Consumer Price Index

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Table of contents

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```r
library(AER)
library(dynlm)
library(forecast)
library(readxl)
library(stargazer)
library(scales)
library(xts)
library(quantmod)
library(urca)
library(readxl)
library(tidyverse)
library(tsibble)
```

Consumer Price Index

To see change in CPI over time, we plot data

```r
cpi_urban <- read_excel("cpi_urban.xlsx")
```

New names:
* `` -> `...7`

```r
cpi_urban
```

```
# A tibble: 52 x 7
   Date                CPI_National CPI_Urban CPI_Urban_F~1   WPI   SPI     ...7
   <dttm>                     <dbl>     <dbl>         <dbl> <dbl> <dbl>    <dbl>
 1 2016-07-01 00:00:00         103.      103.          103.  103.  98.4 NA
 2 2016-08-01 00:00:00         103.      103.          103.  103.  98.7  0.00422
 3 2016-09-01 00:00:00         104.      104.          104.  103.  99.4  0.00931
 4 2016-10-01 00:00:00         105.      104.          105.  103. 100.   0.00474
 5 2016-11-01 00:00:00         104.      104.          103.  104.  99.3 -0.00581
 6 2016-12-01 00:00:00         105.      105.          103.  104.  98.6  0.00434
 7 2017-01-01 00:00:00         105.      105.          103.  105.  99.6  0.00484
 8 2017-02-01 00:00:00         106.      106.          106.  106. 102.   0.0105
 9 2017-03-01 00:00:00         107.      107.          107.  106. 102.   0.00721
10 2017-04-01 00:00:00         106.      107.          106.  106. 101.  -0.00516
# ... with 42 more rows, and abbreviated variable name 1: CPI_Urban_Food
# i Use `print(n = ...)` to see more rows
```
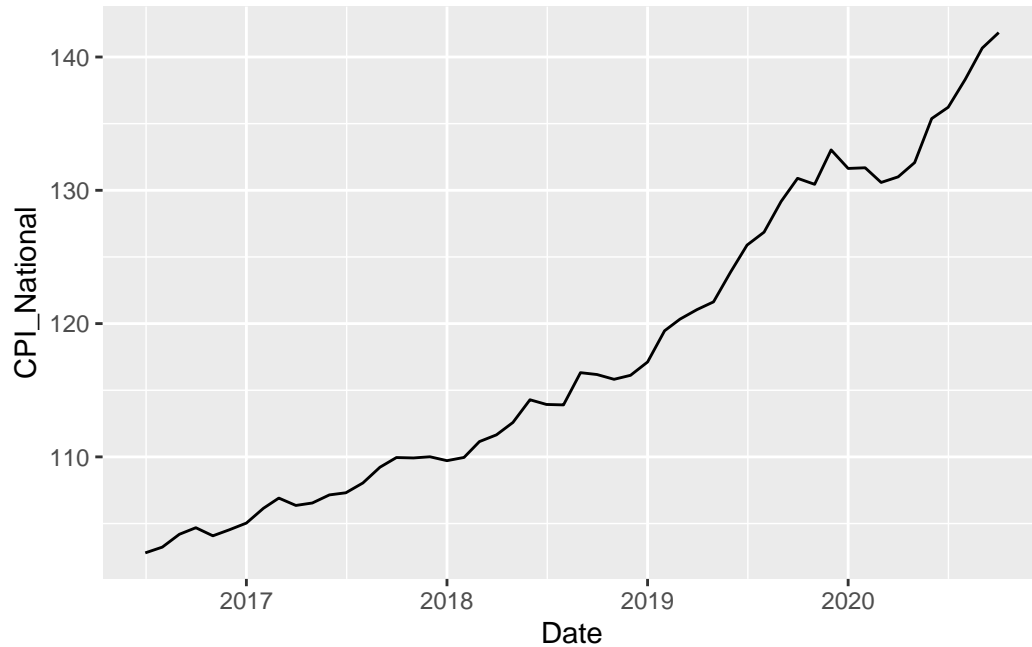
```r
ggplot(cpi_urban)+aes(x=Date, CPI_National)+geom_line()
```

```
cpi_urban<-cpi_urban %>% mutate(MoM_pct=(CPI_National/lag(CPI_National)-1)*100)
cpi_urban<-cpi_urban %>% mutate(pos=MoM_pct>=0)
cpi_urban
```

```
# A tibble: 52 x 9
   Date                CPI_National CPI_U~1 CPI_U~2   WPI   SPI    ...7 MoM_pct
   <dttm>                     <dbl>   <dbl>   <dbl> <dbl> <dbl>   <dbl>   <dbl>
 1 2016-07-01 00:00:00         103.    103.    103.  103.  98.4 NA       NA
 2 2016-08-01 00:00:00         103.    103.    103.  103.  98.7  0.00422  0.422
 3 2016-09-01 00:00:00         104.    104.    104.  103.  99.4  0.00931  0.931
 4 2016-10-01 00:00:00         105.    104.    105.  103. 100.   0.00474  0.474
 5 2016-11-01 00:00:00         104.    104.    103.  104.  99.3 -0.00581 -0.581
 6 2016-12-01 00:00:00         105.    105.    103.  104.  98.6  0.00434  0.434
 7 2017-01-01 00:00:00         105.    105.    103.  105.  99.6  0.00484  0.484
 8 2017-02-01 00:00:00         106.    106.    106.  106. 102.   0.0105   1.05
 9 2017-03-01 00:00:00         107.    107.    107.  106. 102.   0.00721  0.721
10 2017-04-01 00:00:00         106.    107.    106.  106. 101.  -0.00516 -0.516
# ... with 42 more rows, 1 more variable: pos <lgl>, and abbreviated variable
#   names 1: CPI_Urban, 2: CPI_Urban_Food
```
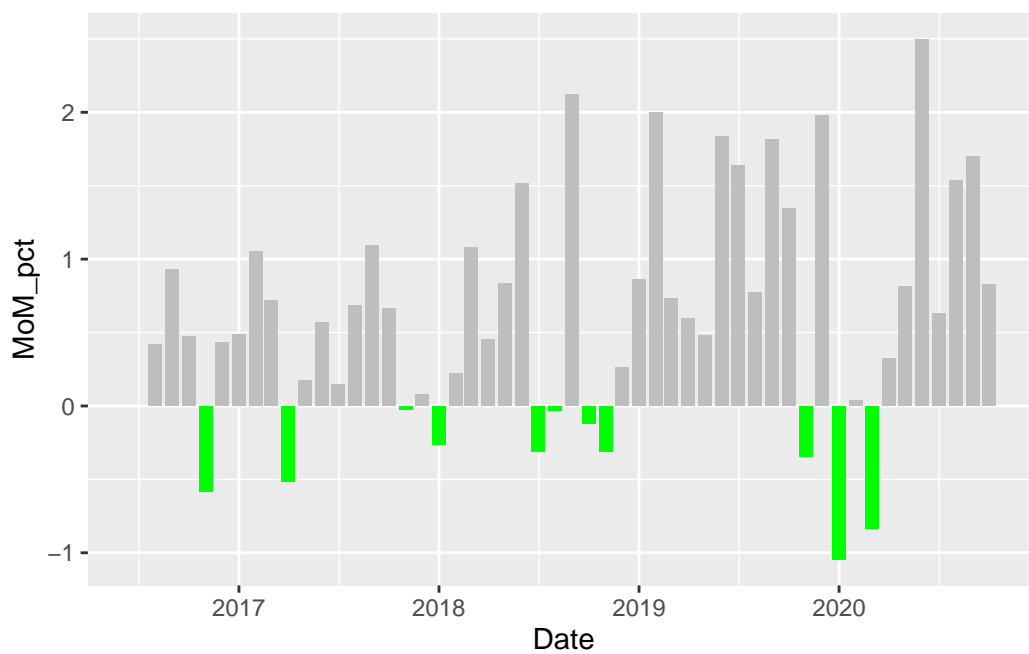
3

```
# i Use `print(n = ...)` to see more rows, and `colnames()` to see all variable names
```

```
ggplot(cpi_urban)+aes(x=Date, MoM_pct, fill=pos)+geom_col(position = "identity",  size = 0
    scale_fill_manual(values = c("Green", "Grey"), guide = FALSE)
```

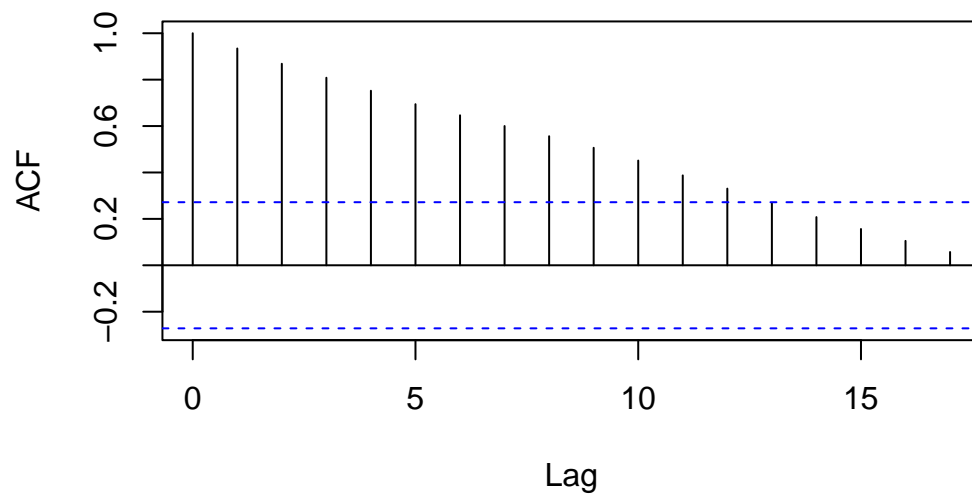Warning: Removed 1 rows containing missing values (geom_col).

Warning: It is deprecated to specify `guide = FALSE` to remove a guide. Please
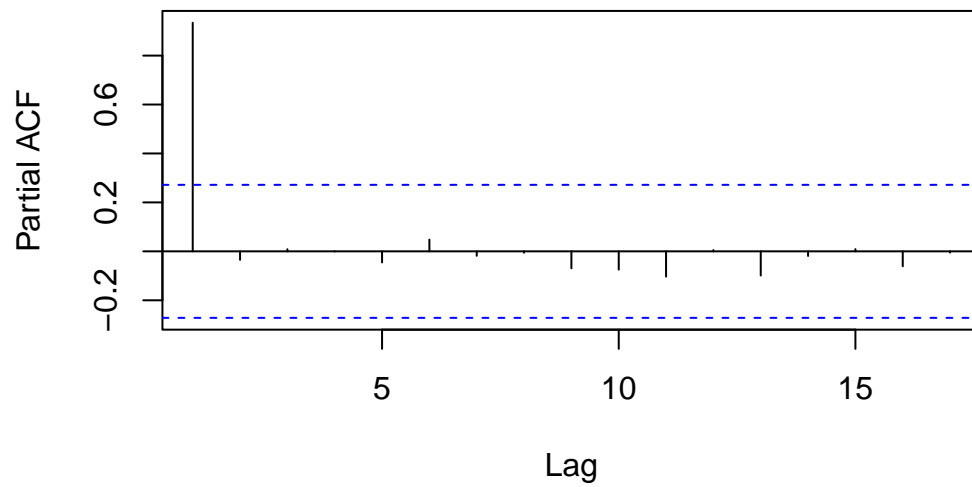use `guide = "none"` instead.


```
acf(cpi_urban$CPI_National)
```
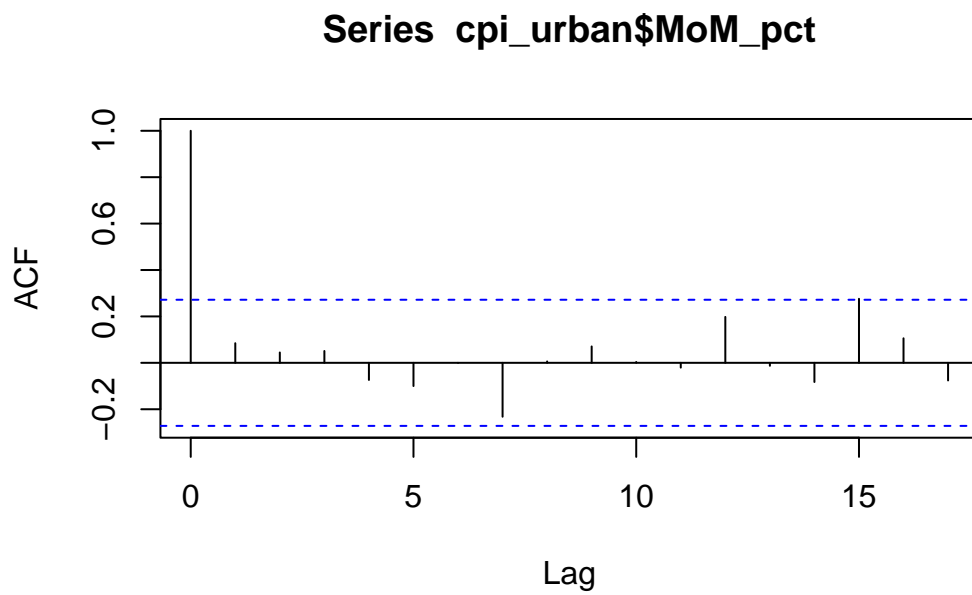
Series cpi_urban$CPI_National


```
pacf(cpi_urban$CPI_National)
```
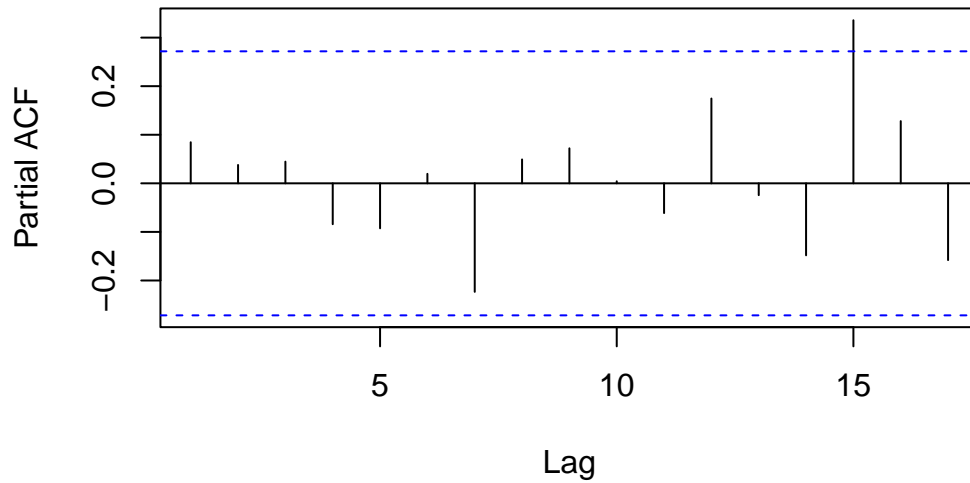
Series cpi_urban$CPI_National

```
acf(cpi_urban$MoM_pct,na.action = na.pass)
```

Series cpi_urban$MoM_pct


```
pacf(cpi_urban$MoM_pct,na.action = na.pass)
```

Series cpi_urban$MoM_pct


```
cpi_urban
```

```
# A tibble: 52 x 9
   Date                CPI_National CPI_U~1 CPI_U~2   WPI   SPI     ...7 MoM_pct
   <dttm>                     <dbl>   <dbl>   <dbl> <dbl> <dbl>    <dbl>   <dbl>
 1 2016-07-01 00:00:00         103.    103.    103.  103.  98.4 NA       NA
 2 2016-08-01 00:00:00         103.    103.    103.  103.  98.7  0.00422  0.422
 3 2016-09-01 00:00:00         104.    104.    104.  103.  99.4  0.00931  0.931
 4 2016-10-01 00:00:00         105.    104.    105.  103. 100.   0.00474  0.474
 5 2016-11-01 00:00:00         104.    104.    103.  104.  99.3 -0.00581 -0.581
 6 2016-12-01 00:00:00         105.    105.    103.  104.  98.6  0.00434  0.434
 7 2017-01-01 00:00:00         105.    105.    103.  105.  99.6  0.00484  0.484
 8 2017-02-01 00:00:00         106.    106.    106.  106. 102.   0.0105   1.05
 9 2017-03-01 00:00:00         107.    107.    107.  106. 102.   0.00721  0.721
10 2017-04-01 00:00:00         106.    107.    106.  106. 101.  -0.00516 -0.516
# ... with 42 more rows, 1 more variable: pos <lgl>, and abbreviated variable
#   names 1: CPI_Urban, 2: CPI_Urban_Food
# i Use `print(n = ...)` to see more rows, and `colnames()` to see all variable names
```

```r
cpi_urban<-cpi_urban %>% mutate(YoY_pct=(CPI_National/lag(CPI_National,12)-1)*100)
cpi_urban<-cpi_urban %>% mutate(pos=YoY_pct>=0)
```

```
cpi_urban
```

```
# A tibble: 52 x 10
   Date                CPI_National CPI_U~1 CPI_U~2   WPI   SPI      ...7 MoM_pct
   <dttm>                     <dbl>   <dbl>   <dbl> <dbl> <dbl>     <dbl>   <dbl>
 1 2016-07-01 00:00:00         103.    103.    103.  103.  98.4 NA         NA
 2 2016-08-01 00:00:00         103.    103.    103.  103.  98.7  0.00422    0.422
 3 2016-09-01 00:00:00         104.    104.    104.  103.  99.4  0.00931    0.931
 4 2016-10-01 00:00:00         105.    104.    105.  103. 100.   0.00474    0.474
 5 2016-11-01 00:00:00         104.    104.    103.  104.  99.3 -0.00581   -0.581
 6 2016-12-01 00:00:00         105.    105.    103.  104.  98.6  0.00434    0.434
 7 2017-01-01 00:00:00         105.    105.    103.  105.  99.6  0.00484    0.484
 8 2017-02-01 00:00:00         106.    106.    106.  106. 102.   0.0105     1.05
 9 2017-03-01 00:00:00         107.    107.    107.  106. 102.   0.00721    0.721
10 2017-04-01 00:00:00         106.    107.    106.  106. 101.  -0.00516   -0.516
# ... with 42 more rows, 2 more variables: pos <lgl>, YoY_pct <dbl>, and
#   abbreviated variable names 1: CPI_Urban, 2: CPI_Urban_Food
# i Use `print(n = ...)` to see more rows, and `colnames()` to see all variable names
```

```
ggplot(cpi_urban)+aes(x=Date, YoY_pct, fill=pos)+geom_col(position = "identity",  size = 0
    scale_fill_manual(values = c("Green", "Grey"), guide = FALSE)
```

```
Warning: Removed 12 rows containing missing values (geom_col).
```

```
Warning: It is deprecated to specify `guide = FALSE` to remove a guide. Please
use `guide = "none"` instead.
```