In [34]:
```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
```

0.) Clean the Apple Data to get a quarterly series of EPS.

In [4]:
```
y = pd.read_csv("AAPL_quarterly_financials.csv")
```

In [5]:
```
y.index = y.name
```

In [6]:
```
y = pd.DataFrame(y.loc["BasicEPS", :]).iloc[2:,:]
```

In [7]:
```
y.index = pd.to_datetime(y.index)
```

In [8]:
```
# ASSUMPTION NULLS ARE 0s. NEED TO INVESTIGATE
y = y.fillna(0).sort_index()
```

3.) Come up with 6 search terms you think could nowcast earnings. (Different than the ones I used) Add in 3 terms that that you think will not Nowcast earnings. Pull in the gtrends data. Clean it to have a quarterly average.

In [9]:
```
from pytrends.request import TrendReq
import time
```

In [10]:
```
# Create pytrends object
pytrends = TrendReq(hl='en-US', tz=360)

# Set up the keywords and the timeframe
keywords = ["iPhone", "Apple Layoffs","MacBook","iPad",
             "Apple CEO","Apple Share Price","Recession","Chip Costs",
            "Taylor Swift Tickets","Is The Earth Flat", "Hospital"]
             # Add your keywords here
start_date = '2004-01-01'
end_date = '2024-01-01'

# Create an empty DataFrame to store the results
df = pd.DataFrame()

# Iterate through keywords and fetch data
for keyword in keywords:
    time.sleep(5)
    pytrends.build_payload([keyword], cat=0, timeframe=f'{start_date} {end_date}', geo='', gprop='')
    interest_over_time_df = pytrends.interest_over_time()
    df[keyword] = interest_over_time_df[keyword]
```

In [11]:
```
X = df.resample("Q").mean()
```

In [30]:
```
# FIX DATA
temp = pd.concat([y,X],axis = 1).dropna()
y = temp[["BasicEPS"]].copy()
x = temp.iloc[:,1:].copy()
```

2.) Normalize all the X data

In [26]:
```
from sklearn.preprocessing import StandardScaler
```

In [27]:
```
scaler = StandardScaler()
```

In [28]:
```
X_scaled = scaler.fit_transform(X)
```

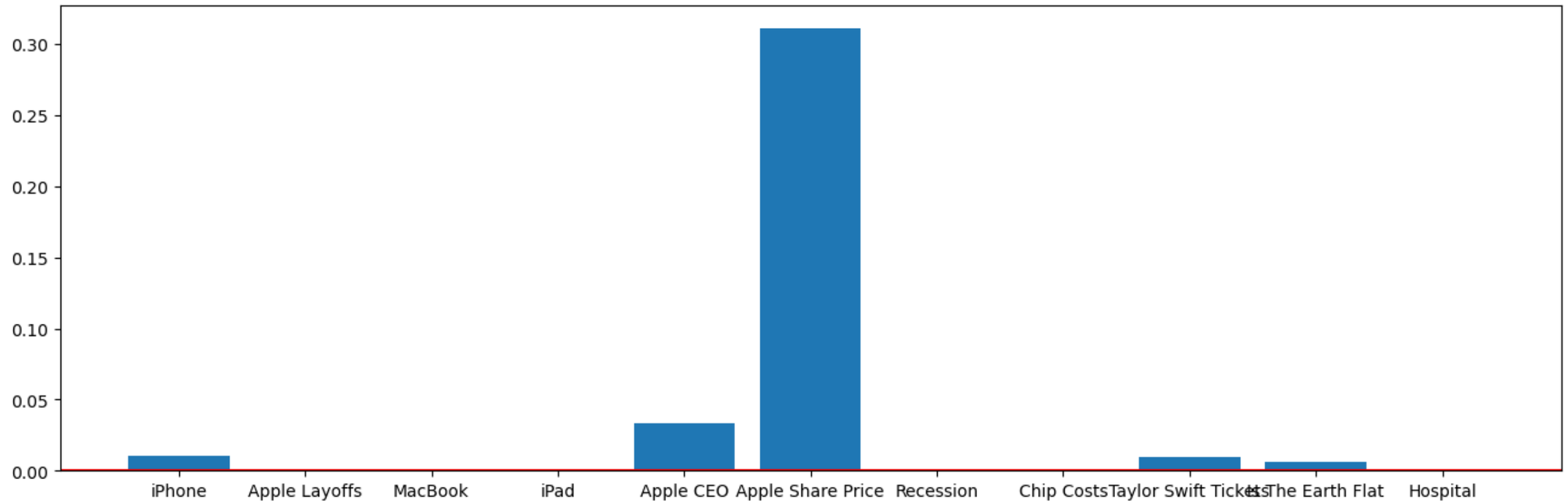
In [38]:
```
#Ensure same sample size
X_scaled = np.delete(X_scaled, [79, 80], axis=0)
```

4.) Run a Lasso with lambda that reduces less than half of your variables. Plot a bar chart.

In [54]:
```
from sklearn.linear_model import Lasso

lasso_model = Lasso(alpha=.1)
lasso_model.fit(X_scaled, y)
coefficients = lasso_model.coef_
```

In [55]:
```
plt.figure (figsize = (16,5))
plt.bar(range(len(coefficients)), coefficients, tick_label = X.columns)
plt.axhline(0, color = "red")
plt.show()
```



5.) Do these coefficient magnitudes make sense?

Based on the Lasso regression model, the "Apple Share Price" is identified as the primary predictor for Apple's EPS which has positive influence , overshadowing other variables which have minimal (Apple CEO) to no influence. The presence of seemingly unrelated features, such as "Taylor Swift Tickets" or "The Earth Flat," suggests potential overfitting or a need for more careful feature selection to ensure the model's relevance and accuracy.

6.) Run a for loop looking at 10 different Lambdas and plot the coefficient magnitude for each.

In [ ]:

In [ ]:

7.) Run a cross validation. What is your ideal lambda?

In [ ]:

In [ ]: