TufteLab

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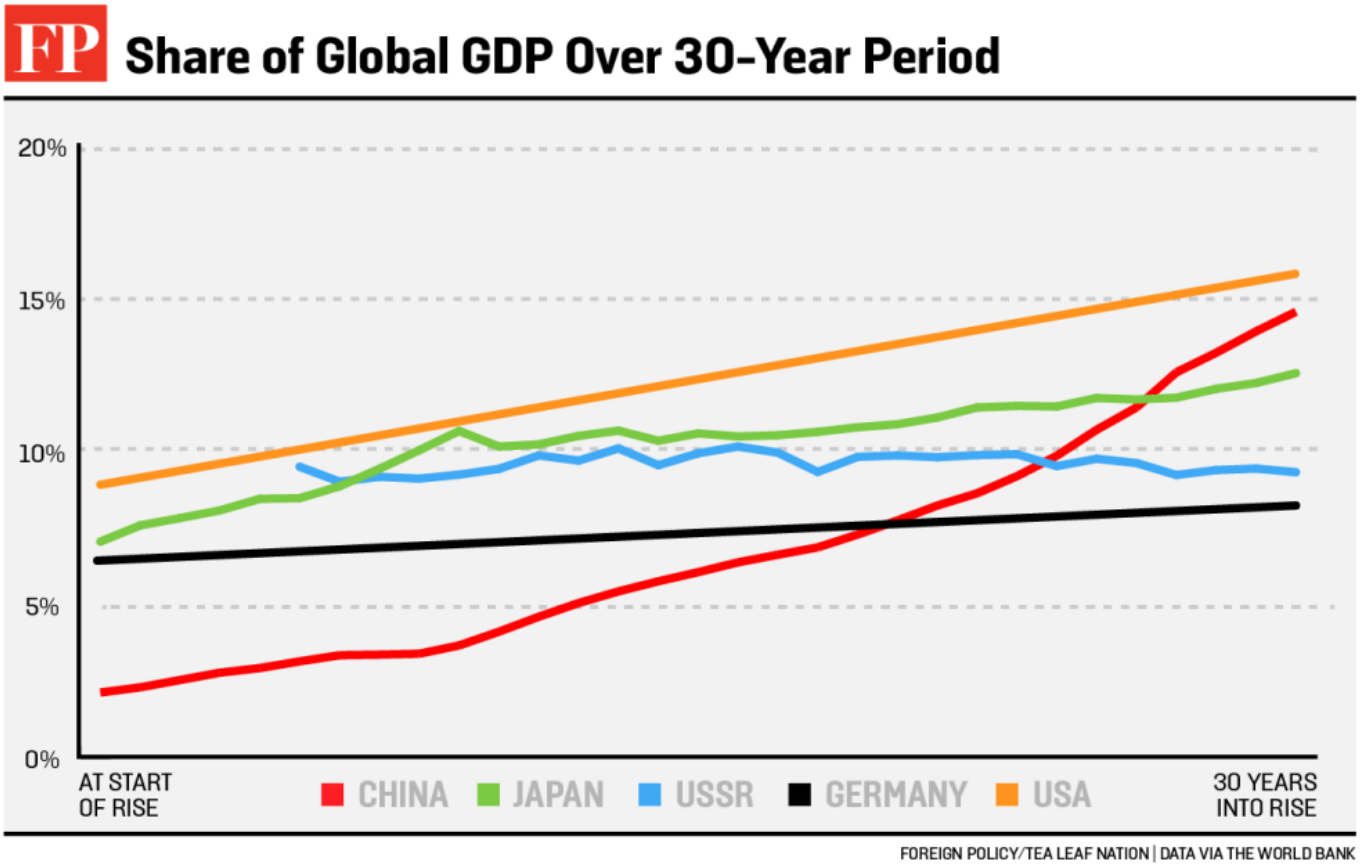
This Lab recreates the graphs included in Foreign Policy's article "Is China the Fastest Rising Power in History" http://foreignpolicy.com/2014/05/16/is-china-the-fastest-rising-power-in-history/#img2 (http://foreignpolicy.com/2014/05/16/is-china-the-fastest-rising-power-in-history/#img2)



While the article considers China's **share of global trade** and **share of global military spending** , "speed is where China stands out. In 30 years of ascent, starting from a low base, it has come farther, faster than any of the other rising powers in the comparison group," when measuring its **share of global GDP**.

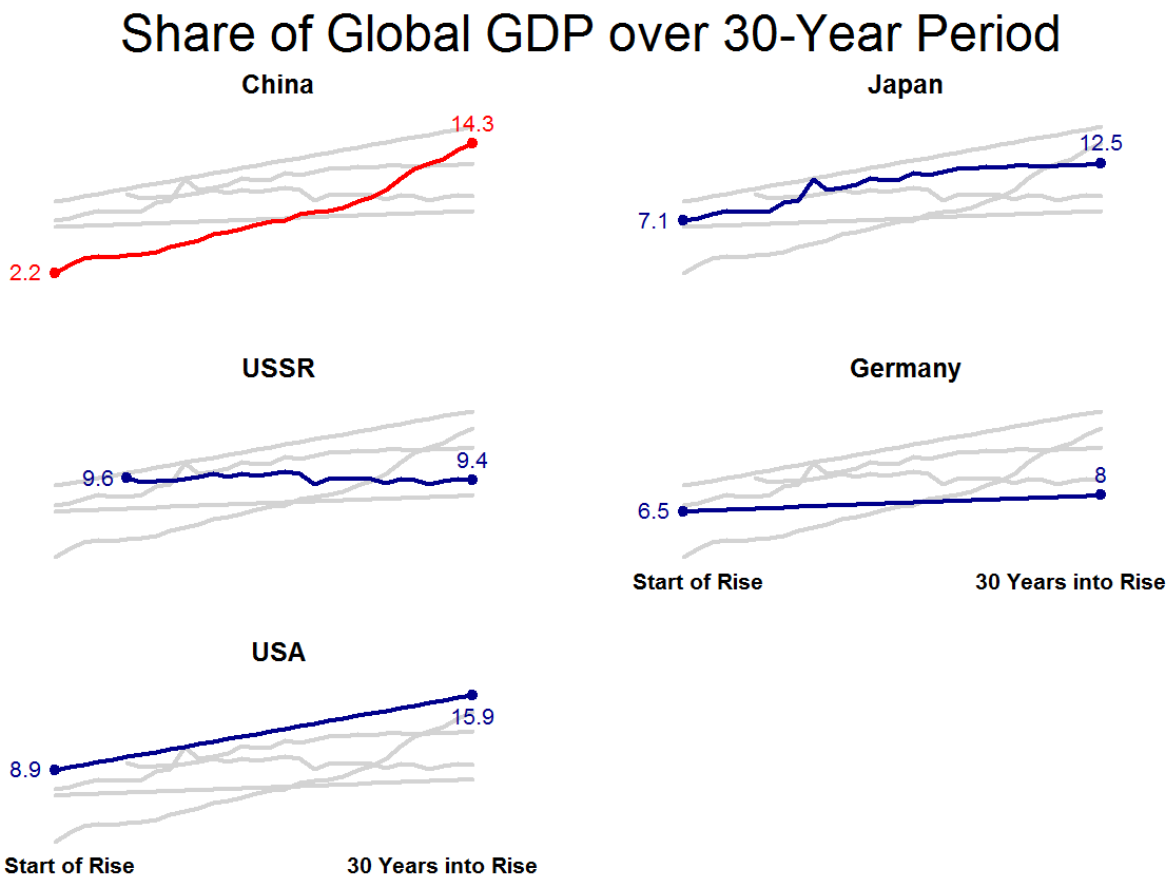
Set Up

```
#SETWD
setwd("C:/Users/snhalbritter/Documents/1. Syracuse/8. Spring 2016/5. Data Driven/8. tuft
e")

#READ IN DATA SET IN TIME SERIES FORMAT
gdp.30 <- read.csv("gdp30.csv")

#READ IN DATA SET IN NORMAL FORMAT
gdp.30.2 <- read.csv("share of global GDP over 30 years.csv")

#REMOVE COLUMNS TO ONLY KEEP COUNTRY, YEAR1, AND YEAR30
gdp.short <- gdp.30.2[,-c(3:30)]

#USSR DATA STARTS YEAR 5, MAKE YEAR5 DATA YEAR1
gdp.short[3,2] <- gdp.30.2[3,7]

#SUBSETS
china <- gdp.30[,1:2]
japan <- gdp.30[,c(1,3)]
ussr <- gdp.30[,c(1,4)]
germany <- gdp.30[,c(1,5)]
usa <- gdp.30[,c(1,6)]

#RENAME
names(gdp.short)[names(gdp.short)=="X"] <- "Country"
names(gdp.short)[names(gdp.short)=="X1"] <- "Year1"
names(gdp.short)[names(gdp.short)=="X30"] <- "Year30"

#REORDER BY SIZE OF CHANGE OVER 30 YEARS
gdp.short$size <- gdp.short$Year30 - gdp.short$Year1
gdp.short <- gdp.short[ order( gdp.short$size, decreasing=T ), ]

country <- gdp.short$Country
gdp.Y1 <- gdp.short$Year1
gdp.Y30 <- gdp.short$Year30
```

Plot 5 Graphs with Country Share of GDP Growth Highlighted

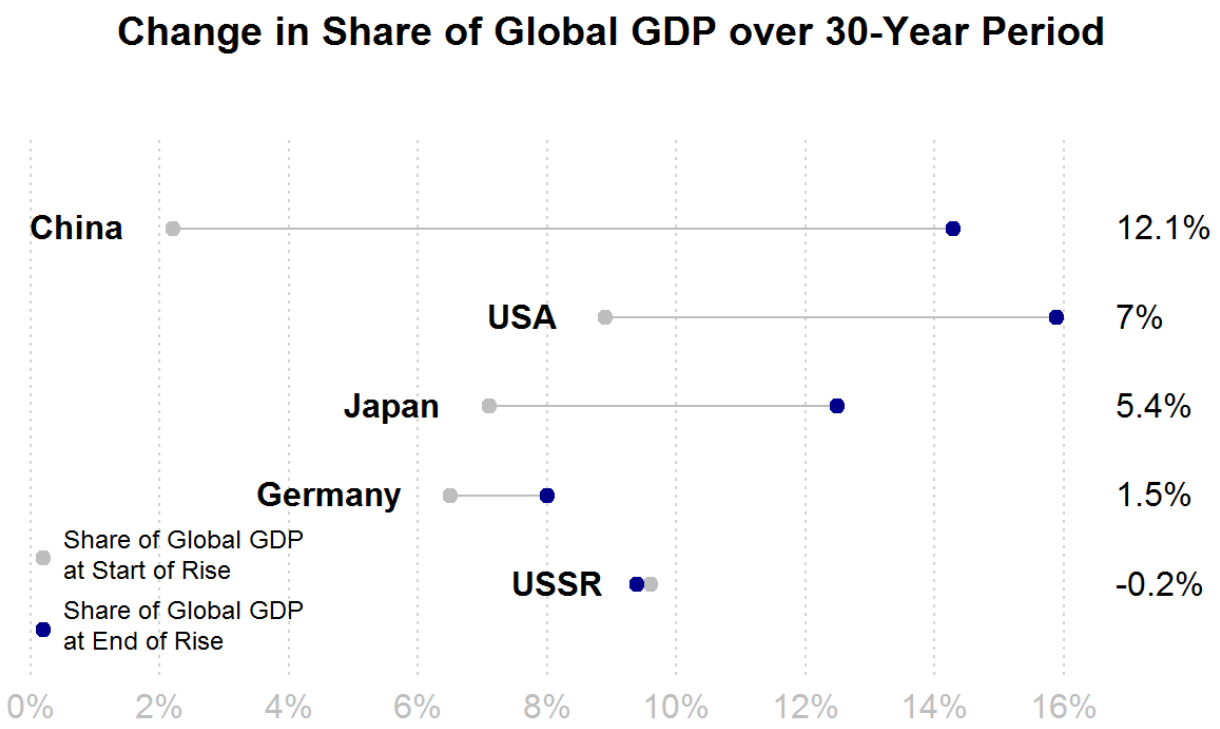
```
#SET PARAMETERS
par( mfrow=c(3,2), oma=c(3,3,3,3), mar=c(1,1,1,1))

#Plot 1 - Highlight China
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "China",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(china, col="red", lwd=2)
points(x=1, y=gdp.30[1,2], col="red", pch=19)
points(x=30, y=gdp.30[30,2], col="red", pch=19)
text(x=1, y=gdp.30[1,2], labels=gdp.30[1,2], pos=2, col="red")
text(x=30, y=gdp.30[30,2], labels=gdp.30[30,2], pos=3, col="red")

#Plot 2: Highlight Japan
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "Japan",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(japan, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,3], col="blue4", pch=19)
points(x=30, y=gdp.30[30,3], col="blue4", pch=19)
text(x=1, y=gdp.30[1,3], labels=gdp.30[1,3], pos=2, col="blue4")
text(x=30, y=gdp.30[30,3], labels=gdp.30[30,3], pos=3, col="blue4")

#Plot 3 - Highlight USSR
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "USSR",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
```

```
lines(usa, col="lightgray", lwd=2)
lines(ussr, col="blue4", lwd=2)
points(x=6, y=gdp.30[6,4], col="blue4", pch=19)
points(x=30, y=gdp.30[30,4], col="blue4", pch=19)
text(x=6, y=gdp.30[6,4], labels=gdp.30[6,4], pos=2, col="blue4")
text(x=30, y=gdp.30[30,4], labels=gdp.30[30,4], pos=3, col="blue4")

#Plot 4 - Highlight Germany
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "Germany",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
        xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(germany, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,5], col="blue4", pch=19)
points(x=30, y=gdp.30[30,5], col="blue4", pch=19)
text(x=1, y=gdp.30[1,5], labels=gdp.30[1,5], pos=2, col="blue4")
text(x=30, y=gdp.30[30,5], labels=gdp.30[30,5], pos=3, col="blue4")
text(x=2, y=-2, labels="Start of Rise", pos=3, font=2)
text(x=28, y=-2, labels="30 Years into Rise", pos=3, font=2)

#Plot 5 - Highlight USA
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "USA",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,6], col="blue4", pch=19)
points(x=30, y=gdp.30[30,6], col="blue4", pch=19)
text(x=1, y=gdp.30[1,6], labels=gdp.30[1,6], pos=2, col="blue4")
text(x=30, y=gdp.30[30,6], labels=gdp.30[30,6], pos=1, col="blue4")
text(x=2, y=-2, labels="Start of Rise", pos=3, font=2)
text(x=28, y=-2, labels="30 Years into Rise", pos=3, font=2)


mtext("Share of Global GDP over 30-Year Period", side=3, line=.5,outer = TRUE, cex = 1.5)
```



Plot Country Share of GDP Growth - Start and 30 Year Only

```
par(mar=c(2,3,4,1))
plot( gdp.Y1, 5:1,
      xlim=c(0,18), ylim=c(-2,6),
      col="lightgray", pch=19, type="n",
      bty="n", ylab="", yaxt="n", xlab="", xaxt="n",
      main="Change in Share of Global GDP over 30-Year Period")

#VERTICAL BARS FOR % SHARE OF GDP
segments( x0=0, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=2, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=4, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=6, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=8, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=10, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=12, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=14, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=16, y0=0, y1=6, col="lightgray", lty=3 )

#TEXT FOR VERTICAL BARS
text(x=0, y=0, labels="0%", pos=1, col="gray")
text(x=2, y=0, labels="2%", pos=1, col="gray")
text(x=4, y=0, labels="4%", pos=1, col="gray")
text(x=6, y=0, labels="6%", pos=1, col="gray")
text(x=8, y=0, labels="8%", pos=1, col="gray")
text(x=10, y=0, labels="10%", pos=1, col="gray")
text(x=12, y=0, labels="12%", pos=1, col="gray")
text(x=14, y=0, labels="14%", pos=1, col="gray")
text(x=16, y=0, labels="16%", pos=1, col="gray")

#DATA SEGMENTS
segments( x0=gdp.Y1, x1=gdp.Y30, y0=5:1, col="gray", lty=1 )

#DATA POINTS
points(gdp.Y1, 5:1, col="gray", pch=19)
points( gdp.Y30, 5:1, col="blue4", pch=19 )

#COUNTRY LABELS
text(gdp.Y1, 5:1, labels=gdp.short$Country, pos=2, offset=1.2, font=2)

#LEGEND
points(x=c(.2,.2), y=c(1.3, .5), col=c("gray", "blue4"), pch=19, cex=1)
text(x=c(.2,.2), y=c(1.3, .5), pos=4, cex=.75, labels=c("Share of Global GDP\nat Start of
Rise", "Share of Global GDP\nat End of Rise"))

#LABEL OF CHANGE
text(16.5, 5:1, labels=paste(round(gdp.short$size, digits=2), "%", sep=""), pos=4)
```



Plot All 6 Graphs Together

```
par( mfrow=c(3,2), oma=c(3,3,3,3), mar=c(1,1,1,1))

#Plot 1 - Highlight China
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "China",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(china, col="red", lwd=2)
points(x=1, y=gdp.30[1,2], col="red", pch=19)
points(x=30, y=gdp.30[30,2], col="red", pch=19)
text(x=1, y=gdp.30[1,2], labels=gdp.30[1,2], pos=2, col="red")
text(x=30, y=gdp.30[30,2], labels=gdp.30[30,2], pos=3, col="red")

#Plot 2: Highlight Japan
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "Japan",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
        xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(japan, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,3], col="blue4", pch=19)
points(x=30, y=gdp.30[30,3], col="blue4", pch=19)
text(x=1, y=gdp.30[1,3], labels=gdp.30[1,3], pos=2, col="blue4")
text(x=30, y=gdp.30[30,3], labels=gdp.30[30,3], pos=3, col="blue4")

#Plot 3 - Highlight USSR
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "USSR",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
```

```
lines(ussr, col="blue4", lwd=2)
points(x=6, y=gdp.30[6,4], col="blue4", pch=19)
points(x=30, y=gdp.30[30,4], col="blue4", pch=19)
text(x=6, y=gdp.30[6,4], labels=gdp.30[6,4], pos=2, col="blue4")
text(x=30, y=gdp.30[30,4], labels=gdp.30[30,4], pos=3, col="blue4")

#Plot 4 - Highlight Germany
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "Germany",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
         xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(usa, col="lightgray", lwd=2)
lines(germany, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,5], col="blue4", pch=19)
points(x=30, y=gdp.30[30,5], col="blue4", pch=19)
text(x=1, y=gdp.30[1,5], labels=gdp.30[1,5], pos=2, col="blue4")
text(x=30, y=gdp.30[30,5], labels=gdp.30[30,5], pos=3, col="blue4")
text(x=2, y=-2, labels="Start of Rise", pos=3, font=2)
text(x=28, y=-2, labels="30 Years into Rise", pos=3, font=2)

#Plot 5 - Highlight USA
plot.ts(gdp.30[,2:6],
        plot.type = "single",
        xlab= "Years Since Start of Rise", ylab= "Share of Global GDP",
        main = "USA",
        bty= "n", type="n",
        xaxt="n", yaxt="n",
        xlim=c(-2, 35), ylim=c(-2, 18))
lines(china, col="lightgray", lwd=2)
lines(japan, col="lightgray", lwd=2)
lines(ussr, col="lightgray", lwd=2)
lines(germany, col="lightgray", lwd=2)
lines(usa, col="blue4", lwd=2)
points(x=1, y=gdp.30[1,6], col="blue4", pch=19)
points(x=30, y=gdp.30[30,6], col="blue4", pch=19)
text(x=1, y=gdp.30[1,6], labels=gdp.30[1,6], pos=2, col="blue4")
text(x=30, y=gdp.30[30,6], labels=gdp.30[30,6], pos=1, col="blue4")
text(x=2, y=-2, labels="Start of Rise", pos=3, font=2)
text(x=28, y=-2, labels="30 Years into Rise", pos=3, font=2)


plot( gdp.Y1, 5:1,
      xlim=c(-2,19), ylim=c(-2,6),
      col="lightgray", pch=19, type="n",
```

```
      bty="n", ylab="", yaxt="n", xlab="", xaxt="n",
      main="Change in Share of Global GDP")

#add vertical bar of % share

segments( x0=0, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=2, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=4, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=6, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=8, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=10, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=12, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=14, y0=0, y1=6, col="lightgray", lty=3 )
segments( x0=16, y0=0, y1=6, col="lightgray", lty=3 )

#TEXT FOR VERTICAL BARS
text(x=0, y=0, labels="0%", pos=1, col="gray")
text(x=2, y=0, labels="2%", pos=1, col="gray")
text(x=4, y=0, labels="4%", pos=1, col="gray")
text(x=6, y=0, labels="6%", pos=1, col="gray")
text(x=8, y=0, labels="8%", pos=1, col="gray")
text(x=10, y=0, labels="10%", pos=1, col="gray")
text(x=12, y=0, labels="12%", pos=1, col="gray")
text(x=14, y=0, labels="14%", pos=1, col="gray")
text(x=16, y=0, labels="16%", pos=1, col="gray")



#Segments for data
segments( x0=gdp.Y1, x1=gdp.Y30, y0=5:1, col="gray", lty=1 )

#Points for Data
points(gdp.Y1, 5:1, col="gray", pch=19)
points( gdp.Y30, 5:1, col="blue4", pch=19 )

#Country Labels
text(gdp.Y1, 5:1, labels=gdp.short$Country, pos=2, offset=1.2, font=2)

#add legend for start/end color
points(x=c(.2,.2), y=c(1.3, .5), col=c("gray", "blue4"), pch=19, cex=1.5)
text(x=c(.2,.2), y=c(1.3, .5), pos=4, cex=.75, labels=c("Start", "End"))

#change in GDP over 30 years
text(16.5, 5:1, labels=paste(round(gdp.short$size, digits=2), "%", sep=""), pos=4)

mtext("Share of Global GDP over 30-Year Period", side=3, line=.5, outer = TRUE, cex = 1.
5)
```

Share of Global GDP over 30-Year Period