Risk Analysis

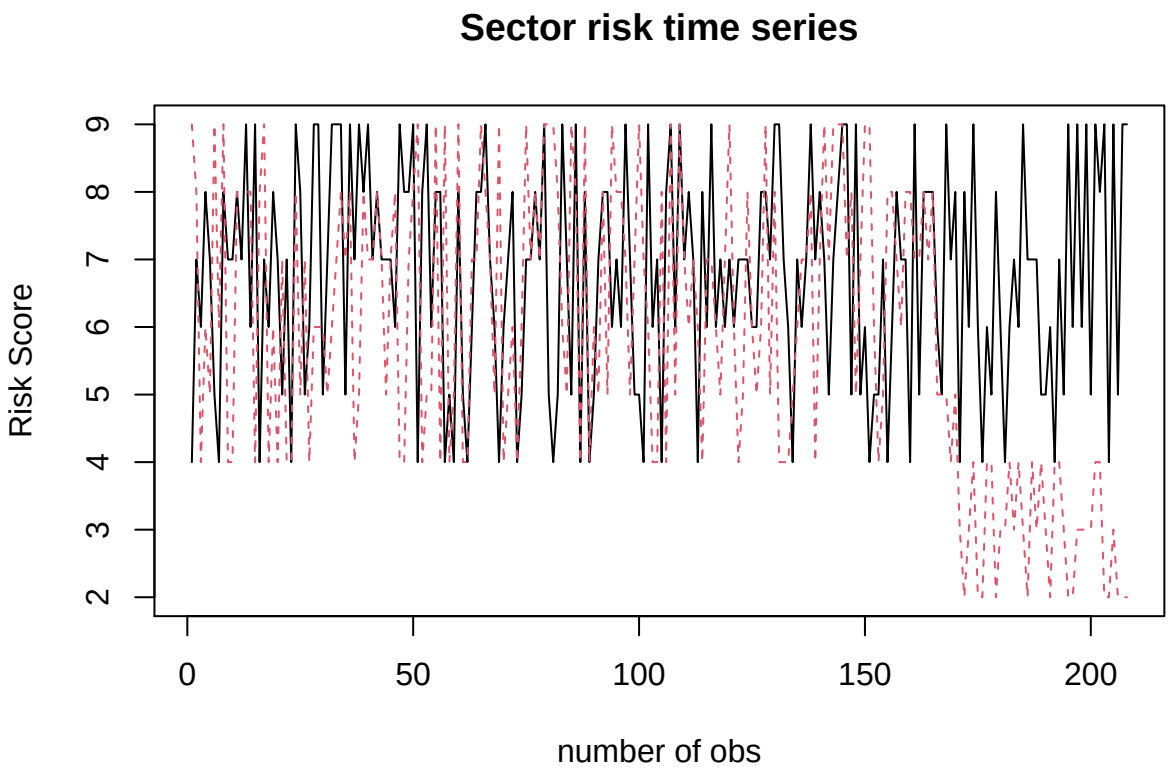
Diego Vallarino

2022-05-09

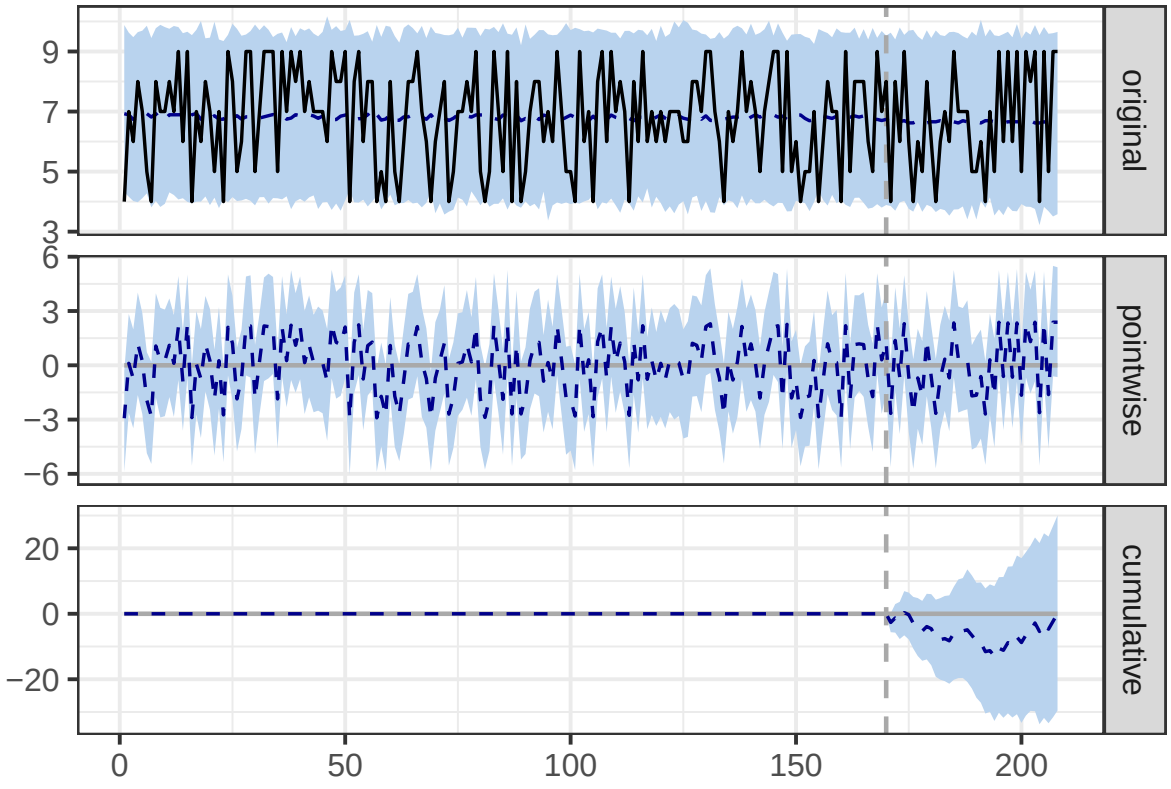
Let's do an exercise with real but anonymous data. Suppose we take a kind of risk score from different companies in the same sector. The score goes from 1 to 100, but we cut them by deciles. That's the first column. Now we take the same data (company scores) in another sector.

```
## # A tibble: 6 x 2
##    ...1  ...2
##   <dbl> <dbl>
## 1     4     9
## 2     7     8
## 3     6     4
## 4     8     6
## 5     7     5
## 6     5     9
```

Then we graph how the evolution of the scores behaved for each company in each sector over time. We see that there is a trend change in one sector *(red)* than in the other sector *(black)*.



We see that on the date there is a specific event that has impacted one sector and another not. To continue with anonymity, we can say that the effect can be: a) the breakdown of a relevant player in the red sector, b) the exposure of the red sector to the war in Ukraine, c) the bottlenecks in the processes of supply chain.



Therefore, the question would be: **are the changes in a), b) or c) causes of the reduction in the scores of the companies, and therefore of the sector?** Here the explanation. Long story, we make it short, **NO**.

```
## Posterior inference {CausalImpact}
##
##                          Average         Cumulative
## Actual                   6.7             253.0
## Prediction (s.d.)        6.7 (0.4)       252.9 (15.1)
## 95% CI                   [5.9, 7.4]      [223.0, 282.6]
##
## Absolute effect (s.d.)   0.0016 (0.4)    0.0610 (15.1)
## 95% CI                   [-0.78, 0.79]   [-29.56, 30.03]
##
## Relative effect (s.d.)   0.024% (6%)     0.024% (6%)
## 95% CI                   [-12%, 12%]     [-12%, 12%]
##
## Posterior tail-area probability p:   0.49353
## Posterior prob. of a causal effect:  51%
##
## For more details, type: summary(impact, "report")

## Analysis report {CausalImpact}
##
##
## During the post-intervention period, the response variable had an average value of approx. 6.66. In
```

```
##
## Summing up the individual data points during the post-intervention period (which can only sometimes
##
## The above results are given in terms of absolute numbers. In relative terms, the response variable s
##
## This means that, although the intervention appears to have caused a positive effect, this effect is
##
## The probability of obtaining this effect by chance is p = 0.494. This means the effect may be spuriou
```