regulation period only. The results are similar when I examine the impact of institutional environments on the value of recommendation revisions.

CONCLUSION

This thesis contains three studies that explored three separate aspects of the value of analyst stock recommendations in international stock markets. The thesis started with a broad perspective by examining the role of aggregated analyst recommendations in international asset allocation. The second study extended Miller's theory (1977) to global stock markets and investigated whether the negative relation between differences of opinion and stock returns exists at the country level. Finally, the third study examined whether stock prices react differently across the globe and focused on the role of the institutional environment in determining the value of analyst recommendations.

The first study contributes to our understanding of the role of aggregate stock recommendations in international stock markets and provides potential investment strategies that can improve global fund managers' performance. By averaging individual stock recommendations across stocks in each country, this study showed that analyst recommendations aggregated at the country level can predict one-month ahead stock market returns across countries. The results are robust to different international asset pricing models, portfolio construction rules, and measurement windows. I also showed that country-level analyst recommendations predict the next quarter's GDP growth, even when I controlled for survey-based forecasts by a panel of economists.

My second study took a different perspective and focused on the second moment of analyst recommendations. In particular, it examined whether Miller's theory (1977) is applicable at the country level. Results showed weak evidence that recommendation dispersion aggregated at the country level is negatively related to future stock market returns. In contrast to the evidence at the firm level, I also showed that short selling constraints are not a necessary condition for a stock market to be overpriced. Moreover, this study showed that aggregate idiosyncratic volatility does not provide useful cross-country information even though it predicts the stock market performance within each country.

The final study contributes to our understanding of the impact of the institutional environment on the financial analyst industry. Using a sample of 32 countries from 1994 to 2015, I found that stock prices react significantly stronger to recommendation announcements in countries with higher accounting standards, more effective security enforcement, better earnings quality, common law origins, and better protection of private property. In addition, results showed that this effect is stronger for negative recommendations. The results are robust to alternative research settings, such as longer event windows, the post-regulatory period, and when recommendations around earnings announcements are excluded. Moreover, the institutional environment affects the value of recommendation revisions in a similar way.

APPENDICES

Appendix A: BlackRock ETFs and Descriptive Statistics for Other Variables

Table A.1 provides information about the ETFs on MSCI country indices based on data from BlackRock's website. All the ETFs in the table are equity only. By the end of June 2016, ETFs for all sample countries are available. I include the information for two ETFs for China. The results in this chapter are based on the MSCI China A Index. There is no ETF on the US MSCI index. There are several alternative products for the US such as iShare's Russell 3000 ETF. Expense ratio is provided in the fund prospectus, and it measures all operating expenses of the fund, except interest expense, taxes, brokerage expenses, future distribution fees or expenses, and extraordinary expenses. The usual and customary brokerage commissions and other charges when buying and selling shares of the Fund is not included as well.

Table A. 1: Cost and Inception Date of BlackRock ETFs on MSCI Country Indices

This table presents the inception date and net expense ratio of ETFs on MSCI country indices used in the trading strategies.

Ticker	Name	Inception Date	Country	Net Expense Ratio
EWA	iShares MSCI Australia ETF	Mar 12, 1996	Australia	0.48
EWK	iShares MSCI Belgium Capped ETF	Mar 12, 1996	Belgium	0.48
EWZ	iShares MSCI Brazil Capped ETF	Jul 10, 2000	Brazil	0.62
EWC	iShares MSCI Canada ETF	Mar 12, 1996	Canada	0.48
CNYA	iShares MSCI China A ETF	Jun 13, 2016	China	0.65
MCHI	iShares MSCI China ETF	Mar 29, 2011	China	0.62
EDEN	iShares MSCI Denmark Capped ETF	Jan 25, 2012	Denmark	0.53
EFNL	iShares MSCI Finland Capped ETF	Jan 25, 2012	Finland	0.53
EWQ	iShares MSCI France ETF	Mar 12, 1996	France	0.48
EWG	iShares MSCI Germany ETF	Mar 12, 1996	Germany	0.48
EWH	iShares MSCI Hong Kong ETF	Mar 12, 1996	Hong Kong	0.48
INDA	iShares MSCI India ETF	Feb 2, 2012	India	0.68
EIDO	iShares MSCI Indonesia ETF	May 5, 2010	Indonesia	0.62
EWI	iShares MSCI Italy Capped ETF	Mar 12, 1996	Italy	0.48
EWJ	iShares MSCI Japan ETF	Mar 12, 1996	Japan	0.48
EWY	iShares MSCI South Korea Capped ETF	May 9, 2000	Korea	0.62
EWM	iShares MSCI Malaysia ETF	Mar 12, 1996	Malaysia	0.48
EWW	iShares MSCI Mexico Capped ETF	Mar 12, 1996	Mexico	0.48
EWN	iShares MSCI Netherlands ETF	Mar 12, 1996	Netherlands	0.48
ENZL	iShares MSCI New Zealand Capped ETF	Sep 1, 2010	New Zealand	0.48
ENOR	iShares MSCI Norway Capped ETF	Jan 23, 2012	Norway	0.53
EPHE	iShares MSCI Philippines ETF	Sep 28, 2010	Philippines	0.62
EPOL	iShares MSCI Poland Capped ETF	May 25, 2010	Poland	0.62
ERUS	iShares MSCI Russia Capped ETF	Nov 9, 2010	Russia	0.62
EWS	iShares MSCI Singapore ETF	Mar 12, 1996	Singapore	0.48
EZA	iShares MSCI South Africa ETF	Feb 3, 2003	South Africa	0.62
EWP	iShares MSCI Spain Capped ETF	Mar 12, 1996	Spain	0.48

Table A.1 Continued

EWD	iShares MSCI Sweden ETF	Mar 12, 1996	Sweden	0.48
EWL	iShares MSCI Switzerland Capped ETF	Mar 12, 1996	Switzerland	0.48
EWT	iShares MSCI Taiwan ETF	Jun 20, 2000	Taiwan	0.62
THD	iShares MSCI Thailand Capped ETF	Mar 26, 2008	Thailand	0.62
TUR	iShares MSCI Turkey ETF	Mar 26, 2008	Turkey	0.62
EWU	iShares MSCI United Kingdom ETF	Mar 12, 1996	United Kingdom	0.48
IWV	iShares Russell 3000 ETF	May 22, 2000	United States	0.2
IYY	iShares Dow Jones US ETF	Jun 12, 2000	United States	0.2

Table A. 2: Descriptive Statistics for Aggregate Analyst Recommendation, Market Returns and Other Variables

This table presents descriptive statistics for the excess world market returns in U.S. dollar, and excess world market return denominated in local currencies, currency risk factors and one-month U.S. Treasury Bill Rate for the period from January 1994 to June 2015. All variables are monthly. WMKT is the excess world market return denominated in U.S. dollar, which is calculated by subtracting the one-month U.S. Treasury Bill rate from the world market return obtained from MSCI world market index . LWMKT is the excess return on the world market portfolio denominated in local currencies. Dollar is the average change in the exchange in the exchange rate between the U.S. dollar and all other currencies. Carry is defined as the difference in exchange rates between baskets of high and low-interest rate currencies. RF is the 30-day U.S. Treasury Bill Rate. In Panel B, I report Pearson correlations. The superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Univariate Statistics

	Mean	Median	Standard Deviation	Maximum	Minimum
MSCI world market-excess return (WMKT)-%	0.29	0.67	4.32	10.89	-19.13
MSCI World market-excess return (LWMKT)-%	0.26	0.89	4.04	10.01	-16.54
Dollar-%	0.11	0.17	1.80	4.69	-6.86
Carry-%	0.67	0.84	2.44	8.84	-7.43
30-day U.S. Treasury Bill Rate (RF)	0.22	0.20	0.18	0.56	0

Panel B: Correlation Matrix

	WMKT	LWMKT	Dollar	Carry	RF
WMKT	1				
LWMKT	0.969***	1			
Dollar	0.522***	0.320***	1		
Carry	0.404***	0.457***	0.207***	1	
RF	-0.037	-0.027	-0.072	0.081	1

Appendix B: Ifo World Economic Survey Facts

The Ifo WES is an economic confidence survey conducted in more than 90 countries by the Ifo Institute for Economic Research in Munich, in cooperation with the Paris-based International Chamber of Commerce and with the financial support of the European Commission.[86] I collect the WES data for all countries in the sample from Datastream. The survey was initiated in the early 1980s and has been conducted quarterly since 1989. The survey is conducted in the first month of every quarter. Experts are asked for their near-term expectations, corresponding to a six-month horizon. Survey participants are required to respond within four weeks of receipt of the survey.

Survey respondents are domiciled in the country for which they answer the survey, and the panel contains economic experts with a range of specializations in management, finance, and other business functions. For each quarterly survey, the WES receives a total of about 1,100 questionnaires from 121 countries. The questionnaire is comparable over time and across countries since it is the same for all countries and has been used almost unchanged since 1983, except for a few questions that were introduced in 1998.

The survey is qualitative in nature and respondents can answer either ‘higher’, ‘about the same’, or ‘lower’. This study uses the average score of the survey respondents when asked their opinion with regards to the country's general situation regarding the overall economy expected by the end of the next six months. The respondents answer the question by ticking a box to indicate either ‘better’, ‘about the same’, or ‘worse’.

[86] For more details, see Koijen et al. (2015) and Stangl (2007).

Appendix C: Alternative Proxies of Aggregate Cash Flow News

In this section, I use two alternative proxies as indicator for the growth in countries' aggregate cash flows: growth in industrial production (IP) and growth in aggregate earnings. I obtain the quarterly IP data from the OECD database.[87] I obtain earnings data and the other inputs to construct measures of aggregate earnings changes from the Compustat Annual files. I use annual earnings data because quarterly earnings data are only infrequently available for the firms in the sample from 33 countries.

IP changes are defined as the percentage change relative to the same quarter in the previous year (seasonally-differenced).[88] Cash flow news proxied by aggregate earnings changes is based on three measures suggested in Kothari et al. (2006). For each firm, I first calculate the change in annual earnings (dE) as income before extraordinary items in year *y* (IB_y) minus income before extraordinary items in year *y-1* (IB_{y-1}) . To ensure that firms within each country have the same fiscal year end, I determine the most common fiscal year end month for each country and retain only firms reporting earnings in that month.[89] To be included in the sample, I also require that earnings change data is available for at least 50 firms for each country-year. I trim the sample at the top and bottom 0.5% based on these three measures (Howe et al., 2009; Kothari et al., 2006).

The first measure scales the earnings change in country *c* in year *y* aggregated across all firms *i*, i.e. the sum of $dE_{c,i,y}$by the market capitalization at the end of the previous fiscal year aggregated across these firms, i.e. the sum of $MktCap_{c,i,y-1}$. Thus the first measure is:

$$E1_{c,y} = \frac{\sum_{i=1}^{N} dE_{c,i,y}}{\sum_{i=1}^{N} MktCap_{c,i,y-1}} \quad \text{(C.1)}$$

[87] https://data.oecd.org/ Quarterly IP data is available for 24 countries. The database does not include IP data for China, Hong Kong, Indonesia, Malaysia, Philippines, Singapore, Thailand, Taiwan, and South Africa.
[88] I can get similar results if I use the percentage change to the previous period.
[89] The typical fiscal-year end month is stable through time for each country and covers most of the firms in that country.

The second aggregate earnings change measure is defined in a similar way, but now the scalar is last year's book equity aggregated across all firms, i.e. the sum of $BE_{c,i,y-1}$:

$$E2_{c,y} = \frac{\sum_{i=1}^{N} dE_{c,i,y}}{\sum_{i=1}^{N} BE_{c,i,y-1}} \quad \text{(C.2)}$$

The third measure of aggregate earnings changes, is based on last year's earnings aggregated across all firms, i.e. the sum of $IB_{c,i,y-1}$:

$$E3_{c,y} = \frac{\sum_{i=1}^{N} dE_{c,i,y}}{\sum_{i=1}^{N} IB_{c,i,y-1}} \quad \text{(C.3)}$$

1.1 Changes in IP

To examine whether aggregate analyst recommendations can predict cash flow news proxied by future IP changes, I estimate the following panel regressions:

$$\Delta IP_{c,q} = \alpha + \alpha_1 Rec_{c,q-1} + \alpha_2 \Delta IP_{c,q-1} + C_{\ i} + \ \varepsilon_{c,q} \quad \text{(C.4)}$$

Where $\Delta IP_{c,q}$ is the percentage change in IP for country *c* (from quarter *q-4* to quarter *q*). $Rec_{c,q-1}$ is the aggregate analyst recommendation for each country *c* at the end of the previous quarter *q-1*. Since growth in IP is highly auto-correlated, I also include lagged IP growth in the model. Finally to allow for systematic differences in growth rates across countries, I also include country fixed effects.

The first Panel in Table A.3 report the results for panel regressions C.4. The evidence clearly shows that country level recommendations contain information about next quarter's IP growth with positive and significant coefficient for both models.

In Panel B of Table A.3, I present the results from the Anderson Hsiao estimator. I also include these results to deal with the well-known problem that using fixed effects in a model that includes lagged values of the dependent variable results in biased estimates. The use of the Anderson Hsiao estimator in case of equation C.4 involves differencing equation C.4 to remove

the country fixed effects and replacing ($IP_{c,q-1} - IP_{c,q-2}$) by $IP_{c,q-2}$ as instrument. The coefficient estimates based on the Anderson Hsiao estimator are smaller but again show that aggregate analyst recommendations predict next-quarter IP growth.

1.2 Changes in aggregate earnings

To examine whether aggregate analyst recommendation can predict cash flow news represented by aggregate earnings changes, I estimate the following panel regression:[90]

$$\Delta E_{c,y} = \alpha + \alpha_1 Rec_{c,y-1} + C_i + Y_y + \varepsilon_{c,q} \quad \text{(C.5)}$$

Where $\Delta E_{c,y}$ is the annual aggregate earnings change for country *c* in year *y*, based on one of the three measures discussed before. $Rec_{c,y-1}$ is the aggregate analyst recommendation for country c at the end of the previous fiscal-year.

Table A.3 Panel C presents the original results and the ranked results. The first set of results are based on the original model after I trim the sample at top and bottom 0.5% to exclude extreme observations at firm level. The second set of results uses rank deciles to replace the aggregate earnings changes. The rank deciles range from -0.5 to 0.5 each year, where the decile of countries with the lowest aggregate earnings change is assigned a value of -0.5 and the decile of countries with the highest aggregate earnings change is assigned a value of 0.5. For each of the three measures I find that if aggregate earnings changes are replaced by their rank values, that country level analyst recommendations provide information with regard to next year's aggregate earnings change.

[90] Since there is no evidence of significant autocorrelation in any of the three aggregate earnings measures, I do not include $\Delta E_{c,y-1}$. When I do include lagged earnings growth, the coefficient is insignificant for measure one and three, and α_1 is very similar compared to the models without lagged earnings growth.

Table A. 3: Regressions of One-Quarter-Ahead IP on Aggregate Analyst Recommendations

Panel A shows the regression results of one-quarter-ahead IP on aggregate analyst recommendations. The sample period is from 1995Q1 to 2015Q4. All variables are quarterly. I include 24 countries in IP analysis due to data availability. The lagged one-quarter aggregate analyst recommendation is the aggregate analyst recommendation at the previous quarter-end month. I also require at least 50 firms that have an outstanding recommendation for that quarter-end-month in each country. IP data are from OECD and analyst recommendations are from I/B/E/S, respectively. For the percentage change of IP, I report results for the quarter to four quarter before change. In the OLS Estimator panel, Model 1 is the regression estimated with country fixed effect. Model 2 is the model estimated with country fixed effect plus the lagged IP growth. In the Anderson Hsiao Estimator Panel B, Model 1 is the regression estimated with lagged two quarters IP. Panel C shows the results for regressions of one-quarter-ahead aggregate earnings changes on aggregate analyst recommendations. I report the coefficient on aggregate analyst recommendations for three different measures of earnings changes. The sample period is from 1995 to 2015. All variables are annual. For each firm-annual observation, I calculate the annual changes of actual earnings (dE) as the income before extraordinary items (IB) minus its value from last year. To ensure that firms within each country have same fiscal year end, I simply choose the most typical fiscal year end month for each country and only keep companies that report earnings in that month. Similar to the previous studies, I keep only firms that have March, June, September, and December fiscal year end to ensure fiscal quarters are aligned. I trim the sample at top and bottom 0.5% based on these earnings changes measures. I also require at least 50 firms with outstanding recommendations are available within this country in a particular year when calculating the aggregate earnings changes. M1 is the first measure of earnings changes, which is computed as total individual firm's earnings changes scaled by the total market capitalization of these companies in country c at the previous year. M2 is computed as the total earnings changes within country c, scaled by the cross-sectional total book value of equity one year ago. M3 is calculated as the cross-sectional sum of earnings changes divided by the total earnings one year ago. All the *t*-statistics are clustered by country. The superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A: One-Quarter-Ahead IP OLS Estimator	**Panel B:** One-Quarter-Ahead IP Anderson-Hsiao Estimator	**Panel C:** One-Year-Ahead Aggregate Earnings Changes		
			Earnings Change	Original Results	Decile Ranks
	IP(q+1)	IP(q+1)			
Model 1	0.049	0.683	M1	2.328	1.539
	5.17***	2.59***		1.45	2.72***
Model 2	0.016		M2	0.038	1.642
	4.79***			2.44**	2.98***
			M3	0.063	1.638
				1.88*	3.34***

Appendix D: Alternative Constructions of Aggregate Analyst Recommendation

In this thesis, I use three measurements of country aggregate recommendation level. The first method is the value-weighted country level recommendation and is mainly used in the reporting results in this thesis. For the aggregate analyst recommendation, an alternative measure is the simple average recommendation, $Simple\_Rec_{i,t}$, which just takes the mean of all the outstanding recommendations for all stocks in the last month (exclude the last two days for current calendar month) at the end of each month for a particular country. Specifically, I use the following formula to calculate $Simple\_Rec_{i,t}$,

$$Simple\_Rec_{i,t} = \sum_{j=1}^{n} Rec_{j,t} * \frac{Cov\_Num_{j,t}}{\sum_{j=1}^{n} Cov\_Num_{j,t}} \quad \text{(D.1)}$$

where $Cov\_Num_{j,t}$ is the number of recommendation that covered firm j in month t, $\sum_{j=1}^{n} Cov\_Num_{j,t}$ is the total number of recommendation for country i in month t. This measure gives a weighted average that reflects the relative analyst activity for each stock. [91]

The other method is the equal average recommendation, $Equal\_Rec_{i,t}$. For each firm, I calculate the consensus recommendation for firm j, $Rec_{j,t}$ at the end of each calendar month using the same way as value-weight average recommendation. Then I take the mean of the consensus recommendation for all the eligible stocks for country i.

$$Equal\_Rec_{i,t} = \frac{1}{n} * \sum_{j=1}^{n} Rec_{j,t} \quad \text{(D.2)}$$

By first computing the consensus recommendation for each firm and then calculating the average recommendation rating for the country, I aim to prevent large firms with greater analyst coverage from unduly influencing aggregate analyst recommendations. Unreported

[91] To illustrate, suppose for Country C1 in month m1, there are three recommendations, two for firm A and one for firm B. If I use the equally-weighted method, each company has a weight of 1/2, whereas if I use the simple average method, Firm A has a weight of 2/3 and Firm B has a weight of 1/3. So the simple average method adjusts for the analyst coverage, if a company has more analyst recommendations, it will have a larger influence on the country average.

descriptive analysis shows that the correlation between three different measures of analyst recommendation is on average 0.75.

Appendix E: Discussion of Potential Time Stamp Errors in I/B/E/S

Prior studies have looked the issue of time-stamp errors in I/B/E/S and tried to mitigate the possible problems using various methods. Among these studies, Jegadeesh and Kim (2006) compared a sample of I/B/E/S recommendation dates with dates from analyst reports on Investext, both for the U.S. and G7 countries. They could match only about 8% of I/B/E/S recommendation revisions with Investext, which makes it difficult for statistical comparison. Among the reports that they found, most of the Investext dates matched I/B/E/S dates, but some of them preceded, and some of them followed I/B/E/S dates, both in the U.S. and G7 countries. However, virtually all Investext dates were within I/B/E/S announcement dates from -3 to +3 in both the U.S. and G7 countries. Irvine et al. (2007) have also discussed the potential date error problem. They randomly selected approximately 2% of the initiations sample from the I/B/E/S database and checked those dates against the Dow Jones news. They did not find any evidence that I/B/E/S dating errors could explain the price impact of recommendation initiations. Specifically, for the 194 initiations they checked, 133 were not reported by the Dow Jones. For the remaining 61 initiations, 57 dates matched precisely, and four initiation dates on I/B/E/S were one day after the Dow Jones records.

Loh and Mian (2006) document that I/B/E/S records a recommendation within 24 hours of its (electronic) submission by the issuing analyst. They compared the issue dates of recommendations in I/B/E/S with those in the actual company reports available from First Call and found that 92% of the I/B/E/S recommendations dates are the same as those on the actual reports.[92]

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

[92] Womack (1996) used First Call data to identify the precise date of revised analyst recommendations. He argues that First Call is a better data source than Investext and Zacks data.

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.[93]

Hoechle et al. (2012) found similar evidence by extending their studies to Germany and Switzerland. They document that the announcement date in I/B/E/S before 2002 is effectively the activation date, that is, when Thomson Reuters recorded the announcement. They also found that the announcement dates in I/B/E/S were delayed by about 0.61 trading days for recommendations compared to the announcement dates in First Call over the period 1994 to 2001. After 2002, the time-lag between I/B/E/S announcement dates and First Call announcement dates becomes significantly negative However, the average time difference falls within one day. By replicating previous work focusing on the price impact of analyst recommendations, they also argue that although the time stamp errors disappear in the U.S. after 2001, this type of error still exists in Germany and Switzerland after 2001. Apart from the time stamp errors, they also examined the abnormal returns around the announcement dates and found that when extending the event window to (-2, +2), there was no significant difference between I/B/E/S and First Call for both recommendation upgrades and downgrades. More recently, Bradley et al. (2014) documented that I/B/E/S introduced a new data collection tool in 2002 that allows it to collect research PDFs around the clock. Before this tool, I/B/E/S relied more heavily on batch files from contributors, where some recommendations were collected and sent to I/B/E/S at the same time.94 However, in their intraday study, Bradley et al. (2014) found that I/B/E/S time stamps were still delayed by about 2.4 hours when compared to concurrent news media.

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

[94] WRDS also documents that the new-version of I/B/E/S is time-stamped and the announcement date is when recommendation is released by an analyst.

Appendix F: Literature Review—the Value of Analyst Recommendations

1. Analysts' Recommendations at the Firm Level

The value of analysts' stock recommendations at the firm level has attracted the interest of both academics and practitioners. This strand of literature dates back to Cowles (1933). He showed that investments based on recommendations perform worse than the general run of stocks in the same period. However, a group of subsequent studies have found empirical evidence of abnormal returns earned around the recommendation initiations or revisions, which suggests that sell-side analysts play a significant role in the price discovery process. This section provides an extensive literature review of the evidence on the value of analyst recommendations. Moreover, it discusses studies relating to the characteristics of recommendations and factors that affect the value of analyst recommendations. Finally, this section discusses analyst recommendation research in an international context.

1.1 Do stock recommendations have predictive power at the firm level?

Analysts are important information agents who convey positive or negative information about firm performance through initial coverage or recommendation revisions. Several studies show that analysts' stock recommendations predict future stock price changes and are thus useful to investors. For example, Davies and Canes (1978) and Beneish (1991) found significant positive price reactions to favorable recommendation revisions, and negative price reactions to adverse recommendation revisions issued in the Wall Street Journal.

In an influential study, Womack (1996) used First Call data to analyze price and volume reactions to stock recommendation revisions that changed from or to the most extreme buy and sell categories. He showed that the issuance of recommendations has both an instant and long-term influence on stock prices where the market reacts strongest to downgrades to strong sell recommendations. Specifically, he found that stocks added to (removed from) strong buy obtained 2.98% (-1.94%) size-adjusted returns, while stocks added to (deleted from) strong sell

earned size-adjusted returns of -4.69% (0.32%) in the three-day event window of the recommendation revision. The post-recommendation price drift was also different for sell and buy recommendations where the average price drift for buy recommendations was short-lived and modest (one-month drift of 2.4%). For sell recommendations, however, the drift was long-lived and significant (six-month drift of -9.1%).

Kim, Lin, and Slovin (1997) examined opening trade behavior in response to the initial buy recommendations for publicly traded firms and found a robust positive valuation effect.[95] Instead of focusing on a particular type of recommendation, Irvine (2003) compared the stock returns around initiations to revisions or reiterations and found that two-day size-adjusted incremental price changes around initiations were 1.02% higher than the impact of recommendations issued by analysts already covering the stock. He also found that the incremental price impact of analyst initiations depended on the type of initial recommendation. Positive recommendations produced significant positive incremental price reactions, whereas hold and sell recommendations produced insignificant positive returns. In a contemporaneous paper, Bradley, Jordan, and Ritter (2003) confirmed that securities with positive analyst initiations (buy, or strong buy) experience abnormal market returns as high as 4%.

However, Altınkılıç and Hansen (2009) employed a narrow event window and found that returns within 40 minutes of revision announcements were economically insignificant (on average 0.03% for upgrades and -0.03% for downgrades), while the average return from the day before the revision until the revision announcement was economically significant (on average 1.1% before upgrades and -3.7% before downgrades). They suggest these results show that analysts tend to upgrade after positive news and downgrade following negative news.

[95] The authors claim that the opening trade is a critical factor because the analyst recommendations are disseminated to brokerage firms' important clients before the market opens. Hence, the opening trade is the first transaction that is likely to reflect this private information. Also, this information dissemination structure enables the authors to test the relative efficiency of call and dealer markets.

Considering this conflicting evidence, Bradley et al. (2014) checked the accuracy of recommendation announcement times reported in I/B/E/S and re-examined the value of analyst recommendations. They found that I/B/E/S time stamps are on average delayed by 2.4 hours compared to real-time newswire sources, and thus the findings in Altınkılıç and Hansen (2009) could have been the result of this time delay. After correcting for the time delay, the average 30 minute return is economically significant (1.83% for upgrades and -2.1% for downgrades).

In general, the studies discussed until now have examined the information content of analyst recommendations using average stock-price reactions to individual recommendation announcements as a proxy for the value of analyst activity. Instead of looking at individual analyst recommendations, several studies have also explored the value of consensus recommendations and taken a more investor-directed perspective.

Jegadeesh et al. (2004) formed portfolios for each quarter based on the relative position of consensus analyst recommendations and recommendation revisions. Buying the highest recommendation (revision) quintile of stocks and selling the lowest recommendation (revision) quintile of stocks yielded a 2.3% (2.7%) return over the following six-month period.[96] Barber et al. (2001) reported that daily rebalancing improved portfolio performance. They found that a portfolio of stocks with the most (least) favorable consensus yields an average annual abnormal return of 4.13% (-4.91%). However, a less frequent balancing of the portfolio or a reaction delay to the recommendations diminishes the abnormal returns for favorably recommended stocks, but not for least favorably recommended stocks. [97] In addition,

[96] Boni and Womack (2006) also tested the performance of recommendation-based investment strategies and found that an industry-based recommendation strategy improved trading performance substantially, and this industry-based profit may be large enough to offset trading costs.

[97] A similar study was done by Barber, Lehavy, Mcnichols, and Trueman (2003). However, this study showed that analysts performed poorly during 2000-2001, but for the longer period (1986-2001), more favorable recommended stocks still generated significantly greater market-adjusted returns. They suggest that one possible explanation for the poor performance during 2000-2001 is that analysts continued their tendency to cover small-cap growth stocks, which underperformed in the market during these two years.

considering the number of transactions involved in the trading process, this trading strategy is no longer profitable.

Overall, irrespective of whether individual recommendations or consensus recommendations are used, most studies provide evidence that analysts convey useful firm-specific information.

1.2 What factors affect the value of analyst recommendations at the firm level?

In addition to finding that recommendations affect stock prices, Stickel (1995) identified factors associated with short-term and long-term stock price changes in response to analyst recommendations. Using the cumulative abnormal return (CAR) over a short window (-5, 5) and a long window (-5, 120) surrounding the recommendation announcement to proxy the temporary and the permanent price performance, the author showed that recommendation strength, firm size, and contemporaneous earnings forecast revisions have a permanent impact on the price, whereas recommendation changes' magnitude, analyst reputation, and brokerage firm size temporarily affect price changes.

Green (2006) took a different perspective and discussed whether certain types of recommendations were more informative compared to others. In particular, he investigated whether brokerage firms' clients with early access to analyst recommendations could capture short-term profits. To minimize reliance on the accuracy of the time stamp of recommendations, the author restricted this study to analyst reports issued outside regular trading hours and focused on the price changes from the day before recommendation announcements to the day after recommendation announcements.[98] He found that investors with early access to recommendations could obtain an average two-day return of 1.02% (1.5%) by purchasing (selling) stocks following upgrades (downgrades) after controlling for transaction costs. A

[98] On the recommendation day, clients have access to the recommendation change before the market opens. The information typically becomes publicly available by the opening trade on the day following the recommendation day.

calendar-based trading strategy resulted in average excess returns greater than 30% per year, indicating that trading promptly to recommendation announcements enhanced the portfolio returns studied in previous studies (Jegadeesh et al., 2004).

Barber et al. (2006) divided brokers into five groups based on the percentage of end-of-quarter buy recommendations and considered whether recommendation announcement day returns differed across brokers' favorableness quintiles. They found that upgrades to buy (downgrades to hold or sell) issued by brokers with the smallest percentage of buy recommendations significantly outperformed same types of recommendations issued by brokers with the highest percentage of buys, with 50 basis points per month (underperformed with 46 basis points per month).

Several studies have found that analyst experience affects market reactions to analyst recommendations or revisions. For example, Sorescu and Subrahmanyam (2006) found that analysts with more experience provide more informed recommendations. This study introduced the concept of "weight" and "strength" to specific events. The dramatic nature of a revision is given a strength measurement, while the analyst's experience or reputation is given a weight measurement. In particular, the returns from buying upgraded stock and selling downgraded stock were negative in response to low-weight (inexperienced analysts or analysts from less reputable investment banks) high-strength recommendation changes. In contrast, for high-weight low-strength recommendation changes, there was a return drift of 6% to 9% per year. Muslu and Xue (2013) examined the positive feedback effect of momentum recommendations and found that momentum recommendations are more likely to be issued by less talented and less experienced analysts.

Instead of focusing on the average effect of analyst recommendations, Loh and Stulz (2011) examined whether individual recommendations are influential. In particular, they found that recommendations from the leader, star, and previously influential analysts are more

influential. Moreover, recommendations issued away from consensus, accompanied by earnings forecasts, and published on growth firms are also more influential. Similarly, Fang and Yasuda (2014) examined the effects of reputation on the value of recommendations and found the impact was different between the tech sector and non-tech sector. Specifically, reputable analysts significantly outperformed less reputable analysts at a personal and institutional level in the tech sector, whereas in the non-tech sector, reputation only made a difference at the institutional level.

Several studies have highlighted that "proximity" is an important determinant of the value of analyst reports. For example, Malloy (2005) found that geographic proximity provides an information advantage to U.S. analysts. Thus, local analysts are more accurate, and their reports have a more substantial effect on stock prices compared to other analysts. However, this paper does not exclude the possibility that the demand of local investors caused the observed abnormal returns. Bae et al. (2008) extended Malloy (2005) to a large sample of countries and found that analysts that reside in a country make more precise earnings forecasts for firms in that country than analysts residing outside that country. Furthermore, Du, Yu, and Yu (2017) examined whether cultural proximity affects analyst forecast accuracy. Specifically, they restricted their sample to a set of firms that traded in the U.S. but were headquartered in the "pan-Chinese region" and identified Chinese analysts by surname.[99] They found that among the 9,788 U.S. analysts in their sample, the 333 analysts with Chinese ethnic origins provided more accurate forecasts for Chinese firms than non-Chinese analysts. However, these studies did not control for the differential information between local and foreign analysts. Jia, Wang, and Xiong (2017) controlled for the information difference and employed a unique set of segmented dual-class shares issued by a group of Chinese firms. They examined the different reactions of local and foreign investors to recommendations and found that local investors reacted stronger to recommendations issued by local analysts compared to foreign investors.

[99] The "pan-Chinese region" includes mainland China, Hong Kong, Taiwan, and Singapore.

Similarly, foreign shares had stronger price reactions to recommendations made by foreign brokerage houses compared to local shares.

Herding behavior toward the consensus is another possible source that affects the value of analyst recommendations (Hong, Lim, & Stein, 2000; Trueman, 1994; Welch, 2000). Jegadeesh and Kim (2009) argued that stock prices react significantly more to recommendations that are away from the consensus compared to recommendations that are closer to the consensus. Bradley et al. (2014) defined recommendation revisions that are opposite to recent stock price movements as contrarian recommendations, and tested whether these recommendations induce larger market reactions. Interestingly, they found that upgrade and downgrade contrarian recommendations induce larger market reactions than non-contrarian recommendations, and the strongest results appear in the period before Regulation Fair Disclosure.

1.3 Do analyst recommendations convey new information?

There is another strand of literature that challenges the view that analysts provide useful information. Several studies argue that recommendations are considered to be informative only because analysts typically issue recommendations immediately after related announcements. For example, Altınkılıç and Hansen (2009) showed that about 80% of analyst recommendation revisions are announced within a few hours of earnings announcements or other corporate events. They argue that analyst recommendations are information-free and they usually "piggyback" on recent news, long-term momentum, and short-term reversal indicators.[100]

Similarly, Loh and Stulz (2011) found that after excluding recommendations announced within three days of the release of confounding firm-specific news, the average two-

[100] Altınkılıç, Balashov, and Hansen (2013) did a similar study for analyst earnings forecast revisions using intraday returns evidence and demonstrated that announcements of analysts' forecast revisions on average release little new information in the short run. Jegadeesh et al. (2004) also showed that analysts prefer to cover high momentum and growth stocks, and the recommendations are usually inconsistent with momentum indicators and negatively related to contrarian indicators.

day abnormal return around revisions dropped dramatically, and only 12% of analyst recommendations led to significant cumulative abnormal returns over the two-day event window.

Asquith et al. (2005) argue that analysts provide both new information and interpret existing information. After controlling for firm characteristics and contemporaneous information releases, they found average market-adjusted returns of -6.6% for downgrades, and an average market-adjusted return of 4.5% for upgrades over the (-2, 2) five-day event window.

Michaely and Womack (1999) examined the information content of recommendations, focusing on favorable recommendations announced in the period after the quiet period.[101] They found that in the month after the quiet period, analysts from lead underwriters disseminated 50% more buy recommendations on IPOs compared with analysts from other brokerage firms. Moreover, the authors showed that recommendations are biased when analysts are affiliated with the underwriter. Specifically, the size-adjusted excess return for stock recommended by the underwriter was 2.7% on the announcement day of buy recommendations, whereas the size-adjusted excess return for stock recommended by non-underwriter was 4.4%.

Ivković and Jegadeesh (2004) found that recommendations are often released around the same time as earnings announcements and coincide with management guidance. They used three-day market adjusted excess returns (including the day of the announcement and the two following trading days) and found that the strongest price reaction to recommendation upgrades occurs in the week before earnings announcements. This evidence is consistent with their hypothesis that analysts have early access to positive news before earnings announcements.

Yezegel (2015) provides an alternative explanation for the clustering of recommendations around earnings announcements and identified the factors that affect the

[101] The quiet period typically starts 25 days after the IPO and it is only then that underwriters and syndicate members can start commenting on the valuation and provide earnings estimates for the new company.

timing of analysts' recommendations. Consistent with Altınkılıç and Hansen (2009), he found that analysts strategically time their revisions, and analysts who need to improve their stock-picking performance tend to react strongly to earnings surprises. However, the magnitude of this relation is small and ranks last when compared to the economic effect of other factors. He found that analysts issue recommendations when investor demand for advice is high, when the relative supply of information available on earnings announcements is high, and when they detect mispricing. These results suggest that analysts try to provide useful guidance to their clients.

Several studies have questioned whether the three main elements of analyst reports provide different information. For example, Asquith et al. (2005) showed that changes in summary earnings forecasts, stock recommendations, and price targets all provide independent information to the capital markets. Bradshaw (2004) attempted to explore how analysts use their earnings forecast when preparing stock recommendations.[102] He showed that investors equipped with basic valuation knowledge (for example, a price-earnings-to-growth model) can come up with an investment strategy that outperforms analyst recommendations. Loh and Mian (2006) examined the relation between the accuracy of analysts' earnings forecasts and the profitability of their stock recommendations. They sorted analysts into five groups based on the accuracy of their earnings forecasts, and within each quintile, formed long-short portfolios based on the average recommendations. They documented that the average factor-adjusted return associated with the recommendations of analysts in the highest earnings forecast accuracy quintile exceeded the corresponding return for analysts in the lowest accuracy quintile

[102] While analysts issue both earnings forecasts and recommendations, the timing of their forecasts and recommendations is likely to differ because of differences in the purpose of the two types of outputs. Forecasts reflect analysts' predictions of various future financial statement line items, and therefore, analysts are expected to update their forecasts upon receiving material information that changes their estimates of future corporate performance. In contrast, recommendations reflect the divergence or convergence between the analyst's valuation and the market's valuation. Therefore, recommendation revisions are not necessarily expected to follow the arrival of material information, unless analysts produce private information or stock prices incorporate private information previously discovered by analysts.

by 1.27% per month, which means that analysts who issue more accurate earnings forecasts also provide more useful stock recommendations.

Kecskés, Michaely, and Womack (2016) argue that analysts update their stock recommendations either for earnings-related or non-earnings reasons and provide more detailed evidence of the reasons for asset price changes.[103] They found that stock recommendations accompanied by earnings forecast revisions are more profitable and lead to more extensive price reactions (1.3% for earnings-related upgrades and -2.8% for earnings-related downgrades).

1.4 Analyst recommendation research in an international context

The literature on financial analysts' stock recommendations primarily focuses on the value of recommendations in the U.S. markets. Several studies have examined the performance of analyst recommendations in other countries and compared them to the performance of analysts based in the U.S.

Jegadeesh and Kim (2006) evaluated the value of analyst recommendations in the G7 countries. Specifically, they examined the distribution of recommendation levels in each country and found that although a positive bias exists in all the G7 countries, the U.S. has the lowest frequency of sell recommendations.[104] Moreover, they also found that the U.S. has the largest price reactions to recommendation changes and the most significant post-recommendation drift. By testing recommendations of ADRs and their underlying local stocks, which are the same set of securities that have been covered by U.S. analyst and foreign analysts, the authors argue that the possible reason for the superior performance of the U.S. analysts might be their superior skills compared to their foreign counterparts.

[103] The authors define a recommendation revision as earnings-related if they could find a matched firm-date-analyst observation in both the recommendation and earnings estimate database.
[104] The literature generally views the level of recommendations as one indicator of the conflict of interest that analysts face. See Lin and Mcnichols (1998), Michaely and Womack (1999).

A similar study in emerging markets was done by Moshirian et al. (2009). They documented that stock prices reacted strongly to analyst stock recommendations and revisions for a sample of 13 emerging markets over the period 1996 to 2005. They also found that analyst recommendations have a stronger positive bias compared with more developed markets. He, Grant, and Fabre (2013) examined the investment value of analyst recommendations in Australia and found that stocks with positive consensus recommendations obtain higher returns than the market index, whereas stocks with negative consensus recommendations earn lower returns than the market index. Table A.4 summarizes similar studies that have been done in other countries; the results of these studies provide mixed results on the value of analysts' recommendations.

Table A. 4: Selected Papers Conducting International Studies Related to Analyst Stock Recommendations

Reference	Sample	Key Results
Jegadeesh and Kim (2006)	G7 countries, 1993-2002	The U.S has the largest price reactions to recommendation changes and the most significant post recommendation drift.
Moshirian et al. (2009)	13 emerging countries, 1996-2005	Stock prices react strongly to analyst stock recommendations and revisions.
He et al. (2013)	Australia, 1998-2008	Recommendations are positively associated with stock returns.
Azzi and Bird (2005)	Australia, 1994-2003	Recommendations are useful when selecting stocks with negative prospect, whereas recommendation revisions provide useful information across all stocks.
Lonkani, Khanthavit, and Chunahachinda (2010)	Thailand, 1993-2002	Recommendations provide useful information in the Thai market.
Da Silva (2013)	Portugal, 2009-2011	Sell and hold recommendations affect prices negatively, whereas buy recommendations do not have predictive value to investors.
Erdogan, Palmon, and Yezegel (2010)	Turkey, 1993-2005	Recommendations cannot predict stock returns.

1.5 Industry expertise or country specialization?

Due to the growing number of listed firms and the increasing amount of information that analysts have to cope with, the evolution of the financial analyst industry has tended towards specialization. Analysts usually center on only one or a few industries in the country that they work in. For example, Boni and Womack (2006) claim that financial analysts

specialize by industry. They suggest that analysts, as industry specialists, can provide useful suggestions when they pick securities within industries. A strategy that invests based on recommendations from within the industry substantially improves the return to risk ratio (from 0.28 to 0.49). Moreover, Womack (1996) has shown that the outperformance of sell recommendations is mainly due to industry selection.

However, Kini, Mian, Rebello, and Venkateswaran (2009) argued that the structure of analyst portfolios is endogenously determined by choice of analysts and brokerage firms, which may affect the accuracy of analyst forecasts as well. They found that analysts' decisions to specialize by country or industry depends on market capitalization, which is consistent with the story that generating revenue is essential for the sell-side research. They also provided evidence that brokerage firms tend to assign analysts to cover stocks from sectors or countries that they are familiar with.

Using the Herfindahl–Hirschman Index (HHI), Salva and Sonney (2010) classified analysts as either country-specialized or industry-specialized, and examined the relative usefulness of recommendations issued by country-specialized analysts and industry-specialized analysts.[105] They found that country-specialized analysts perform better than industry-specialized analysts.

2. Positive Bias in Analyst Recommendations

Several studies have shown that favorable recommendations are much more frequent than unfavorable ones, and that analysts are reluctant to issue negative recommendations. Womack (1996) noted a ratio of 7 to 1 in his sample. Barber et al. (2001) found that between 1985 and 1996, 54 percent of recommendations were "buy" and "strong buy." Barber et al.

[105] The Herfindahl Index is a concentration ratio that is generally used as an indicator of the degree of competition in an industry. So for each year and each analyst, there is one sector HHI and one country HHI, with a maximum value of 1. Based on the HHI value, the authors classified country specialists and industry specialists, and then compared the performance difference of these two groups of analysts.

(2003) also documented that analysts were optimistic before 2000 and that this reversed somewhat in 2001.

2.1. Conflicts of interest faced by analysts

One strand of literature views the distribution of recommendations tilted towards positive recommendations as intentional and examines the incentives that cause analysts to issue favorable recommendations. For example, Lin and Mcnichols (1998) studied the effect of the underwriting relationship on stock advice and found that analysts from lead and co-underwriters tend to issue more favorable recommendations compared with independent analysts. Michaely and Womack (1999) argued that stocks recommended by underwriter analysts performed poorly relative to stocks that received "buy" recommendations from unaffiliated analysts. Their results suggest that analysts face potential conflicts of interests with brokerage firms wanting to secure potential clients to obtain future investment banking business. Hong and Kubik (2003) examined the career concerns of financial analysts and found that forecast accuracy can help analysts move to upper ranking brokerage houses. However, the brokerage houses do not solely rely on forecast accuracy and tend to reward more optimistic analysts.

However, Dugar and Nathan (1995) provide contrary evidence. They found that although affiliated analysts are more optimistic than independent ones, their earnings forecasts have on average the same level of accuracy as the earnings forecasts issued by non-investment banker analysts.[106] Malloy (2005) re-examined this issue by focusing on the value of hold recommendations and conditioning on the geographic proximity between analysts and firms. He found that the average three-day excess return to hold recommendations issued by distant affiliated analysts is -1.74% (*t*-statistic = -3.87), which is significantly higher than the average

[106] However, Dechow, Hutton, and Sloan (1997) documented that the earnings estimates of underwriters' analysts are significantly more optimistic than those of unaffiliated analysts, and that stocks are most overpriced when they are covered by affiliated underwriters.

three-day reaction to hold recommendations issued by local affiliated analysts (-0.25% with *t*-statistics of -0.78). The author thus concluded that the well-known underwriter affiliation bias in analyst recommendations is due to the distant affiliated analysts instead of local affiliated analysts.

Due to the existence of conflicts of interest, the market discounts the recommendations issued by affiliated analysts. However, unaffiliated analysts may recognize the advantage of the underwriter in competing for future investment banking business, which gives unaffiliated analysts a strong incentive to issue favorable recommendations and get potential business. Bradley, Jordan, and Ritter (2008) further investigated this issue and found no evidence that the market treats affiliated and unaffiliated analysts' recommendations differently after controlling for the recommendation characteristics and timing (quiet period and post-quiet period). Consistent with Bradley et al. (2003), they observed a significant five-day price reaction to the initiations issued by both affiliated (4.39%) and unaffiliated analysts (7.16%) in a quiet period.

Moreover, in addition to attributing this positive bias to underwriting activities, Cowen, Groysberg, and Healy (2006) have provided evidence that analysts from retail brokerage firms issue more favorable recommendations than those that only serve institutional investors. This study supports the idea that positive bias is partly due to the trading activities.

2.2. Analysts' self-selection

Another strand of literature claims that analysts prefer to recommend stocks for which they hold favorable views. For example, Mcnichols and O'brien (1997) showed that analysts tend to start following firms they think have favorable prospects and stop following firms that do not. Consistent with this idea, returns are significantly higher for stocks that are added to coverage compared to stocks already covered and subsequently dropped stocks, which means

analysts' self-selection is at least a partial explanation for the observed positive bias in recommendations.

Other studies have also shown that analysts are inclined to cover certain types of stocks. First, sell-side analysts tend to follow and give out recommendations for large firms. For example, Womack (1996) found that 57% of recommendations issued by the largest 14 brokerage firms in the U.S. were for stocks in the top two NYSE/AMEX market capitalization deciles. However, only one percent of all recommendations were for the bottom two market capitalization deciles. This phenomenon is consistent with the idea that large firms' stocks provide more liquidity than small firms, and that recommendations will generate higher fees for the brokerage firms.

Jegadeesh et al. (2004) found that sell-side analysts are more inclined to recommend "glamour" stocks instead of "value" stocks. Specifically, stocks that have positive momentum, high trading volume, significant sales, and earnings growth tend to receive more favorable recommendations. A possible explanation is that sell-side analysts typically work for brokerage firms whose income also comes from investment banking activities. Since growth firms provide more business opportunities, such as the issuance of new equity, sell-side analysts working for brokerage firms have an incentive to follow these stocks.

2.3 Recommendations and regulatory changes

2.3.1 Regulation Fair Disclosure

In reaction to the practice of firms disclosing important information to certain institutions in advance, Regulation Fair Disclosure (Reg. FD) was introduced in October 2000. Reg. FD aims to prevent differential information access to firm insiders and eliminate "selective disclosure" where analysts obtain information from firm management that is not publicly available. The important question is whether the rules implemented by regulators and politicians had the expected effect and made analyst research more useful to investors.

Several studies have found that Reg. FD has had a significant impact on the information content of analyst reports. For example, Herrmann, Hope, and Thomas (2008) examined the effect of Reg. FD on analyst forecast bias for companies with a high portion of foreign operations. Analysts following such companies are inclined to maintain good relations with management to get useful information. The authors showed that both the forecast errors and the positive relation between forecast optimism and firm international diversifications decreased, which indicates that Reg. FD has successfully reduced the positive bias.

Gintschel and Markov (2004) studied the informativeness of earnings forecasts and recommendations after Reg. FD. They found that the total price impact of forecasts declined by 28% after Reg. FD, and the reduction in average price reaction to recommendations was about 22%. Moreover, they also showed that Reg. FD affects the informativeness of recommendations for growth firms, i.e., firms for which analysts are more likely to require internal, firm-specific information. Apart from the investigation of the impact of regulatory changes on the value of analyst recommendations, the authors also provided empirical evidence that communication with managers is an important source of information for analysts.[107]

However, Loh and Stulz (2011) employed a probit model to test whether Reg. FD stifled or improved analysts' ability to produce useful research. They found that although the overall mean price impact of recommendations has reduced since Reg. FD, the probability that a recommendation change is influential has increased.

Eleswarapu, Thompson, and Venkataraman (2004) concluded that aggregate information flow has been unchanged by Reg. FD, but information asymmetry as reflected in the adverse selection component of trading costs has decreased.[108]

[107] Similarly, Cornett, Tehranian, and Yalçın (2007) found that within a four year window, stock price reactions to analyst recommendation revisions decreased significantly after the passage of Reg. FD.

[108] Heflin, Subramanyam, and Zhang (2003) documented that since Reg. FD, there is a higher frequency of public disclosure of forward-looking earnings information by firms, which has led to improved information efficiency.

2.3.2 Regulation changes since the Global Analyst Research Settlement

In April 2003, U.S. and state regulators announced the Global Analyst Research Settlement, with ten of the largest investment banking firms settling enforcement actions related to alleged conflicts of interest between research and investment banking operations. These rule changes were triggered by controversies and complaints about the conflicts of interest faced by analysts making recommendations. In the middle of 2001, the U.S. House of Representatives held hearings on sell-side analysts' conflicts of interest. The Office of Investor Education and Assistance of the U.S. Securities and Exchange Commission (SEC) published an "Investor Alert" to inform investors about the conflicts of interest faced by brokerage analysts. National Association of Securities Dealers (NASD) requested comments on "Proposed Amendments to Rule 2210" that would increase firms' disclosure requirements. The Association for Investment Management and Research (AIMR) set up a task force on analyst independence and invited comments on a proposed issues paper titled "Preserving the Integrity of Research." The Securities Industry Association (SIA) organized an Ad Hoc Committee on analyst integrity and came to a set of guidelines, presented in "Best Practices for Research." Motivated by these activities, the U.S. SEC approved the new NASD Rule 2711 and NYSE Rule 472 in May 2002 and agreed to a "global research settlement" in December 2002.[109] The outcome of this process was the separation of investment banking business and financial analyst research. So from December 2002 onwards, analysts have not received compensation from investment banking activities. The rules also require that brokerage firms report the rating distributions and analysts' trading positions in the stocks they cover.

Boni and Womack (2002) collected buy-side investment professionals' view of sell-side analysts, conflicts of interest, and possible remedies in the fall of 2001. They compared

[109] On May 10, 2002, the SEC approved new National Association of Securities Dealers (NASD) Rule 2711 and amendments to New York Exchange (NYSE) Rule 472 to "address conflicts of interest that are raised when research analysts recommend securities in public communications" (SEC, 2002, p. 3). The rules were implemented in phases from July to November 2002.

the survey results with the provisions that the SEC approved.[110] They concluded that the new NASD and NYSE rules were inconsistent with most of the concerns proposed by the majority of the surveyed buy-side professionals. However, the majority of surveyed buy-side professionals were skeptical about how to eliminate the incentives and pressures that analysts face from investment banking. In general, experts argued that trading commissions could not cover the cost of investment research.

Boni and Womack (2003) further explored the effects of the new rules and settlements. They document that after the announcement of the new rules, brokerage firms cut research department funding, decreased the number of employed analysts, and reduced the coverage of particular companies and industries. With the decline of analyst coverage, the speed with which new information got incorporated in stock prices also decreased. Recommendations became less frequent than before, and the financial analyst industry became less competitive. Boni and Womack (2003) also showed that institutional investors and retail investors use analyst recommendations differently, and it is possible that institutional investors are more likely to read the disclosures and use that information than individual investors.

Barber et al. (2006) analyzed the distribution of analyst recommendations from brokerage firms and investment banks. They found that the proportion of buy ratings dropped from 74% in mid-2000 to 42% in mid-2003. One possible explanation is that stock markets and the economy suffered a sharp decline during that period, so analysts were more likely to issue negative ratings. However, this cannot fully explain the sharp drop in favorable recommendations because research has shown that even during the economic recovery, analysts were less optimistic than before. Kadan et al. (2009) also studied the effect of the

[110] The SEC noted that "some aspects of the rules incorporate novel approaches to dealing with conflict problems" that may have negative and unforeseen impacts in the marketplace. The SEC therefore requested that the NASD and NYSE evaluate "the operation and effectiveness" of the rules by November 1, 2003. The SEC also stated that it had "commenced a formal inquiry into market practices concerning research analysts and the conflicts that can arise from the relationship between research and investment banking", which would possibly "indicate the need for further SRO rulemaking or additional Commission action" (SEC, 2002, pp. 36-37).

regulations and settlement on sell-side analysts. They point out that many brokerage firms changed their analyst rating system from 5-tiers to 3-tiers after the implementation of the new rules. They report finding that favorable recommendations became less frequent and more informative, whereas the negative recommendations became more frequent and less informative. They also used the absolute price reaction to examine the overall usefulness of analyst recommendations after the rule changes and found a reduced level of information. Their results indicate that the rules and regulations changes may have gone too far. Although the overall informativeness of recommendations decreased, they also found that the declining number of positive recommendations could have caused positive recommendations to become more informative.

Irvine et al. (2007) examined the trading behavior of institutions before the public release of analysts' buy and strong buy initial recommendations. They found that before the announcement of analysts' initial recommendations, there was high institutional trading volume and institutional buying starting from five days before recommendations were released to the public. They demonstrated that institutions buying before the recommendation release earned abnormal profits and provided empirical evidence consistent with the existence of tips received by some institutional investors.

Loh and Stulz (2011) have also shown that recommendation changes are more likely to be influential after the Settlement. It is, therefore, possible that the regulatory scrutiny improved the overall quality of analyst recommendations.

Similar laws aimed at reorganizing European financial markets, called the Market Abuse Directive (MAD), were adopted in 2003 in Europe. MAD also tried to mitigate the conflicts of interest faced by analysts and create a more strict disclosure environment. Dubois, Dumontier, and Frésard (2010) have provided evidence that the implementation of MAD significantly reduced the percentage of positive recommendations from affiliated analysts, but

investors in Europe did not change their behavior. European investors continued to discount recommendations from affiliated analysts, whereas U.S. investors tended to respond more strongly to the regulation changes. Dubois et al. (2013) relate the differing impact of the rule changes to different legal conditions and demonstrate that the effect of rule changes is stronger in countries that have more vigorous enforcement and more severe legal punishment.

The studies mentioned above examine the impact of legal reforms on analyst recommendations in a single country. Hovakimian and Saenyasiri (2014) analyzed the spillover effects of the U.S. Global Settlement on earnings forecasts in 40 countries. They argued that after the adoption of the new rules, the positive bias in earnings estimates decreased, and the spillover effect was stronger in countries with more active connections with U.S. investment banks and fewer investor protections. Contrary to their study, Dubois et al. (2010) showed that the European financial analysis industry was not directly affected by the U.S. regulations and that even analysts from U.S. brokerage firms continued to issue biased recommendations on European companies.

3. The Value of Aggregate Information

There is growing literature on the predictive content of aggregate managerial actions. Lakonishok and Lee (2001) examined the insider trading activities of all companies trading on the NYSE, AMEX, and NASDAQ during the period 1975-1995.[111] They calculated the net purchase ratios of three different sized groups by dividing the net aggregate number of insider purchases by the total number of insider transactions over a six-month period. In general, insiders seemed to be able to predict market returns, and the results were driven by their ability to predict returns for smaller firms. Lynch, Nikolic, Yan, and Yu (2014) found that aggregate shorting forecasts market returns. For each day, they constructed a predictive variable based on aggregate shorting activity during the previous five trading days, and forecast future market

[111] Seyhun (1992) showed that aggregate insider trading significantly predicts future market movements.

excess returns over the following ten days. One standard deviation increase in daily aggregate shorting was associated with a decrease of 36 basis points in excess market return over the following 10 trading days.

Anilowski et al. (2007) examined the effect of aggregate earnings guidance on market returns and tested whether aggregate measures of quarterly earnings guidance could capture overall earnings news and drive stock market returns. They found that market returns accompany downward aggregate earnings guidance. They also showed that the aggregate earnings guidance is a leading indicator of the economic news and events that drive aggregate stock market returns.

A few studies provide evidence on the value of aggregate accounting information. Kothari et al. (2006) found that returns are unrelated to past earnings, suggesting that prices neither underreact nor overreact to aggregate earnings news. That is, there is no evidence of post-earnings announcement drift in aggregate data. Second, they found that aggregate returns are negatively related to contemporaneous earnings in the U.S. The strong negative relation suggests that discount rates rise when earnings are unexpectedly high, an effect that dominates the cash-flow news in quarterly and annual earnings. Aggregate earnings fluctuate with discount rates because both are tied to macroeconomic conditions, while firms' earnings primarily reflect the idiosyncratic cash-flow news. Put differently, the cash-flow news is mainly idiosyncratic, while discount rate changes are common across firms.[112]

However, He and Hu (2014) showed that the negative aggregate earnings-returns relation is unique to the United States. They found that in 28 non-U.S. markets, aggregate earnings changes were positively associated with contemporaneous market returns. Moreover, their results also showed that for international countries, the lagged aggregate earnings changes were not related to contemporaneous market returns, suggesting that market prices respond to

[112] See also Cready and Gurun (2010).

aggregate earnings changes in an efficient way. Further evidence shows that the relation between aggregate earnings and returns is weakened in countries with more transparent financial disclosures.

Hirshleifer et al. (2009) examined whether aggregate accruals can predict the aggregate stock market. Contrary to previous findings that accruals cannot predict stock returns at firm-level, this study demonstrates that aggregated accruals are a strong predictor of aggregate stock returns.

Finally, Howe et al. (2009) aggregated recommendations at the firm level and tested its predictive power for aggregate market and industry returns. Using only recommendations for U.S. companies, they demonstrate that aggregating analyst recommendations helps to predict market and industry returns. Specifically, they found that positive changes in aggregate analyst recommendations predict high market excess returns, and these results hold after controlling for macroeconomic variables. They also tested industry returns using the same method and found that changes in aggregate analyst recommendations weakly predict industry return and industry earnings growth.

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