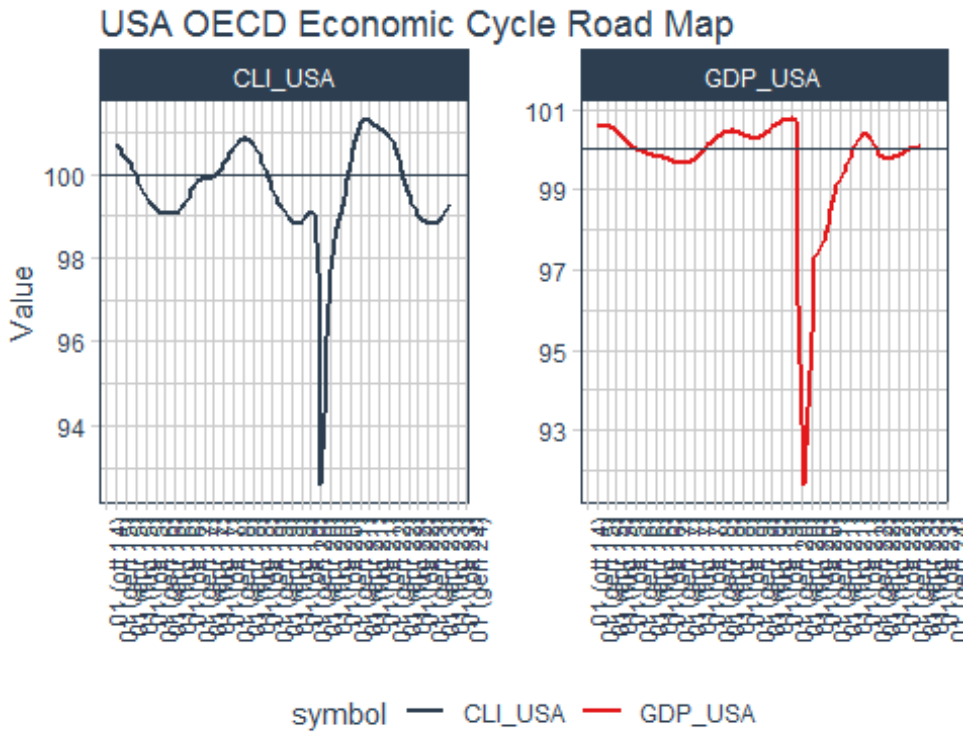
macro

2023-09-19

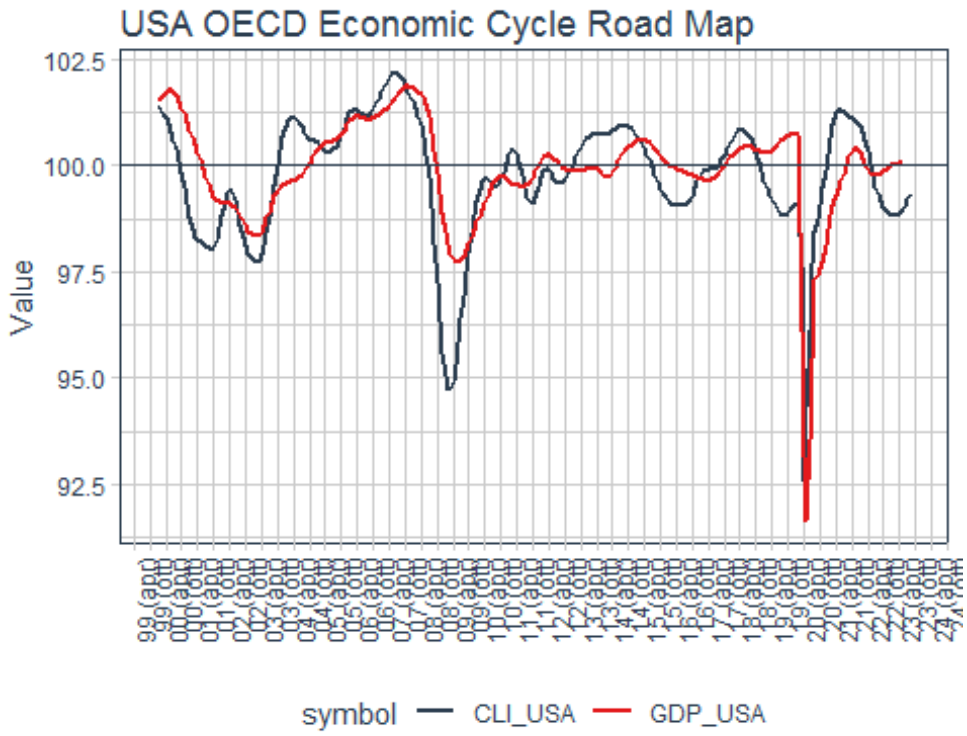
```
CLI_america <- c( "USALOLITOAASTSAM","USALORSGPNOSTSAM")%>% tq_get(get  =
"economic.data",
                                                                  from = "1900-
01-01",
                                                                  to   = "2023-
12-31")   %>% rename ( Date = date, Value = price)

CLI_america %>%
  mutate(symbol = ifelse(symbol == "USALOLITOAASTSAM", "CLI_USA", "GDP_USA")) ->
CLI_america




CLI_america %>% spread( symbol , Value  ) %>%       filter(Date >= "2015-01-01")
%>% tail()
```

```
## # A tibble: 6 x 3
##   Date       CLI_USA GDP_USA
##   <date>       <dbl>   <dbl>
## 1 2023-03-01    98.8    100.
## 2 2023-04-01    98.9    100.
## 3 2023-05-01    99.0    100.
## 4 2023-06-01    99.1     NA
## 5 2023-07-01    99.2     NA
## 6 2023-08-01    99.3     NA
```

```
CLI_america %>% filter(Date >= "2015-01-01") %>%
ggplot(aes(x=Date,y=Value,color=symbol))+
  geom_line(size=1)+
  geom_hline(yintercept = 100, color = palette_light()[[1]]) +
  facet_wrap(~ symbol, ncol = 2, scales = "free_y") +
  ggtitle("USA OECD Economic Cycle Road Map")+
  theme_tq() +
  theme(axis.text.x = element_text(angle = 90, hjust = 1),
        axis.title.x = element_blank())+
  scale_color_tq()+
  scale_x_date(date_breaks = "3 months",date_labels = "%d (%b %y)")
```



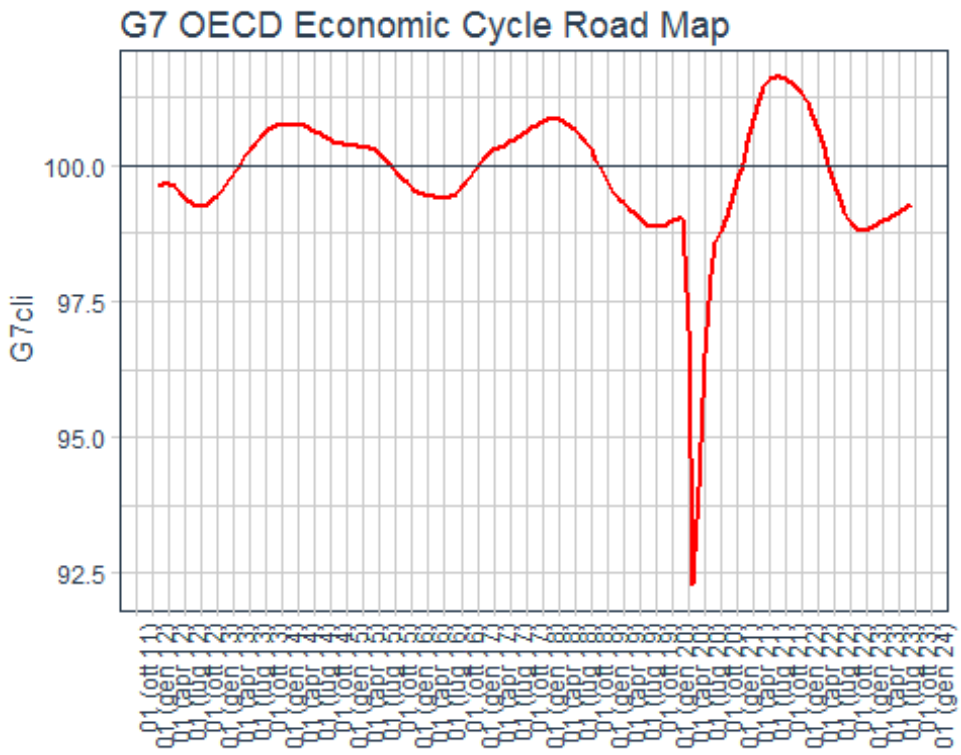

```
CLI_america %>% filter(Date >= "2000-01-01") %>% ggplot(aes(x=Date,y=Value, color
= symbol))+
  geom_line(size=1)+
  geom_hline(yintercept = 100, color = palette_light()[[1]]) +
  ggtitle("USA OECD Economic Cycle Road Map")+
  theme_tq() +
  theme(axis.text.x = element_text(angle = 90, hjust = 1),
        axis.title.x = element_blank())+
  scale_color_tq()+

  scale_x_date(date_breaks = "6 months",date_labels = "%y (%b)")
```




```
## Monthly Economic indicator for G7 Economies

dataset_list <- get_datasets()
search_dataset("MEI", data = dataset_list)

## # A tibble: 6 x 2
##   id                                title
##   <chr>                             <chr>
## 1 MEI_CLI                           Composite Leading Indicators (MEI)
## 2 MEI_REAL                          Production and Sales (MEI)
## 3 MEI_BTS_COS                       Business Tendency and Consumer Opinion
Surve~
## 4 MEI_FIN                           Monthly Monetary and Financial Statistics
(M~
## 5 EAR_MEI                           Hourly Earnings (MEI)
## 6 AEO11_OVERVIEW_CHAPTER1_FIG10_PT Figura 1.13: Preços de importações de bens
a~

datasetG7 <- "MEI"
dstrucG7 <- get_data_structure(datasetG7)


G7_filter_list <- list("G-7", "LOLITOAA" )
G7_cli <- get_dataset(dataset = datasetG7 , filter = G7_filter_list )

G7_cli %>% tail(10)
```

```
## # A tibble: 10 x 9
##    LOCATION SUBJECT  MEASURE FREQUENCY TIME_FORMAT UNIT  POWERCODE obsTime
##    <chr>    <chr>    <chr>   <chr>     <chr>       <chr> <chr>     <chr>
##  1 G-7      LOLITOAA STSA    M         P1M         IDX   0         2022-11
##  2 G-7      LOLITOAA STSA    M         P1M         IDX   0         2022-12
##  3 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-01
##  4 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-02
##  5 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-03
##  6 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-04
##  7 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-05
##  8 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-06
##  9 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-07
## 10 G-7      LOLITOAA STSA    M         P1M         IDX   0         2023-08
## # ... with 1 more variable: obsValue <dbl>
```

```
G7_cli$obsTime %>% AsDate() %>% ceiling_date( "month")  -1 -> G7_cli$obsTime
G7_cli %>% select(obsTime,obsValue) %>% rename(Date = obsTime, G7cli = obsValue) -
> G7_cli
G7_cli %>%  filter(Date >= "2012-01-01") %>% ggplot(aes(x=Date,y=G7cli))+
  geom_line(size=1,color='red')+
  geom_hline(yintercept = 100, color = palette_light()[[1]]) +
  ggtitle("G7 OECD Economic Cycle Road Map")+
  theme_tq() +
  theme(axis.text.x = element_text(angle = 90, hjust = 1),
        axis.title.x = element_blank())+
  scale_color_tq()+
  scale_x_date(date_breaks = "3 months",date_labels = "%d (%b %y)")
```



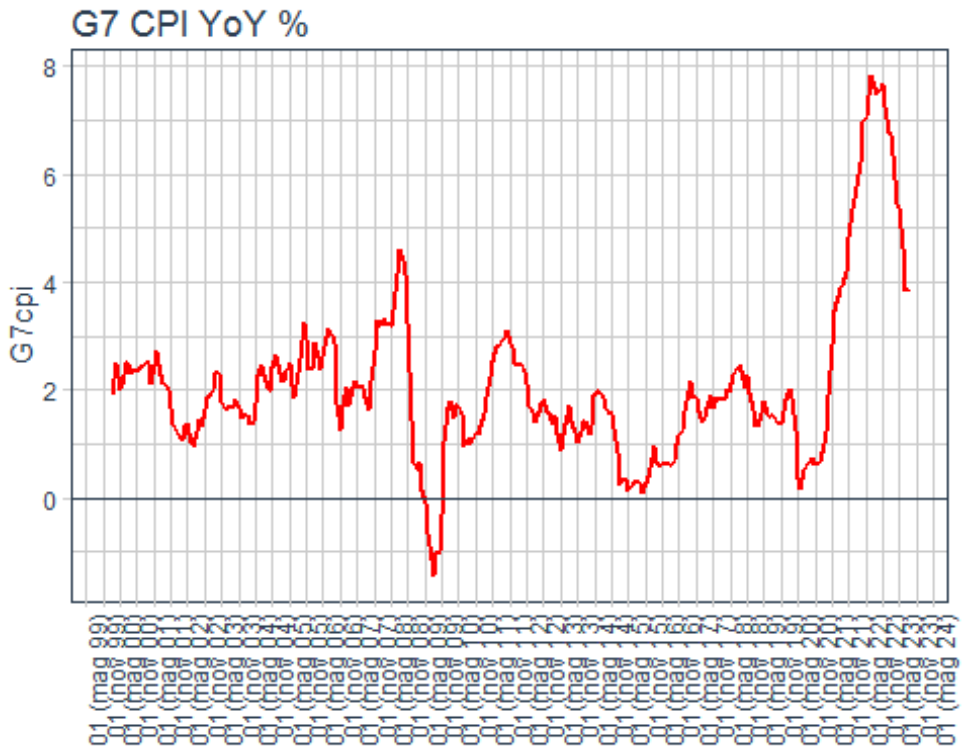
```r
## Inflation data


search_dataset("CPI", data = dataset_list)
```

```
## # A tibble: 3 x 2
##   id          title
##   <chr>       <chr>
## 1 G20_PRICES  "G20 – CPI All items "
## 2 PT_CH5_TAB3 "2012 Tabela 5.3: Índice de Percepção da corrupção (CPI) por
Tran~
## 3 PRICES_CPI  "Consumer price indices (CPIs) - Complete database"
```

```r
dataset_cpi <- "PRICES_CPI"

filter_list <- list("G-7", "CPALTT01", "GY", "M" )
cpi_g7 <- get_dataset(dataset = dataset_cpi, filter = filter_list)
cpi_g7$obsTime %>% AsDate() %>% ceiling_date( "month")  -1 -> cpi_g7$obsTime
cpi_g7 %>% select(obsTime,obsValue) %>% rename(Date = obsTime, G7cpi = obsValue) -
> cpi_g7
cpi_g7 %>% tail(10)
```

```
## # A tibble: 10 x 2
##    Date       G7cpi
##    <date>     <dbl>
##  1 2022-10-31  7.67
##  2 2022-11-30  7.26
##  3 2022-12-31  6.78
##  4 2023-01-31  6.72
##  5 2023-02-28  6.36
##  6 2023-03-31  5.44
##  7 2023-04-30  5.40
##  8 2023-05-31  4.63
##  9 2023-06-30  3.86
## 10 2023-07-31  3.88
```

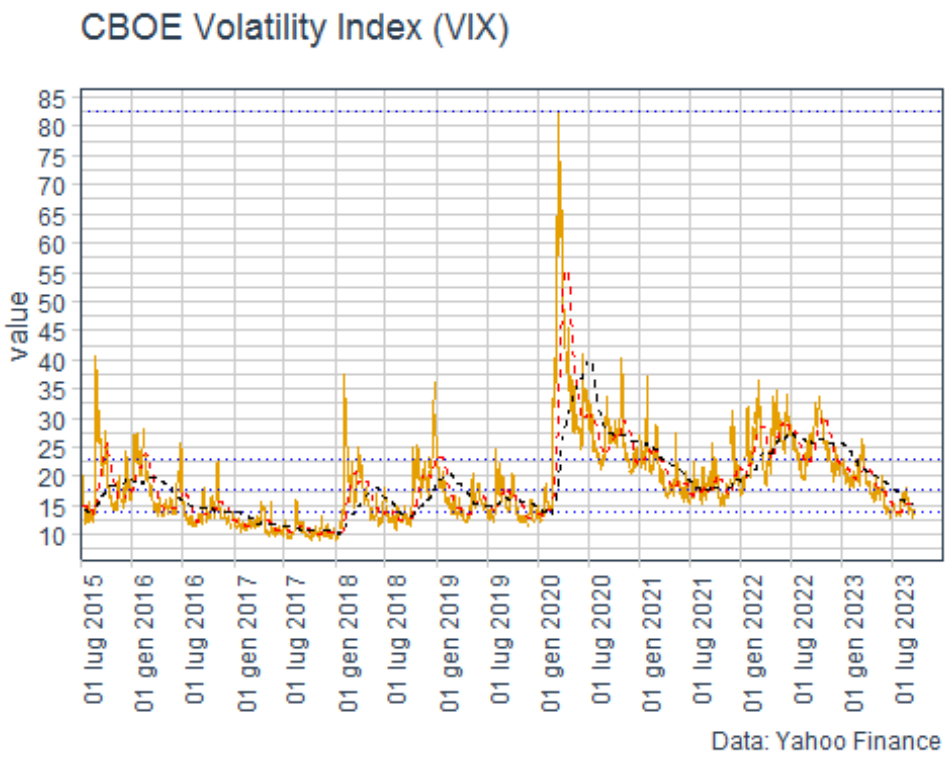
```r
cpi_g7%>%  filter(Date >= "2000-01-01") %>% ggplot(aes(x=Date,y=G7cpi))+
  geom_line(size=1,color='red')+
  geom_hline(yintercept = 0, color = palette_light()[[1]]) +
  ggtitle("G7 CPI YoY %")+
  theme_tq() +
  theme(axis.text.x = element_text(angle = 90, hjust = 1),
        axis.title.x = element_blank())+
  scale_color_tq()+
scale_x_date(date_breaks = "6 months",date_labels = "%d (%b %y)")
```




```
## VIX

vix <- tq_get(c("^VIX"),
              get  = "stock.prices",
              from = "1900-01-01",
              to   = Sys.Date()) %>%
  mutate(symbol = "VIX")

vix %>%
  #filter(date > "2019-12-31") %>%
  ggplot(aes(x = date, y = adjusted, color = symbol)) +

  geom_line(color = "#E69F00") +
  geom_hline(yintercept = vix$adjusted %>% quantile(0.25,na.rm = T) , color =
"blue" , linetype = "dotted") +
  geom_hline(yintercept = vix$adjusted %>% quantile(0.50,na.rm = T), color =
"blue" , linetype = "dotted") +
  geom_hline(yintercept = vix$adjusted %>% mean() , color = "black" , linetype =
"dashed") +
  geom_hline(yintercept = vix$adjusted %>% quantile(0.75,na.rm = T), color =
"blue" , linetype = "dotted") +
  geom_hline(yintercept = vix$adjusted %>% quantile(1,na.rm = T), color = "blue" ,
linetype = "dotted")+
  #geom_smooth(color = "black") +
  scale_x_date(date_breaks =  "6 months", date_labels = "%d %b %Y", expand = c(0,
0)) +
  scale_y_continuous(breaks = seq(0,100, by = 5)) +
  scale_fill_brewer(type = "qual", palette =   "Set3", guide = F) +
```

```
  labs(title = "CBOE Volatility Index (VIX)", subtitle = "",
       x = "", y = "value", caption = "Data: Yahoo Finance") +
  theme_tq() + theme(axis.text.x = element_text(angle = 90, hjust = 1),
                     axis.title.x = element_blank()) +
  theme(legend.position = "none")+
  geom_ma(ma_fun = SMA, n = 30, color="red") +
  geom_ma(ma_fun = SMA, n = 90, color="black") +

  coord_x_date(xlim = c("2015-07-01", "2023-12-31"))
```

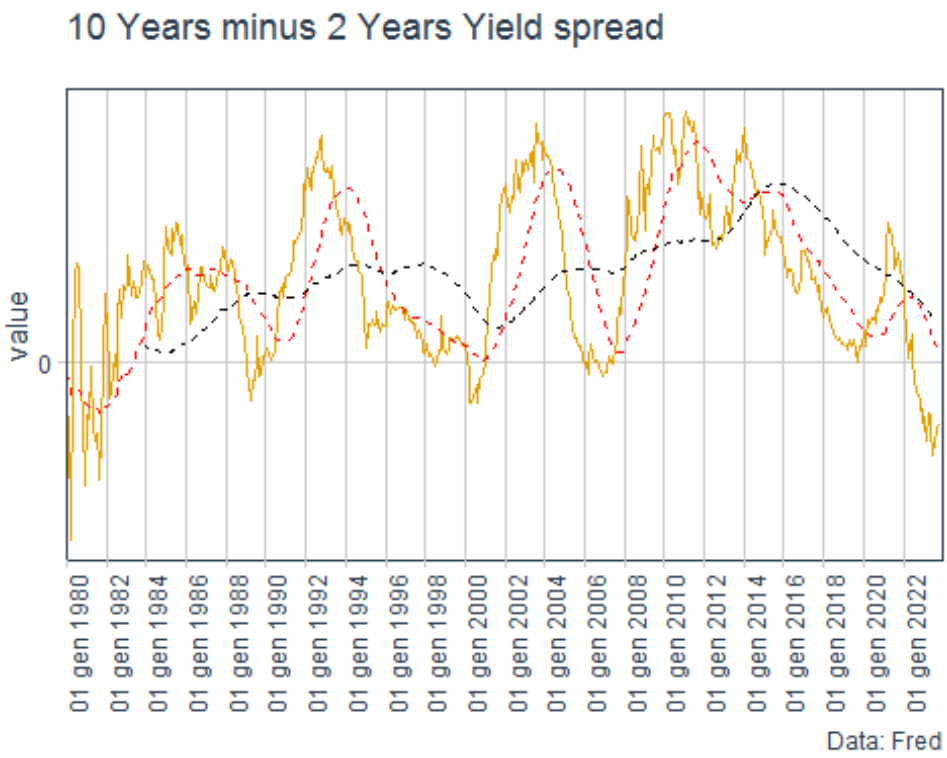
```
## Warning: Removed 1 rows containing missing values (geom_hline).
```




```
vix %>% select(date,adjusted)%>%rename(Date = date, VIX = adjusted)-> VIX
VIX %>% tq_transmute(select = VIX , mutate_fun = to.monthly, indexAt = "lastof") -
> VIX

## Warning in to.period(x, "months", indexAt = indexAt, name = name, ...): missing
## values removed from data

# Yields Spreads


TED_spread <- tq_get(c("TEDRATE"),
                     get  = "economic.data",
                     from = "1900-01-01",
                     to   = Sys.Date())
TED_spread %>% select(-symbol) %>% rename(Date = date, TED = price) -> TED_spread
```

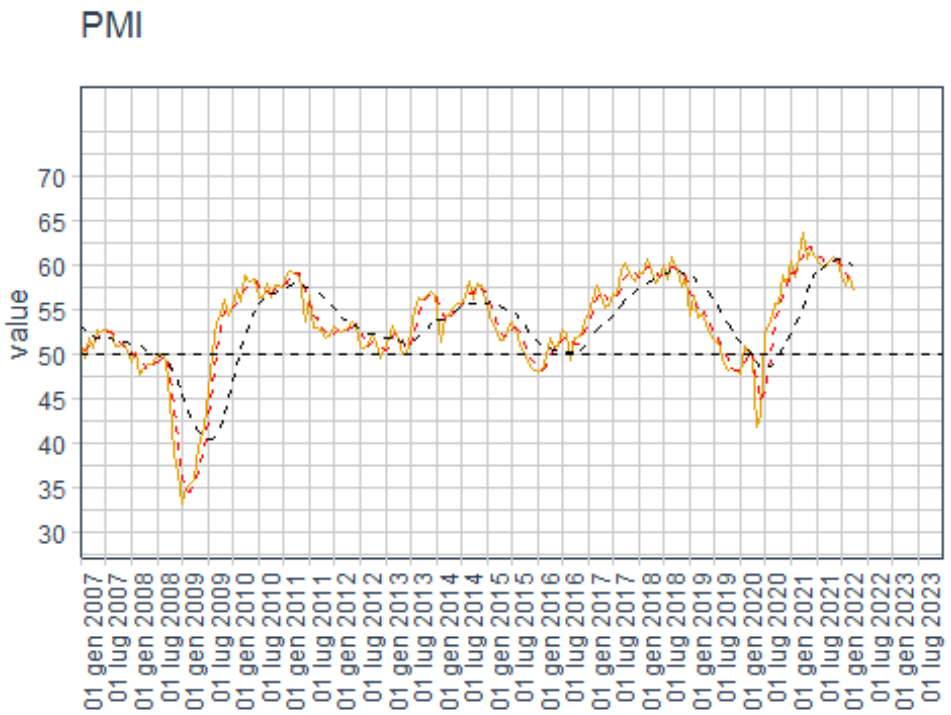
```
TED_spread %>% tq_transmute(select = TED , mutate_fun = to.monthly, indexAt =
"lastof") -> TED_spread

## Warning in to.period(x, "months", indexAt = indexAt, name = name, ...): missing
## values removed from data

Tenyearminustwo_spread <- tq_get(c("T10Y2Y"),
                     get  = "economic.data",
                     from = "1900-01-01",
                     to   = Sys.Date())
Tenyearminustwo_spread %>% select(-symbol) %>% rename(Date = date, TENTWO = price)
-> Tenyearminustwo_spread
Tenyearminustwo_spread %>% tq_transmute(select = TENTWO , mutate_fun = to.monthly,
indexAt = "lastof") ->  Tenyearminustwo_spread

## Warning in to.period(x, "months", indexAt = indexAt, name = name, ...): missing
## values removed from data

Tenyear <- tq_get(c("DGS10"),
                                 get  = "economic.data",
                                 from = "1900-01-01",
                                 to   = Sys.Date())
Tenyear %>% select(-symbol) %>% rename(Date = date, TEN = price) -> Tenyear
Tenyear %>% tq_transmute(select = TEN , mutate_fun = to.monthly, indexAt =
"lastof") ->  Tenyear

## Warning in to.period(x, "months", indexAt = indexAt, name = name, ...): missing
## values removed from data

Twoyear <- tq_get(c("DGS2"),
                  get  = "economic.data",
                  from = "1900-01-01",
                  to   = Sys.Date())
Twoyear %>% select(-symbol) %>% rename(Date = date, TWO = price) -> Twoyear
Twoyear %>% tq_transmute(select = TWO , mutate_fun = to.monthly, indexAt =
"lastof") ->  Twoyear

## Warning in to.period(x, "months", indexAt = indexAt, name = name, ...): missing
## values removed from data

Tenyearminustwo_spread %>%

  ggplot(aes(x = Date, y = TENTWO )) +

  geom_line(color = "#E69F00") +
  scale_x_date(date_breaks =  "2 years", date_labels = "%d %b %Y", expand = c(0,
0)) +
  scale_y_continuous(breaks = seq(0,100, by = 5)) +
  scale_fill_brewer(type = "qual", palette =   "Set3", guide = F) +
  labs(title = "10 Years minus 2 Years Yield spread", subtitle = "",
       x = "", y = "value", caption = "Data: Fred") +
  theme_tq() + theme(axis.text.x = element_text(angle = 90, hjust = 1),
                     axis.title.x = element_blank()) +
```

```
  theme(legend.position = "none")+
  geom_ma(ma_fun = SMA, n = 30, color="red") +
  geom_ma(ma_fun = SMA, n = 90, color="black") +

  coord_x_date(xlim = c("1980-01-01", "2023-12-31"))
```




```
## PMI data

Quandl("ISM/MAN_PMI") -> PMI

PMI  %>% as.tibble() %>%
  tq_transmute(select = PMI, mutate_fun = to.monthly, indexAt = "lastof") -> PMI

## Warning: `as.tibble()` was deprecated in tibble 2.0.0.
## Please use `as_tibble()` instead.
## The signature and semantics have changed, see `?as_tibble`.

PMI %>%
  ggplot(aes(x = Date, y = PMI)) +

  geom_line(color = "#E69F00") +
  geom_hline(yintercept = 50 , color = "black" , linetype = "dashed") +
  scale_x_date(date_breaks = "6 months", date_labels = "%d %b %Y", expand = c(0,
0)) +
  scale_y_continuous(breaks = seq( 30,70, by = 5)) +
  scale_fill_brewer(type = "qual", palette =   "Set3", guide = F) +
  labs(title = "PMI", subtitle = "",
       x = "", y = "value", caption = "") +
```

```
  theme_tq() + theme(axis.text.x = element_text(angle = 90, hjust = 1),
                     axis.title.x = element_blank()) +
  theme(legend.position = "none")+
  geom_ma(ma_fun = SMA, n = 3, color="red") +
  geom_ma(ma_fun = SMA, n = 12, color="black") +
coord_x_date(xlim = c("2007-01-01", "2023-12-31"))
```




```
## FED Funds data

FEDFUNDS <- tq_get(c("FEDFUNDS"),
                   get  = "economic.data",
                   from = "1900-01-01",
                   to   = Sys.Date())
    FEDFUNDS %>% select(-symbol) %>% rename(Date = date, FF = price) -> FEDFUNDS
    FEDFUNDS %>% tq_transmute(select = FF , mutate_fun = to.monthly, indexAt =
"lastof") ->  FEDFUNDS

## Join macro data

left_join( G7_cli, cpi_g7 , by = 'Date') %>%  left_join( VIX , by = 'Date')%>%
  left_join( Tenyearminustwo_spread, by = 'Date')%>%
   left_join( Tenyear , by = 'Date')%>% left_join( Twoyear  , by = 'Date')  %>%
  left_join( FEDFUNDS  , by = 'Date') -> big_matrix



big_matrix %>% na.omit()   %>% mutate( G7cpi_m3 = SMA(G7cpi,3)       ) %>%
  mutate( G7cpi_m36 = SMA(G7cpi,36) ) %>% mutate( G7cli_m3 = SMA(G7cli,3) ) ->
```

```
big_matrix
big_matrix %>% tail(10)
```

```
## # A tibble: 10 x 11
##    Date       G7cli G7cpi   VIX TENTWO   TEN   TWO    FF G7cpi_m3 G7cpi_m36
##    <date>     <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl>    <dbl>     <dbl>
##  1 2022-10-31  98.8  7.67  25.9  -0.41  4.1   4.51  3.08     7.57      3.53
##  2 2022-11-30  98.8  7.26  20.6  -0.7   3.68  4.38  3.78     7.50      3.69
##  3 2022-12-31  98.8  6.78  21.7  -0.53  3.88  4.41  4.1      7.24      3.82
##  4 2023-01-31  98.9  6.72  19.4  -0.69  3.52  4.21  4.33     6.92      3.95
##  5 2023-02-28  98.9  6.36  20.7  -0.89  3.92  4.81  4.57     6.62      4.08
##  6 2023-03-31  99.0  5.44  18.7  -0.58  3.48  4.06  4.65     6.18      4.19
##  7 2023-04-30  99.0  5.40  15.8  -0.6   3.44  4.04  4.83     5.73      4.34
##  8 2023-05-31  99.1  4.63  17.9  -0.76  3.64  4.4   5.06     5.16      4.46
##  9 2023-06-30  99.1  3.86  13.6  -1.06  3.81  4.87  5.08     4.63      4.55
## 10 2023-07-31  99.2  3.88  13.6  -0.91  3.97  4.88  5.12     4.12      4.64
## # ... with 1 more variable: G7cli_m3 <dbl>
```

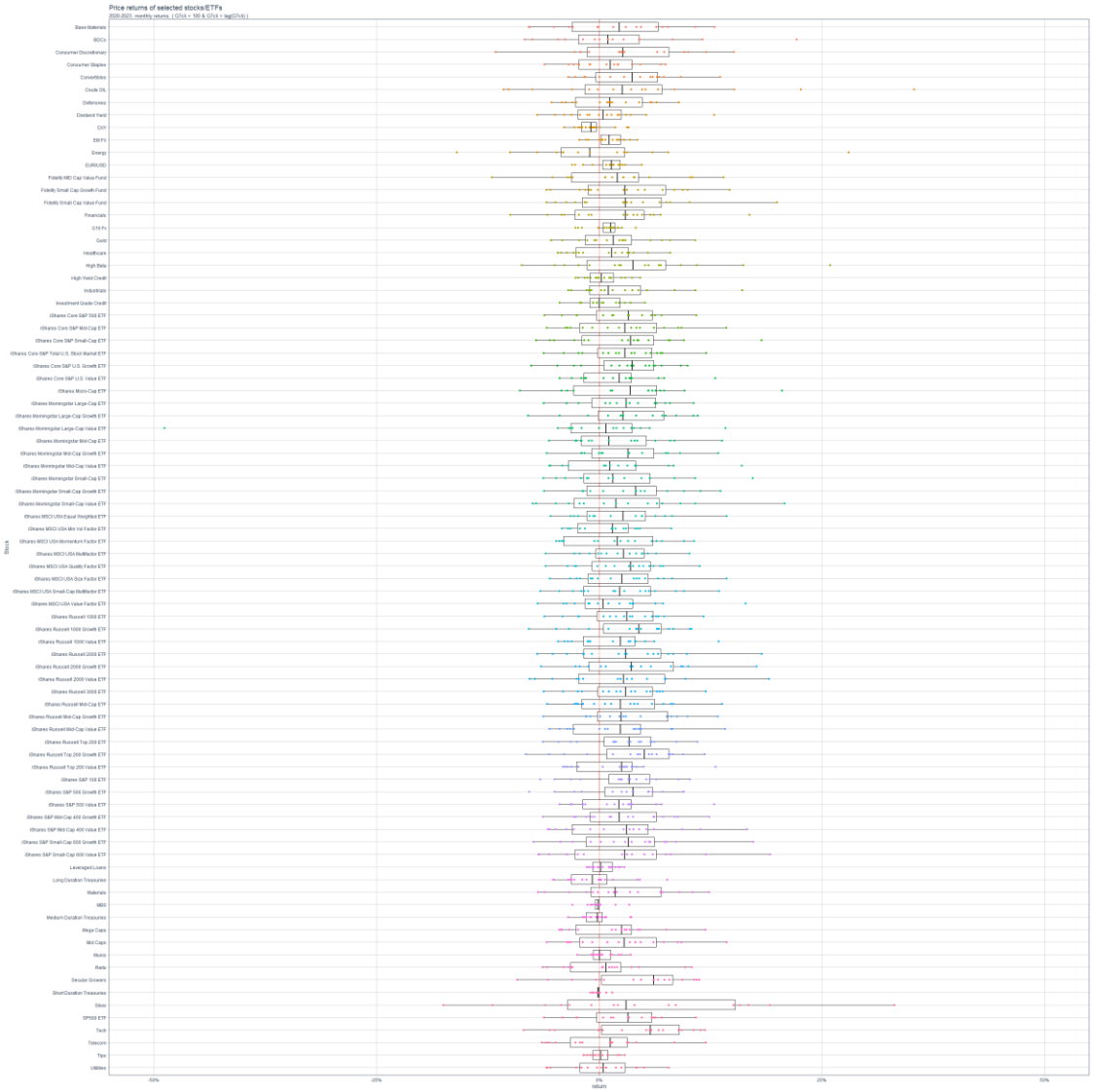
Download etf prices and filter out etf quoted after 2015/04/30

```
etfs <- read_excel("C:/Users/Utente/Downloads/asd.xlsx")

prices_factors <-  etfs %>%
  tq_get(get = "stock.prices", from = "1960-01-01") %>%
  group_by(Ticker, Name)
prices_factors %>%  filter( min(date) <= "2015-04-30"   ) -> prices_factors

prices_factors
```

```
## # A tibble: 402,957 x 9
## # Groups:   Ticker, Name [84]
##    Ticker Name                date        open  high   low close volume
adjusted
##    <chr>  <chr>               <date>     <dbl> <dbl> <dbl> <dbl>  <dbl>
<dbl>
##  1 IVV    iShares Core S&P 5~ 2000-05-19  143.  143.  140.  141. 7.76e5
92.0
##  2 IVV    iShares Core S&P 5~ 2000-05-22  141.  141.  137.  140. 1.85e6
91.4
##  3 IVV    iShares Core S&P 5~ 2000-05-23  140.  140.  138.  138. 3.74e5
90.0
##  4 IVV    iShares Core S&P 5~ 2000-05-24  138.  140.  137.  140. 4.00e5
91.4
##  5 IVV    iShares Core S&P 5~ 2000-05-25  140.  141.  138.  138. 6.96e4
90.5
##  6 IVV    iShares Core S&P 5~ 2000-05-26  138.  139.  137   138. 2.37e5
90.1
##  7 IVV    iShares Core S&P 5~ 2000-05-30  139.  142.  139.  142. 1.18e5
93.1
##  8 IVV    iShares Core S&P 5~ 2000-05-31  142.  144.  142.  143. 2.17e5
```

```
93.3
##  9 IVV    iShares Core S&P 5~ 2000-06-01  144.  145.  144.  145. 1.29e5
94.8
## 10 IVV    iShares Core S&P 5~ 2000-06-02  148.  149.  147.  148. 1.08e5
96.7
## # ... with 402,947 more rows

prices_factors %>% tq_transmute(select = close , mutate_fun = periodReturn , type
= 'arithmetic', period = 'monthly' ,
                                indexAt ="lastof", values_fill = 0,
                                col_rename = "Returns") -> Returns_factors_etfs
Returns_factors_etfs %>% rename(Date = date) -> Returns_factors_etfs

## Join macro and etfs returns data

left_join(  Returns_factors_etfs , big_matrix , by = 'Date' ) %>% group_by(Ticker,
Name) -> Returns_MSCI_cli

Returns_MSCI_cli %>% tail(10)

## # A tibble: 10 x 14
## # Groups:   Ticker, Name [1]
##    Ticker Name    Date        Returns G7cli G7cpi   VIX TENTWO   TEN   TWO
FF
##    <chr>  <chr>   <date>        <dbl> <dbl> <dbl> <dbl>  <dbl> <dbl> <dbl>
<dbl>
##  1 FSMVX  Fideli~ 2022-12-31 -0.121    98.8  6.78  21.7  -0.53  3.88  4.41  4.1
##  2 FSMVX  Fideli~ 2023-01-31  0.105    98.9  6.72  19.4  -0.69  3.52  4.21
4.33
##  3 FSMVX  Fideli~ 2023-02-28 -0.0301   98.9  6.36  20.7  -0.89  3.92  4.81
4.57
##  4 FSMVX  Fideli~ 2023-03-31 -0.0524   99.0  5.44  18.7  -0.58  3.48  4.06
4.65
##  5 FSMVX  Fideli~ 2023-04-30  0.00655  99.0  5.40  15.8  -0.6   3.44  4.04
4.83
##  6 FSMVX  Fideli~ 2023-05-31 -0.0354   99.1  4.63  17.9  -0.76  3.64  4.4
5.06
##  7 FSMVX  Fideli~ 2023-06-30  0.102    99.1  3.86  13.6  -1.06  3.81  4.87
5.08
##  8 FSMVX  Fideli~ 2023-07-31  0.0563   99.2  3.88  13.6  -0.91  3.97  4.88
5.12
##  9 FSMVX  Fideli~ 2023-08-31 -0.0268   NA   NA     NA    NA    NA    NA    NA
## 10 FSMVX  Fideli~ 2023-09-30 -0.0171   NA   NA     NA    NA    NA    NA    NA
## # ... with 3 more variables: G7cpi_m3 <dbl>, G7cpi_m36 <dbl>, G7cli_m3 <dbl>

### performance when economy is in recovery after recession

Returns_MSCI_cli %>% filter ( G7cli < 100 & G7cli > lag(G7cli) ) %>%
tq_performance( Ra = Returns , performance_fun =  table.Stats , Rb = NULL ) %>%
arrange(desc( GeometricMean))
```

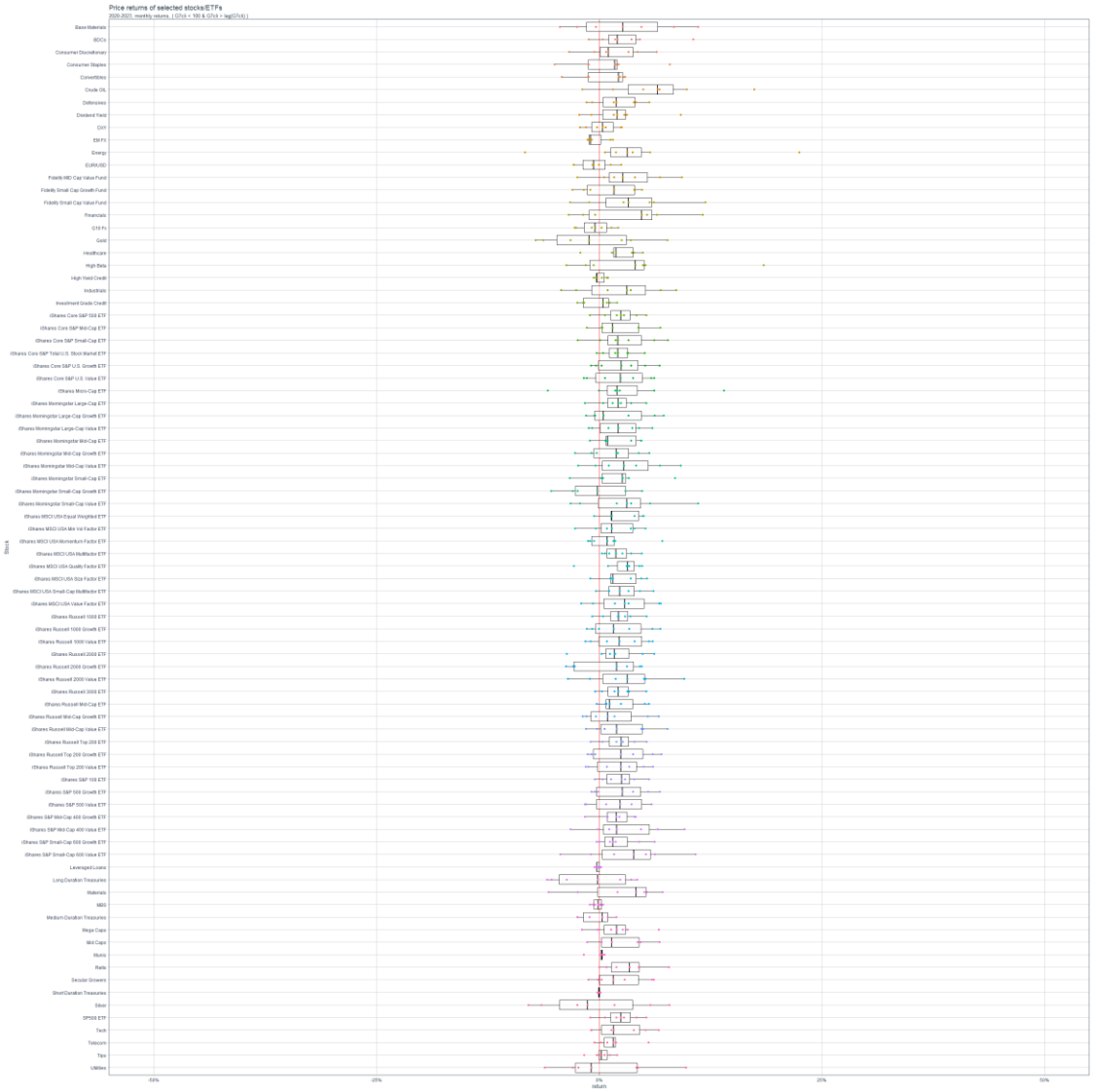
```
## # A tibble: 84 x 18
## # Groups:   Ticker, Name [84]
##    Ticker Name     ArithmeticMean GeometricMean Kurtosis `LCLMean(0.95)`
Maximum
##    <chr>  <chr>             <dbl>         <dbl>    <dbl>           <dbl>
<dbl>
##  1 SPHB   High Be~         0.0355        0.0336    2.38           0.0139
0.259
##  2 IJS    iShares~         0.0322        0.0308    0.805          0.0185
0.192
##  3 IWM    iShares~         0.0319        0.0307    0.253          0.0191
0.182
##  4 IWO    iShares~         0.032         0.0306   -0.256          0.0185
0.177
##  5 XLY    Consume~         0.0318        0.0306    1.08           0.0193
0.185
##  6 XLF    Financi~         0.032         0.0305    1.28           0.0181
0.218
##  7 IWC    iShares~         0.0317        0.0302    1.19           0.0155
0.205
##  8 IWN    iShares~         0.0314        0.0301    0.704          0.0184
0.191
##  9 IJR    iShares~         0.0308        0.0296    0.927          0.018
0.182
## 10 FCPVX  Fidelit~         0.0307        0.0293    1.36           0.0149
0.199
## # ... with 74 more rows, and 11 more variables: Median <dbl>, Minimum <dbl>,
## #   NAs <dbl>, Observations <dbl>, Quartile1 <dbl>, Quartile3 <dbl>,
## #   SEMean <dbl>, Skewness <dbl>, Stdev <dbl>, `UCLMean(0.95)` <dbl>,
## #   Variance <dbl>

Returns_MSCI_cli %>%  filter( Date >= "2020-01-01"   ) %>%
  filter( G7cli < 100 & G7cli > lag(G7cli) ) %>%
  ggplot(aes(y = Returns , x = reorder(Name, desc(Name)), color = Name)) +
  geom_hline(yintercept = 0, color = "red") +
  geom_boxplot(color = "black", alpha = 0.5) +
  geom_point() +
  scale_y_continuous(labels = scales::percent, limits = c(-0.5, 0.5)) +
  coord_flip() +
  labs(title = "Price returns of selected stocks/ETFs", subtitle = "2020-2023,
monthly returns, ( G7cli < 100 & G7cli > lag(G7cli) )",
       x = "Stock", y = "return") +
  theme_tq() +
  theme(legend.position = "none")

## Warning: Removed 8 rows containing non-finite values (stat_boxplot).

## Warning: Removed 8 rows containing missing values (geom_point).
```




```
### performance when economy is in expansion and high inflation

Returns_MSCI_cli %>% filter ( G7cli > 100 & G7cli > lag(G7cli) & G7cpi > FF &
G7cpi > G7cpi_m3 ) %>% tq_performance( Ra = Returns , performance_fun =
table.Stats , Rb = NULL ) %>% arrange(desc( GeometricMean))

## # A tibble: 84 x 18
## # Groups:   Ticker, Name [84]
##    Ticker Name     ArithmeticMean GeometricMean Kurtosis `LCLMean(0.95)`
Maximum
##    <chr>  <chr>             <dbl>         <dbl>    <dbl>           <dbl>
<dbl>
##  1 USO    Crude O~         0.0357        0.0345   0.104           0.0152
0.174
##  2 IWC    iShares~         0.0352        0.0342  -0.362           0.0172   0.14
##  3 XLI    Industr~         0.0304        0.0298  -0.0494          0.0171
0.110
##  4 JKH    iShares~         0.0292        0.0287   0.798           0.0171
```

```
0.117
##  5 JKJ    iShares~         0.0294        0.0287   0.202           0.0149
0.122
##  6 QQQ    Secular~         0.0293        0.0287   0.548           0.0161
0.129
##  7 XLF    Financi~         0.0289        0.0282  -0.552           0.0139
0.116
##  8 SPHB   High Be~         0.0292        0.0281   2.50            0.0055
0.184
##  9 XLE    Energy           0.0297        0.028    2.55            0.0071
0.225
## 10 IJR    iShares~         0.0286        0.0279  -0.614           0.0147
0.110
## # ... with 74 more rows, and 11 more variables: Median <dbl>, Minimum <dbl>,
## #   NAs <dbl>, Observations <dbl>, Quartile1 <dbl>, Quartile3 <dbl>,
## #   SEMean <dbl>, Skewness <dbl>, Stdev <dbl>, `UCLMean(0.95)` <dbl>,
## #   Variance <dbl>
```

```
Returns_MSCI_cli %>%  filter( Date >= "2020-01-01"   ) %>%
  filter(G7cli > 100 & G7cli > lag(G7cli) & G7cpi > FF & G7cpi > G7cpi_m3 ) %>%
  ggplot(aes(y = Returns , x = reorder(Name, desc(Name)), color = Name)) +
  geom_hline(yintercept = 0, color = "red") +
  geom_boxplot(color = "black", alpha = 0.5) +
  geom_point() +
  scale_y_continuous(labels = scales::percent, limits = c(-0.5, 0.5)) +
  coord_flip() +
  labs(title = "Price returns of selected stocks/ETFs", subtitle = "2020-2023,
monthly returns, ( G7cli < 100 & G7cli > lag(G7cli) )",
       x = "Stock", y = "return") +
  theme_tq() +
  theme(legend.position = "none")
```




```
### performance when economy is in Slowdown ,inflation and rising interest rates

Returns_MSCI_cli %>% filter ( G7cli > 100 & G7cli < lag(G7cli) & FF > lag(FF) &
G7cpi > G7cpi_m3 ) %>% tq_performance( Ra = Returns , performance_fun =
table.Stats , Rb = NULL ) %>% arrange(desc( GeometricMean))

## # A tibble: 84 x 18
## # Groups:   Ticker, Name [84]
##    Ticker Name     ArithmeticMean GeometricMean Kurtosis `LCLMean(0.95)`
Maximum
##    <chr>  <chr>             <dbl>         <dbl>    <dbl>           <dbl>
<dbl>
##  1 USO    Crude O~         0.0191        0.0173   -0.454         -0.0152  0.111
##  2 XLU    Utiliti~         0.014         0.0134    0.888         -0.0015
0.0961
##  3 SPHD   Dividen~         0.0094        0.0091   -0.762         -0.0065
0.0486
##  4 UUP    DXY              0.0076        0.0075   -0.270         -0.0036
```

```
0.0483
##  5 XLE    Energy           0.0073        0.006    -0.234         -0.0154
0.0949
##  6 VNQ    Reits            0.005         0.004     0.670         -0.0171
0.0577
##  7 XLP    Consume~         0.0024        0.0021   -0.346         -0.0102
0.0542
##  8 DEF    Defensi~         0.002         0.0015   -0.967         -0.0195  0.041
##  9 USMV   iShares~         0.0004        0        -0.360         -0.0183
0.0521
## 10 SHY    Short D~        -0.0017       -0.0017    4.02          -0.0035
0.0028
## # ... with 74 more rows, and 11 more variables: Median <dbl>, Minimum <dbl>,
## #   NAs <dbl>, Observations <dbl>, Quartile1 <dbl>, Quartile3 <dbl>,
## #   SEMean <dbl>, Skewness <dbl>, Stdev <dbl>, `UCLMean(0.95)` <dbl>,
## #   Variance <dbl>
```

```
Returns_MSCI_cli %>%  filter( Date >= "2020-01-01"   ) %>%
  filter( G7cli > 100 & G7cli < lag(G7cli) & FF > lag(FF) & G7cpi > G7cpi_m3 ) %>%
  ggplot(aes(y = Returns , x = reorder(Name, desc(Name)), color = Name)) +
  geom_hline(yintercept = 0, color = "red") +
  geom_boxplot(color = "black", alpha = 0.5) +
  geom_point() +
  scale_y_continuous(labels = scales::percent, limits = c(-0.5, 0.5)) +
  coord_flip() +
  labs(title = "Price returns of selected stocks/ETFs", subtitle = "2020-2023,
monthly returns, ( G7cli < 100 & G7cli > lag(G7cli) )",
       x = "Stock", y = "return") +
  theme_tq() +
  theme(legend.position = "none")
```


Price returns of selected stocks/ETFs
2020-2023, monthly returns, (GTch < 100 & GTch > log(GTch))
Base Materials
BDCs
Consumer Discretionary
Consumer Staples
Convertibles
Crude Oil
Defensives
Dividend Yield
DXY
EM Fi
Energy
EURUSD
Fidelity MID Cap Value Fund
Fidelity Small Cap Growth Fund
Fidelity Small Cap Value Fund
Financials
G10 Fi
Gold
Healthcare
High Beta
High Yield Credit
Industrials
Investment Grade Credit
iShares Core S&P 500 ETF
iShares Core S&P Mid-Cap ETF
iShares Core S&P Small-Cap ETF
iShares Core S&P Total U.S. Stock Market ETF
iShares Core S&P U.S. Growth ETF
iShares Core S&P U.S. Value ETF
iShares Micro-Cap ETF
iShares Morningstar Large-Cap ETF
iShares Morningstar Large-Cap Growth ETF
iShares Morningstar Large-Cap Value ETF
iShares Morningstar Mid-Cap ETF
iShares Morningstar Mid-Cap Growth ETF
iShares Morningstar Mid-Cap Value ETF
iShares Morningstar Small-Cap ETF
iShares Morningstar Small-Cap Growth ETF
iShares Morningstar Small-Cap Value ETF
iShares MSCI USA Equal Weighted ETF
iShares MSCI USA Min Vol Factor ETF
iShares MSCI USA Momentum Factor ETF
iShares MSCI USA Multifactor ETF
iShares MSCI USA Quality Factor ETF
iShares MSCI USA Size Factor ETF
iShares MSCI USA Small-Cap Multifactor ETF
iShares MSCI USA Value Factor ETF
iShares Russell 1000 ETF
iShares Russell 1000 Growth ETF
iShares Russell 1000 Value ETF
iShares Russell 2000 ETF
iShares Russell 2000 Growth ETF
iShares Russell 2000 Value ETF
iShares Russell 3000 ETF
iShares Russell Mid-Cap ETF
iShares Russell Mid-Cap Growth ETF
iShares Russell Mid-Cap Value ETF
iShares Russell Top 200 ETF
iShares Russell Top 200 Growth ETF
iShares Russell Top 200 Value ETF
iShares S&P 100 ETF
iShares S&P 500 Growth ETF
iShares S&P 500 Value ETF
iShares S&P Mid-Cap 400 Growth ETF
iShares S&P Mid-Cap 400 Value ETF
iShares S&P Small-Cap 600 Growth ETF
iShares S&P Small-Cap 600 Value ETF
Leveraged Loans
Long Duration Treasuries
Materials
MBS
Medium Duration Treasuries
Mega Caps
Mid Caps
Munis
Reits
Secular Growers
Short Duration Treasuries
Silver
SPY500 ETF
Tech
Telecom
Tips
Utilities
Stock
-50%
-25%
0%
25%
50%
return