We investigate empirical links between the Oslo Stock Exchange (OSE) and the weather, asking whether daily returns on the market, or market trading activity, seems to be related to the weather. We find a positive correlation between the OSE and two measures of “bad weather”: clouds and windchill. High windchill is also associated with low market liquidity.

Weather and the Stock Market
How can the weather can directly influence the stock market?
When the weather influences the running of the stock exchange: Hurricane Sandy in October 2012. New York Stock Exchange was closed for two days.
Prices of stocks on the market: The weather can influence stock prices through the flows of the firms on it. The same Hurricane Sandy resulted in large future losses to insurance companies, some of which are on the NYSE.

Behavioural finance
Alternative explanation for why the weather affects the stock market:
Ask whether the weather influences the “mood” of participants on the exchange.
If people trading on the exchange is facing a sunny spring day with wonderful weather, they may be more optimistic about the market than on one of those bleak, rainy fall days.

What is done?
Construct measures of weather “quality”
Estimate empirical link between measures of weather quality and stock returns.

Regression
To investigate link between weather and stock returns, run the regression

\[ R_{m,t} = a + bW_t + \varepsilon_t \]

where \( R_{m,t} \) is return on stock market and \( W_t \) is the “weather” variable

<table>
<thead>
<tr>
<th>Dependent variable: ( R^{\text{RET}}_{m,t} )</th>
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<tbody>
<tr>
<td>Temperature</td>
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<tr>
<td>Rain</td>
</tr>
<tr>
<td>Sunshine</td>
</tr>
<tr>
<td>Cloud Coverage</td>
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<tr>
<td>WindChill</td>
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<tr>
<td>Constant</td>
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<tr>
<td>Observations</td>
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<tr>
<td>Adjusted ( R^2 )</td>
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</tbody>
</table>

Note: \( *p < 0.1; \quad **p < 0.05; \quad ***p < 0.01 \)

Results for different regressions \( R_{m,t} = a + bW_t + \varepsilon_t \) where \( R_{m,t} \) is the return on the stock market (in percent), and \( W_t \) is a weather variable. The five weather variables are: Temperature: The difference between observed temperature and a “normal” temperature. Rain: Precipitation in mm. Sunshine: Fraction of day with sunshine. Cloud coverage: NN. WindChill: Difference between calculated Windchill and Windchill of normal temperature with zero wind.

Windchill

\[ T_{\text{wc}} = 13.12 + 0.6215T_a - 11.37V^{0.16} + 0.3965T_aV^{0.16} \]
where \( T_a \) is the air temperature, and \( V \) is the wind speed at 10 metres altitude.

Conclusion
We investigate links between stock returns at the Oslo Stock Exchange and Oslo Weather. We find that cloudy days and cold, windy days are associated with lower returns. We make no claims about causality.