HOLIDAYS' EFFECT AND OPTIMISM IN ANALYST RECOMMENDATIONS: EVIDENCE FROM EUROPE

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Abstract

This paper documents Holidays effect in analyst recommendations in European stock markets (Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden) during the period between 2003 and 2014. Our results indicate that analysts issue overly pessimistic recommendations on pre-holidays and overly optimistic recommendations on post-holidays (Christmas, Halloween and valentine). Our results are consistent with prior literature on day-of-the-week effect that documents upward trend in stock prices during the week and downward trend in stock prices over the weekend. We argue that by issuing bulk of favorable (optimistic) recommendations on Post-Holidays, analysts may hope to benefit from upward trend in stock prices. Similarly, by issuing bulk of unfavorable (pessimistic) recommendations on pre-holidays, analysts may hope to benefit from downward trend in stock prices. Moreover, we also show that our results are more pronounced in firms with higher information uncertainty and among less experienced analysts.

JEL Classification: G15; G20
Keywords: Analyst Recommendations; Holidays Effect; Optimism

1. INTRODUCTION

Prior literature documents optimistic bias in analyst recommendations (Lin and McNichols, 1998; Barber et al., 2007; Lai and Teo, 2008). Jegadeesh et al. (2004), for example, report that average analyst recommendation is close to a Buy recommendation; the same had been illustrated by Satt (2015). They also show that Underperform or Sell recommendations make up less than five percent of all recommendations, showing that analysts are reluctant to issue negative recommendations. In another related study, Jegadeesh and Kim (2006) document similar findings by reporting that almost half of analyst recommendations are either Strong Buy or Buy in the G7 countries. They also show that unfavorable recommendations (Underperform or Sell) constitute less than fifteen percent of total recommendations. Prior literature identifies numerous reasons behind why analyst recommendations are skewed towards favorable recommendations (Das et al., 1998; Lin and McNichols, 1998; O'Brien et al., 2005). Most of these reasons are related to certain features of the work environment that encourages analysts to issue favorable recommendations.2 Jackson (2005), for instance, argues that the pressure to generate brokerage commissions can induce analysts to issue optimistic recommendations.3 Given that favorable recommendations generate more brokerage commissions than unfavorable recommendations, analysts are under considerable pressure from their employers to issue optimistic recommendations (Eames et al., 2002).4

Analysts, however, recognize that they have to optimize between optimistic biases in their recommendations and their reputation as an unbiased investment advisor. Hong and Kubic (2003) find that accurate analysts have favorable career outcomes. They show that accurate analysts tend to move up to a high status within their brokerage houses or move to large and prestigious brokerage houses. This paper argues that interaction between the need to generate brokerage commissions and accuracy concerns may result in a situation where analysts are tempted to issue relatively more favorable (optimistic) recommendations on post-holidays and relatively less favorable (pessimistic) recommendations on pre-holidays. We call this situation as *Holidays Effect* in analyst recommendations. Our assertion that Holidays' effect may also exist in analyst recommendations depends on prior literature that documents day-of-the-week effect in returns (French, 1980; Lakonishok and Smidt, 1988; Solnik and Bousquet, 1990; Barone,

[2] Lin and McNichols (1998) note that investment banking pressures result in optimistic bias in analyst recommendations. They show that lead underwriter analysts issue more favorable recommendations than unaffiliated analysts. McNichols and O'Brien (1997) argue that analysts are tempted to be optimistic because firms select those underwriters that are more optimistic.

[3] Analyst's compensation, partly, depends on trade generated by him.

[4] A competing strand of literature associates behavioral biases with optimistic bias in analyst recommendations. Cornell (2001), for example, finds that analysts are reluctant to recognize negative changes in corporate fundamentals. He argues that cognitive processing biases affect formation of analyst recommendations. Similarly, Abarbanell and Lehavy (2003) consider cognitive obstacles as the main reason behind analyst's reluctance to downgrade his opinion.

1990).[5] This strand of literature documents that stock returns tend to be the least on Post-holidays and the most on Pre-holidays. In other words, day-of-the-week effect in returns implies that returns, generally, trend upwards during the week – returns are the lowest on Post-holidays and the highest on Pre-holidays.[6] If this is true, it may be in the best interest of analysts to issue most of their favorable recommendations on Post-holidays. Issuance of more optimistic recommendations on Post-holidays serves two goals. First, it may satisfy the pressures from analysts' employers regarding issuance of optimistic recommendations. Second, analysts may hope to increase the performance, at least the short-term performance, of optimistically biased recommendations by benefiting from upward trend in stock prices. Holiday's effect implies upward trend in stock prices during the week of holidays. Consequently, analysts can better optimize between pressure to generate brokerage commissions and their reputational concerns by issuing bulk of optimistic recommendations on Pre-holidays. Furthermore, we also argue that, if Holidays effect exists in returns, analysts may be tempted to wait till the end of the holidays' week to issue pessimistic (less optimistic) recommendations. Holiday's effect implies downward trend in stock prices over the week of holidays – returns are the highest on Pre-holidays and the lowest of Post-holidays. Therefore, performance of pessimistic (less optimistic) recommendations may improve if they are issued on Post-holidays.

Consistent with our arguments, this paper documents that holiday's effect exists in analyst recommendations. Using analyst recommendations data from ten European stock markets (Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden), we show that analysts issue overly optimistic recommendations on post-holidays (2 days after), while they issue overly pessimistic recommendations on pre-holidays (2 days before) during the period between 2003 and 2014. These results are robust to alternate measures of optimism and after controlling for various firm-specific characteristics. Given that optimistic (less optimistic) recommendations are synonymous to favorable (unfavorable) recommendations, we also show that likelihood of issuing Strong Buy or Buy recommendation is higher on Pre-holidays and likelihood of issuing Underperform or Sell recommendation is higher on Post-holidays .

Our results, however, also indicate that holidays' effect exists primarily in firms with higher information uncertainty. We argue that reputational concerns are low whenever information uncertainty is high. Therefore, it is relatively easier for analysts to issue optimistically biased recommendations for firms with high information uncertainty. We also show that holidays' effect is more dominant among less experienced analysts. These analysts are more susceptible to pressures from their employers. As a result, they are more likely to issue optimistic recommendations. Experienced analysts, on the other hand, are more independent in a way that they have more skills, stronger networks, and higher expertise. They, therefore, are less likely to issue optimistically biased recommendations. We would like to mention that, to the best of our knowledge, this is the first evidence regarding the existence of holidays' effect in analyst recommendations.

The remainder of the paper is structured as follows: Section 2 summarizes the data. Section 3 presents assessment of our arguments, and Section 4 document robustness of our analysis. Section 5 discusses some of the implications of our results and the paper ends with Section 6 where we present conclusions.

2. DATA

This paper aims to document holidays' effect in analyst recommendations. For the purpose of this paper, we include firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden in our analysis. The period of analysis is between 2003 and 2014. We will, briefly, discuss the data in the following sub-sections.

2.1. Analyst recommendations

We obtain analyst recommendations data from the I/B/E/S International history recommendation database. The I/B/E/S International history recommendation database provides a data entry for each recommendation announcement by each analyst. Each observation in the file represents the issuance of a recommendation by a particular analyst for a specific firm. The I/B/E/S converts original text recommendations provided by analysts to its own 5-point rating system. Recommendations in the I/B/E/S database are coded as: 1 = Strong Buy, 2 = Buy, 3 = Hold, 4 = Underperform, 5 = Sell. Recommendations were obtained for 5 trading days putting the holiday in the middle; in other words, our sample include 3 events: Christmas, Halloween and valentine. In every year (from 2003 to 2014) we take the observations of the event, 2 trading days before and 2 trading days after the event. Descriptive statistics for analyst recommendations are reported in Table 1. As is documented in previous literature, our results show that analysts issue fewer unfavorable recommendations (Jegadeesh and Kim, 2006). We report that around 20% of recommendations are Underperform or Sell in our sample, analysts always tend to avoid downgrades in their recommendations, downgrades will lower their reputation and commissions, Satt (2015). Table 1 also shows that most of recommendations are either Strong Buy or Buy. Table 1 show that almost 45% of recommendations are classified as Strong Buy or Buy. We argue that significant divergence between the proportion of favorable (Strong Buy and Buy) and the proportion of unfavorable recommendations (Underperform and Sell) is an outcome of conflict of interests – such as investment banking pressures and desire to generate brokerage commissions – that analysts face in their jobs (Lin and McNichols, 1998; Barber et al., 2007).

[5] Day-of-the-week effect has also been observed in stock market volatility. Kiymaz and Berument (2003), for instance, document that stock markets exhibit the highest volatilities on Pre-holidays. In another related study, Farooq et al. (2013) document the highest volatility on the last trading day of the week and the lowest volatility on the first trading day of the week. In addition to stock markets, day-of-the-week effect is also observed in fixed income markets, foreign exchange markets, and derivatives markets. For example, Corhay et al. (1995), Flannary and Protopapadakis (1988), and Gesser and Poncet (1997) document that futures and foreign exchange markets are subject to day-of-the-week effect.

Table 1. Descriptive statistics for analyst recommendations

Following table documents the number and percentage of each type of recommendation. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden.

Country	Strong Buy	Buy	Hold	Underperform	Sell
Belgium	1434	2543	3423	1423	354
	(15,63%)	(27,71%)	(37,30%)	(15,51%)	(3,86%)
Denmark	1323	2677	3112	1772	688
	(13,82%)	(29,17%)	(33,91%)	(19,31%)	(7,50%)
Finland	2122	5433	3887	1996	887
	(14,81%)	(37,93%)	(27,13%)	(13,93%)	(6,19%)
France	8766	15445	16544	9886	2877
	(16,38%)	(28,86%)	(30,91%)	(18,47%)	(5,38%)
Germany	14334	18799	21002	7459	4312
	(21,75%)	(28,52%)	(31,87%)	(11,32%)	(6,54%)
Italy	4998	5668	11277	4387	1433
	(18,00%)	(20,42%)	(40,62%)	(15,80%)	(5,16%)
Netherlands	4334	7443	8211	3112	1498
	(17,62%)	(30,26%)	(33,38%)	(12,65%)	(6,09%)
Norway	3224	6989	6122	2489	1189
	(16,11%)	(34,92%)	(30,59%)	(12,44%)	(5,94%)
Spain	4889	6112	7009	3676	2334
	(20,35%)	(25,45%)	(29,18%)	(15,30%)	(9,72%)
Sweden	4677	9776	9121	6112	1336
	(15,08%)	(31,51%)	(29,40%)	(19,70%)	(4,31%)
Total	50101	80885	89708	42312	16908
	(17,90%)	(28,90%)	(32,05%)	(15,12%)	(6,04%)

2.2. Recommendation optimism

Optimism (OPT) is defined as the difference between analyst's current recommendation and the last month's consensus recommendation (Lai and Teo, 2008; Farooq and Taouss, 2012). Consensus recommendation is the average of all outstanding recommendations. Consensus recommendation is computed for those firms that have at least five outstanding recommendations. The optimism variable is created in a way that lower values represent higher optimism. Descriptive statistics for recommendation optimism are reported in Table 2. The results show that recommendations issued on Post-holidays have the highest optimism, while recommendations issued on Pre-holidays have the least optimism. We report the lowest mean and median values of optimism on Post-holidays and the highest on Pre-holidays. Table 2 may provide an early indication of the presence of day-of-the-week effect in analyst recommendations.

Table 2. Descriptive statistics for optimism

Following table documents the descriptive statistics for optimism during our sample period on each day. Optimism is the difference between analyst recommendation and last month's consensus recommendation. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden.

Statistics	*J-2*	*J-1*	*Holiday*	*J+1*	*J+2*
Mean	0.1445	0.1257	0.1120	0.1215	0.1021
Median	0.1200	0.0999	0.100	0.1222	0.0833
Standard Deviation	1.3326	1.7693	1.5887	1.1900	1.1122
Total Recommendations	45112	46553	41223	47888	49009

2.3. Control variables

This paper uses following variables as control variables:

- **SIZE:** We define SIZE as log of market capitalization on the day of recommendation. Lai and Teo (2008) argue that size has moderating effect on recommendation optimism. Data for SIZE is obtained from the Datastream.
- **LEVERAGE:** We define LEVERAGE as total debt to total asset ratio. Given that high degree of leverage exposes firm to distress risk, it may have moderating effect on recommendation optimism. Data for LEVERAGE is obtained from the Worldscope.
- **EPS:** This paper defines EPS as earnings per share. Higher earnings attract stock market participants. We argue that higher earnings may lead to higher optimism in recommendations. Data for EPS is obtained from the Worldscope.
- **GROWTH:** We define GROWTH as growth in firm's assets. We argue that firms with high growth attract investors. Greater visibility among investors may induce analysts to issue optimistic recommendations. Data for GROWTH is obtained from the Worldscope.
- **ANALYST:** We define ANALYST as the total number of analysts issuing recommendations for a firm during the year. Lai and Teo (2008) show that the extent of analyst coverage has a moderating effect on recommendation optimism. Data for ANALYST is obtained from the I/B/E/S.
- **EXPERIENCE:** This paper defines EXPERIENCE as the number of years since analyst

first appeared in the I/B/E/S database. We argue that higher experience may make analysts more independent, thereby reducing recommendation optimism. Data for EXPERIENCE is obtained from the I/B/E/S.

- **STD:** We define STD as the dispersion in analyst recommendations. Higher dispersion is associated with higher information uncertainty. Ackert and Athanassakos (1997) argue that analysts tend to be more biased whenever information uncertainty is high. Data for STD is obtained from the I/B/E/S.

3. METHODOLOGY

3.1. Univariate analysis

In this section, we document whether day-of-the-week effect exists in analyst recommendations or not. More specifically, we aim to show whether analysts issue more (or less) optimistic recommendations on certain days. Table 3 documents whether average recommendation optimism (Panel A) or median recommendation optimism (Panel B) differs between different days of the week. Our results show that average recommendation optimism and median recommendation optimism on Pre-holidaysis significantly less than recommendation optimism on other days. For instance, difference between average (median) recommendation optimism on Post-holidays and average (median) recommendation optimism on Pre-holidays is 0.0440 (0.0550). Table 3, Panel A, also shows that average recommendation optimism on Post-holidays is significantly more than average recommendation optimism on other days. For instance, difference between average recommendation optimism on Post-holidays and average recommendation optimism on Thursdays is 0.0236. Our results also show no significant difference between average recommendation optimism on other days – Tuesdays, Wednesdays, and Thursdays.

Table 3. Difference between optimism

Following table documents the difference between optimism on different days. Optimism is the difference between analyst recommendation and last month's consensus recommendation. Panel A document differences in average optimism and Panel B documents differences in median optimism. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

Panel A: Difference between average optimism					
Days	**J-2**	**J-1**	**Holiday**	**J+1**	**J+2**
J-2	-				
J-1	-0.034***	-			
Holiday	-0.0122	0.0605	-		
J+1	-0.055***	-0.0033	-0.0117	-	
J+2	-0.067***	-0.0216**	-0.0122***	-0.0542**	-
Panel B: Difference between median optimism					
Days	**J-2**	**J-1**	**Holiday**	**J+1**	**J+2**
J-2	-				
J-1	-0.045***	-			
Holiday	-0.050*	-0.0299**	-		
J+1	-0.0669	-0.341	-0.345	-	
J+2	-0.077***	-0.020***	-0.056***	-0.068**	-

3.2. Multivariate analysis

We hypothesized that day-of-the-week effect exists in analyst recommendations. In order to test our hypothesis, we estimate a regression with optimism (OPT) as a dependent variable and four dummy variables representing different days of the week. In the following regressions, POST-HOLIDAYS takes the value of 1 if the recommendation is issued on Post-holidays and 0 otherwise, TUESDAY takes the value of 1 if the recommendation is issued on Tuesday and 0 otherwise, THURSDAY takes the value of 1 if the recommendation is issued on Thursday and 0 otherwise, while PRE-HOLIDAYS takes the value of 1 if the recommendation is issued on Pre-holidays and 0 otherwise. As indicated above, we also include SIZE, LEVERAGE, GROWTH, EPS, ANALYST, and EXPERIENCE as control variables. For the purpose of completeness, we also include year dummies (YDUM), industry dummies (IDUM), and country dummies (CDUM) in our regression equations. Our regression equations take the following form:

$$OPT = \alpha + \beta_1(MONDAY) + \beta_2(TUESDAY) + \beta_3(THURSDAY) + \beta_4(FRIDAY) + \sum_{Year} \beta^{Year}(YDUM) + \sum_{Ind} \beta^{Ind}(IDUM) + \sum_{Ctry} \beta^{Ctry}(CDUM) + \varepsilon \quad (1)$$

$$OPT = \alpha + \beta_1(MONDAY) + \beta_2(TUESDAY) + \beta_3(THURSDAY) + \beta_4(FRIDAY) + \beta_5(SIZE) + \sum_{Year} \beta^{Year}(YDUM) + \sum_{Ind} \beta^{Ind}(IDUM) + \sum_{Ctry} \beta^{Ctry}(CDUM) + \varepsilon \quad (2)$$

$$OPT = \alpha + \beta_1(MONDAY) + \beta_2(TUESDAY) + \beta_3(THURSDAY) + \beta_4(FRIDAY) + \beta_5(SIZE) + \beta_6(LEVERAGE) + \beta_7(EPS) + \beta_8(GROWTH) + \beta_9(ANALYST) + \beta_{10}(EXPERIENCE) + \sum_{Year} \beta^{Year}(YDUM) + \sum_{Ind} \beta^{Ind}(IDUM) + \sum_{Ctry} \beta^{Ctry}(CDUM) + \varepsilon \quad (3)$$

The results of our analysis are reported in Table 4. Our results indicate the presence of day-of-the-week effect in analyst recommendations. We report that recommendations issued on Post-holidays are the most optimistic. We report significantly negative coefficient of POST-HOLIDAYS for all equations. We argue that day-of-the-week effect in analyst recommendations is an outcome of day-of-the-week effect in returns. To the extent that analysts have to optimize between optimistic biases in their recommendations and their reputation as an unbiased investment advisor, it is in their best interest to issue most of their favorable recommendations on Post-holidays. By doing so, they not only accommodate pressures to issue excessive number of optimistic recommendations but also guarantee that short-term returns following favorable recommendations would trend upwards. Our results also show that recommendations issued on Pre-holidays are the least optimistic. We report significantly positive coefficient of PRE-HOLIDAYS for all equations. We argue that by issuing greater proportion of unfavorable recommendations on Pre-holidays, analysts hope that, at least, short-term returns following unfavorable recommendations would trend downwards.

Table 4. Day-of-the-week effect and optimism in analyst recommendations

Following table uses Equation (1), Equation (2), and Equation (3) to document the relationship between recommendation optimism and 2 days before and after the holiday. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	Equation (1)	*Equation (2)*	*Equation (3)*
J-2	-0.0233**	-0.0554**	-0.0654**
J-1	-0.0034	-0.0044	-0.0066
J+1	0.0323	0.0134	-0.0012
J+2	0.0544***	0.0223***	0.0266**
SIZE		0.0055***	0.01344*
LEVERAGE			-0.0044**
EPS			-0.0005
GROWTH			-0.0067***
ANALYST			0.0007
EXPERIENCE			-0.0088***
STD			-0.5688***
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes
No. of Observations	233451	197898	134553
F-value	19.45	25.22	34.11
Adjusted R-square	0.05	0.04	0.022

4. ROBUSTNESS CHECKS

4.1. Day-of-the-week effect and optimism in analyst recommendations (alternate measure)

As a second robustness check, we use alternate measure of optimism and re-estimate Equation (1), Equation (2), and Equation (3). We define alternate measure of optimism as the difference between analyst's current recommendation and the median of last month's outstanding recommendations. The results are reported in Table 5. The results of our analysis are qualitatively the same as those reported in Table 4. We show significantly higher optimism in recommendations issued on Post-holidays and significantly lower optimism in recommendations issued on Pre-holidays. We report significantly negative coefficient of POST-HOLIDAYS and significantly positive coefficient of PRE-HOLIDAYS for all equations.

4.2. Day-of-the-week effect and optimism in analyst recommendations (quantile regression approach)

Our analysis implies that no matter what point on the conditional distribution is analyzed, the estimates of the relationship between day of the week and optimism in analyst recommendations are the same, testing for linearity in specific and the LINE assumptions in general, we ended up with the conclusion that the linearity assumption holds. To test the empirical validity of this restrictive assumption and to document day-of-the-week at different points of conditional distribution of optimism in analyst recommendations, a quantile regression is applied at five quantiles (namely 0.10, 0.30, 0.50, 0.70, and 0.90). The results of our analysis are reported in Table 6. The quantile regression results indicate that the relationship between optimism and recommendations issued on Post-holidays hold only in lower quantiles. We report significantly negative coefficient of POST-HOLIDAYS for 10^{th}, 30^{th}, and 50^{th} quantile. For the remaining two quantiles (70^{th} and 90^{th}), we report insignificant coefficient of POST-HOLIDAYS. Comparing our results with Table 4 indicate that OLS regression underestimate this relationship at 10^{th} and 30^{th} quantile. We also show that the relationship between optimism and recommendations issued on Pre-holidays hold only in higher quantiles. We report significantly positive coefficient of PRE-HOLIDAYS for 50^{th}, 70^{th}, and 90^{th} quantile. For the remaining two quantiles (10^{th} and 30^{th}), we report insignificant coefficient of PRE-HOLIDAYS. Comparing our results with Table 4 indicate that OLS regression overestimate this relationship at 50^{th}, 70^{th}, and 90^{th} quantile.

Table 5. Day-of-the-week effect and optimism in analyst recommendations (alternate measure)

Following table uses Equation (1), Equation (2), and Equation (3) to document the relationship between recommendation optimism (using an alternate measure) and 2 days before and after the holiday. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	Equation (1)	***Equation (2)***	***Equation (3)***
J-2	-0.0133**	-0.0154**	-0.0122***
J-1	-0.0066	-0.0044	-0.0066
J+1	0.0044	0.0034	-0.0008
J+2	0.0221***	0.0129***	0.0167*
SIZE		0.0023	0.0122***
LEVERAGE			-0.0000**
EPS			0.0004
GROWTH			-0.0011***
ANALYST			-0.0056***
EXPERIENCE			-0.0055***
STD			-0.1778***
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes
No. of Observations	233344	197123	134211
F-value	21.22	16.65	23.33
Adjusted R-square	0.04	0.01	0.05

Table 6. Day-of-the-week effect and optimism in analyst recommendations (quantile regression approach)

Following table uses quantile regression and Equation (3) to document the relationship between recommendation optimism and 2 days before and after the holiday. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	0.10	***0.30***	***0.50***	***0.70***	***0.90***
J-2	-0.0665***	-0.0343***	-0.0332*	-0.0023	-0.0055
J-1	-0.0233	-0.0033	0.0033	0.0023	-0.0126
J+1	-0.0125***	-0.0122	-0.0067	0.0233	0.0166
J+2	-0.0277	0.0077	0.0234**	0.0233**	0.0566***
SIZE	0.0557***	0.0466***	-0.0005*	-0.0087**	-0.0878***
LEVERAGE	-0.0066	-0.0045***	-0.0008	-0.0003**	0.0022
EPS	0.0008	-0.0007	-0.0099*	-0.0029***	-0.0046
GROWTH	-0.0089***	-0.0021***	-0.0012***	-0.01989***	-0.0056***
ANALYST	-0.0055**	-0.0033	0.0012**	-0.01778	0.0077***
EXPERIENCE	-0.0034**	-0.0067**	-0.0055***	-0.01445***	-0.0089***
STD	-0.5233***	-0.4567**	-0.2321***	-0.7887***	-0.2334***
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes
No. of Observations	199872	199872	199872	199872	199872
F-value					
Adjusted R-square	0.033	0.037	0.009	0.022	0.019

4.3 Day-of-the-week effect and optimism in analyst recommendations (level of recommendations)

As a last robustness check, we replace optimism measure with the level of recommendations.[7] Given that level of recommendation is an ordinal variable, we use ordered probit regressions to estimate Equation (1), Equation (2), and Equation (3).[8] The results of our analysis are reported in Table 7. Our results show that there is significantly higher likelihood that analysts issue unfavorable recommendations (Underperform and Sell) on Pre-holidays. We report significantly positive coefficient of PRE-HOLIDAYS for all equations. Furthermore, our results from Equation (6) – the most comprehensive equation – indicate that there is significantly higher likelihood that analysts issue favorable recommendations (Strong Buy and Buy) on Post-holidays. We report significantly positive coefficient of POST-HOLIDAYS.

[7] Our results have shown that recommendations issued on Post-holidays are the most optimistic and recommendations issued on Pre-holidays are the least optimistic. Therefore, it is possible that most of favorable recommendations (Strong Buy and Buy) are issued on Post-holidays and most of unfavorable recommendations (Underperform and Sell) are issued on Pre-holidays.

[8] Level of recommendation is coded as follows: 1 for Strong Buy, 2 for Buy, 3 for Hold, 4 for Underperform, and 5 for Sell.

Table 7. Day-of-the-week effect and optimism in analyst recommendations (level of recommendations)

Following table uses Equation (1), Equation (2), and Equation (3) to document the relationship between level of recommendations and 2 days before and after the holiday. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	Equation (4)	***Equation (5)***	***Equation (6)***
J-2	-0.0055	-0.0089	-0.0334**
J-1	0.0016	0.0087	-0.0036
J+1	-0.0007	-0.0033	-0.0099
J+2	0.0670***	0.0334***	0.0998***
SIZE		-0.0554***	-0.0445***
LEVERAGE			0.0009***
EPS			-0.0044***
GROWTH			-0.0055***
ANALYST			0.0198***
EXPERIENCE			-0.0077***
STD			0.2343***
Industry Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes
No. of Observations	197721	193988	167933
Wald Chi2	2546.33	2334.56	3421.23
Pseudo R-square	0.03	0.03	0.09

5. DISCUSSION OF RESULTS

5.1 Information uncertainty and day-of-the-week effect

Prior literature documents that behavioral biases are prevalent in stocks with higher uncertainty. Ackert and Athanassakos (1997) argue that analysts tend to be more biased whenever information uncertainty is high. In more uncertain information environment, analysts are less concerned about their reputation. Consequently, it is possible that day-of-the-week effect is less pronounced for firms with more certain information environment. In order to address these concerns, we divide our sample into two groups – first sub-sample comprising of firms with above-average dispersion in analyst recommendations and second sub-sample consisting of firms with below-average dispersion in analyst recommendations – and re-estimate Equation (3) for both sub-samples. The results of our analysis are reported in Table 8. Our results show that day-of-the-week effect is missing in firms with higher information certainty. We report insignificant coefficients of POST-HOLIDAYS and PRE-HOLIDAYS for a sub-sample with below average dispersion in analyst recommendations. Table 8 shows that day-of-the-week effect is only present in firms with higher information uncertainty. We report significant coefficients of POST-HOLIDAYS and PRE-HOLIDAYS for this sub-sample. Consistent with Ackert and Athanassakos (1997), we argue that behavioral biases are more pronounced whenever information uncertainty is high.

Table 8. Information uncertainty and day-of-the-week effect

Following table uses Equation (3) to document the effect of information uncertainty on holidays' effect. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	Low Information Uncertainty	**High Information Uncertainty**
J-2	-0.0011**	-0.0334**
J-1	-0.0334*	0.0566**
J+1	-0.0088**	0.0033*
J+2	0.0144*	0.0876***
SIZE	0.0083**	0.0099*
LEVERAGE	-0.0015**	-0.0033**
EPS	-0.0026	-0.0005*
GROWTH	-0.0067***	-0.0033***
ANALYST	0.0044	0.0009*
EXPERIENCE	-0.0088***	-0.0066***
STD	-0.5654***	-0.4566***
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Country Dummies	Yes	Yes
No. of Observations	125565	143386
F-value	19.51	19.78
Adjusted R-square	0.067	0.081

5.2. Analyst experience and day-of-the-week effect

There may be concerns that our results are confined to those analysts that have less experience. Less experience may make analysts more vulnerable to pressures of their employers. This is in contrast to analysts with high experience who may be less vulnerable to pressures of their employers due to their skills and networks. In order to address these concerns, we divide our sample into two groups – first sub-sample comprising of analysts with above average experience and second sub-sample consisting of firms with below average experience. We re-estimate Equation (3) for both sub-samples. The results of our analysis are reported in Table 9. Our results show that high optimism is prevalent among analysts with low experience. We report significantly negative coefficient of POST-HOLIDAYS for recommendations issued by less experienced analysts. We argue that it is hard for less experienced analysts to resist pressures from their employers. Therefore, they are more likely to issue optimistic recommendations. We also report that analysts with high experience issue less optimistic recommendations on Pre-holidays. We report significantly positive coefficient of PRE-HOLIDAYS for recommendations issued by more experienced analysts. We argue that analysts with high experience may have higher skills and better networks. Therefore, they can resist any pressure from their employers to issue optimistic recommendations.

Table 9. Analyst experience and day-of-the-week effect

Following table uses Equation (3) to document the effect of analyst experience on holidays' effect. The sample period is between 2003 and 2014. The sample consists of firms listed in Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden. 1% significance is represented by ***, 5% significance by **, and 10% significance by *.

	Low Analyst Experience	***High Analyst Experience***
J-2	-0.0887***	0.0023
J-1	-0.0334**	0.0223
J+1	-0.0657**	0.0938
J+2	0.0045	0.0566***
SIZE	0.0055	0.0088*
LEVERAGE	-0.0056	-0.0045***
EPS	-0.0006*	-0.0055
GROWTH	-0.0056***	-0.0034***
ANALYST	0.0022	0.0088
EXPERIENCE	0.0005***	-0.0045***
STD	-0.5665***	-0.4554***
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
Country Dummies	Yes	Yes
No. of Observations	134445	113667
F-value	23.88	33.16
Adjusted R-square	0.033	0.023

6. CONCLUSIONS

This paper examines whether day-of-the-week effect exists in analyst recommendations or not in Europe (Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, and Sweden) during the period between 2000 and 2011. Our results show that analysts issue overly optimistic recommendations on Post-holidays and overly pessimistic recommendations on Pre-holidays. Our results are robust to alternate measures of optimism and after controlling for various firm-specific characteristics. Our results are consistent with prior literature on day-of-the-week effect that documents upward trend in stock prices during the week and downward trend in stock prices over the weekend. We argue that by issuing bulk of favorable (optimistic) recommendations on Post-holidays, analysts may hope to benefit from upward trend in stock prices. Similarly, by issuing bulk of unfavorable (optimistic) recommendations on Pre-holidays, analysts may hope to benefit from downward trend in stock prices. Moreover, we also show that our results are more pronounced in firms with higher information uncertainty and among less experienced analysts. For future research, we propose creating buy-and-hold portfolios based on recommendations issued on each day of the week and computing their performance.

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