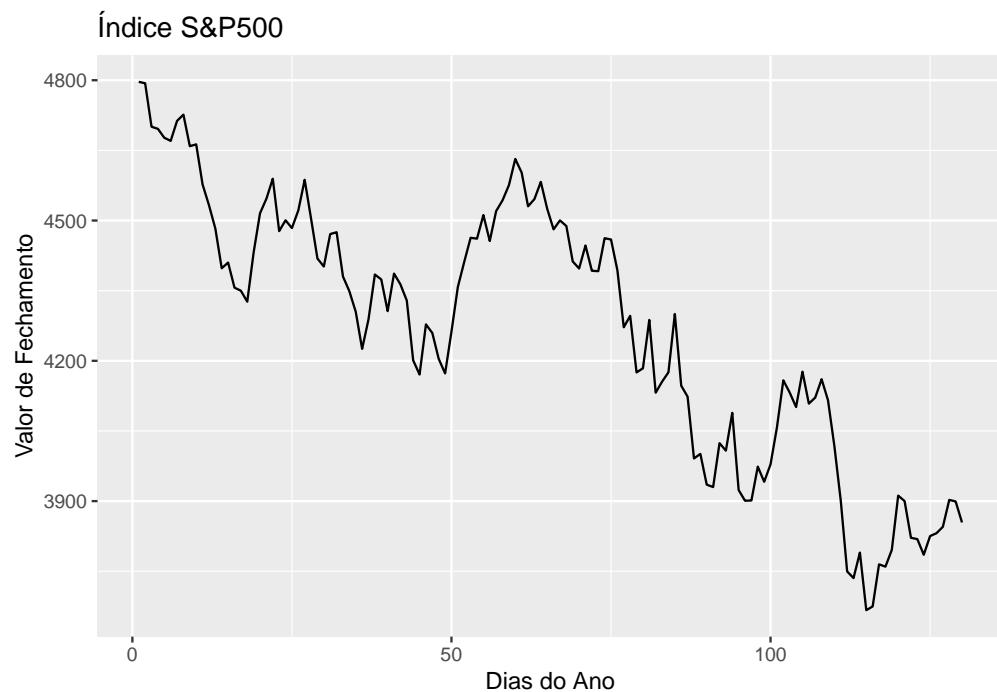


# Prova GED-17

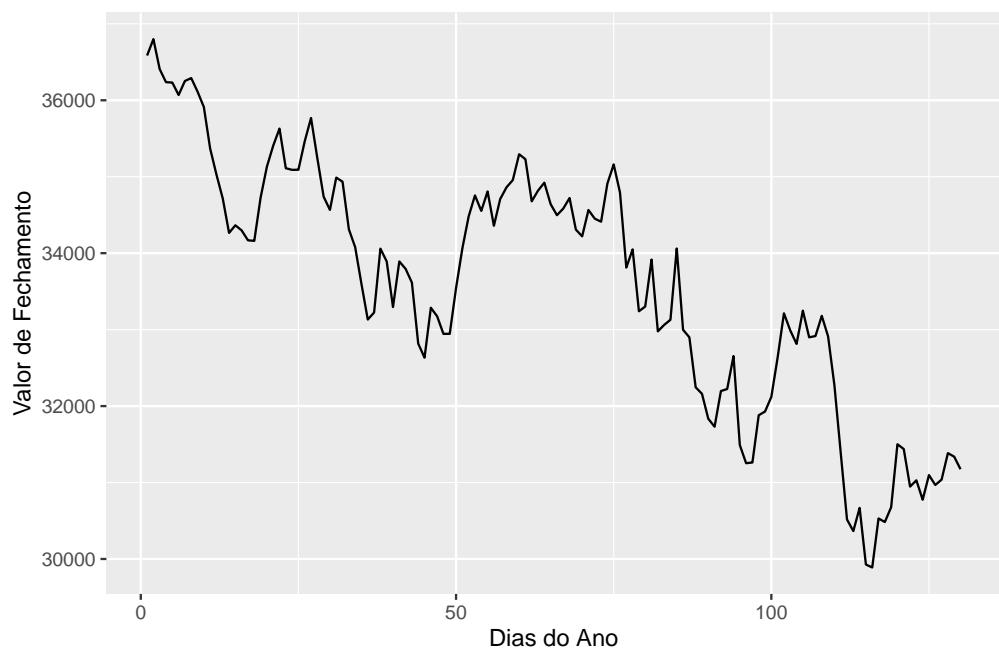
Arthur Stevenson

2022-07-05

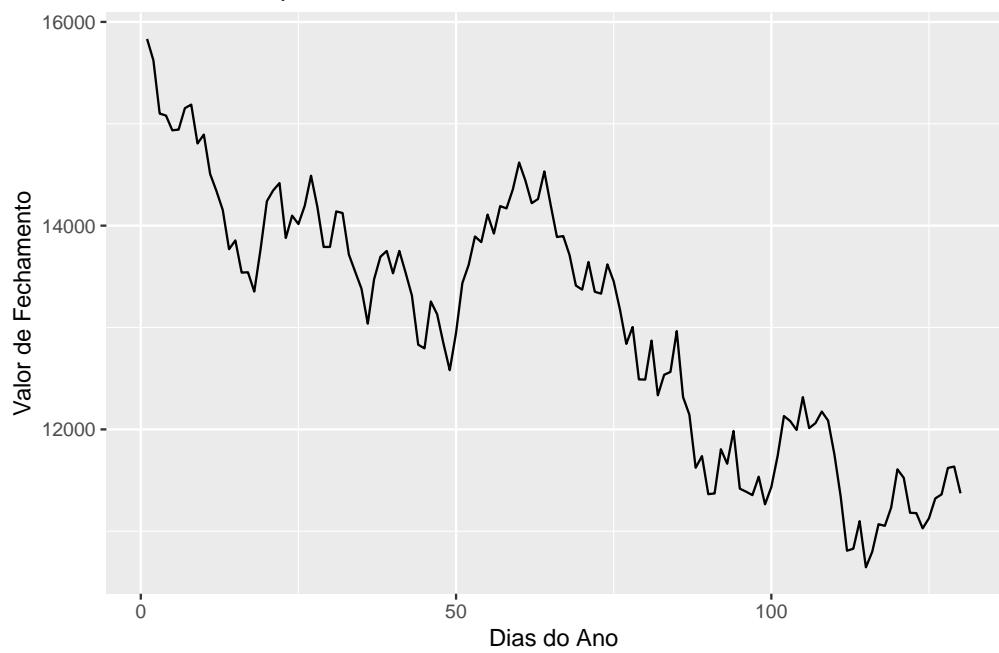
Inicialmente, são fornecidas várias séries temporais, representando os valores de diferentes índices, como o Bovespa, e a cotação de diferentes moedas, como o Dólar. Assim, tratando dos valores de fechamento para essas séries, podemos gerar os seus respectivos plots.



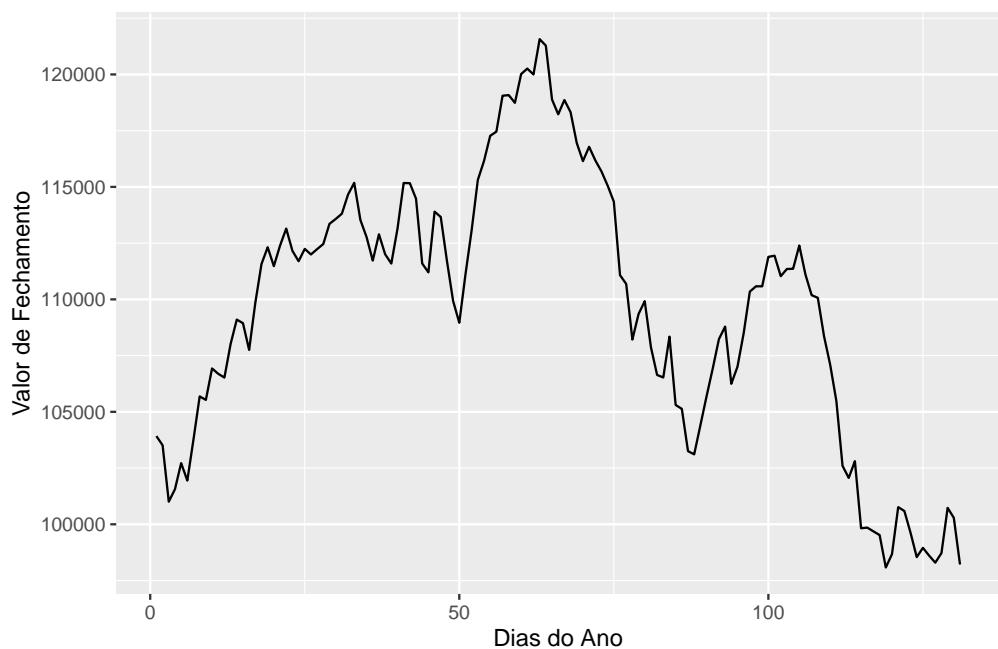
**Índice Dow Jones**



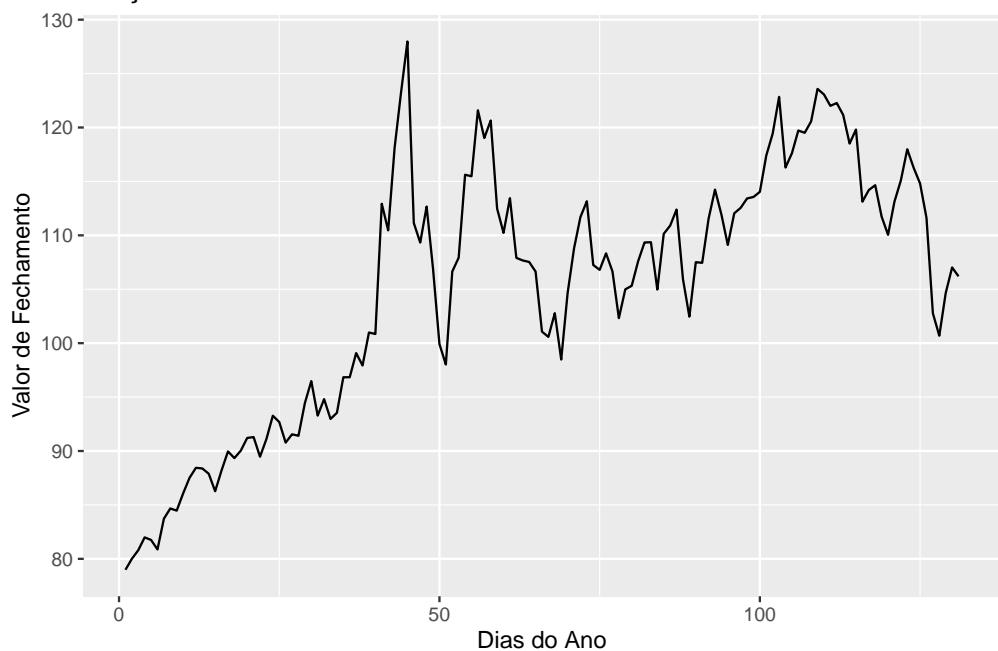
**Índice Nasdaq**

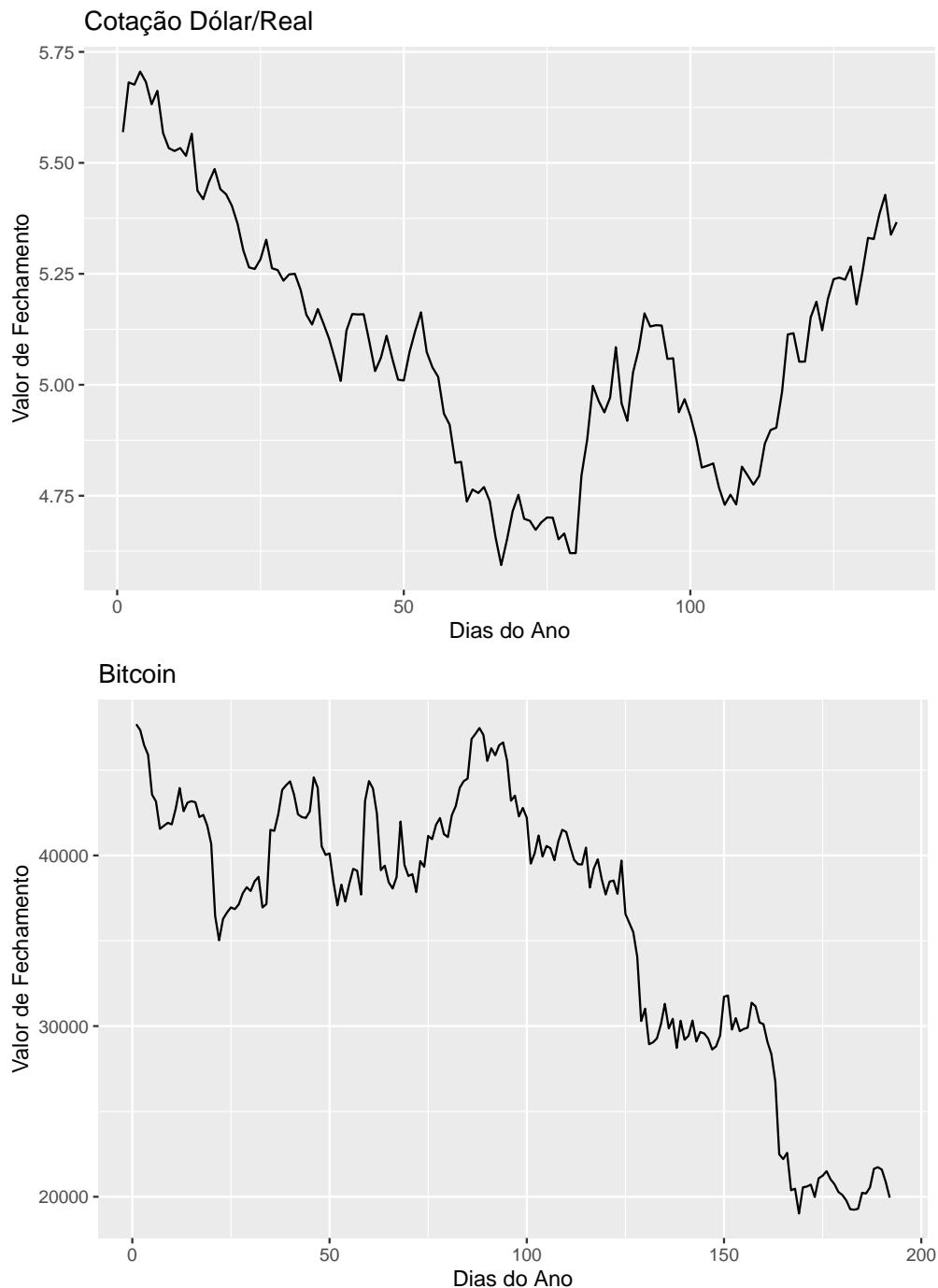


**Índice IBOVESPA**



**Preço do Petróleo Brent**





Em seguida, podemos fazer o teste ADF para as séries temporais originais obtidas.

```
##  
## Augmented Dickey-Fuller Test  
##  
## data: stdpoors.ts  
## Dickey-Fuller = -2.6571, Lag order = 5, p-value = 0.3033  
## alternative hypothesis: stationary  
  
##  
## Augmented Dickey-Fuller Test
```

```

##
## data: dowjones.ts
## Dickey-Fuller = -2.9621, Lag order = 5, p-value = 0.1765
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: nasdaq.ts
## Dickey-Fuller = -2.5921, Lag order = 5, p-value = 0.3304
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: bovespa.ts
## Dickey-Fuller = -2.5755, Lag order = 5, p-value = 0.3372
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: brent.ts
## Dickey-Fuller = -2.4028, Lag order = 5, p-value = 0.409
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: dolar.ts
## Dickey-Fuller = -1.1202, Lag order = 5, p-value = 0.9161
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: bitcoin.ts
## Dickey-Fuller = -1.758, Lag order = 5, p-value = 0.6774
## alternative hypothesis: stationary

```

Com os plots das séries temporais, podemos, então, obter as séries do log, e da diferença do log e, assim realizar o teste ADF novamente.

```

## Warning in adf.test(stdpoors.ts.difflog): p-value smaller than printed p-value

##
## Augmented Dickey-Fuller Test
##
## data: stdpoors.ts.difflog
## Dickey-Fuller = -5.0284, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

## Warning in adf.test(dowjones.ts.difflog): p-value smaller than printed p-value

##
## Augmented Dickey-Fuller Test
##
## data: dowjones.ts.difflog
## Dickey-Fuller = -5.0185, Lag order = 5, p-value = 0.01

```

```

## alternative hypothesis: stationary
## Warning in adf.test(nasdaq.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data: nasdaq.ts.difflog
## Dickey-Fuller = -5.2601, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

##
## Augmented Dickey-Fuller Test
##
## data: bovespa.ts.difflog
## Dickey-Fuller = -3.9145, Lag order = 5, p-value = 0.01564
## alternative hypothesis: stationary

## Warning in adf.test(brent.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data: brent.ts.difflog
## Dickey-Fuller = -6.2331, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

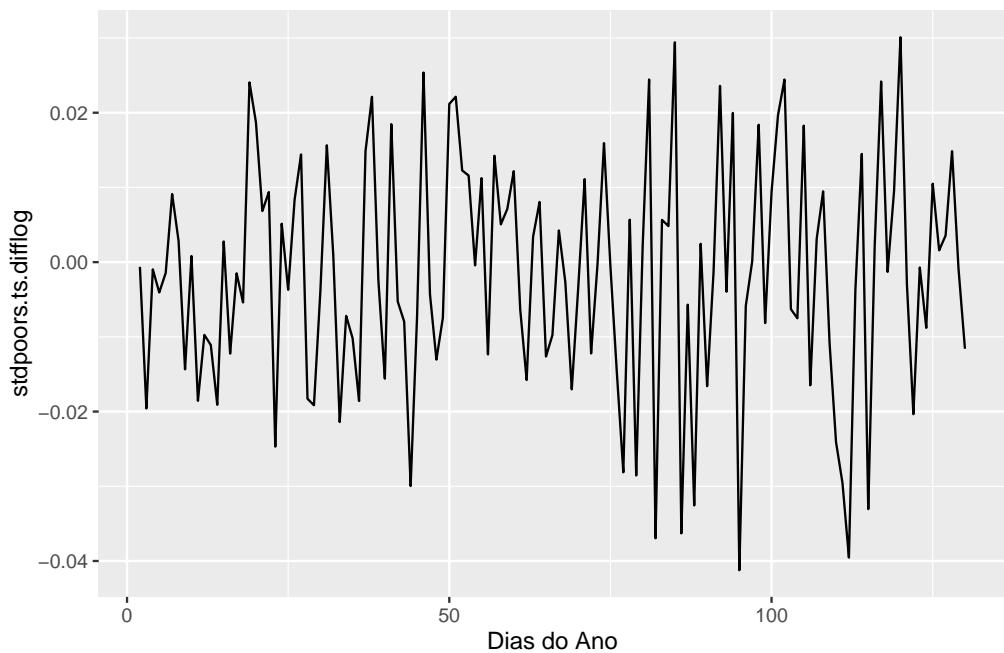
## Warning in adf.test(dolar.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data: dolar.ts.difflog
## Dickey-Fuller = -4.2795, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

## Warning in adf.test(bitcoin.ts.difflog): p-value smaller than printed p-value
##
## Augmented Dickey-Fuller Test
##
## data: bitcoin.ts.difflog
## Dickey-Fuller = -5.6309, Lag order = 5, p-value = 0.01
## alternative hypothesis: stationary

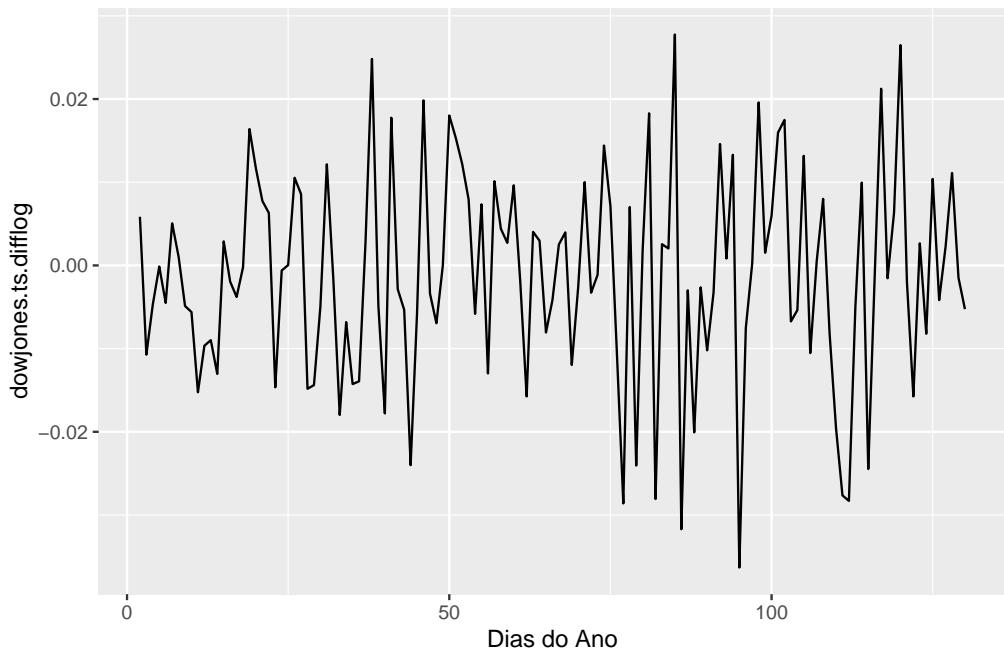
```

Assim, com os resultados do teste ADF, podemos então realizar o plot das séries da diferença do logaritmo.

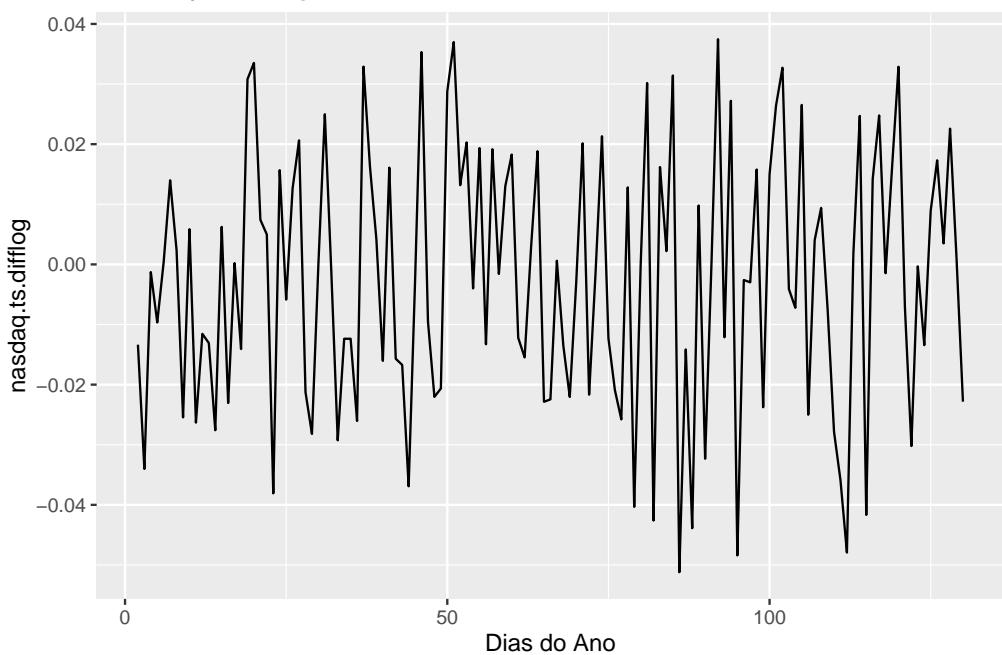
Diferença do Logaritmo de S&P500



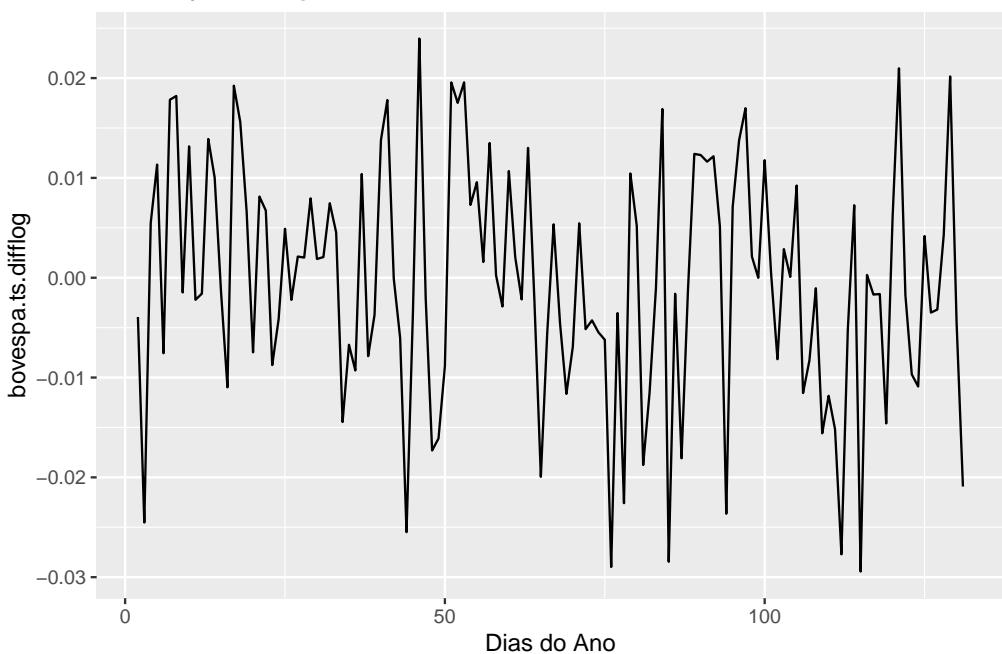
Diferença do Logaritmo de Dow Jones



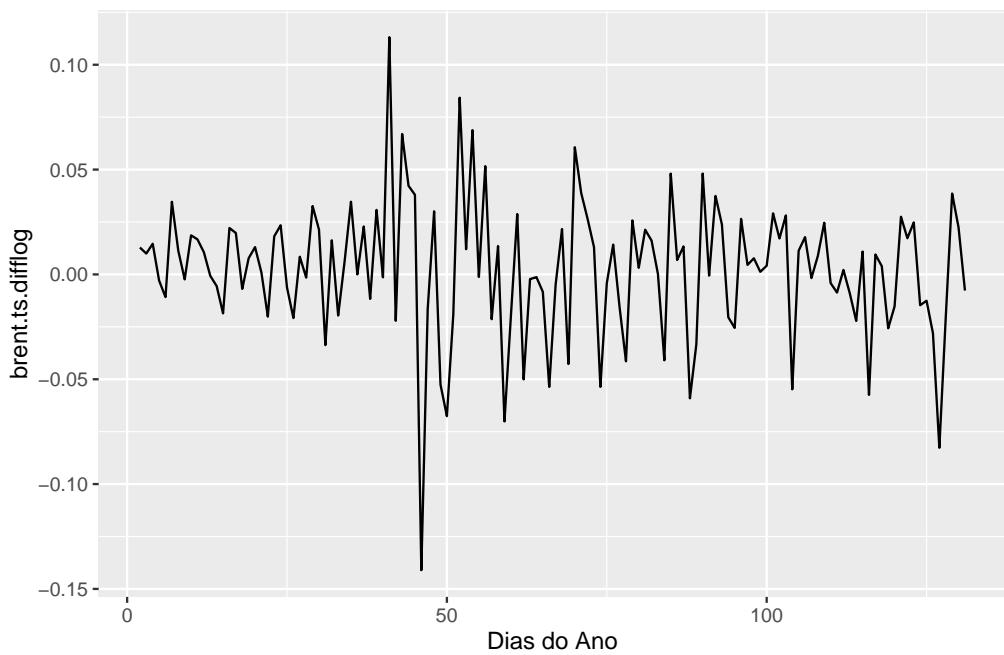
Diferença do Logaritmo de Nasdaq



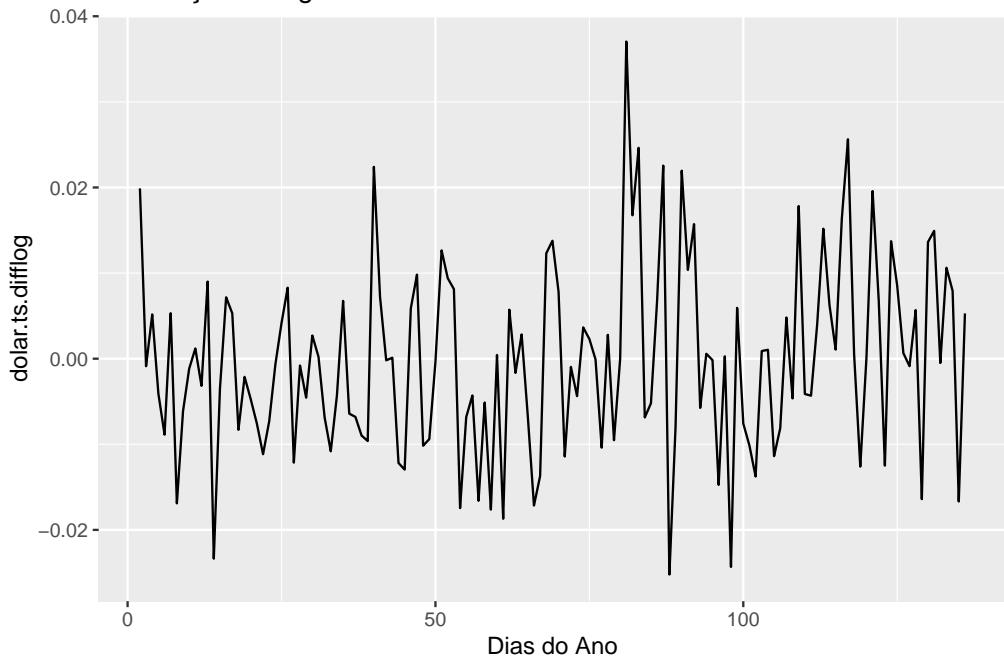
Diferença do Logaritmo de IBOVESPA



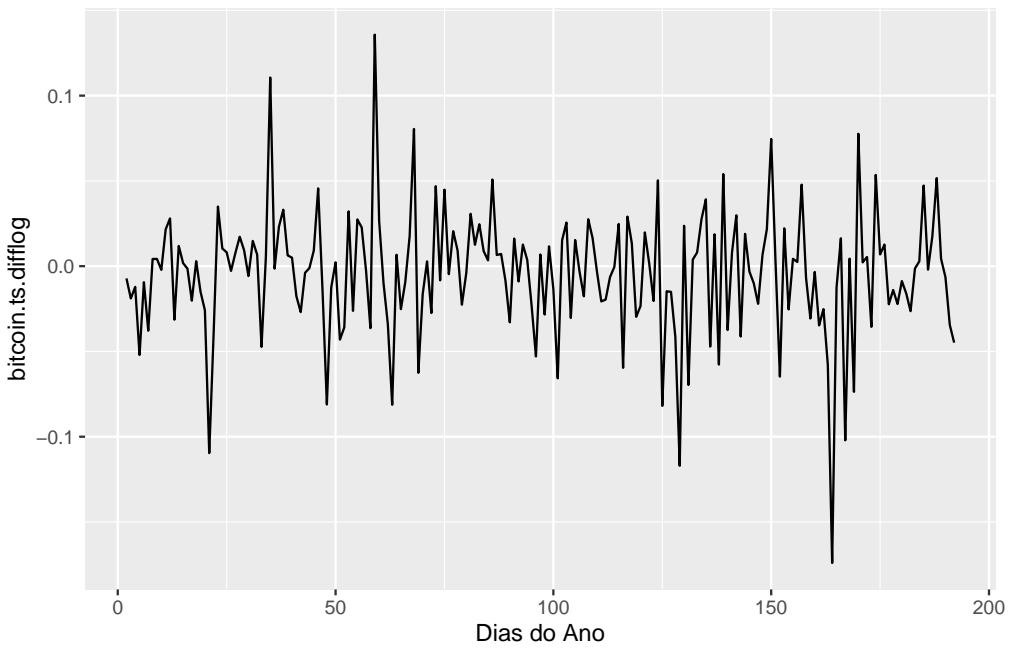
Diferença do Logaritmo de Petróleo Brent



Diferença do Logaritmo de Dólar

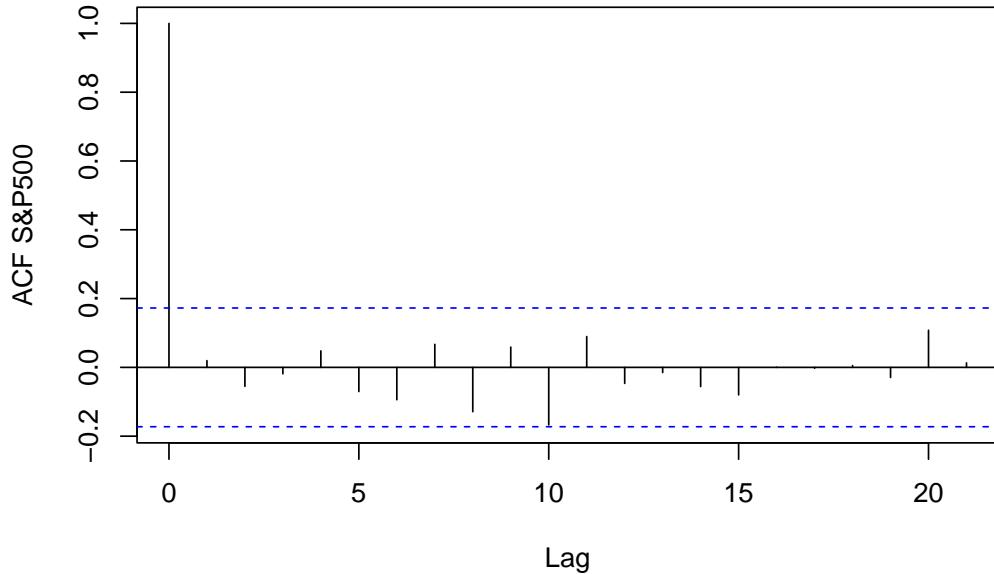


Diferença do Logaritmo de Bitcoin

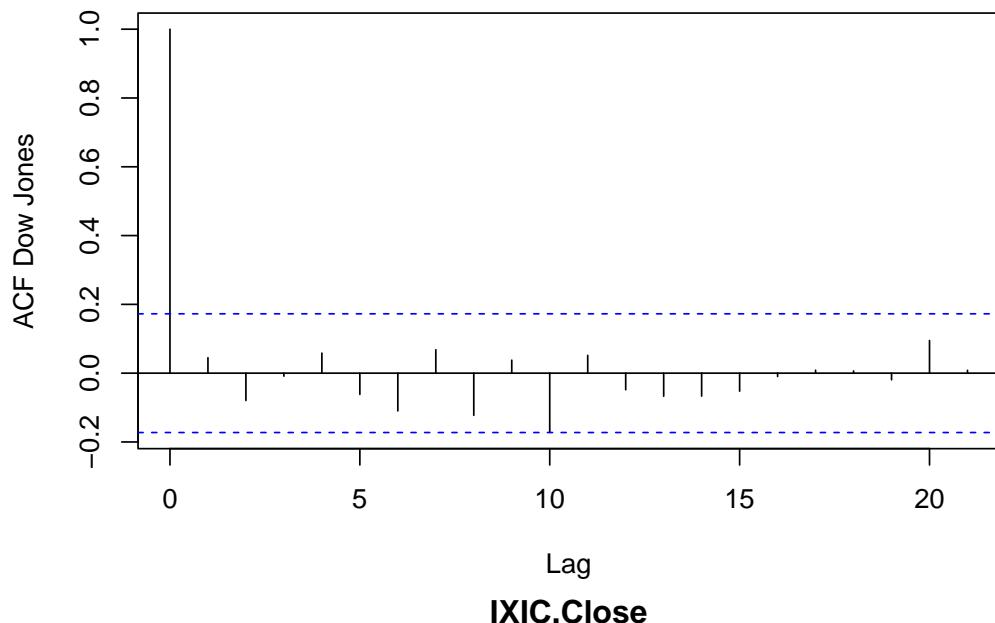


Feitos os plots das diferenças dos logaritmos, podemos, então, construir o correograma da série da diferença do logaritmo de cada uma das séries criadas.

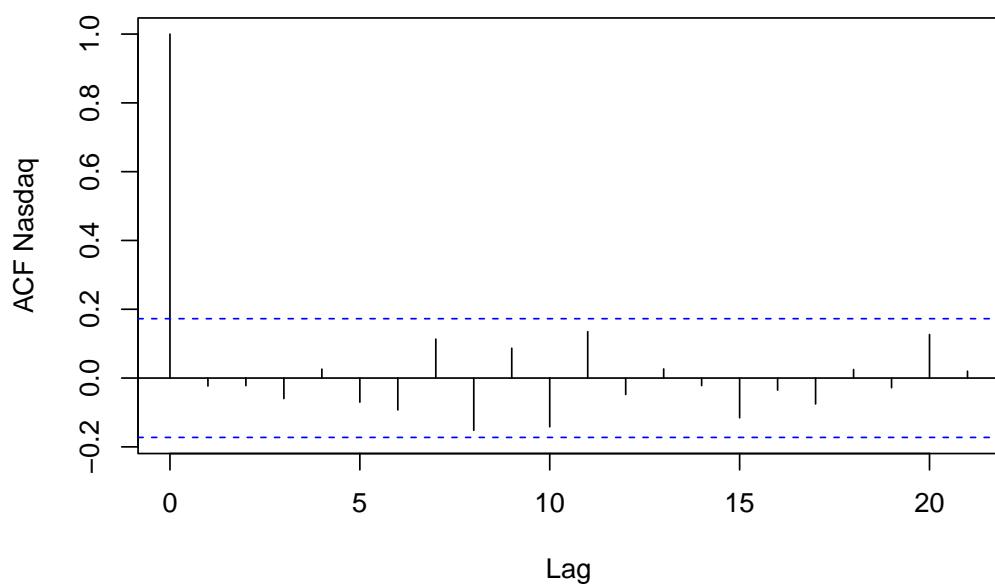
### GSPC.Close



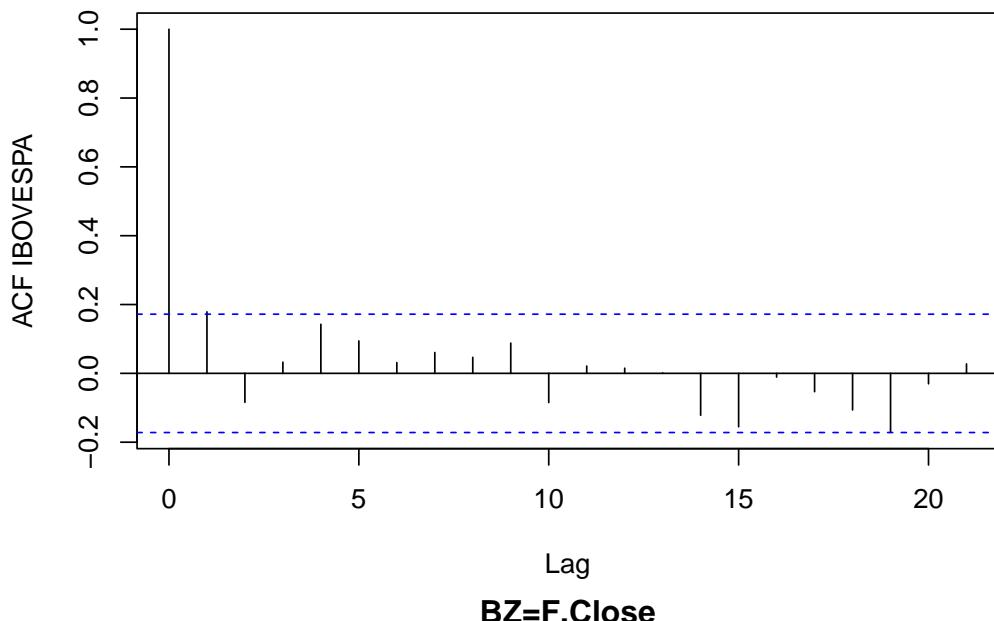
**DJI.Close**



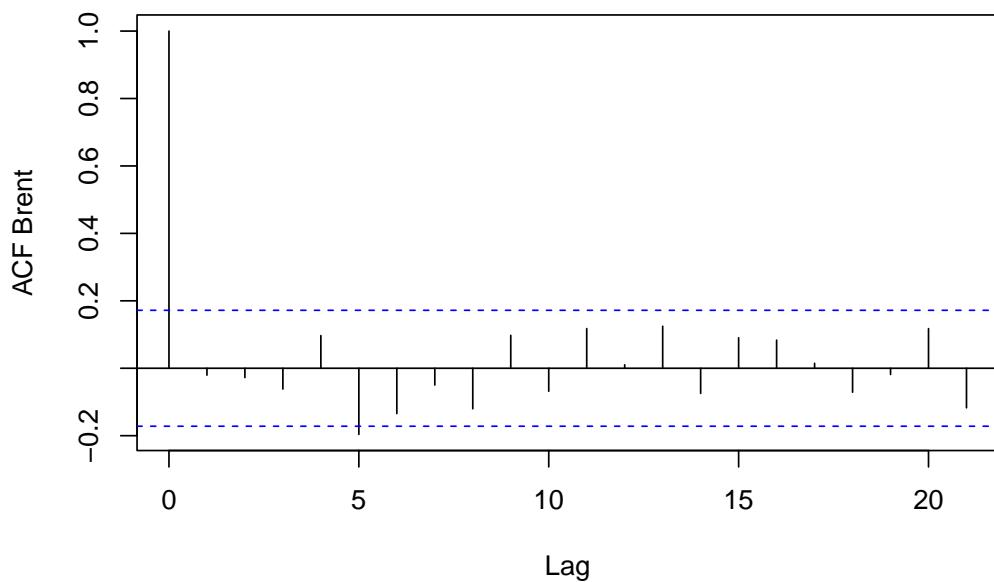
**IXIC.Close**



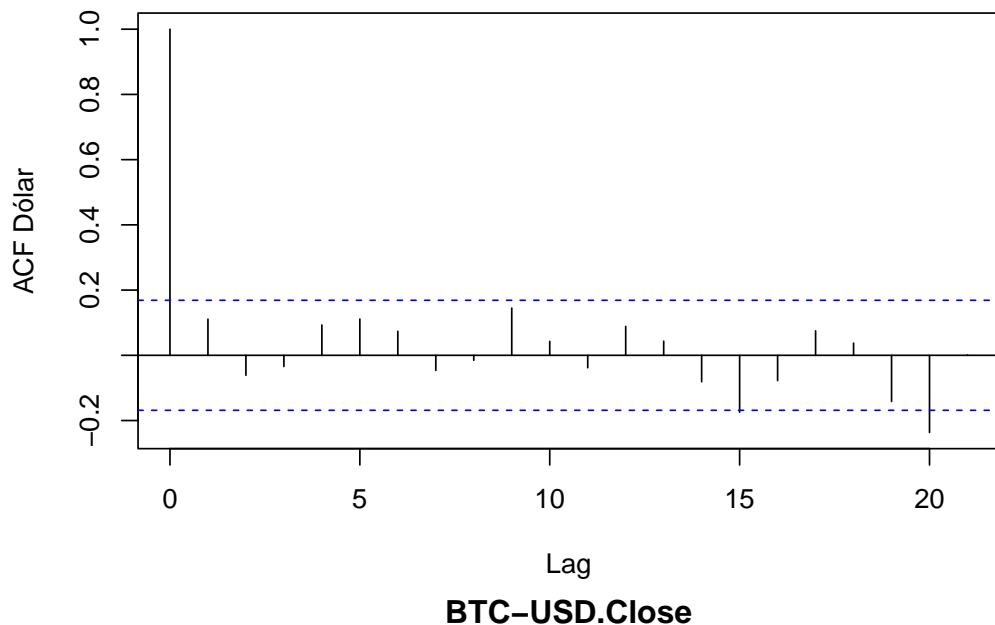
**BVSP.Close**



**BZ=F.Close**



**BRL=X.Close**



**BTC-USD.Close**

