In [1]:

```
from IPython.display import HTML
HTML('''<script>
code_show_err=false;
function code_toggle_err() {
 if (code_show_err){
 $('div.output_stderr').hide();
 } else {
 $('div.output_stderr').show();
 }
 code_show_err = !code_show_err
}
$( document ).ready(code_toggle_err);
</script>
To toggle on/off output_stderr, click <a href="javascript:code_toggle_err()">here</a>.''')
```

Out[1]:

To toggle on/off output_stderr, click here.

In [1]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from scipy.stats.stats import pearsonr
from scipy.stats import linregress
%matplotlib inline

df_tweets = pd.read_excel(r'C:\Users\timod\Desktop\BTC_tweets_all.xlsx')
df_price = pd.read_csv(r'C:\Users\timod\Desktop\BTC_historical data_all.csv')
```

In [2]:

```
df_tweets.head()
```

Out[2]:

	date	text	follower_count	polarity	subjectivity
0	2020-03-27	b"Time's out. Pretty mediocre volume for a bre...	31828	0.094866	0.621652
1	2020-03-27	b'$BTC / $USD\n\nBearish it is.\xf0\x9f\x90\xb...	4470	0.000000	0.000000
2	2020-03-27	b'It fucking did something \n\n#Btc\n#BITCOIN ...	21	-0.600000	0.800000
3	2020-03-27	b'$BTC - volatility enters in the last half ho...	46125	0.044444	0.331746
4	2020-03-27	b'Just sold my positions, since it went below ...	75	0.000000	0.000000

In [3]:

```
df_price
```

Out[3]:

	Date	Price	Open	High	Low	Vol.	Change %
0	Mar 27, 2020	6,373.4	6,725.5	6,813.7	6,322.3	1.16M	-5.23%
1	Mar 26, 2020	6,725.1	6,677.9	6,772.9	6,541.7	1.18M	0.69%
2	Mar 25, 2020	6,678.9	6,744.8	6,930.2	6,474.6	1.52M	-0.97%
3	Mar 24, 2020	6,744.6	6,468.8	6,814.2	6,380.8	1.73M	4.26%
4	Mar 23, 2020	6,468.9	5,822.0	6,564.7	5,710.8	1.88M	11.11%
5	Mar 22, 2020	5,822.1	6,186.9	6,394.4	5,771.2	1.48M	-5.89%
6	Mar 21, 2020	6,186.2	6,205.6	6,438.3	5,887.0	1.64M	-0.31%

	Date	Price	Open	High	Low	Vol.	Change %
7	Mar 20, 2020	6,205.3	6,177.6	6,858.1	5,748.2	2.22M	0.94%
8	Mar 19, 2020	6,172.0	5,359.2	6,379.5	5,256.0	2.18M	15.12%
9	Mar 18, 2020	5,361.4	5,260.7	5,373.1	5,020.9	1.80M	1.91%
10	Mar 17, 2020	5,261.1	5,030.2	5,432.8	4,946.5	1.89M	4.59%
11	Mar 16, 2020	5,030.0	5,366.4	5,369.3	4,477.7	2.55M	-6.27%
12	Mar 15, 2020	5,366.3	5,182.9	5,863.3	5,120.6	1.61M	3.54%
13	Mar 14, 2020	5,182.7	5,589.4	5,634.9	5,072.2	1.69M	-7.19%
14	Mar 13, 2020	5,584.3	4,815.2	5,934.3	3,869.5	4.17M	15.71%
15	Mar 12, 2020	4,826.0	7,935.2	7,963.1	4,546.6	3.22M	-39.18%
16	Mar 11, 2020	7,935.1	7,892.1	7,976.5	7,606.0	1.10M	0.56%
17	Mar 10, 2020	7,891.2	7,933.0	8,145.5	7,740.2	1.20M	-0.53%
18	Mar 09, 2020	7,933.0	8,035.8	8,158.8	7,648.7	1.54M	-1.26%
19	Mar 08, 2020	8,034.1	8,887.8	8,888.0	8,015.3	1.11M	-9.61%
20	Mar 07, 2020	8,887.8	9,134.2	9,180.8	8,848.7	750.65K	-2.70%
21	Mar 06, 2020	9,134.8	9,060.6	9,165.2	9,004.9	1.04M	0.82%
22	Mar 05, 2020	9,060.3	8,757.9	9,147.3	8,751.5	950.76K	3.45%
23	Mar 04, 2020	8,757.9	8,761.3	8,840.3	8,679.7	759.69K	-0.04%
24	Mar 03, 2020	8,761.4	8,906.1	8,911.7	8,669.3	1.01M	-1.61%
25	Mar 02, 2020	8,904.8	8,537.5	8,961.8	8,503.1	1.02M	4.27%
26	Mar 01, 2020	8,540.0	8,543.8	8,737.2	8,437.2	784.05K	-0.04%
27	Feb 29, 2020	8,543.7	8,697.1	8,793.7	8,539.8	683.44K	-1.77%
28	Feb 28, 2020	8,697.5	8,820.1	8,898.7	8,451.9	1.08M	-1.37%
29	Feb 27, 2020	8,818.6	8,800.1	8,968.3	8,538.5	1.13M	0.21%
30	Feb 26, 2020	8,800.3	9,317.1	9,368.1	8,672.0	1.32M	-5.55%
31	Feb 25, 2020	9,317.2	9,662.6	9,672.3	9,269.8	937.97K	-3.57%
32	Feb 24, 2020	9,662.7	9,943.2	9,981.0	9,507.0	980.00K	-2.82%
33	Feb 23, 2020	9,942.7	9,655.6	9,965.6	9,653.4	775.88K	2.97%
34	Feb 22, 2020	9,655.7	9,684.5	9,706.5	9,569.8	589.88K	-0.30%
35	Feb 21, 2020	9,684.5	9,602.2	9,747.1	9,574.5	716.61K	0.85%
36	Feb 20, 2020	9,602.4	9,611.9	9,681.4	9,448.9	870.80K	-0.07%
37	Feb 19, 2020	9,609.4	10,158.6	10,230.9	9,424.3	905.95K	-5.40%
38	Feb 18, 2020	10,158.4	9,701.5	10,230.1	9,601.6	945.91K	4.71%
39	Feb 17, 2020	9,701.4	9,931.7	9,951.5	9,468.9	961.88K	-2.32%
40	Feb 16, 2020	9,932.3	9,907.4	10,056.4	9,654.9	808.91K	0.25%
41	Feb 15, 2020	9,907.7	10,336.0	10,369.8	9,831.7	808.81K	-4.12%
42	Feb 14, 2020	10,333.0	10,235.5	10,372.4	10,125.2	732.51K	0.96%
43	Feb 13, 2020	10,235.1	10,321.9	10,482.6	10,116.9	940.30K	-0.80%
44	Feb 12, 2020	10,317.7	10,229.3	10,435.6	10,229.3	803.25K	0.86%
45	Feb 11, 2020	10,229.5	9,854.0	10,314.1	9,725.1	791.28K	3.81%
46	Feb 10, 2020	9,854.1	10,151.5	10,181.7	9,774.8	781.22K	-2.93%
47	Feb 09, 2020	10,151.5	9,895.4	10,157.1	9,882.7	617.35K	2.59%
48	Feb 08, 2020	9,895.5	9,817.3	9,931.2	9,673.2	551.31K	0.78%
49	Feb 07, 2020	9,818.6	9,771.9	9,872.5	9,738.7	608.96K	0.48%
50	Feb 06, 2020	9,772.0	9,611.8	9,854.9	9,536.1	778.67K	1.67%
51	Feb 05, 2020	9,611.8	9,194.1	9,726.8	9,179.9	771.46K	4.54%
52	Feb 04, 2020	9,193.9	9,296.5	9,347.5	9,193.9	651.68K	-1.10%
53	Feb 03, 2020	9,296.6	9,334.6	9,582.8	9,243.1	701.39K	-0.41%
54	Feb 02, 2020	9,334.9	9,381.5	9,465.4	9,183.1	683.37K	-0.50%
55	Feb 01, 2020	9,381.6	9,349.3	9,458.8	9,301.5	458.42K	0.35%

In [4]:

```
#Gathering the following for each of the first seven days of february:
#number of positive tweets, number of negative tweets, number of neutral tweets, total volume, sen
timent polarity

'''
pos0331 = df_tweets.loc[df_tweets.date=='2020-03-31'][df_tweets.polarity > 0].shape[0]
neg0331 = df_tweets.loc[df_tweets.date=='2020-03-31'][df_tweets.polarity < 0].shape[0]
neutral0331 = df_tweets.loc[df_tweets.date=='2020-03-31'][df_tweets.polarity == 0].shape[0]
nonZero0331 = pos0331 + neg0331
px0331 = round(((pos0331-neg0331)/nonZero0331),3)
volume0331 = nonZero0331 + neutral0331

pos0330 = df_tweets.loc[df_tweets.date=='2020-03-30'][df_tweets.polarity > 0].shape[0]
neg0330 = df_tweets.loc[df_tweets.date=='2020-03-30'][df_tweets.polarity < 0].shape[0]
neutral0330 = df_tweets.loc[df_tweets.date=='2020-03-30'][df_tweets.polarity == 0].shape[0]
nonZero0330 = pos0330 + neg0330
px0330 = round(((pos0330-neg0330)/nonZero0330),3)
volume0330 = nonZero0330 + neutral0330

pos0329 = df_tweets.loc[df_tweets.date=='2020-03-29'][df_tweets.polarity > 0].shape[0]
neg0329 = df_tweets.loc[df_tweets.date=='2020-03-29'][df_tweets.polarity < 0].shape[0]
neutral0329 = df_tweets.loc[df_tweets.date=='2020-03-29'][df_tweets.polarity == 0].shape[0]
nonZero0329 = pos0329 + neg0329
px0329 = round(((pos0329-neg0329)/nonZero0329),3)
volume0329 = nonZero0329 + neutral0329

pos0328 = df_tweets.loc[df_tweets.date=='2020-03-28'][df_tweets.polarity > 0].shape[0]
neg0328 = df_tweets.loc[df_tweets.date=='2020-03-28'][df_tweets.polarity < 0].shape[0]
neutral0328 = df_tweets.loc[df_tweets.date=='2020-03-28'][df_tweets.polarity == 0].shape[0]
nonZero0328 = pos0328 + neg0328
px0328 = round(((pos0328-neg0328)/nonZero0328),3)
volume0328 = nonZero0328 + neutral0328
'''

pos0327 = df_tweets.loc[df_tweets.date=='2020-03-27'][df_tweets.polarity > 0].shape[0]
neg0327 = df_tweets.loc[df_tweets.date=='2020-03-27'][df_tweets.polarity < 0].shape[0]
neutral0327 = df_tweets.loc[df_tweets.date=='2020-03-27'][df_tweets.polarity == 0].shape[0]
nonZero0327 = pos0327 + neg0327
px0327 = round(((pos0327-neg0327)/nonZero0327),3)
volume0327 = nonZero0327 + neutral0327

pos0326 = df_tweets.loc[df_tweets.date=='2020-03-26'][df_tweets.polarity > 0].shape[0]
neg0326 = df_tweets.loc[df_tweets.date=='2020-03-26'][df_tweets.polarity < 0].shape[0]
neutral0326 = df_tweets.loc[df_tweets.date=='2020-03-26'][df_tweets.polarity == 0].shape[0]
nonZero0326 = pos0326 + neg0326
px0326 = round(((pos0326-neg0326)/nonZero0326),3)
volume0326 = nonZero0326 + neutral0326

pos0325 = df_tweets.loc[df_tweets.date=='2020-03-25'][df_tweets.polarity > 0].shape[0]
neg0325 = df_tweets.loc[df_tweets.date=='2020-03-25'][df_tweets.polarity < 0].shape[0]
neutral0325 = df_tweets.loc[df_tweets.date=='2020-03-25'][df_tweets.polarity == 0].shape[0]
nonZero0325 = pos0325 + neg0325
px0325 = round(((pos0325-neg0325)/nonZero0325),3)
volume0325 = nonZero0325 + neutral0325

pos0324 = df_tweets.loc[df_tweets.date=='2020-03-24'][df_tweets.polarity > 0].shape[0]
neg0324 = df_tweets.loc[df_tweets.date=='2020-03-24'][df_tweets.polarity < 0].shape[0]
neutral0324 = df_tweets.loc[df_tweets.date=='2020-03-24'][df_tweets.polarity == 0].shape[0]
nonZero0324 = pos0324 + neg0324
px0324 = round(((pos0324-neg0324)/nonZero0324),3)
volume0324 = nonZero0324 + neutral0324

pos0323 = df_tweets.loc[df_tweets.date=='2020-03-23'][df_tweets.polarity > 0].shape[0]
neg0323 = df_tweets.loc[df_tweets.date=='2020-03-23'][df_tweets.polarity < 0].shape[0]
neutral0323 = df_tweets.loc[df_tweets.date=='2020-03-23'][df_tweets.polarity == 0].shape[0]
nonZero0323 = pos0323 + neg0323
px0323 = round(((pos0323-neg0323)/nonZero0323),3)
volume0323 = nonZero0323 + neutral0323

pos0322 = df_tweets.loc[df_tweets.date=='2020-03-22'][df_tweets.polarity > 0].shape[0]
neg0322 = df_tweets.loc[df_tweets.date=='2020-03-22'][df_tweets.polarity < 0].shape[0]
neutral0322 = df_tweets.loc[df_tweets.date=='2020-03-22'][df_tweets.polarity == 0].shape[0]
nonZero0322 = pos0322 + neg0322
px0322 = round(((pos0322-neg0322)/nonZero0322),3)
volume0322 = nonZero0322 + neutral0322
```

```
pos0321 = df_tweets.loc[df_tweets.date=='2020-03-21'][df_tweets.polarity > 0].shape[0]
neg0321 = df_tweets.loc[df_tweets.date=='2020-03-21'][df_tweets.polarity < 0].shape[0]
neutral0321 = df_tweets.loc[df_tweets.date=='2020-03-21'][df_tweets.polarity == 0].shape[0]
nonZero0321 = pos0321 + neg0321
px0321 = round(((pos0321-neg0321)/nonZero0321),3)
volume0321 = nonZero0321 + neutral0321

pos0320 = df_tweets.loc[df_tweets.date=='2020-03-20'][df_tweets.polarity > 0].shape[0]
neg0320 = df_tweets.loc[df_tweets.date=='2020-03-20'][df_tweets.polarity < 0].shape[0]
neutral0320 = df_tweets.loc[df_tweets.date=='2020-03-20'][df_tweets.polarity == 0].shape[0]
nonZero0320 = pos0320 + neg0320
px0320 = round(((pos0320-neg0320)/nonZero0320),3)
volume0320 = nonZero0320 + neutral0320

pos0319 = df_tweets.loc[df_tweets.date=='2020-03-19'][df_tweets.polarity > 0].shape[0]
neg0319 = df_tweets.loc[df_tweets.date=='2020-03-19'][df_tweets.polarity < 0].shape[0]
neutral0319 = df_tweets.loc[df_tweets.date=='2020-03-19'][df_tweets.polarity == 0].shape[0]
nonZero0319 = pos0319 + neg0319
px0319 = round(((pos0319-neg0319)/nonZero0319),3)
volume0319 = nonZero0319 + neutral0319

pos0318 = df_tweets.loc[df_tweets.date=='2020-03-18'][df_tweets.polarity > 0].shape[0]
neg0318 = df_tweets.loc[df_tweets.date=='2020-03-18'][df_tweets.polarity < 0].shape[0]
neutral0318 = df_tweets.loc[df_tweets.date=='2020-03-18'][df_tweets.polarity == 0].shape[0]
nonZero0318 = pos0318 + neg0318
px0318 = round(((pos0318-neg0318)/nonZero0318),3)
volume0318 = nonZero0318 + neutral0318

pos0317 = df_tweets.loc[df_tweets.date=='2020-03-17'][df_tweets.polarity > 0].shape[0]
neg0317 = df_tweets.loc[df_tweets.date=='2020-03-17'][df_tweets.polarity < 0].shape[0]
neutral0317 = df_tweets.loc[df_tweets.date=='2020-03-17'][df_tweets.polarity == 0].shape[0]
nonZero0317 = pos0317 + neg0317
px0317 = round(((pos0317-neg0317)/nonZero0317),3)
volume0317 = nonZero0317 + neutral0317

pos0316 = df_tweets.loc[df_tweets.date=='2020-03-16'][df_tweets.polarity > 0].shape[0]
neg0316 = df_tweets.loc[df_tweets.date=='2020-03-16'][df_tweets.polarity < 0].shape[0]
neutral0316 = df_tweets.loc[df_tweets.date=='2020-03-16'][df_tweets.polarity == 0].shape[0]
nonZero0316 = pos0316 + neg0316
px0316 = round(((pos0316-neg0316)/nonZero0316),3)
volume0316 = nonZero0316 + neutral0316

pos0315 = df_tweets.loc[df_tweets.date=='2020-03-15'][df_tweets.polarity > 0].shape[0]
neg0315 = df_tweets.loc[df_tweets.date=='2020-03-15'][df_tweets.polarity < 0].shape[0]
neutral0315 = df_tweets.loc[df_tweets.date=='2020-03-15'][df_tweets.polarity == 0].shape[0]
nonZero0315 = pos0315 + neg0315
px0315 = round(((pos0315-neg0315)/nonZero0315),3)
volume0315 = nonZero0315 + neutral0315

pos0314 = df_tweets.loc[df_tweets.date=='2020-03-14'][df_tweets.polarity > 0].shape[0]
neg0314 = df_tweets.loc[df_tweets.date=='2020-03-14'][df_tweets.polarity < 0].shape[0]
neutral0314 = df_tweets.loc[df_tweets.date=='2020-03-14'][df_tweets.polarity == 0].shape[0]
nonZero0314 = pos0314 + neg0314
px0314 = round(((pos0314-neg0314)/nonZero0314),3)
volume0314 = nonZero0314 + neutral0314

pos0313 = df_tweets.loc[df_tweets.date=='2020-03-13'][df_tweets.polarity > 0].shape[0]
neg0313 = df_tweets.loc[df_tweets.date=='2020-03-13'][df_tweets.polarity < 0].shape[0]
neutral0313 = df_tweets.loc[df_tweets.date=='2020-03-13'][df_tweets.polarity == 0].shape[0]
nonZero0313 = pos0313 + neg0313
px0313 = round(((pos0313-neg0313)/nonZero0313),3)
volume0313 = nonZero0313 + neutral0313

pos0312 = df_tweets.loc[df_tweets.date=='2020-03-12'][df_tweets.polarity > 0].shape[0]
neg0312 = df_tweets.loc[df_tweets.date=='2020-03-12'][df_tweets.polarity < 0].shape[0]
neutral0312 = df_tweets.loc[df_tweets.date=='2020-03-12'][df_tweets.polarity == 0].shape[0]
nonZero0312 = pos0312 + neg0312
px0312 = round(((pos0312-neg0312)/nonZero0312),3)
volume0312 = nonZero0312 + neutral0312

pos0311 = df_tweets.loc[df_tweets.date=='2020-03-11'][df_tweets.polarity > 0].shape[0]
neg0311 = df_tweets.loc[df_tweets.date=='2020-03-11'][df_tweets.polarity < 0].shape[0]
neutral0311 = df_tweets.loc[df_tweets.date=='2020-03-11'][df_tweets.polarity == 0].shape[0]
nonZero0311 = pos0311 + neg0311
px0311 = round(((pos0311-neg0311)/nonZero0311),3)
volume0311 = nonZero0311 + neutral0311
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pos0310 = df_tweets.loc[df_tweets.date=='2020-03-10'][df_tweets.polarity > 0].shape[0]
neg0310 = df_tweets.loc[df_tweets.date=='2020-03-10'][df_tweets.polarity < 0].shape[0]
neutral0310 = df_tweets.loc[df_tweets.date=='2020-03-10'][df_tweets.polarity == 0].shape[0]
nonZero0310 = pos0310 + neg0310
px0310 = round(((pos0310-neg0310)/nonZero0310),3)
volume0310 = nonZero0310 + neutral0310

pos0309 = df_tweets.loc[df_tweets.date=='2020-03-09'][df_tweets.polarity > 0].shape[0]
neg0309 = df_tweets.loc[df_tweets.date=='2020-03-09'][df_tweets.polarity < 0].shape[0]
neutral0309 = df_tweets.loc[df_tweets.date=='2020-03-09'][df_tweets.polarity == 0].shape[0]
nonZero0309 = pos0309 + neg0309
px0309 = round(((pos0309-neg0309)/nonZero0309),3)
volume0309 = nonZero0309 + neutral0309

pos0308 = df_tweets.loc[df_tweets.date=='2020-03-08'][df_tweets.polarity > 0].shape[0]
neg0308 = df_tweets.loc[df_tweets.date=='2020-03-08'][df_tweets.polarity < 0].shape[0]
neutral0308 = df_tweets.loc[df_tweets.date=='2020-03-08'][df_tweets.polarity == 0].shape[0]
nonZero0308 = pos0308 + neg0308
px0308 = round(((pos0308-neg0308)/nonZero0308),3)
volume0308 = nonZero0308 + neutral0308

pos0307 = df_tweets.loc[df_tweets.date=='2020-03-07'][df_tweets.polarity > 0].shape[0]
neg0307 = df_tweets.loc[df_tweets.date=='2020-03-07'][df_tweets.polarity < 0].shape[0]
neutral0307 = df_tweets.loc[df_tweets.date=='2020-03-07'][df_tweets.polarity == 0].shape[0]
nonZero0307 = pos0307 + neg0307
px0307 = round(((pos0307-neg0307)/nonZero0307),3)
volume0307 = nonZero0307 + neutral0307

pos0306 = df_tweets.loc[df_tweets.date=='2020-03-06'][df_tweets.polarity > 0].shape[0]
neg0306 = df_tweets.loc[df_tweets.date=='2020-03-06'][df_tweets.polarity < 0].shape[0]
neutral0306 = df_tweets.loc[df_tweets.date=='2020-03-06'][df_tweets.polarity == 0].shape[0]
nonZero0306 = pos0306 + neg0306
px0306 = round(((pos0306-neg0306)/nonZero0306),3)
volume0306 = nonZero0306 + neutral0306

pos0305 = df_tweets.loc[df_tweets.date=='2020-03-05'][df_tweets.polarity > 0].shape[0]
neg0305 = df_tweets.loc[df_tweets.date=='2020-03-05'][df_tweets.polarity < 0].shape[0]
neutral0305 = df_tweets.loc[df_tweets.date=='2020-03-05'][df_tweets.polarity == 0].shape[0]
nonZero0305 = pos0305 + neg0305
px0305 = round(((pos0305-neg0305)/nonZero0305),3)
volume0305 = nonZero0305 + neutral0305

pos0304 = df_tweets.loc[df_tweets.date=='2020-03-04'][df_tweets.polarity > 0].shape[0]
neg0304 = df_tweets.loc[df_tweets.date=='2020-03-04'][df_tweets.polarity < 0].shape[0]
neutral0304 = df_tweets.loc[df_tweets.date=='2020-03-04'][df_tweets.polarity == 0].shape[0]
nonZero0304 = pos0304 + neg0304
px0304 = round(((pos0304-neg0304)/nonZero0304),3)
volume0304 = nonZero0304 + neutral0304

pos0303 = df_tweets.loc[df_tweets.date=='2020-03-03'][df_tweets.polarity > 0].shape[0]
neg0303 = df_tweets.loc[df_tweets.date=='2020-03-03'][df_tweets.polarity < 0].shape[0]
neutral0303 = df_tweets.loc[df_tweets.date=='2020-03-03'][df_tweets.polarity == 0].shape[0]
nonZero0303 = pos0303 + neg0303
px0303 = round(((pos0303-neg0303)/nonZero0303),3)
volume0303 = nonZero0303 + neutral0303

pos0302 = df_tweets.loc[df_tweets.date=='2020-03-02'][df_tweets.polarity > 0].shape[0]
neg0302 = df_tweets.loc[df_tweets.date=='2020-03-02'][df_tweets.polarity < 0].shape[0]
neutral0302 = df_tweets.loc[df_tweets.date=='2020-03-02'][df_tweets.polarity == 0].shape[0]
nonZero0302 = pos0302 + neg0302
px0302 = round(((pos0302-neg0302)/nonZero0302),3)
volume0302 = nonZero0302 + neutral0302

pos0301 = df_tweets.loc[df_tweets.date=='2020-03-01'][df_tweets.polarity > 0].shape[0]
neg0301 = df_tweets.loc[df_tweets.date=='2020-03-01'][df_tweets.polarity < 0].shape[0]
neutral0301 = df_tweets.loc[df_tweets.date=='2020-03-01'][df_tweets.polarity == 0].shape[0]
nonZero0301 = pos0301 + neg0301
px0301 = round(((pos0301-neg0301)/nonZero0301),3)
volume0301 = nonZero0301 + neutral0301

pos0229 = df_tweets.loc[df_tweets.date=='2020-02-29'][df_tweets.polarity > 0].shape[0]
neg0229 = df_tweets.loc[df_tweets.date=='2020-02-29'][df_tweets.polarity < 0].shape[0]
neutral0229 = df_tweets.loc[df_tweets.date=='2020-02-29'][df_tweets.polarity == 0].shape[0]
nonZero0229 = pos0229 + neg0229
px0229 = round(((pos0229-neg0229)/nonZero0229),3)
volume0229 = nonZero0229 + neutral0229
```

```
pos0228 = df_tweets.loc[df_tweets.date=='2020-02-28'][df_tweets.polarity > 0].shape[0]
neg0228 = df_tweets.loc[df_tweets.date=='2020-02-28'][df_tweets.polarity < 0].shape[0]
neutral0228 = df_tweets.loc[df_tweets.date=='2020-02-28'][df_tweets.polarity == 0].shape[0]
nonZero0228 = pos0228 + neg0228
px0228 = round(((pos0228-neg0228)/nonZero0228),3)
volume0228 = nonZero0228 + neutral0228

pos0227 = df_tweets.loc[df_tweets.date=='2020-02-27'][df_tweets.polarity > 0].shape[0]
neg0227 = df_tweets.loc[df_tweets.date=='2020-02-27'][df_tweets.polarity < 0].shape[0]
neutral0227 = df_tweets.loc[df_tweets.date=='2020-02-27'][df_tweets.polarity == 0].shape[0]
nonZero0227 = pos0227 + neg0227
px0227 = round(((pos0227-neg0227)/nonZero0227),3)
volume0227 = nonZero0227 + neutral0227

pos0226 = df_tweets.loc[df_tweets.date=='2020-02-26'][df_tweets.polarity > 0].shape[0]
neg0226 = df_tweets.loc[df_tweets.date=='2020-02-26'][df_tweets.polarity < 0].shape[0]
neutral0226 = df_tweets.loc[df_tweets.date=='2020-02-26'][df_tweets.polarity == 0].shape[0]
nonZero0226 = pos0226 + neg0226
px0226 = round(((pos0226-neg0226)/nonZero0226),3)
volume0226 = nonZero0226 + neutral0226

pos0225 = df_tweets.loc[df_tweets.date=='2020-02-25'][df_tweets.polarity > 0].shape[0]
neg0225 = df_tweets.loc[df_tweets.date=='2020-02-25'][df_tweets.polarity < 0].shape[0]
neutral0225 = df_tweets.loc[df_tweets.date=='2020-02-25'][df_tweets.polarity == 0].shape[0]
nonZero0225 = pos0225 + neg0225
px0225 = round(((pos0225-neg0225)/nonZero0225),3)
volume0225 = nonZero0225 + neutral0225

pos0224 = df_tweets.loc[df_tweets.date=='2020-02-24'][df_tweets.polarity > 0].shape[0]
neg0224 = df_tweets.loc[df_tweets.date=='2020-02-24'][df_tweets.polarity < 0].shape[0]
neutral0224 = df_tweets.loc[df_tweets.date=='2020-02-24'][df_tweets.polarity == 0].shape[0]
nonZero0224 = pos0224 + neg0224
px0224 = round(((pos0224-neg0224)/nonZero0224),3)
volume0224 = nonZero0224 + neutral0224

pos0223 = df_tweets.loc[df_tweets.date=='2020-02-23'][df_tweets.polarity > 0].shape[0]
neg0223 = df_tweets.loc[df_tweets.date=='2020-02-23'][df_tweets.polarity < 0].shape[0]
neutral0223 = df_tweets.loc[df_tweets.date=='2020-02-23'][df_tweets.polarity == 0].shape[0]
nonZero0223 = pos0223 + neg0223
px0223 = round(((pos0223-neg0223)/nonZero0223),3)
volume0223 = nonZero0223 + neutral0223

pos0222 = df_tweets.loc[df_tweets.date=='2020-02-22'][df_tweets.polarity > 0].shape[0]
neg0222 = df_tweets.loc[df_tweets.date=='2020-02-22'][df_tweets.polarity < 0].shape[0]
neutral0222 = df_tweets.loc[df_tweets.date=='2020-02-22'][df_tweets.polarity == 0].shape[0]
nonZero0222 = pos0222 + neg0222
px0222 = round(((pos0222-neg0222)/nonZero0222),3)
volume0222 = nonZero0222 + neutral0222

pos0221 = df_tweets.loc[df_tweets.date=='2020-02-21'][df_tweets.polarity > 0].shape[0]
neg0221 = df_tweets.loc[df_tweets.date=='2020-02-21'][df_tweets.polarity < 0].shape[0]
neutral0221 = df_tweets.loc[df_tweets.date=='2020-02-21'][df_tweets.polarity == 0].shape[0]
nonZero0221 = pos0221 + neg0221
px0221 = round(((pos0221-neg0221)/nonZero0221),3)
volume0221 = nonZero0221 + neutral0221

pos0220 = df_tweets.loc[df_tweets.date=='2020-02-20'][df_tweets.polarity > 0].shape[0]
neg0220 = df_tweets.loc[df_tweets.date=='2020-02-20'][df_tweets.polarity < 0].shape[0]
neutral0220 = df_tweets.loc[df_tweets.date=='2020-02-20'][df_tweets.polarity == 0].shape[0]
nonZero0220 = pos0220 + neg0220
px0220 = round(((pos0220-neg0220)/nonZero0220),3)
volume0220 = nonZero0220 + neutral0220

pos0219 = df_tweets.loc[df_tweets.date=='2020-02-19'][df_tweets.polarity > 0].shape[0]
neg0219 = df_tweets.loc[df_tweets.date=='2020-02-19'][df_tweets.polarity < 0].shape[0]
neutral0219 = df_tweets.loc[df_tweets.date=='2020-02-19'][df_tweets.polarity == 0].shape[0]
nonZero0219 = pos0219 + neg0219
px0219 = round(((pos0219-neg0219)/nonZero0219),3)
volume0219 = nonZero0219 + neutral0219

pos0218 = df_tweets.loc[df_tweets.date=='2020-02-18'][df_tweets.polarity > 0].shape[0]
neg0218 = df_tweets.loc[df_tweets.date=='2020-02-18'][df_tweets.polarity < 0].shape[0]
neutral0218 = df_tweets.loc[df_tweets.date=='2020-02-18'][df_tweets.polarity == 0].shape[0]
nonZero0218 = pos0218 + neg0218
px0218 = round(((pos0218-neg0218)/nonZero0218),3)
```

```
volume0210 = nonZero0210 + neutral0210

pos0217 = df_tweets.loc[df_tweets.date=='2020-02-17'][df_tweets.polarity > 0].shape[0]
neg0217 = df_tweets.loc[df_tweets.date=='2020-02-17'][df_tweets.polarity < 0].shape[0]
neutral0217 = df_tweets.loc[df_tweets.date=='2020-02-17'][df_tweets.polarity == 0].shape[0]
nonZero0217 = pos0217 + neg0217
px0217 = round(((pos0217-neg0217)/nonZero0217),3)
volume0217 = nonZero0217 + neutral0217

pos0216 = df_tweets.loc[df_tweets.date=='2020-02-16'][df_tweets.polarity > 0].shape[0]
neg0216 = df_tweets.loc[df_tweets.date=='2020-02-16'][df_tweets.polarity < 0].shape[0]
neutral0216 = df_tweets.loc[df_tweets.date=='2020-02-16'][df_tweets.polarity == 0].shape[0]
nonZero0216 = pos0216 + neg0216
px0216 = round(((pos0216-neg0216)/nonZero0216),3)
volume0216 = nonZero0216 + neutral0216

pos0215 = df_tweets.loc[df_tweets.date=='2020-02-15'][df_tweets.polarity > 0].shape[0]
neg0215 = df_tweets.loc[df_tweets.date=='2020-02-15'][df_tweets.polarity < 0].shape[0]
neutral0215 = df_tweets.loc[df_tweets.date=='2020-02-15'][df_tweets.polarity == 0].shape[0]
nonZero0215 = pos0215 + neg0215
px0215 = round(((pos0215-neg0215)/nonZero0215),3)
volume0215 = nonZero0215 + neutral0215

pos0214 = df_tweets.loc[df_tweets.date=='2020-02-14'][df_tweets.polarity > 0].shape[0]
neg0214 = df_tweets.loc[df_tweets.date=='2020-02-14'][df_tweets.polarity < 0].shape[0]
neutral0214 = df_tweets.loc[df_tweets.date=='2020-02-14'][df_tweets.polarity == 0].shape[0]
nonZero0214 = pos0214 + neg0214
px0214 = round(((pos0214-neg0214)/nonZero0214),3)
volume0214 = nonZero0214 + neutral0214

pos0213 = df_tweets.loc[df_tweets.date=='2020-02-13'][df_tweets.polarity > 0].shape[0]
neg0213 = df_tweets.loc[df_tweets.date=='2020-02-13'][df_tweets.polarity < 0].shape[0]
neutral0213 = df_tweets.loc[df_tweets.date=='2020-02-13'][df_tweets.polarity == 0].shape[0]
nonZero0213 = pos0213 + neg0213
px0213 = round(((pos0213-neg0213)/nonZero0213),3)
volume0213 = nonZero0213 + neutral0213

pos0212 = df_tweets.loc[df_tweets.date=='2020-02-12'][df_tweets.polarity > 0].shape[0]
neg0212 = df_tweets.loc[df_tweets.date=='2020-02-12'][df_tweets.polarity < 0].shape[0]
neutral0212 = df_tweets.loc[df_tweets.date=='2020-02-12'][df_tweets.polarity == 0].shape[0]
nonZero0212 = pos0212 + neg0212
px0212 = round(((pos0212-neg0212)/nonZero0212),3)
volume0212 = nonZero0212 + neutral0212

pos0211 = df_tweets.loc[df_tweets.date=='2020-02-11'][df_tweets.polarity > 0].shape[0]
neg0211 = df_tweets.loc[df_tweets.date=='2020-02-11'][df_tweets.polarity < 0].shape[0]
neutral0211 = df_tweets.loc[df_tweets.date=='2020-02-11'][df_tweets.polarity == 0].shape[0]
nonZero0211 = pos0211 + neg0211
px0211 = round(((pos0211-neg0211)/nonZero0211),3)
volume0211 = nonZero0211 + neutral0211

pos0210 = df_tweets.loc[df_tweets.date=='2020-02-10'][df_tweets.polarity > 0].shape[0]
neg0210 = df_tweets.loc[df_tweets.date=='2020-02-10'][df_tweets.polarity < 0].shape[0]
neutral0210 = df_tweets.loc[df_tweets.date=='2020-02-10'][df_tweets.polarity == 0].shape[0]
nonZero0210 = pos0210 + neg0210
px0210 = round(((pos0210-neg0210)/nonZero0210),3)
volume0210 = nonZero0210 + neutral0210

pos0209 = df_tweets.loc[df_tweets.date=='2020-02-09'][df_tweets.polarity > 0].shape[0]
neg0209 = df_tweets.loc[df_tweets.date=='2020-02-09'][df_tweets.polarity < 0].shape[0]
neutral0209 = df_tweets.loc[df_tweets.date=='2020-02-09'][df_tweets.polarity == 0].shape[0]
nonZero0209 = pos0209 + neg0209
px0209 = round(((pos0209-neg0209)/nonZero0209),3)
volume0209 = nonZero0209 + neutral0209

pos0208 = df_tweets.loc[df_tweets.date=='2020-02-08'][df_tweets.polarity > 0].shape[0]
neg0208 = df_tweets.loc[df_tweets.date=='2020-02-08'][df_tweets.polarity < 0].shape[0]
neutral0208 = df_tweets.loc[df_tweets.date=='2020-02-08'][df_tweets.polarity == 0].shape[0]
nonZero0208 = pos0208 + neg0208
px0208 = round(((pos0208-neg0208)/nonZero0208),3)
volume0208 = nonZero0208 + neutral0208

pos0207 = df_tweets.loc[df_tweets.date=='2020-02-07'][df_tweets.polarity > 0].shape[0]
neg0207 = df_tweets.loc[df_tweets.date=='2020-02-07'][df_tweets.polarity < 0].shape[0]
neutral0207 = df_tweets.loc[df_tweets.date=='2020-02-07'][df_tweets.polarity == 0].shape[0]
nonZero0207 = pos0207 + neg0207
px0207 = round(((pos0207-neg0207)/nonZero0207),3)
volume0207 = nonZero0207 + neutral0207
```

```
volume0207 = nonZero0207 + neutral0207

pos0206 = df_tweets.loc[df_tweets.date=='2020-02-06'][df_tweets.polarity > 0].shape[0]
neg0206 = df_tweets.loc[df_tweets.date=='2020-02-06'][df_tweets.polarity < 0].shape[0]
neutral0206 = df_tweets.loc[df_tweets.date=='2020-02-06'][df_tweets.polarity == 0].shape[0]
nonZero0206 = pos0206 + neg0206
px0206 = round(((pos0206-neg0206)/nonZero0206),3)
volume0206 = nonZero0206 + neutral0206

pos0205 = df_tweets.loc[df_tweets.date=='2020-02-05'][df_tweets.polarity > 0].shape[0]
neg0205 = df_tweets.loc[df_tweets.date=='2020-02-05'][df_tweets.polarity < 0].shape[0]
neutral0205 = df_tweets.loc[df_tweets.date=='2020-02-05'][df_tweets.polarity == 0].shape[0]
nonZero0205 = pos0205 + neg0205
px0205 = round(((pos0205-neg0205)/nonZero0205),3)
volume0205 = nonZero0205 + neutral0205

pos0204 = df_tweets.loc[df_tweets.date=='2020-02-04'][df_tweets.polarity > 0].shape[0]
neg0204 = df_tweets.loc[df_tweets.date=='2020-02-04'][df_tweets.polarity < 0].shape[0]
neutral0204 = df_tweets.loc[df_tweets.date=='2020-02-04'][df_tweets.polarity == 0].shape[0]
nonZero0204 = pos0204 + neg0204
px0204 = round(((pos0204-neg0204)/nonZero0204),3)
volume0204 = nonZero0204 + neutral0204

pos0203 = df_tweets.loc[df_tweets.date=='2020-02-03'][df_tweets.polarity > 0].shape[0]
neg0203 = df_tweets.loc[df_tweets.date=='2020-02-03'][df_tweets.polarity < 0].shape[0]
neutral0203 = df_tweets.loc[df_tweets.date=='2020-02-03'][df_tweets.polarity == 0].shape[0]
nonZero0203 = pos0203 + neg0203
px0203 = round(((pos0203-neg0203)/nonZero0203),3)
volume0203 = nonZero0203 + neutral0203

pos0202 = df_tweets.loc[df_tweets.date=='2020-02-02'][df_tweets.polarity > 0].shape[0]
neg0202 = df_tweets.loc[df_tweets.date=='2020-02-02'][df_tweets.polarity < 0].shape[0]
neutral0202 = df_tweets.loc[df_tweets.date=='2020-02-02'][df_tweets.polarity == 0].shape[0]
nonZero0202 = pos0202 + neg0202
px0202 = round(((pos0202-neg0202)/nonZero0202),3)
volume0202 = nonZero0202 + neutral0202

pos0201 = df_tweets.loc[df_tweets.date=='2020-02-01'][df_tweets.polarity > 0].shape[0]
neg0201 = df_tweets.loc[df_tweets.date=='2020-02-01'][df_tweets.polarity < 0].shape[0]
neutral0201 = df_tweets.loc[df_tweets.date=='2020-02-01'][df_tweets.polarity == 0].shape[0]
nonZero0201 = pos0201 + neg0201
px0201 = round(((pos0201-neg0201)/nonZero0201),3)
volume0201 = nonZero0201 + neutral0201
```

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In [5]:

```
#combining daily returns and daily sentiment polarity into one dataframe
```

```
#combining daily returns and daily sentiment polarity into one dataframe

returnSeries = df_price['Change %'].apply(lambda x: float(x.strip('%')))
sentimentSeries = [px0201, px0202, px0203, px0204, px0205, px0206, px0207,
                   px0208, px0209, px0210, px0211, px0212, px0213, px0214,
                   px0215, px0216, px0217, px0218, px0219, px0220, px0221,
                   px0222, px0223, px0224, px0225, px0226, px0227, px0228,
                   px0229, px0301, px0302, px0303, px0304, px0305, px0306,
                   px0307, px0308, px0309, px0310, px0311, px0312, px0313,
                   px0314, px0315, px0316, px0317, px0318, px0319, px0320,
                   px0321, px0322, px0323, px0324, px0325, px0326, px0327]

ts = pd.DataFrame()
ts['Date'], ts['Daily Return in %'], ts['Sentiment Polarity'] = df_price['Date'], returnSeries, sen
timentSeries
ts = ts.iloc[::-1].reset_index(drop=True)
ts
```

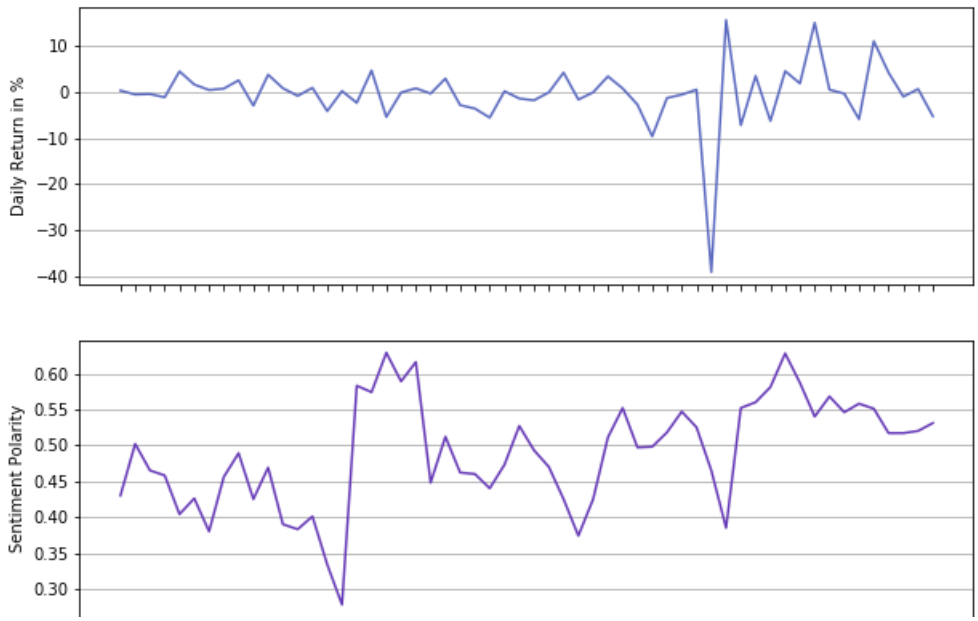
Out[5]:

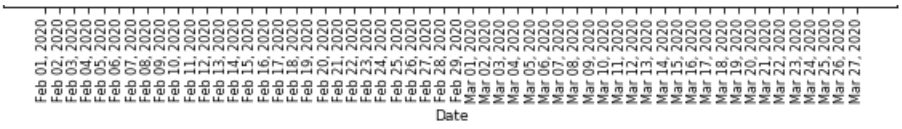
	Date	Daily Return in %	Sentiment Polarity
0	Feb 01, 2020	0.35	0.430
1	Feb 02, 2020	-0.50	0.502
2	Feb 03, 2020	-0.41	0.465
3	Feb 04, 2020	-1.10	0.458
4	Feb 05, 2020	4.54	0.404
5	Feb 06, 2020	1.67	0.426
6	Feb 07, 2020	0.48	0.380
7	Feb 08, 2020	0.78	0.456
8	Feb 09, 2020	2.59	0.489
9	Feb 10, 2020	-2.93	0.425
10	Feb 11, 2020	3.81	0.469
11	Feb 12, 2020	0.86	0.390
12	Feb 13, 2020	-0.80	0.383
13	Feb 14, 2020	0.96	0.401
14	Feb 15, 2020	-4.12	0.334
15	Feb 16, 2020	0.25	0.278
16	Feb 17, 2020	-2.32	0.583
17	Feb 18, 2020	4.71	0.574
18	Feb 19, 2020	-5.40	0.629
19	Feb 20, 2020	-0.07	0.589
20	Feb 21, 2020	0.85	0.616
21	Feb 22, 2020	-0.30	0.448
22	Feb 23, 2020	2.97	0.512
23	Feb 24, 2020	-2.82	0.462
24	Feb 25, 2020	-3.57	0.460
25	Feb 26, 2020	-5.55	0.440
26	Feb 27, 2020	0.21	0.473
27	Feb 28, 2020	-1.37	0.527
28	Feb 29, 2020	-1.77	0.493
29	Mar 01, 2020	-0.04	0.470
30	Mar 02, 2020	4.27	0.425
31	Mar 03, 2020	-1.61	0.374
32	Mar 04, 2020	-0.04	0.425
33	Mar 05, 2020	3.45	0.511
34	Mar 06, 2020	0.82	0.552
35	Mar 07, 2020	-2.70	0.497

	Date	Daily Return in %	Sentiment Polarity
36	Mar 08, 2020	-9.64	0.489
37	Mar 09, 2020	-1.26	0.518
38	Mar 10, 2020	-0.53	0.547
39	Mar 11, 2020	0.56	0.525
40	Mar 12, 2020	-39.18	0.465
41	Mar 13, 2020	15.71	0.385
42	Mar 14, 2020	-7.19	0.552
43	Mar 15, 2020	3.54	0.560
44	Mar 16, 2020	-6.27	0.581
45	Mar 17, 2020	4.59	0.628
46	Mar 18, 2020	1.91	0.587
47	Mar 19, 2020	15.12	0.540
48	Mar 20, 2020	0.54	0.568
49	Mar 21, 2020	-0.31	0.546
50	Mar 22, 2020	-5.89	0.558
51	Mar 23, 2020	11.11	0.551
52	Mar 24, 2020	4.26	0.517
53	Mar 25, 2020	-0.97	0.517
54	Mar 26, 2020	0.69	0.520
55	Mar 27, 2020	-5.23	0.531

In [6]:

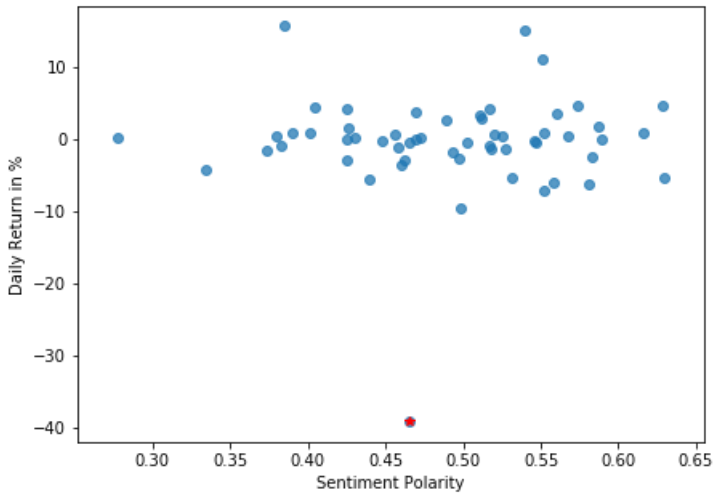
```
fig, axs = plt.subplots(2, sharex=True, sharey=False, figsize=(10,7))
#fig.suptitle('Relevance and Stock Price Over Time')


x = ts['Date']
plt.xticks(rotation=90, fontsize=8)

axs[0].yaxis.grid()
axs[1].yaxis.grid()

axs[0].plot(x, ts['Daily Return in %'],color='#5C6BC0')
axs[1].plot(x, ts['Sentiment Polarity'],color='#673AB7')

axs[0].set_ylabel("Daily Return in %",fontsize=10)
axs[1].set_ylabel("Sentiment Polarity",fontsize=10)

axs[1].set_xlabel("Date",fontsize=9)
plt.show()
```





In [7]:

```
plt.figure(figsize=(7,5))
plt.scatter(ts['Sentiment Polarity'],ts['Daily Return in %'], alpha=0.75)
plt.plot(ts['Sentiment Polarity'][40],ts['Daily Return in %'][40], 'r*')
#plt.plot(ts['Sentiment Polarity'][35],ts['Daily Return in %'][35], 'y*')
#plt.plot(ts['Sentiment Polarity'][29],ts['Daily Return in %'][18], 'r*')
#plt.plot(ts['Sentiment Polarity'][27],ts['Daily Return in %'][27], 'r*')
plt.xlabel("Sentiment Polarity")
plt.ylabel("Daily Return in %")
plt.show()
```

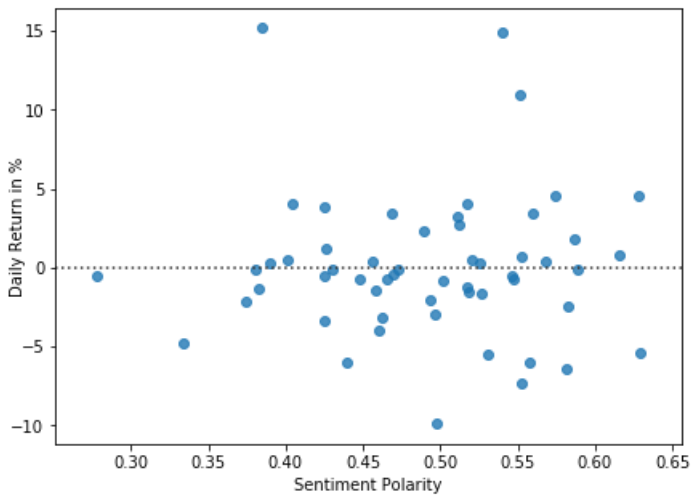


In [29]:

```
plt.figure(figsize=(7,5))
sns.residplot(x='Sentiment Polarity',y='Daily Return in %',data=tsNO)
plt.ylabel('Daily Return in %',labelpad=-10)
```

Out[29]:

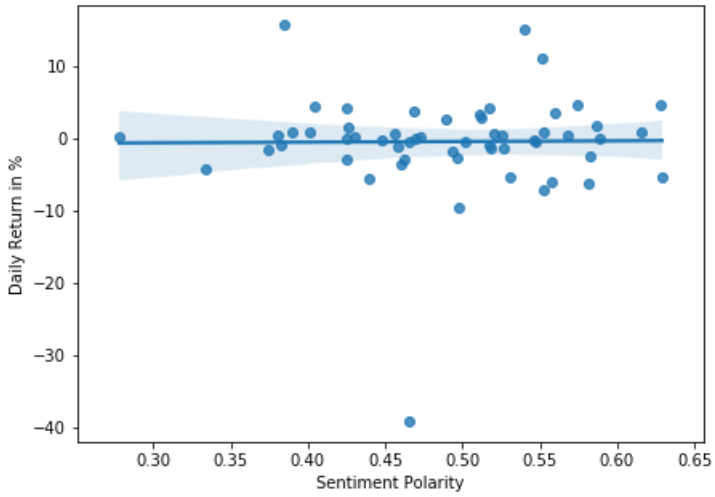
```
Text(0, 0.5, 'Daily Return in %')
```



In [30]:

```
plt.figure(figsize=(7,5))
sns.regplot(x='Sentiment Polarity',y='Daily Return in %',data=ts)
print(linregress(ts['Sentiment Polarity'],ts['Daily Return in %']))
```

```
LinregressResult(slope=0.9316105237988257, intercept=-0.8540557002702674,
rvalue=0.01012883554123564, pvalue=0.9409391178637084, stderr=12.515716214218896)
```



In [9]:

```
tsNO = pd.DataFrame(ts)
tsNO = tsNO.drop(tsNO.index[[40]])
tsNO
```

Out[9]:

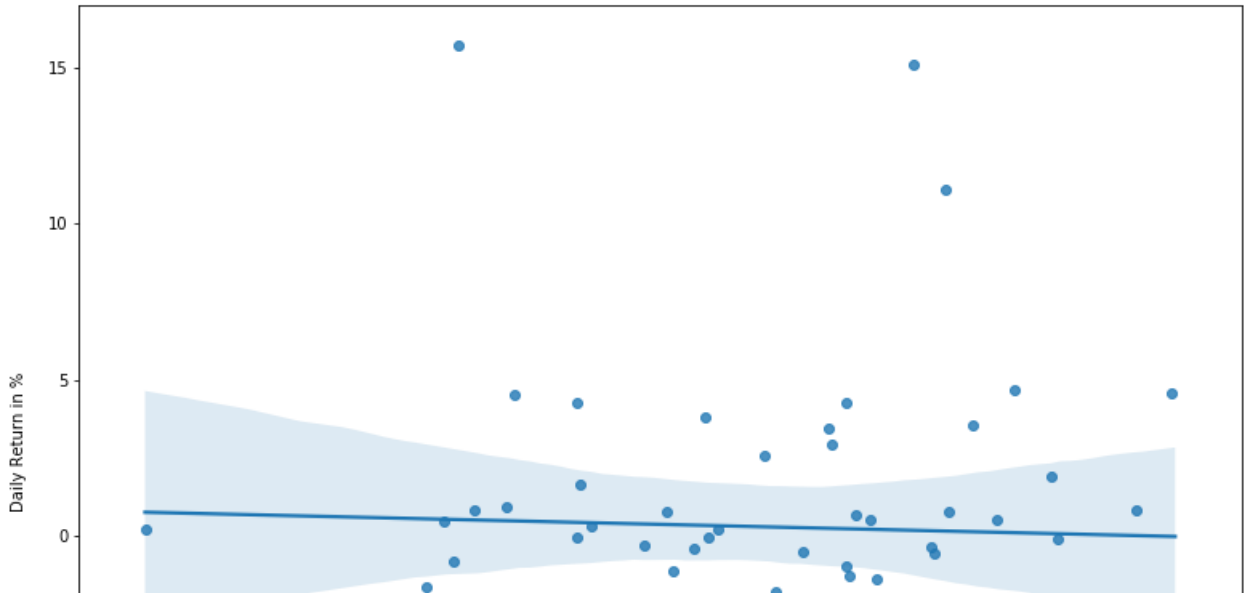
	Date	Daily Return in %	Sentiment Polarity
0	Feb 01, 2020	0.35	0.430
1	Feb 02, 2020	-0.50	0.502
2	Feb 03, 2020	-0.41	0.465
3	Feb 04, 2020	-1.10	0.458
4	Feb 05, 2020	4.54	0.404
5	Feb 06, 2020	1.67	0.426
6	Feb 07, 2020	0.48	0.380
7	Feb 08, 2020	0.78	0.456
8	Feb 09, 2020	2.59	0.489
9	Feb 10, 2020	-2.93	0.425
10	Feb 11, 2020	3.81	0.469
11	Feb 12, 2020	0.86	0.390
12	Feb 13, 2020	-0.80	0.383
13	Feb 14, 2020	0.96	0.401
14	Feb 15, 2020	-4.12	0.334
15	Feb 16, 2020	0.25	0.278
16	Feb 17, 2020	-2.32	0.583
17	Feb 18, 2020	4.71	0.574
18	Feb 19, 2020	-5.40	0.629
19	Feb 20, 2020	-0.07	0.589
20	Feb 21, 2020	0.85	0.616
21	Feb 22, 2020	-0.30	0.448
22	Feb 23, 2020	2.97	0.512
23	Feb 24, 2020	-2.82	0.462
24	Feb 25, 2020	-3.57	0.460
25	Feb 26, 2020	-5.55	0.440
26	Feb 27, 2020	0.21	0.473

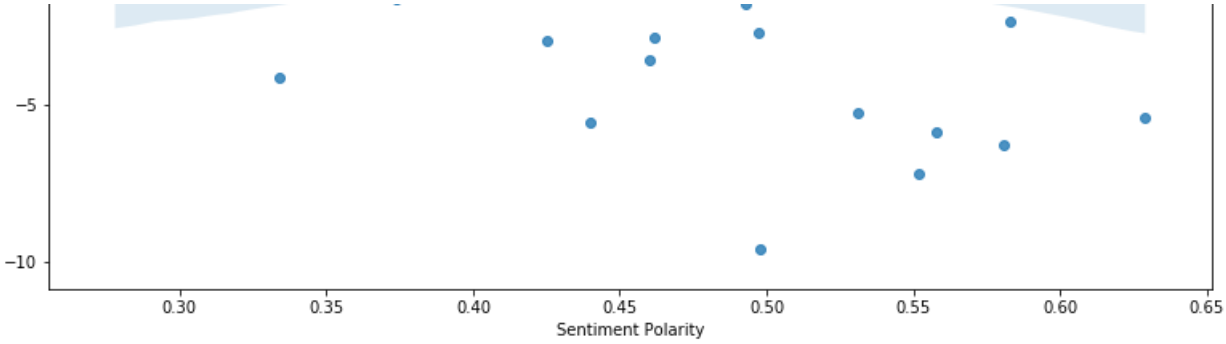
	Date	Daily Return in %	Sentiment Polarity
27	Feb 28, 2020	-1.37	0.527
28	Feb 29, 2020	-1.77	0.493
29	Mar 01, 2020	-0.04	0.470
30	Mar 02, 2020	4.27	0.425
31	Mar 03, 2020	-1.61	0.374
32	Mar 04, 2020	-0.04	0.425
33	Mar 05, 2020	3.45	0.511
34	Mar 06, 2020	0.82	0.552
35	Mar 07, 2020	-2.70	0.497
36	Mar 08, 2020	-9.61	0.498
37	Mar 09, 2020	-1.26	0.518
38	Mar 10, 2020	-0.53	0.547
39	Mar 11, 2020	0.56	0.525
41	Mar 13, 2020	15.71	0.385
42	Mar 14, 2020	-7.19	0.552
43	Mar 15, 2020	3.54	0.560
44	Mar 16, 2020	-6.27	0.581
45	Mar 17, 2020	4.59	0.628
46	Mar 18, 2020	1.91	0.587
47	Mar 19, 2020	15.12	0.540
48	Mar 20, 2020	0.54	0.568
49	Mar 21, 2020	-0.31	0.546
50	Mar 22, 2020	-5.89	0.558
51	Mar 23, 2020	11.11	0.551
52	Mar 24, 2020	4.26	0.517
53	Mar 25, 2020	-0.97	0.517
54	Mar 26, 2020	0.69	0.520
55	Mar 27, 2020	-5.23	0.531

In [10]:

```
plt.figure(figsize=(13,10))
sns.regplot(x='Sentiment Polarity',y='Daily Return in %',data=tsNO)
print(linregress(tsNO['Sentiment Polarity'],tsNO['Daily Return in %']))
```

```
LinregressResult(slope=-2.2112488574772704, intercept=1.3923142350159867, rvalue=-
0.03679165941129175, pvalue=0.7897175817445649, stderr=8.25004229801967)
```





In [ ]:

```
```

In [ ]:

```
```

In [31]:

```
gDelta = pd.read_excel(r'C:\Users\timod\Desktop\BTC_gDelta_all.xlsx')
gDelta['Daily Return in %'] = ts['Daily Return in %']

gDelta
```

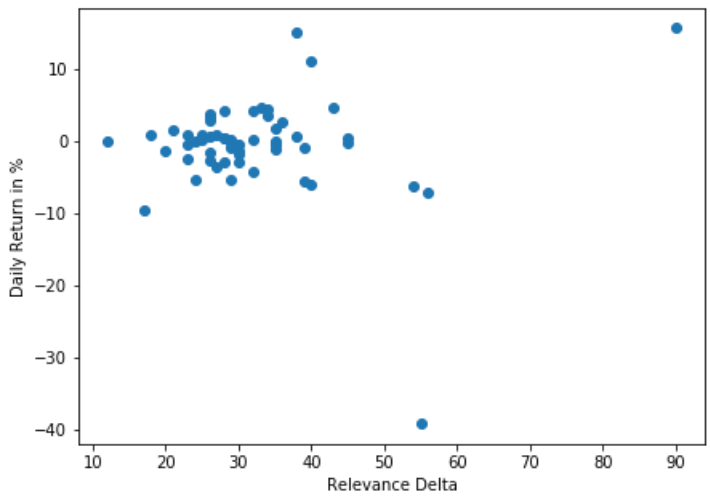
Out[31]:

	Date	Buy Bitcoin	Sell Bitcoin	Delta	Daily Return in %
0	2020-02-01	30	5	25	0.35
1	2020-02-02	27	4	23	-0.50
2	2020-02-03	34	4	30	-0.41
3	2020-02-04	40	5	35	-1.10
4	2020-02-05	39	5	34	4.54
5	2020-02-06	27	6	21	1.67
6	2020-02-07	33	5	28	0.48
7	2020-02-08	31	5	26	0.78
8	2020-02-09	42	6	36	2.59
9	2020-02-10	34	4	30	-2.93
10	2020-02-11	30	4	26	3.81
11	2020-02-12	33	8	25	0.86
12	2020-02-13	36	7	29	-0.80
13	2020-02-14	21	3	18	0.96
14	2020-02-15	39	7	32	-4.12
15	2020-02-16	36	4	32	0.25
16	2020-02-17	27	4	23	-2.32
17	2020-02-18	35	2	33	4.71
18	2020-02-19	28	4	24	-5.40
19	2020-02-20	24	12	12	-0.07
20	2020-02-21	29	6	23	0.85
21	2020-02-22	31	2	29	-0.30
22	2020-02-23	29	3	26	2.97
23	2020-02-24	35	7	28	-2.82
24	2020-02-25	30	3	27	-3.57
25	2020-02-26	43	4	39	-5.55
26	2020-02-27	37	8	29	0.21

	Date	Buy Bitcoin	Sell Bitcoin	Delta	Daily Return in %
27	2020-02-28	24	4	20	-1.37
28	2020-02-29	34	4	30	-1.77
29	2020-03-01	39	4	35	-0.04
30	2020-03-02	35	3	32	4.27
31	2020-03-03	31	5	26	-1.61
32	2020-03-04	35	11	24	-0.04
33	2020-03-05	30	4	26	3.45
34	2020-03-06	30	3	27	0.82
35	2020-03-07	31	5	26	-2.70
36	2020-03-08	23	6	17	-9.61
37	2020-03-09	33	3	30	-1.26
38	2020-03-10	42	7	35	-0.53
39	2020-03-11	34	6	28	0.56
40	2020-03-12	70	15	55	-39.18
41	2020-03-13	100	10	90	15.71
42	2020-03-14	64	8	56	-7.19
43	2020-03-15	43	9	34	3.54
44	2020-03-16	60	6	54	-6.27
45	2020-03-17	53	10	43	4.59
46	2020-03-18	42	7	35	1.91
47	2020-03-19	43	5	38	15.12
48	2020-03-20	58	13	45	0.54
49	2020-03-21	49	4	45	-0.31
50	2020-03-22	44	4	40	-5.89
51	2020-03-23	44	4	40	11.11
52	2020-03-24	33	5	28	4.26
53	2020-03-25	42	3	39	-0.97
54	2020-03-26	39	1	38	0.69
55	2020-03-27	31	2	29	-5.23

In [33]:

```
plt.figure(figsize=(7,5))
plt.scatter(x='Delta',y='Daily Return in %',data=gDelta)
plt.xlabel("Relevance Delta")
plt.ylabel("Daily Return in %")
plt.show()
```



In [33]:

```
GT_Delta = pd.read_excel(r'C:\Users\timod\Desktop\test_gDelta_BTC.xlsx')
GT_Delta['Daily Return in %'] = ts['Daily Return in %']
GT_Delta
```

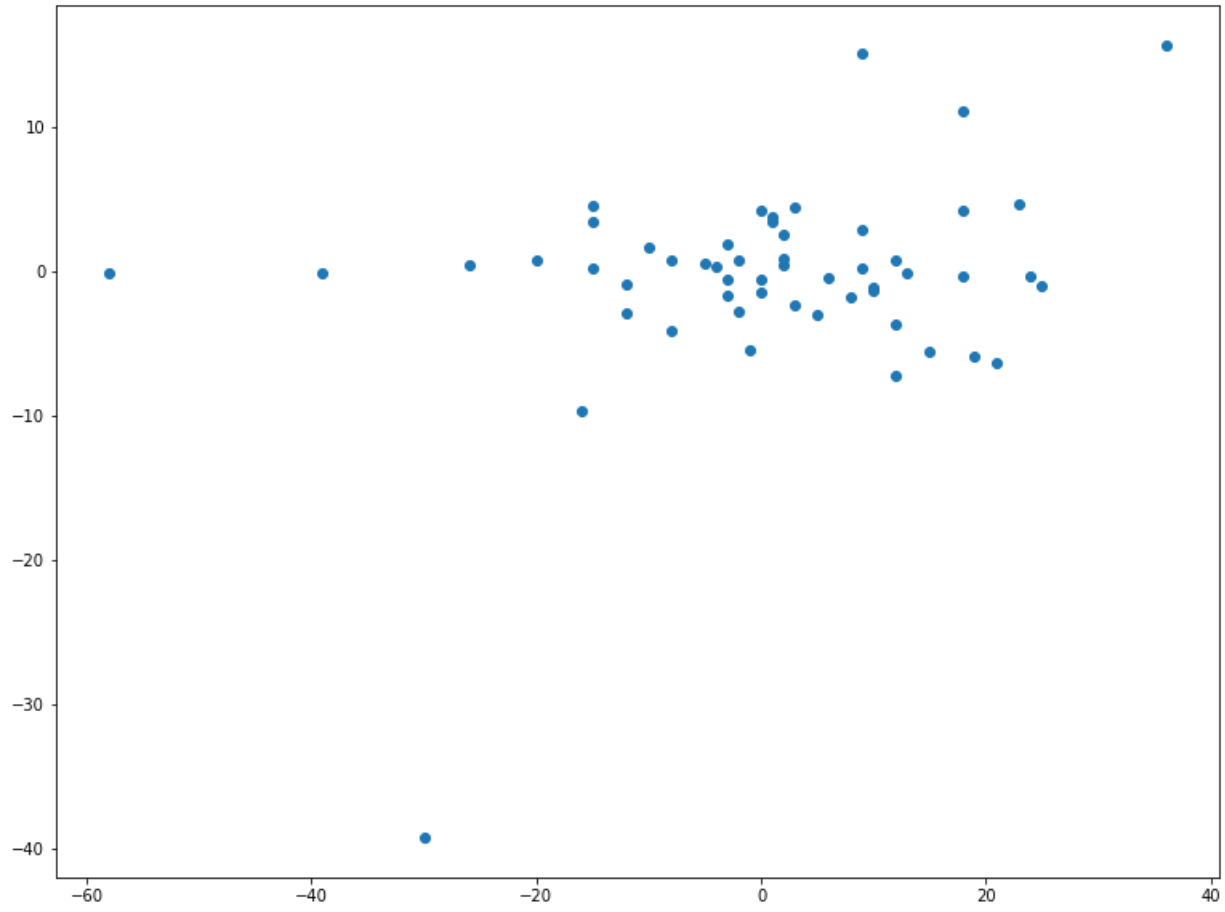
Out[33]:

	Date	Buy Bitcoin	Sell Bitcoin	GT_Delta	Daily Return in %
0	2020-02-01	30	34	-4.0	0.35
1	2020-02-02	27	27	0.0	-0.50
2	2020-02-03	34	28	6.0	-0.41
3	2020-02-04	40	30	10.0	-1.10
4	2020-02-05	39	36	3.0	4.54
5	2020-02-06	27	37	-10.0	1.67
6	2020-02-07	33	31	2.0	0.48
7	2020-02-08	31	33	-2.0	0.78
8	2020-02-09	42	40	2.0	2.59
9	2020-02-10	34	29	5.0	-2.93
10	2020-02-11	30	29	1.0	3.81
11	2020-02-12	33	53	-20.0	0.86
12	2020-02-13	36	48	-12.0	-0.80
13	2020-02-14	21	19	2.0	0.96
14	2020-02-15	39	47	-8.0	-4.12
15	2020-02-16	36	27	9.0	0.25
16	2020-02-17	27	24	3.0	-2.32
17	2020-02-18	35	12	23.0	4.71
18	2020-02-19	28	29	-1.0	-5.40
19	2020-02-20	24	82	-58.0	-0.07
20	2020-02-21	29	37	-8.0	0.85
21	2020-02-22	31	13	18.0	-0.30
22	2020-02-23	29	20	9.0	2.97
23	2020-02-24	35	47	-12.0	-2.82
24	2020-02-25	30	18	12.0	-3.57
25	2020-02-26	43	28	15.0	-5.55
26	2020-02-27	37	52	-15.0	0.21
27	2020-02-28	24	24	0.0	-1.37
28	2020-02-29	34	26	8.0	-1.77
29	2020-03-01	39	26	13.0	-0.04
30	2020-03-02	35	17	18.0	4.27
31	2020-03-03	31	34	-3.0	-1.61
32	2020-03-04	35	74	-39.0	-0.04
33	2020-03-05	30	29	1.0	3.45
34	2020-03-06	30	18	12.0	0.82
35	2020-03-07	31	33	-2.0	-2.70
36	2020-03-08	23	39	-16.0	-9.61
37	2020-03-09	33	23	10.0	-1.26
38	2020-03-10	42	45	-3.0	-0.53
39	2020-03-11	34	39	-5.0	0.56
40	2020-03-12	70	100	-30.0	-39.18
41	2020-03-13	100	64	36.0	15.71
42	2020-03-14	64	52	12.0	-7.19
43	2020-03-15	43	58	-15.0	3.54

	Date	Buy Bitcoin	Sell Bitcoin	GT_Delta	Daily Return in %
44	2020-03-16	60	39	21.0	6.27
45	2020-03-17	53	68	-15.0	4.59
46	2020-03-18	42	45	-3.0	1.91
47	2020-03-19	43	34	9.0	15.12
48	2020-03-20	58	84	-26.0	0.54
49	2020-03-21	49	25	24.0	-0.31
50	2020-03-22	44	25	19.0	-5.89
51	2020-03-23	44	26	18.0	11.11
52	2020-03-24	33	33	0.0	4.26
53	2020-03-25	42	17	25.0	-0.97
54	2020-03-26	39	6	NaN	0.69
55	2020-03-27	31	11	NaN	-5.23

In [35]:

```
plt.figure(figsize=(13,10))
plt.scatter(x='GT_Delta',y='Daily Return in %',data=GT_Delta)
plt.show()
```



In [12]:

```
gt = pd.read_excel(r'C:\Users\timod\Desktop\BTC_GoogleTrends.xlsx')
gt['Daily Return in %'] = ts['Daily Return in %'].abs()
gt
```

Out[12]:

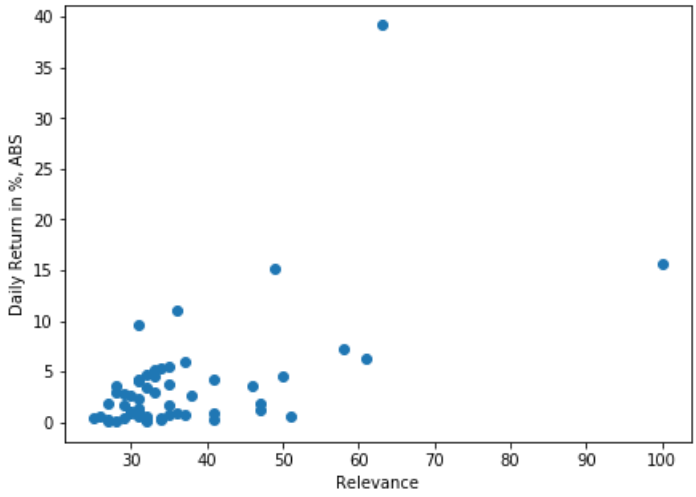
	Date	BTC	Daily Return in %
0	2020-02-01	25	0.35
1	2020-02-02	26	0.50
2	2020-02-03	29	0.41

	Date	BTC	Daily Return in %
3	2020-02-04	30	1.10
4	2020-02-05	33	4.54
5	2020-02-06	35	1.67
6	2020-02-07	34	0.48
7	2020-02-08	31	0.78
8	2020-02-09	38	2.59
9	2020-02-10	33	2.93
10	2020-02-11	35	3.81
11	2020-02-12	41	0.86
12	2020-02-13	37	0.80
13	2020-02-14	31	0.96
14	2020-02-15	31	4.12
15	2020-02-16	32	0.25
16	2020-02-17	31	2.32
17	2020-02-18	32	4.71
18	2020-02-19	34	5.40
19	2020-02-20	32	0.07
20	2020-02-21	30	0.85
21	2020-02-22	27	0.30
22	2020-02-23	28	2.97
23	2020-02-24	29	2.82
24	2020-02-25	28	3.57
25	2020-02-26	35	5.55
26	2020-02-27	34	0.21
27	2020-02-28	31	1.37
28	2020-02-29	27	1.77
29	2020-03-01	27	0.04
30	2020-03-02	31	4.27
31	2020-03-03	29	1.61
32	2020-03-04	28	0.04
33	2020-03-05	32	3.45
34	2020-03-06	31	0.82
35	2020-03-07	30	2.70
36	2020-03-08	31	9.61
37	2020-03-09	47	1.26
38	2020-03-10	32	0.53
39	2020-03-11	31	0.56
40	2020-03-12	63	39.18
41	2020-03-13	100	15.71
42	2020-03-14	58	7.19
43	2020-03-15	46	3.54
44	2020-03-16	61	6.27
45	2020-03-17	50	4.59
46	2020-03-18	47	1.91
47	2020-03-19	49	15.12
48	2020-03-20	51	0.54
49	2020-03-21	41	0.31
50	2020-03-22	37	5.89
51	2020-03-23	36	11.11
52	2020-03-24	41	4.26

	Date	BTC	Daily Return in %
53	2020-03-25	36	0.97
54	2020-03-26	35	0.69
55	2020-03-27	33	5.23

In [17]:

```
plt.figure(figsize=(7,5))
plt.scatter(x='BTC',y='Daily Return in %',data=gt)
plt.xlabel('Relevance')
plt.ylabel('Daily Return in %, ABS')
plt.show()
print(linregress(gt['BTC'],gt['Daily Return in %']))
```

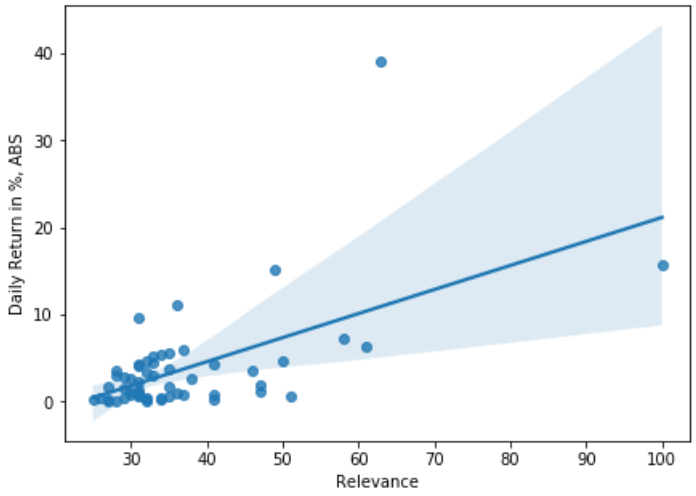



```
LinregressResult(slope=0.27618819832402236, intercept=-6.451396124301677,
rvalue=0.5696334493851202, pvalue=4.6070589298496154e-06, stderr=0.054228941906207306)
```

In [18]:

```
plt.figure(figsize=(7,5))
sns.regplot(x='BTC',y='Daily Return in %', data=gt)
plt.xlabel('Relevance')
plt.ylabel('Daily Return in %, ABS')
print(linregress(gt['BTC'],gt['Daily Return in %']))
```

```
LinregressResult(slope=0.27618819832402236, intercept=-6.451396124301677,
rvalue=0.5696334493851202, pvalue=4.6070589298496154e-06, stderr=0.054228941906207306)
```



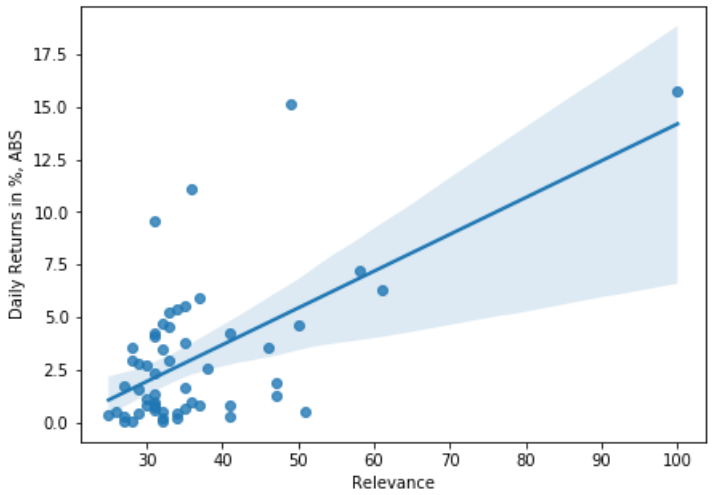
In [15]:

```
gt2 = pd.DataFrame(data=gt)
gt2 = gt2.drop(gt2.index[[40]])
```

In [16]:

```
plt.figure(figsize=(7,5))
sns.regplot(x='BTC',y='Daily Return in %', data=gt2)
plt.xlabel('Relevance')
plt.ylabel('Daily Returns in %, ABS')
print(linregress(gt2['BTC'],gt2['Daily Return in %']))
```

```
LinregressResult(slope=0.17483991399816126, intercept=-3.299574344406232,
rvalue=0.5976966975194093, pvalue=1.4498081917823032e-06, stderr=0.03221408206936435)
```



In [ ]:

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