

HO HO HOLDINGS

THE HOLIDAY EFFECT ON STOCK RETURNS IN
THE NORDIC REGION

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Ho Ho Holdings: The Holiday Effect on Stock Returns in the Nordic Region

Abstract:

This paper studies the Holiday Effect in modern Nordic and U.K. stock exchanges between 2006 and 2024. The Holiday Effect refers to the empirical observation that stock returns are higher on the final trading day before stock market holidays compared to remaining trading days. We find mixed evidence when considering all public holidays for the indices: OMXS30, OMXC20, OMXH25, OSEBX, and FTSE100. When studying *long holidays* only – defined as Easter and Christmas – we find that stock returns are significantly higher across all markets on the final trading day. Long holidays are also associated with lower volatility and reduced trading volume. The findings challenge the traditional risk-return trade-off and points to non-fundamental, potentially behavioral, drivers of market behavior. Our study contributes to literature by studying geographies in the Nordics over a more recent timeframe.

Keywords:

Holiday Effect, Stock Returns, Behavioral Finance, Investor Sentiment, Santa Claus Rally

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1 Introduction

Holidays are often associated with joy, celebrations, and time off. For investors, the period around Christmas also draws attention to a financial pattern: higher stock returns during the so-called *Santa Claus Rally*¹ (Patel, 2023). Notably, this tendency may not be unique to Christmas. Empirical studies (Lakonishok and Smidt, 1988; Ariel, 1990; Cadsby and Ratner, 1992 etc.) have observed high returns before several public holidays across geographies. This pattern is referred to as the *Holiday Effect*, which is an empirical finding that stock returns tend to be higher on the final trading day before a public holiday compared to other trading days (Ariel, 1990). First observed in U.S. markets by Lakonishok and Smidt (1988) and Ariel (1990), the anomaly has since been documented in several international settings² and continues to receive attention in financial literature and media.

The purpose of our thesis is to study the Holiday Effect in the Nordic and UK equity markets between 2006 and 2024. We examine whether abnormal pre-holiday returns persist in this region and period, whether the magnitude of the effect varies across indices and holiday types, and what mechanisms may underlie it. Our study also considers the practical relevance of the anomaly and who might benefit from understanding it. Specifically, we address the following research question: *Does the Holiday Effect persist in modern Nordic equity markets, and what factors might explain its presence or absence?*

This study also contributes to the discussion on market efficiency and behavioral finance research. According to the Efficient Market Hypothesis, stock prices should fully and immediately reflect all available information (Fama, 1970). The documented Holiday Effect involves predictable, recurring events and have been studied for decades, so we deem it relevant and interesting to study if the anomaly persists and the reasons why. Could it reflect behavioral patterns among investors, institutional trading routines, or structural frictions in modern markets? Academic research on the Holiday Effect in current market conditions is limited, and the few existing modern studies report ambiguous results. For example, Vidal-García and Vidal (2025) find continued evidence of pre-holiday returns in Asian and North American markets, while Patel (2023) argues that the “Santa Claus Rally” is not observed in the U.S. stock market between 2000 and 2021. Moreover, the Nordic region³ remains absent from existing literature. To our knowledge, this study is the first to systematically investigate the presence and magnitude of the Holiday Effect in modern Nordic equity markets, addressing a gap in the current literature.

¹ Tendency for stock prices to rise during the final five trading days of December and the first two trading days of January

² Including U.S., Canada, Japan and Australia.

³ The “Nordic region” includes Sweden, Finland, Norway, Denmark

Foundational studies in the subject of calendar anomalies⁴ have explored the Holiday Effect primarily in the U.S. (Lakonishok & Smidt, 1988; Ariel, 1990) and in select countries such as Japan, Canada, and Australia (Kim & Park, 1994; Cadsby & Ratner, 1992). These studies report strong and significant pre-holiday returns. However, recent research paints a more complex picture. Marquering et al. (2006) find calendar anomalies such as the Holiday Effect weaken or disappear over time as markets become more efficient, suggesting anomalies are arbitrated away. These developments make it relevant to examine whether the pattern persists in the 21st century, especially in less studied, modernized markets such as those in the Nordic region. The Nordic region also offers advantages for comparative analysis. In Sweden, Norway, and Denmark, financial media recurrently discuss seasonal market trends such as the “Santa Claus Rally” (Dagens Industri, 2024; Dagens Næringsliv, 2022; Finans.dk, 2021), reflecting a widespread belief in pre-holiday return patterns. Moreover, major holidays like Easter and Christmas are culturally and institutionally shared across these countries, enabling meaningful cross-country comparisons.

To answer our research question, we test a set of hypotheses grounded on prior literature and theoretical frameworks. First, we hypothesize that stock returns on days immediately preceding a holiday is significantly higher than those on regular trading days, consistent with the findings of e.g. Ariel (1990) and Lakonishok and Smidt (1988). Second, we hypothesize that the effect is especially pronounced around longer holidays, specifically Easter and Christmas, where sentiment and time off may play a stronger role. Finally, drawing on behavioral and market microstructure theory, we hypothesize that the effect may be driven by either a combination of or separate effect of optimism-driven risk-taking, reduced trading volume, and temporary shifts in liquidity conditions. Together, these hypotheses aim to clarify whether the anomaly persists and, if so, whether it can be attributed to investor psychology, structural market frictions, or a combination of both.

Our study replicates selected parts of the methodology introduced by Ariel (1990), whose work on the pre-holiday effect remains one of the most influential contributions to the literature of calendar anomalies and seasonal return patterns. We use Ariel’s (1990) framework for our analysis due to the study’s widespread adoption in subsequent works. Following his approach, we examine the most prominent indices in each selected market as proxies for national equity performance: OMX30 (Sweden), OMXC20 (Denmark), OMXH25 (Finland), OSEBX (Norway), and FTSE100 (United Kingdom). We employ a mean comparison method, categorizing daily return data into two groups: (1) *Pre-Holidays* and (2) *Non-pre-holidays*. Daily returns are calculated based on closing prices, and the mean returns of

⁴ Marquering et al. (2006) use “Calendar anomalies” as a group-name for anomalies related to specific dates, times, or periods of the year, such as *The Holiday Effect*, *The Weekend Effect*, *The January Effect*, *The Time-of-the-Month effect* etc.

the two groups are then compared. To further validate the relationship, we also run a simple ordinary least squares (OLS) regression for each index, regressing daily returns on a binary pre-holiday indicator. To assess the statistical significance of any observed differences, we use Welch's t-test. We conduct this analysis twice for each index, using two distinct holiday samples. The samples we analyze are: (A) *All national holidays* relevant to each country, and (B) *Long Holidays* – defined as Easter and Christmas – which are common across all five markets and thus enable direct cross-country comparisons.

We then explore potential mechanisms behind the Holiday Effect, with a focus on risk-taking behavior and trading activity. Ariel (1990) explicitly notes that “*the pre-holiday variance is actually lower than the variance of non-pre-holidays*,” and emphasizes that “*the high pre-holiday return is not a reward for bearing extra risk*”. This represents a key deviation from standard asset pricing theory. Rather than serving as compensation for risk, Ariel suggests that an “*extra component of return is added to a regular trading day*,” which cannot be explained by conventional risk-return tradeoffs. To examine whether increased risk-taking could account for the Holiday Effect, we follow Ariel's method by calculating the standard deviation of daily returns for each sample. These values serve as proxies for volatility and allow us to assess whether risk levels differ between *Pre-holidays* and *Non-pre-holidays*. In addition to risk, Ariel also considers trading activity as a potential explanatory factor. We compare log-adjusted trading volumes across *Pre-holidays* and *Non-pre-holidays* to investigate whether changes in market participation or liquidity could help explain observed return differences.

To complement the quantitative analysis, we conduct semi-structured interviews⁵ with finance professionals active in equity brokerage at Nordic investment banks. These conversations offer insights into how market participants perceive the Holiday Effect in practice – whether they believe it exists, whether they act on it, and how it fits within broader trading strategies. By combining empirical testing with qualitative input, we aim to enhance both the academic understanding and practical relevance of our findings.

We find a Holiday Effect around *Long Holidays* – Easter and Christmas – across all Nordic and UK stock markets. Daily stock returns on the trading day immediately preceding these holidays are significantly higher during period 2006-2024. However, when accounting for all public holidays, the effect is only present in the Norwegian and UK indices. For Sweden, Finland and Denmark, we do not find statistically significant evidence of elevated pre-holiday return across the full holiday sample. These results should be interpreted with caution. The OLS regression provides significant results only for Norway and UK, and additional robustness tests of the mean comparison method confirm that the observed effects in Norway and the United Kingdom are not attributed to randomness. Although not significant, the OLS

⁵ “The semi-structured interviews is a qualitative data collection strategy in which the researcher asks informants a series of predetermined but open-ended questions”. (Harvard Library, 2025)

regression and robustness test indicate returns are higher on pre-holidays than non-pre-holidays.

For the Holiday Effect observed around Easter and Christmas, we find that abnormal returns cannot be explained by increased risk. This finding closely aligns with Ariel's (1990) observation of elevated pre-holiday returns without a corresponding rise in volatility. In none of the markets do we observe evidence of increased risk-taking prior to these holidays; instead, risk – measured by volatility – is lower, while returns are higher. This contradicts the traditional risk-return trade-off in financial theory and supports explanations rooted in behavioral finance. We identify an additional holiday-related pattern in trading behavior: trading volume is significantly lower on the day preceding Easter and Christmas in the Swedish, Norwegian, Finnish and British stock markets. These findings highlight reactions of investors around stock market holidays.

The background of our hypotheses is grounded in prior research on the Holiday Effect. One of the earliest studies was conducted by Lakonishok and Smidt (1988), who analyze daily return data for the Dow Jones Industrial Average (DJIA) from 1897 to 1986. They find that the average return on the trading day before holidays is approximately 0.220%, compared to just 0.009% on regular trading days – a difference of more than twentyfold. Remarkably, nearly half of the total price increase in the DJIA over the 90-year period occurs in pre-holiday trading days alone. Their findings are statistically robust across subperiod and remain one of the strongest long-term confirmations of the Holiday Effect to date (Lakonishok & Smidt, 1988). Building on this, Ariel (1990) conducts a narrower but methodologically rigorous study using daily U.S. stock market returns between 1963 and 1982, which laid the empirical groundwork for subsequent investigations in seasonal return anomalies. Ariel finds that average returns on pre-holiday trading days are approximately nine to fourteen times greater than on ordinary trading days, with over one-third of cumulative market gains occurring on just eight pre-holiday days per year. Importantly, Ariel (1990) notes that these returns are not accompanied by higher volatility. This represents a critical departure from standard asset pricing theory, which typically links higher returns with higher risk, and suggests that the anomaly cannot be explained by conventional risk-based models. While Ariel (1990) does not identify a definitive explanation, he proposes several plausible explanations, including investor optimism, reduced selling pressure, and the trading behavior of specific investor clienteles. Subsequent international studies support the global relevance of this anomaly. Kim and Park (1994) find consistent pre-holiday return patterns in Japan, Canada, and the U.K., and attributes these effects to investor sentiment rather than structural factors. Cadsby and Ratner (1992) extends the analysis to 18 global markets, finding that while the holiday effect is significant in countries like Canada, Japan, and Australia, it is largely absent in European markets – suggesting possible geographical or cultural distinctions in how

holidays impact investor behavior. Later research raised questions about the persistence of such anomalies. Marquering et al. (2006) find that the holiday effect in U.S. markets weakened considerably after its initial publication, supporting the idea that once anomalies become widely known, they are arbitrated away. This “self-destruction” characteristic of return anomalies adds further complexity to our understanding the Holiday Effect in modern markets. Patel (2023) reinforces these views, concluding that the Santa Claus Rally was absent in U.S. stock markets from 2000 to 2021, which suggests that the diminishing impact observed by Marquering et al. may still be evident today.

The structure of this paper proceeds as follows: Section 2 presents the theoretical background. Section 3 outlines the data we use and the methodology we apply. Section 4 presents the main empirical results and statistical tests of the results. In section 5, we discuss our results. This is followed by Section 6 including additional robustness tests through permutation tests. Finally, Section 6 contains a conclusion and suggestions for future research.

2 Theoretical Background

2.1 Efficient Market Hypothesis & Standard Asset Pricing Theory

The Efficient Market Hypothesis (EMH), introduced by Fama (1970), is a cornerstone of modern financial theory. It states that financial markets are informationally efficient, meaning that asset prices fully reflect all available information, making it impossible to consistently earn excess returns using historical or public data. EMH is commonly categorized into three forms, depending on the nature of the information reflected in prices: weak-form⁶, semi-strong-form⁷, strong-form⁸ (Fama, 1970).

The Holiday Effect challenges the weak-form version of EMH. If stock returns are systematically higher on trading days before a public holiday – a predictable and publicly known pattern – it suggests that markets do not fully adjust for this information. Empirical studies, including Lakonishok and Smidt (1988) and Ariel (1990), have shown that pre-holiday returns consistently exceed average daily returns. This predictability contradicts weak-form efficiency, implying that calendar-based patterns may enable investors to earn abnormal returns without access to new or private information.

In *Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk*, Sharpe (1964) developed the Capital Asset Pricing Model (CAPM), which explains how investors construct portfolios that balance risk and return to maximize utility. Through

⁶ Historical trading information is reflected in prices

⁷ Publicly available information is reflected prices, in addition to historical information

⁸ All information is reflected in prices

diversification, investors can eliminate unsystematic risk, leaving only systematic risk⁹ - the portion priced by the market. The Capital Market Line (CML) represents the set of optimal portfolios, illustrating a linear relationship between expected return and risk. CAPM assumes that asset prices adjust to reflect risk differences and that no predictable anomalies exist, as any mispricing would be corrected through arbitrage or other market forces.

2.2 Behavioral Finance and Risk-Taking

Several foundational studies, including Ariel (1990), Kim and Park (1994), and Cadsby and Ratner (1992), suggest that behavioral factors are among the most plausible drivers of the Holiday Effect. Ariel (1990) proposes that investor optimism and reduced selling pressure, possibly tied to positive holiday sentiment, may explain the consistent outperformance of pre-holiday trading days. Similarly, Kim and Park (1994) points to sentiment and psychological mood as likely causes for their results.

Investor decisions are not made in a psychological vacuum. A growing body of behavioral finance research shows that mood states – especially when shared across large groups – can significantly influence investor risk preferences, optimism, and asset pricing. These moods are often transient and unrelated to financial fundamentals, yet they affect perception, judgement, and ultimately trading behavior (Lucey & Dowling, 2005). A central concept in this literature is investor sentiment, which refers to broad, often irrational shifts in mood not directly tied to fundamentals. Lucey and Dowling (2005) argue that when large groups of people experience uniform mood shifts – triggered by factors such as weather, biorhythms, and social events – these shifts can influence investor decision-making. When large segments of the market are affected simultaneously, this may lead to systematic mispricing. In this context, mood alters not only perception but also actual investment behavior. As summarized in Lucey and Dowling (2005), Schwarz (1990) find that positive moods promote heuristic, intuitive decision-making, while negative moods encourage more analytical processing. In other words, investors in good moods may rely more on feelings and optimism than on careful risk assessment.

Taken together, this strand of behavioral finance research highlights how non-fundamental factors – such as mood, sentiment, and emotional state – can lead to deviations from rational behavior in financial markets. These mechanisms help explain the emergence of short-term return patterns, particularly when investors exhibit collective emotional responses.

⁹ Risk inherent to the entire market

2.3 Trading Activity

Trading volume, which reflects the total quantity of shares or contracts traded in a period, is widely used as a proxy for market activity and is closely linked to liquidity (Duan et al., 2023). Liquidity refers to the ease with which assets can be bought or sold without causing significant price movements. High liquidity is typically associated with high trading volume and tight bid-ask spreads, enabling efficient trade execution. In contrast, low liquidity implies wider spreads, higher trading costs, and reduced market efficiency (Amihud and Mendelson, 1986). When liquidity is low, investors may demand higher returns as compensation. Moreover, reduced trading volume can contribute to temporary mispricing and unstable price movements (Duan et al., 2023).

3 Data and Methodology

In this section, we describe the data and methodology we have used to examine the Holiday Effect in Nordic and UK stock markets, following Ariel's (1990) approach.

3.1 Data Collection

Our study uses daily closing prices and trading volumes for main equity indices in the Nordic region and UK: OMXS30, OMXC20, OMXH25, OSEBX, and FTSE100. The daily close prices, used to calculate daily returns, covers the period from January 2006 to December 2024. All data is sourced from Refinitiv Eikon via access provided by the Stockholm School of Economics Library. Refinitiv Eikon (Datastream) is a database providing access to real time market data, news, analytics and data on asset classes such as equities, FX, funds, and more. For each index, we used filters in Refinitiv to extract daily closing prices for the period from 2006-01-01 to 2024-12-31. Trading volume data was also collected from Refinitiv for each index.

We manually collect pre-holiday dates using publicly available information on stock market holidays for each country, as summarized in Table 4. For the Nordic countries, we retrieved data on stock exchange closures from Avanza, the largest stockbroker in Sweden and on the Stockholm Stock Exchange (Avanza, 2025). For the UK, we used the official website of London Stock Exchange (LSE), which is part of the London Exchange Group – a global provider of financial markets data and infrastructure (London Stock Exchange, 2025). We cross-checked all holiday closure dates with the index closing data to ensure no trading occurred on those days. The trading day immediately preceding each closure was then added to a list of pre-holiday dates in Excel.

3.2 Index Data Description and Processing

We study prominent indices from Sweden, Denmark, Finland and Norway as proxies for stock market performance in the Nordic region. An overview of these indices is provided in Table 1, their price development in Figure 1, and a discussion of using indices as a proxy follows in section 3.5. A UK index is also included due to its prominent role in global finance, close ties to Nordic financial markets, and its location near the Nordic region. The inclusion of this UK index allows for comparison across regions and adds to the discussion of earlier findings by Kim and Park (1994) and Cadsby and Ratner (1992). Additionally, the five indices are relevant to study and compare, as the countries experience similar events and behavior, for example shown in Figure 1, in which we see similar patterns for daily closing prices for the five indices.

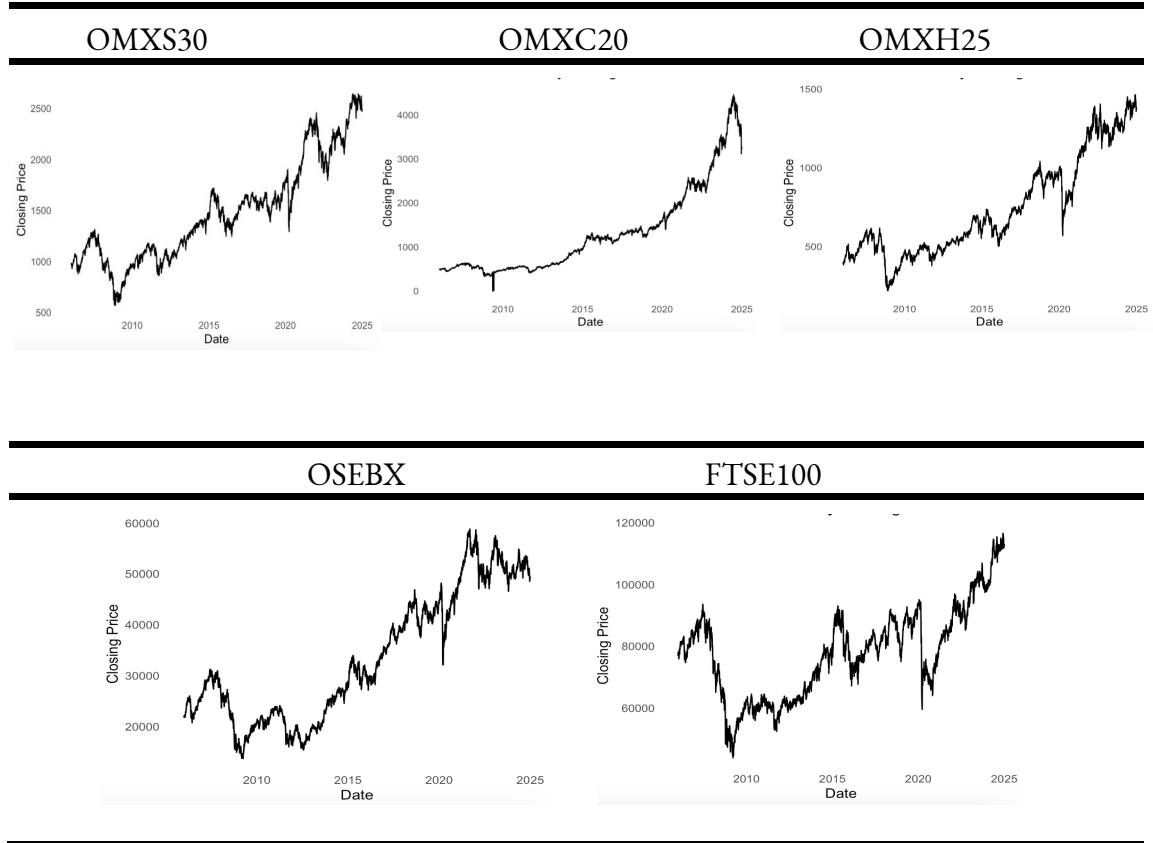
Table 1
Index Overview

Table 1 provides an overview of the five indices analyzed in our study. Each index consists of the most actively traded stocks in its respective country. All indices are market-cap weighted and listed on their national stock exchanges. The number of components refers to the total number of stocks included in each index.

Index	Country	Listing	Components	Weight
OMXS30	Sweden	Nasdaq Stockholm	30	Market Cap
OMXC20	Denmark	Nasdaq Copenhagen	20	Market Cap
OMXH25	Finland	Nasdaq Helsinki	25	Market Cap
OSEBX	Norway	Oslo Børs	60	Market Cap
FTSE100	UK	London Stock Exchange	100	Market Cap

Figure 1: Index Daily Close Prices

Figure 1 displays descriptive graphs of the observed indices and their daily close prices over the studies period from 2006 to 2024. The x-axis shows the year and the y-axis show the close price in SEK.



The availability of daily closing price data on the indices in Refinitiv Eikon determines the time frame of our study. Our analysis of the Holiday Effect spans the period from 2006 to 2024. This 19-year period is comparable in length to Ariel’s (1990) study, which covers U.S. stock returns from 1963 to 1982. This long observation window provides many data points and enhances the statistical power and reliability of the results. It also allows us to capture a wide range of market conditions, including different economic cycles, and unusual market events, and allows us to draw more general conclusions. All indices share the same time frame for closing price data and daily return calculations. However, trading volume data is more limited, resulting in shorter time frames for OMXC20, OMXH25, and OSEBX, as seen in Table 2.

Table 2
Time Frame for Observations

This table outlines the observation periods for each index used in our analysis. It shows the start and end dates for daily closing prices and returns, as well as for daily trading volume. The availability of volume data varies across indices due to differences in data access.

Index	<i>Daily Close Prices and Returns</i>		<i>Daily Volume</i>	
	Starting Date	Ending date	Starting Date	Ending date
OMXS30	2006-01-02	2024-12-30	2006-01-02	2024-12-30
OMXC20	2006-01-02	2024-12-30	2013-11-11	2024-12-30
OMXH25	2006-01-02	2024-12-30	2014-12-22	2024-12-30
OSEBX	2006-01-02	2024-12-30	2011-10-01	2024-12-30
FTSE100	2006-01-02	2024-12-30	2006-01-02	2024-12-30

Dates taken away from the sample for daily close prices include days with missing data, stating the day was a closed trading day, explaining an error in Refinitiv Eikon. In the below table, the initial and final sample of daily close prices is observed. In Table 3, we describe the data processing from initial to final sample for index data.

Table 3
Initial and Final Sample

Table 3 presents the number of observations in the initial sample, the observations removed to get to the final sample, which is used for the remainder of the study.

Index	Initial Sample	Removed from sample	Final Sample
OMXS30	4779	2	4777
OMXC20	4755	0	4755
OMXH25	4776	0	2776
OSEBX	4773	2	4771
FTSE100	4801	0	4801

3.3 Holidays and Justification of Subsample Selection

We study the Holiday Effect using two holiday groups: all official stock market holidays and a focused subsample consisting of Easter and Christmas, referred to as *All Holidays* (Panel A) and *Long Holidays* (Panel B) respectively. The motivation for analyzing Easter and Christmas separately is twofold: they involve extended market closures and hold shared institutional and cultural significance across the countries in our sample. As shown in Table 5, these holidays consistently result in multi-day exchange closures in all observed markets. This makes them uniquely suitable for cross-country comparison. The Nordic stock exchanges and the London Stock Exchange are all closed for at least two consecutive trading days during Easter and Christmas.

Table 4
Panel and Sample Definition

Table 4 defines and describes labels used throughout the paper.

Labels	Definitions	Descriptions
Panel A	<i>All Holidays</i>	All regional holidays
Panel B	<i>Long Holidays</i>	Easter and Christmas
Sample 1	<i>Pre-holidays</i>	Trading day preceding a holiday
Sample 2	<i>Non-pre-holidays</i>	Regular trading days

The overview of Holidays in Table 5 highlights the degree of overlap in holiday observance across countries and the frequency of market closures on shared dates. In addition to their structural significance, Easter and Christmas are widely celebrated across Western economies and often coincide with official holidays in major financial centers such as the U.S. and Germany. Prior research suggests that the Holiday Effect is more pronounced when local holidays align with those in larger markets, possibly due to synchronized slowdowns in global trading activity and a shared uplift in sentiment (Cadsby & Ratner, 1992). This makes Easter and Christmas particularly relevant to examine separately from other public holidays. These holidays are also both institutionally and emotionally salient. Christmas, for instance, is strongly associated with positive sentiment, gift-giving, and year-end financial positioning. The widespread anticipation and planning around these events may amplify behavioral factors such as reduced trading activity, mood-driven inertia, and optimistic sentiment – all of which have been proposed as mechanisms behind the Holiday Effect (Ariel, 1990; Kim & Park, 1994).

Table 5
Holidays Across Observed Indices

This table presents all stock market holidays included in our analysis across the five observed indices. A holiday is marked as *Closed* if the exchange was fully closed on that day during the sample period. Asterisks (*) denote half-days, where the trading day is shortened but not fully closed. The row *Total days closed* reports the total number of full-day closures, while *Including half-days* adds partial closures to the total. In the analysis, we consider *Total days closed* when referring to *All Holidays*.

Index	OMXS30	OMXC20	OMXH25	OSEBX	FTSE100
New Years Day	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	
Epiphany	<i>Closed</i>		<i>Closed</i>		
Maundy Thursday	<i>Closed*</i>	<i>Closed</i>		<i>Closed</i>	
Good Friday	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>
Easter Monday	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>
Ascension Day Eve	<i>Closed*</i>	<i>Closed</i>			
Ascension Day	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	
Walpurgis Night	<i>Closed*</i>				
Labor Day	<i>Closed</i>		<i>Closed</i>		
May Bank Holiday					<i>Closed</i>
Spring Bank Holiday					<i>Closed</i>
Summer Bank Holiday					<i>Closed</i>
National Day	<i>Closed</i>	<i>Closed</i>		<i>Closed</i>	
Whit Monday		<i>Closed</i>		<i>Closed</i>	
Midsummer's Eve	<i>Closed</i>		<i>Closed</i>		
All Saints' Day	<i>Closed*</i>				
Christmas Eve	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	
Christmas Day	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>
Christmas Monday	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>
New Years Eve	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed</i>	<i>Closed*</i>
Total days closed	11	11	11	10	7
<i>Including half-days</i>	15	11	11	10	8

3.4 Methodology

This section outlines the methodology, which build on the approach used by Ariel (1990). We use a quantitative research design that begins with a mean comparison, followed by an OLS regression. We define *pre-holiday* trading days – the day immediately preceding a holiday - as **Sample 1**, and all other trading days are defined as *non-pre-holidays* and belongs to **Sample 2**. Returns across these two groups are compared to assess whether a statistically significant difference in mean returns exists. To test for this difference in means, we use Welch’s t-test, which accounts for unequal variances between groups. While previous studies have primarily documented the Holiday Effect, some have also suggested possible explanations, such as changes in sentiment or trading patterns around holidays (Ariel, 1990; Kim and Park, 1994). Building on these suggestions and drawing from broader behavioral finance research – which shows that mood and sentiment can influence trading behavior and risk perception – we hypothesize that optimism-driven risk-taking and altered trading activity may contribute to the anomaly. To explore these mechanisms, we analyze differences in return volatility and trading volume between *pre-holidays* and *non-pre-holidays*.

To conduct these tests, we sort the dataset of daily closing prices in from descending to ascending order in Excel. We then calculate simple daily returns in Excel using Formula (1):

$$r_{t,i} = \frac{P_{t,i} - P_{t-1,i}}{P_{t-1,i}} \times 100 \quad (1)$$

where $r_{t,i}$ is daily return for index i , on day t , $P_{t,i}$ is closing price on day t , and $P_{t-1,i}$ is the closing price on the previous trading day to day t .

We then divide the dataset of daily closing prices, trading volumes, and returns into two samples: *pre-holidays* (Sample 1) and *non-pre-holidays* (Sample 2). In R, each pre-holiday is assigned a binary indicator value of one (1), while non-pre-holidays are assigned a value of zero (0). Sample 2, consisting of these regular trading days, serves as the reference group for statistical comparison. This classification, with sample sizes reported in Table 6, establishes a benchmark for normal market behavior against which the performance of pre-holiday trading days can be evaluated.

If the holiday fell on a non-trading day (e.g. Saturday or Sunday), the previous trading day (e.g. Friday) is classified as the *pre-holiday*. For the Swedish and UK stock exchanges, where half trading day occur, we only define pre-holidays as those preceding a full-day market closure. As a result, half-trading days are included in Sample 2.

Table 6
Panel A and Panel B: Observations

This table presents the number of trading day observations used in the analysis for each index. The data is divided into two panels: Panel A includes *all* market-closed public holidays, while Panel B focuses only on the Long Holidays - Easter and Christmas. For each panel, the total number of observations is reported, along with a breakdown of number of *Non-pre-holiday* and *Pre-holiday* trading days.

Index	Panel A: All Holidays	Panel B: Easter and Christmas
OMXS30	4777	4777
<i>Non-pre-holidays</i> <i>Pre-holidays</i>	4627 150	4739 38
OMXC20	4755	4755
<i>Non-pre-holidays</i> <i>Pre-holidays</i>	4626 129	4717 38
OMXH25	4776	4776
<i>Non-pre-holidays</i> <i>Pre-holidays</i>	4644 132	4733 38
OSEBX	4771	4771
<i>Non-pre-holidays</i> <i>Pre-holidays</i>	4645 126	4738 38
FTSE100	4801	4801
<i>Non-pre-holidays</i> <i>Pre-holidays</i>	4687 114	4763 38

To examine whether a Holiday Effect exists – that is, whether stock returns are higher before holidays - we calculate the means of the two samples. The arithmetic mean of daily returns for the two groups is computed using Formula (2):

$$\bar{R} = \frac{1}{N} \times \sum_{t=1}^n r_{t,i} \quad (2)$$

where \bar{R} is the mean return of the sample, N is the number of observations, and $r_{t,i}$ is the daily return on day t for index i .

We compare the mean returns of the two samples and test whether the difference is statistically significant using Welch's t-test (Duke University, 2025). Welch's t-test is preferred over the standard Student's t-test, as it does not assume equal variance and is more robust when sample sizes differ, as seen in Table 6. The t-statistic is calculated as shown in Formula 3:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad (3)$$

where \bar{X}_1 and \bar{X}_2 are the sample mean returns of pre-holidays and non-pre-holidays respectively, s_1^2 and s_2^2 are the sample standard deviations, and n_1, n_2 are the sample sizes for each group. The resulting t-statistic is compared against a critical value from the t-distribution, using adjusted degrees of freedom. We perform a one-sided t-test with the null hypothesis that there is no difference in mean returns, and the alternative hypothesis that pre-holiday returns are higher. Welch's t-test yields a p-value, which is used to assess the significance of the observed difference.

To further quantify a potential Holiday Effect and see its direct impact on returns, we estimate an OLS regression model as shown in Formula (4):

$$R_{t,i} = \beta_0 + \beta_1 \times PreHoliday_{Dummy} + \varepsilon_i \quad (4)$$

Where $R_{t,i}$ is the daily return for index i on day t , β_0 is the intercept, and $PreHoliday_{Dummy}$ is a binary variable equal to 1 if the observation falls on a pre-holiday, and 0 otherwise. The coefficient β_1 captures the magnitude attributable to the return if the trading day is a pre-holiday.

To assess whether the Holiday Effect is associated with changes in trading activity, we apply a two-sample approach for analyzing trading volume. Volumes for pre-holidays and non-pre-holidays are transformed using a natural logarithm to reduce the impact of outliers. Logarithmic volumes are calculated using Formula (5):

$$LogVolume_{t,i} = \log (Volume_{t,i} + 1) \quad (5)$$

where $Volume_t$ is the raw trading volume on day t , and 1 is added to avoid issues with $\log(0)$.

We then calculate the average logarithmic volume for each sample using Formula (6):

$$\overline{LogVolume}_{t,i} = \frac{1}{N} \times \sum_{t=1}^n LogVolume_{t,i} \quad (6)$$

where $\overline{LogVolume}_i$ is the mean logarithmic volume for index i , N is the number of observations, and $LogVolume_{t,i}$ is the log-transformed trading volume on day t . The difference in mean log volume between the two samples is then tested using Welch's t-test, as described in Formula (3).

To assess whether the Holiday effect is related to increased risk-taking behavior, we calculate the standard deviation of daily returns as a proxy for return volatility, where higher

volatility may reflect greater risk-taking by investors. The standard deviation is calculated using Formula (7):

$$s = \sqrt{\frac{1}{n-1} \sum_{t=1}^n (r_t - \bar{R}_{t,i})^2} \quad (7)$$

where s is the sample standard deviation, r_t is the return on day t , $\bar{R}_{t,i}$ is the sample mean return, and n is the number of observations in the group. We then compare standard deviations for pre-holidays and non-pre-holidays.

3.5 Data Limitations and Methodological Limitations

One hypothesis drawn from previous literature is that the Holiday Effect is driven by investor sentiment – specifically increased mood and optimism ahead of holidays. Ideally, testing this mechanism would require direct measures of investor mood, such as survey-based sentiment indices. However, such data is not available for our sample, which limits our ability to establish a direct causal relationship between sentiment and stock returns. Instead, we investigate observable mechanisms through which sentiment may manifest, namely risk-taking behavior and trading activity. These are proxied by return volatility and trading volume, respectively, observed at the index level.

A second ideal feature of the dataset would be investor-level portfolio data, including positions in equities, options, and derivatives. Access to such information would enable analysis of hedging strategies, risk exposures, and shifts in asset allocation around holidays, providing a more detailed view of investor behavior. However, due to privacy restrictions and limited data access, such portfolio granular data is unavailable. As a result, our analysis is limited to market-level behavior and cannot distinguish between actions of different investor groups.

Another methodological limitation stems from the use of major stock indices as proxies for market returns. Unlike Ariel (1990), who used CRSP's value-weighted and equally weighted indices covering the full U.S. equity market, we rely on predefined benchmark indices for the Nordic and UK markets. These indices include only the largest and most liquid stocks, excluding small- and mid-cap segments. This limited coverage reduces the generalizability of our findings, particularly if the Holiday Effect is more pronounced in parts of the market not captured by large-cap indices.

The use of indices further limits our ability to measure liquidity as a potential mechanism behind the Holiday Effect. The most used liquidity measure is the bid-ask spread, which reflects the cost of trading and market efficiency. However, bid-ask spreads are not available at the index level, since indices are not directly traded instruments and do not have

order books. While spreads exist for the underlying stocks, aggregating them to construct an index-level liquidity measure presents conceptual and practical challenges. Given our focus on investor behavior and trading activity around holidays, we instead use aggregate trading volume as a proxy for market participation. The trading volume data retrieved from Refinitiv Eikon reflects the combined volume of the underlying constituent stocks for each index.

Another limitation of this study is the exclusion of control variables in the OLS regression that could account for other recurring events coinciding with holidays. Including such controls could have improved the precision of the results and expanded their applicability. For example, day-of-the-week effects could have been controlled for, if holidays often fall on specific weekdays such as Fridays. Additionally, in some years, Easter also coincides with the release of quarterly earnings reports, which may affect returns independently of the holidays. These variables were intentionally excluded, as our primary objective is to isolate and examine whether a significant difference in returns exists between pre-holiday and non-pre-holiday trading days. Moreover, because the dataset spans a long period, calendar regularities such as holidays falling on Fridays are expected to balance out over time, which mitigates some of these concerns. Future research could build on our work by incorporating such control variables to disentangle overlapping effects.

4 Results

This section presents the results of the Holiday Effect analysis across the Nordic and UK stock markets. The findings are structured according to two panels: Panel A, including *All Public Holidays*, and Panel B, including only *Long Holidays*. We report differences in returns, volatility, and trading volume by comparing pre-holiday and non-pre-holiday trading days. While we do not find a consistent significant Holiday Effect across all indices for Panel A, we find a more significant pattern for Panel B, where several indices have higher pre-holiday returns. However, the OLS-regression indicates that the explanatory power of pre-holiday returns is low across most markets. In addition to higher pre-holiday returns, we find that both return volatility and trading activity are lower on pre-holidays for Panel B.

4.1 Daily Returns for Panel A: All Holidays

This section presents the results of our analysis of the Holiday Effect across all public holidays (Panel A) for the five indices. Sweden has the highest number of pre-holiday observations (150), followed by Finland (132). The United Kingdom has the fewest number of pre-holidays (114). From the results in Table 7, we do not find evidence of a Holiday Effect in terms of higher returns for OMXS30. The mean return on pre-holidays is negative (-0.173%), compared to a positive return (0.035%) on non-pre-holidays. However, this difference is not statistically

significant in Table 8. For OMXC20, pre-holiday returns are slightly higher (0.069%) than non-pre-holidays (0.040%), suggesting a possible Holiday Effect, though the result is not statistically significant. In case of OMXH25, the pre-holiday return (0.152%), is approximately 7.0x higher than the non-pre-holiday return (0.022%). The difference is statistically significant at the 10% level and provides moderate evidence of a Holiday Effect in the Finnish market. More robust evidence is found for OSEBX and FTSE100. For OSEBX, the mean pre-holiday return (0.261%) is approximately 8.0x higher than the non-pre-holiday return (0.033%). This mean return is also the highest number for the entire pre-holiday sample. For FTSE100, the pre-holidays return (0.197%) is 19.1x larger than remaining trading days (0.010%), which is the strongest relative effect observed in Panel A, and exceeds that observed in the Nordic markets.

Table 7

Daily Return Statistics for Panel A: All Holidays

Table 7 reports descriptive statistics for daily returns across the five indices, based on the full sample of market-closing public holidays. The results are divided into two samples: Panel A1 (*Pre-holidays*) and Panel A2 (*Non-pre-holidays*). For each sample and index, the table shows the number of observations (sample size), the mean daily return, and the standard deviation of daily returns.

<i>Panel A1: Pre-holidays</i>			
Index	Sample Size	Mean Daily return	Std.dev
OMXS30	150	-0.173%	0.0103
OMXC20	129	0.069%	0.0108
OMXH25	132	0.152%	0.0114
OSEBX	126	0.261%	0.0110
FTSE100	114	0.197%	0.0083
<i>Panel A2: Non-Pre-holidays</i>			
Index	Sample Size	Mean Daily return	Std.dev
OMXS30	4627	0.035%	0.0133
OMXC20	4626	-0.040%	0.0321
OMXH25	4644	0.022%	0.0128
OSEBX	4645	0.033%	0.0156
FTSE100	4687	0.010%	0.0117

Table 8

Difference in Mean Daily Returns for Panel A: All Holidays

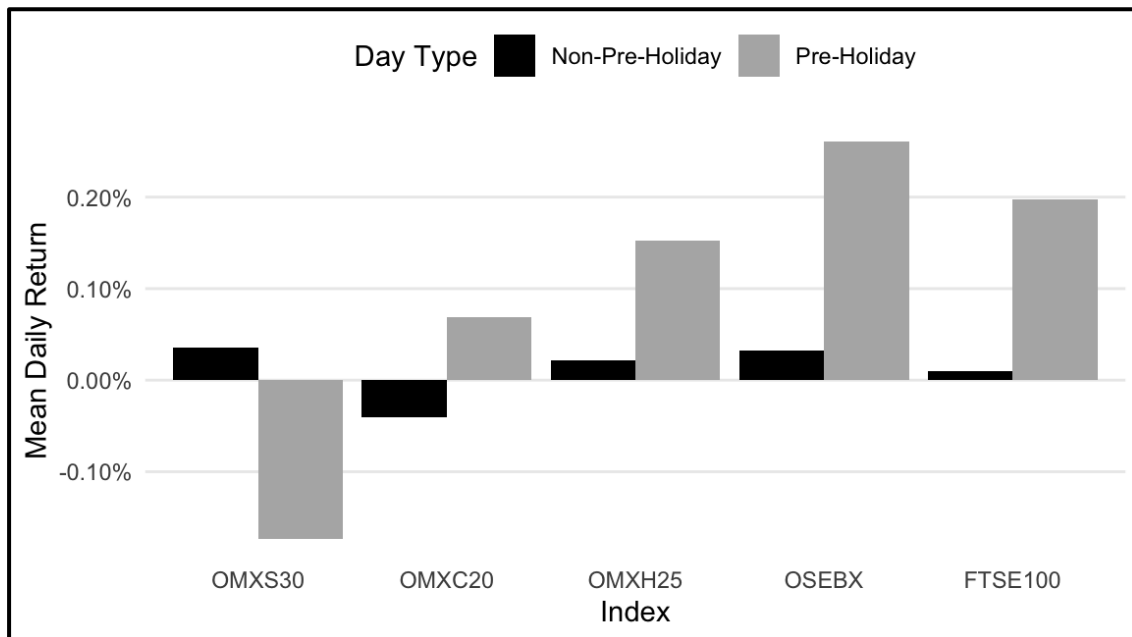
Table 8 compares mean daily returns between pre-holiday trading days (Panel A1) and non-pre-holiday trading days (Panel A2) for each index. It includes the mean return of each sample, the absolute difference between them (*Mean Panel A1 – Mean Panel A2*), and the p-value from Welch’s one-sided t-test. Symbols ., *, **, and *** denote significance levels at the 10%, 5%, 1%, and 0.1% significance level respectively. The relative difference (*Mean Panel A1/Mean Panel A2*) indicates how many times larger or smaller the average return is on pre-holidays compared to non-pre-holidays.

Index	Mean Panel A1	Mean Panel A2	Absolute difference	p-value	Significance	Relative difference
OMXS30	-0.173%	0.035%	-0.208%	n.m.		-4.9x
OMXC20	0.069%	-0.040%	0.109%	0.1539		-1.7x
OMXH25	0.152%	0.022%	0.130%	0.0999	.	7.0x
OSEBX	0.261%	0.033%	0.228%	0.0120	*	8.0x
FTSE100	0.197%	0.010%	0.187%	0.0104	*	19.1x

Figure 2

Mean Daily Returns for Panel A: All Holidays

Figure 2 plots the mean daily returns for the two samples in Panel A across the five indices. The x-axis shows the index, and the y-axis shows the mean daily return. Grey bars represent Sample 1 (pre-holidays) and black bars represent Sample 2 (non-pre-holidays).



These results suggest that the Holiday Effect is not uniformly present across all the Nordic markets when considering all public holidays from 2006 to 2024. The effect varies across markets, both in magnitude and direction. While Norway (OSEBX) and the UK (FTSE100) display strong and statistically significant pre-holiday returns, Sweden (OMXS30) and Denmark (OMXC20) show no significant effect. Overall, we find support for the hypothesis that pre-holiday returns are significantly higher than non-pre-holiday returns for OSEBX and FTSE100, partial support in OMXH25, and no support for OMXS30 and OMXC20.

4.2 Daily Returns for Panel B: Long Holidays

In this section, we present the results of our analysis of the Holiday Effect for the Panel B: Long Holidays. The results in Tables 9 and 10 provide evidence of a Holiday Effect for Long Holidays. All five indices show higher average returns on pre-holidays relative to regular days, with varying degrees of statistical significance. All mean returns can be found in Table 9, and relative differences and statistical significance in Table 10.

For OMXS30, the mean return on pre -holidays (0.312%) is a 12.0x larger return than for remaining trading days (0.026%). This difference is significant at the convenient 5% significance level. For OMXC20, the mean daily returns are lower (negative) for the long holidays compared to the non-pre-holidays. OMXH25 demonstrates the strongest result among the Nordic indices, with a pre-holiday mean return of 0.482% that is 22.2x higher than for regular trading days 0.022%. This finding is highly significant at the 0.1% level and represents the highest return in our long-holiday sample. For OSEBX, the mean return on pre-long-holidays (0.336%), is a 9.3x increase from regular days (0.036%). The finding is significant for OSEBX. Lastly, for FTSE100, we see the strongest relative effect with returns that are 27.8x higher on pre-long-holidays (0.334%) than on non-pre-long-holidays (0.012%), significant at the 1% level.

Table 9**Daily Return Statistics for Panel B: Long Holidays**

Table 9 reports descriptive statistics for daily returns across the five indices, based on subsample of market-closing Long Holidays. The results are divided into two samples: Panel B1 (*Pre-holidays*) and Panel B2 (*Non-pre-holidays*). For each sample, the table presents the number of observations (sample size), the mean daily return, and the standard deviation of daily returns.

<i>Panel B1: Pre-holidays</i>			
Index	Sample size	Mean Daily return	Std.dev
OMXS30	38	0.312%	0.00859
OMXC20	38	0.269%	0.0125
OMXH25	38	0.482%	0.00842
OSEBX	38	0.336%	0.00939
FTSE100	38	0.334%	0.0068
<i>Panel B2: Non-Pre-holidays</i>			
Index	Sample size	Mean Daily return	Std.dev
OMXS30	4627	0.035%	0.0133
OMXC20	4626	-0.040%	0.0321
OMXH25	4644	0.022%	0.0128
OSEBX	4645	0.033%	0.0156
FTSE100	4687	0.010%	0.0117

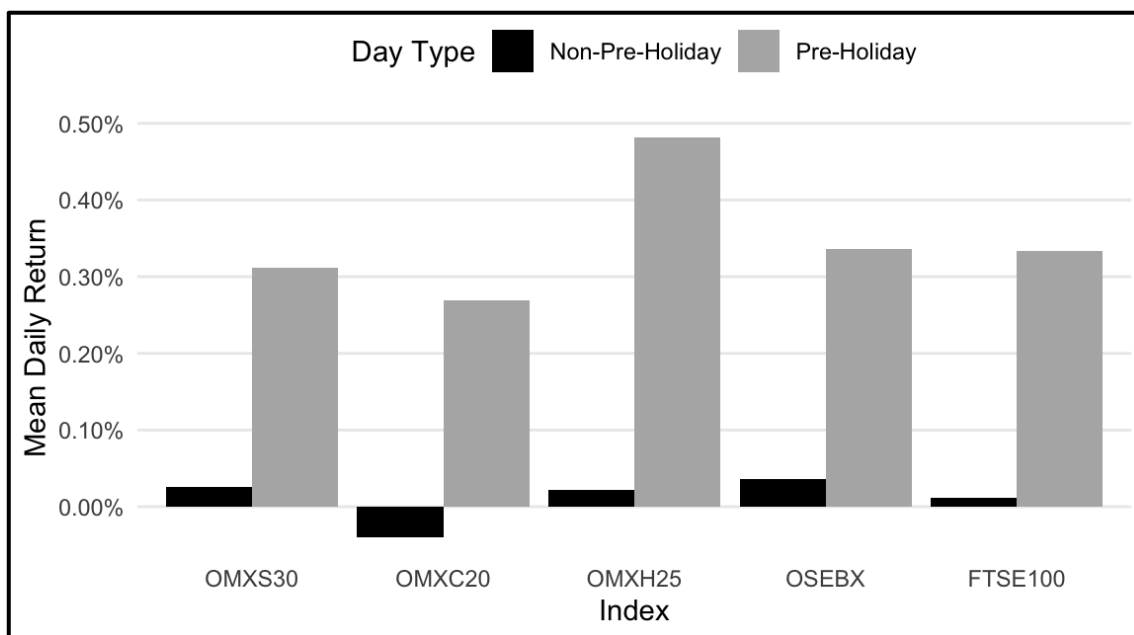
Table 10**Difference in Mean Daily Returns for Panel B: Long Holidays**

Table 10 presents mean daily returns for pre-holiday trading days (Panel B1) and non-pre-holiday trading days (Panel B2) for each index, limited to the Long Holiday sample. It includes the absolute difference between the two means (*Mean Panel B1 – Mean Panel B2*), the p-value from Welch's one-sided t-test, and corresponding significance levels. Symbols ., *, **, and *** denote significance levels at the 10%, 5%, 1%, and 0.01% significance levels, respectively. The relative difference (*Mean Panel B1/Mean Panel B2*) indicates how many times larger or smaller the average return is on pre-holidays compared to non-pre-holidays.

Index	Mean Panel B1	Mean Panel B2	Absolute difference	P-value	Significance	Relative difference
OMXS30	0.312%	0.026%	0.286%	0.0284	*	12.0x
OMXC20	0.269%	-0.040%	0.309%	0.0723	.	-6.8x
OMXH25	0.482%	0.022%	0.460%	0.0009	**	22.2x
OSEBX	0.336%	0.036%	0.300%	0.0387	*	9.3x
FTSE100	0.334%	0.012%	0.322%	0.0032	**	27.8x

Figure 3
Mean Daily Returns for Panel B: Long Holidays

Figure 3 plots the mean daily returns for the samples in Panel B across the five indices. The x-axis shows the index, and the y-axis shows the mean daily return. Grey bars represent Sample 1 (pre-holidays) and the black bars represent Sample 2 (non-pre-holidays).



In Table 10 and Figure 3, we see that the relative difference in daily returns between pre-holidays and non-pre-holidays ranges from 9.3x to 22.2x. When comparing Section 4.1 with Section 4.2, we find a clear distinction. As we concluded for Panel A, the Holiday Effect is not consistently observed across all public holidays. However, when focusing specifically on Easter and Christmas, a more consistent pattern appears: all indices exhibit higher pre-holiday returns, several showing statistically significant differences. In other words, for Long Holidays, we observe a clearer and more robust Holiday Effect. This suggests that not all holidays influence market returns equally.

Interviews with market professionals reinforce this interpretation. All participants recall seasonal patterns around Christmas and Easter – particularly references to the “Santa Claus Rally”. One equity sales professional noted, “*At the end of the year there is usually a Santa Claus Rally*” (Equity Sales Professional 1, 2025), while another added, “*It is definitely a well-known phenomenon*” (Equity Sales Professional 2, 2025). Several interviewees also emphasized the extended time off associated with these holidays. One professional mentioned, “*Before a long weekend, investors do not want to be stuck with something messy,*” and added, “*People generally want to go home and enjoy the holiday, so there is not much activity*”. This distinction

supports the idea that cultural familiarity and institutional prominence may be necessary conditions for the Holiday Effect to emerge in the Nordic markets.

Since an effect appears to be present around Long Holidays (Panel B), we ran an OLS-regression to quantify its magnitude. The output is presented in Table 11, and results align with our earlier. The coefficient for the pre-holiday dummy is positive across all indices, but statistically significant only for OMXH25 and marginally significant for FTSE100. However, the explanatory power is very low, with low R squared. For example, the R-squared for OMXH25 is just 0.00102, meaning if it occurs on a pre-holiday, it will only explain 0.1% of the daily return. This low R-squared is expected, as daily return data are inherently noisy and influenced by numerous factors.

Table 11
Ordinary Least Square for Panel B: Long Holidays

Table 11 presents the outputs from ordinary least squares (OLS) regressions run separately for each of the five indices. This model estimates the effect of long-holiday trading days on daily returns. For each index, the table reports the intercept β_0 , and the coefficient for the pre-holiday dummy variable β_1 , with standard errors in parentheses. Statistical significance is indicated by a bullet or asterisks \cdot , $*$, $**$, and $***$ corresponding to the 10%, 5%, 1%, and 0.1% levels, respectively. The table also shows the number of observations, the R-squared, and the adjusted R-squared for each index.

	OMXS30	OMXC20	OMXH25	OSEBX	FTSE100
β_0 Intercept	0.0003 (0.0002)	-0.0004 (0.0005)	0.0002 (0.0002)	0.0004 (0.0030)	0.0001 (0.0002)
β_1 Pre-holiday dummy	0.0029 (0.0022)	0.0031 (0.0052)	0.0046* (0.0021)	0.0030 (0.0025)	0.0032 (0.0019)
Observations	4775	4753	4774	4769	4799
R2	0.00037	0.00008	0.00102	0.00029	0.00060
Adjusted R2	0.00016	-0.00014	0.00082	0.00008	0.00039

4.3 Risk-Return Tradeoff and Risk-Taking

To examine whether higher pre-holiday returns are associated with increased risk-taking, we compare return volatility between pre-holiday and non-pre-holiday trading days. In Table 12, we see that across all five indices, volatility is lower on pre-holiday trading days. The most pronounced difference is seen for OMXC20, where pre-holiday volatility is 1.93 percentage points lower than on non-pre-holidays. This suggests that the observed return premium is not driven by increased risk-taking – contradicting the risk-return trade-off.

Table 12
Volatility Statistics for Panel B: Long Holidays

This table presents return volatility for pre-holiday trading days preceding long holidays (Panel B1) and all other trading days (Panel B2). Volatility is measured as the standard deviation of daily returns and reported in percentage terms. For each index, the table shows the volatility in both groups, the absolute difference (*Panel B1 – Panel B2*), and the relative difference (*Panel B1/Panel B2*). A relative difference indicates how large the pre-holiday volatility is compared to non-pre-holiday volatility, with values below 1.0 indicating lower volatility on pre-holiday trading days.

Index	Volatility Panel B1	Volatility Panel B2	Absolute Difference	Relative Difference
OMXS30	0.86%	1.33%	-0.47%	0.65x
OMXC20	1.25%	3.18%	-1.93%	0.39x
OMXH25	0.84%	1.28%	-0.44%	0.66x
OSEBX	0.94%	1.56%	-0.62%	0.60x
FTSE100	0.68%	1.17%	-0.49%	0.58x

The absolute and relative difference across indices confirms that pre-holiday volatility is consistently lower than on regular trading days. OMXC20 again shows the largest absolute difference in volatility. OMXH25 follows a similar pattern, with pre-holiday volatility reduced to nearly half of its non-holiday level. OMXS30 and OSEBX both show modest declines, while FTSE100 exhibits a smaller reduction in relative terms but still follows the same downward direction.

Interviews with equity sales professionals provide context for the observed lower volatility on pre-holiday trading days. One equity broker noted that “*investors often don’t make big decisions before a long weekend...they are less risk taking ahead of holidays*” (Equity Sales Professional 1, 2025), suggesting investors have a more passive mindset and avoid risk-taking ahead of longer breaks. This behavioral inertia and “mental checkout” align with the observed reduction in volatility around Easter and Christmas, reinforcing the view that the Holiday Effect is not driven by increased risk-taking but rather by reluctance to act.

4.4 Trading Volume Effects on Long Holidays

To explore potential mechanisms behind the Holiday Effect observed around Easter and Christmas, we analyze trading volumes on pre-holiday trading days. Across all indices, we find that trading volume is consistently lower on the day preceding these Long Holidays compared to regular trading days.

Table 13
Trading Activity for Panel B: Long Holidays

This table presents descriptive statistics on trading activity for Panel B. It includes the sample size, mean logarithmic trading volume, and standard deviation for pre-holiday (Panel B1) and non-pre-holiday (Panel B2) trading days across all five indices.

<i>Panel B1: Pre-holidays</i>			
Index	Sample size	Mean Log Volume	Std.dev
OMXS30	38	18.00	0.47
OMXC20	23	16.27	0.60
OMXH25	21	17.30	0.31
OSEBX	28	17.90	0.44
FTSE100	38	19.84	0.87
<i>Panel B2: Non-Pre-holidays</i>			
Index	Sample size	Mean Log Volume	Std.dev
OMXS30	4739	18.50	0.46
OMXC20	2757	16.38	0.54
OMXH25	2497	17.50	0.35
OSEBX	3482	18.40	0.56
FTSE100	4763	20.60	0.39

Tables 13 and 14 reports the mean log trading volumes, the results from one-sided t-tests, and the relative difference of the trading volumes between pre-holiday and regular trading days. For OMXS30 and OSEBX, pre-holiday volumes are only 97.3% of the volume observed on regular trading days. A similar pattern appears for FTSE100, where trading volume drops to 96.3% of regular-day volume. All three differences are statistically significant at the 1% level. While OMXC20 does not show a statistically significant difference, the decrease in average volume still aligns behavioral trend observed across other indices.

Table 14
Difference in Trading Activity for Panel B

This table presents mean log trading volumes between pre-holiday trading days (Panel B1) and non-pre-holiday trading days (Panel B2) across all indices. The first two columns present the mean logarithmic volumes from each sample, followed by the absolute difference (*Panel B1 – Panel B2*), and the results from one-sided t-tests testing whether trading volume is lower on pre-holidays. The p-values and corresponding significance levels are also reported. Statistical significance is indicated by a bullet and asterisks \cdot , \ast , $\ast\ast$, and $\ast\ast\ast$ corresponding to 10%, 5%, 1%, and 0.1% levels, respectively. The relative difference is also reported (*Panel B1/Panel B2*).

Index	Log volume Panel B1	Log volume Panel B2	Absolute difference	P-value	Significance	Relative difference
OMXS30	18.00	18.50	-0.50	0.0000	$\ast\ast$	0.973x
OMXC20	16.27	16.38	-0.11	0.1848		0.993x
OMXH25	17.30	17.50	-0.20	0.0032	\ast	0.989x
OSEBX	17.90	18.40	-0.50	0.0000	$\ast\ast$	0.973x
FTSE100	19.84	20.60	-0.77	0.0000	$\ast\ast$	0.963x

The observed lower trading volume on pre-holidays, as shown in Table 14, is further supported by interview insights. Several market professionals emphasized that trading activity typically slows ahead of major holidays. One equity sales professional stated, “*The activity slows down a lot during the summer or before a longer period off,*” and added, “*Most desks do not want unnecessary activity that day,*” (Equity Sales Professional 2, 2025), describing a tendency to minimize transactions around holiday periods. Another interviewee noted, “*You do not have the energy to react to bad news when you’re in holiday-mode – people probably avoid talking about negative news and just leave it,*” (Equity Sales Professional 1, 2025), suggesting that negative sentiment is often downplayed or postponed. A third stockbroker commented, “*Even on Fridays, we typically do the fewest trades, because people are already eager to go home,*” (Equity Sales Professional 3, 2025), further highlighting a broader pattern of reduced trading ahead of breaks. These behaviors help contextualize our empirical findings: lower pre-holiday volume likely reflects a collective disengagement, where market participants delay decisions or avoid entering new positions before anticipated time off.

5 Additional Robustness Checks

To validate the main findings on the Holiday Effect for Long Holidays presented in Section 4.2, we conduct additional robustness tests using the permutation test in R. This test evaluates whether the higher returns on pre-holiday trading days could have occurred by random

chance. The permutation test functions as an additional check and assesses the sensitivity of the results to distributional assumptions. We assess whether the significant differences in mean returns between pre-holidays and non-pre-holidays for Panel B can be attributed to randomness. The permutation test works by randomly reassigning the daily return data into two groups that match the sizes of the actual pre-holiday and non-pre-holiday samples. For each permutation, the difference in mean returns between these two randomly generated groups is calculated, presented in Table 15. This process is repeated for the non-random sample split, whereafter the p-value of differences in these is calculated as the proportion of permutations where the mean difference was greater than or equal to the observed differences. If the p-value is below 0.05, the difference is considered statistically significant.

For Panel B, we find a statistically significant difference in returns for the Finnish and UK indices that is not due to randomness, and marginal significance for the Swedish index. For the Danish and Norwegian indices, the results point toward a potential Holiday Effect, but the findings cannot be excluded to be caused by randomness.

Table 15

Placebo Permutation Test for Daily Returns of Long Holidays

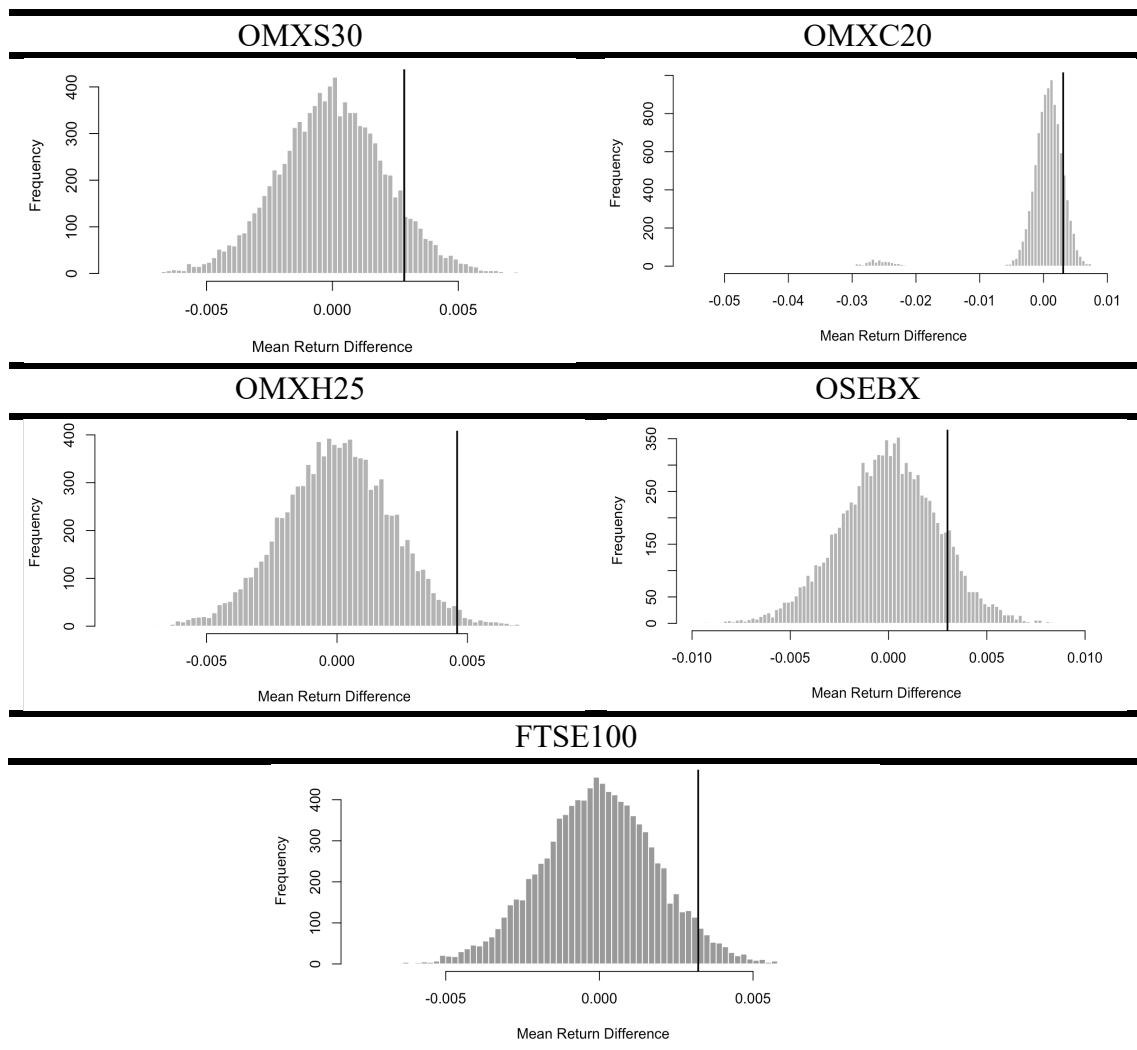
This table presents the output of the permutation test for Panel B. For each index, we report the observed mean difference in stock returns, the average permuted differences under randomly assigned sample divisions, the p-value of the observed difference, and the corresponding significance level. The statistical significance levels are represented by bullets and asterixis: ·, *, **, ***, representing <10%, <5%, <1%, and 0.1% respectively.

Index	Observed Mean Difference	Permuted Differences	p-value	Significance
OMXS30	0.0029	0.0000	0.0884	·
OMXC20	0.0031	0.0000	0.1343	
OMXH25	0.0046	0.0000	0.0140	*
OSEBX	0.0030	0.0000	0.1137	
FTSE100	0.0032	0.0000	0.0417	*

Figure 4

Permutation Test for Daily Returns of Panel B

This figure plots the permutation distribution of mean return differences for daily returns preceding Long Holidays (Panel B) across all five indices. Each histogram shows the distribution generated by randomly reassigning pre-holiday labels over 10,000 times, and the number of times a certain difference in mean returns occurs in the dataset. The vertical black line in each histogram represents the actual observed mean difference in returns.



In Figure 4, we see that for OMXH25, OSEBX and FTSE100, the vertical line clearly lies on the tail of the distribution, suggesting that the actual pre-holiday returns are unusually high relative to what could be expected by chance. This supports the results from Table 15 and Section 4.2 of there being a statistically significant Holiday Effect for these indices. For OMXC20, the observed value lies closer to the center of the null distribution, suggesting the observed difference could be by random variation, or at least not statistically significant

enough to exclude the possibility. The permutation tests strengthen the validity of the result of the presence of the Holiday Effect for Long Holidays for Finland (OMXH25) and UK (FTSE100). The test provides marginal evidence of a Holiday Effect for Sweden (OMXS30), suggesting some support but not at conventional significance levels. For Denmark (OMXC20) and Norway (OSEBX), the observed differences are not statistically significant, and thus only cautious conclusions should be drawn of the significance of this effect on returns for the other observed indices.

6 Discussion

Our findings add nuance to the existing literature on the Holiday Effect. Previous studies such as Lakonishok and Smidt (1988), Ariel (1990), Kim and Park (1994), and Cadsby and Ratner (1992) documented a widespread pattern of abnormally high returns on pre-holidays. They point to the Holiday Effect as a broad international phenomenon observed from North America to Asia. However, in modern Nordic markets, we find a less consistent pattern, suggesting that the anomaly does not persist uniformly and that regional or contextual factors play a key role.

When we consider all public holidays across the indices, the Holiday Effect is not universally supported; we only find a different in returns for three of five observed countries. However, when the focus is narrowed to only Long Holidays, we find higher and more consistently significant pre-holiday returns across indices. This distinction suggests that not all holidays have equal impact on investor behavior or market outcomes. Another perspective lies in the study by Cadsby and Ratner (1992) who found that the holiday effect was stronger when local and U.S. holidays aligned. Easter and Christmas are widely and uniformly celebrated across Western economies and coincide with public holidays in the U.S., so a similar pattern may also be at play in the Nordic region.

Behavioral finance theory has frequently been cited as a leading explanation for the Holiday Effect. Studies such as Ariel (1990), Kim and Park (1994), and Cadsby and Ratner (1992) suggest that pre-holiday optimism, positive mood, and reduced selling pressure among investors may contribute to the anomaly. One hypothesis in this thesis was that this optimism would lead to increased risk-taking, and subsequently higher returns in line with traditional asset pricing theory. If this were the case, we would expect to observe higher volatility on pre-holiday trading days. Yet, our results show the opposite, challenging this assumption. This directly contradicts the standard risk-return tradeoff, which holds that higher returns are compensation for bearing higher risk (Sharpe, 1964). The findings are in line with those of Ariel (1990) who also noted this paradox, concluding that the pre-holiday return premium is not a reward for risk.

If sentiment does not translate into greater risk-taking, how might it still elevate returns? One possibility is that it shapes investor behavior through inaction rather than active risk-taking. According to Schwarz (1990) in Lucey and Dowling (2005), individuals in a positive mood tend to rely more on heuristics and routine behavior and are less likely to engage in deliberate analytical decision-making. In the context of pre-holiday trading, this may create a passive environment where few are motivated to adjust their portfolios unless necessary, an idea supported by the interviewed professionals who describe postponing decisions and ignoring certain news due to an optimistic holiday-anticipation.

This behavioral inertia may manifest as reduced selling pressure, which Ariel (1990) also proposed as a mechanism behind the holiday effect. Our interviews support this view, revealing a tendency among professionals to avoid complex trades or portfolio adjustments before longer break. Mild optimism and holiday anticipation may give investors a preference for stability. This behavior reflects a combination of trading routines and institutional habits and mood. Our findings on trading volume further reinforce this interpretation: for Easter and Christmas, we observe consistently lower pre-holiday trading volumes across all indices, with significant differences for OMXS30, OMXH25, OSEBX, and FTSE100. These results align with earlier studies by Ariel (1990), which associate holiday periods with thinner markets and reduced participation. A limitation to this conclusion is we cannot from volume data alone be certain of selling pressure. The analysis is limited to trading activity. While we also do not directly observe liquidity, the consistent decline in trading volume before long holidays likely signals such conditions of less liquid markets. As Duan et al. (2005) note, even modest orders can have substantial price impact in low-liquidity environments. Combined with our interview insights indicating a reluctance to trade ahead of holidays, this helps explain how limited participation could tilt price dynamics upward.

Finally, our findings on the Holiday Effect not being significantly present for all holidays provide support to research by Marquering et al. (2006), who find the Holiday Effect to have weakened over time. Despite analyzing a recent 19-year period, we did not find the same robust evidence of the anomaly as earlier studies. This suggests a decline or transformation of the anomaly in modern financial markets. At the same time, the presence of a Holiday Effect for Easter and Christmas indicates that the anomaly has not disappeared entirely, challenging Patel's (2023) conclusion regarding the Santa Claus Rally disappearing in the U.S. Its Nordic persistence suggests that certain psychological or structural dynamics may remain underappreciated as suggested above. However, referring to it as "persistence" should be done with caution, since we do not have evidence of its existence prior to 2006.

Future research could further study the behavioral drivers underlying the Holiday Effect by more precisely isolating the psychological mechanisms at play. For instance, studies could closer examine whether specific mood-related factors, such as increased optimism or inertia in

reaction to new information, are directly linked to the observed patterns of higher stock returns, lower risk and lower trading activity. Additionally, a more granular categorization of holidays may help clarify whether it is the length of the holiday break or its cultural and emotional significance that drives the effect seen before Christmas and Easter, as we hypothesized, or if it is something different. Expanding the scope to include investor-type segmentation (e.g., institutional vs. retail) could also provide valuable insights into the conditions under which the Holiday Effect emerges or dissipates.

7 Conclusion

Our results contribute to the broader academic conversation on market efficiency and calendar-based return anomalies. According to the Efficient Market Hypothesis (Fama, 1970), it should not be possible to consistently achieve above-average returns based on the timing of holidays. Yet, the persistence of higher returns before Easter and Christmas challenges this principle. Despite decades of academic attention and widespread awareness in financial media, the anomaly continues. This suggests that the anomaly is somewhat, but not fully arbitrated away, and that market prices may not always reflect known patterns in investor behavior. Our findings suggest that these windows offer mild return advantages for short-term positioning. Being aware of the timing around Long Holidays may inform marginal decisions – such as delaying a sale or entering a position earlier. The behavioral underpinning of the effect serves as a cautionary reminder. Investors should be aware that such patterns may disappear as quickly as they appear, and that exploiting calendar effects carries no guarantee of consistent outperformance. The pre-holiday return pattern is best understood not as an arbitrage opportunity, but as a recurring behavioral phenomenon that can inform investor awareness, rather than dictate trading strategies. Furthermore, it creates an interesting discussion, challenging the efficient market hypothesis and traditional asset pricing theories.

Our results lend support to behavioral finance theories, which emphasize the role of mood, sentiment, and routine-driven decision-making in influencing market outcomes. Specifically, our finding suggests investor behavior changes ahead of extended and culturally important Holidays, such as Christmas and Easter. This study contributes to behavioral finance literature by providing empirical support for the notion that psychological and routine-based factors may drive return anomalies. While the exact mechanisms remain subject to further research, our findings underscore the importance of considering both behavioral and structural factors when analyzing market patterns such as the Holiday Effect and other return anomalies in modern markets.

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Appendix

AI Disclaimer: We have used ChatGPT for support in grammar, assistance with understanding coding, as well as its tool “Deep Research” to receive inspiration and guidance for the thesis.