

Introduction to gganimate

Unemployment in Europe

Luca Picci

Getting Started

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- Build the skeleton of the plot (declare aesthetics and build the theme and annotations)
- Then use `facet_wrap()` and declare the geoms to show the different bar lengths at each time period

Getting Started

Showing the steps to create an animated bar chart can be tricky. In order to demonstrate the steps required to build this animated plot we will:

- Build the skeleton of the plot (declare aesthetics and build the theme and annotations)
- Then use `facet_wrap()` and declare the geoms to show the different bar lengths at each time period
- Finally we will combine the plots and add the animation

Data Manipulation

```
unemployment
```

```
## # A tibble: 810 x 5
##   LOCATION Country SUBJECT  TIME Value
##   <chr>      <chr>   <chr>   <dbl> <dbl>
## 1 AUT      Austria TOT      1999  4.97
## 2 AUT      Austria TOT      2000  5.15
## 3 AUT      Austria TOT      2001  5.7
## 4 AUT      Austria TOT      2002  6.18
## 5 AUT      Austria TOT      2003  7.05
## 6 AUT      Austria TOT      2004 10.5
## 7 AUT      Austria TOT      2005 11.0
## 8 AUT      Austria TOT      2006  9.8
## 9 AUT      Austria TOT      2007  9.38
## 10 AUT     Austria TOT      2008  8.48
## # ... with 800 more rows
```

Data Manipulation

```
unemployment %>%
```

```
  filter(SUBJECT == "TOT")
```

```
## # A tibble: 271 x 5
```

```
##   LOCATION Country SUBJECT  TIME Value
##   <chr>      <chr>   <chr>   <dbl> <dbl>
## 1 AUT      Austria TOT      1999  4.97
## 2 AUT      Austria TOT      2000  5.15
## 3 AUT      Austria TOT      2001  5.7
## 4 AUT      Austria TOT      2002  6.18
## 5 AUT      Austria TOT      2003  7.05
## 6 AUT      Austria TOT      2004 10.5
## 7 AUT      Austria TOT      2005 11.0
## 8 AUT      Austria TOT      2006  9.8
## 9 AUT      Austria TOT      2007  9.38
## 10 AUT     Austria TOT      2008  8.48
## # ... with 261 more rows
```


Data Manipulation

```
unemployment %>%  
  filter(SUBJECT == "TOT") %>%  
  filter(TIME>=2007)
```

```
## # A tibble: 164 x 5  
##   LOCATION Country SUBJECT  TIME Value  
##   <chr>      <chr>   <chr>  <dbl> <dbl>  
## 1 AUT      Austria TOT      2007  9.38  
## 2 AUT      Austria TOT      2008  8.48  
## 3 AUT      Austria TOT      2009 10.6  
## 4 AUT      Austria TOT      2010  9.48  
## 5 AUT      Austria TOT      2011  8.95  
## 6 AUT      Austria TOT      2012  9.4  
## 7 AUT      Austria TOT      2013  9.68  
## 8 AUT      Austria TOT      2014 10.3  
## 9 AUT      Austria TOT      2015 10.6  
## 10 AUT     Austria TOT      2016 11.2  
## # ... with 154 more rows
```

Data Manipulation

```
unemployment %>%  
  filter(SUBJECT == "TOT") %>%  
  filter(TIME>=2007) %>%  
  filter(Country!= "Estonia")
```

```
## # A tibble: 154 x 5  
##   LOCATION Country SUBJECT  TIME Value  
##   <chr>      <chr>   <chr>   <dbl> <dbl>  
## 1 AUT      Austria TOT      2007  9.38  
## 2 AUT      Austria TOT      2008  8.48  
## 3 AUT      Austria TOT      2009 10.6  
## 4 AUT      Austria TOT      2010  9.48  
## 5 AUT      Austria TOT      2011  8.95  
## 6 AUT      Austria TOT      2012  9.4  
## 7 AUT      Austria TOT      2013  9.68  
## 8 AUT      Austria TOT      2014 10.3  
## 9 AUT      Austria TOT      2015 10.6  
## 10 AUT     Austria TOT      2016 11.2  
## # ... with 144 more rows
```

Data Manipulation

```
unemployment %>%  
  filter(SUBJECT == "TOT") %>%  
  filter(TIME>=2007) %>%  
  filter(Country!= "Estonia") %>%  
  select(-LOCATION)
```

```
## # A tibble: 154 x 4  
##   Country SUBJECT  TIME Value  
##   <chr>   <chr>   <dbl> <dbl>  
## 1 Austria TOT      2007  9.38  
## 2 Austria TOT      2008  8.48  
## 3 Austria TOT      2009 10.6  
## 4 Austria TOT      2010  9.48  
## 5 Austria TOT      2011  8.95  
## 6 Austria TOT      2012  9.4  
## 7 Austria TOT      2013  9.68  
## 8 Austria TOT      2014 10.3  
## 9 Austria TOT      2015 10.6  
## 10 Austria TOT      2016 11.2  
## # ... with 144 more rows
```

Data Manipulation

```
unemployment %>%  
  filter(SUBJECT == "TOT") %>%  
  filter(TIME>=2007) %>%  
  filter(Country!= "Estonia") %>%  
  select(-LOCATION) %>%  
  select(-SUBJECT)
```

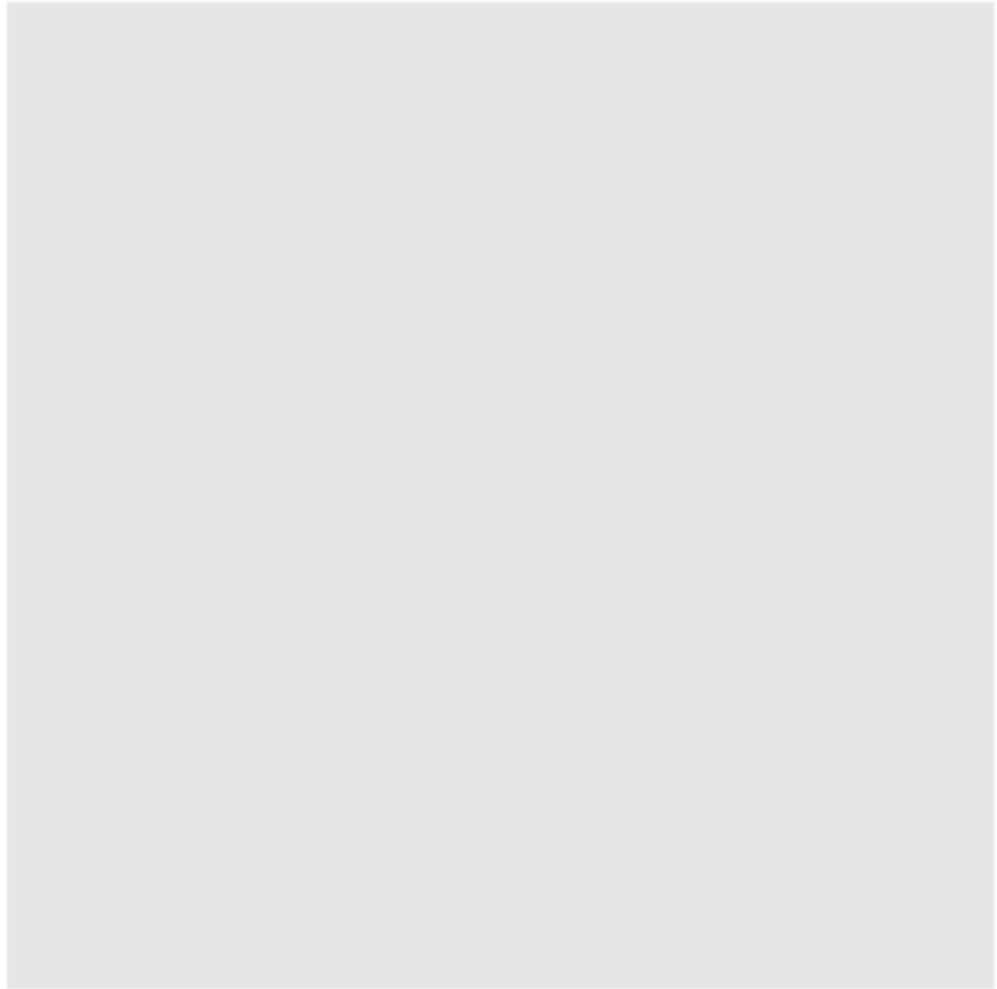
```
## # A tibble: 154 x 3  
##   Country  TIME Value  
##   <chr>    <dbl> <dbl>  
## 1 Austria  2007   9.38  
## 2 Austria  2008   8.48  
## 3 Austria  2009  10.6  
## 4 Austria  2010   9.48  
## 5 Austria  2011   8.95  
## 6 Austria  2012   9.4  
## 7 Austria  2013   9.68  
## 8 Austria  2014  10.3  
## 9 Austria  2015  10.6  
## 10 Austria 2016  11.2  
## # ... with 144 more rows
```

Data Manipulation

```
unemployment %>%  
  filter(SUBJECT == "TOT") %>%  
  filter(TIME>=2007) %>%  
  filter(Country!= "Estonia") %>%  
  select(-LOCATION) %>%  
  select(-SUBJECT) ->  
plotdata
```

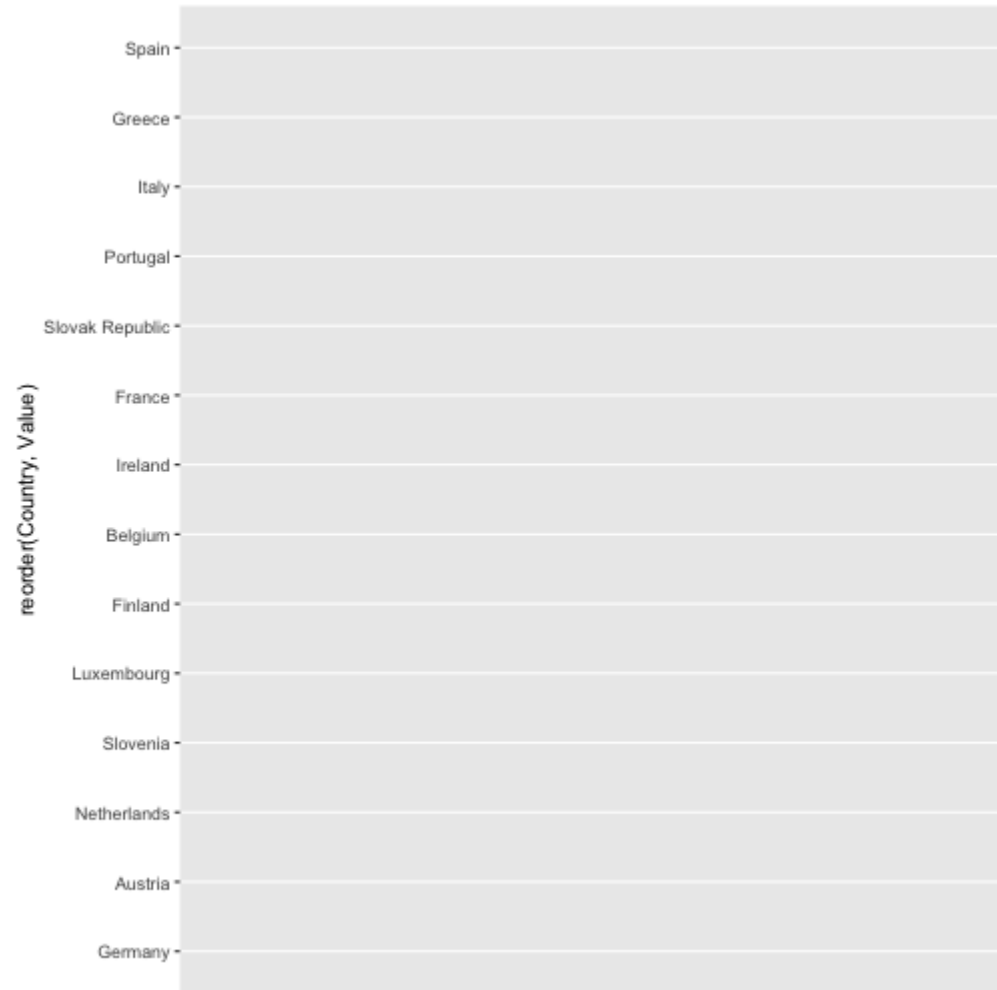
Building the Plot

```
ggplot(data = plotdata)
```



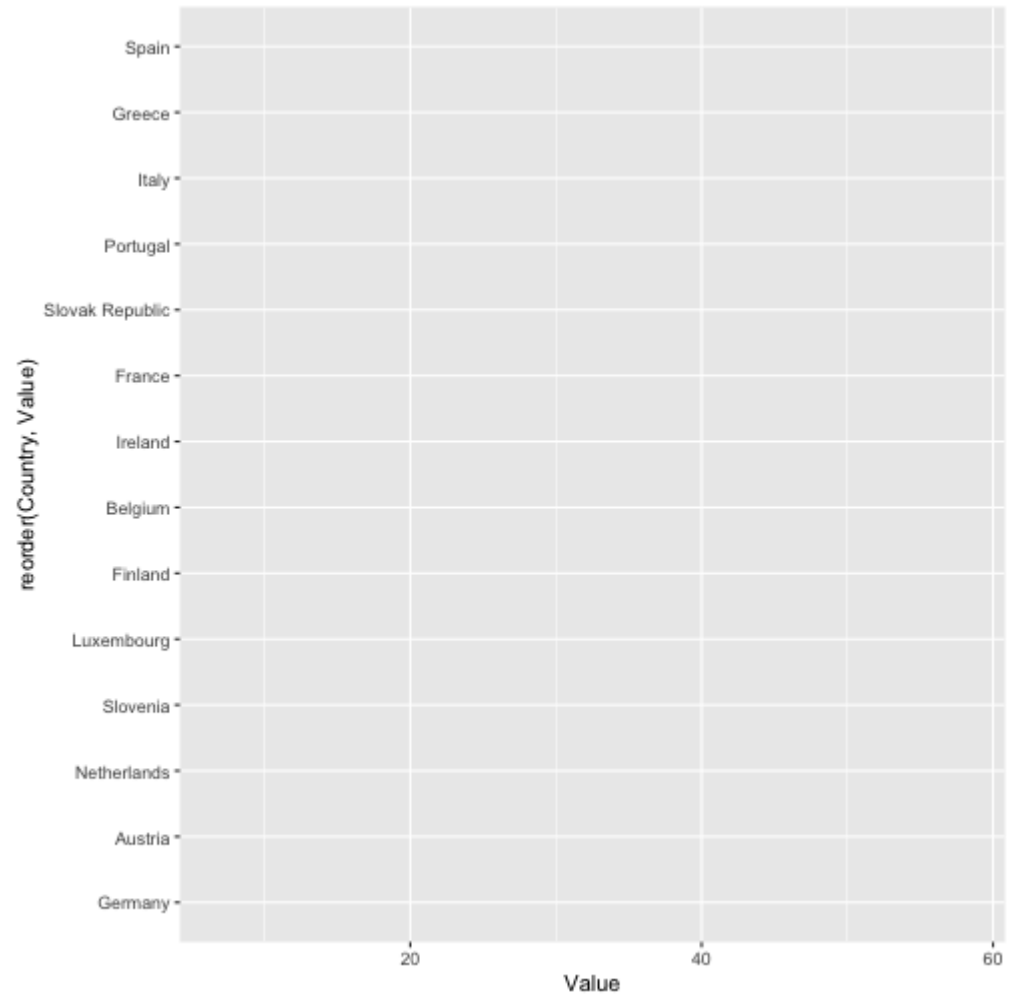
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))
```



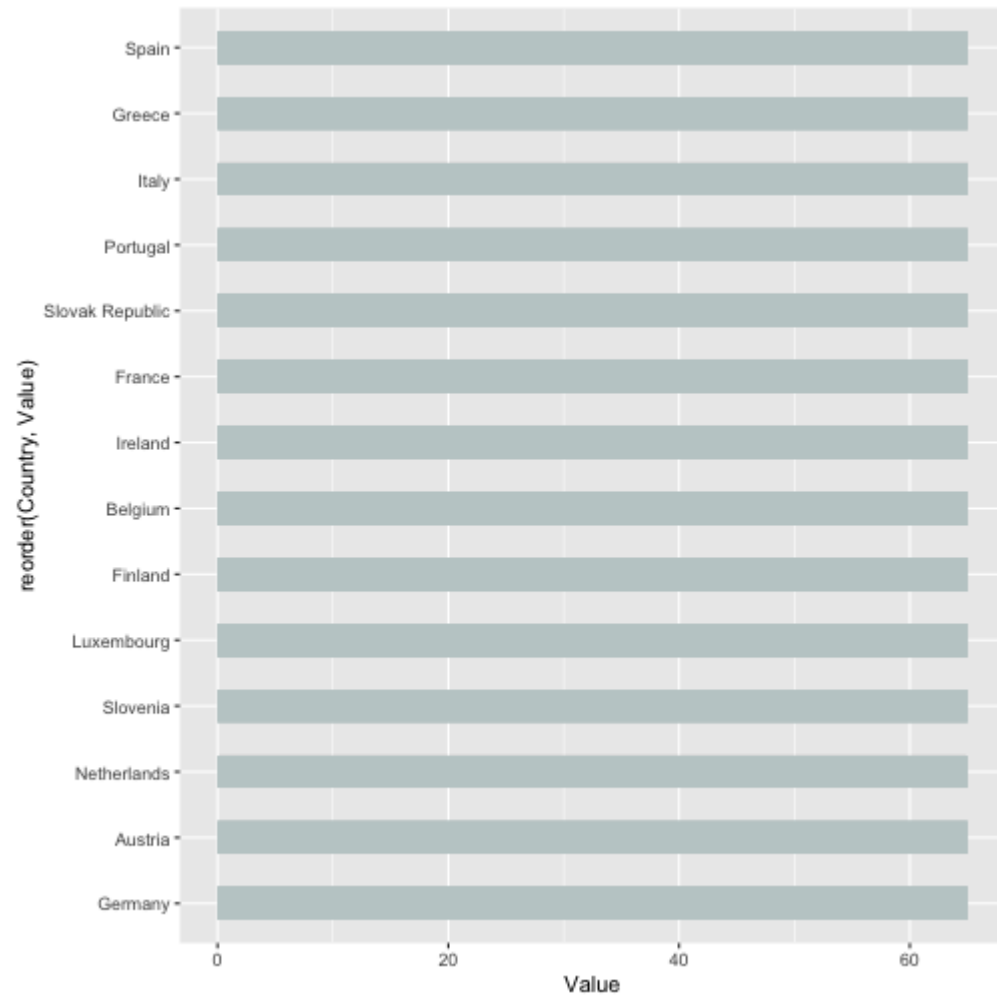
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value)) +  
  aes(x = Value)
```



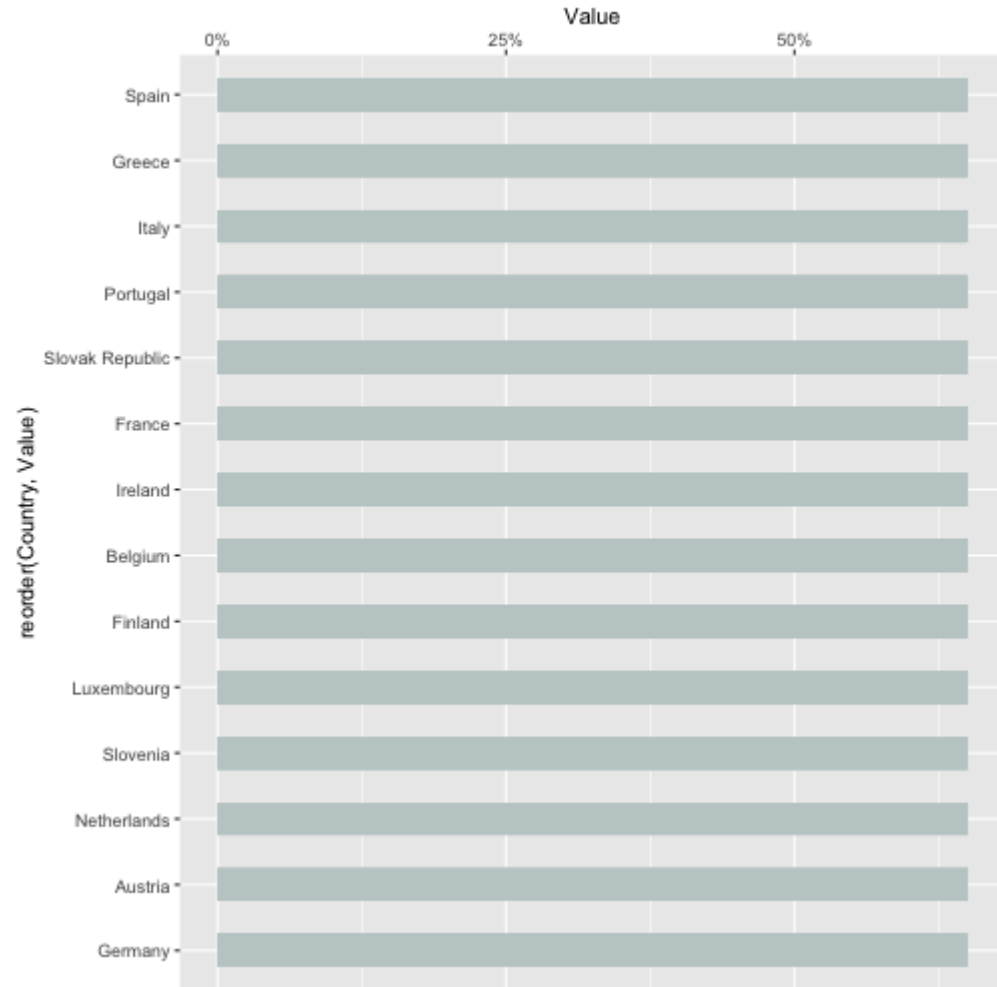
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value)) +  
  aes(x = Value) +  
  geom_segment(aes(x = 0, xend = 65,  
                   yend = Country),  
               size = 7.5,  
               color = "azure3")
```



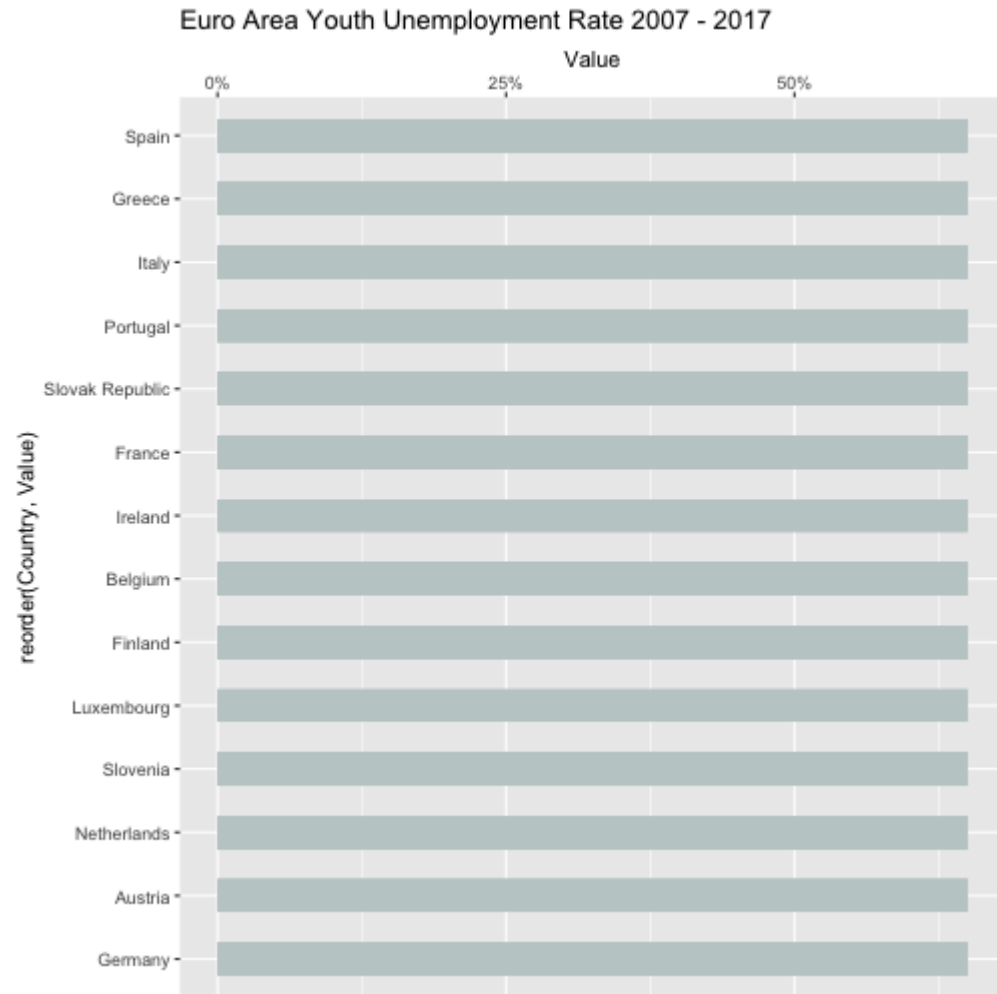
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value)) +  
  aes(x = Value) +  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3") +  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels =  
                      function(x) paste0(x, "%"))
```



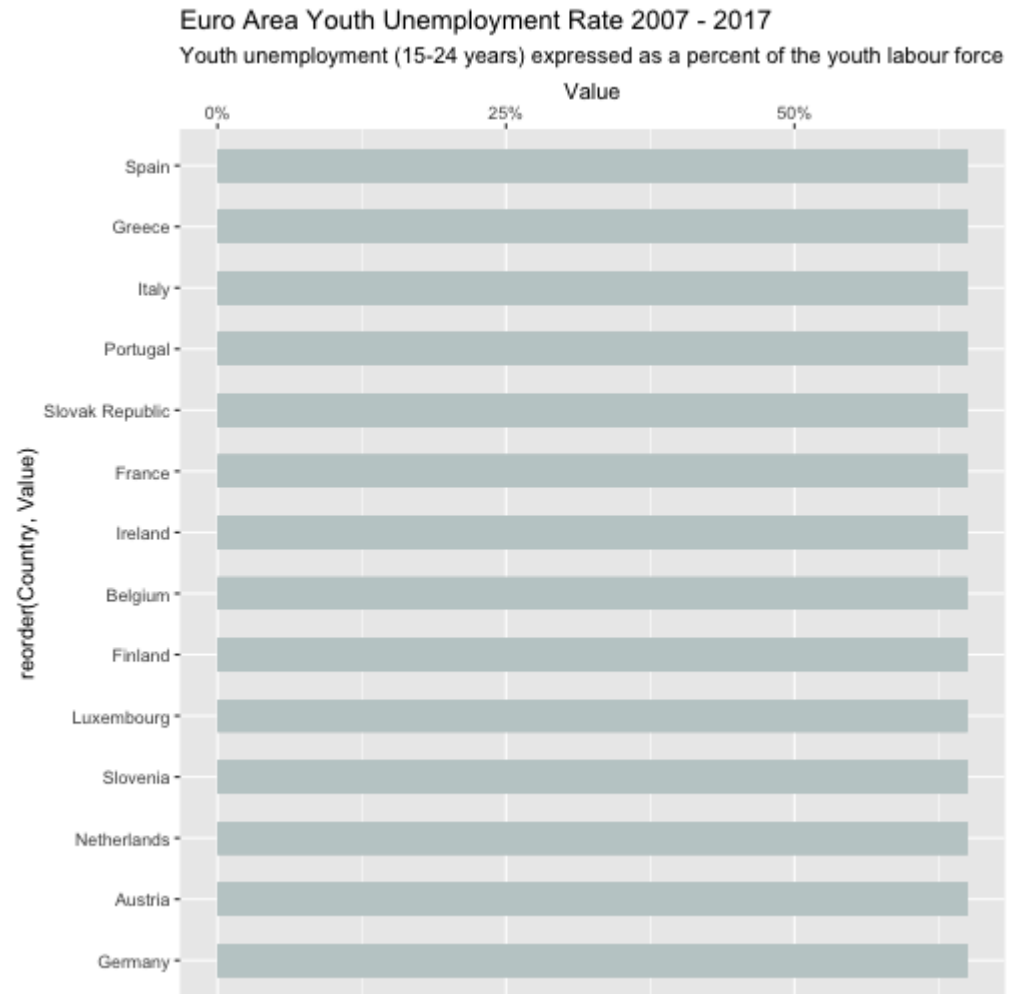
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))+  
  aes(x = Value)+  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3")+  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels =  
                      function(x) paste0(x, "%"))+  
  labs(title = "Euro Area Youth Unemployment Rate 2007 - 2017")
```



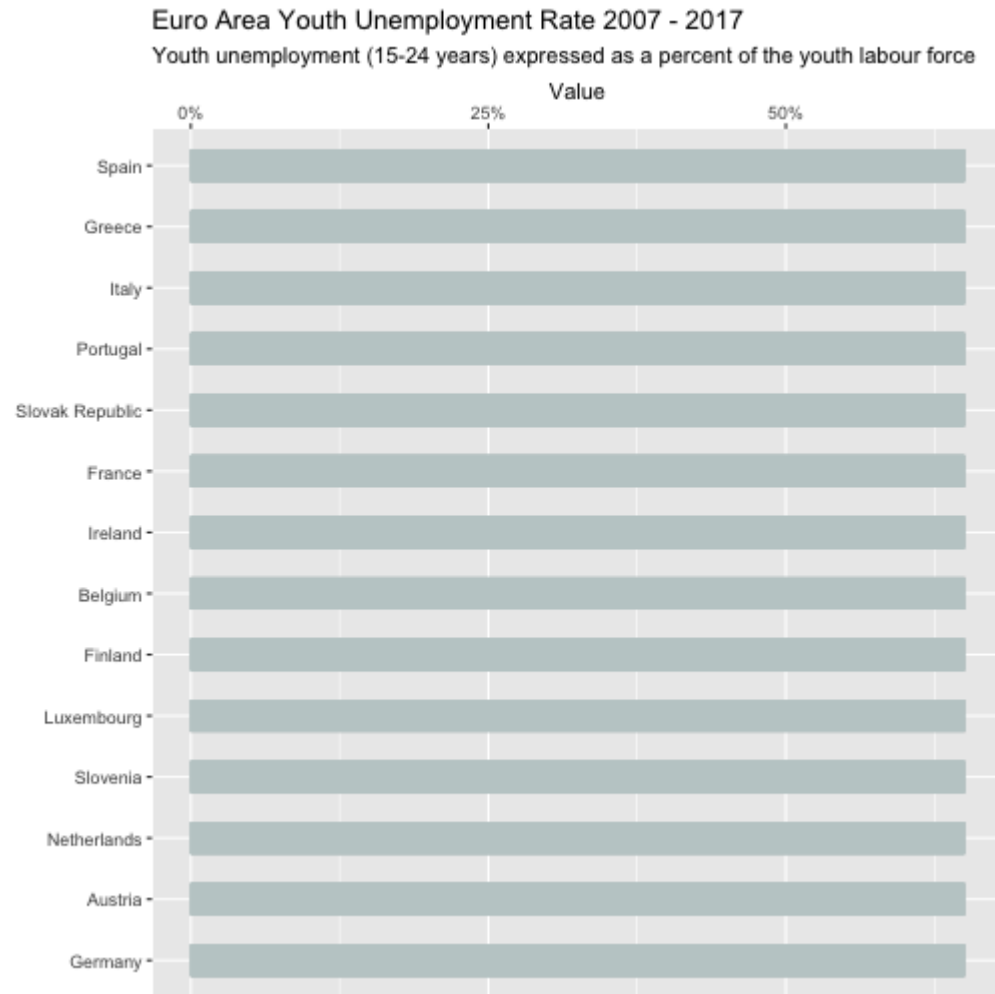
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))+  
  aes(x = Value)+  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3")+  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels =  
                      function(x) paste0(x, "%"))+  
  labs(title = "Euro Area Youth Unemployment Rate %",  
       subtitle = "Youth unemployment (15-24 years)
```



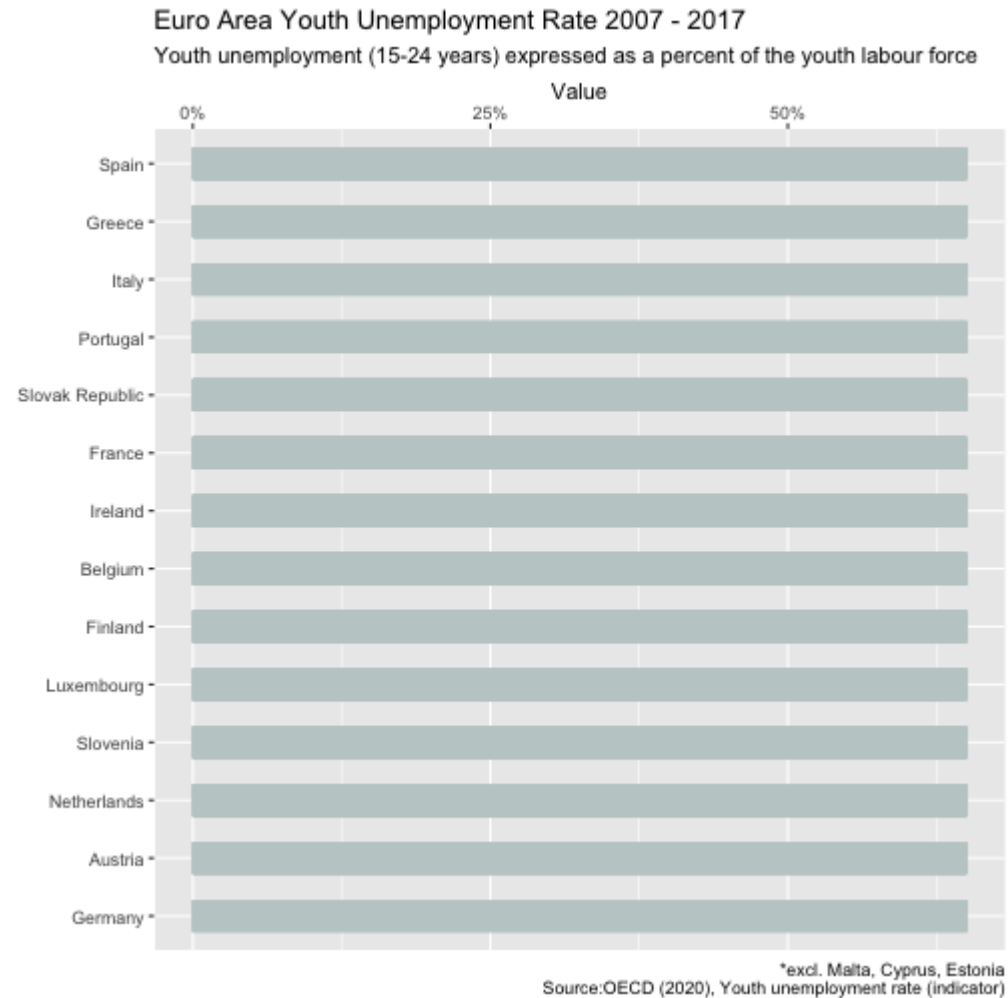
Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))+  
  aes(x = Value)+  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3")+  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels=  
                      function(x) paste0(x,"%"))+  
  labs(title = "Euro Area Youth Unemployment Rate %",  
       subtitle = "Youth unemployment (15-24 years)",  
       y = NULL)
```



Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value)) +  
  aes(x = Value) +  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3") +  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels =  
                      function(x) paste0(x, "%")) +  
  labs(title = "Euro Area Youth Unemployment Rate 2007 - 2017",  
       subtitle = "Youth unemployment (15-24 years)",  
       y = NULL) +  
  labs(caption = "*excl. Malta, Cyprus, Estonia\nSource:OECD (2020), Youth unemployment rate (indicator)")
```



Building the Plot

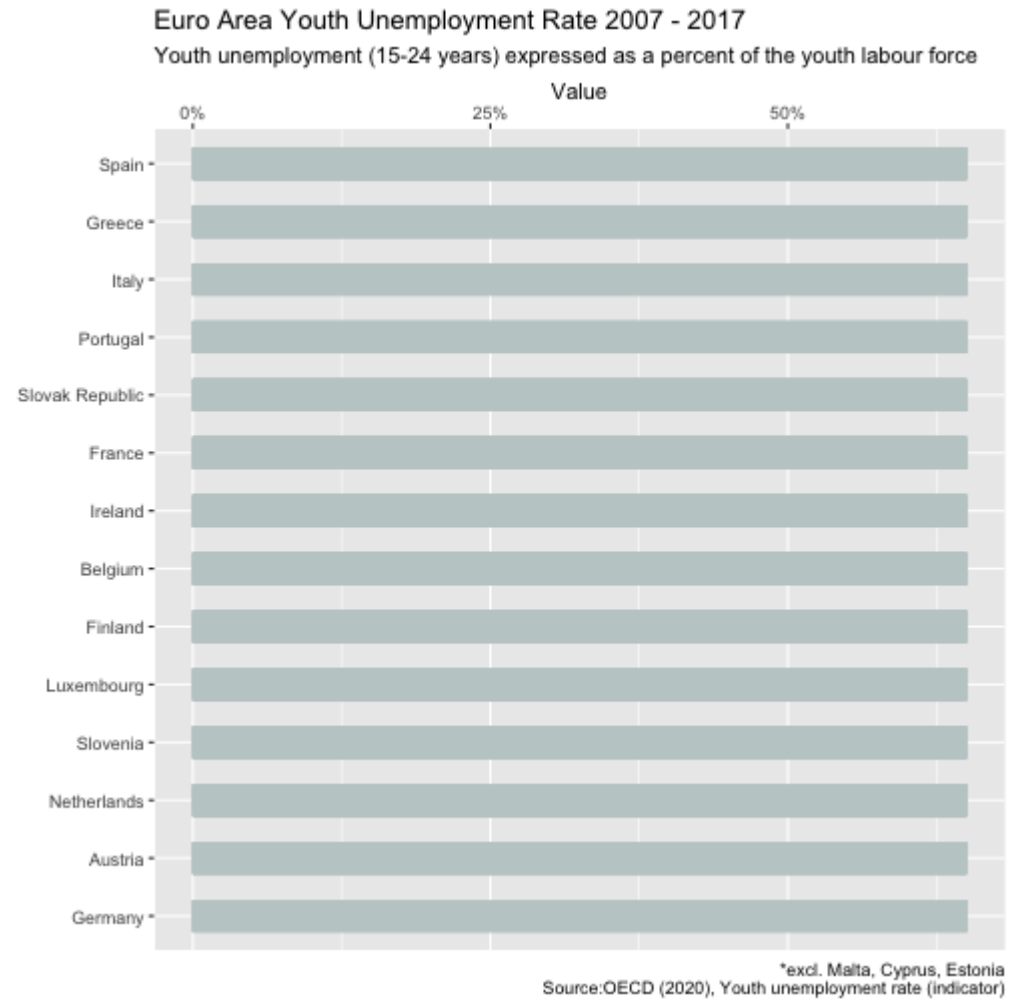
```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))+  
  aes(x = Value)+  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3")+  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels=  
                      function(x) paste0(x,"%")+  
  labs(title = "Euro Area Youth Unemployment Rate :",  
        subtitle = "Youth unemployment (15-24 years)",  
        y = NULL)+  
  labs(caption = "*excl. Malta, Cyprus, Estonia\nSc  
plot
```

Building the Plot

```
ggplot(data = plotdata) +  
  aes(y = reorder(Country, Value))+  
  aes(x = Value)+  
  geom_segment(aes(x = 0, xend = 65,  
                  yend = Country),  
              size = 7.5,  
              color = "azure3")+  
  scale_x_continuous(position = "top",  
                    breaks = c(0, 25, 50),  
                    labels=  
                      function(x) paste0(x,"%"))+  
  labs(title = "Euro Area Youth Unemployment Rate :",  
       subtitle = "Youth unemployment (15-24 years)",  
       y = NULL)+  
  labs(caption = "*excl. Malta, Cyprus, Estonia\nSc  
plot
```

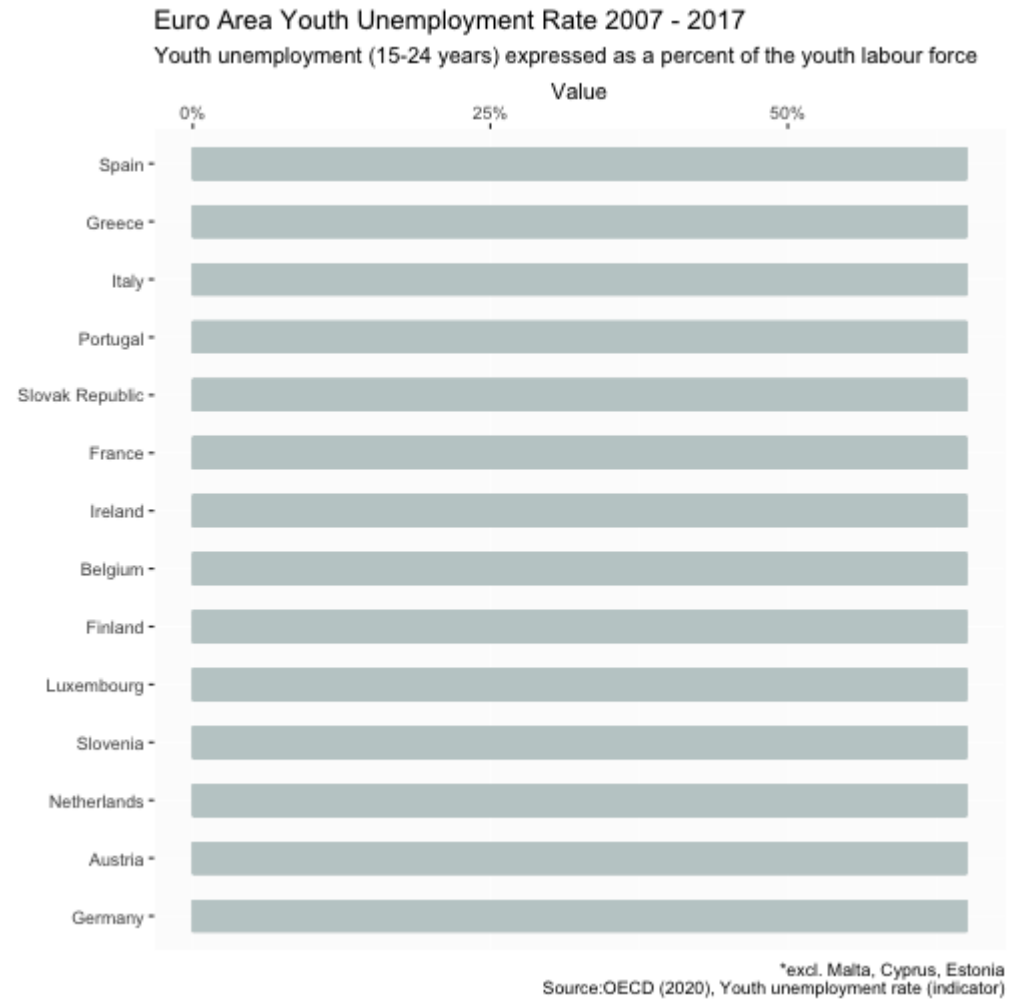

Building the Theme

```
plot
```



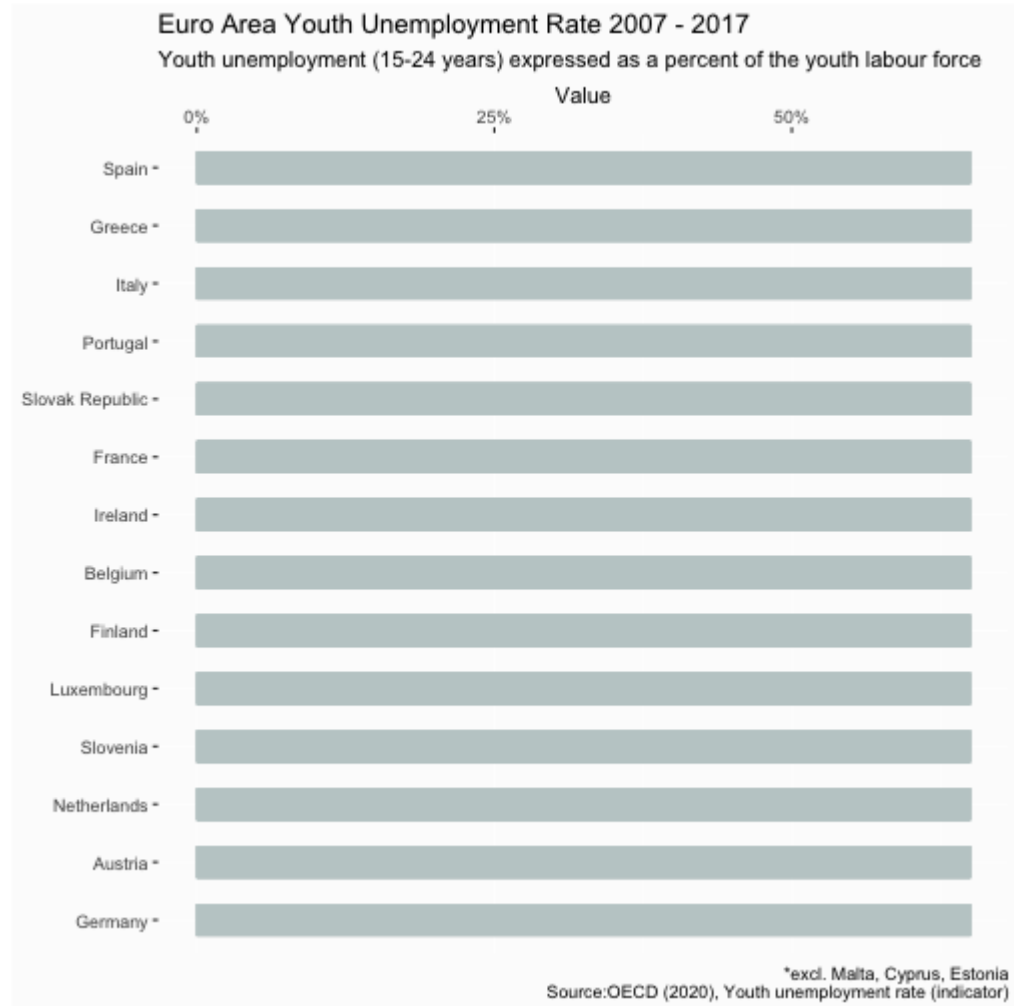
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))
```



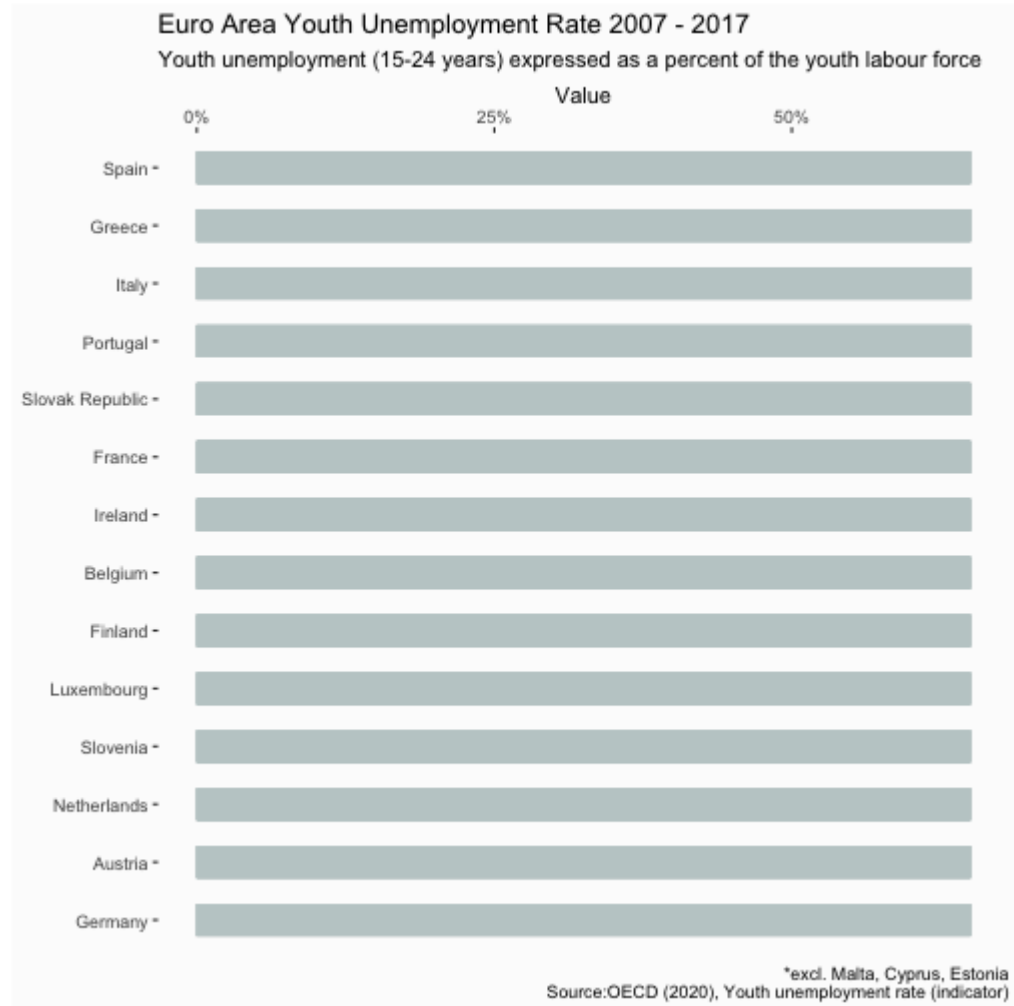
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))
```



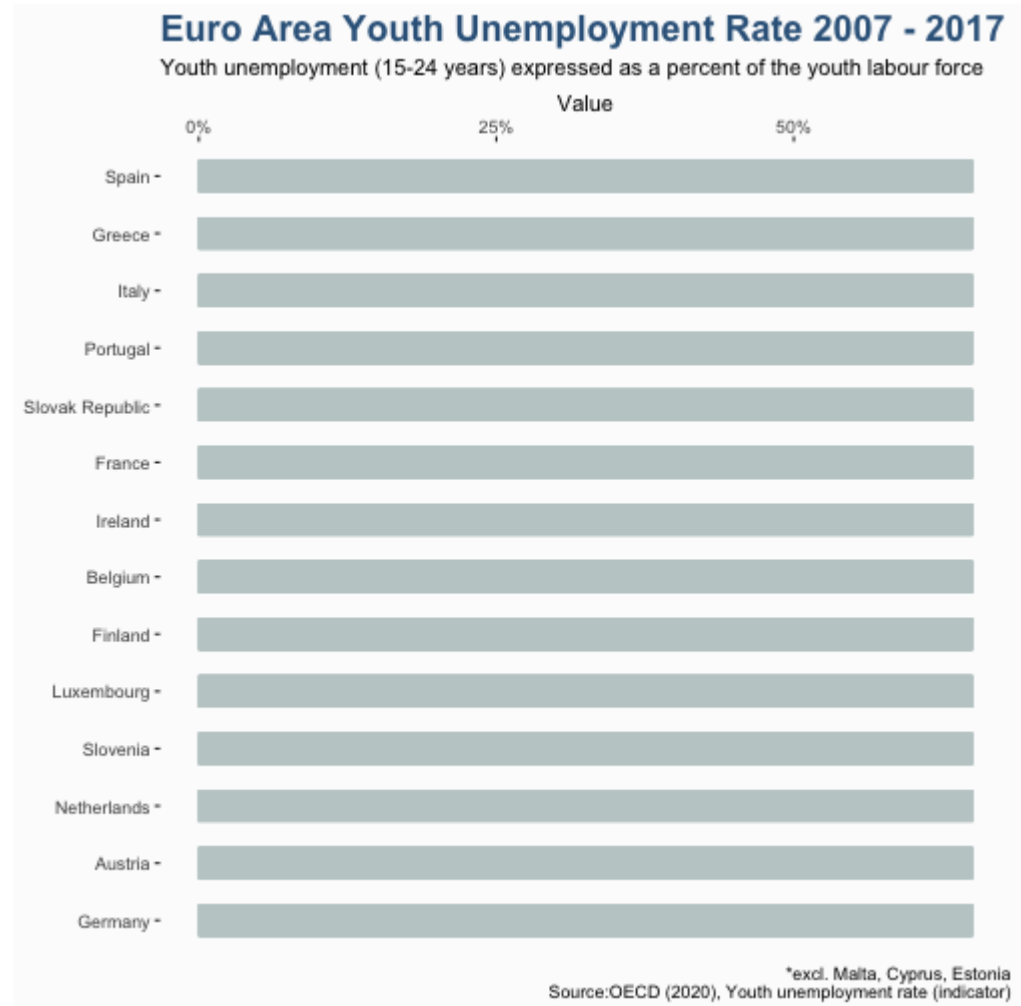
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())
```



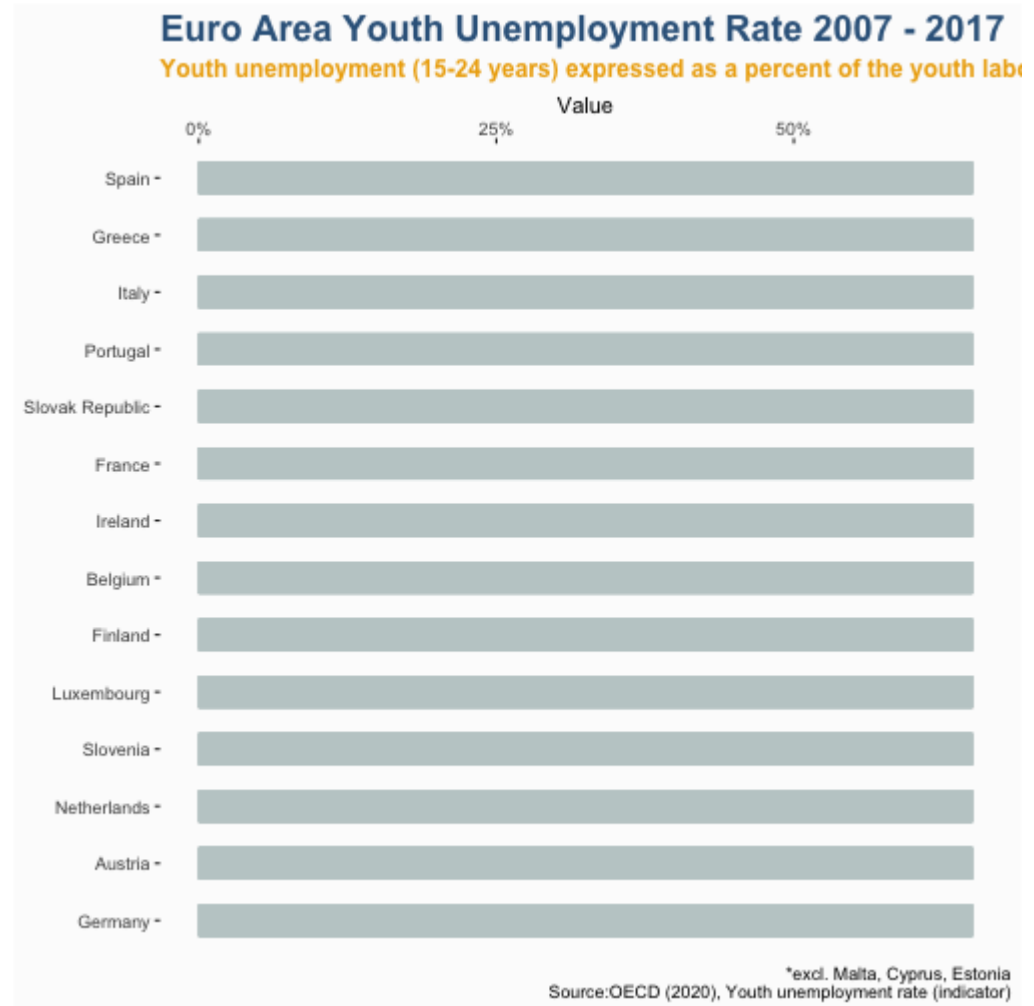
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
                  color = "steelblue4",  
                  face = "bold"))
```



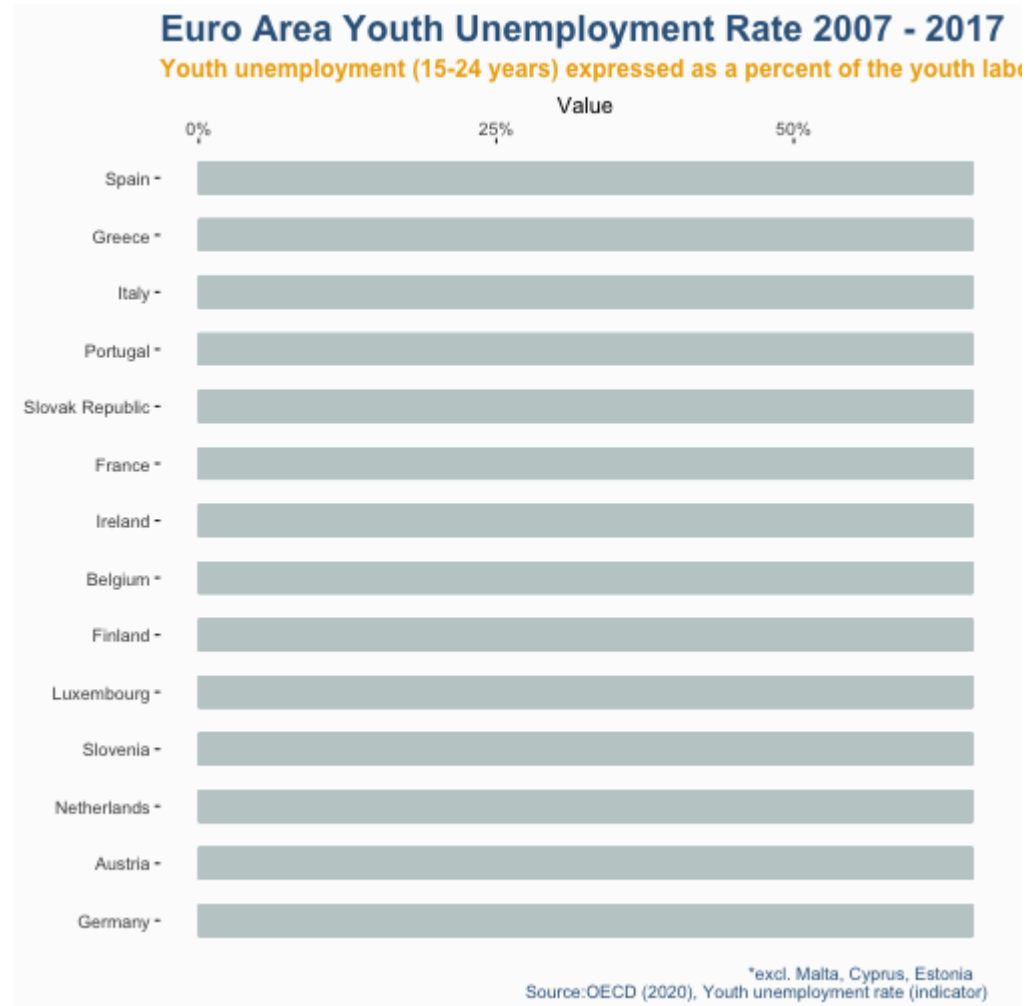
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
                  color = "steelblue4",  
                  face = "bold"))+  
  theme(plot.subtitle =  
    element_text(size = 12,  
                  color = "darkgoldenrod2",  
                  hjust = 0, face = "bold"))
```



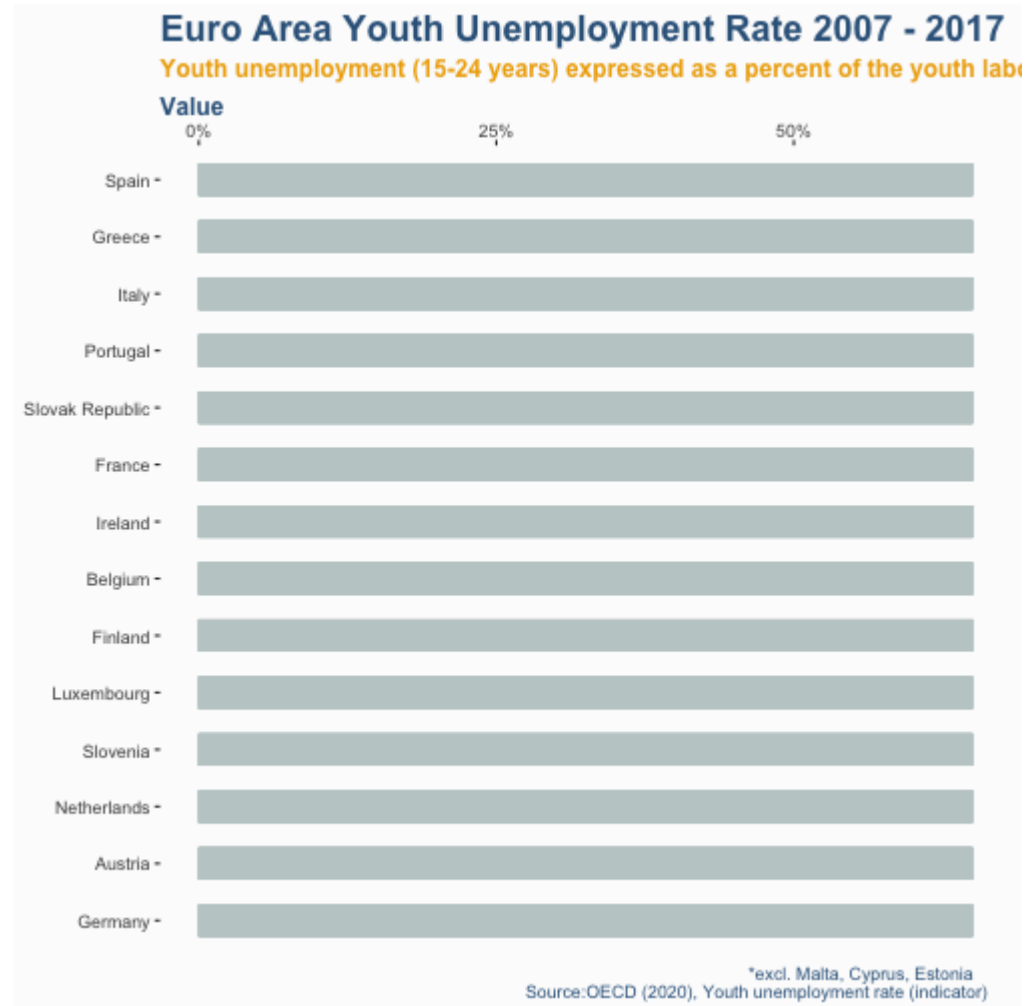
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
                  color = "steelblue4",  
                  face = "bold"))+  
  theme(plot.subtitle =  
    element_text(size = 12,  
                  color = "darkgoldenrod2",  
                  hjust = 0, face = "bold"))+  
  theme(plot.caption =  
    element_text(color = "steelblue4",  
                  hjust = 0.94))
```



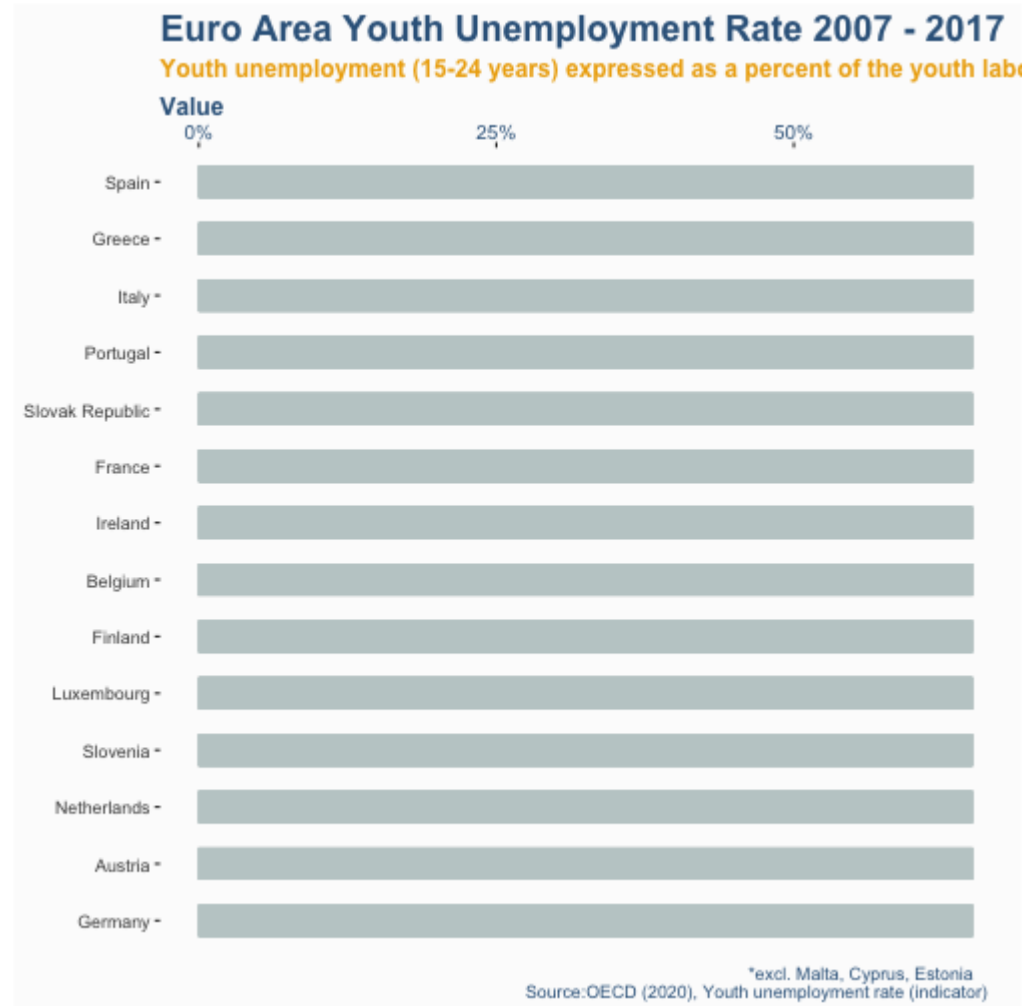
Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))+  
  theme(plot.subtitle =  
    element_text(size = 12,  
      color = "darkgoldenrod2",  
      hjust = 0, face = "bold"))+  
  theme(plot.caption =  
    element_text(color = "steelblue4",  
      hjust = 0.94))+  
  theme(axis.title.x =  
    element_text(size = 12, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))
```



Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))+  
  theme(plot.subtitle =  
    element_text(size = 12,  
      color = "darkgoldenrod2",  
      hjust = 0, face = "bold"))+  
  theme(plot.caption =  
    element_text(color = "steelblue4",  
      hjust = 0.94))+  
  theme(axis.title.x =  
    element_text(size = 12, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))+  
  theme(axis.text.x =  
    element_text(size = 10,  
      color = "steelblue4",  
      hjust = 0.5))
```

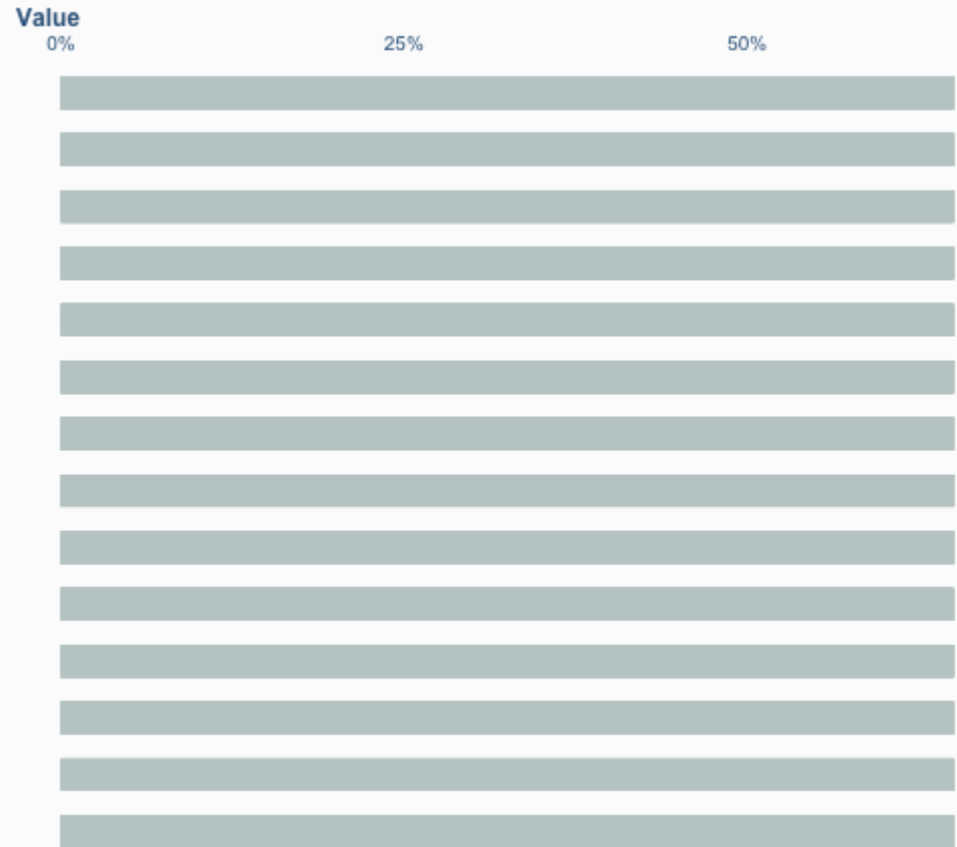


Building the Theme

```
plot+  
  theme(panel.background =  
    element_rect(fill = "grey99"))+  
  theme(plot.background =  
    element_rect(fill = "grey99"))+  
  theme(panel.grid = element_blank())+  
  theme(plot.title =  
    element_text(size = 18, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))+  
  theme(plot.subtitle =  
    element_text(size = 12,  
      color = "darkgoldenrod2",  
      hjust = 0, face = "bold"))+  
  theme(plot.caption =  
    element_text(color = "steelblue4",  
      hjust = 0.94))+  
  theme(axis.title.x =  
    element_text(size = 12, hjust = 0,  
      color = "steelblue4",  
      face = "bold"))+  
  theme(axis.text.x =  
    element_text(size = 10,  
      color = "steelblue4",  
      hjust = 0.5))+  
  theme(  
    axis.line.y = element_blank(),  
    axis.text.y = element_blank(),  
    axis.ticks.y = element_blank(),  
    axis.ticks.x = element_blank(),  
    axis.line.x = element_blank())
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

Building the Theme

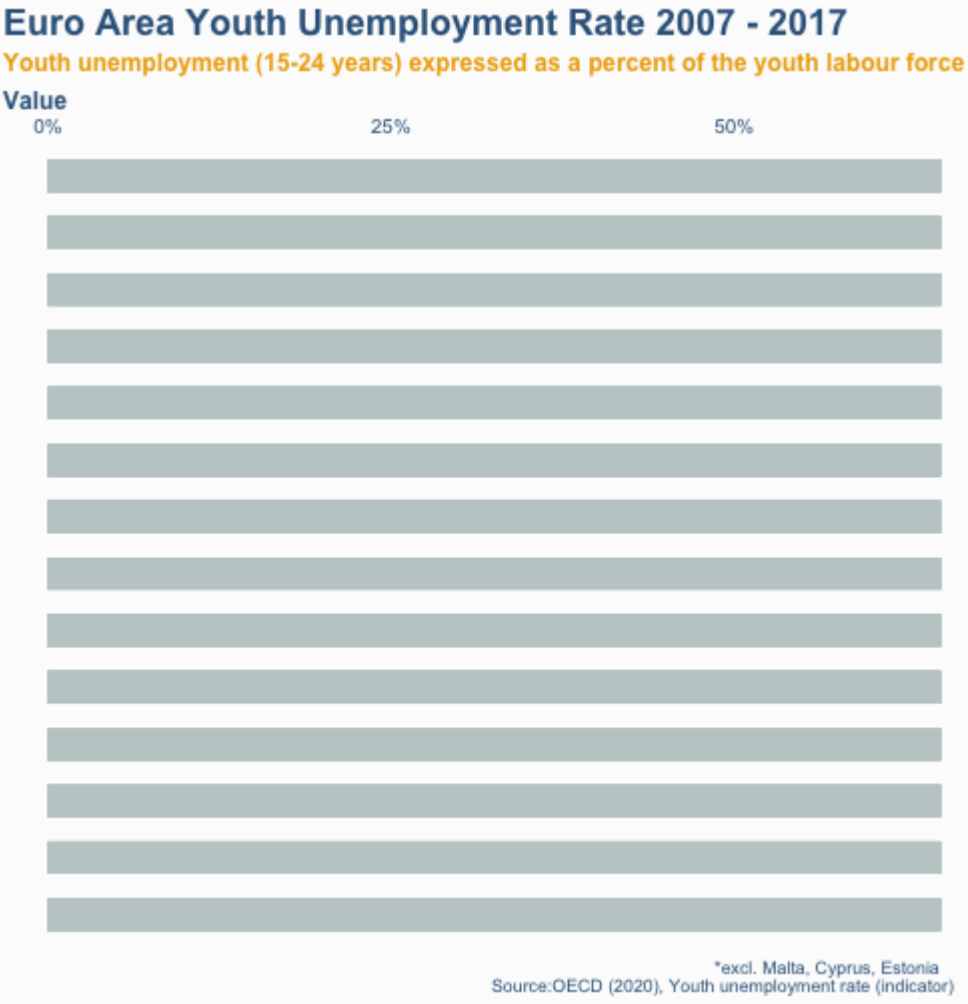
```
plot+
  theme(panel.background =
    element_rect(fill = "grey99"))+
  theme(plot.background =
    element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
    element_text(size = 18, hjust = 0,
      color = "steelblue4",
      face = "bold"))+
  theme(plot.subtitle =
    element_text(size = 12,
      color = "darkgoldenrod2",
      hjust = 0, face = "bold"))+
  theme(plot.caption =
    element_text(color = "steelblue4",
      hjust = 0.94))+
  theme(axis.title.x =
    element_text(size = 12, hjust = 0,
      color = "steelblue4",
      face = "bold"))+
  theme(axis.text.x =
    element_text(size = 10,
      color = "steelblue4",
      hjust = 0.5))+
  theme(
    axis.line.y = element_blank(),
    axis.text.y = element_blank(),
    axis.ticks.y = element_blank(),
    axis.ticks.x = element_blank(),
    axis.line.x = element_blank())->
plot2
```

Faceting

This intermediate step is not necessary, but in order to demonstrate clearly how the plot will be built, we will facet by year using `facet_wrap()` to create an individual plot for each year. This will allow us to see how the bar lengths vary and add annotations before adding animations

Faceting

plot2



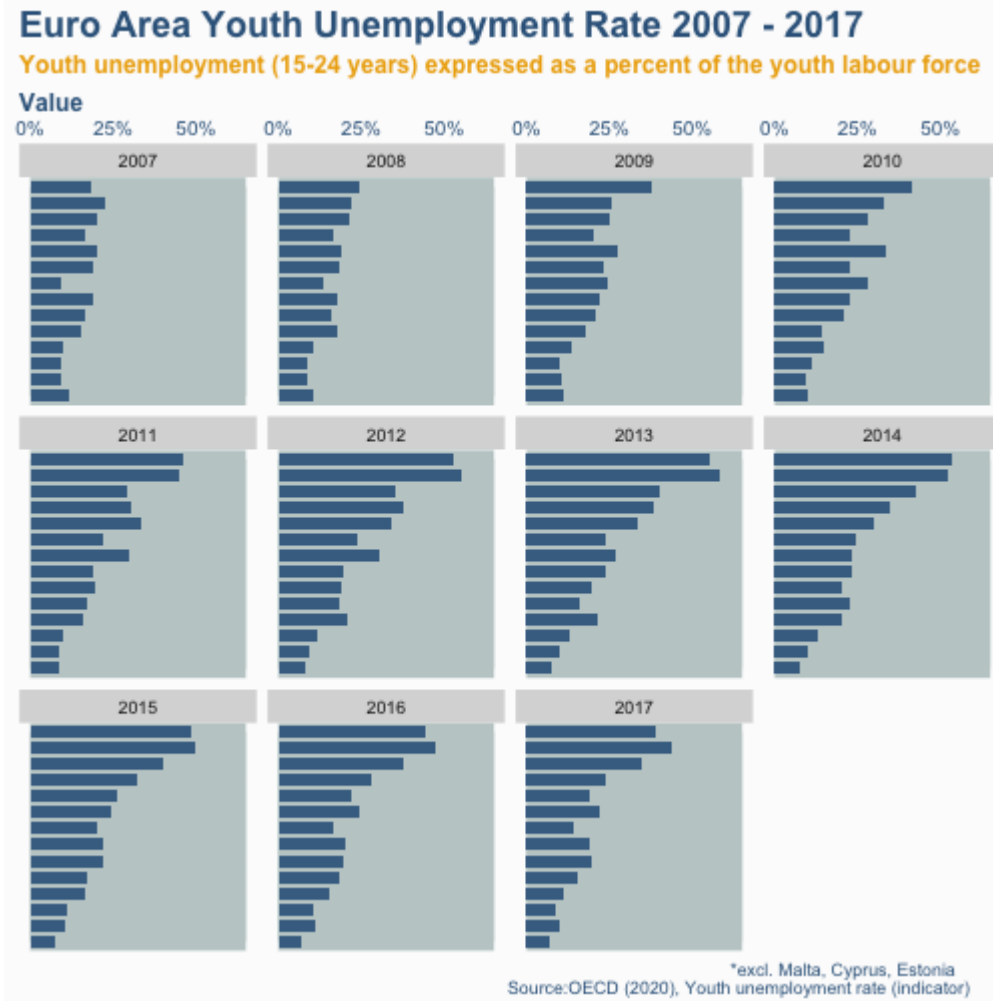
Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)
```



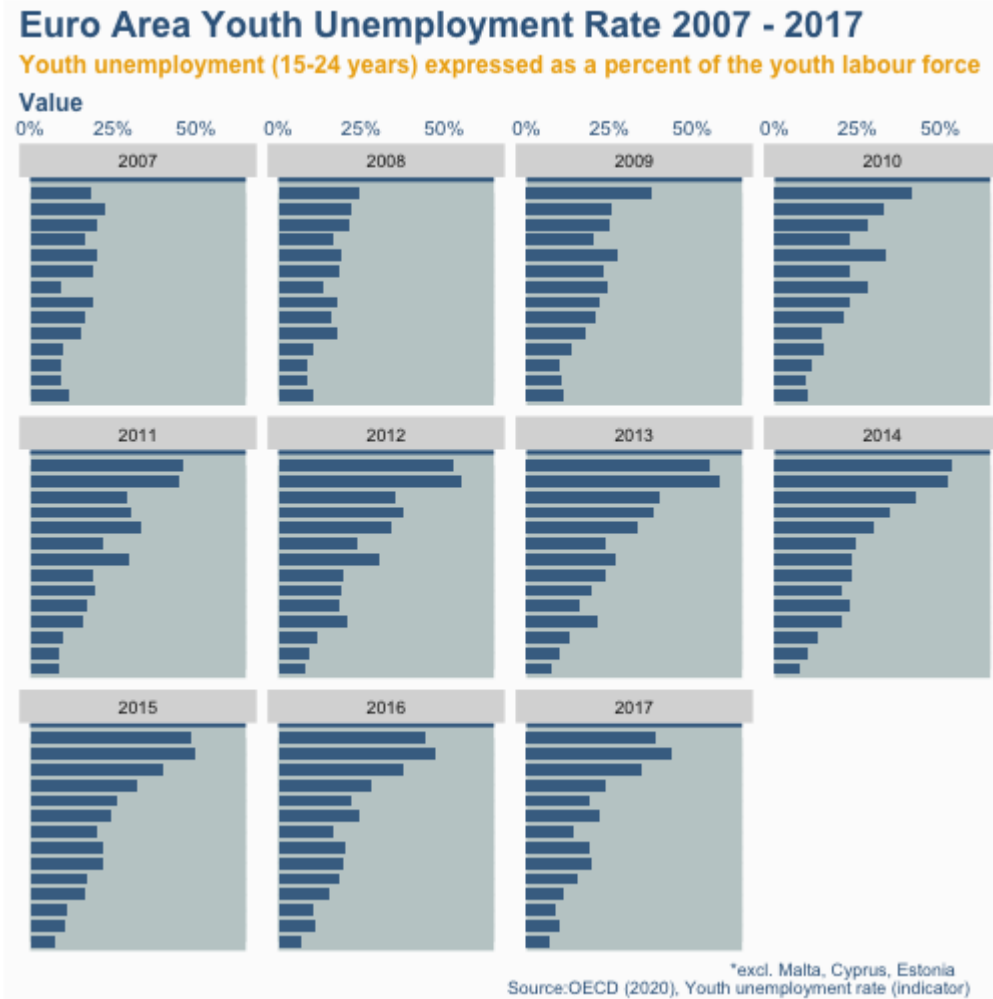
Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)+  
  geom_col(fill = "steelblue4",  
           width = 0.75,  
           alpha = 0.9)
```



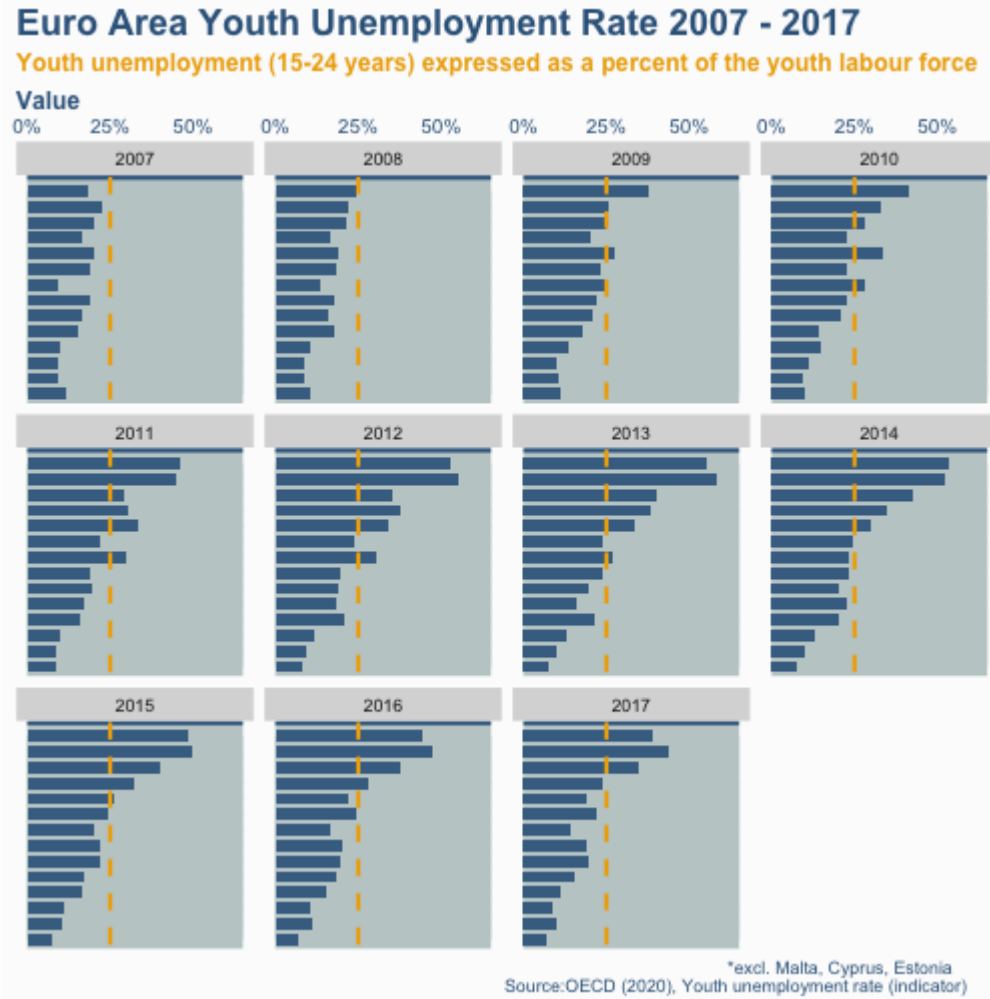
Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)+  
  geom_col(fill = "steelblue4",  
           width = 0.75,  
           alpha = 0.9)+  
  annotate(x=0, xend=65,  
         y=15, yend=15,  
         colour="steelblue4",  
         geom="segment",  
         size = 2)
```



Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)+  
  geom_col(fill = "steelblue4",  
           width = 0.75,  
           alpha = 0.9)+  
  annotate(x=0, xend=65,  
         y=15, yend=15,  
         colour="steelblue4",  
         geom="segment",  
         size = 2)+  
  annotate(x = 25, xend = 25,  
         y = 14.9, yend = 0.5,  
         size = 1, geom="segment",  
         color = "darkgoldenrod2",  
         linetype = "dashed")
```

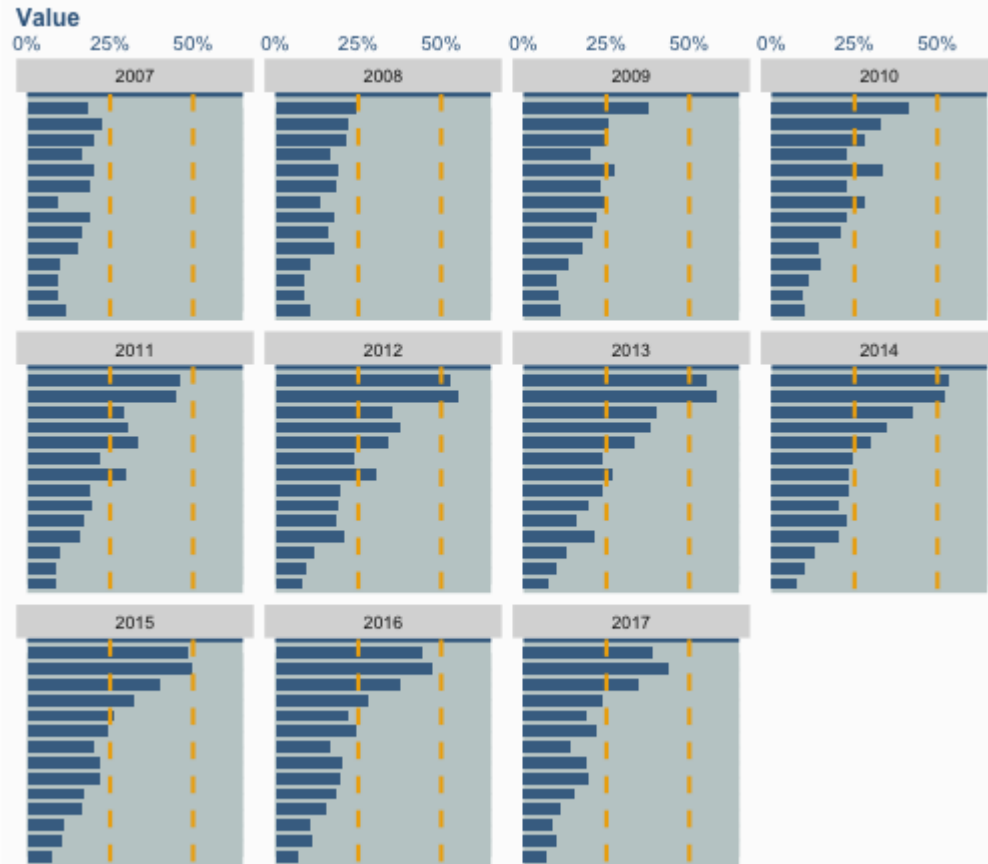


Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)+  
  geom_col(fill = "steelblue4",  
           width = 0.75,  
           alpha = 0.9)+  
  annotate(x=0, xend=65,  
         y=15, yend=15,  
         colour="steelblue4",  
         geom="segment",  
         size = 2)+  
  annotate(x = 25, xend = 25,  
         y = 14.9, yend = 0.5,  
         size = 1, geom="segment",  
         color = "darkgoldenrod2",  
         linetype = "dashed")+  
  annotate(x = 50, xend = 50,  
         y = 14.9, yend = 0.5,  
         size = 1, geom="segment",  
         color = "darkgoldenrod2",  
         linetype = "dashed")
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force



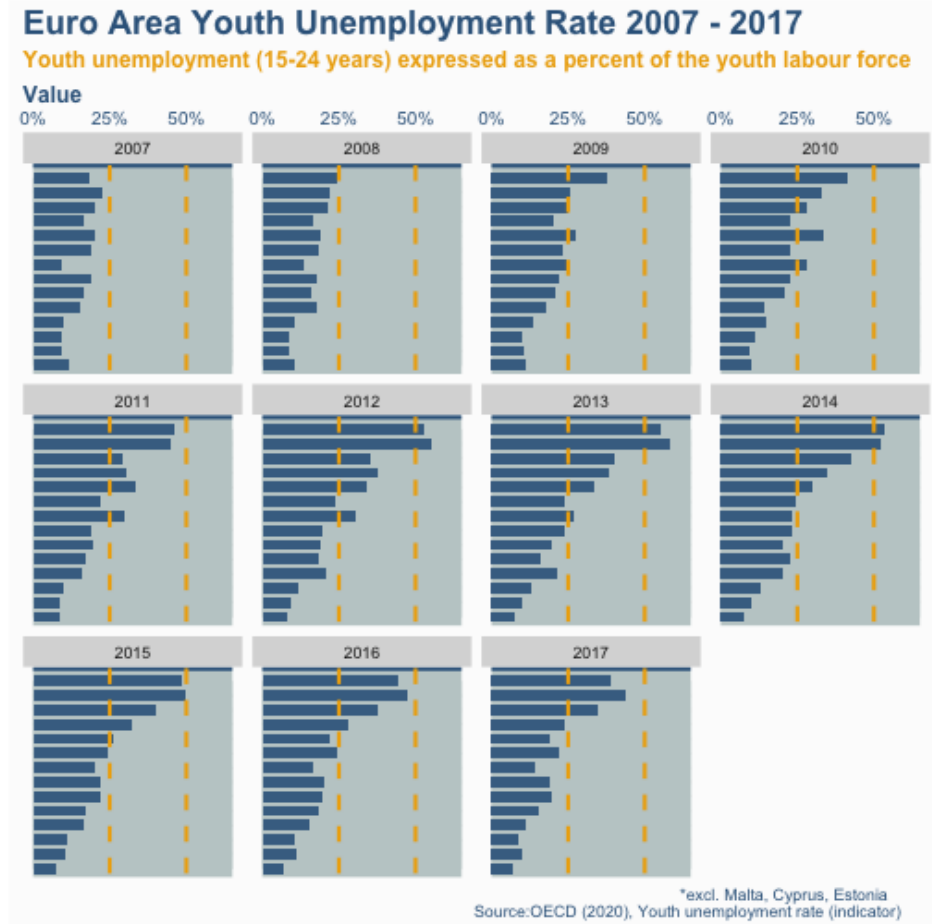
*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

Faceting

```
plot2+  
  facet_wrap(~ TIME, nrow=3)+  
  geom_col(fill = "steelblue4",  
           width = 0.75,  
           alpha = 0.9)+  
  annotate(x=0, xend=65,  
          y=15, yend=15,  
          colour="steelblue4",  
          geom="segment",  
          size = 2)+  
  annotate(x = 25, xend = 25,  
          y = 14.9, yend = 0.5,  
          size = 1, geom="segment",  
          color = "darkgoldenrod2",  
          linetype = "dashed")+  
  annotate(x = 50, xend = 50,  
          y = 14.9, yend = 0.5,  
          size = 1, geom="segment",  
          color = "darkgoldenrod2",  
          linetype = "dashed")->  
plot3
```

Adding the Animation

```
plot3
```



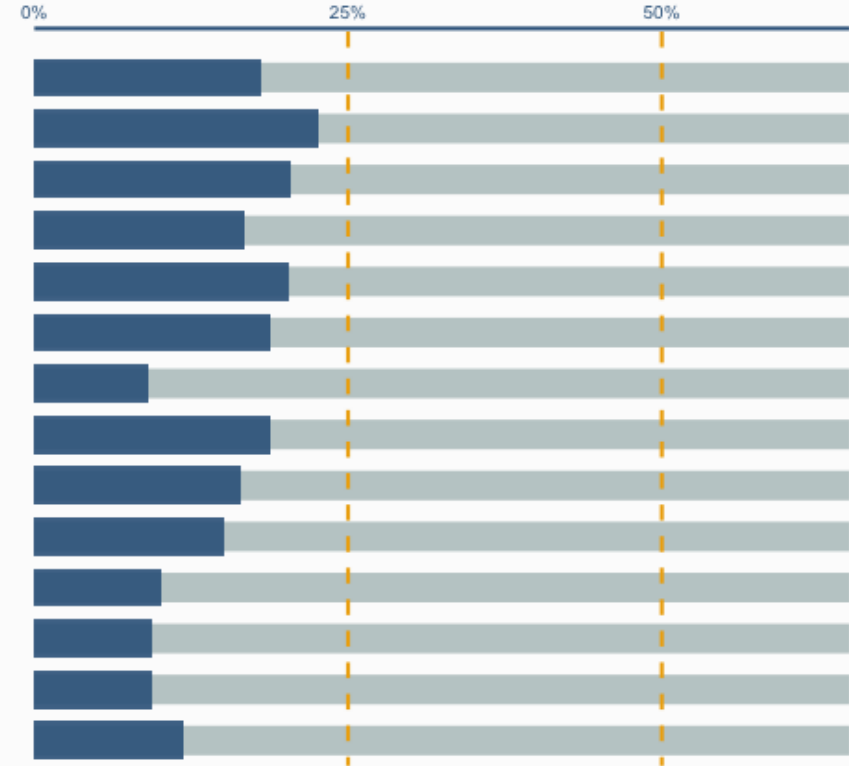
Adding the Animation

```
plot3+  
  facet_null()+  
  gganimate::transition_time(TIME)
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Value



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

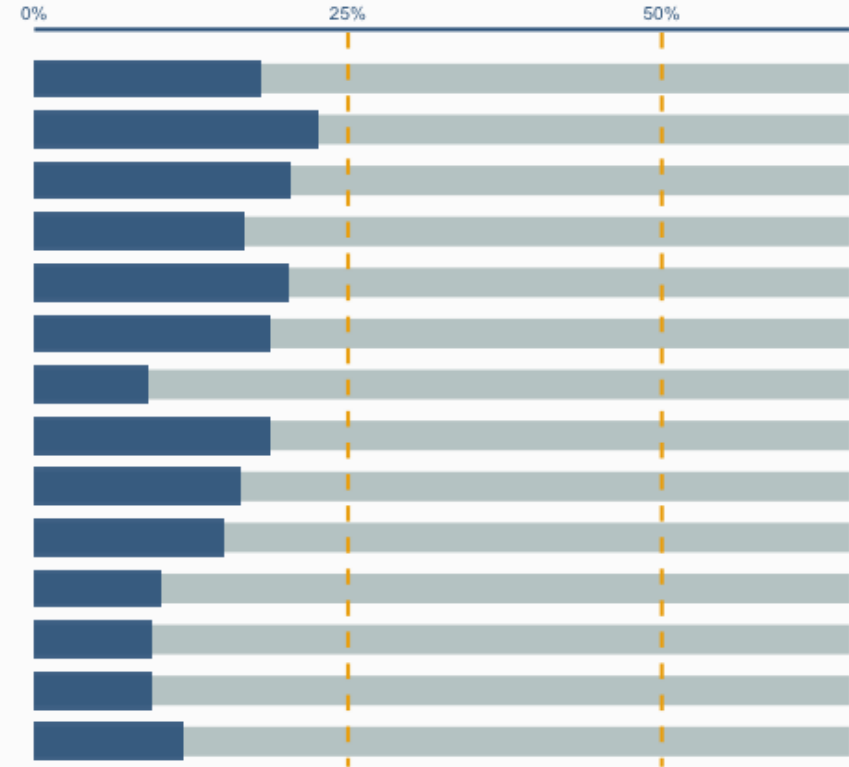
Adding the Animation

```
plot3+  
  facet_null()+  
  gganimate::transition_time(TIME)+  
  ease_aes('linear')
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Value



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

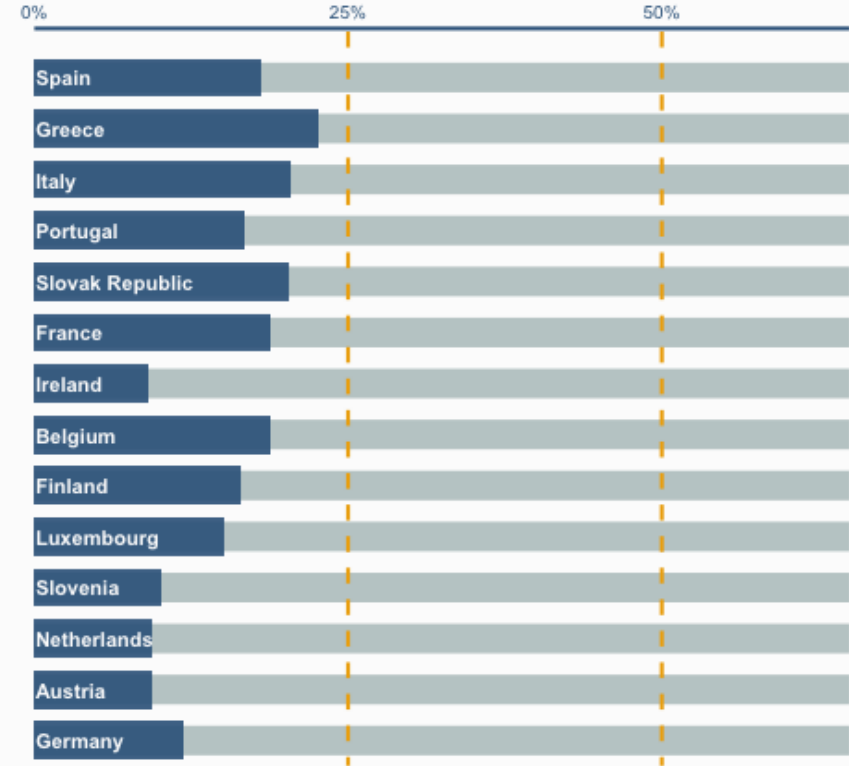
Adding the Animation

```
plot3+  
  facet_null()+  
  gganimate::transition_time(TIME)+  
  ease_aes('linear')+  
  labs(x = 'Year: {format(round(frame_time, digits = 0))}') +  
  geom_text(aes(label = reorder(Country, Value)),  
            x = 0.1, hjust = 0, color = "grey99",  
            fontface = "bold")
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Year: 2007



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

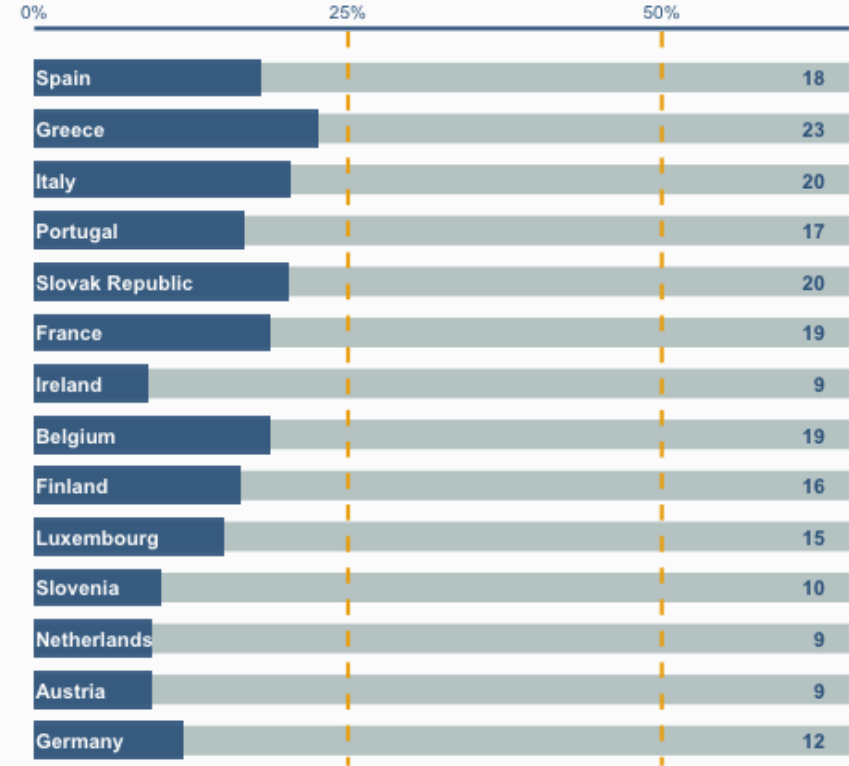
Adding the Animation

```
plot3+  
  facet_null()+  
  gganimate::transition_time(TIME)+  
  ease_aes('linear')+  
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+  
  geom_text(aes(label = reorder(Country, Value)),  
            x = 0.1, hjust = 0, color = "grey99",  
            fontface = "bold")+  
  geom_text(aes(label =  
                format(round(Value, digits = 0))),  
            x = 63, color = "steelblue4",  
            fontface = "bold", hjust = 1)
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Year: 2007



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

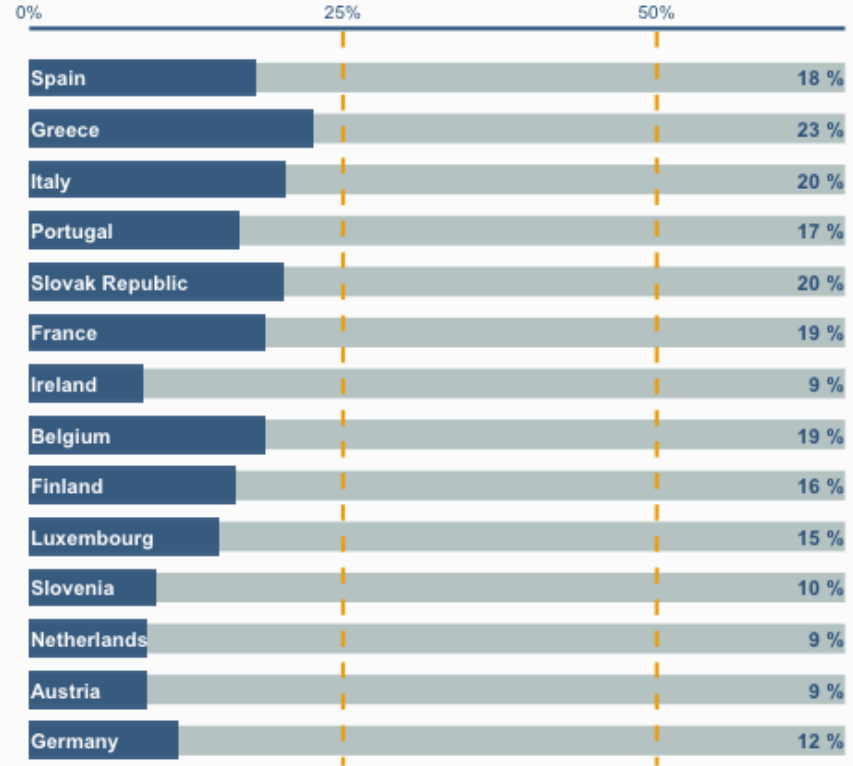
Adding the Animation

```
plot3+  
  facet_null()+  
  gganimate::transition_time(TIME)+  
  ease_aes('linear')+  
  labs(x = 'Year: {format(round(frame_time, digits = 0))}') +  
  geom_text(aes(label = reorder(Country, Value)),  
            x = 0.1, hjust = 0, color = "grey99",  
            fontface = "bold")+  
  geom_text(aes(label =  
                format(round(Value, digits = 0))),  
            x = 63, color = "steelblue4",  
            fontface = "bold", hjust = 1)+  
  geom_text(x=63.5, label = "%", color = "steelblue4",  
            fontface = "bold", hjust = 0)
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Year: 2007



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

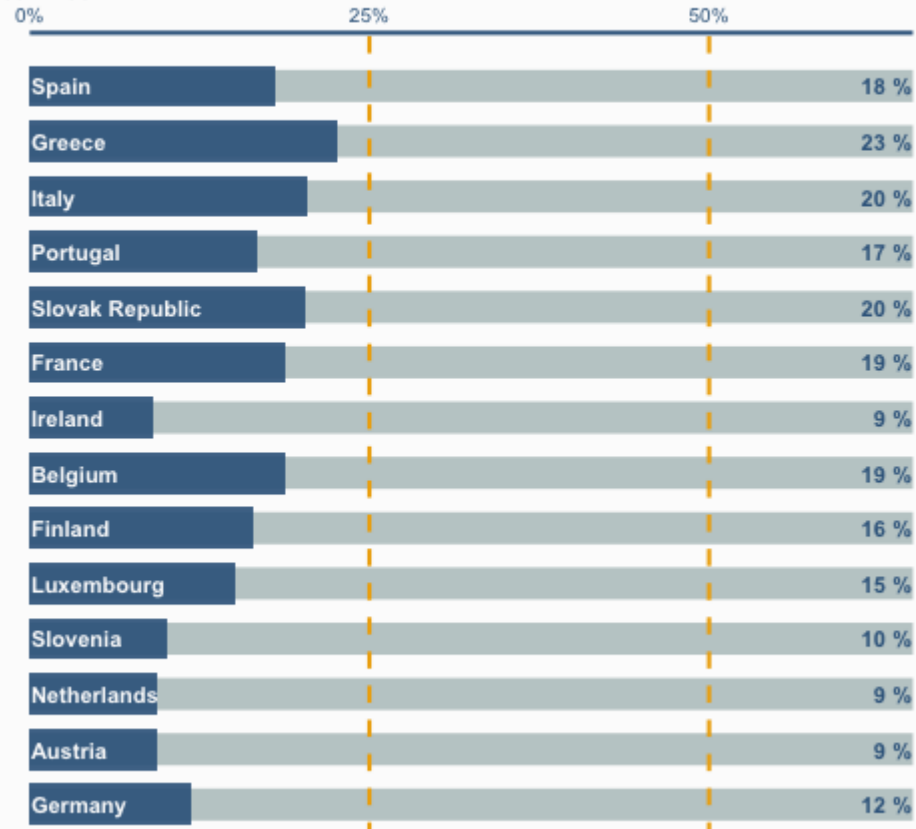
Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')+
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+
  geom_text(aes(label = reorder(Country, Value)),
            x = 0.1, hjust = 0, color = "grey99",
            fontface = "bold")+
  geom_text(aes(label =
                format(round(Value, digits = 0))),
            x = 63, color = "steelblue4",
            fontface = "bold", hjust = 1)+
  geom_text(x=63.5, label = "%", color = "steelblue4",
            fontface = "bold", hjust = 0)->
  finalplot
```

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Year: 2007

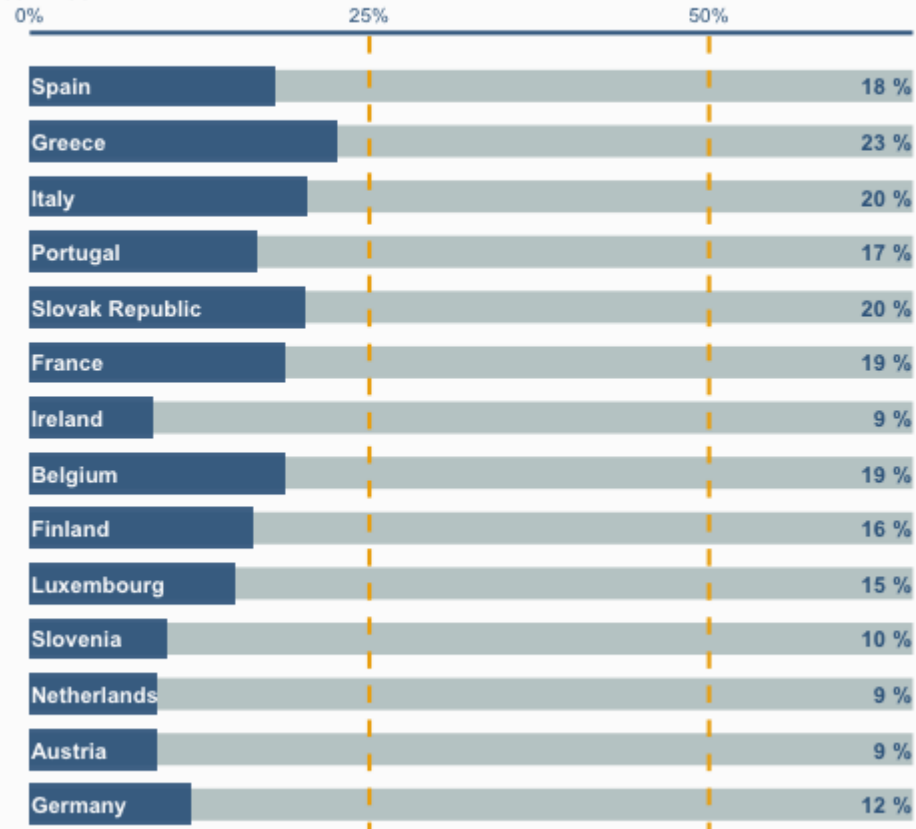


*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)

Euro Area Youth Unemployment Rate 2007 - 2017

Youth unemployment (15-24 years) expressed as a percent of the youth labour force

Year: 2007



*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)