Historical Time Series Analysis

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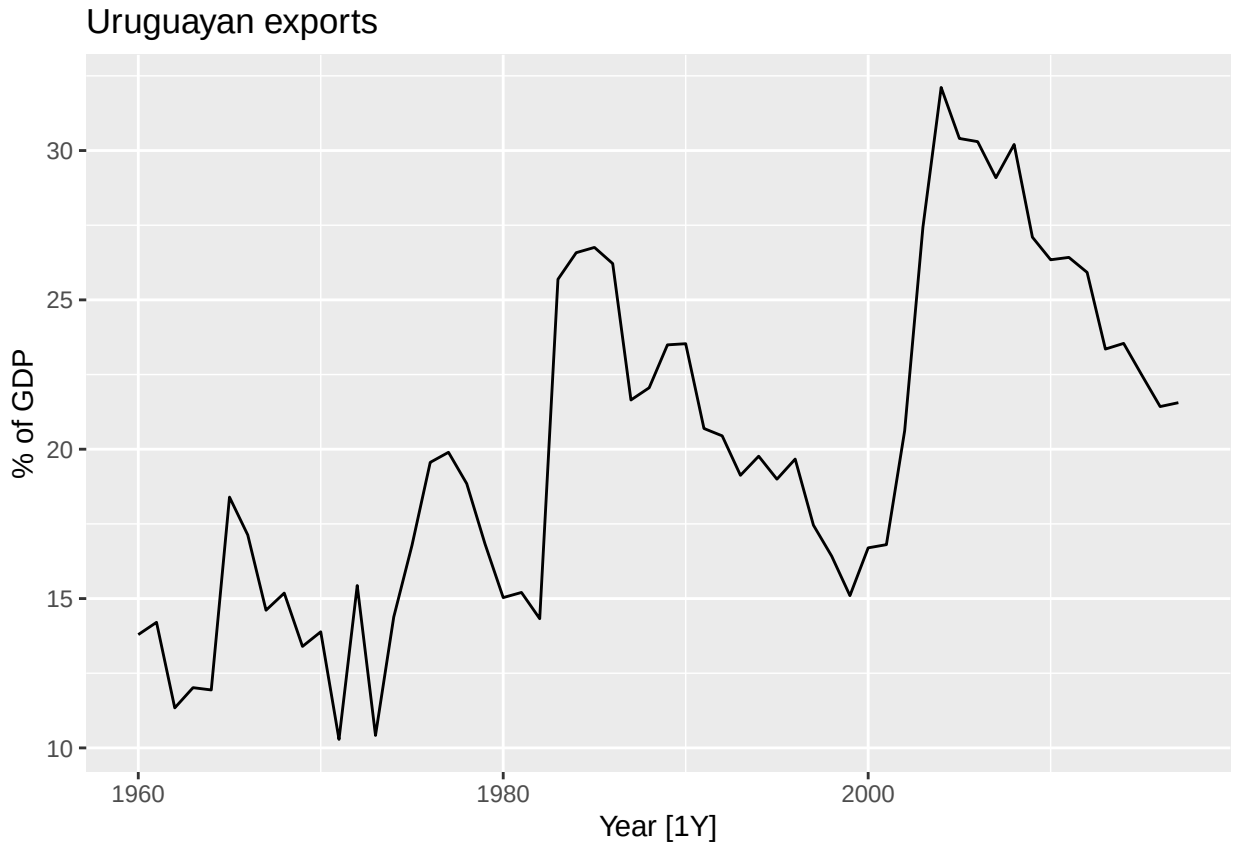
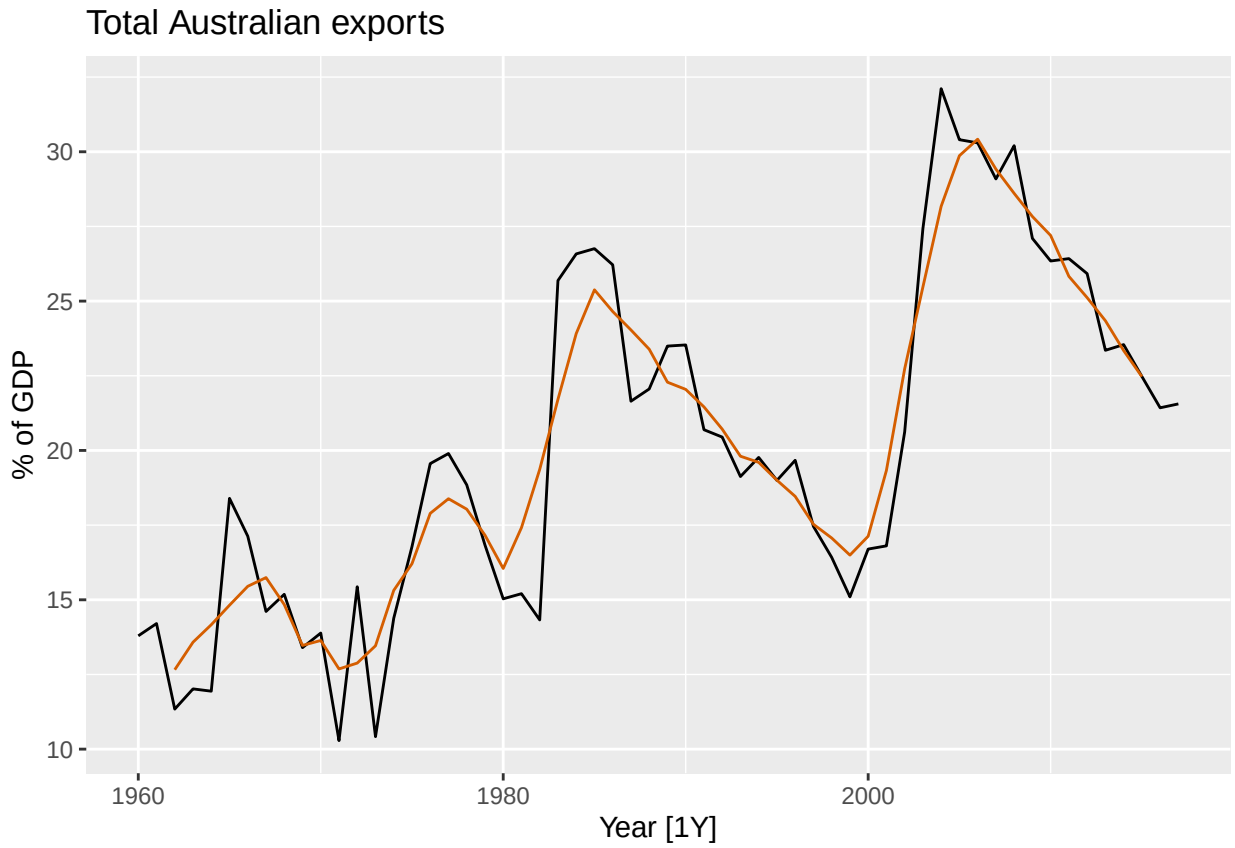
In this small example I will use time series analysis, from the perspective of cliometry (history + economy + econometrics) to understand how Uruguay's Exports behaved from 1960 to 2017, and what would be its projection with the information that was had in 2017.

```
library(fpp3)

global_economy %>%
filter(Code == "URY") %>%
autoplot(Exports) +
labs(y = "% of GDP", title = "Uruguayan exports")
```



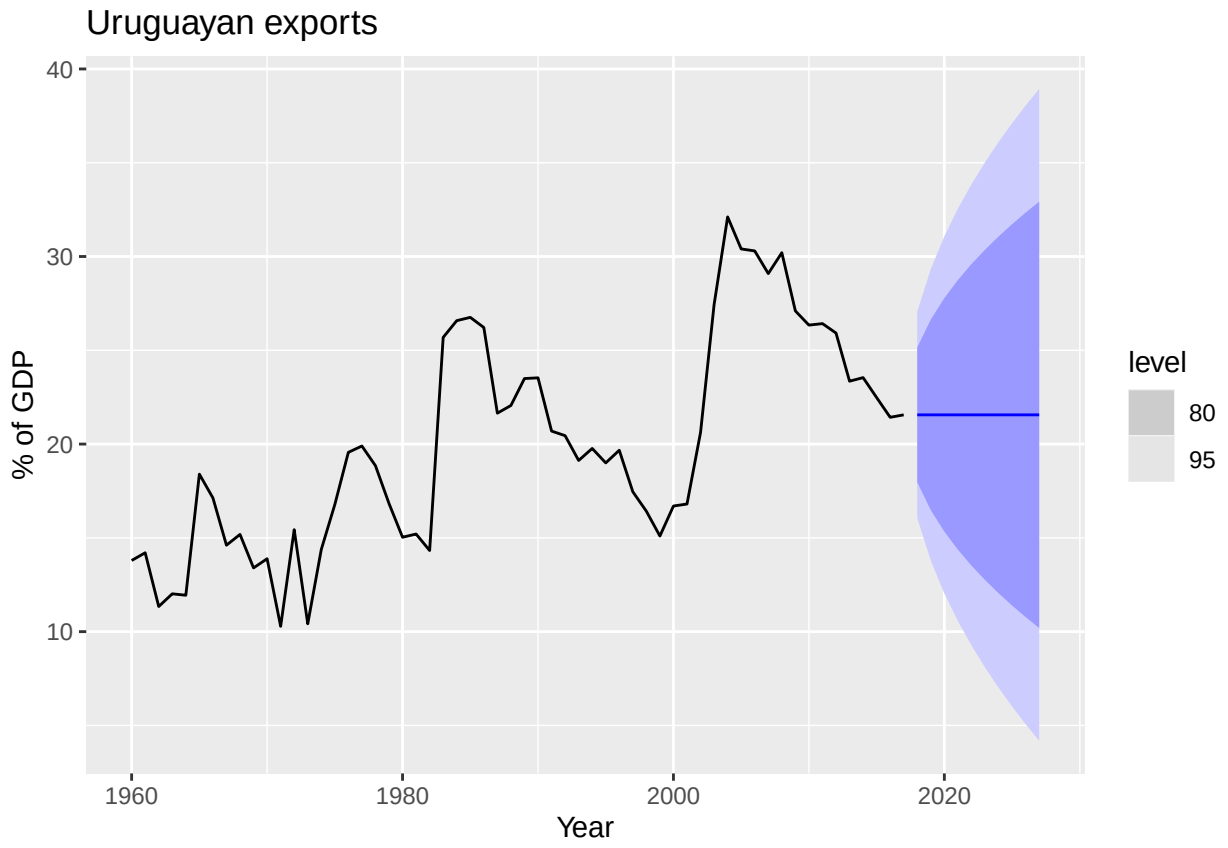
```
uy_exports <- global_economy %>%
  filter(Country == "Uruguay") %>%
  mutate(
    `5-MA` = slider::slide_dbl(Exports, mean,
                .before = 2, .after = 2, .complete = TRUE)
  )

uy_exports %>%
  autoplot(Exports) +
  geom_line(aes(y = `5-MA`), colour = "#D55E00") +
  labs(y = "% of GDP",
       title = "Total Australian exports") +
  guides(colour = guide_legend(title = "series"))
```



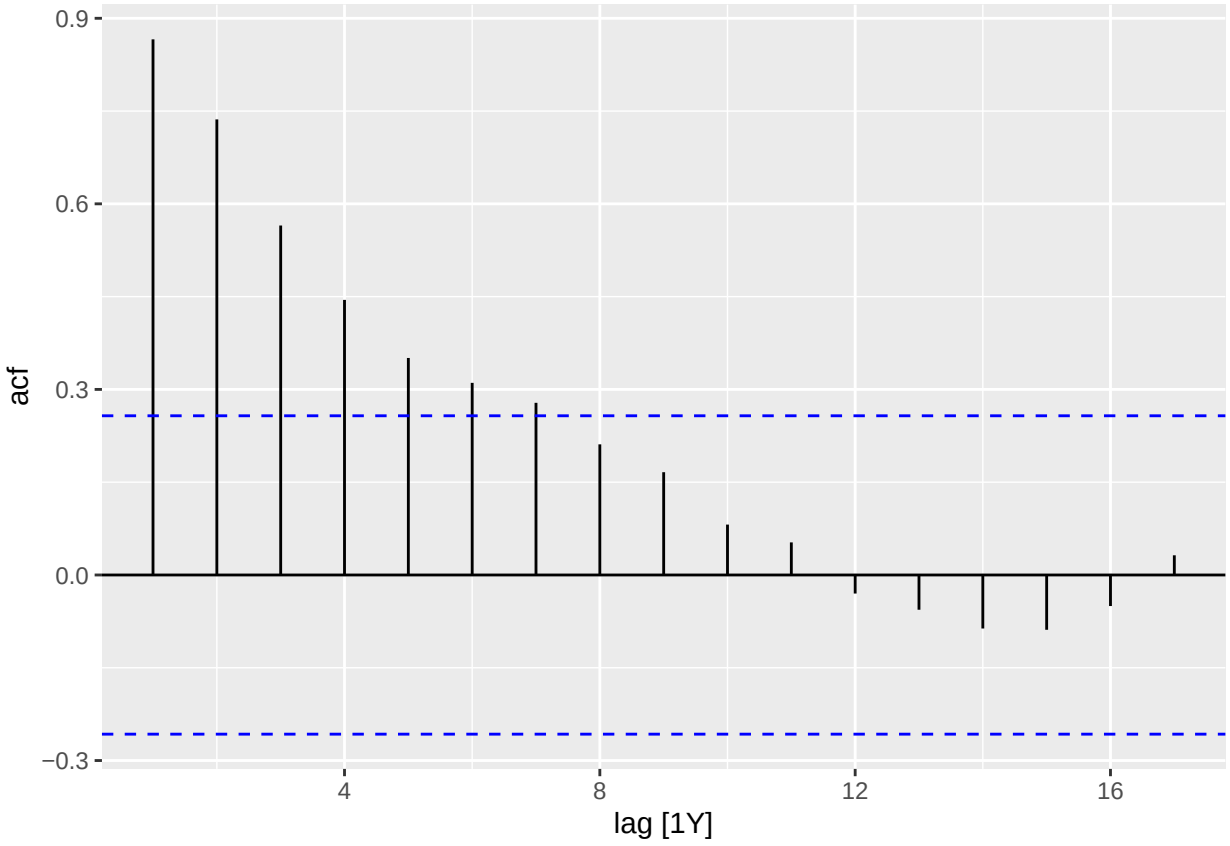

```
fit <- global_economy %>%
  filter(Code == "URY") %>%
  model(ARIMA(Exports))
report(fit)
```

```
## Series: Exports
## Model: ARIMA(0,1,0)
##
## sigma^2 estimated as 7.863:  log likelihood=-139.65
## AIC=281.3   AICc=281.38   BIC=283.35
```

```
fit %>% forecast(h=10) %>%
  autoplot(global_economy) +
  labs(y = "% of GDP", title = "Uruguayan exports")
```



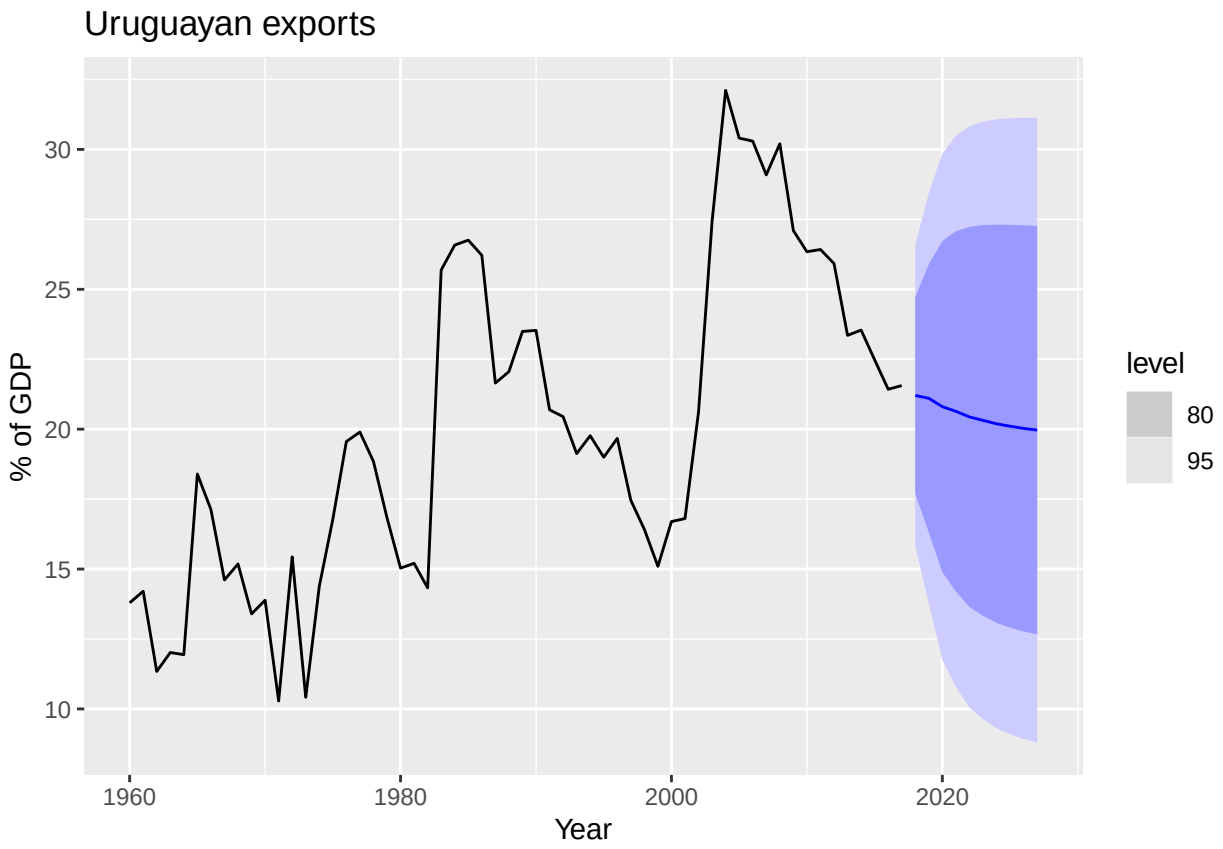

```
global_economy %>%
  filter(Code == "URY") %>%
  ACF(Exports) %>%
  autoplot()
```




```
fit2 <- global_economy %>%
  filter(Code == "URY") %>%
  model(ARIMA(Exports ~ pdq(4,0,0)))
report(fit2)
```

```
## Series: Exports
## Model: ARIMA(4,0,0) w/ mean
##
## Coefficients:
##          ar1     ar2      ar3     ar4  constant
##       0.9277  0.1270  -0.3131  0.1133    2.8556
## s.e.  0.1285  0.1728   0.1730  0.1301    0.3204
##
## sigma^2 estimated as 7.521:  log likelihood=-139.01
## AIC=290.01   AICc=291.66   BIC=302.38
```

```
fit2 %>% forecast(h=10) %>%
    autoplot(global_economy) +
    labs(y = "% of GDP", title = "Uruguayan exports")
```


Uruguayan exports
% of GDP
30
25
20
15
10
1960
1980
2000
2020
Year
level
80
95