# INTRODUCCIÓN A LA ESTABILIDAD FINANCIERA

LUIS ORTIZ-CEVALLOS

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# Contents

# Chapter 1

# La importancia en la medición del riesgo sistémico

## 1.1 El mapa de riesgos

### 1.1.1 Aplicación para una series

El caso de las remesas en El Salvador.

Para conocer mejor esta metodología por favor revisar Ortiz (2019)

```
library("zoo")
library("xts")
library("dplyr")
library("ggplot2")
library("ggrepel")
library("ggthemes")
REMESAS<-as.xts(read.zoo("REMESAS.csv", index.column = 1, sep = ";", header=TRUE, format = "%d/%m
SV<-data.frame(date=index(REMESAS), coredata(REMESAS))
SV          <-mutate(SV, SLV_R  =  SLV/(IPC_SV/100))
SV          <-mutate(SV, DIFF   = SLV_R-lag(SLV_R, n=12))
SV          <-mutate(SV, G1     = (DIFF/(lag(SLV_R, n=12)))*100)
BASE<-data.frame(date=SV$date, coredata(SV$G1))
colnames(BASE)<- c("date", "SV")
inicial       <-"2002-01-01"
finalista     <-"2021-07-01"
Data          <- filter(BASE, date>="2002-01-01"&date<="2021-07-01")
dates         <- Data[,'date']
```

```
LARGO         <- length(dates)
missing.color <- "white"
colours1T     <- c('forestgreen','yellow','red3')
DIR           <- -1
VARIABLES     <- colnames(Data)
VAR           <- Data[, VARIABLES[2]]
VAR.DIR       <- VAR*DIR
EMP           <- ecdf(VAR.DIR)
QUANT         <- EMP(VAR.DIR)
z             <- QUANT
zz            <- z
assign(paste0(VARIABLES[2],'.s.lim'), max(VAR,na.rm=T)+sd(VAR.DIR,na.rm=T)/2)
assign(paste0(VARIABLES[2],'.i.lim'), min(VAR,na.rm=T)-sd(VAR.DIR,na.rm=T)/2)
dates.s   <- Data$date[1]
dates     <- Data$date
for (t in seq_along(dates)[-1]) {
  mean.day <- dates[t-1] + ((dates[t]-dates[t-1])/2)
  dates.s <- c(dates.s, mean.day, dates[t])
}
dates.s <- c(dates.s[1]-45, dates.s, dates.s[length(dates.s)]+45)
assign(paste0(VARIABLES[2]), VAR.DIR)
for (t in seq_along(dates)[-length(dates)]) {
  pos <- which(dates[t]==dates.s)
  assign(paste0(VARIABLES[2],'.t.',t),dates.s[pos+c(-1,0,1)])
  if (is.na(zz[t])) {
    assign(paste0(VARIABLES[2],'.c.',t),rgb(matrix(col2rgb(missing.color),1,3)/255))
  } else {
    assign(paste0(VARIABLES[2],'.c.',t),rgb(colorRamp(colours1T)(z[t])/255))
  }
}
DATOS<-select(Data, date, SV)
DATOS$date<-as.Date(DATOS$date)
DATOS$MAX<-zz
DATOS$INICIO<-as.Date(DATOS$date)-46
DATOS$FINAL <-as.Date(DATOS$date)+46
for (t in seq_along(dates)[c(-LARGO)]) {
  DATOS$COLOR[t]<-get(paste0(VARIABLES[2],'.c.',t))
}
DATOS$COLOR[LARGO]<-get(paste0(VARIABLES[2],'.c.',LARGO-1))
P_2  <- paste0('+geom_rect(data = DATOS,aes(xmin =as.Date(\'',DATOS$INICIO[1],'\'), xma
for (j in 2:LARGO){
  P_2  <- paste0(P_2, '+geom_rect(data = DATOS,aes(xmin =as.Date(\'',DATOS$INICIO[j],'\'
}

P_1<-"ggplot(data = DATOS, aes(x = date, y=SV))+labs(y=\'\', x=\'\')"
```

```
P  <-paste0(P_1,P_2)
PS <- eval(parse(text=P))
PS <-PS+geom_line(size = 2, color = "blue")+
  ggtitle("Tasa de crecimiento anual de las remesas en términos reales y mapa de riesgo")+
  geom_hline(aes(yintercept=0), color="black",size = 1.0, linetype = "dashed")
PS <-PS+theme_classic()+theme(
  axis.line.x = element_line(colour = "black", size = 1.0),
  axis.line.y = element_line(colour = "black", size = 1.0),
  axis.line.y.right = element_blank(),
  axis.title.y = element_text(size=12),
  legend.title = element_blank(),
  legend.text  = element_blank(),
  plot.title   = element_text(size=10, hjust = 0.5, face="bold"),
  panel.grid.major = element_line(size = 0.5,
                                  linetype = 'solid', colour = "#EAEAF2"),
  axis.text.x = element_text( color = "black", size = 8),
  axis.text.y = element_text( color = "black", size = 8)
)
PS <-PS+scale_x_date(date_breaks = "24 month", date_labels = "%Y")+
  scale_y_continuous(breaks = seq(-50,50,by=5), limits = c(-50, 50))+
  coord_cartesian(xlim =  as.Date(c("2002-01-01", "2021-07-15")))
```

```
PS
```