In [56]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import warnings
```

In [57]:
```
project3 = pd.read_csv('results.csv')
```

In [58]:
```
project3.head()
```

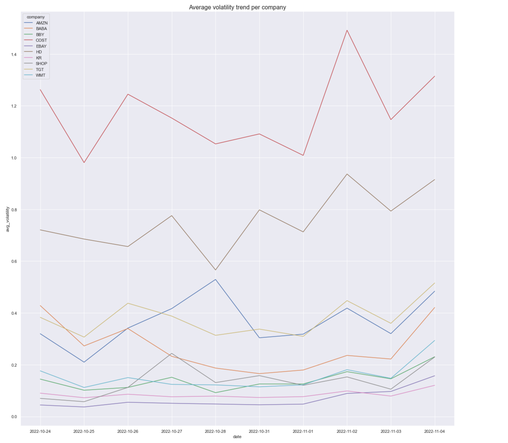
Out[58]:

	company	date	avg_volatility	max_volatility	min_volatility
0	AMZN	2022-10-24	0.319658	1.39	0.0
1	AMZN	2022-10-25	0.209692	1.16	0.0
2	AMZN	2022-10-26	0.341453	1.23	0.0
3	AMZN	2022-10-27	0.418774	2.00	0.0
4	AMZN	2022-10-28	0.529327	3.00	0.0

In [59]:
```
#Graphing the average volatility trend per company.
#The most volatile company company is COSTCO
```

In [60]:
```
warnings.filterwarnings("ignore")
sns.lineplot('date', 'avg_volatility', ci=None,
             hue='company', data=project3)
sns.set(rc={'figure.figsize':(20.7,20.27)})
plt.title('Average volatility trend per company', fontsize=16)
```

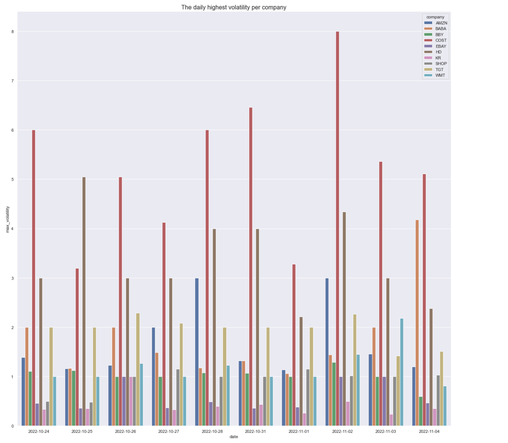
Out[60]:
```
Text(0.5, 1.0, 'Average volatility trend per company')
```



In [61]:
```
#Graphing the daily highest volatility per company
#Yes, once again, COSTCO is the most volatile company per day.
```

In [62]:
```
warnings.filterwarnings("ignore")
sns.barplot('date', 'max_volatility', ci=None,
            hue='company', data=project3)
sns.set(rc={'figure.figsize':(20.7,20.27)})
plt.title('The daily highest volatility per company', fontsize=16)
```

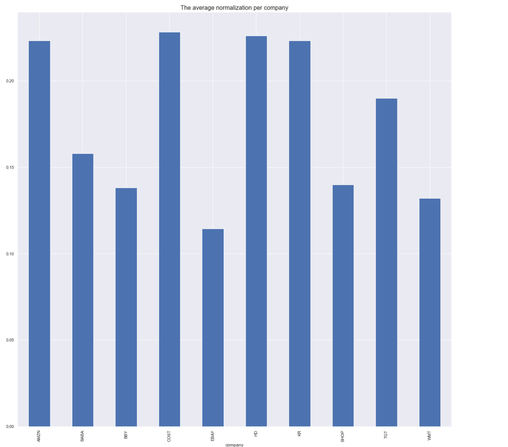
Out[62]:
```
Text(0.5, 1.0, 'The daily highest volatility per company')
```



In [63]:
```
#Graphing the normalized average volatility per company
#The most volatile company per normalized average is Kroger
```

In [64]:
```
project3["norm_avg"] = (project3["avg_volatility"] - project3["min_volatility"]) / (project3["max_volatility"] - project3["min_volatility"])
project3.groupby(["company"]).mean()["norm_avg"].plot(kind='bar')
plt.title('The average normalization per company', fontsize=16)
```

Out[64]:
```
Text(0.5, 1.0, 'The average normalization per company')
```



In [65]:
```
#Showing the numeric results
project3.groupby(["company"]).mean()["norm_avg"]
project3.sort_values('norm_avg', ascending=False)
```

Out[65]:

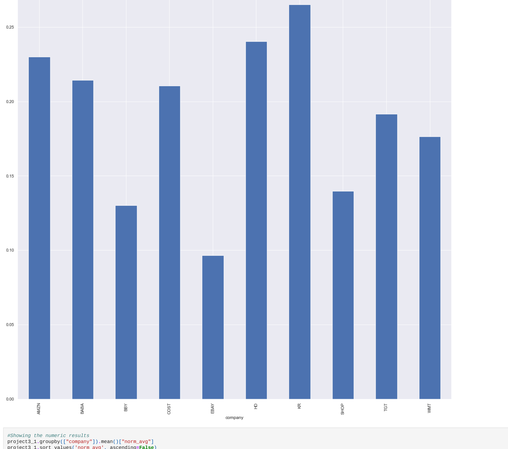
	company	date	avg_volatility	max_volatility	min_volatility	norm_avg
58	KR	2022-11-03	0.078846	0.24	0.0	0.328526
56	HD	2022-11-01	0.713034	2.21	0.0	0.322640
36	COST	2022-11-01	1.008494	3.28	0.0	0.307468
31	COST	2022-10-25	0.980602	3.20	0.0	0.306457
66	KR	2022-11-01	0.076709	0.26	0.0	0.295036
...	...	...	...	...	...	...
62	KR	2022-10-26	0.066004	1.00	0.0	0.066004
24	BBY	2022-10-28	0.092094	1.08	0.0	0.085272
19	BABA	2022-11-04	0.421026	4.18	0.1	0.079583
98	WMT	2022-11-03	0.147436	2.18	0.0	0.067631
42	EBAY	2022-10-26	0.054968	1.00	0.0	0.054968

100 rows × 6 columns

In [66]:
```
#Graphing the normalized average volatility on October 24th, 2022
#The most volatile company per normalized average on October 24,2022 is Kroger
```

In [67]:
```
project3_1 = project3.loc[project3["date"].str.contains("2022-10-24")]
project3_1.groupby(["company"]).mean()["norm_avg"].plot(kind='bar')
plt.title('The average normalization per company on October 24, 2022', fontsize=16)
```

Out[67]:
```
Text(0.5, 1.0, 'The average normalization per company on October 24, 2022')
```



In [68]:
```
#Showing the numeric results
project3_1.groupby(["company"]).mean()["norm_avg"]
project3_1.sort_values('norm_avg', ascending=False)
```

Out[68]:

	company	date	avg_volatility	max_volatility	min_volatility	norm_avg
60	KR	2022-10-24	0.090171	0.34	0.0	0.265209
56	HD	2022-10-24	0.720780	3.00	0.0	0.240260
0	AMZN	2022-10-24	0.319658	1.39	0.0	0.229970
19	BABA	2022-10-24	0.428526	2.00	0.0	0.214263
36	COST	2022-10-24	1.262447	6.00	0.0	0.210408
80	TGT	2022-10-24	0.382959	2.00	0.0	0.191480
98	WMT	2022-10-24	0.176335	1.00	0.0	0.176335
78	SHOP	2022-10-24	0.069925	0.50	0.0	0.139850
20	BBY	2022-10-24	0.144391	1.11	0.0	0.130002
40	EBAY	2022-10-24	0.044444	0.46	0.0	0.096618