

Who are the financial profiteers of war?

University of Applied Sciences Lucerne

Master of Science in Applied Information and Data Science

Time Series in Finance (TSA01)

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```
## Warning in register(): Can't find generic `scale_type` in package ggplot2 to
## register S3 method.
```

Potential structure

- Context and Goal (Literature?)
- Methods
- Data
 - Import data (indices & Google words)
 - Describe data
 - Preprocessing
- VAR & Causality Testing
- Results & Discussion

1. Context and Goal

With recent outbreaks of war (e.g., in Israel or in the Ukraine), the question arises of how stock markets react to this and if there are sectors that profit from such crises. Specifically, the case study should examine if certain indices from specific economic sectors perform well in situations of crisis. To do this, the performance of several sector-specific indices in relation to an overall crisis measure should be compared and evaluated with the goal of examining if positive correlations between situations of crisis and stock market profits exist. Alternatively, the research question could be evaluated by comparing the development of sector-specific indices since the outbreak of the war in the Ukraine with the development of non-sector-specific indices (like SMI or S&P 500). If they perform better than overall indices this would indicate that they profit from war.

2. Methods

The precise methods to examine the hypothesis are not clear yet and will have to be decided once more methods are introduced in the lectures. However, correlation measurements as well as potential tests for causality will have to be included. If we use the alternative way to answer our research question we could probably use OLS (as described in class last week).

3. Data

Import Time Series Data

TODO: - Justify why Adjusted values and not close values - Timeframe: December 2021 until December 2022

```
# Ticker Data
ticker_data <- NULL
tickers_index <- c("XLK", "XLF", "XLV", "XLY", "XLE", "XLU")

for (Ticker in tickers_index){
  ticker_data <- cbind(ticker_data,
                      getSymbols.yahoo(Ticker, from="2021-12-01", to="2023-12-01",
                                       periodicity = "weekly", auto.assign=FALSE)[,6])
}
# Remove first row as it is still in November to match Gtrends data
ticker_data <- ticker_data[-1, ]
```

```
# Check length and min max date
length(ticker_data$XLK.Adjusted)
```

```
## [1] 104
```

```
summary(ticker_data)[c(1, 6)]
```

```
## [1] "Min.      :2021-12-06  " "Max.      :2023-11-27  "
```

```
ticker_data
```

```
##           XLK.Adjusted XLF.Adjusted XLV.Adjusted XLY.Adjusted XLE.Adjusted
## 2021-12-06      171.7439      37.54185      130.4269      201.5340      52.77941
## 2021-12-13      164.8694      37.09961      133.6638      191.9975      50.13306
## 2021-12-20      169.8387      37.32073      135.0012      199.7643      50.62176
## 2021-12-27      171.0750      37.72171      137.0669      201.2943      51.83763
## 2022-01-03      163.2626      39.76960      130.7044      196.4106      57.29226
## 2022-01-10      163.0954      39.44117      130.4320      193.4961      60.25307
## 2022-01-17      151.8491      36.90062      125.9568      177.6438      58.32901
## 2022-01-24      155.4601      37.40294      126.9394      175.3595      61.29917
## 2022-01-31      157.0344      38.73600      128.7100      181.5626      64.35338
## 2022-02-07      152.4001      38.74566      126.7156      177.7029      65.76374
## 2022-02-14      149.9895      37.88593      124.0500      177.2303      63.55948
## 2022-02-21      151.8688      37.77001      127.3966      173.4789      64.33470
## 2022-02-28      147.3428      35.96362      128.9240      168.9596      70.26567
## 2022-03-07      141.7442      35.16185      125.4412      164.1546      71.77877
## 2022-03-14      152.5772      37.67341      133.2727      179.0814      69.00476
## 2022-03-21      155.6766      38.17572      132.5723      180.5386      73.55339
## 2022-03-28      156.2008      37.06440      134.7424      182.6600      72.66338
## 2022-04-04      150.2371      36.74438      139.3877      176.9898      74.99247
## 2022-04-11      144.5493      35.77462      135.2987      175.9248      75.29420
## 2022-04-18      141.0401      35.07638      130.4485      173.3806      71.85245
## 2022-04-25      139.4037      33.46657      127.1499      160.6201      70.86237
## 2022-05-02      138.5659      33.68962      126.6522      155.9557      78.18905
## 2022-05-09      133.9230      32.51620      125.5007      150.2066      76.17115
## 2022-05-16      129.1915      31.92465      126.6522      138.4619      77.10465
## 2022-05-23      139.4432      34.49452      130.7900      151.6266      83.47897
## 2022-05-30      137.9941      33.81569      126.6913      150.8772      84.40307
## 2022-06-06      129.2210      31.54644      122.4656      142.4655      83.64870
## 2022-06-13      122.8433      29.99482      117.0006      134.2117      69.29707
## 2022-06-20      131.5474      31.36219      126.0862      144.9506      67.50547
## 2022-06-27      125.9199      31.08089      127.0889      138.3867      69.20650
## 2022-07-04      131.3160      31.27588      128.1277      144.6730      67.65225
## 2022-07-11      130.8317      30.98340      127.5985      143.1607      65.40194
## 2022-07-18      135.6151      31.92909      127.2359      152.9558      67.84296
## 2022-07-25      142.5333      32.86502      129.7545      160.9421      74.77504
## 2022-08-01      145.3005      32.84552      128.8235      162.4050      69.68325
## 2022-08-08      148.8485      34.66865      130.9502      167.9400      74.82272
## 2022-08-15      146.3778      34.08369      130.2641      165.5876      75.76671
## 2022-08-22      138.2440      32.87477      124.7466      157.8286      78.98960
## 2022-08-29      131.2962      32.06557      122.4926      153.6873      76.24347
```

## 2022-09-05	135.5954	33.49873	127.8925	162.5730	76.85371
## 2022-09-12	127.2047	32.23132	124.9034	156.1088	74.79412
## 2022-09-19	122.2928	30.27170	120.2778	144.7224	67.20410
## 2022-09-26	117.6806	29.75470	119.1632	141.0932	69.42125
## 2022-10-03	119.6522	30.27413	120.6490	139.3103	78.84835
## 2022-10-10	115.7190	30.39174	121.9084	133.9816	77.38319
## 2022-10-17	123.1892	31.54821	124.5059	141.0437	83.79324
## 2022-10-24	128.3807	33.50834	130.7243	143.5793	86.02953
## 2022-10-31	119.8702	33.23392	128.7073	136.1904	88.12122
## 2022-11-07	131.9077	35.15484	130.9900	143.7081	89.76952
## 2022-11-14	130.8675	34.66481	132.4069	139.6471	88.32364
## 2022-11-21	132.3635	35.39006	134.9454	141.2715	88.55499
## 2022-11-28	134.1072	35.21364	137.5331	144.5698	87.05127
## 2022-12-05	129.6984	33.84156	135.7621	138.1020	79.69659
## 2022-12-12	126.3001	33.02811	133.3514	132.6346	81.31597
## 2022-12-19	123.4468	33.27312	133.9123	128.1972	83.91855
## 2022-12-26	123.6423	33.72831	134.2169	128.2804	85.18214
## 2023-01-02	123.9304	34.89204	134.0391	131.1706	85.26978
## 2023-01-09	129.6535	35.62183	133.8217	138.7486	87.59726
## 2023-01-16	130.4980	34.86245	132.3002	138.0335	88.11341
## 2023-01-23	135.8237	35.75004	131.2628	146.8829	88.84379
## 2023-01-30	140.8612	36.08535	131.0949	150.3193	83.71163
## 2023-02-06	139.4801	35.98673	130.8973	147.1411	87.85046
## 2023-02-13	138.9237	35.88811	130.4033	149.5446	82.28008
## 2023-02-20	135.2176	35.16818	126.9651	142.8803	82.44564
## 2023-02-27	139.2416	35.49363	127.6172	145.3136	84.97763
## 2023-03-06	134.8996	32.47583	122.6575	137.2589	80.46873
## 2023-03-13	142.5403	30.55272	124.3470	140.3775	74.95677
## 2023-03-20	145.0243	30.56259	125.7697	140.6158	75.85271
## 2023-03-27	150.3732	31.86395	128.4026	148.9748	81.50535
## 2023-04-03	148.4413	31.70538	132.4294	144.3823	83.62096
## 2023-04-10	148.0231	32.58746	133.4709	146.3448	85.83498
## 2023-04-17	147.1369	32.92443	133.2031	146.8130	83.62096
## 2023-04-24	150.1939	32.87487	132.4393	147.3012	83.76855
## 2023-05-01	150.6022	32.04235	132.4989	146.6337	78.94693
## 2023-05-08	150.3134	31.61618	131.1103	147.2713	77.26427
## 2023-05-15	156.8159	32.30995	130.2375	150.9772	78.36636
## 2023-05-22	164.0851	31.82431	126.4884	151.3957	77.51027
## 2023-05-29	166.1961	32.50817	129.2556	156.4066	78.62221
## 2023-06-05	165.3099	32.85506	129.3548	160.5908	80.02934
## 2023-06-12	172.4596	33.28123	131.1301	165.7512	79.56685
## 2023-06-19	167.9388	32.44871	130.9219	164.8247	76.12283
## 2023-06-26	173.4894	33.55998	132.1878	169.5085	80.57540
## 2023-07-03	170.8451	33.44052	128.4730	169.0693	80.19819
## 2023-07-10	175.6149	34.09758	131.1620	174.6094	80.85336
## 2023-07-17	175.7546	35.10308	135.6835	170.6764	83.68248
## 2023-07-24	177.5607	35.04335	134.6378	172.4533	85.22112
## 2023-07-31	170.7952	34.75464	131.8591	171.2454	86.28329
## 2023-08-07	166.5443	34.76460	135.1158	169.4187	89.24146
## 2023-08-14	164.6084	33.82878	132.9845	162.3712	88.15944
## 2023-08-21	168.3504	33.83874	132.8650	164.3677	86.94837
## 2023-08-28	175.8244	34.53562	133.0244	169.3688	90.07530
## 2023-09-04	172.4217	34.14736	131.5205	168.4504	91.37571
## 2023-09-11	168.5400	34.67500	131.6500	171.4850	91.33600

##	2023-09-18	164.0596	33.51020	129.6183	160.6443	88.65578
##	2023-09-25	163.9300	33.17000	128.7400	160.9800	90.39000
##	2023-10-02	168.2200	33.04000	130.0100	160.6100	85.73000
##	2023-10-09	168.6300	33.21000	130.1900	158.9700	89.59000
##	2023-10-16	163.9400	32.20000	128.0600	151.6900	90.26000
##	2023-10-23	161.1200	31.45000	123.1400	149.5900	84.63000
##	2023-10-30	171.7600	33.78000	127.4100	160.2200	86.68000
##	2023-11-06	179.5200	33.91000	126.2700	161.4000	83.41000
##	2023-11-13	182.8000	35.01000	128.2500	167.1400	84.69000
##	2023-11-20	184.4100	35.38000	131.1300	168.2400	84.93000
##	2023-11-27	185.1600	35.90000	131.3100	168.7800	84.58000
##	XLU.Adjusted					
##	2021-12-06	65.07196				
##	2021-12-13	65.88124				
##	2021-12-20	65.60835				
##	2021-12-27	67.88811				
##	2022-01-03	66.77846				
##	2022-01-10	65.82055				
##	2022-01-17	65.28942				
##	2022-01-24	64.45481				
##	2022-01-31	64.94800				
##	2022-02-07	63.57278				
##	2022-02-14	62.80455				
##	2022-02-21	64.09442				
##	2022-02-28	67.23370				
##	2022-03-07	66.79743				
##	2022-03-14	67.15781				
##	2022-03-21	69.02621				
##	2022-03-28	72.08438				
##	2022-04-04	73.47832				
##	2022-04-11	72.64769				
##	2022-04-18	70.89094				
##	2022-04-25	68.03620				
##	2022-05-02	68.94322				
##	2022-05-09	68.19851				
##	2022-05-16	68.49448				
##	2022-05-23	71.96027				
##	2022-05-30	70.98640				
##	2022-06-06	68.11258				
##	2022-06-13	61.93529				
##	2022-06-20	65.88799				
##	2022-06-27	69.14847				
##	2022-07-04	67.19481				
##	2022-07-11	67.13706				
##	2022-07-18	66.81947				
##	2022-07-25	71.16951				
##	2022-08-01	71.43899				
##	2022-08-08	73.83536				
##	2022-08-15	74.77851				
##	2022-08-22	72.86333				
##	2022-08-29	71.79507				
##	2022-09-05	74.47054				
##	2022-09-12	71.66997				
##	2022-09-19	69.06186				

##	2022-09-26	63.47388
##	2022-10-03	61.77827
##	2022-10-10	60.21831
##	2022-10-17	61.34226
##	2022-10-24	65.31483
##	2022-10-31	65.00477
##	2022-11-07	65.96400
##	2022-11-14	66.71007
##	2022-11-21	68.73511
##	2022-11-28	68.82231
##	2022-12-05	68.62852
##	2022-12-12	68.28941
##	2022-12-19	68.70604
##	2022-12-26	68.86770
##	2023-01-02	69.35612
##	2023-01-09	69.67847
##	2023-01-16	67.62710
##	2023-01-23	67.29497
##	2023-01-30	66.33767
##	2023-02-06	66.14230
##	2023-02-13	66.89447
##	2023-02-20	65.06777
##	2023-02-27	64.71609
##	2023-03-06	62.92846
##	2023-03-13	65.41943
##	2023-03-20	64.16907
##	2023-03-27	66.61012
##	2023-04-03	68.69630
##	2023-04-10	67.79098
##	2023-04-17	68.50934
##	2023-04-24	67.87955
##	2023-05-01	67.92875
##	2023-05-08	67.92875
##	2023-05-15	65.05534
##	2023-05-22	63.55957
##	2023-05-29	64.08112
##	2023-06-05	65.33086
##	2023-06-12	66.22635
##	2023-06-19	63.99256
##	2023-06-26	64.91399
##	2023-07-03	64.86439
##	2023-07-10	66.31264
##	2023-07-17	67.90971
##	2023-07-24	66.50112
##	2023-07-31	63.47564
##	2023-08-07	64.05097
##	2023-08-14	62.97966
##	2023-08-21	63.11853
##	2023-08-28	62.13649
##	2023-09-04	62.67215
##	2023-09-11	64.41801
##	2023-09-18	62.78127
##	2023-09-25	58.93000
##	2023-10-02	57.25000

```
## 2023-10-09      59.30000
## 2023-10-16      58.03000
## 2023-10-23      58.73000
## 2023-10-30      61.86000
## 2023-11-06      60.32000
## 2023-11-13      62.29000
## 2023-11-20      62.69000
## 2023-11-27      62.76000
```

```
# Google Trends data
gtrends_war_web <- gtrends(
  keyword = "war",
  time = "2021-11-30 2023-12-01",
  gprop = "web"
)$interest_over_time
gtrends_war_web
```

```
# Too many requests exclude?
#gtrends_war_news <- gtrends(
  #keyword = "war",
  #time = "2021-12-01 2023-12-01",
  # gprop = "news"
#)$interest_over_time
```

Google Trends delivers data always from Sunday weekly. This has to be put to the weekly data from the financial tickers, which always starts at Monday.

```
# Increase date by one day to match ticker data
gtrends_war_web$date <- gtrends_war_web$date + days(1)
```

```
# Check length and min max date
length(gtrends_war_web$date)
min(gtrends_war_web$date)
max(gtrends_war_web$date)
```

```
# Visualization
ticker_data_df <- fortify.zoo(ticker_data)
colnames(ticker_data_df)[1] <- "Date"
ticker_data_df <- gather(ticker_data_df, key="Ticker", value="Value",
  c("XLK.Adjusted", "XLF.Adjusted", "XLV.Adjusted",
    "XLY.Adjusted", "XLE.Adjusted", "XLU.Adjusted"), -Date)

ticker_data_df
```

```
##           Date      Ticker      Value
## 1  2021-12-06  XLK.Adjusted  171.74385
## 2  2021-12-13  XLK.Adjusted  164.86938
## 3  2021-12-20  XLK.Adjusted  169.83865
## 4  2021-12-27  XLK.Adjusted  171.07500
## 5  2022-01-03  XLK.Adjusted  163.26265
## 6  2022-01-10  XLK.Adjusted  163.09538
## 7  2022-01-17  XLK.Adjusted  151.84911
## 8  2022-01-24  XLK.Adjusted  155.46011
```


## 9	2022-01-31	XLK.Adjusted	157.03441
## 10	2022-02-07	XLK.Adjusted	152.40010
## 11	2022-02-14	XLK.Adjusted	149.98949
## 12	2022-02-21	XLK.Adjusted	151.86879
## 13	2022-02-28	XLK.Adjusted	147.34276
## 14	2022-03-07	XLK.Adjusted	141.74420
## 15	2022-03-14	XLK.Adjusted	152.57724
## 16	2022-03-21	XLK.Adjusted	155.67657
## 17	2022-03-28	XLK.Adjusted	156.20081
## 18	2022-04-04	XLK.Adjusted	150.23706
## 19	2022-04-11	XLK.Adjusted	144.54935
## 20	2022-04-18	XLK.Adjusted	141.04008
## 21	2022-04-25	XLK.Adjusted	139.40375
## 22	2022-05-02	XLK.Adjusted	138.56587
## 23	2022-05-09	XLK.Adjusted	133.92300
## 24	2022-05-16	XLK.Adjusted	129.19147
## 25	2022-05-23	XLK.Adjusted	139.44318
## 26	2022-05-30	XLK.Adjusted	137.99414
## 27	2022-06-06	XLK.Adjusted	129.22104
## 28	2022-06-13	XLK.Adjusted	122.84327
## 29	2022-06-20	XLK.Adjusted	131.54738
## 30	2022-06-27	XLK.Adjusted	125.91987
## 31	2022-07-04	XLK.Adjusted	131.31601
## 32	2022-07-11	XLK.Adjusted	130.83173
## 33	2022-07-18	XLK.Adjusted	135.61514
## 34	2022-07-25	XLK.Adjusted	142.53326
## 35	2022-08-01	XLK.Adjusted	145.30052
## 36	2022-08-08	XLK.Adjusted	148.84853
## 37	2022-08-15	XLK.Adjusted	146.37778
## 38	2022-08-22	XLK.Adjusted	138.24402
## 39	2022-08-29	XLK.Adjusted	131.29625
## 40	2022-09-05	XLK.Adjusted	135.59535
## 41	2022-09-12	XLK.Adjusted	127.20467
## 42	2022-09-19	XLK.Adjusted	122.29279
## 43	2022-09-26	XLK.Adjusted	117.68063
## 44	2022-10-03	XLK.Adjusted	119.65221
## 45	2022-10-10	XLK.Adjusted	115.71896
## 46	2022-10-17	XLK.Adjusted	123.18918
## 47	2022-10-24	XLK.Adjusted	128.38069
## 48	2022-10-31	XLK.Adjusted	119.87019
## 49	2022-11-07	XLK.Adjusted	131.90773
## 50	2022-11-14	XLK.Adjusted	130.86746
## 51	2022-11-21	XLK.Adjusted	132.36346
## 52	2022-11-28	XLK.Adjusted	134.10718
## 53	2022-12-05	XLK.Adjusted	129.69838
## 54	2022-12-12	XLK.Adjusted	126.30012
## 55	2022-12-19	XLK.Adjusted	123.44678
## 56	2022-12-26	XLK.Adjusted	123.64227
## 57	2023-01-02	XLK.Adjusted	123.93041
## 58	2023-01-09	XLK.Adjusted	129.65347
## 59	2023-01-16	XLK.Adjusted	130.49802
## 60	2023-01-23	XLK.Adjusted	135.82367
## 61	2023-01-30	XLK.Adjusted	140.86118
## 62	2023-02-06	XLK.Adjusted	139.48009

## 63	2023-02-13	XLK.Adjusted	138.92368
## 64	2023-02-20	XLK.Adjusted	135.21759
## 65	2023-02-27	XLK.Adjusted	139.24161
## 66	2023-03-06	XLK.Adjusted	134.89964
## 67	2023-03-13	XLK.Adjusted	142.54033
## 68	2023-03-20	XLK.Adjusted	145.02431
## 69	2023-03-27	XLK.Adjusted	150.37315
## 70	2023-04-03	XLK.Adjusted	148.44135
## 71	2023-04-10	XLK.Adjusted	148.02310
## 72	2023-04-17	XLK.Adjusted	147.13686
## 73	2023-04-24	XLK.Adjusted	150.19392
## 74	2023-05-01	XLK.Adjusted	150.60220
## 75	2023-05-08	XLK.Adjusted	150.31340
## 76	2023-05-15	XLK.Adjusted	156.81587
## 77	2023-05-22	XLK.Adjusted	164.08508
## 78	2023-05-29	XLK.Adjusted	166.19614
## 79	2023-06-05	XLK.Adjusted	165.30989
## 80	2023-06-12	XLK.Adjusted	172.45963
## 81	2023-06-19	XLK.Adjusted	167.93877
## 82	2023-06-26	XLK.Adjusted	173.48943
## 83	2023-07-03	XLK.Adjusted	170.84508
## 84	2023-07-10	XLK.Adjusted	175.61488
## 85	2023-07-17	XLK.Adjusted	175.75459
## 86	2023-07-24	XLK.Adjusted	177.56073
## 87	2023-07-31	XLK.Adjusted	170.79518
## 88	2023-08-07	XLK.Adjusted	166.54425
## 89	2023-08-14	XLK.Adjusted	164.60840
## 90	2023-08-21	XLK.Adjusted	168.35040
## 91	2023-08-28	XLK.Adjusted	175.82443
## 92	2023-09-04	XLK.Adjusted	172.42169
## 93	2023-09-11	XLK.Adjusted	168.53999
## 94	2023-09-18	XLK.Adjusted	164.05957
## 95	2023-09-25	XLK.Adjusted	163.92999
## 96	2023-10-02	XLK.Adjusted	168.22000
## 97	2023-10-09	XLK.Adjusted	168.63000
## 98	2023-10-16	XLK.Adjusted	163.94000
## 99	2023-10-23	XLK.Adjusted	161.12000
## 100	2023-10-30	XLK.Adjusted	171.75999
## 101	2023-11-06	XLK.Adjusted	179.52000
## 102	2023-11-13	XLK.Adjusted	182.80000
## 103	2023-11-20	XLK.Adjusted	184.41000
## 104	2023-11-27	XLK.Adjusted	185.16000
## 105	2021-12-06	XLF.Adjusted	37.54185
## 106	2021-12-13	XLF.Adjusted	37.09961
## 107	2021-12-20	XLF.Adjusted	37.32073
## 108	2021-12-27	XLF.Adjusted	37.72171
## 109	2022-01-03	XLF.Adjusted	39.76960
## 110	2022-01-10	XLF.Adjusted	39.44117
## 111	2022-01-17	XLF.Adjusted	36.90062
## 112	2022-01-24	XLF.Adjusted	37.40294
## 113	2022-01-31	XLF.Adjusted	38.73600
## 114	2022-02-07	XLF.Adjusted	38.74566
## 115	2022-02-14	XLF.Adjusted	37.88593
## 116	2022-02-21	XLF.Adjusted	37.77001

##	117	2022-02-28	XLF.Adjusted	35.96362
##	118	2022-03-07	XLF.Adjusted	35.16185
##	119	2022-03-14	XLF.Adjusted	37.67341
##	120	2022-03-21	XLF.Adjusted	38.17572
##	121	2022-03-28	XLF.Adjusted	37.06440
##	122	2022-04-04	XLF.Adjusted	36.74438
##	123	2022-04-11	XLF.Adjusted	35.77462
##	124	2022-04-18	XLF.Adjusted	35.07638
##	125	2022-04-25	XLF.Adjusted	33.46657
##	126	2022-05-02	XLF.Adjusted	33.68962
##	127	2022-05-09	XLF.Adjusted	32.51620
##	128	2022-05-16	XLF.Adjusted	31.92465
##	129	2022-05-23	XLF.Adjusted	34.49452
##	130	2022-05-30	XLF.Adjusted	33.81569
##	131	2022-06-06	XLF.Adjusted	31.54644
##	132	2022-06-13	XLF.Adjusted	29.99482
##	133	2022-06-20	XLF.Adjusted	31.36219
##	134	2022-06-27	XLF.Adjusted	31.08089
##	135	2022-07-04	XLF.Adjusted	31.27588
##	136	2022-07-11	XLF.Adjusted	30.98340
##	137	2022-07-18	XLF.Adjusted	31.92909
##	138	2022-07-25	XLF.Adjusted	32.86502
##	139	2022-08-01	XLF.Adjusted	32.84552
##	140	2022-08-08	XLF.Adjusted	34.66865
##	141	2022-08-15	XLF.Adjusted	34.08369
##	142	2022-08-22	XLF.Adjusted	32.87477
##	143	2022-08-29	XLF.Adjusted	32.06557
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##	147	2022-09-26	XLF.Adjusted	29.75470
##	148	2022-10-03	XLF.Adjusted	30.27413
##	149	2022-10-10	XLF.Adjusted	30.39174
##	150	2022-10-17	XLF.Adjusted	31.54821
##	151	2022-10-24	XLF.Adjusted	33.50834
##	152	2022-10-31	XLF.Adjusted	33.23392
##	153	2022-11-07	XLF.Adjusted	35.15484
##	154	2022-11-14	XLF.Adjusted	34.66481
##	155	2022-11-21	XLF.Adjusted	35.39006
##	156	2022-11-28	XLF.Adjusted	35.21364
##	157	2022-12-05	XLF.Adjusted	33.84156
##	158	2022-12-12	XLF.Adjusted	33.02811
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##	162	2023-01-09	XLF.Adjusted	35.62183
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##	164	2023-01-23	XLF.Adjusted	35.75004
##	165	2023-01-30	XLF.Adjusted	36.08535
##	166	2023-02-06	XLF.Adjusted	35.98673
##	167	2023-02-13	XLF.Adjusted	35.88811
##	168	2023-02-20	XLF.Adjusted	35.16818
##	169	2023-02-27	XLF.Adjusted	35.49363
##	170	2023-03-06	XLF.Adjusted	32.47583

##	171	2023-03-13	XLF.Adjusted	30.55272
##	172	2023-03-20	XLF.Adjusted	30.56259
##	173	2023-03-27	XLF.Adjusted	31.86395
##	174	2023-04-03	XLF.Adjusted	31.70538
##	175	2023-04-10	XLF.Adjusted	32.58746
##	176	2023-04-17	XLF.Adjusted	32.92443
##	177	2023-04-24	XLF.Adjusted	32.87487
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##	179	2023-05-08	XLF.Adjusted	31.61618
##	180	2023-05-15	XLF.Adjusted	32.30995
##	181	2023-05-22	XLF.Adjusted	31.82431
##	182	2023-05-29	XLF.Adjusted	32.50817
##	183	2023-06-05	XLF.Adjusted	32.85506
##	184	2023-06-12	XLF.Adjusted	33.28123
##	185	2023-06-19	XLF.Adjusted	32.44871
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##	188	2023-07-10	XLF.Adjusted	34.09758
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##	201	2023-10-09	XLF.Adjusted	33.21000
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##	204	2023-10-30	XLF.Adjusted	33.78000
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##	207	2023-11-20	XLF.Adjusted	35.38000
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##	209	2021-12-06	XLV.Adjusted	130.42688
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##	213	2022-01-03	XLV.Adjusted	130.70439
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##	216	2022-01-24	XLV.Adjusted	126.93938
##	217	2022-01-31	XLV.Adjusted	128.70998
##	218	2022-02-07	XLV.Adjusted	126.71561
##	219	2022-02-14	XLV.Adjusted	124.04996
##	220	2022-02-21	XLV.Adjusted	127.39661
##	221	2022-02-28	XLV.Adjusted	128.92401
##	222	2022-03-07	XLV.Adjusted	125.44117
##	223	2022-03-14	XLV.Adjusted	133.27272
##	224	2022-03-21	XLV.Adjusted	132.57225

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## 225 2022-03-28 XLV.Adjusted 134.74243
## 226 2022-04-04 XLV.Adjusted 139.38770
## 227 2022-04-11 XLV.Adjusted 135.29868
## 228 2022-04-18 XLV.Adjusted 130.44847
## 229 2022-04-25 XLV.Adjusted 127.14991
## 230 2022-05-02 XLV.Adjusted 126.65221
## 231 2022-05-09 XLV.Adjusted 125.50066
## 232 2022-05-16 XLV.Adjusted 126.65221
## 233 2022-05-23 XLV.Adjusted 130.79004
## 234 2022-05-30 XLV.Adjusted 126.69126
## 235 2022-06-06 XLV.Adjusted 122.46560
## 236 2022-06-13 XLV.Adjusted 117.00056
## 237 2022-06-20 XLV.Adjusted 126.08618
## 238 2022-06-27 XLV.Adjusted 127.08889
## 239 2022-07-04 XLV.Adjusted 128.12770
## 240 2022-07-11 XLV.Adjusted 127.59850
## 241 2022-07-18 XLV.Adjusted 127.23589
## 242 2022-07-25 XLV.Adjusted 129.75453
## 243 2022-08-01 XLV.Adjusted 128.82350
## 244 2022-08-08 XLV.Adjusted 130.95016
## 245 2022-08-15 XLV.Adjusted 130.26414
## 246 2022-08-22 XLV.Adjusted 124.74664
## 247 2022-08-29 XLV.Adjusted 122.49259
## 248 2022-09-05 XLV.Adjusted 127.89251
## 249 2022-09-12 XLV.Adjusted 124.90344
## 250 2022-09-19 XLV.Adjusted 120.27776
## 251 2022-09-26 XLV.Adjusted 119.16322
## 252 2022-10-03 XLV.Adjusted 120.64896
## 253 2022-10-10 XLV.Adjusted 121.90838
## 254 2022-10-17 XLV.Adjusted 124.50594
## 255 2022-10-24 XLV.Adjusted 130.72433
## 256 2022-10-31 XLV.Adjusted 128.70731
## 257 2022-11-07 XLV.Adjusted 130.99001
## 258 2022-11-14 XLV.Adjusted 132.40688
## 259 2022-11-21 XLV.Adjusted 134.94539
## 260 2022-11-28 XLV.Adjusted 137.53311
## 261 2022-12-05 XLV.Adjusted 135.76205
## 262 2022-12-12 XLV.Adjusted 133.35144
## 263 2022-12-19 XLV.Adjusted 133.91228
## 264 2022-12-26 XLV.Adjusted 134.21692
## 265 2023-01-02 XLV.Adjusted 134.03906
## 266 2023-01-09 XLV.Adjusted 133.82172
## 267 2023-01-16 XLV.Adjusted 132.30023
## 268 2023-01-23 XLV.Adjusted 131.26285
## 269 2023-01-30 XLV.Adjusted 131.09489
## 270 2023-02-06 XLV.Adjusted 130.89729
## 271 2023-02-13 XLV.Adjusted 130.40331
## 272 2023-02-20 XLV.Adjusted 126.96513
## 273 2023-02-27 XLV.Adjusted 127.61720
## 274 2023-03-06 XLV.Adjusted 122.65755
## 275 2023-03-13 XLV.Adjusted 124.34699
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## 278 2023-04-03 XLV.Adjusted 132.42944

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279 2023-04-10 XLV.Adjusted 133.47087
 ## 280 2023-04-17 XLV.Adjusted 133.20306
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 ## 282 2023-05-01 XLV.Adjusted 132.49886
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 ## 292 2023-07-10 XLV.Adjusted 131.16200
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 ## 296 2023-08-07 XLV.Adjusted 135.11578
 ## 297 2023-08-14 XLV.Adjusted 132.98453
 ## 298 2023-08-21 XLV.Adjusted 132.86502
 ## 299 2023-08-28 XLV.Adjusted 133.02437
 ## 300 2023-09-04 XLV.Adjusted 131.52054
 ## 301 2023-09-11 XLV.Adjusted 131.65001
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 ## 303 2023-09-25 XLV.Adjusted 128.74001
 ## 304 2023-10-02 XLV.Adjusted 130.00999
 ## 305 2023-10-09 XLV.Adjusted 130.19000
 ## 306 2023-10-16 XLV.Adjusted 128.06000
 ## 307 2023-10-23 XLV.Adjusted 123.14000
 ## 308 2023-10-30 XLV.Adjusted 127.41000
 ## 309 2023-11-06 XLV.Adjusted 126.27000
 ## 310 2023-11-13 XLV.Adjusted 128.25000
 ## 311 2023-11-20 XLV.Adjusted 131.13000
 ## 312 2023-11-27 XLV.Adjusted 131.31000
 ## 313 2021-12-06 XLY.Adjusted 201.53400
 ## 314 2021-12-13 XLY.Adjusted 191.99753
 ## 315 2021-12-20 XLY.Adjusted 199.76434
 ## 316 2021-12-27 XLY.Adjusted 201.29425
 ## 317 2022-01-03 XLY.Adjusted 196.41057
 ## 318 2022-01-10 XLY.Adjusted 193.49611
 ## 319 2022-01-17 XLY.Adjusted 177.64384
 ## 320 2022-01-24 XLY.Adjusted 175.35954
 ## 321 2022-01-31 XLY.Adjusted 181.56258
 ## 322 2022-02-07 XLY.Adjusted 177.70291
 ## 323 2022-02-14 XLY.Adjusted 177.23030
 ## 324 2022-02-21 XLY.Adjusted 173.47891
 ## 325 2022-02-28 XLY.Adjusted 168.95956
 ## 326 2022-03-07 XLY.Adjusted 164.15463
 ## 327 2022-03-14 XLY.Adjusted 179.08138
 ## 328 2022-03-21 XLY.Adjusted 180.53860
 ## 329 2022-03-28 XLY.Adjusted 182.66000
 ## 330 2022-04-04 XLY.Adjusted 176.98981
 ## 331 2022-04-11 XLY.Adjusted 175.92477
 ## 332 2022-04-18 XLY.Adjusted 173.38060

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## 333 2022-04-25 XLY.Adjusted 160.62015
## 334 2022-05-02 XLY.Adjusted 155.95573
## 335 2022-05-09 XLY.Adjusted 150.20663
## 336 2022-05-16 XLY.Adjusted 138.46188
## 337 2022-05-23 XLY.Adjusted 151.62665
## 338 2022-05-30 XLY.Adjusted 150.87721
## 339 2022-06-06 XLY.Adjusted 142.46553
## 340 2022-06-13 XLY.Adjusted 134.21169
## 341 2022-06-20 XLY.Adjusted 144.95059
## 342 2022-06-27 XLY.Adjusted 138.38670
## 343 2022-07-04 XLY.Adjusted 144.67296
## 344 2022-07-11 XLY.Adjusted 143.16069
## 345 2022-07-18 XLY.Adjusted 152.95581
## 346 2022-07-25 XLY.Adjusted 160.94214
## 347 2022-08-01 XLY.Adjusted 162.40498
## 348 2022-08-08 XLY.Adjusted 167.94005
## 349 2022-08-15 XLY.Adjusted 165.58763
## 350 2022-08-22 XLY.Adjusted 157.82864
## 351 2022-08-29 XLY.Adjusted 153.68726
## 352 2022-09-05 XLY.Adjusted 162.57298
## 353 2022-09-12 XLY.Adjusted 156.10883
## 354 2022-09-19 XLY.Adjusted 144.72240
## 355 2022-09-26 XLY.Adjusted 141.09322
## 356 2022-10-03 XLY.Adjusted 139.31033
## 357 2022-10-10 XLY.Adjusted 133.98160
## 358 2022-10-17 XLY.Adjusted 141.04367
## 359 2022-10-24 XLY.Adjusted 143.57930
## 360 2022-10-31 XLY.Adjusted 136.19037
## 361 2022-11-07 XLY.Adjusted 143.70805
## 362 2022-11-14 XLY.Adjusted 139.64714
## 363 2022-11-21 XLY.Adjusted 141.27151
## 364 2022-11-28 XLY.Adjusted 144.56979
## 365 2022-12-05 XLY.Adjusted 138.10197
## 366 2022-12-12 XLY.Adjusted 132.63455
## 367 2022-12-19 XLY.Adjusted 128.19720
## 368 2022-12-26 XLY.Adjusted 128.28041
## 369 2023-01-02 XLY.Adjusted 131.17061
## 370 2023-01-09 XLY.Adjusted 138.74864
## 371 2023-01-16 XLY.Adjusted 138.03352
## 372 2023-01-23 XLY.Adjusted 146.88286
## 373 2023-01-30 XLY.Adjusted 150.31929
## 374 2023-02-06 XLY.Adjusted 147.14107
## 375 2023-02-13 XLY.Adjusted 149.54463
## 376 2023-02-20 XLY.Adjusted 142.88029
## 377 2023-02-27 XLY.Adjusted 145.31361
## 378 2023-03-06 XLY.Adjusted 137.25885
## 379 2023-03-13 XLY.Adjusted 140.37746
## 380 2023-03-20 XLY.Adjusted 140.61584
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## 385 2023-04-24 XLY.Adjusted 147.30119
## 386 2023-05-01 XLY.Adjusted 146.63373

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## 387 2023-05-08 XLY.Adjusted 147.27130
## 388 2023-05-15 XLY.Adjusted 150.97725
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## 396 2023-07-10 XLY.Adjusted 174.60944
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## 401 2023-08-14 XLY.Adjusted 162.37122
## 402 2023-08-21 XLY.Adjusted 164.36766
## 403 2023-08-28 XLY.Adjusted 169.36876
## 404 2023-09-04 XLY.Adjusted 168.45039
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## 407 2023-09-25 XLY.Adjusted 160.98000
## 408 2023-10-02 XLY.Adjusted 160.61000
## 409 2023-10-09 XLY.Adjusted 158.97000
## 410 2023-10-16 XLY.Adjusted 151.69000
## 411 2023-10-23 XLY.Adjusted 149.59000
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## 413 2023-11-06 XLY.Adjusted 161.39999
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## 417 2021-12-06 XLE.Adjusted 52.77941
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## 419 2021-12-20 XLE.Adjusted 50.62176
## 420 2021-12-27 XLE.Adjusted 51.83763
## 421 2022-01-03 XLE.Adjusted 57.29226
## 422 2022-01-10 XLE.Adjusted 60.25307
## 423 2022-01-17 XLE.Adjusted 58.32901
## 424 2022-01-24 XLE.Adjusted 61.29917
## 425 2022-01-31 XLE.Adjusted 64.35338
## 426 2022-02-07 XLE.Adjusted 65.76374
## 427 2022-02-14 XLE.Adjusted 63.55948
## 428 2022-02-21 XLE.Adjusted 64.33470
## 429 2022-02-28 XLE.Adjusted 70.26567
## 430 2022-03-07 XLE.Adjusted 71.77877
## 431 2022-03-14 XLE.Adjusted 69.00476
## 432 2022-03-21 XLE.Adjusted 73.55339
## 433 2022-03-28 XLE.Adjusted 72.66338
## 434 2022-04-04 XLE.Adjusted 74.99247
## 435 2022-04-11 XLE.Adjusted 75.29420
## 436 2022-04-18 XLE.Adjusted 71.85245
## 437 2022-04-25 XLE.Adjusted 70.86237
## 438 2022-05-02 XLE.Adjusted 78.18905
## 439 2022-05-09 XLE.Adjusted 76.17115
## 440 2022-05-16 XLE.Adjusted 77.10465

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##	441	2022-05-23	XLE.Adjusted	83.47897
##	442	2022-05-30	XLE.Adjusted	84.40307
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##	457	2022-09-12	XLE.Adjusted	74.79412
##	458	2022-09-19	XLE.Adjusted	67.20410
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##	460	2022-10-03	XLE.Adjusted	78.84835
##	461	2022-10-10	XLE.Adjusted	77.38319
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##	467	2022-11-21	XLE.Adjusted	88.55499
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##	469	2022-12-05	XLE.Adjusted	79.69659
##	470	2022-12-12	XLE.Adjusted	81.31597
##	471	2022-12-19	XLE.Adjusted	83.91855
##	472	2022-12-26	XLE.Adjusted	85.18214
##	473	2023-01-02	XLE.Adjusted	85.26978
##	474	2023-01-09	XLE.Adjusted	87.59726
##	475	2023-01-16	XLE.Adjusted	88.11341
##	476	2023-01-23	XLE.Adjusted	88.84379
##	477	2023-01-30	XLE.Adjusted	83.71163
##	478	2023-02-06	XLE.Adjusted	87.85046
##	479	2023-02-13	XLE.Adjusted	82.28008
##	480	2023-02-20	XLE.Adjusted	82.44564
##	481	2023-02-27	XLE.Adjusted	84.97763
##	482	2023-03-06	XLE.Adjusted	80.46873
##	483	2023-03-13	XLE.Adjusted	74.95677
##	484	2023-03-20	XLE.Adjusted	75.85271
##	485	2023-03-27	XLE.Adjusted	81.50535
##	486	2023-04-03	XLE.Adjusted	83.62096
##	487	2023-04-10	XLE.Adjusted	85.83498
##	488	2023-04-17	XLE.Adjusted	83.62096
##	489	2023-04-24	XLE.Adjusted	83.76855
##	490	2023-05-01	XLE.Adjusted	78.94693
##	491	2023-05-08	XLE.Adjusted	77.26427
##	492	2023-05-15	XLE.Adjusted	78.36636
##	493	2023-05-22	XLE.Adjusted	77.51027
##	494	2023-05-29	XLE.Adjusted	78.62221

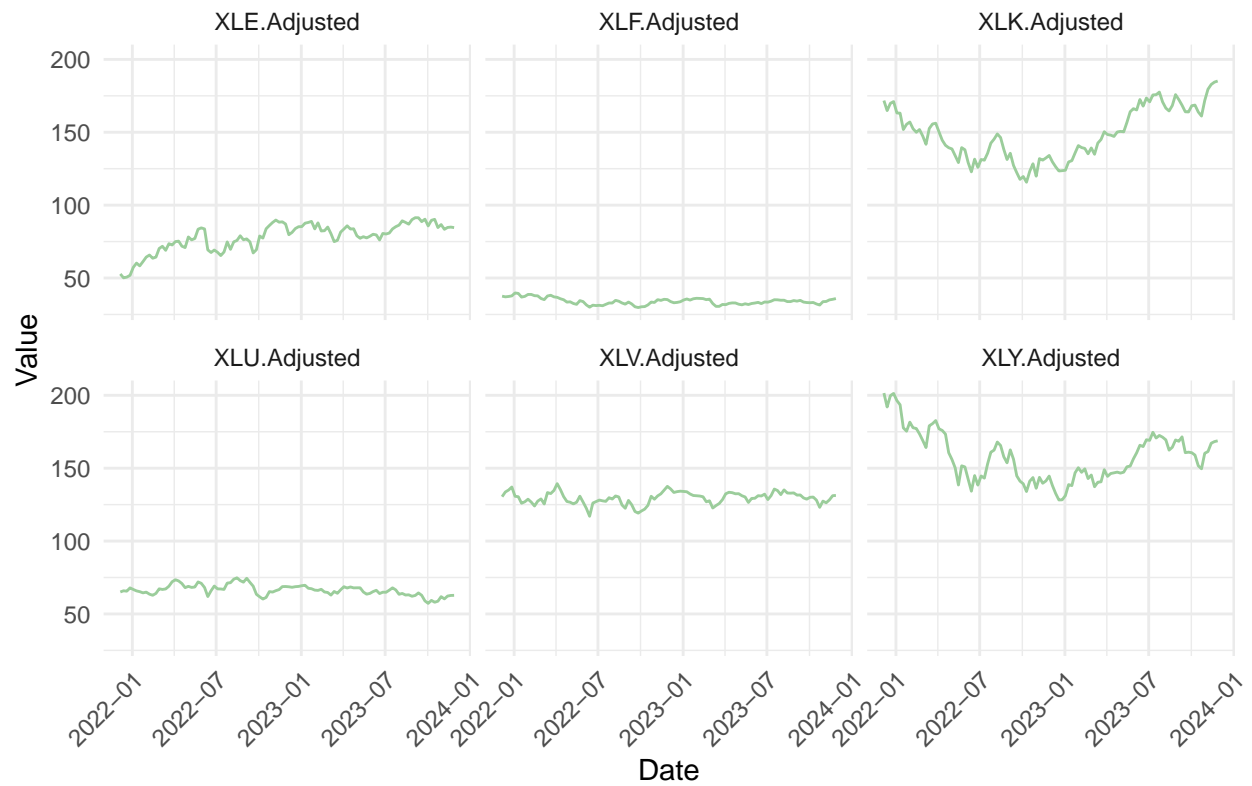
##	495	2023-06-05	XLE.Adjusted	80.02934
##	496	2023-06-12	XLE.Adjusted	79.56685
##	497	2023-06-19	XLE.Adjusted	76.12283
##	498	2023-06-26	XLE.Adjusted	80.57540
##	499	2023-07-03	XLE.Adjusted	80.19819
##	500	2023-07-10	XLE.Adjusted	80.85336
##	501	2023-07-17	XLE.Adjusted	83.68248
##	502	2023-07-24	XLE.Adjusted	85.22112
##	503	2023-07-31	XLE.Adjusted	86.28329
##	504	2023-08-07	XLE.Adjusted	89.24146
##	505	2023-08-14	XLE.Adjusted	88.15944
##	506	2023-08-21	XLE.Adjusted	86.94837
##	507	2023-08-28	XLE.Adjusted	90.07530
##	508	2023-09-04	XLE.Adjusted	91.37571
##	509	2023-09-11	XLE.Adjusted	91.33600
##	510	2023-09-18	XLE.Adjusted	88.65578
##	511	2023-09-25	XLE.Adjusted	90.39000
##	512	2023-10-02	XLE.Adjusted	85.73000
##	513	2023-10-09	XLE.Adjusted	89.59000
##	514	2023-10-16	XLE.Adjusted	90.26000
##	515	2023-10-23	XLE.Adjusted	84.63000
##	516	2023-10-30	XLE.Adjusted	86.68000
##	517	2023-11-06	XLE.Adjusted	83.41000
##	518	2023-11-13	XLE.Adjusted	84.69000
##	519	2023-11-20	XLE.Adjusted	84.93000
##	520	2023-11-27	XLE.Adjusted	84.58000
##	521	2021-12-06	XLU.Adjusted	65.07196
##	522	2021-12-13	XLU.Adjusted	65.88124
##	523	2021-12-20	XLU.Adjusted	65.60835
##	524	2021-12-27	XLU.Adjusted	67.88811
##	525	2022-01-03	XLU.Adjusted	66.77846
##	526	2022-01-10	XLU.Adjusted	65.82055
##	527	2022-01-17	XLU.Adjusted	65.28942
##	528	2022-01-24	XLU.Adjusted	64.45481
##	529	2022-01-31	XLU.Adjusted	64.94800
##	530	2022-02-07	XLU.Adjusted	63.57278
##	531	2022-02-14	XLU.Adjusted	62.80455
##	532	2022-02-21	XLU.Adjusted	64.09442
##	533	2022-02-28	XLU.Adjusted	67.23370
##	534	2022-03-07	XLU.Adjusted	66.79743
##	535	2022-03-14	XLU.Adjusted	67.15781
##	536	2022-03-21	XLU.Adjusted	69.02621
##	537	2022-03-28	XLU.Adjusted	72.08438
##	538	2022-04-04	XLU.Adjusted	73.47832
##	539	2022-04-11	XLU.Adjusted	72.64769
##	540	2022-04-18	XLU.Adjusted	70.89094
##	541	2022-04-25	XLU.Adjusted	68.03620
##	542	2022-05-02	XLU.Adjusted	68.94322
##	543	2022-05-09	XLU.Adjusted	68.19851
##	544	2022-05-16	XLU.Adjusted	68.49448
##	545	2022-05-23	XLU.Adjusted	71.96027
##	546	2022-05-30	XLU.Adjusted	70.98640
##	547	2022-06-06	XLU.Adjusted	68.11258
##	548	2022-06-13	XLU.Adjusted	61.93529

##	549	2022-06-20	XLU.Adjusted	65.88799
##	550	2022-06-27	XLU.Adjusted	69.14847
##	551	2022-07-04	XLU.Adjusted	67.19481
##	552	2022-07-11	XLU.Adjusted	67.13706
##	553	2022-07-18	XLU.Adjusted	66.81947
##	554	2022-07-25	XLU.Adjusted	71.16951
##	555	2022-08-01	XLU.Adjusted	71.43899
##	556	2022-08-08	XLU.Adjusted	73.83536
##	557	2022-08-15	XLU.Adjusted	74.77851
##	558	2022-08-22	XLU.Adjusted	72.86333
##	559	2022-08-29	XLU.Adjusted	71.79507
##	560	2022-09-05	XLU.Adjusted	74.47054
##	561	2022-09-12	XLU.Adjusted	71.66997
##	562	2022-09-19	XLU.Adjusted	69.06186
##	563	2022-09-26	XLU.Adjusted	63.47388
##	564	2022-10-03	XLU.Adjusted	61.77827
##	565	2022-10-10	XLU.Adjusted	60.21831
##	566	2022-10-17	XLU.Adjusted	61.34226
##	567	2022-10-24	XLU.Adjusted	65.31483
##	568	2022-10-31	XLU.Adjusted	65.00477
##	569	2022-11-07	XLU.Adjusted	65.96400
##	570	2022-11-14	XLU.Adjusted	66.71007
##	571	2022-11-21	XLU.Adjusted	68.73511
##	572	2022-11-28	XLU.Adjusted	68.82231
##	573	2022-12-05	XLU.Adjusted	68.62852
##	574	2022-12-12	XLU.Adjusted	68.28941
##	575	2022-12-19	XLU.Adjusted	68.70604
##	576	2022-12-26	XLU.Adjusted	68.86770
##	577	2023-01-02	XLU.Adjusted	69.35612
##	578	2023-01-09	XLU.Adjusted	69.67847
##	579	2023-01-16	XLU.Adjusted	67.62710
##	580	2023-01-23	XLU.Adjusted	67.29497
##	581	2023-01-30	XLU.Adjusted	66.33767
##	582	2023-02-06	XLU.Adjusted	66.14230
##	583	2023-02-13	XLU.Adjusted	66.89447
##	584	2023-02-20	XLU.Adjusted	65.06777
##	585	2023-02-27	XLU.Adjusted	64.71609
##	586	2023-03-06	XLU.Adjusted	62.92846
##	587	2023-03-13	XLU.Adjusted	65.41943
##	588	2023-03-20	XLU.Adjusted	64.16907
##	589	2023-03-27	XLU.Adjusted	66.61012
##	590	2023-04-03	XLU.Adjusted	68.69630
##	591	2023-04-10	XLU.Adjusted	67.79098
##	592	2023-04-17	XLU.Adjusted	68.50934
##	593	2023-04-24	XLU.Adjusted	67.87955
##	594	2023-05-01	XLU.Adjusted	67.92875
##	595	2023-05-08	XLU.Adjusted	67.92875
##	596	2023-05-15	XLU.Adjusted	65.05534
##	597	2023-05-22	XLU.Adjusted	63.55957
##	598	2023-05-29	XLU.Adjusted	64.08112
##	599	2023-06-05	XLU.Adjusted	65.33086
##	600	2023-06-12	XLU.Adjusted	66.22635
##	601	2023-06-19	XLU.Adjusted	63.99256
##	602	2023-06-26	XLU.Adjusted	64.91399

```
## 603 2023-07-03 XLU.Adjusted 64.86439
## 604 2023-07-10 XLU.Adjusted 66.31264
## 605 2023-07-17 XLU.Adjusted 67.90971
## 606 2023-07-24 XLU.Adjusted 66.50112
## 607 2023-07-31 XLU.Adjusted 63.47564
## 608 2023-08-07 XLU.Adjusted 64.05097
## 609 2023-08-14 XLU.Adjusted 62.97966
## 610 2023-08-21 XLU.Adjusted 63.11853
## 611 2023-08-28 XLU.Adjusted 62.13649
## 612 2023-09-04 XLU.Adjusted 62.67215
## 613 2023-09-11 XLU.Adjusted 64.41801
## 614 2023-09-18 XLU.Adjusted 62.78127
## 615 2023-09-25 XLU.Adjusted 58.93000
## 616 2023-10-02 XLU.Adjusted 57.25000
## 617 2023-10-09 XLU.Adjusted 59.30000
## 618 2023-10-16 XLU.Adjusted 58.03000
## 619 2023-10-23 XLU.Adjusted 58.73000
## 620 2023-10-30 XLU.Adjusted 61.86000
## 621 2023-11-06 XLU.Adjusted 60.32000
## 622 2023-11-13 XLU.Adjusted 62.29000
## 623 2023-11-20 XLU.Adjusted 62.69000
## 624 2023-11-27 XLU.Adjusted 62.76000
```

```
ggplot(ticker_data_df, aes(Date, Value)) +
  geom_line(color='darkseagreen3') +
  facet_wrap(~Ticker) +
  labs(title="Ticker Time Series") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1))
```

Ticker Time Series



4. VAR & Causality Testing

5. Results & Discussion