The impact of weather-induced moods on M&A performance

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Highlights

- Unpleasant weather induces a negative mood and increases managerial risk aversion.
- M&A deals announced in unpleasant weather outperform those in pleasant weather.
- Acquirers earn positive CARs when the weather is unpleasant and negative CARs otherwise.

Abstract

Unpleasant weather induces negative moods and, consequently, increases managerial risk aversion. We conjecture that this weather-induced risk aversion leads to better M&A performance by constraining managerial hubris, over-confidence and over-payment for targets. Using a large UK sample, we document robust and significant heterogeneity in M&A performance conditional on the weather. Specifically, UK acquirers earn significant positive CARs from deals announced in unpleasant weather but negative CARs otherwise.

Keywords: M&A, Acquirers, Weather, Moods, Risk aversion, United Kingdom

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1 Introduction

Acquirers systematically underperform when merger and acquisitions (M&As) are announced with their performance shaped by the deal, governance and managerial characteristics, amongst other factors (Alexandridis et al., 2017; Tunyi, 2021; Renneboog and Vansteenkiste, 2019; Tuch and O'Sullivan, 2007). Prior studies attribute much of the underperformance to acquiring managers' over-optimism, hubris and overconfidence, which results in over-payment for their targets (see Renneboog and Vansteenkiste, 2019, for a review). Consequently, acquirers might experience better performance in settings in which over-optimism, hubris and overconfidence are constrained. Drawing from a behavioural perspective (i.e., the literature on weather-induced moods), we explore whether murky, gloomy or unpleasant weather conditions constitute such a setting. To the best of our knowledge, our paper is the first attempt to examine the impact of weather-induced moods on M&A performance.

We build on two important findings from a well-established body of research exploring how the weather (sunlight, rain, wind and cloud cover) affects decision-making, productivity and investments through its influence on moods (e.g., optimism *versus* pessimism), risk preferences and activity levels (see, for example, Patel et al., 2020; Shafi and Mohammadi, 2020; Goetzmann et al., 2015; Dehaan et al., 2017; Hirshleifer and Shumway, 2003; Li and Patel, 2021; Kamstra et al., 2003). Firstly, people have better moods and are generally more optimistic when the weather improves. Perhaps, this is more so in the case of the UK, where the weather takes pride of place as one of the most important conversation starters. Secondly, bad weather increases risk aversion through its influence on mood (Bassi et al., 2013; Shafi and Mohammadi, 2020). A study by Shafi and Mohammadi (2020), for example, finds that higher levels of cloud cover — a proxy for worsening investors' weather-induced moods — leads to a reduction in contributions towards crowdfunding campaigns due to higher risk aversion and increased pessimism.

Given the above findings on the causes of poor M&A performance, we conjecture that M&A performance improves during periods of unpleasant weather as such periods are characterised by negative weather-induced moods, pessimism and risk-aversion. Consistent with this conjecture, we find robust empirical evidence suggesting that UK acquirers earn significantly higher cumulative abnormal returns (CARs) from deals announced in unpleasant weather. Specifically, acquirers earn 1.19% average CARs (p-value of 0.000) in the seven days around the deal (CAR[-3,+3]) from deals announced in unpleasant weather but lose (average CARs of -0.72%, p-value of 0.061) from all other deals. We discuss our data, empirical tests, findings and robustness tests in the sections that follow.

2 Data and Methodology

We collect M&A and financial data from Thomson Reuters Eikon. Our data covers all M&A deals (valued at $10 million or more) announced by UK listed firms (acquirers) between 1st January 1987 and 31st December 2019 for UK and international public or privately-owned targets. The sample covers all industries and deal types.[1] We only retain deals with complete information on all key variables. Our final sample covers 3,975 deals announced by 1,507 acquirers from 1987 to 2019.

We follow prior research (Brooks et al., 2018; Tunyi, 2021; Du and Gerety, 2018) and estimate acquirer performance (CAR) using an event study approach and the market model. Our estimation window consists of 280 days (ending 41 days before the deal announcement date). For robustness, we measure CAR in the three (CAR[-1,+1]), five (CAR[-2,+2]), seven (CAR[-3,+3]), nine (CAR[-4,+4]) and eleven (CAR[-5,+5]) days centred on the bid announcement day. Our results are consistent across different CAR measures, so, in line with prior research (Brooks et al., 2018; Tunyi, 2021), we focus our main discussion on CAR[-3,+3].

We proxy for "unpleasant weather" using the UK's meteorological seasons. We generate a variable (Season) to capture the four main seasons during which a deal is announced; Winter (21 December - 20 March), Spring (21 March - 20 June), Summer (21 June - 21 September) and Autumn (22 September - 20 December). We use the Winter season as our main proxy for unpleasant weather as it is characterised by fewer hours of daylight, which has a profound effect on moods and risk aversion. For example, Kamstra et al. (2003) show that seasonal affective disorder or "winter blues" emanating from fewer hours of daylight in the autumn (fall) and winter seasons impact risk-taking, investment decisions, and consequently, stock returns. Additionally, we use the Winter as the weather in Spring and Autumn varies from one year to the other, and the British Summer is notoriously unpredictable. We generate a dummy variable, $Winter\ deals$, which takes a value of one if a deal is announced between 21 December and 20 March (inclusive) in each year, and a value of zero, otherwise. To test whether M&A performance is affected by weather-induced moods, we estimate the following model:-

$$CAR_{i,t} = \beta_0 + \beta_1 Winter\ deals_{i,t} + \sum \beta_k\ Controls_{i,t} + v_i + v_t + \epsilon_{it} \quad (1)$$

To improve our identification and ensure that we are not capturing seasonal effects that might correlate with the winter season's timing, we also use the average monthly temperature as an alternative proxy for weather-induced moods. This approach is in line with Cao and Wei (2005) and accounts for variability in winter weather across the

[1] Our results are consistent when we restrict the sample to deals for control and when we exclude financial firms following Tunyi (2021).

years. Our temperature data is collected from the UK's Meteorological Office.[2] We match announcement dates for our sample deals to the temperature data in the corresponding month and year. In each year, we rank deals by the average temperature of the deal month and create a dummy variable, *Low Temperature deals* to capture the first quartile i.e., 25% of deals announced when the temperature was lowest (i.e., unpleasant weather) in each year.[3] We use this measure as an alternative proxy to *Winter deals* in Eq.(1). Our empirical model depicted in Eq.(1) controls for the firm- and deal-specific characteristics, as well as industry and year fixed effects.

3 Results and Discussion

We plot acquirer CARs for all firms and the deals announced in different seasons and for low and high temperatures in Figure 1. Consistent with our conjecture, *Winter deals* and *Low Temperature deals* outperform other deals. Deals announced in Summer and High-temperature periods perform worse. Importantly, we find that the heterogeneity in returns to acquirers across different seasons and temperature groups are long-lasting and persist over the 26-day event window (CAR[-5,+20]).[4] This suggests that the winter and low-temperature CARs we observe in Figure 1 are not simply driven by market sentiment (over or under-reaction) at the time of the deal (Danbolt et al., 2015) but, possibly, by weather-induced moods. These plots are consistent with our conjecture that weather-induced moods impact risk-aversion, and hence, acquirers' M&A choices.

Insert Figure 1 Here

We then test whether the differences in CARs around the announcement day are statistically significant using the difference-of-means t test in Table 1.[5] In column 1, consistent with the literature (Renneboog and Vansteenkiste, 2019), we document zero average CARs for UK acquirers around M&A deals. These returns are, however, heterogeneous conditional on weather conditions. As shown in columns 3 and 4, returns to acquirers are positive (significant at the 1% level) when deals are announced in the winter but generally negative when announced in other seasons. For example, CAR[-3,+3] averages 1.19% during winter but -0.72% in the other three seasons. The difference of 1.92 percentage points is significant at the 1% level. Similarly, as in columns 6 and 7, acquirer CARs are positive when deals are announced in Low-temperature periods but negative otherwise. The differences in CARs are statistically significant, at least at the 5% level.

[2]Historic Station Data: https://www.metoffice.gov.uk/research/climate/maps-and-data/historic-station-data.

[3]Our results are robust when we use quintiles (20%) instead.

[4]Our results are robust to the choice of event window and hold when we apply shorter and longer event windows e.g., CAR [-2,+20] and CAR[-40,+20].

[5]While the CARs from longer event windows (e.g., CAR[-40,+20] and CAR[-5,+20]) are consistent with our story, they are prone to influences from confounding events.

Insert Table 1 Here

In Table 2, we explore whether the patterns observed in Figure 1 and Table 1 persist after controlling for other factors that might drive acquirer returns. For this analysis, we focus on CAR[-3,+3]. Our results are robust to using different event window periods — different CAR measures (see Appendix A). Results in columns 1-3 show that after controlling for firm- and deal-specific attributes, and industry and year fixed effects, CARs earned by acquirers in Winter deals are significantly higher than those earned from deals initiated in all other seasons (Autumn, Summer and Spring).[6] When we compare Winter to Summer deals directly, in column 4, we find that CARs earned in Winter are 5.1 percentage points higher (significant at the 5% level) than for the Autumn, Summer and Spring seasons. Our results suggest that weather-induced mood partly explains acquirer returns, with acquirers earning positive returns when the weather is unpleasant.

Insert Table 2 Here

While meteorological seasons are exogenous to firms, they might be correlated with other seasonal factors. Hence, our results might capture other seasonal effects not accounted for in the model (omitted variable bias).[7] In columns 5-6, we explore whether the same effect is observed when we use an alternative measure for unpleasant weather, which is less seasonal — the average temperature in the month during which the deal was initiated. We find that the quartile (25%) of deals completed in the coldest months of each year generate abnormal returns that are 1.2 to 1.5 percentage points higher than those reported in warmer months. In column 8, we present results for the quintile (20%) of deals completed in the coldest months of each year. Consistent with our previous results, we find further evidence that acquirers in UK M&As perform slightly better in relatively colder months. In unreported tests, we have also explored other weather variables including, sunshine, rainfall and air frost. In these cases, we find some evidence that acquirers generally perform worse when the weather (sunshine, rainfall and air frost) is relatively more pleasant.

4 Conclusions

In this study, we conjecture that weather-induced moods influence M&A decisions and outcomes. Specifically, negative weather-induced moods constrain managerial optimism, hubris, overconfidence and the tendency to over-pay for targets, thus resulting in better M&A performance. Using a comprehensive dataset of 3,975 M&A deals announced by UK acquirers between 1987 and 2019, we find robust empirical evidence consistent with

[6] Our results are also robust to controlling for month fixed effects in addition to firm- and deal-specific attributes, and industry and year fixed effects.

[7] In unreported results, we partly address this by controlling for month fixed effects and also excluding the month with the most negative results. Our conclusions are robust to these alternative model specifications.

our conjecture. More specifically, we find significant heterogeneity in M&A abnormal returns conditional on the season in which the deals were initiated. Deals initiated in the Winter and, more generally, in colder months tend to outperform others. Our evidence suggests that acquirers generate positive, albeit small, abnormal returns from Winter deals, unlike deals initiated in other seasons.

Our findings open up fruitful avenues for future research exploring how moods impact M&A decisions and outcomes. For example, a more comprehensive study could draw from cross-country (international) data which allows for variations in weather conditions across different geographic locations to be exploited. There is also scope to explore within-season effects, as well as, how weather-induced moods impact on the target's decision-making around the deal. Finally, there are opportunities to explore how other weather conditions (including rainfall and cloud cover) which have been shown to influence moods, shape M&A decisions.

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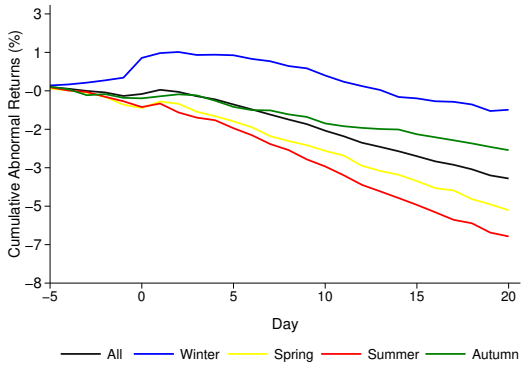
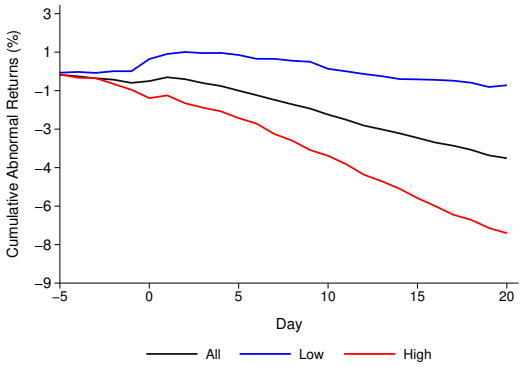


(a) Seasons



(b) Temperature

Figure 1 Cumulative abnormal returns

Table 1 Univariate tests

The table presents summary statistics of CARs earned by UK acquirers around the M&A announcements. The sample consists of listed firms in the UK drawn from *Thomson Eikon* from 1987 to 2019. In Panel A, we test whether CARs are different from zero. "Difference" indicates results from difference-of-means tests across all variables. ***, **, * indicate significance at the one, five, and ten percent levels, respectively.

Variable	Full sample		Winter (A)	Non-Winter (B)	(A) *vs* (B)	Low Temp (C)	High Temp (D)	(C) *vs* (D)
	Mean	Stdev	Mean	Mean	Difference	Mean	Mean	Difference
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Cumulative Abnormal Returns and significance								
CAR[-1,+1]	-0.0004	0.1650	0.0124***	-0.0040	0.0164***	0.0093***	-0.0047	0.0139**
CAR[-2,+2]	-0.0004	0.1650	0.0124***	-0.0040	0.0164***	0.0093***	-0.0047	0.0139**
CAR[-3,+3]	-0.0030	0.1947	0.0119***	-0.0072*	0.0192***	0.0083***	-0.0080*	0.0163**
CAR[-4,+4]	-0.0049	0.2333	0.0124***	-0.0099**	0.0224**	0.0088***	-0.0110**	0.0198**
CAR[-5,+5]	-0.0088*	0.3106	0.0111***	-0.0145**	0.0256**	0.0070*	-0.0158**	0.0227**
Panel B: Acquirer and deal characteristics								
Loss	0.1019	0.3025	0.1090	0.0998	0.0092	0.0934	0.1057	-0.0123
Tobin's q	2.2442	2.8858	2.4570	2.1816	0.2755**	2.3317	2.2052	0.1266
Leverage	0.5531	0.2561	0.5474	0.5547	-0.0073	0.5537	0.5528	0.0009
Sales growth	0.9636	10.7646	1.4306	0.8292	0.6014	1.2102	0.8545	0.3556
Firm size	12.7014	2.1689	12.7085	12.6993	0.0092	12.6665	12.7168	-0.0503
Cross border deal	0.7746	0.4179	0.4651	0.8636	-0.3985***	0.4881	0.9016	-0.4135***
Diversifying deals	0.8647	0.3421	0.6937	0.9138	-0.2201***	0.6929	0.9408	-0.2479***
Hostile deal	0.0068	0.0821	0.0135	0.0049	0.0087***	0.0188	0.0015	0.0174***
Previous deals	0.4252	0.4944	0.4550	0.4166	0.0384**	0.4414	0.4179	0.0235
Toehold	0.0081	0.0894	0.0203	0.0045	0.0157***	0.0205	0.0025	0.0179***
Competing offer	0.3947	0.4889	0.9561	0.2332	0.7228***	0.8943	0.1732	0.7211***
Public target	0.0923	0.2895	0.2230	0.0547	0.1682***	0.2088	0.0407	0.1682***
Cash payment	0.1675	0.3735	0.4032	0.0998	0.3034***	0.3784	0.0741	0.3043***
Observations	3,975		888	3,087		1,221	2,754	

Table 2 Weather effect on acquirer cumulative abnormal returns

The table reports regression results exploring whether weather-induced moods (captured by "winter deals" and "Low-temperature deals") drive M&A CARs (CAR[-3,+3]) as specified in Eq.(1). The sample consists of UK acquirers from 1987 to 2019. The $p-values$ in presented in parenthesis are computed from robust standard errors. ***, **, * indicate significance at the one, five, and ten percent levels, respectively.

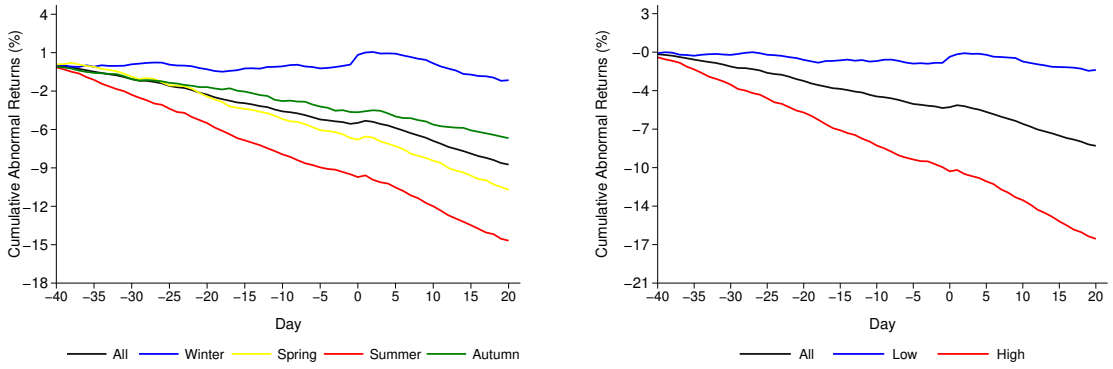
	Seasons				Temperature			
	Winter vs. Other			Winter vs. Summer	Quartile 1 vs. Other			Quintile 1 vs. Other
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winter deals	0.016***	0.016***	0.016***	0.051**				
	(0.005)	(0.005)	(0.005)	(0.022)				
Low-temperature deals					0.014***	0.012**	0.012**	0.008*
					(0.005)	(0.006)	(0.006)	(0.004)
Loss		-0.025**	-0.023**	-0.020		-0.024**	-0.022**	-0.022**
		(0.010)	(0.010)	(0.017)		(0.010)	(0.010)	(0.010)
Tobin's q		-0.007**	-0.007**	-0.003		-0.007*	-0.007*	-0.007**
		(0.003)	(0.003)	(0.002)		(0.003)	(0.003)	(0.003)
Leverage		0.024*	0.021	0.026		0.024*	0.021	0.021
		(0.014)	(0.013)	(0.023)		(0.014)	(0.013)	(0.013)
Sales Growth		0.000	0.000	-0.000		0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Firm size		-0.004***	-0.005***	-0.006**		-0.004***	-0.005***	-0.005***
		(0.001)	(0.002)	(0.003)		(0.001)	(0.002)	(0.002)
Cross border deal			-0.001	-0.011			-0.001	-0.001
			(0.005)	(0.008)			(0.005)	(0.005)
Diversifying deal			0.002	-0.006			0.003	0.003
			(0.005)	(0.007)			(0.005)	(0.005)
Hostile deal			0.007	-0.007			0.004	0.006
			(0.017)	(0.021)			(0.017)	(0.017)
Previous deals			0.012	0.014			0.012	0.012
			(0.008)	(0.016)			(0.008)	(0.008)
Toehold			-0.003	-0.017			-0.003	-0.002
			(0.017)	(0.024)			(0.017)	(0.016)
Competing offer			0.008	-0.036			0.010	0.013
			(0.010)	(0.024)			(0.009)	(0.010)
Public target			-0.017***	-0.019**			-0.017***	-0.017***
			(0.006)	(0.009)			(0.006)	(0.006)
Cash payment			0.001	-0.006			0.001	0.000
			(0.005)	(0.008)			(0.005)	(0.005)
Constant	-0.004	0.052***	0.059***	0.071***	-0.006	0.051***	0.057***	0.059***
	(0.010)	(0.018)	(0.020)	(0.027)	(0.010)	(0.018)	(0.020)	(0.020)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,975	3,440	3,440	1,639	3,975	3,440	3,440	3,440
R^2	0.020	0.029	0.031	0.026	0.020	0.029	0.030	0.030

Appendix A Weather effect on alternative acquirer CAR measures

The table reports regression results exploring whether weather-induced moods (captured by "winter deals" and "Low-temperature deals") drive M&A CARs as specified in Eq.(1). Here, we explore alternative measures of CARs not covered in Table 2. The sample consists of UK acquirers from 1987 to 2019. Coefficients for firm and deal controls are suppressed for brevity. The $p-values$ in presented in parenthesis are computed from robust standard errors. ***, **, * indicate significance at the one, five, and ten percent levels, respectively

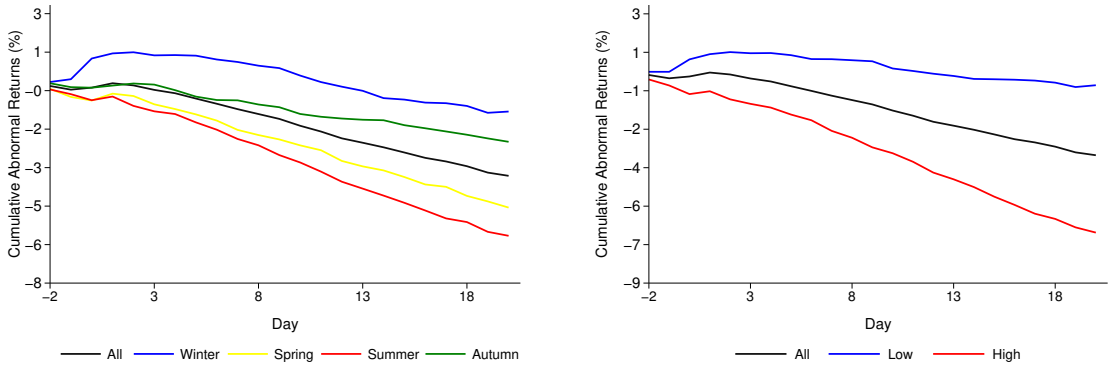
	Seasons				Temperature			
	CAR[-1,+1]	CAR[-2,+2]	CAR[-4,+4]	CAR[-5,+5]	CAR[-1,+1]	CAR[-2,+2]	CAR[-4,+4]	CAR[-5,+5]
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Winter deals	0.014***	0.014***	0.018***	0.018***				
	(0.005)	(0.005)	(0.005)	(0.006)				
Low-temperature deals					0.011**	0.011**	0.016**	0.019**
					(0.005)	(0.005)	(0.007)	(0.008)
Constant	0.054***	0.054***	0.066***	0.068***	0.051***	0.051***	0.062***	0.064**
	(0.018)	(0.018)	(0.022)	(0.026)	(0.018)	(0.018)	(0.022)	(0.026)
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,440	3,440	3,440	3,440	3,440	3,440	3,440	3,440
R^2	0.033	0.033	0.027	0.023	0.033	0.033	0.026	0.023

Online Appendices
Not For Publication



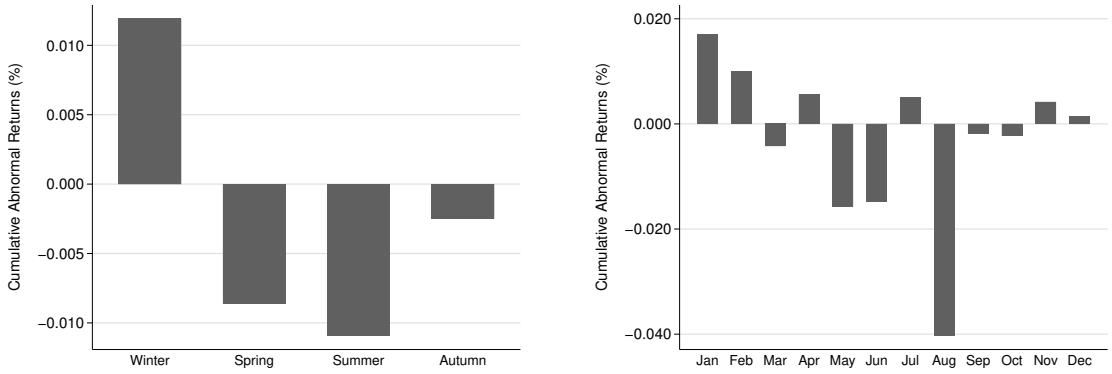
(a) Seasons **(b)** Temperature

Figure A.1 Cumulative abnormal returns (Long window)



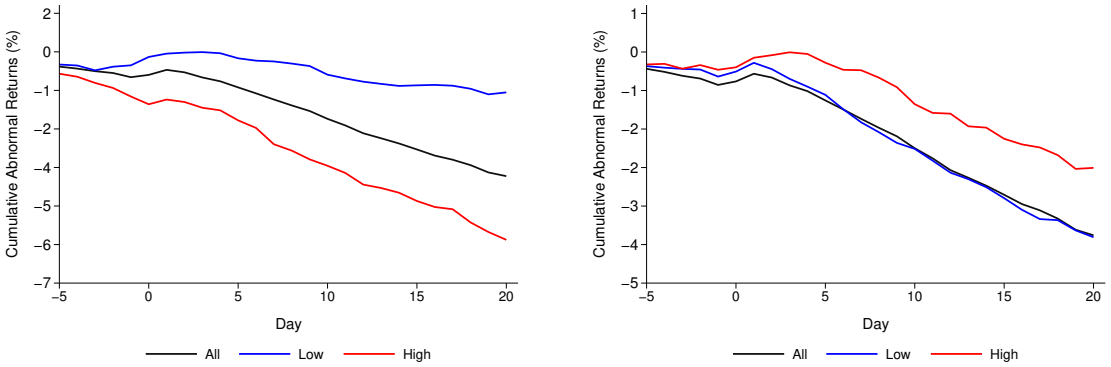
(a) Seasons **(b)** Temperature

Figure A.2 Cumulative abnormal returns (Short window)



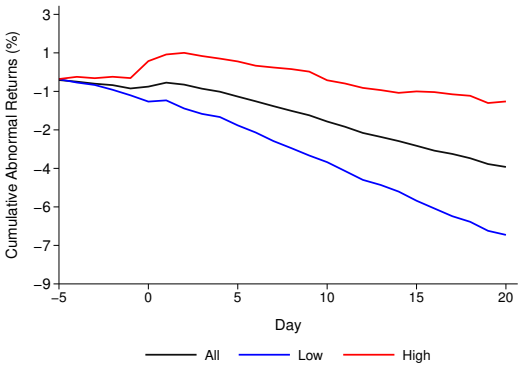
(a) Seasonally **(b)** Monthly

Figure A.3 Cumulative abnormal returns by seasons and months



(a) Sunshine

(b) Rainfall



(c) Air Frost

Figure A.4 Cumulative abnormal returns: Alternative measures of weather conditions

Table A.1 Distribution of deals across months

Month	Deals	Mean CAR
January	247	0.017
February	302	0.010
March	375	-0.004
April	315	0.006
May	365	-0.016
June	339	-0.015
July	381	0.005
August	277	-0.040
September	329	-0.002
October	310	-0.002
November	365	0.004
December	370	0.001

Table A.2 Weather effect on acquirer CARs: Month fixed-effects

The table reports regression results exploring whether weather-induced moods (captured by "winter deals" drive M&A CARs as specified in Eq.(1). This table additionally controls for Month fixed effects not accounted for in Table 2. The sample consists of UK acquirers from 1987 to 2019. Coefficients for firm and deal controls are suppressed for brevity. The $p-values$ in presented in parenthesis are computed from robust standard errors. ***, **, * indicate significance at the one, five, and ten percent levels, respectively

	Month Effects			Winter deals with month controls			Excluding August
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Winter deals				0.030***	0.027***	0.025***	0.025***
				(0.007)	(0.007)	(0.007)	(0.007)
February	-0.005	-0.006	-0.005	-0.005	-0.006	-0.005	-0.005
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
March	-0.019**	-0.017**	-0.017**	-0.010	-0.009	-0.010	-0.009
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
April	-0.005	-0.008	-0.009	0.017	0.011	0.009	0.009
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.012)
May	-0.027	-0.014	-0.014	-0.005	0.005	0.004	0.005
	(0.020)	(0.011)	(0.011)	(0.020)	(0.011)	(0.011)	(0.011)
June	-0.027**	-0.013	-0.013	-0.005	0.006	0.005	0.004
	(0.013)	(0.011)	(0.011)	(0.014)	(0.012)	(0.012)	(0.012)
July	-0.006	-0.009	-0.009	0.016	0.010	0.009	0.009
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.011)
August	-0.055*	-0.056	-0.056	-0.033	-0.037	-0.038	
	(0.032)	(0.038)	(0.037)	(0.032)	(0.038)	(0.038)	
September	-0.017	-0.017	-0.017	0.005	0.002	0.001	0.002
	(0.012)	(0.011)	(0.011)	(0.013)	(0.012)	(0.012)	(0.011)
October	-0.015	-0.019*	-0.020**	0.008	0.001	-0.001	0.000
	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)
November	-0.012*	-0.015**	-0.014*	0.018*	0.012	0.011	0.011
	(0.007)	(0.007)	(0.007)	(0.010)	(0.011)	(0.011)	(0.010)
December	-0.018**	-0.018**	-0.018***	0.005	0.002	0.001	0.000
	(0.007)	(0.007)	(0.007)	(0.009)	(0.008)	(0.008)	(0.008)
Loss		-0.023**	-0.021**		-0.023**	-0.021**	-0.025**
		(0.010)	(0.011)		(0.010)	(0.011)	(0.010)
Tobin's Q		-0.007**	-0.007**		-0.007**	-0.007**	-0.006*
		(0.003)	(0.003)		(0.003)	(0.003)	(0.003)
Leverage		0.024*	0.022		0.024*	0.022	0.009
		(0.014)	(0.013)		(0.014)	(0.013)	(0.010)
Sales Growth		0.000	0.000		0.000	0.000	-0.000
		(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Firm size		-0.004***	-0.005***		-0.004***	-0.005***	-0.004***
		(0.001)	(0.002)		(0.001)	(0.002)	(0.001)
Cross border deal			-0.001			-0.001	-0.001
			(0.005)			(0.005)	(0.005)
Diversifying deal			0.002			0.002	0.002
			(0.005)			(0.005)	(0.005)
Hostile deal			0.005			0.007	0.005
			(0.017)			(0.017)	(0.016)
Previous deals			0.012			0.011	0.004
			(0.007)			(0.007)	(0.003)
Toehold			0.001			-0.000	0.002
			(0.017)			(0.017)	(0.016)
Competing offer			0.011			0.003	0.003
			(0.012)			(0.012)	(0.012)
Public target			-0.018***			-0.017***	-0.017***
			(0.006)			(0.006)	(0.006)
Cash payment			0.001			0.001	-0.001
			(0.005)			(0.005)	(0.005)
Constant	0.018*	0.073***	0.076***	-0.014	0.044**	0.057**	0.051**
	(0.011)	(0.019)	(0.025)	(0.013)	(0.020)	(0.025)	(0.023)
Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,975	3,440	3,440	3,975	3,440	3,440	3,208
R^2	0.023	0.033	0.034	0.024	0.034	0.035	0.087
F-Stat	2.483	2.616	2.560	2.600	2.711	2.650	2.517
p-value	0.055	0.000	0.000	0.001	0.000	0.000	0.000

Table A.3 Within-Season effects

	Cumulative abnormal returns			T-Test
Seasons	(1)	(2)	(3)	(4)
Panel A: Temperature	Low Temperature	High Temperature	Difference (Low-High)	p-value
Winter	0.014	0.007	0.007	0.318
Spring	-0.011	-0.002	-0.009	0.624
Summer	-0.005	-0.023	0.018	0.356
Autumn	0.000	-0.008	0.008	0.239
Panel B: Rainfall	Low Rainfall	High Rainfall	Difference (Low-High)	p-value
Winter	0.010	0.014	-0.004	0.470
Spring	-0.014	0.001	-0.015	0.308
Summer	-0.018	0.001	-0.019	0.333
Autumn	-0.001	-0.006	0.005	0.401