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Value of analyst recommendations: International evidence ☆

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Abstract

We evaluate the value of analysts' recommendations in the G7 countries. Stock prices react significantly to recommendation revisions in all countries except Italy. We find the largest price reactions around recommendation revisions and the largest post-revision price drift in the US. Neither differences in the timing of recommendation revisions relative to earnings announcements nor differences in industry coverage explain the superior performance of the US analysts' recommendations. Tests within a subsample of ADRs indicate that the most likely explanation for the superior performance is that the US analysts are more skilled at identifying mispriced stocks than their foreign counterparts.

JEL classification: G14; G15; G24

Keywords: International financial markets; Analyst recommendations; Conflicts of interest

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1. Introduction

Stock analysts form an integral part of capital market operations, providing stock related research for their brokerage clients who use their research reports, earnings forecasts and stock recommendations for investment decisions. Recently, analysts' roles as investment advisors have come under intense scrutiny. Media reports and some anecdotal evidence suggest that analysts compromise their objectivity and issue positive recommendations to curry favor with potential investment banking clients of their employers, rather than for the benefit of the investors who rely on their advice. A recent Fortune article, for instance, claims that the investment advice offered by analysts is "so dishonest and fraught with conflicts of interest that it has become worthless."[1]

Analyst recommendations do contain an element of bias towards being favorable. Earlier papers document that analysts rarely issue sell or strong sell recommendations. Jegadeesh et al. (2004) report that the average analyst rating over the 1985 to 1999 period is close to a buy recommendation and sell or strong sell recommendations make up less than five percent of all recommendations. Furthermore, Lin and McNichols (1998) and Michaely and Womack (1999) find that the analysts employed by the lead underwriters for new equity issues issue more favorable recommendations for those stocks than the other analysts who follow them.[2]

Extant literature finds that despite inherent biases analyst recommendations do add value. Stickel (1995) and Womack (1996) document that recommendation upgrades tend to outperform downgrades, and Barber et al. (2001), Jegadeesh et al. (2004), Boni and Womack(2003) and Green (2006) find that the stocks with the most favorable recommendations outperform the stocks with the least favorable recommendations. These findings indicate that investors can benefit from analysts' recommendations if they consider the relative levels of recommendations across stocks, or if they pay attention to changes in recommendations.

How much value can analysts potentially add? This is certainly a hard question to answer because there is no natural benchmark. In a perfectly efficient market, analysts would not be able to add any value because market prices already would reflect any information analysts might have. If analysts possess unique skills in collecting and analyzing value-relevant information, however, then they can add value, but its magnitude can only be empirically determined. Several papers have examined the value of analyst recommendations in the US to shed light on this issue. The recent controversy about the US analysts' objectivity and the debate about the usefulness of their recommendations, however, indicate that our understanding of how much value analysts can add is far from complete. An examination of the value of analyst recommendations in other developed countries will give us a more comprehensive picture of the extent to which the unique skills of analysts are useful for investors.

This paper examines analyst recommendations in the Group of Seven (G7) industrialized countries and evaluates their value for investors. While the value that analysts add has been extensively studied in the US, that value in the other countries has

[1]See Gimein (2002).

[2]Also see Bradley et al. (2003) for more evidence on conflicts of interest due to investment banking relationships.

received scant attention in the literature. This paper fills that gap. The results here shed light on the importance of the role that analysts play in various markets.

We first examine the distribution of analyst recommendation levels in each country in our sample. The literature generally views the level of recommendations as one indication of the conflict of interest analysts face (e.g., Lin and McNichols, 1998; Michaely and Womack 1999). We find that the frequencies of sell and strong sell recommendations are far fewer than the frequencies of the buys and strong buys in all countries. The frequency of sell recommendations is the lowest in the US. In fact, during our sample period, sell recommendations are about four to five times as frequent in the other countries as in the US. These results support the general notion that the analysts in the US face the largest conflicts of interest. Therefore, if conflicts of interest were a dominant factor in determining the value of analysts' forecasts, then we would expect the value of analyst recommendations to be the lowest in the US.

Our next tests examine the value of analyst recommendations in each country. We use two approaches to assess the value of recommendations. In the first approach, we examine the event time performance of analysts' recommendation upgrades and downgrades. Specifically, we examine the returns of upgraded and downgraded stocks from the revision dates to six months after the revisions. This approach is similar to that in Womack (1996), and it allows us to determine the extent of mispricing that analysts can detect in various countries.

The second approach analyzes the performance of calendar-time trading strategies that buy stocks with recommendation upgrades and sell stocks with recommendation downgrades. The calendar-time strategies are implementable in practice, and hence their performances provide an indication of the extent to which investors can profit by using analyst recommendation changes as inputs in their trading strategy.

Earlier papers by Barber et al. (2001) and Jegadeesh et al. (2004) examine calendar time trading strategies based on the level of analysts' recommendations. Specifically, the strategies buy the most favorably recommended quintile of stocks and sell the least favorably recommended quintile of stocks. Barber at al. (2001) and Jegadeesh et al. (2004) find that this strategy yields significant profits. Jegadeesh et al. (2004), however, show that recommendation levels-based strategy profits largely from the price and earnings momentum, which are correlated with recommendation levels, rather than from the recommendations per se.[3] Jegadeesh et al. (2004) also examine the performance of trading strategies based on analysts' recommendation revisions and they find that the profitability of revisions-based strategies is not driven by momentum or any other stock characteristics.

Since the incremental information content of recommendation revisions is stronger than that of recommendation levels, we examine the profitability of revisions-based calendar-time trading strategies. We examine the performance of various trading strategies, with different holding periods, and different levels of delays between the time when the revisions are made and the time when the stocks enter the portfolios.

In both the event time analysis and the calendar time strategies, we find that the US analysts add the most value. The values analysts add in the other countries are about the same. In a sample of American Depositary Receipts (ADRs) that are covered by both US analysts and foreign analysts, we find larger price reactions following recommendation revisions by US analysts than by foreign analysts. Since both US analysts and foreign

[3]See Chan et al. (1996) for an analysis of price and earnings momentum strategies.

analysts follow the same set of stocks in this experiment, the higher value added by the US analysts cannot be due to any differences in efficiency across markets.

We also find that revisions issued by large brokerages are related to larger price reactions, especially in the US. These findings indicate that the US analysts are more skilled than the analysts in other developed countries at identifying mispriced stocks, which more than offsets the effect of potential conflicts of interest. Most likely, the higher compensation that the analysts in the US receive attracts more skilled analysts, who in turn deliver more informative recommendations.

An alternative possibility is that US analysts add more value because they time their revisions close to earnings announcements. Since analysts tend to upgrade stocks with positive earnings surprises and downgrade stocks with negative earnings surprises, a part of the value that the US analysts add could come from the post-earnings announcement drift, rather than from any value that they add through their skills.[4] To test this alternative hypothesis, we exclude all recommendations that were issued around earnings announcement dates and find similar results. In additional tests, we also find that the differences in value of analyst recommendations across countries are not due to any inter-country differences in industry composition.

Additionally, we examine the value of analysts' recommendations for ADRs that are followed by both US analysts and by analysts in the ADR's domestic country. We find that the US analysts' recommendations add more value than the recommendations of their foreign counterparts for this subsample of stocks as well. These findings indicate that the most likely explanation for the US analysts' superiority is that they are more skilled than their foreign counterparts.

We also examine trading volumes around recommendation revisions. We expect that the level of attention that investors pay to analyst recommendations would be related to the value they add. We use changes in trading volume around recommendation revisions as a measure of attention that analysts get in various countries. We find that the US stocks experience the largest increase in trading volume around recommendation revisions, which is consistent with our findings that analysts in the US add the most value.

The rest of the paper is organized as follows. Section 2 describes our data sources and our sample. Section 3 compares the level of recommendations across the countries we examine. Section 4 presents the event-time analysis of the performance of analyst recommendations. Section 5 investigates the source of the superior performance of US analysts. Section 6 examines the cross-sectional relation between the brokerage size and analysts' recommendations. Section 7 examines the pattern of trading volume around recommendation revisions. Section 8 evaluates the profitability of calendar-time trading strategies and Section 9 presents our conclusions.

2. Data and sample

2.1. Data

We obtain the stock recommendations data for the G7 countries from the IBES detailed file; stock returns, shares outstanding and trading volume data from Xpressfeed, which is a

[4]Ivković and Jegadeesh (2004) find a large fraction of recommendation revisions is concentrated around earnings announcements in the US.

Table 1
Sample descriptive statistics
This table presents the descriptive statistics for the sample. The sample includes all firms in the G7 countries that have at least two active recommendations from the same analyst in the IBES international recommendations database, and also have stock return data on recommendation revision dates. The sample excludes all stocks priced lower than $1 on the day before the recommendation revision date. The columns present the average number of stocks per year, the average number of analysts per year, and the average number of brokerage firms per year. The sample period is from November 1993–July 2002.

Country	Stocks/year	Analysts/year	Brokerage firms/year
US	2,761	1,890	164
Britain	471	431	41
Canada	261	262	43
France	217	343	39
Germany	172	286	39
Italy	79	116	26
Japan	336	165	14
Average (Excluding US)	256	267	34
Average (All countries)	614	499	52

product of the Standard and Poor's corporation; and returns on market indices from Datastream. The sample period is from November 1993 to July 2002.

Our sample comprises all stocks that satisfy the following criteria:

(a) There should be at least one analyst who issues a recommendation for the stock and revises the recommendation during the sample period,
(b) The analyst code should be available on IBES,
(c) The stock return data on the recommendation revision date should be available,
(d) The stock price should be at least $1 on the day before the recommendation revision date,[5] and
(e) The recommendation should be either an upgrade or a downgrade from the previous recommendation by the same analysts.

We impose these criteria since our primary focus is on the performance of stocks after recommendation revisions. Therefore, we do not include recommendations in our sample if the recommendation is a reiteration of an old recommendation, if an analyst makes only one recommendation for the stock, or if IBES does not provide an analyst code because we need the code to identify revisions.

Table 1 presents the descriptive statistics for the sample. Analyst coverage on IBES is by far the most extensive for the US stocks. On average, there are 2,761 stocks per year in the US sample. Outside the US, the sample contains 256 stocks per year per country.

Italy has the fewest stocks in our sample, with 79 firms per year on average.

[5]To impose the $1 price cutoff, we convert all prices to U.S. dollars using prices and exchange rates on event dates. We found similar results with a $5 price cutoff and requirement of at least 2 analysts per stock per year as well.

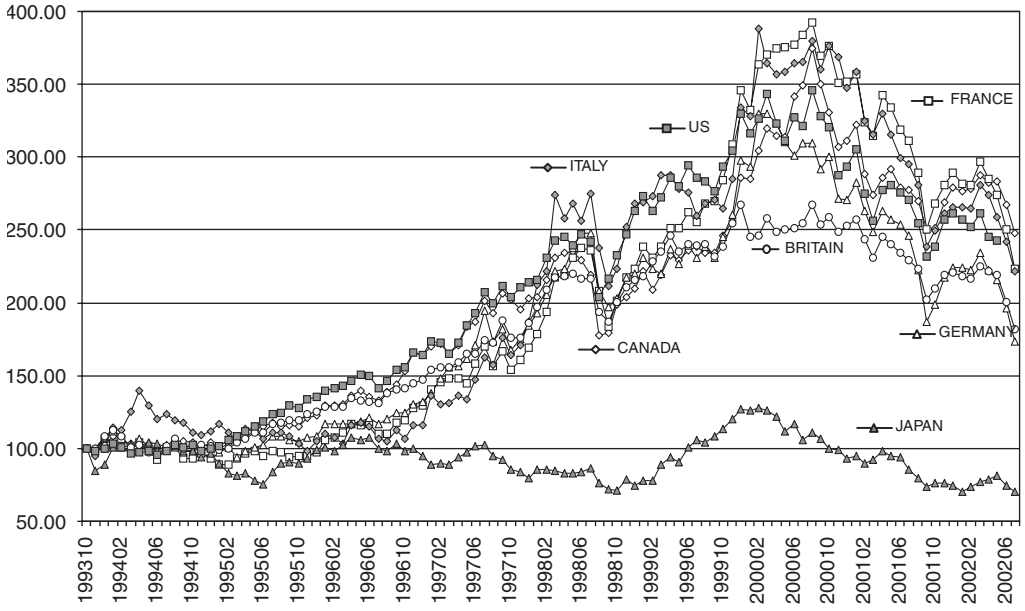

Fig. 1. Cumulative stock market returns in the G7 countries from November 1993 to July 2002. We use the CRSP value-weighted index to represent the U.S. market, and the Datastream indices for the other markets.

2.2. Market statistics

Fig. 1 presents the cumulative market returns in each of the countries during our sample period. All the countries in the sample except Japan experience strong positive returns until 1999 or 2000, and large market declines in 2001 and 2002. The Japanese market is relatively flat during most of the sample period, except in 1999. In 1999, the Japanese stock index rises nearly 70 percent, but most of this gain is reversed in the following two years. Overall, the sample period contains both bull markets and bear markets for all countries.

Panel A of Table 2 presents the size of the stock market in various countries at the end of each year in the sample period. Datastream provides the market capitalization of publicly traded stocks in the G7 countries. The US is by far the largest market with capitalization ranging from a low of $5056 billion in 1994 to a high of $16,590 billion in 1999. Panel B of this table presents the aggregate market capitalization of the stocks in our sample at the end of each year, and Panel C presents the percentage of the total market that our sample includes. We have the widest coverage in the US at 81.91 percent on average, followed by Germany at 71.81 percent and Britain at 66.86 percent.

Panel D of Table 2 presents the median size of the firms in our sample for the G7 countries at the end of each year. For comparison, we also present the median size of NYSE traded firms. The average median size is the largest for Japan at $1,985 million, which is about twice that of the median NYSE firm. Among the other countries, the average median sizes range from $272 million in Canada, to $820 million in Italy.

Table 2
Market size and the sample coverage

This table presents an overview of the total market size and median market value of equity in the G7 countries. Panel A presents the total stock market capitalization; Panel B presents the market capitalization of the firms in our sample as of the first day of each calendar year; Panel C presents the fraction of the market covered by our sample; and Panel D presents the median market capitalizations of the stocks in the sample. The row titled "NYSE" in Panel D presents the median market capitalization of New York Stock Exchange listed stocks. The sample period is from November 1993–July 2002.

Country	Average	1993	1994	1995	1996	1997	1998	1999	2000	2001
Panel A: Total market capitalization of G7 countries (unit: $U.S. billions)										
US	10,498	5,129	5,056	6,910	8,466	10,451	12,747	16,590	15,117	14,015
Britain	1,940	1,139	1,165	1,384	1,702	2,042	2,274	2,926	2,689	2,137
Canada	415	211	214	265	355	447	447	603	641	548
France	865	452	461	519	600	667	973	1,501	1,443	1,170
Germany	874	437	509	585	675	816	1,082	1,431	1,267	1,068
Italy	413	134	184	214	263	343	563	727	766	525
Japan	3,063	2,912	3,619	3,595	3,060	2,053	2,430	4,440	3,177	2,279
Panel B: Sample market capitalization of G7 Countries (unit: $U.S. billions)										
US	8,599	1,100	3,853	5,368	6,632	8,947	11,389	14,347	13,864	11,891
Britain	1,297	712	760	904	1,141	1,371	1,484	1,982	1,765	1,554
Canada	238	64	116	144	217	291	290	352	347	317
France	421	129	191	232	300	361	541	730	720	585
Germany	628	296	400	390	475	625	788	1099	858	719
Italy	239	48	93	91	147	191	331	340	573	338
Japan	1,583	236	1,698	2,066	1,577	1,223	817	2,923	2,012	1,691
Panel C: Sample coverage (Panel A/Panel B, %)										
US	81.91	21.44	76.21	77.68	78.34	85.61	89.34	86.48	91.71	84.84
Britain	66.86	62.49	65.20	65.36	67.04	67.13	65.28	67.74	65.63	72.73
Canada	57.29	30.04	53.95	54.33	61.18	65.23	64.84	58.31	54.17	57.92
France	48.66	28.54	41.42	44.66	49.98	54.13	55.62	48.60	49.91	49.99
Germany	71.81	67.66	78.68	66.67	70.42	76.58	72.80	76.85	67.72	67.35
Italy	57.85	35.84	50.66	42.46	56.10	55.55	58.83	46.77	74.76	64.28
Japan	51.67	8.12	46.91	57.47	51.54	59.59	33.63	65.83	63.33	74.20
Panel D: Median market capitalization of the sample (Unit: $U.S. millions)										
US	499	790	330	384	418	457	386	505	539	678
Britain	539	782	584	598	575	491	391	585	452	395
Canada	272	577	329	269	252	232	153	175	214	249
France	471	1,305	619	424	382	286	337	340	298	251
Germany	590	1,329	491	643	596	591	418	619	466	158
Italy	820	1,338	379	410	385	692	852	978	1,353	995
Japan	1,985	1,982	2,406	2,214	1,807	1,000	2,122	2,732	2,443	1,162
NYSE	836	679	615	715	794	945	813	825	986	1,149

3. Average recommendations

This section examines the average recommendation levels in each country. Most commonly, analyst recommendations rate stocks as "strong buy," "buy," "hold," "sell," and "strong sell." Analysts do use other labels such as "market underperform" and

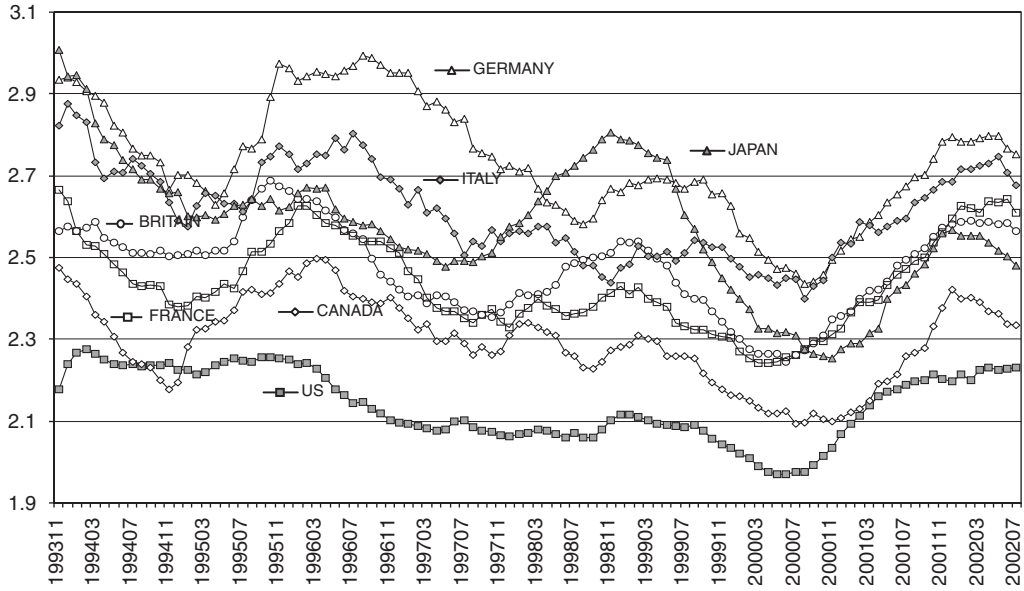

Fig. 2. Average recommendation levels in the G7 countries. The sample includes all firms with valid recommendations in the IBES. At the end of each month, all active recommendations are identified and the frequencies of recommendations in various categories are computed. The recommendations range from 1 (strong buy) to 5 (strong sell). The sample period is from November 1993 to July 2002.

"market outperform," or "underweight" and "overweight," to convey their opinions, but IBES standardizes the recommendations, and converts them to numerical scores where "1" is strong buy, "2" is buy, and so on.

Fig. 2 presents average analyst recommendations at the end of each month in each country. To compute the averages in this figure, we average across all outstanding recommendations in each country on the last day of each month. Since more analysts follow large firms than small firms, our averaging procedure gives more weight to large firms than to small firms.

One piece of striking evidence in this figure is that the US stocks are more favorably recommended on average than stocks in any other country in the sample for almost the entire sample period. The average recommendations in Canada are the second most favorable, except in the last quarter of 1994, when the Canadian stocks are recommended more favorably than the US stocks. The order of average recommendations among the other countries varies over time.

We compute the frequencies of different recommendation levels among the active recommendations each month, and Table 3 presents the annual averages for each country. On average, only 3.3% of the recommendations are either sell or strong sell in the US. Even the hold recommendations decline during the bull market of the nineties. The percentage of hold recommendations declines from 38.4% in 1995 to 27.8% in 2000, the year that marked the end of the strong market run up in recent years. Buys and strong buys increase from 57% to 70.1% during this period. However, the trend of rising buy recommendations reverses course in 2001 and 2002, and in these two years buy and strong buy recommendations account for 61.5% and 58.1% of all recommendations, respectively.

Table 3
Distribution of recommendation levels in the G7 countries

This table presents the distribution of recommendation levels in the G7 countries. The sample includes all firms with valid recommendations in the IBES. At the end of each month, we compute the frequencies of each recommendation level. The table reports the averages of the monthly relative frequencies of each recommendation level in percentages. The sample period is from November 1993 to July 2002.

Country		1993–2002	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
US	Strong buy	28.6	31.6	27.1	26.3	29.1	31.6	30.4	28.9	32.8	25.0	24.4
	Buy	33.6	24.8	28.3	30.7	31.5	33.3	35.0	37.4	37.3	36.5	33.7
	Hold	34.5	38.2	40.2	38.4	35.2	32.0	32.3	31.4	27.8	35.8	38.2
	Sell/strong sell	3.3	5.3	4.4	4.7	4.2	3.1	2.3	2.4	2.1	2.7	3.7
Britain	Strong buy	24.3	25.7	26.9	24.4	27.4	30.9	23.3	21.2	24.3	19.2	17.9
	Buy	22.3	13.2	14.3	16.2	13.2	17.7	24.0	28.6	32.8	29.5	27.7
	Hold	41.7	48.4	46.2	45.5	45.9	40.5	41.1	39.8	35.4	40.0	38.3
	Sell/strong sell	11.8	12.7	12.6	14.0	13.5	10.9	11.5	10.4	7.5	11.3	16.1
Canada	Strong buy	29.4	35.0	38.8	33.0	29.6	32.9	27.3	25.4	28.6	23.6	20.5
	Buy	28.6	13.4	15.7	15.9	22.0	23.5	33.3	37.1	40.3	39.4	35.0
	Hold	29.9	29.8	29.4	36.8	31.7	29.9	28.0	28.0	24.1	28.9	34.3
	Sell/strong sell	12.1	21.7	16.0	14.3	16.7	13.6	11.4	9.4	7.0	8.2	10.2
France	Strong buy	24.7	24.9	27.8	28.0	23.7	28.3	24.6	25.4	23.6	21.4	16.1
	Buy	28.3	13.4	19.2	22.6	25.9	26.7	30.1	32.4	39.8	31.1	30.7
	Hold	31.1	45.9	40.0	32.4	28.5	28.9	31.4	27.9	24.8	31.5	32.5
	Sell/strong sell	15.9	15.8	13.0	16.9	22.0	16.1	13.9	14.3	11.8	16.0	20.7
Germany	Strong buy	18.3	21.9	23.9	23.4	15.9	18.5	20.3	14.7	17.7	14.5	12.9
	Buy	20.3	8.4	8.9	13.1	15.2	18.8	21.1	25.5	31.6	27.4	25.2
	Hold	41.5	43.9	47.0	42.6	40.8	37.9	40.9	43.8	38.6	40.8	40.2
	Sell/strong sell	19.9	25.9	20.1	21.0	28.1	24.8	17.7	16.0	12.1	17.3	21.7
Italy	Strong buy	19.2	18.5	21.4	26.4	19.7	23.0	20.9	16.2	17.3	14.2	10.6
	Buy	20.0	6.0	9.7	9.9	15.1	15.8	21.7	28.5	30.1	26.7	28.7
	Hold	47.1	56.5	53.4	45.6	46.8	48.3	46.8	45.8	44.7	46.5	42.7
	Sell/strong sell	13.6	19.0	15.4	18.2	18.5	12.9	10.7	9.4	7.9	12.6	17.9
Japan	Strong buy	23.6	17.8	28.2	34.8	28.6	24.5	16.3	14.3	25.4	21.9	16.0
	Buy	22.4	11.6	8.4	6.9	15.5	24.3	27.4	32.0	31.7	29.9	31.4
	Hold	35.7	43.6	40.4	37.2	36.3	34.9	32.2	34.7	32.4	34.5	38.0
	Sell/strong sell	18.3	27.0	23.0	21.1	19.6	16.4	24.2	19.0	10.5	13.7	14.7
Average	Strong buy	23.2	24.0	27.8	28.3	24.1	26.3	22.1	19.5	22.8	19.1	15.7
(Ex the US)	Buy	23.7	11.0	12.7	14.1	17.8	21.1	26.3	30.7	34.4	30.7	29.8
	Hold	37.8	44.7	42.8	40.0	38.3	36.7	36.7	36.7	33.3	37.0	37.7
	Sell/strong sell	15.3	20.3	16.7	17.6	19.7	15.8	14.9	13.1	9.5	13.2	16.9
Average	Strong buy	24.0	25.1	27.7	28.0	24.8	27.1	23.3	20.9	24.2	20.0	16.9
(All countries)	Buy	25.1	13.0	14.9	16.5	19.8	22.9	27.5	31.6	34.8	31.5	30.3
	Hold	37.3	43.8	42.4	39.8	37.9	36.0	36.1	35.9	32.5	36.8	37.7
	Sell/strong sell	13.6	18.2	14.9	15.7	17.5	14.0	13.1	11.6	8.4	11.7	15.0

We observe the general pattern of changes in buy and sell recommendations in the US in the other countries as well. The buy recommendations increase from 1993 to 2000, and then decrease in 2001. The sell recommendations follow the opposite path. This pattern

indicates that analysts tend to issue more buy recommendations during bull markets than during bear markets, and more sell recommendations during bear markets than during bull markets. In unreported results, we found that the proportion of the strong buy recommendations is significantly related to past six- month market returns both in the US and in all countries outside the US as a group. Therefore, the general level of optimism among analysts depends on the past market performance.

Sell recommendations are generally less common than buy recommendations in countries outside the US as well. Overall, there are 15.3% sell or strong sell recommendations in these countries compared with 46.9% buy or strong buy recommendations. The frequency of sell recommendations outside the US, however, is much larger than that in the US. The higher frequency cannot be due to any relation between analyst recommendations and past market performance because the pattern of market returns in most of these countries is similar to that in the US. Our results indicate that analysts in these countries are far less reluctant to issue sell recommendations than those in the US.

One of the criticisms that the US analysts encounter is that they do not sufficiently discriminate across stocks since they often do not use the full range of recommendations. The literature generally attributes analysts' reluctance to issue sell recommendations as evidence of conflicts of interest; analysts have incentives to be on the good books of the management of the companies they follow. Therefore, the distributions of analysts' recommendations suggest that analysts in the US shade their recommendations the most due to conflicts of interest.

Also, the recommendations in countries outside the US have larger variability, and if this were a desirable feature then the recommendations in these countries should be more valuable. Nevertheless, the bias in average recommendation levels is fairly transparent, and the market can easily see through this bias. Investors, for instance, can treat a buy recommendation as a market perform rating, and a hold or lower recommendation as a market underperform rating, and decide on their investments accordingly. Therefore, if investors are able to read the signals correctly then the particular label for a recommendation should not matter. In any event, our empirical tests will help us assess whether the higher propensity of analysts outside the US to issue sell recommendations adds value for investors in those countries.

4. Recommendation changes: event-time analysis

This section examines the performance of stocks that analysts either upgrade or downgrade in an event study framework. The methodology here is similar to that of Womack's (1996) study of analysts' recommendations in the US.

4.1. Distribution of upgrades and downgrades

Table 4 presents the distribution of upgrades and downgrades within each country. We count each recommendation change as one observation. For instance, if two analysts make recommendation upgrades for a stock and one analyst makes a downgrade, then we count the stock twice in the upgrade category and once in the downgrade category. There are a total of 50,238 upgrades and 63,444 downgrades in the US, and 37,728 upgrades and 39,764 downgrades in the other countries.

Table 4
Distribution of analyst recommendation revisions in G7 countries

This table presents the distribution of recommendation revisions in the sample. We characterize each revision as an upgrade or a downgrade by comparing the revised recommendation with the previous recommendation for the stock by the revising analyst. We further classify upgrades and downgrades into revisions to and from strong buy and from and to sell or strong sell. "All revisions" column includes both upgrades and downgrades. The first column in each revision category presents the number of revisions, and the second column presents the percentages across all revisions in that country. The sample period is from November 1993 to July 2002.

Country	All revisions No.	Upgrades						Downgrades					
		All		To str. buy		From sell/str. sell		All		To sell/str. sell		From str. buy	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
US	113,682	50,238	44.19	29,188	25.68	3,578	3.15	63,444	55.81	4,587	4.03	35,057	30.84
Britain	21,993	10,930	49.70	5,144	23.39	3,166	14.40	11,063	50.30	3,152	14.33	5,265	23.94
Canada	20,165	9,667	47.94	4,605	22.84	2,084	10.33	10,498	52.06	2,187	10.85	5,268	26.12
France	13,408	6,510	48.55	2,766	20.63	2,229	16.62	6,898	51.45	2,460	18.35	2,951	22.01
Germany	10,965	5,252	47.90	2,131	19.43	2,053	18.72	5,713	52.10	2,160	19.70	2,382	21.72
Italy	3,794	1,847	48.68	766	20.19	596	15.71	1,947	51.32	552	14.55	827	21.80
Japan	7,167	3,522	49.14	1,548	21.60	1,291	18.01	3,645	50.86	1,209	16.87	1,763	24.60
Total (ex US)	77,492	37,728	48.69	16,960	21.89	11,419	14.74	39,764	51.31	11,720	15.12	18,456	23.82
Total (all G7)	191,174	87,966	46.01	46,148	24.14	14,997	7.84	103,208	53.99	16,307	8.53	53,513	27.99

We also separately examine upgrades to strong buys and upgrades from sell or strong sell, and downgrades to sell or strong sell and downgrades from strong buy. Since strong buy is the highest recommendation level, it is possible that a recommendation revision to or from this category conveys a stronger signal about the analyst's opinion than a revision to or from any of the other recommendation levels. Also, as we note in the last section, analysts rarely issue sell or strong sell recommendations. Therefore, additions to or removal from these categories may be viewed as a stronger signal by the market than other recommendation revisions.

Our US sample size for upgrades to strong buy is 29,188. Our sample size is much larger than the 694 upgrades in Womack's (1996) sample. In part, Womack's sample is smaller because his sample period is shorter (from January 1989 to June 1990), and his sample comprises only recommendation revisions issued by analysts from the top 14 brokerages. However, we found that our sample contains far more revisions to strong buys per month from the top 14 brokerage houses (based on the number of analysts in the IBES database) than in the Womack sample. The difference between our sample sizes is most likely due to the fact that Womack constructs his sample from a text search of First Call analyst reports while we rely on IBES codes for analyst recommendations.

4.2. Past returns and size

Table 5 presents the past three- and six-month return ranks and size ranks for various upgrade and downgrade categories. For each recommendation revision we compute the cumulative returns over the three- and six-month period prior to the revision date. We then assign a return rank based on the return decile over the corresponding period, across all stocks in the sample for that particular country. We assign a rank of 10 to the highest return decile, 9 to the next decile, and so on.[6]

The average six-month return rank for upgrades in the US is 6.12, which is significantly larger than the return rank of 5.57 for downgrades.[7] The average six-month return rank for upgrades to strong buy is 6.25 and for downgrades to sell or strong sell is 5.26. The three-month return ranks are also larger for upgrades than downgrades. Clearly, the US analysts favor high price momentum stocks, and this evidence is consistent with the findings in earlier papers by Womack (1996) and Jegadeesh et al. (2004).[8]

Interestingly, we observe a similar pattern in all the other G7 countries as well. Specifically, we find that upgrades have higher price momentum rank than downgrades, except for Britain, and upgrades to strong buy have the highest rank while downgrades to sell or strong sell have the lowest. Jegadeesh et al. (2004) find that the value of analyst recommendation levels is largely attributable to the fact that analysts tilt their recommendations toward high momentum stocks. A momentum strategy that buys past winners and sells past losers is profitable in the US as well as in Canada and in the

[6]If any stock in the revision sample does not have return data over a particular return period, we exclude the stock from the sample for computing past return ranks, but we do include that stock in the sample when we compute future returns.

[7]The average past return ranks for both upgrades and downgrades are larger than the average rank for the entire sample because analysts tend not to actively follow many of the past losers.

[8]Although the momentum ranks for upgrades are larger than those for downgrades, the differences in the ranks are fairly small and they do not contribute significantly to the differences in their performances.

Table 5
Past returns and size characteristics of analyst recommendation revisions across G7 countries: 1993–2002

This table presents average past return ranks and size ranks for the recommendation revisions in the sample. We characterize each revision as an upgrade or a downgrade by comparing the revised recommendation with the previous recommendation for the stock by the revising analyst. We further classify upgrades and downgrades into revisions to and from strong buy and from and to sell or strong sell that analysts upgrade or downgrade. For each revision, we compute past three- and six-month returns and separately assign return decile ranks based on the returns for the corresponding period for all stocks in the respective countries. We assign rank 1 to stocks in the lowest return decile, rank 2 to the next return decile, and so on. To determine the size ranks, we compute the market value of the stock as of the end of the month before the revision. For all countries, we assign size ranks basked on NYSE size decile break points. We assign rank 1 to stocks in the smallest size decile, rank 2 to the next size decile, and so on. The column titled "6m" and "3m" reports average six- and three-month return ranks, and the column titled "size" reports the average size ranks. The sample period is from November 1993 to July 2002.

Country	Upgrades									Downgrades								
	All			To strong buy			From sell/strong sell			All			To sell/strong sell			From strong buy		
	6 m	3 m	size	6 m	3 m	size	6 m	3 m	size	6 m	3 m	size	6 m	3 m	size	6 m	3 m	size
US	6.12	5.93	6.38	6.25	5.97	6.31	5.50	5.54	6.59	5.57	5.54	5.89	5.26	5.45	6.05	5.71	5.64	5.88
Britain	5.57	5.51	6.51	5.66	5.57	6.33	5.33	5.33	6.90	5.72	5.67	6.45	5.49	5.47	6.83	5.77	5.71	6.23
Canada	5.94	5.82	4.87	6.08	5.89	5.06	5.49	5.50	4.42	5.87	5.88	4.70	5.44	5.58	4.16	5.97	5.94	4.85
France	5.81	5.80	6.03	6.13	6.05	6.18	5.46	5.60	5.83	5.45	5.34	5.77	5.12	5.03	5.61	5.76	5.54	5.89
Germany	6.02	5.97	6.91	6.22	6.08	7.11	5.73	5.77	6.59	5.57	5.38	6.64	5.09	4.94	6.31	5.90	5.66	6.90
Italy	5.95	5.90	6.52	6.17	6.11	6.66	5.42	5.54	6.35	5.78	5.62	6.55	5.17	5.33	6.58	6.10	5.88	6.62
Japan	6.24	6.21	7.38	6.66	6.47	7.54	5.85	5.99	7.40	5.76	5.52	7.20	5.28	5.14	7.21	6.11	5.79	7.16
Total (ex US)	5.85	5.79	6.27	6.04	5.90	6.30	5.52	5.58	6.36	5.70	5.61	6.10	5.29	5.26	6.17	5.89	5.76	6.11
Total (all G7)	6.00	5.87	6.33	6.17	5.94	6.30	5.51	5.57	6.42	5.62	5.57	5.97	5.28	5.31	6.14	5.77	5.68	5.95

European countries.[9] Therefore, to some extent, analyst recommendations in North America and in Europe benefit from this phenomenon. The momentum strategy, however, is not profitable in Japan (see Chui et al., 2000), but the Japanese analysts also favor high momentum stocks. In fact, the spread between upgrades to strong buy and downgrades to sell or strong sell in Japan is the largest among all G7 countries. This evidence suggests that analysts' favorable ratings for past winners may stem from the "everybody likes a winner" phenomenon, rather than from an attempt by analysts to benefit from the empirical association between past returns and future performance.

Table 5 also presents the average size rank for upgrades and downgrades. To facilitate comparability across countries, we use the NYSE size decile cutoffs for all countries. Except for Canada, the average size decile ranks for upgrades and downgrades are above the average NYSE size decile rank. Although the median sizes in Table 2 are smaller than the NYSE median, the average size ranks in this table are bigger for all countries except Canada because our unit of observation here is a recommendation revision. On average, more analysts follow larger firms, and hence these stocks experience more revisions. Therefore, our recommendation sample is tilted towards larger firms. The results here indicate that the firms in the upgrade sample tend to be bigger than those in the downgrade sample.

4.3. Performance

For each recommendation revision, we compute $CR_k(T)$, the T-day cumulative market-adjusted return for stock k, as follows:

$$CR_k(T) = \prod_{t=0}^{T}(1 + R_{k,t}) - \prod_{t=0}^{T}(1 + R_{mkt,t}), \tag{1}$$

where $t = 0$ is the recommendation revision date, $R_{k,t}$ and $R_{mkt,t}$ are the day t return for stock k and the market index for the country of listing, respectively. We measure the event time in trading days and not in calendar days.

Table 6 presents the market-adjusted returns for stocks in each category, within each country. Since multiple recommendation revisions are made on many days, the returns for stocks for which the event windows overlap in calendar time would be correlated. To allow for this cross-sectional dependence in our statistical tests, we follow the approach in Jegadeesh (2000). We first compute the average market-adjusted returns for all recommendation revisions in each calendar month. The average abnormal return for each category is the weighted average of the abnormal returns for the monthly cohorts in the sample, where the weights are proportional to the number of observations in the respective cohorts. Specifically,

$$\overline{AR} = w'\mathrm{AR}, \tag{2}$$

where $\overline{AR}$ is the average abnormal return, w the vector of weights where the jth element is the ratio of the number of observations in month j divided by the total number of observations over the sample period, AR the vector of average abnormal return where the element $\mathrm{AR_j}$ is the average abnormal return for the jth monthly cohort.

[9]See Jegadeesh and Titman (1993, 2001) and Rouwenhorst (1998) for evidence on the profitability of momentum strategies in the US and Europe, respectively.

Table 6
Cumulative returns following analyst recommendation revisions in the G7 countries

This table presents the cumulative abnormal returns following recommendation revisions. We characterize each revision as an upgrade or a downgrade by comparing the revised recommendation with the previous recommendation for the stock by the revising analyst. We further classify upgrades and downgrades into revisions to and from strong buy and from and to sell or strong sell. The abnormal return is the raw return minus the market return in the respective country over the corresponding period. For the US, the market return is the CRSP value-weighted index returns and for the other six countries, the market returns are the Datastream index returns for the countries. Day 0 is the revision date and other days in the columns are the number of trading days from the revision date. The average returns reported in italics are statistically significant at least at the five percent level (absolute value of *t*-statistics greater than 1.96). We use heteroskedasticity and serial correlation consistent standard errors to compute the *t*-statistics. The sample period is November 1993 to July 2002.

Country	Recommendation revision		Number of trading days after the revision date					
			0	1	2	22	44	132
US	Upgrades	All	*1.76*	*2.10*	*2.20*	*3.34*	*3.65*	*4.75*
		To strong buy	*1.91*	*2.29*	*2.41*	*3.59*	*3.84*	*4.64*
		From sell/strong sell	*0.66*	*0.78*	*0.82*	*1.23*	*1.57*	0.77
	Downgrades	All	*−3.19*	*−3.38*	*−3.50*	*−4.20*	*−4.76*	*−6.20*
		To sell/strong sell	*−2.39*	*−2.41*	*−2.66*	*−3.42*	*−4.04*	*−5.74*
		From strong buy	*−3.16*	*−3.35*	*−3.44*	*−4.26*	*−4.87*	*−6.42*
	Upgrades minus downgrades		*4.95*	*5.48*	*5.70*	*7.54*	*8.41*	*10.96*
Britain	Upgrades	All	*0.18*	*0.28*	*0.37*	*1.02*	1.16	0.40
		To strong buy	*0.18*	*0.30*	*0.44*	*1.26*	1.34	0.69
		From sell/strong sell	*0.18*	*0.21*	*0.25*	*0.63*	0.93	−0.77
	Downgrades	All	*−0.18*	*−0.23*	*−0.26*	−0.59	−0.79	−2.04
		To sell/strong sell	*−0.30*	*−0.36*	*−0.41*	*−0.86*	−0.93	−2.92
		From strong buy	*−0.13*	*−0.16*	*−0.19*	−0.65	−1.13	−2.41
	Upgrades minus downgrades		*0.36*	*0.50*	*0.63*	*1.61*	*1.95*	2.44†
Canada	Upgrades	All	*0.40*	*0.54*	*0.60*	*1.06*	1.06	−1.38
		To strong buy	0.47	*0.69*	0.68	*1.06*	1.19	−1.18
		From sell/strong sell	*0.14*	*0.24*	*0.37*	−0.05	−0.79	*−4.09*
	Downgrades	All	*−0.45*	*−0.64*	*−0.71*	*−1.58*	*−2.35*	*−5.80*
		To sell/strong sell	*−0.66*	*−0.86*	*−0.98*	*−2.59*	*−4.53*	*−9.07*
		From strong buy	*−0.36*	*−0.55*	*−0.64*	*−1.32*	*−1.87*	*−5.22*
	Upgrades minus downgrades		*0.85*	*1.18*	*1.31*	*2.64*	*3.41*	*4.42*
France	Upgrades	All	*0.32*	*0.38*	*0.42*	0.20	0.44	−0.90
		To strong buy	*0.43*	*0.55*	*0.62*	0.66	0.97	0.39
		From sell/strong sell	*0.16*	0.12	0.09	−0.50	−0.46	*−2.03*
	Downgrades	All downs	*−0.35*	*−0.48*	*−0.56*	*−1.50*	*−2.41*	*−5.20*
		To sell/strong sell	*−0.41*	*−0.52*	*−0.61*	*−2.06*	*−3.21*	*−6.66*
		From strong buy	*−0.33*	*−0.43*	*−0.53*	*−1.27*	*−2.01*	*−4.67*
	Upgrades minus downgrades		*0.67*	*0.86*	*0.98*	*1.70*	*2.85*	*4.30*
Germany	Upgrades	All	*0.16*	*0.21*	*0.19*	0.09	−0.05	−1.93
		To strong buy	*0.23*	*0.43*	*0.41*	0.03	0.01	*−2.09*
		From sell/strong sell	0.14	0.12	0.00	−0.18	−0.32	*−2.69*
	Downgrades	All	*−0.22*	*−0.33*	*−0.38*	*−1.41*	*−2.91*	*−5.86*
		To sell/strong sell	−0.31	*−0.41*	*−0.51*	*−1.80*	*−3.34*	*−6.67*
		From strong buy	*−0.13*	*−0.30*	*−0.34*	*−1.28*	*−2.84*	*−5.78*
	Upgrades minus downgrades		*0.38*	*0.54*	*0.58*	*1.50*	*2.86*	*3.93*

Table 6 (*continued*)

Country	Recommendation revision		Number of trading days after the revision date					
			0	1	2	22	44	132
Italy	Upgrades	All	0.04	0.05	0.00	0.09	−0.03	−0.29
		To strong buy	−0.08	0.03	0.02	0.48	0.33	1.22
		From sell/strong sell	0.08	0.09	0.03	−0.30	*−1.40*	*−3.51*
	Downgrades	All	−0.09	−0.14	−0.09	−0.44	*−0.91*	*−2.22*
		To sell/strong sell	−0.09	−0.15	−0.07	*−0.97*	*−1.65*	*−4.71*
		From strong buy	−0.09	−0.04	0.08	−0.39	*−1.24*	*−2.38*
	Upgrades minus downgrades		0.12	*0.19*	*0.09*	0.53	0.88	*1.93*
Japan	Upgrades	All	*0.46*	*0.74*	*0.90*	*1.61*	*2.36*	*4.21*
		To strong buy	*0.38*	*0.61*	*0.85*	*1.08*	*1.76*	*2.80*
		From sell/strong sell	*0.27*	*0.29*	*0.33*	0.67	*1.62*	3.18
	Downgrades	All	*−0.41*	*−0.71*	*−0.81*	*−1.00*	*−1.25*	−0.45
		To sell/strong sell	*−0.60*	*−0.94*	*−1.09*	*−1.59*	*−1.94*	−0.79
		From strong buy	*−0.29*	*−0.57*	*−0.56*	−0.79	*−1.29*	−1.17
	Upgrades minus downgrades		*0.87*	*1.45*	*1.71*	*2.61*	*3.61*	*4.66*

[†]Standard errors could not be determined because the serial correlation-consistent estimate of variance was negative.

The variance of $\overline{AR}$ is given by

$$\mathrm{Var}(\overline{AR}) = w' V_A w, \tag{3}$$

where V_A is the variance covariance matrix of AR. Since the return measurement intervals for different monthly cohorts overlap, we allow for the first- through sixth-order serial covariance of monthly cohort return to be non-zero, and set the higher order serial covariances to equal zero. To be specific, let $v_{i,j}$ be the ijth element of V_A. The estimator for V_A is

$$\begin{aligned} v_{i,j} &= (AR_i - \overline{AR})^2 \ \forall i = j, \\ &= (AR_i - \overline{AR})(AR_j - \overline{AR}) \ \forall 1 \leqslant |i-j| \leqslant 6, \text{ and} \\ &= 0 \quad \text{otherwise.} \end{aligned} \tag{4}$$

For the US, the average abnormal return on day 0 is 1.76% for upgrades and is −3.19% for downgrades. In comparison, the day 0 abnormal return for upgrades to strong buy is 1.91%, which is not significantly different from that for all upgrades. Similarly, the abnormal return for downgrades that result in sell or strong sell is −2.39%, which is also not significantly different from that for all downgrades.

Fig. 3 presents the cumulative returns over the next six months for each country. The prices continue to drift up for upgrades and drift down for downgrades over the next two to six months in all countries. In the US, the cumulative return for all upgrades is 4.75% over the first six months, and for all downgrades is −6.20%.

The abnormal returns in the other countries are generally smaller than the abnormal returns in the US. For example, on the revision date, the average response for upgrades ranges from a marginal .04% in Italy to .46% in Japan. Similarly, the returns for

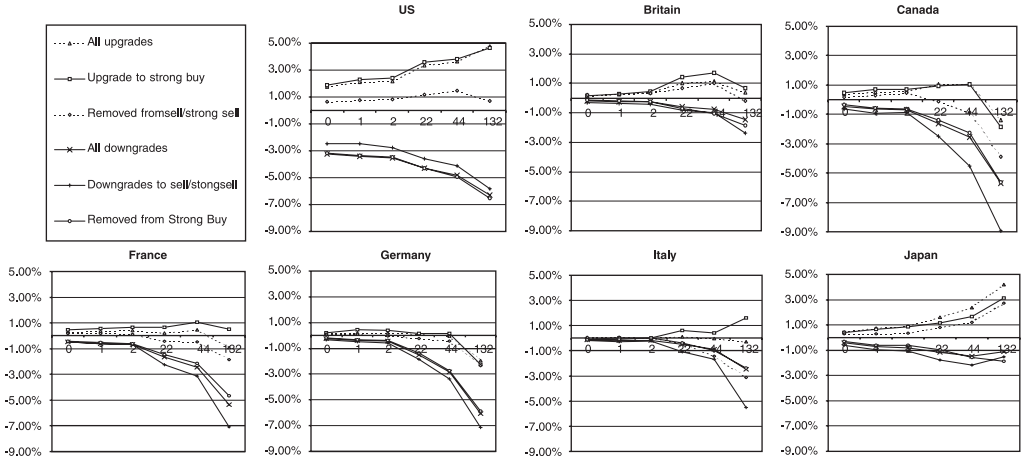

Fig. 3. Cumulative return response to recommendation revisions in G7 countries. The abnormal return is the raw return minus the market return in the respective country over the corresponding period. For the US, the market return is the CRSP value-weighted index return and for the other six countries, the market returns are the Datastream index returns for the countries. *X*-axis represents the number of trading days from the revision date. The sample period is November 1993–July 2002.

downgrades range from −.09% in Italy to −.45% in Canada. Although the abnormal returns are significantly different from zero in all countries except Italy, the magnitude of returns is much smaller than that in the US.

The six-month return for upgrades is significantly positive only in Japan. For instance, the six-month abnormal return in Japan after upgrades is 4.21%, but it is close to zero or marginally negative in all the other countries. Therefore, the weaker stock price reaction on the upgrade dates in countries outside the US cannot be attributed to slower market reaction on the event dates. Rather, the upgrades have either small or no value in the other countries. Furthermore, upgrades that result in either strong buys or removal from sell or strong sell are also of limited value in these countries.

For the downgrades, however, the longer horizon price changes are significant in most countries. The six-month abnormal return after downgrades ranges from −5.86% in Germany to −.45% in Japan. Although the abnormal returns after six months are not significant in Japan and Britain, they are significantly negative over shorter periods. Here again, we do not find a significant difference between all downgrades, and downgrades that result in removal from strong buy or addition to sell or strong sell. Therefore, the signal that matters is the recommendation revision, rather than the recommendation level before or after the revision. Overall, the results indicate that in the countries outside the US, downgrades convey more information than upgrades.

To examine the robustness of the results, we examined the performance of recommendation revisions within 1993–1997 and 1998–2002 subperiods. In unreported results, we found that the average price impact in the second subperiod was more than twice as large as that in the first subperiod in all countries. The US analysts added the most value in both subperiods.

The difference between the abnormal returns following upgrades and downgrades provides a measure of the overall value of recommendation revisions in various countries.

The six-month abnormal return difference is 10.96% in the US, which is the largest among the G7 countries. The six-month abnormal returns in the other countries range from 1.93% in Italy to 4.66% in Japan. Therefore, the US analysts seem to add the most value and the analysts from the other countries perform about equally.

5. Potential explanations

5.1. Potential data coding errors

The superiority of the US analysts that we find, however, would be spurious if the results were due to systematic data coding errors. For example, if IBES recorded the recommendation revision dates in the US correctly, but it recorded the revision dates outside the US with a delay, then we would miss the initial impact of the revisions in the other countries.[10] To check data accuracy, we compared a sample of IBES recommendation dates with dates from analyst reports on Investext, both for the US and for other countries. We found only about 8% of IBES recommendation revisions on Investext, and therefore it was difficult to get a large sample from Investext for statistical comparison. Among the reports that we found, most of the Investext dates matched IBES dates, but some of them preceded and some of them followed IBES dates, both in the US and other countries. Therefore, there are some data coding errors in all countries. However, virtually all Investext dates were within IBES event dates −3 to +3 in the US as well as in other countries.

If any systematic data coding errors in non-US countries were the reason for the differences in the value of analysts' recommendation between the US and other countries, then we should see pre-revision price run-ups in other countries that offset the lower post-revision price run-up we find in Table 6. Fig. 4 presents the cumulative abnormal returns from day −10 through day 10 for upgrades (Panel A) and downgrades (Panel B) in each country. For downgrades, the cumulative abnormal return from day –10 to –1 is the most negative in the US. For upgrades, the cumulative abnormal return from day –10 through day –1 in the US is smaller than that in all the other countries except Canada. For example, the cumulative abnormal return from day −10 through day –1 is the largest in Japan at 1.64%, while the corresponding price run-up in the US is only .64%. Therefore, data coding errors could account for a part of the difference between the value of recommendations in the US and other countries. However, by day +2, the cumulative abnormal returns for both upgrades and downgrades are the largest in magnitude in the US. This finding indicates that potential errors in coding the recommendation dates do not account for the differences in value that we find in Table 6.

As an additional robustness check, we obtained analyst recommendation data from a second source, the JCF group. JCF is one of the leading vendors of European analysts' forecast and recommendation data.[11] The JCF data set has limited coverage for Canada and the US but its coverage in Europe is comparable to the IBES coverage from 1999

[10] If the actual revision date were later than the date recorded in the database, we would not be able to measure the impact of the revision on day 0 but the impact of the revision will be included in the cumulative returns over periods that include the actual revision date. For example, if the actual revision date was 2/10/99 but IBES recorded it as 2/8/99, then day 0 return would mistakenly exclude the impact of the revision but the impact would be included in the cumulative returns over intervals greater than or equal to three days.

[11] JCF group is now a part of Factset, a well-known data vendor in the US.

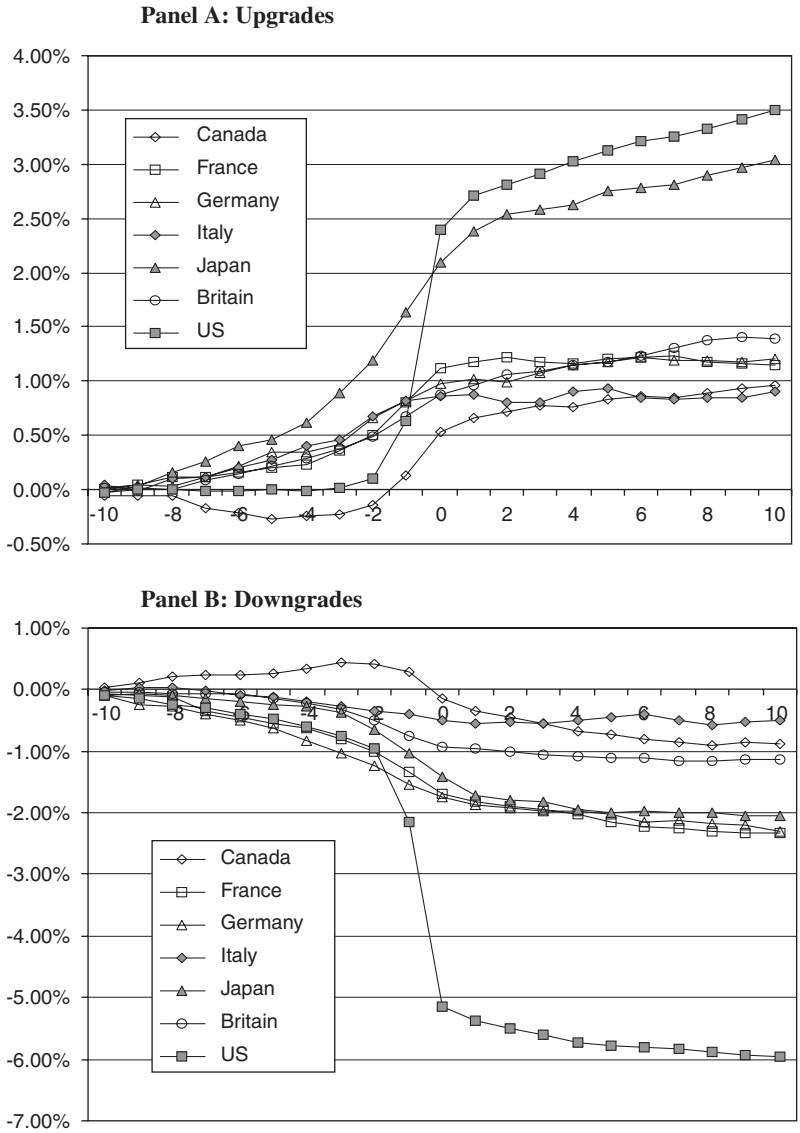

Fig. 4. Cumulative returns around recommendation revisions in G7 countries. This figure presents the cumulative abnormal returns from ten days before through ten days after recommendation revisions. We characterize each revision as an upgrade or a downgrade by comparing the revised recommendation with the previous recommendation for the stock by the revising analyst. The abnormal return is the raw return minus the market return in the respective country over the corresponding period. For the US, the market portfolio is the CRSP value-weighted index, and for the other six countries the market portfolios are the Datastream indices. The sample period is November 1993–July 2002.

onwards. We replicated Table 6 with JCF data from 1999–2003, and found similar results. Therefore, it is unlikely that the evidence that US analysts add the most value is due to systematic data coding errors.

5.2. Revisions around earnings announcements

Ivković and Jegadeesh (2004) find that the frequency of analysts' recommendation revisions in the US is higher on days following earnings announcements than on other days.[12] Analysts tend to upgrade stocks following positive earnings surprises and downgrade stocks following negative earnings surprises (see Jegadeesh et al., 2004). The post earnings announcement drift literature shows that stocks with positive earnings surprises tend to earn positive abnormal returns and stocks with negative earnings surprises tend to earn negative abnormal returns (for example, see Bernard and Thomas, 1989). Therefore, it is possible that the superior performance of the US analysts is driven by post-earnings announcement drift.

To evaluate this explanation, we exclude all recommendation revisions that were issued within the four-day window from the earnings announcement date through three days after the announcement.[13] After excluding these revisions, the US and non-US samples contained 80% and 92% of the respective number of observations in Table 6. The lower percentage of exclusions outside the US is partly due to the fact that firms in continental Europe and Japan announce earnings semi-annually or annually, while the US firms announce earnings quarterly. It is also possible that the analysts outside the US do not time their revisions within the earnings announcement window as in the US.

The results after the exclusion of post-earnings announcement revisions were similar to those in Table 6. Specifically, for this sample, the difference between upgrades and downgrades in the US is 9.6% by the end of six months after revisions. Outside the US the differences in returns range from 1.98% in Italy to 4.37% in Japan. Therefore, the superior performance of the US recommendations is not due to analysts' practice of revising their recommendation more frequently after earnings announcements.

5.3. Industry coverage

The industry composition varies considerably across countries (see Roll, 1992). It is possible that the US analysts cover more of the industries where analysts are more skilled at identifying mispricing. To assess this explanation, we first examine the distribution of industries among publicly traded firms in each country. We classify firms into ten industrial sectors identified by their Global Industry Classification Standard (GICS) codes.[14]

Table 7 presents the population distribution across the ten industries, and the sample distribution. The population industry distributions in the US and the other countries are generally similar, except that the non-US countries have larger proportions in Materials and Industrials, while the US has larger proportions in Health Care, Information Technology and Telecommunications. The sample distributions are by and large similar to the population distributions. Overall, analysts do not strategically cover any particular industry in any country.

[12]In an earlier study, Stickel (1989) documents a higher frequency of analysts' earnings forecast revisions on days following earnings announcements than on other days.

[13]We obtain earnings announcement dates from IBES.

[14]The GICSs are jointly assigned by Standard and Poor's and Morgan Stanley.

Table 7
Distribution of industries in G7 countries

This table presents distribution of industries in the G7 countries. We classify industries based on the sector level global industry classification standard (GICS) code. Panels A and B present the industry distribution for all publicly traded stocks in each country and for the stocks in the sample, respectively. The unit of observation in each panel is firm-years. The column titled "%" presents the percentage of total firms that are in the respective industries. The sample period is November 1993 to July 2002.

Sectors	US		Britain		Canada		France		Germany		Italy		Japan	
	Obs	(%)	Obs	(%)	Obs	(%)	Obs	(%)	Obs	(%)	Obs	(%)	Obs	(%)
Panel A: Population														
Energy	4,228	4	247	2	1,528	14	92	2	24	0	40	2	337	1
Materials	4,913	5	787	6	2,564	24	364	7	466	8	196	8	4,176	12
Industrials	14,682	15	2,728	21	1,210	11	966	19	1,590	26	418	17	11,524	32
Consumer Discretionary	18,861	19	3,492	27	1,561	15	1,120	23	1,229	20	539	22	8,496	24
Consumer Staples	3,849	4	880	7	552	5	467	9	386	6	108	4	2,824	8
Health Care	11,261	11	474	4	402	4	209	4	294	5	42	2	1,121	3
Financials	19,457	20	2,610	20	1,675	16	1,013	20	1,041	17	853	34	2,877	8
Information Technology	18,491	19	1,329	10	827	8	665	13	815	13	147	6	3,899	11
Telecommunication	1,804	2	114	1	224	2	38	1	59	1	39	2	80	0
Utilities	2,083	2	163	1	203	2	42	1	297	5	115	5	278	1
Total	99,629	100	12,824	100	10,746	100	4,976	100	6,201	100	2,497	100	35,612	100
Panel B: Sample														
Energy	1,197	4	96	3	413	16	43	2		0	19	3	33	1
Materials	1,476	5	254	7	508	20	130	7	134	8	35	5	357	11
Industrials	3,545	13	857	23	317	12	384	21	445	27	95	13	778	23
Consumer Discretionary	4,927	18	1,153	30	398	15	499	27	367	22	184	25	769	23
Consumer Staples	1,078	4	302	8	176	7	170	9	68	4	28	4	263	8
Health Care	2,961	11	147	4	84	3	116	6	120	7	22	3	197	6
Financials	4,577	17	551	15	295	11	208	11	207	12	237	32	305	9
Information Technology	5,647	21	340	9	182	7	276	15	237	14	45	6	548	17
Telecommunication	555	2	50	1	102	4	27	1	26	2	23	3	36	1
Utilities	1,016	4	48	1	104	4	11	1	63	4	45	6	33	1
Total	26,979	100	3,798	100	2,579	100	1,864	100	1,667	100	733	100	3,319	100

It is possible, however, that the higher value that the US analysts add relative to analysts in other countries is due to differences in industry distributions across countries. For instance, if it were easier to find larger mispricings in telecommunication and information technology sectors relative to materials and industrials, then the distribution of firms across sectors would help the US analysts add more value.

To evaluate this explanation, we recomputed the value added by the analysts in each country, assuming that each sector got the same weight as in the US. Specifically, we first computed the proportion of each sector in the US sample. We then used these sector proportions to weight the sectors in all the other countries and we computed the weighted average of cumulative abnormal returns over the event windows in Table 6. In unreported results, we found that these weighted cumulative abnormal returns were similar to those in Table 6. Therefore, differences in sector distributions across countries do not explain the superior performance of the US recommendations.

5.4. *Differential skills*

The superior performance of the US analysts' recommendations suggests that they are more skilled than their counterparts in the other developed countries. It is also possible, however, that the markets in the other countries price their stocks more efficiently, and therefore offer the domestic analysts little opportunity to uncover any mispricing. It is difficult, if not impossible, to quantify precisely the relative efficiency of different markets in order to evaluate the latter possibility. However, we can assess whether analysts from different countries exhibit different levels of skills by evaluating the performance of their recommendations when they follow the same set of stocks.[15]

This subsection examines the performance of recommendations for American Depositary Receipts (ADRs) of companies domiciled in Britain, France, Germany, Italy and Japan[16] for which we have recommendation revisions from analysts at both US and foreign brokerages. To classify brokerages, we first assign them to one of the following three categories: multinational, US-only, and non-US-only. We identified the multinationals and their foreign associates by manually examining whether the brokerages had operations both in the US and outside the US. We assigned brokerages to the US-only category when no more than ten percent of their recommendations are for non-US stocks. There are a total of 399 brokerages that belong to this category, of which 372 have only US stock coverage and 27 have some foreign stock coverage.[17] We define brokerages as non-US-only if less than 10% of their recommendations are for US stocks. There are 234 brokerages in this category of which 191 brokerages make recommendations only for non-US stocks. We classify the remaining brokerages as multinationals.

We checked several analyst reports on Investext for ADRs and their underlying stocks to examine the affiliation of the analysts who wrote the reports. In the case of multinationals, most of the reports fell in to one of two categories. One category was that the foreign analyst prepared the research reports for both the ADRs and the underlying

[15]Mikhail et al. (2004) present evidence of differences in skills among US analysts. They report that analysts with superior track records exhibit better stock selection abilities in the future.

[16]There are no Canadian companies that trade ADRs.

[17]Some examples of US-only brokerage with some foreign stock coverage are Brown Brothers, Prudential, and Sanford Bernstein.

Table 8
Cumulative returns following analyst recommendation revisions in G7 countries: ADR subsample

This table presents the cumulative abnormal returns following recommendation revisions for the ADR subsample. The sample in this table comprises American Depositary Receipts (ADRs) of companies in the G7 countries that have at least one recommendation revision by an analyst at a US-only brokerage, and at least one revision for the underlying stock in the home countries by a domestic analyst in non-US-only brokerage. We classify brokerages as US-only brokerages if total number of their foreign recommendations, including those from any international affiliates, is less than 10% of their US recommendations. Non- US-only brokerages are those brokerages whose total number of US recommendations is less than 10% of the brokerages' total recommendations. All other brokerages are classified as multinational brokerages, and these are excluded from the sample in this table. The underlying stocks for ADRs come from five of the seven G7 countries: Britain, France, Germany, Italy and Japan. Day 0 is the revision date and other days in the columns are the number of trading days from the revision date. The table presents the average cumulative abnormal returns from Day 0 to the day indicated in the row heading. The abnormal return is the raw return minus the market return in the respective countries. Average returns reported in italic face are statistically significant at least at the five percent level (absolute value of *t*-statistics greater than 1.96). We use heteroskedasticity and serial correlation consistent standard errors to compute the *t*-statistics. The sample period is November 1993–July 2002.

		Number of revisions	Number of trading days after revision date					
			0 (%)	1 (%)	2 (%)	22 (%)	44 (%)	132 (%)
US Only brokerages	Upgrades	161	*0.62*	*1.15*	*1.41*	*4.69*	*5.87*	9.74
(ADRs)	Downgrades	197	−1.36	−1.39	−1.34	−0.74	0.33	2.61
	Upgrades–downgrades		*1.97*	*2.55*	*2.75*	*5.43*	*5.54*	7.13
Non-US Only	Upgrades	1,296	0.11	0.20	*0.38*	*0.72*	1.10	2.89
brokerages	Downgrades	1,281	*−0.19*	*−0.19*	−0.23	−0.62	−0.23	1.36
(Underlying stocks)	Upgrades–downgrades		*0.30*	*0.39*	*0.61*	*1.34*	*1.33*	1.53

stocks. In these cases IBES carried the same names both in its US database and in its international database. The second category was that the research report contained both a US analyst's and a foreign analyst's name. In these cases, IBES recorded the US analysts' name in its US database and the foreign analysts' names in its international database. These findings indicate that it would be hard to unambiguously identify the actual source of recommendations in the case of multinationals.

In the case of US-only brokerages with some foreign coverage, US analysts prepared the research reports for ADRs, and there were no reports from foreign analysts within the same brokerage for these ADRs. Similarly the non-US-only brokerages had local analysts' reports for the underlying stocks and there were no corresponding ADR reports from these analysts. Therefore, the sample in this subsection comprises only revisions by analysts from US-only and non-US-only brokerages, and excludes all revisions from multinational brokerages.

Table 8 presents the event time performance of ADR recommendation revisions. There are 358 ADR recommendation revisions by US analysts and 2577 revisions by analysts in the home countries of the underlying firms.[18] The difference between upgrade and

[18]The composition of the home countries of US analysts' ADR recommendation revisions is as follows: 73% Britain, 20% France, 5% Germany, and 2% Italy. There are no recommendation revisions for Japanese firms that list ADRs. Because the ADR recommendation revision sample is small for most countries individually, the results

downgrade returns after 6 months is 7.13% for the US analysts, but only 1.53% for the domestic country analysts.

As with the earlier results, we find that the revisions by US analysts have larger price impacts than those of foreign analysts in this sample as well. Since both US analysts and foreign analysts follow the same stocks in this sample, our evidence indicates that the US analysts do indeed identify larger mispricings because of their skills, rather than because the US market is less informationally efficient than the other markets.We would, however, like to add the caveat that the sample size here is relatively small, and therefore these results should be interpreted with caution.

Although it is hard to pinpoint why the US analysts are more skilled than their foreign counterparts, it is possible that the US brokerages attract more skilled analysts by offering them more attractive compensation packages than the brokerages outside the US. To check whether there are any differences in compensation across countries, we obtained compensation data from the CFA Institute and payscale.com. The compensation data for Britain, Canada, and the U.S. are available from these two sources but they do not have data for any of the other G7 countries. We found that the US analysts' median annual total compensation is about $37,000 to $93,000 higher than their Canadian counterparts, and about $46,000 to $75,000 higher than their British counterparts (see Appendix A). Therefore, it seems likely that the better compensation structure in the US attracts more skilled analysts.[19]

One implication of this finding is that regulators should proceed with caution in restricting the role of analysts in investment banking. Brokerage houses pay analysts for the value they add. If an analyst's role in investment banking business were restricted, then his compensation would likely be lower than the compensation without such restrictions. As a consequence, the skill level of the analysts that investment banks are able to attract could be adversely affected, which in turn would erode the value of their recommendations.

6. Cross-sectional analysis

Investment banking revenues typically comprise a larger percentage of revenue for large brokerages (for instance, see Agrawal and Chen, 2005a). Therefore, it is generally presumed that analysts employed by larger brokerages face more severe conflicts of interest related to investment banking businesses. In fact, the SEC and other regulatory agencies levied various fines totaling about $1.3 billion on ten large brokerages for conflicts of interest through the 2003 Global Settlement, and they did not levy any fines on smaller

(*footnote continued*)
here should be viewed as a comparison of the performance of US analysts with analysts from all four European countries combined, rather than as a performance comparison with analysts in individual countries.

[19]It is quite possible that individuals with the same skills earn different compensations in different countries because of inter-country differences in income levels. For instance, the per capita 2004 GNI in Britain, Canada and the US were $33,940, $28,390 and $41,400 (source: World Bank). Although a part of the inter-country GNI differences is due to differences in industry composition and general skill levels, per capita GNI provides a rough benchmark for differences in income levels. While per capita GNI in the US is 22% higher than in Britain, the median analysts' compensation, averaged across the two surveys, is 60% higher in the US than in Britain. The corresponding differences between US and Canada are 46% and 63%, respectively.

brokerages.[20] While conflicts of interest may dilute the value of recommendations from large brokerages, the larger brokerages could potentially attract more skilled analysts because of their reputation and because they generally compensate analysts better than their smaller competitors (see Appendix A). Therefore, the difference between the value of recommendations from large brokerages and small brokerages would depend on the relative importance of conflicts of interests and analysts' skill.

This section examines the cross-sectional relation between brokerage size and the value of recommendations internationally, after controlling for stock characteristics, using the following regression:

$$\begin{aligned} \textit{Revision Dummy}_k * CR_k = {} & a_k + b_k\ \textit{Top 10 Broker}_k \\ & + c_k \textit{Size Decile}_k + d_k \textit{B2mQuartile}_k + \varepsilon_k, \end{aligned} \tag{5}$$

where *RevisionDummy* is +1 for upgrades and –1 for downgrades, and *CR* is the cumulative abnormal returns as defined in Eq. (1). *Top*10*Broker* is a dummy variable that is set equal to 1 if the revision is made by a brokerage that is one of the top 10 brokerages domestically, when ranked by number of analysts in the IBES universe in that particular year. *SizeDecile* is the size decile rank based on NYSE market capitalization cutoffs as of the end of the previous month of the revision, and *B2mQuartile* is book-to-market quartile rank among all firms within each country measured at the end of the previous year.[21] We use firm size and book-to-market ratios as control variables because we know from prior evidence that the price impact on the revision date is related to these characteristics in the US.[22]

We fit the cross-sectional regressions separately for the US and non-US samples using the Fama–MacBeth procedure. Specifically, we fit Regression (5) for each quarter in the sample period and the time-series mean is the coefficient estimate. We use the time-series standard error to compute the *t*-statistics. Table 9 reports the regression estimates.

We find that both size and book-to-market ratios are negatively related to the price impact of recommendation revisions in the US, consistent with prior evidence. We also find similar evidence in the non-US sample. However, the slope coefficients are smaller in magnitude in the non-US sample than in the US sample. For instance, for returns on the revision date, the slope coefficient on size is −.34 in the US and −.03 outside the US. Since the price impact of recommendation revisions is smaller outside the US, it is not surprising that the differences in the impact across size and book-to-market categories are also smaller.[23]

[20]The ten brokerages that were fined in the Global Settlement are Bear, Stearns & Co, Credit Suisse First Boston, Goldman, Sachs & Co., Lehman Brothers, J.P. Morgan Securities, Merrill Lynch, Morgan Stanley, Salomon Smith Barney, UBS Warburg and US Bancorp Piper Jaffray.

[21]Book equity is from each firm's latest fiscal year ending in the previous calendar year and market equity is calculated at the end of the previous calendar year. Negative book values (2.8% of all firm-years) are excluded in the ranking process. We require at least four months lag between the ranking date and recommendation revision date.

[22]For instance, Ivković and Jegadeesh (2004) report that recommendation revisions have a bigger impact on small firms than large firms and Gintschel and Markov (2004) report that the price impact of recommendation revisions is bigger for growth firms.

[23]In unreported results, we found that in most instances the slope coefficients had the same signs as the corresponding coefficients in Table 9 for individual countries outside the US, but they were not statistically significant because of smaller sample sizes.

Table 9
Value of recommendations and brokerage size. This table presents the results of the following regression:

$$RevisionDummy_k * CR_k = a_k + b_k \ Top10Broker_k + c_k \ SizeDecile_k + d_k \ B2mQuartile_k + \varepsilon_k,$$

where $RevisionDummy_k$ is +1 for upgrades and –1 for downgrades, CR_k is the cumulative abnormal returns over the holding period indicated in the column heading, $Top10Broker_k$ is a dummy variable equal to 1 if the revision is made by a brokerage that is one of the top 10 brokerages domestically, when ranked by number of analysts in the IBES universe, $SizeDecile_k$ is the size decile rank based on NYSE market capitalization cutoffs as of the end of the previous month of the revision, and $B2mQuartile_k$ is the book-to-market quartile rank within each country measured at the end of the previous calendar year. Day 0 is the revision date and other days in the columns are the number of trading days from the revision date. The coefficient estimates reported in italics are statistically significant at least at the five percent level (absolute value of t-statistics greater than 1.96). We estimate the quarterly Fama-Macbeth procedure to compute the t-statistics. The sample period is November 1993 to July 2002. The non-US sample includes all G7 countries outside the US.

Country	Explanatory variable	Dependent Variable: Cumulative Abnormal Returns since Revision Date					
		0	1	2	22	44	132
US	*Top 10 Broker*	*1.84*	*1.87*	*1.98*	*2.06*	*1.96*	*2.27*
	Size Decile	*−0.34*	*−0.36*	*−0.38*	*−0.49*	*−0.62*	*−0.91*
	B2m Quartile	*−0.84*	*−0.85*	*−0.81*	*−0.65*	*−0.72*	*−1.20*
Non-US	*Top 10 Broker*	*0.11*	*0.24*	*0.29*	*0.43*	*0.41*	0.38
	Size Decile	*−0.03*	*−0.04*	*−0.06*	*−0.16*	*−0.25*	*−0.44*
	B2m Quartile	*−0.05*	*−0.07*	*−0.07*	*−0.11*	*−0.22*	*−0.43*

The coefficient on Top10 broker dummy variable is positive in both US and non-US samples. A recommendation revision from a large broker has a price impact that is 1.84% greater than that from a small broker in the US and the corresponding difference is .11% outside the US on day 0.[24] This difference increases to 2.06% by the end of one month in the US and to .43% outside the US, which indicates that the differences in the price impacts on the revision dates do not dissipate over time. These results indicate that the large brokers add more value through their recommendation revisions than small brokers, which suggests that the effect of compensation on analyst's skills may more than offset the potential conflicts of interest in large brokerages.

7. Trading volume

So far our analysis has focused on the price impact of recommendation revisions. This section examines the extent to which investors' trades are influenced by these revisions. We expect that changes in trading volume would be related to the value that analysts add because investors would pay more attention to analysts when they add more value. Therefore, we would expect trading volume to respond to revisions the most in the US.

[24] Agrawal and Chen (2005b) also find that recommendation revisions from large brokerages have a bigger price impact than those from the small brokers in the US. Also, Sorescu and Subrahmanyam (2006) find that the revision date price impact and the post-recommendation price drift are positively correlated with brokerage reputation. They use a modified version of the Carter and Manaster (1990) brokerage reputation metric, which is positively correlated with brokerage size.

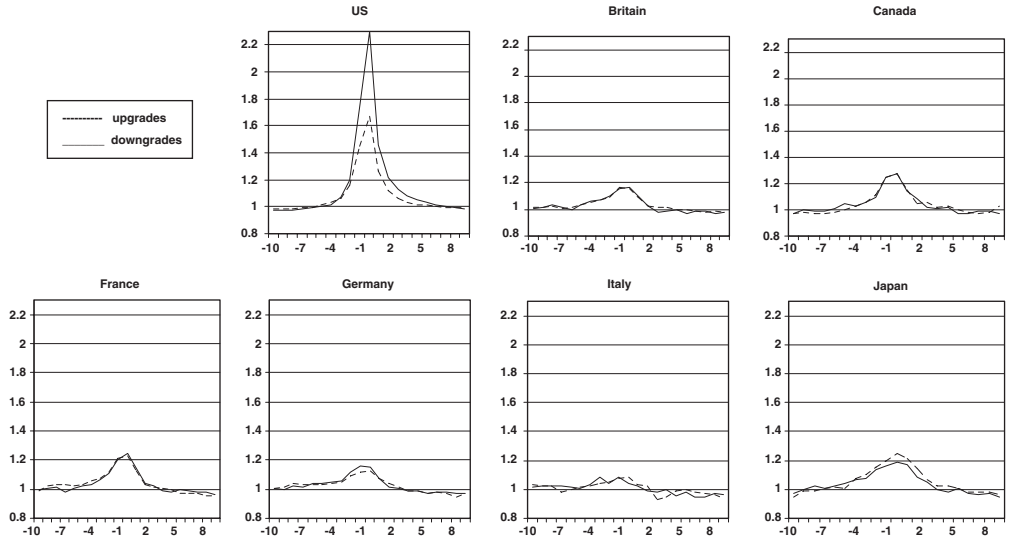

Fig. 5. Average abnormal trading volume around revision date. These figures present average abnormal trading volumes for 10 days before and after recommendation revisions date. For each revision, abnormal volume at date t is the relative magnitude of volume at date t compared to average volume from date -20 to date $+20$, excluding date $-1,0,1$.

To examine the pattern of trading volume, we compute a measure of standardized volume during an event window covering 20 days before and 20 days after recommendation revisions. We define standardized volume (SV_t^i) for stock i on day t as:

$$SV_t^i = \frac{Volume_t^i}{\frac{1}{38} \times \left(\sum_{\tau=-20}^{-2} Volume_\tau^i + \sum_{\tau=2}^{20} Volume_\tau^i \right)}, \tag{6}$$

where $Volume_t^i$ is the number of shares traded on day t, suitably adjusted for any splits within this window.[25]

Fig. 5 plots the standardized volumes for upgrades and downgrades within each country.[26] The standardized volume is significantly different from one on days -1, 0 and 1 in all countries except Italy, and in Italy it is significantly different on days –1 and 0. The US stocks experience the largest increase in trading volume around recommendation revisions. The standardized volume on day 0 is 1.67 for upgrades and 2.3 for downgrades in the US. The standardized volume reverts to 1 by day 3 or day 4 in all of the countries except the US and Japan. In the US, the standardized volume reverts to one on day 7 for upgrades and on day 8 for downgrades. In Japan, the standardized volume is similar to that in the other non-US countries on day 0, but it remains significantly greater than one up to day 5 for the upgrades, and up to day 3 for downgrades. Interestingly, we find that analysts add the most value in the US and Japan, and the investors in these countries trade

[25]If the number of days within an event window for which volume data are available is less than 38, we divide by that number, instead of 38.

[26]In our sample there are a total of 873 observations (0.37% of the sample) where the standardized volume is greater than 30. We exclude these outliers.

more intensely following recommendation revisions than in the other countries. These findings suggest that the extent to which analysts are able to influence investors' trades depends on the value of their recommendations.

8. Calendar-time strategy

So far we have considered the value of analyst recommendations in an event study framework. The event-time analysis provides a perspective on the magnitude of mispricing that analysts are able to detect when they revise their recommendations. However, as Barber et al. (2001) point out, the event time analysis does not measure the profits to an implementable investment strategy. To assess the value of analyst recommendations from a trader's perspective, this section examines the profitability of calendar time strategies.

The prior literature considers many different kinds of trading strategies based on recommendation levels as well as recommendation revisions. For example, Barber et al. (2001) and Jegadeesh et al. (2004) examine the performance of trading strategies based on consensus recommendations with US data. Specifically, these papers sort stocks based on consensus recommendation levels and buy the most favorably recommended category of stocks and sell the least favorably recommended stocks. In unreported tests, we examined the profitability of trading strategies based on recommendation levels similar to those in Barber et al. (2001) and Jegadeesh et al. (2004). We found that none of these strategies was profitable in any country in our sample, including the US. In most countries, these strategies performed poorly in 2000 and 2001, and this poor performance wiped out the profits during the earlier part of the sample period. Barber et al. (2002) previously find that such strategies are extremely unprofitable in these two years in the US, and we uncover similar results in the other countries as well.

One of the possible reasons the consensus recommendations perform poorly is that some of the recommendations that enter into the consensus can be fairly stale. Analysts often leave their recommendations unchanged for long periods of time and recommendations generally become less informative over time. The poor performance of consensus recommendations could perhaps be due to the staleness of some of the inputs. Also, as Jegadeesh et al. (2004) report, the recommendations are generally more favorable for growth stocks than for value stocks. The growth stocks performed much worse than the value stocks towards the end of our sample period, which in turn could account for much of the poor performance of the recommendations.

To avoid these potential problems associated with trading strategies based on consensus recommendation levels, we examine the performance of trading strategies based on recommendation revisions. On each date, we identify all stocks that had upgrades or downgrades over the past T months. We examine the performance of trading strategies with T equal to 1, 3 and 6 months. Each stock that enters a portfolio stays there for T months, and hence T represents the holding period. Although the strategies with shorter holding periods use fresher information, they entail more transactions. In practice, an investor will have to balance the costs of trading with the benefits of fresh information, while deciding on the appropriate holding period. We do not explicitly consider trading costs, but the range of strategies that we examine will provide a perspective on the decay rate of the value of recommendation revisions.

We also examine the effect of delays between the time a revision is made and the time the stock enters a portfolio. In practice, investments based on revisions could be delayed either

because investors do not receive the signals in a timely manner, or because there is a delay between the time the signal is received and action is taken. Our strategies allow for delays of 0, 1 and 5 days.

On each day, all upgrades over the prior T months, with a d day delay, comprise the "Buy" portfolio, and all downgrades over this sample period comprise the "Sell" portfolio.[27] For example, consider the portfolio composition on June 1, 2000, and suppose $T = 3$ months and $d = 1$ day. The buy portfolio formed on that date comprises all stocks that had recommendation upgrades from March 1, 2000 to May 31, 2000. The holding period (T) is 3 months because any stock that enters the buy portfolio on March 2, 2000 stays in the buy portfolio until June 1, 2000. The delay (d) between the last date on which stocks were upgraded (May 31, 2000) and the portfolio formation date is one day.

We examine the performance of an equal-weighted strategy as well as a value-weighted strategy. The value-weighted strategy has its appeal because the portfolio weights are proportional to the market-index weights. Also, a value-weighted strategy is a buy-and-hold strategy, and hence it can be implemented in practice. However, because the sizes of the largest few firms are orders of magnitude larger than that of the small firms, the performance of large firms will dominate in the value-weighted strategy, and the performance of small firms will not be evident. Therefore, we also examine the performance of an equal-weighted portfolio. Since the sample comprises more small firms (relative to the NYSE median) than large firms, the equal-weighted portfolio returns tilt towards the small firm performance. The equal-weighted portfolio, however, is hard to implement in practice since it requires daily rebalancing.[28]

For each of these strategies, we first compute the daily equal- weighted returns for Buy portfolio ($DR^b_{ew,t}$) and Sell portfolio ($DR^s_{ew,t}$) as follows:

$$DR^b_{ew,t} = \frac{1}{N_{b,t}} \sum_{i \in I_{b,t}} R_{i,t}, \text{ and} \tag{7}$$

$$DR^s_{ew,t} = \frac{1}{N_{s,t}} \sum_{i \in I_{s,t}} R_{i,t}, \tag{8}$$

where $I_{b,t}$ and $I_{s,t}$ are the sets of stocks in the Buy and Sell portfolios on day t, and $N_{b,t}$ and $N_{s,t}$ are the number of stocks in these portfolios.

Similarly, we compute the daily value weighted returns for Buy portfolio $DR^b_{vw,t}$ and Sell portfolio $DR^s_{vw,t}$ as follows:

$$DR^b_{vw,t} = \frac{\sum_{i \in I_{b,t}} S_{i,t-1} \times P_{i,t-1} \times R_{i,t}}{\sum_{i \in I_{b,t}} S_{i,t-1} \times P_{i,t-1}}, \quad \text{and} \tag{9}$$

[27] If a stock has both an upgrade and a downgrade within a T-month period, then we include the stock in both Buy and Sell portfolios for the appropriate periods.

[28] The equal-weighted returns are on average biased upwards because of the bid-ask bounce (see Blume and Stambaugh, 1983, Canina et al., 1998; Lyon et al., 1999). This bias is severe for low priced stocks, but many of these low priced stocks do not enter our sample because of our price cut-off and because analysts typically do not follow low-priced stocks. Also, we examine the difference between the returns for the upgrade minus downgrade portfolio. Since the firm sizes are similar for upgrades and downgrades, we expect that any such bias would be negligible.

$$DR^{s}_{vw,t} = \frac{\sum_{i \in I_{s,t}} S_{i,t-1} \times P_{i,t-1} \times R_{i,t}}{\sum_{i \in I_{s,t}} S_{i,t-1} \times P_{i,t-1}}, \tag{10}$$

where, $S_{i,t}$ and $P_{i,t}$ are the number of shares outstanding, and the price for stock i on date t, respectively. We compound the daily returns for the Buy and Sell portfolio within each calendar month, and the Buy minus Sell return is the trading strategy profit.

For each Buy minus Sell portfolio, we compute the CAPM alpha using the following regression:

$$PR_{i,t} = \alpha_i + \beta_i R_{mkt,t} + e_{i,t}, \tag{11}$$

where, $PR_{i,t}$ is the month t Buy portfolio minus Sell portfolio return for strategy i, and $R_{mkt,t}$ is the market return in that country. The regression intercept α is the CAPM excess return (per dollar long or short) per month.

Panel A of Table 10 presents the monthly excess returns for the equal-weighted Buy minus Sell portfolios for various holding periods and delays. One of the striking patterns that we find here is that the portfolio excess returns decline rapidly with an increase in

Table 10
Returns for revisions-based trading strategy in the G7 countries

This table presents the average monthly returns for trading strategies based on analysts' revisions. On each day, the trading strategies buy all upgrades and sell all downgrades that are made in the previous T months. The table presents the profits for trading strategies with T equal to one, three and six months, and the column headings indicate T. The trading strategies also vary the delay between the time a revision is made and the time the stock enters the portfolios. The rows present the number of days of delay. The table presents the returns for the trading strategies implemented with all of the firms in the sample, and also separately with the large firm and small firm subsamples. For all of the countries, the large firm subsample and the small firm subsample comprise stocks above and below the median market capitalization of equity of the NYSE listed stocks at the end of the calendar year before the revision date, respectively. We compute the daily returns for each trading strategy, and compound the daily returns to obtain the monthly returns. The table reports CAPM alphas from the following regression;

$$PR_{i,t} = \alpha_i + \beta_i R_{mkt,t} + e_{i,t},$$

where $PR_{i,t}$is the month t Buy portfolio minus Sell portfolio return for strategy i, and $R_{mkt,t}$is the market return in that country. Panel A reports intercepts from the equal-weighted portfolios, and Panel B reports the alphas for the value-weighted returns. The intercepts reported in italics are statistically significant at least at the five percent level (absolute value of t-statistics greater than 1.96). The sample period is November 1993 to July 2002.

Country	Delay after revision	All firms			Large firms			Small firms		
		1 mon	3 mon	6 mon	1 mon	3 mon	6 mon	1 mon	3 mon	6 mon
Panel A: Equal weighted portfolios										
US	0	*5.79*	*2.12*	*1.10*	*4.17*	*1.27*	*0.55*	*7.88*	*3.07*	*1.65*
	1	*2.40*	*0.98*	*0.58*	*1.66*	*0.52*	*0.21*	*3.39*	*1.61*	*1.03*
	5	*1.38*	*0.68*	*0.47*	*0.85*	*0.27*	0.11	*2.08*	*1.19*	*0.88*
Britain	0	*1.44*	3.33	1.62	*0.85*	*0.33*	*0.14*	*1.97*	3.78	1.90
	1	*1.17*	−0.48	−0.71	*0.63*	*0.29*	*0.14*	*1.67*	−0.11	−0.45
	5	−0.16	−0.67	−0.88	*0.61*	*0.22*	0.10	0.13	−0.42	−0.71
Canada	0	*1.90*	*0.86*	*0.43*	*1.07*	0.22	0.08	*1.65*	*0.74*	*0.44*
	1	*1.38*	*0.70*	*0.37*	0.37	0.06	0.05	*1.07*	0.52	0.40
	5	*0.91*	*0.50*	*0.30*	−0.05	−0.08	0.02	0.56	0.37	0.20

Table 10 (*continued*)

Country	Delay after revision	All firms			Large firms			Small firms		
		1 mon	3 mon	6 mon	1 mon	3 mon	6 mon	1 mon	3 mon	6 mon
France	0	*1.56*	*0.97*	*0.52*	*0.78*	*0.31*	*0.29*	*2.48*	*1.53*	*0.75*
	1	*0.96*	*0.59*	*0.31*	0.32	0.19	*0.24*	*1.74*	*1.09*	*0.50*
	5	*0.82*	*0.76*	*0.42*	0.20	*0.28*	*0.27*	*1.42*	*1.04*	0.46
Germany	0	*1.27*	*0.77*	*0.50*	*0.69*	0.22	0.12	*1.85*	*1.19*	*0.69*
	1	*1.03*	*0.69*	*0.46*	*0.50*	0.15	0.07	*1.35*	*1.04*	*0.60*
	5	*1.11*	*0.59*	0.30	*0.54*	0.05	0.01	*1.35*	*1.06*	*0.55*
Italy	0	0.62	*0.42*	0.29	0.52	0.33	0.21	0.79	0.56	0.45
	1	0.49	0.30	0.18	0.28	0.30	0.18	0.57	0.31	0.34
	5	*0.67*	*0.35*	0.19	0.54	*0.40*	0.15	0.85	0.35	0.41
Japan	0	*2.74*	*1.41*	*0.83*	*2.45*	*1.07*	*0.58*	*5.89*	*3.27*	*2.50*
	1	*1.99*	*1.29*	*0.76*	*1.66*	*0.85*	*0.42*	*4.89*	*2.61*	*2.26*
	5	*0.93*	*0.82*	*0.42*	*0.82*	*0.64*	0.25	*2.15*	*1.99*	*1.68*
Panel B: Value weighted portfolios										
US	0	*2.07*	*0.57*	*0.21*	*1.94*	*0.51*	*0.17*	*7.20*	*2.55*	*1.24*
	1	*0.67*	*0.20*	0.06	*0.60*	*0.22*	*0.09*	*3.06*	*1.22*	*0.64*
	5	0.20	0.11	*0.09*	0.16	0.08	0.06	*1.75*	*0.85*	*0.53*
Britain	0	*0.67*	2.69	−0.11	*0.59*	0.07	−0.09	*1.93*	3.64	0.56
	1	*0.53*	−1.00	−1.15	0.45	0.02	−0.07	*1.74*	−0.20	−0.51
	5	−0.63	−1.13	−1.21	0.35	−0.05	*−0.16*	0.01	−0.57	−0.70
Canada	0	*0.95*	0.11	0.00	*0.88*	0.16	−0.04	*1.30*	0.38	0.13
	1	0.46	0.08	0.05	0.44	0.09	−0.04	0.78	0.19	0.14
	5	−0.04	−0.18	−0.02	−0.13	−0.08	−0.02	0.58	0.14	0.01
France	0	0.25	0.13	0.04	0.14	0.07	*0.10*	*2.22*	*1.14*	*0.48*
	1	−0.07	−0.12	−0.12	−0.18	0.00	0.09	*1.46*	*0.74*	0.27
	5	0.06	*0.27*	*0.19*	−0.04	0.20	*0.15*	*1.12*	*0.76*	0.33
Germany	0	0.51	0.28	0.22	*0.66*	0.19	0.09	0.59	0.70	*0.72*
	1	0.28	*0.41*	0.35	0.33	0.22	0.09	0.43	*1.16*	*1.34*
	5	0.51	−0.02	0.12	0.41	0.05	0.08	−0.13	0.40	*0.62*
Italy	0	0.37	0.22	0.09	0.33	0.22	0.14	0.70	0.35	0.48
	1	0.13	0.17	0.02	0.00	0.22	0.12	0.59	−0.07	0.24
	5	0.25	0.26	0.01	0.15	0.30	0.08	1.11	−0.11	0.17
Japan	0	1.10	−0.08	−0.09	*1.51*	0.25	0.14	*5.09*	*2.43*	*1.86*
	1	0.37	0.12	−0.08	0.76	0.24	0.03	*4.12*	*1.91*	*1.57*
	5	0.32	−0.06	−0.15	0.40	−0.03	−0.10	*2.07*	*1.55*	*1.10*

delay. For example, for the one-month holding period, as we move from no delay to a five-day delay, the excess return declines from 5.79% to 1.38% in the US. We find a similar pattern in the other countries. This pattern reflects the relatively large returns we observe on days 0 and 1 in Table 6.

In all countries, the trading strategy is less profitable as we increase the holding period. For example, in the US, the profit declines from 5.79% for the one-month holding period

to 1.10% for the six-month holding period. The profits are significantly positive for all holding periods and all levels of delays in the US, Canada, France, and Japan. The strategies are reliably profitable in Germany in most cases. The profits in Britain are generally insignificant beyond a one-month holding period, and the profits are not reliably different from zero in most cases in Italy.

Table 10 also presents the excess returns separately for large firms and small firms. To facilitate comparability, for all countries we classify firms as large and small based on the median size of NYSE-listed stocks on the last trading day of the calendar year before the portfolio formation date. The profits are generally larger for smaller firms than larger firms. Analyst recommendations, therefore, add more value for small firms than for large firms.

Panel B of Table 10 presents the value-weighted excess returns. The pattern of the value-weighted excess returns is generally similar to the pattern of equal-weighted excess returns, both across holding periods and across delays. However, for the full sample and for the large firm sample, the value-weighted excess returns are generally much smaller than the equal-weighted excess returns. For example, the value-weighted excess return is 2.07% for the one-month holding period with no delay in the US, compared with the equal-weighted excess return of 5.79%. In the US, Britain and Canada, the value-weighted excess returns are significantly different from zero for the one-month holding period with no delay. However, outside the US, the excess returns are not significantly different from zero for longer holding periods and for longer delays, except in a few cases.

The excess returns are generally larger for the small firm sample than the large firm sample. In fact, for the small firms the value-weighted excess returns are close to the equal-weighted profits in most countries. For example, the value-weighted excess return for small firms is 7.20% for the one-month holding period with no delay in the US and the corresponding equal-weighted excess return is 7.88%. Therefore, within the small firm segment of the market, the value that analysts add is not related to firm size.

Overall, the trading profits are by far the largest in the US, followed by Japan. In fact, the trading profits for small firms are about the same in the US and Japan. The magnitudes of the profits for the equal-weighted strategy are about the same across the other countries for a one-month holding period. The value-weighted strategy is not profitable in these countries except in a few cases.

9. Conclusion

This paper examines analyst recommendations in the G7 countries and evaluates the value of these recommendations. We find that stock prices react significantly to recommendation revisions on the day of recommendation and on the following day in all of these countries except Italy. Stock prices continue to drift up for upgrades and down for downgrades over the next two to six months. We find the largest price drifts in the US, followed by Japan. These are the two largest markets in the world, and our evidence indicates that the value of analyst recommendations is the largest in these countries.

Additionally, we examine the value of analysts' recommendations for ADRs that are followed by both US analysts and foreign analysts. US analysts' recommendations add more value than the recommendations by analysts in other countries for this subsample of stocks as well. These findings indicate that the US analysts add more value because of their skills, rather than because the US market is less informationally efficient than the other

markets. We test an alternative possibility that US analysts time their revisions close to earnings announcements and find no support for this view.

We also examine the performance of calendar-time trading strategies that buy upgraded stocks and sell downgraded stocks. We consider several strategies with different holding periods, and with different delays between the time when revisions are made and the time when the stocks enter the portfolios. The equal-weighted strategies with no delays and with holding periods of one month are profitable in all countries, except Italy, before transaction costs. The value-weighted strategies, however, are profitable only for a one-month holding period strategy that is initiated without a delay. All these strategies are more profitable for small firms than for large firms. Among the G7 countries, we find that the trading strategies are the most profitable in the US, across all horizons.

Our evidence indicates that the market is not semi-strong form efficient in the countries in our sample, despite the fact that these countries have the most developed stock markets in the world. Although the profits from these trading strategies are probably smaller than reasonable transaction cost bounds considered by Barber et al. (2001), it is possible that investors can profitably use recommendation revisions in combination with other signals in their trading strategies. For instance, Jegadeesh et al. (2004) show that in the US, recommendation revisions in combination with several momentum and value signals earn significant profits. Such strategies may work in the other countries as well. However, the US results may not carry over to other countries because the analysts outside the US add less value. We leave the analysis of the incremental value of recommendations in other countries for future research.

Our comparative analysis of the value of analyst recommendation in developed countries also provides a basis for assessing the likely benefits to investors of the recent regulatory settlement with brokerage firms. This settlement includes provisions to restrict links between the investment banking and the stock research departments, and to promote independent research. The settlement will likely promote more ethical practices, and make analysts less reluctant to issue sell recommendations than they have been in the past. In fact, we do find that sell recommendations are more common in the post-settlement period.[29] The recommendations levels also exhibit more cross-sectional variation in 2003 than in the earlier years.

Neither the frequency of sell recommendations nor the cross-sectional variability, however, need translate into more value for investors. During our sample period, the US had the lowest frequency of sell recommendation among all countries we examine. Also, the issue of analysts' conflict of interest has not been a major public concern outside the US. However, analyst recommendations in the US provide the most value for investors.

It seems likely that the US investors were able to see through potential conflicts of interest, even prior to the settlement. Furthermore, the evidence that analysts in all of the most developed countries add only a modest amount of value through their recommendations suggests that these markets are fairly efficient, and it is unlikely that analysts can routinely uncover larger mispricings. Therefore, we do not see any reason to

[29]We found that in the first three months of 2003, 12% of US analysts' recommendations were sell or strong sell, compared with only 3.3% such recommendations during the 1993 to 2002 sample period. In comparison, the frequency of sell recommendations in the other G7 countries increased from 15.3% in our sample period to 17.6% during the first quarter of 2003. The fact that the frequency of sell recommendations increases much more sharply in the US than in the other countries indicates that this change was at least partly driven by the settlements with the SEC and NY state.

Table 11
Analyst compensation in Britain, Canada, and the US

This table presents the median total compensation (salary plus bonus) in 2005 for securities analysts employed by securities brokerages/dealers. Panel A presents the results based on CFA Institute survey and Panel B presents the results based on data collected by payscale.com. The CFA Institute survey classifies securities brokers/dealers as " large" if their revenues or assets are greater than US$ 5 billion, and as " small" otherwise. All figures are in US dollars.

Country	Total compensation (median)	
	Small firms	Large firms
Panel A CFA Institute data		
Britain	$ 109,238	Not available
Canada	$ 106,404	$ 145,098
US	$ 155,250	$ 182,177
Panel B: Payscale.com data		
	Total compensation (median)	
Britain	$ 95,700	
Canada	$ 78,200	
US	$ 171,000	

expect that the recommendations of the US analysts will perform any better in the future, even with the current efforts to remove their conflicting incentives, than they have in the past. In fact, we would caution limiting analysts' role in investment banking business. Brokerage houses pay analysts for the value they add to the firm. If analysts' role in the investment banking arena were restricted, then their compensations would likely decline in the future.[30] As a consequence, tighter restrictions on analysts' activities could lead to a decline in the skill level of analysts, and thereby adversely affect the value of their recommendations.

Appendix A. Analysts' compensation

This appendix presents the median compensation data for securities analysts in Canada, UK and the US. Panel A of Table 11 presents a summary of total compensation for securities analysts (domestic equities) employed by securities brokers/dealers based on data published by the CFA Institute.[31] The CFA Institute surveys its members to collect the raw data.

Panel B of Table 11 presents a summary of total compensation for securities analysts employed by securities brokers/dealers based on data published by the Payscale.com. According to Payscale, it "collects its data from several sources. The primary source of data is employee submissions from individuals around the world. Other sources of data

[30]An article in the Times (London, 2-28-2003) reports that Goldman Sachs fired a few analysts, and suggests that "the sackings come after the banks have been under regulatory pressure to separate investment banking operations from their research divisions in an attempt to avoid conflict of interest, and that "the departures are expected to form part of a trend among Wall Street banks to employ fewer analysts to cover the same number of companies."

[31]We would like to thank Kathy Valentine of the CFA Institute for providing us with the results of their survey.

include various employer and professional association compensation surveys, the US Bureau of Labor and Statistics, and partnerships with other compensation data providers.''

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