R Programming Lab Mini Project

Russio_Ukranian War

An investigation of democracy

Prepared by

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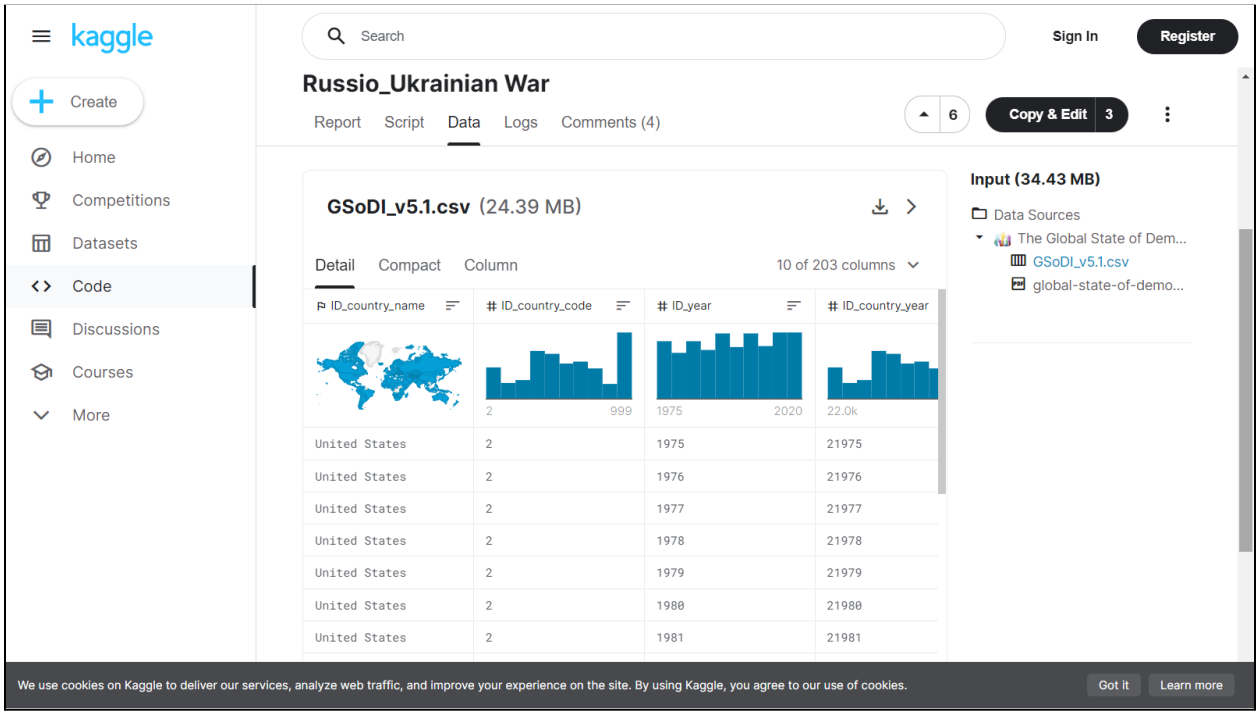
Introduction

- Inspiration: The Russian Ukrainian War that started on the 24 February 2022, and still seems to be going on.
- Looking at the brutal nature of the war, and more so the reason for why it began, it was interesting to dive into the history of both nations and study the analysis done of their democracy, thus laying out a clear picture about the state of democracy throughout history, in both the nations.
- This is a study project done on Mr. Ali. A. Amiri's Kaggle report and code.

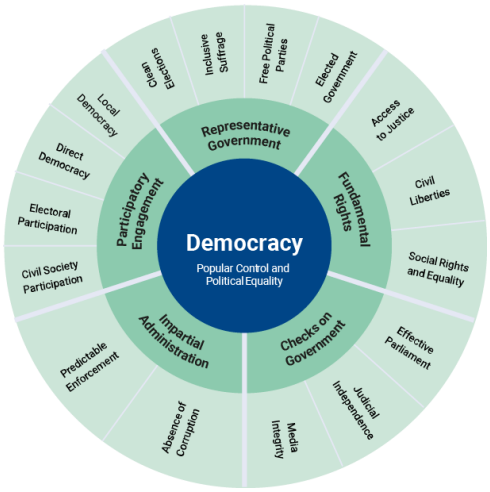
Dataset Used

(https://www.kaggle.com/code/aliaamiri/russio-ukrainian-war/data)

Theory written by author Ali A. Amiri



International Institute for Democracy and Electoral Assistance (International IDEA) publishes an annual global state of democracy (GSoD) which is mainly based on analyses and measurements by the V-Dem Institute (Varieties of Democracy). The V-Dem Institute's measures of democracy are the most elaborate and granular among several well-known democracy indexes (such as the Polity data series and Freedom House's Freedom in the World)7. In the image below you can see an overview of indices and sub attributes of GSoD 2021.



To avoid confirmation bias (cherry picking), none of the sub attributes of the main indices were excluded.

```
data <- read_csv("../input/the-global-state-of-democracy-indices/GSoDI_v5.1.csv")

head(data)
```

```
## # A tibble: 6 × 203
##   ID_country_name ID_country_code ID_year ID_country_year ID_region ID_subregion
##   <chr>                     <dbl>   <dbl>           <dbl>     <dbl>        <dbl>
## 1 United States                 2    1975           21975         3            9
## 2 United States                 2    1976           21976         3            9
## 3 United States                 2    1977           21977         3            9
## 4 United States                 2    1978           21978         3            9
## 5 United States                 2    1979           21979         3            9
## 6 United States                 2    1980           21980         3            9
## # … with 197 more variables: ID_region_name <chr>, ID_subregion_name <chr>,
## #   C_A1 <dbl>, L_A1 <dbl>, U_A1 <dbl>, C_SD11 <dbl>, L_SD11 <dbl>,
## #   U_SD11 <dbl>, C_SD12 <dbl>, C_SD13 <dbl>, L_SD13 <dbl>, U_SD13 <dbl>,
## #   C_SD14 <dbl>, L_SD14 <dbl>, U_SD14 <dbl>, C_A2 <dbl>, L_A2 <dbl>,
## #   U_A2 <dbl>, C_SD21 <dbl>, L_SD21 <dbl>, U_SD21 <dbl>, C_SD22 <dbl>,
## #   L_SD22 <dbl>, U_SD22 <dbl>, C_SD22A <dbl>, L_SD22A <dbl>, U_SD22A <dbl>,
## #   C_SD22B <dbl>, L_SD22B <dbl>, U_SD22B <dbl>, C_SD22C <dbl>, …
```

The dataset consists of many variables which are different attributes, sub attributes, and indicators. We can select and rename our desired variables (sub attributes) according to the codebook provided with the dataset.

```
attributes <- tibble(attribute = c("A1", "A2", "A3", "A4", "A5"),
                     indices = c(
                       "Representative Government ",
                       "Fundamental Rights",
                       "Checks on Government",
                       "Impartial Administration",
                       "Participatory Engagement"
                       )
                     )

data <- data %>%
  select(ID_country_name, ID_year, C_SD11, C_SD12,
         C_SD13, C_SD14, C_SD21, C_SD22A, C_SD22B,
         C_SD22C, C_SD22D, C_SD22E, C_SD23A, C_SD23B,
         C_SD23C, C_SD31, C_SD32, C_SD33, C_SD41,
         C_SD42, C_SD51, C_SD52, C_SD53, C_SD54,
         democratic_performance_name,
         democratic_performance_numeric) %>%
  rename(country = ID_country_name,
         year = ID_year,
         clean_elections_A1 = C_SD11,
         inclusive_suffrage_A1 = C_SD12,
         free_political_parties_A1 = C_SD13,
         elected_government_A1 = C_SD14,
         access_to_justice_A2 = C_SD21,
         freedom_of_expression_A2 = C_SD22A,
         freedom_of_association_and_assembly_A2 = C_SD22B,
         freedom_of_religion_A2 = C_SD22C,
         freedom_of_movement_A2 = C_SD22D,
         personal_integrity_and_security_A2 = C_SD22E,
         social_group_equality_A2 = C_SD23A,
         basic_welfare_A2 = C_SD23B,
         gender_equality_A2 = C_SD23C,
         effective_parliament_A3 = C_SD31,
         judicial_independence_A3 = C_SD32,
         media_integrity_A3 = C_SD33,
         absence_of_corruption_A4 = C_SD41,
         predictable_enforcement_A4 = C_SD42,
         civil_society_participation_A5 = C_SD51,
         electoral_participation_A5 = C_SD52,
         direct_democracy_A5 = C_SD53,
         local_democracy_A5 = C_SD54) %>%
  filter(country %in% c("Russia", "Ukraine", "World") &
           year >= 1991)

head(data)
```

```
## # A tibble: 6 × 26
##   country  year clean_elections_A1 inclusive_suffrage_A1 free_political_parties…
##   <chr>   <dbl>              <dbl>                 <dbl>                    <dbl>
## 1 Russia   1991              0.539                 0.951                    0.379
## 2 Russia   1992              0.550                 0.951                    0.446
## 3 Russia   1993              0.565                 0.888                    0.477
## 4 Russia   1994              0.568                 0.888                    0.477
## 5 Russia   1995              0.567                 0.888                    0.477
## 6 Russia   1996              0.550                 0.888                    0.477
## # … with 21 more variables: elected_government_A1 <dbl>,
## #   access_to_justice_A2 <dbl>, freedom_of_expression_A2 <dbl>,
## #   freedom_of_association_and_assembly_A2 <dbl>, freedom_of_religion_A2 <dbl>,
## #   freedom_of_movement_A2 <dbl>, personal_integrity_and_security_A2 <dbl>,
## #   social_group_equality_A2 <dbl>, basic_welfare_A2 <dbl>,
## #   gender_equality_A2 <dbl>, effective_parliament_A3 <dbl>,
## #   judicial_independence_A3 <dbl>, media_integrity_A3 <dbl>, …
```

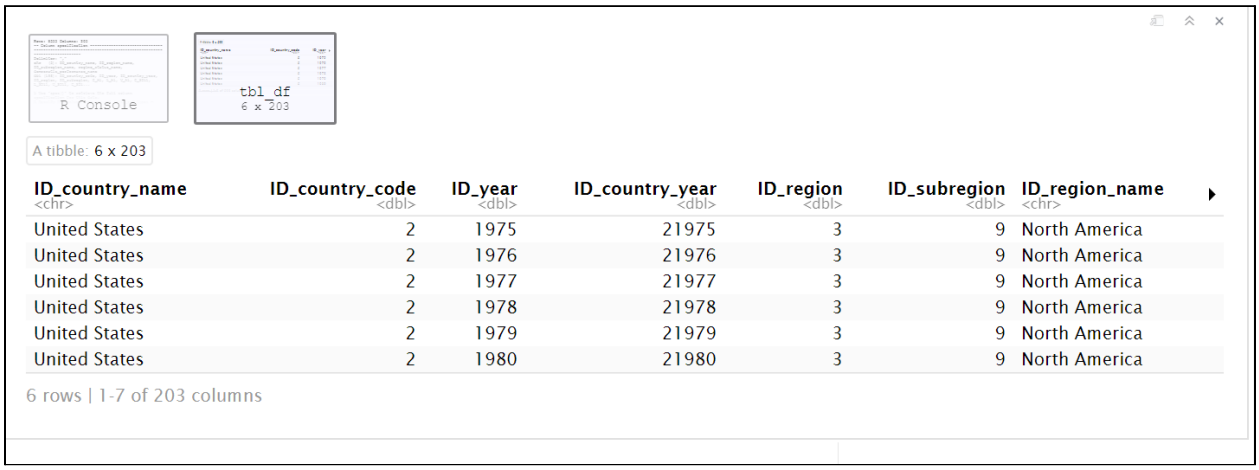
Code & Screenshots

```{r setup, include=FALSE}
  knitr::opts_chunk$set(
  echo=TRUE,
  warning=FALSE,
  message=FALSE,
  fig.align = 'left')
```

```{r}
library(dplyr)    # Data manipulation
library(tidyr)    # Pivotting
library(ggplot2)  # Visualization
library(readr)    # To import CSV files
library(stringr)  # Regex and string operations
library(ggthemes)  # Extra themes for ggplot2
#devtools::install_github("rensa/ggflags")
#library(ggflags)  # Flags of countries
library(ggforce)  # An alternative for facetting
library(ggtext)   # A flexible text styling
```

Overview of indices and sub attributes of GSoD 2021

```{r}

data <- read_csv("../input/the-global-state-of-democracy-indices/GSoDI_v5.1.csv")

head(data)
```



ID_country_name <chr>	ID_country_code <dbl>	ID_year <dbl>	ID_country_year <dbl>	ID_region <dbl>	ID_subregion <dbl>	ID_region_name <chr>
United States	2	1975	21975	3	9	North America
United States	2	1976	21976	3	9	North America
United States	2	1977	21977	3	9	North America
United States	2	1978	21978	3	9	North America
United States	2	1979	21979	3	9	North America
United States	2	1980	21980	3	9	North America

6 rows | 1-7 of 203 columns

```{r}

attributes <- tibble(attribute = c("A1", "A2", "A3", "A4", "A5"),
                     indices = c(
                       "Representative Government ",
                       "Fundamental Rights",
                       "Checks on Government",
                       "Impartial Administration",
                       "Participatory Engagement"
                       )
                     )

data <- data %>%
  select(ID_country_name, ID_year, C_SD11, C_SD12,
         C_SD13, C_SD14, C_SD21, C_SD22A, C_SD22B,
         C_SD22C, C_SD22D, C_SD22E, C_SD23A, C_SD23B,
         C_SD23C, C_SD31, C_SD32, C_SD33, C_SD41,
         C_SD42, C_SD51, C_SD52, C_SD53, C_SD54,
         democratic_performance_name,
         democratic_performance_numeric) %>%
  rename(country = ID_country_name,
         year = ID_year,
```

```
        clean_elections_A1 = C_SD11,
        inclusive_suffrage_A1 = C_SD12,
        free_political_parties_A1 = C_SD13,
        elected_government_A1 = C_SD14,
        access_to_justice_A2 = C_SD21,
        freedom_of_expression_A2 = C_SD22A,
        freedom_of_association_and_assembly_A2 = C_SD22B,
        freedom_of_religion_A2 = C_SD22C,
        freedom_of_movement_A2 = C_SD22D,
        personal_integrity_and_security_A2 = C_SD22E,
        social_group_equality_A2 = C_SD23A,
        basic_welfare_A2 = C_SD23B,
        gender_equality_A2 = C_SD23C,
        effective_parliament_A3 = C_SD31,
        judicial_independence_A3 = C_SD32,
        media_integrity_A3 = C_SD33,
        absence_of_corruption_A4 = C_SD41,
        predictable_enforcement_A4 = C_SD42,
        civil_society_participation_A5 = C_SD51,
        electoral_participation_A5 = C_SD52,
        direct_democracy_A5 = C_SD53,
        local_democracy_A5 = C_SD54) %>%
  filter(country %in% c("Russia", "Ukraine", "World") &
           year >= 1991)

head(data)
```

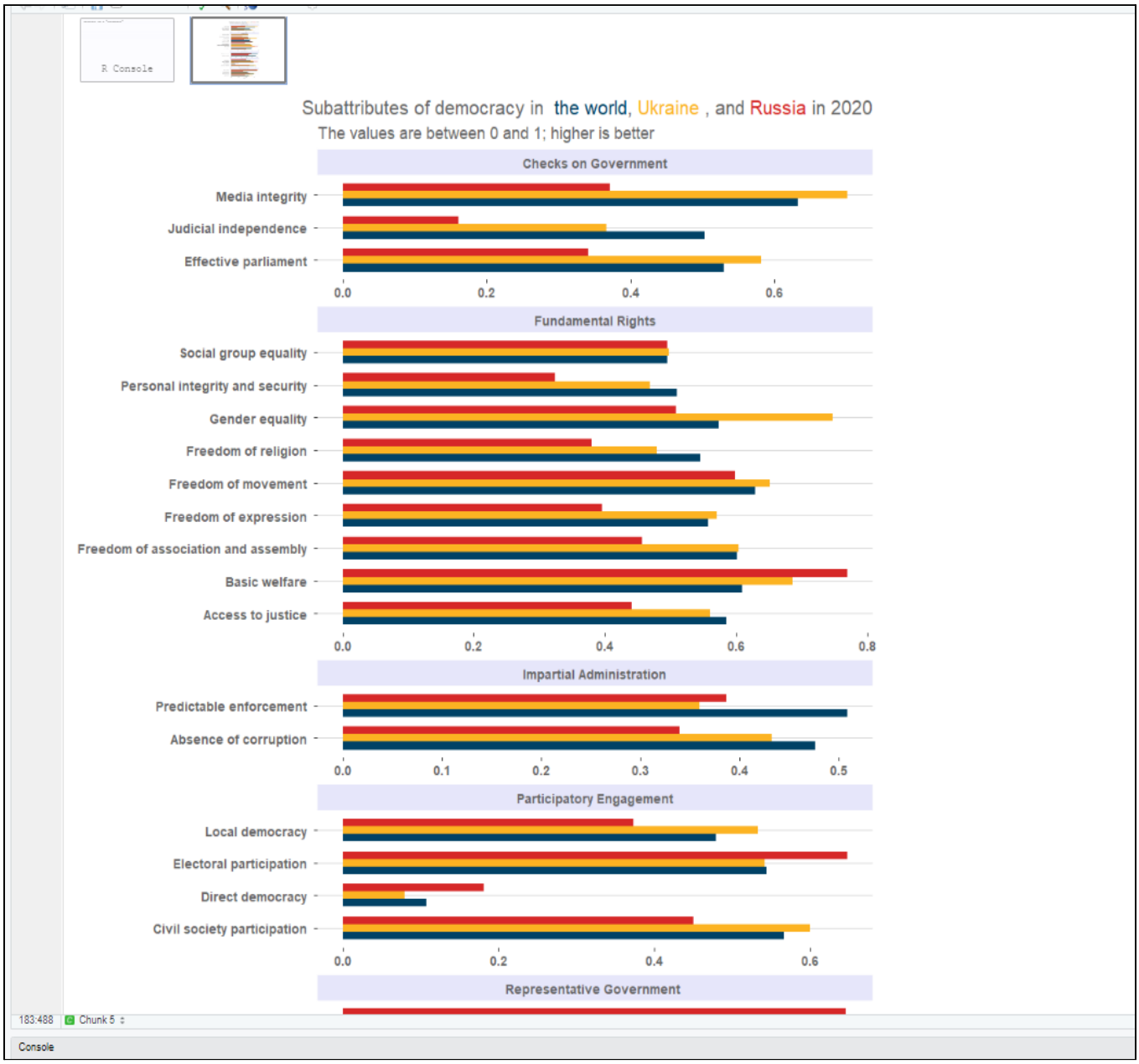
A tibble: 6 x 26

country <chr>	year <dbl>	clean_elections_A1 <dbl>	inclusive_suffrage_A1 <dbl>	free_political_parties_A1 <dbl>
Russia	1991	0.5389405	0.9508783	0.3792062
Russia	1992	0.5501251	0.9508783	0.4463138
Russia	1993	0.5648654	0.8879158	0.4774513
Russia	1994	0.5684420	0.8879158	0.4774513
Russia	1995	0.5674261	0.8884695	0.4774513
Russia	1996	0.5502556	0.8884695	0.4774513

6 rows | 1-5 of 26 columns

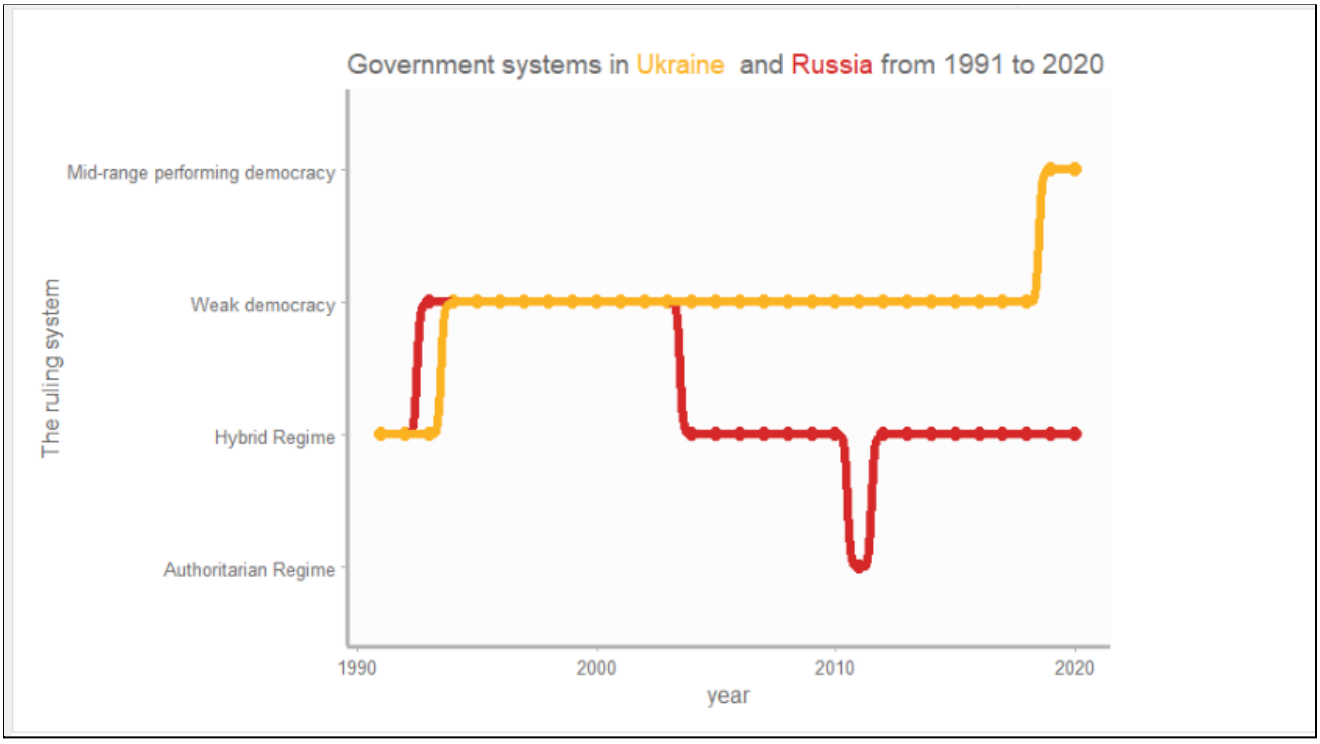
```{r fig.width=8, fig.height=10}

data %>%
  filter(year == 2020) %>%
  select(-c(
    year,
    democratic_performance_name,
    democratic_performance_numeric
    )
  ) %>%
  pivot_longer(!country,
               names_to = "subattribute",
               values_to = "value") %>%
  mutate(attribute = str_extract(subattribute, "A\\d$")) %>%
  left_join(attributes) %>%
  mutate(country = factor(country,
                          levels = c("World", "Ukraine", "Russia"),
                          ordered = TRUE),
         subattribute = str_replace_all(subattribute, "_", " "),
         subattribute = str_remove(subattribute, "A\\d"),
         subattribute = str_to_sentence(subattribute)) %>%
  ggplot(aes(subattribute, value, fill = country)) +
  geom_col(width = 0.7, position = "dodge") +
  facet_col(~indices,
            scales = "free",
            space = "free") +
  coord_flip() +
  scale_fill_manual(values = c(Russia = "#D62828",
                               World = "#004266",
                               Ukraine = "#FCB322"
                               )
                    ) +
  theme_hc() +
  theme(
    axis.text = element_text(face = "bold", color = "grey40"),
    axis.title = element_text(color = "grey40"),
    plot.title = element_markdown(hjust = 1, color = "grey40"),
    plot.subtitle = element_text(color = "grey40"),
    legend.position = "none",
    strip.background = element_rect(fill = "lavender"),
```

```
    strip.text = element_text(face = "bold", color = "grey40")) +
  labs(title = "Subattributes of democracy in <span style = 'color:#004266;'>                the
world</span>, <span style = 'color:#FCB322;'>Ukraine

</span>, and <span style = 'color:#D62828;'>Russia</span>

in 2020",
       subtitle = "The values are between 0 and 1; higher is better",
       x = NULL)
```



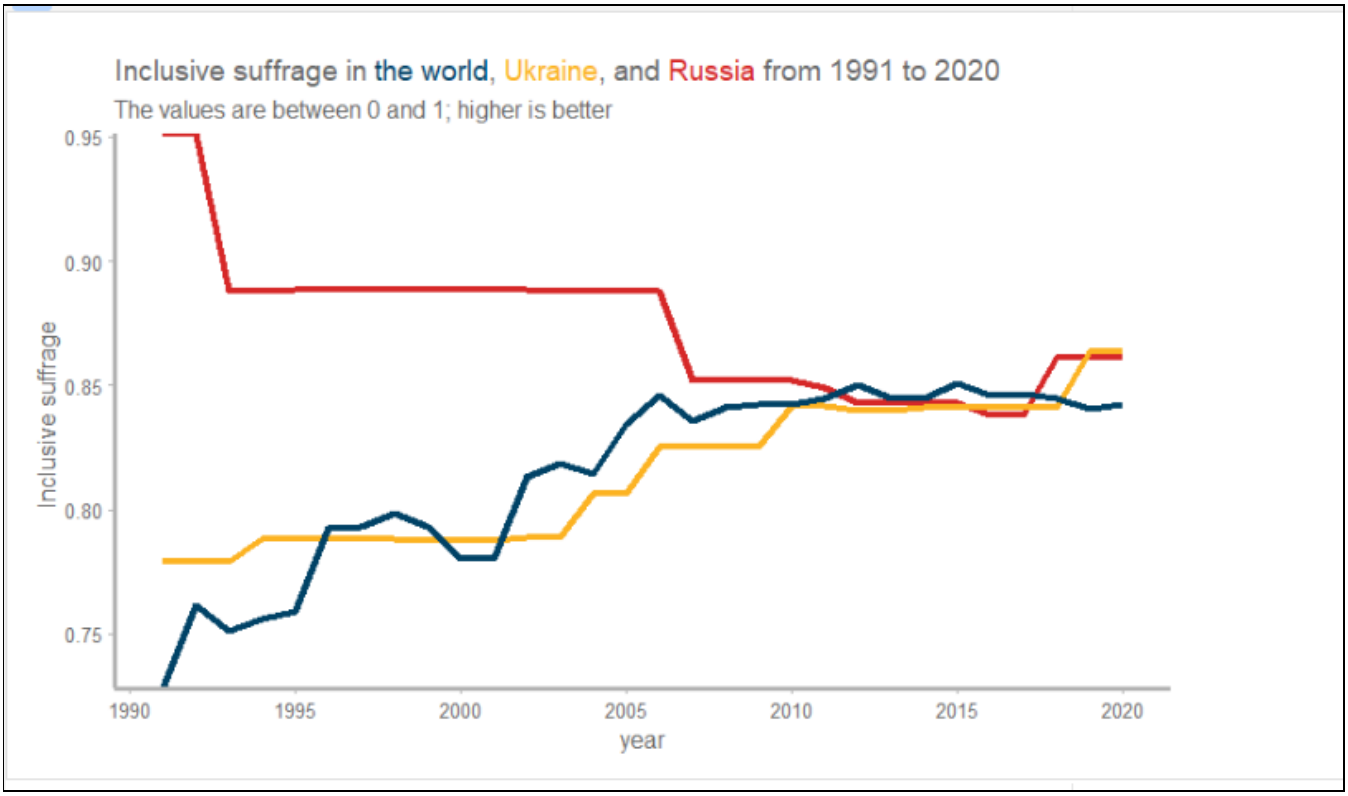
```{r}
# Defining a function for drawing plots

theme_costum <- function (base_size = 11, base_family = "") {
  theme_classic() +
    theme(
      plot.title = element_text(color = "grey40"),
      plot.subtitle = element_text(color = "grey40"),
      axis.title = element_text(color = "grey40"),
      axis.line = element_line(color = "grey70", size = 1),
      axis.ticks = element_line(color = "grey70"),
      axis.text = element_text(color = "grey40"),
      legend.position = "none"
    )
}

data %>%
  filter(country %in% c("Russia", "Ukraine")) %>%
  mutate(country_code = ifelse(country == "Ukraine", "ua", "ru")) %>%
  ggplot(aes(year, reorder(democratic_performance_name,
                           -democratic_performance_numeric),
             group = country
             )
         ) +
  geom_point(aes(year,
                 reorder(democratic_performance_name,
                         -democratic_performance_numeric),
                 col = country
                 ),
             size = 3
             ) +
  ggbump::geom_bump(aes(col = country),
                    size = 2,
                    lineend = "round") +
  scale_color_manual(values = c(Russia = "#D62828",
Ukraine = "#FCB322"
)
) +
    #geom_flag(data = . %>%
    #          filter(year == max(year)),
```

```
  #       aes(x = year + 1,
  #           y = democratic_performance_name,
  #           country = country_code
  #         )
  #    ) +
  labs(title = "Government systems in <span style = 'color:#FCB322;'>Ukraine
            </span> and <span style = 'color:#D62828;'>Russia</span>
            from 1991 to 2020",
       y = "The ruling system"
  ) +
  theme_costum() +
  theme(
    panel.background = element_rect(fill = "grey99"),
    legend.position = "none",
    plot.title = element_markdown()
  )
```

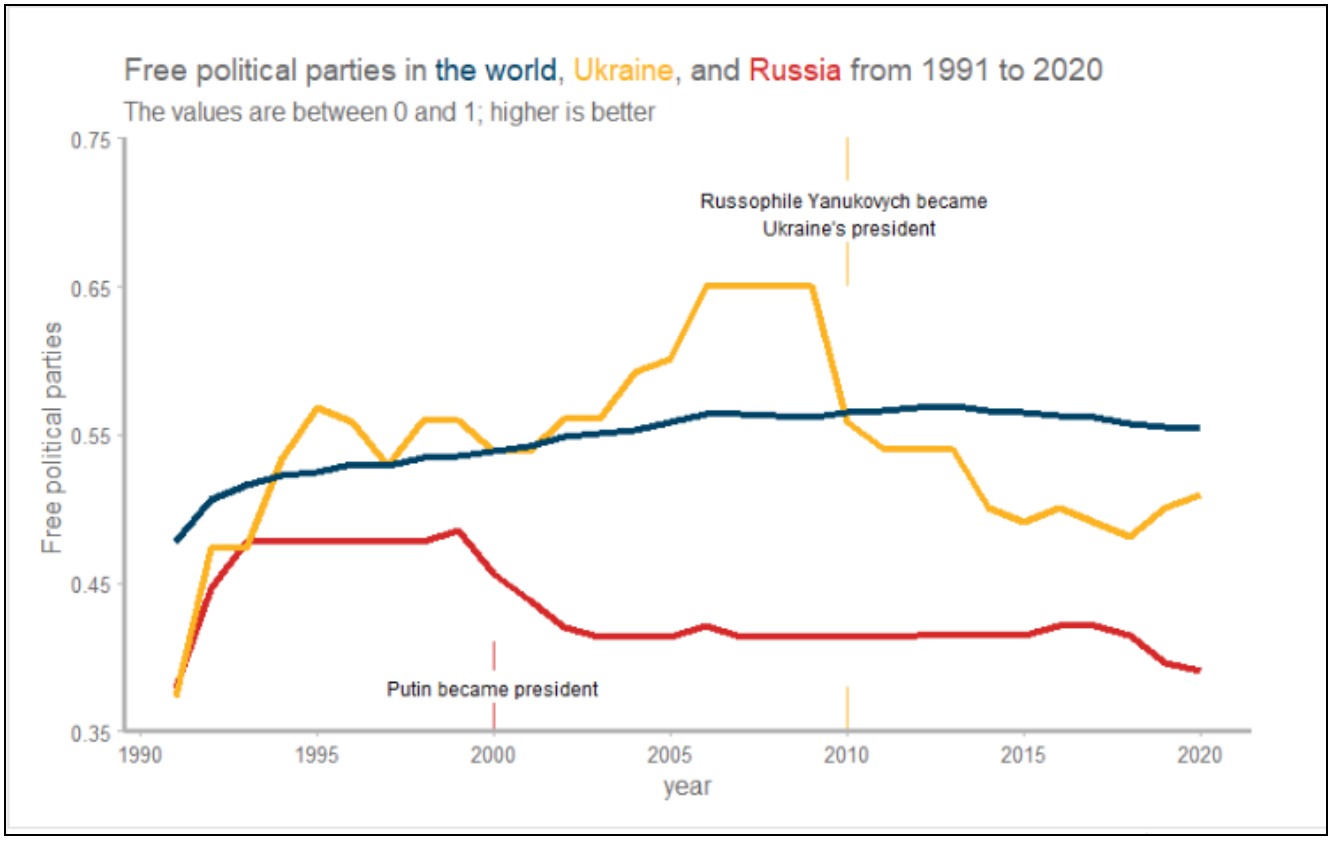


```{r}
graph_index <- function(index){
  subattribute <- as.character(index) %>%
    str_replace_all("_", " ") %>%
    str_remove_all("A\\d") %>%
    str_to_sentence()

  ggplot() +
    geom_path(data = data,
              aes(year,
                  .data[[index]],
                  group = country,
                  col = country
                  ),
              size = 1.5
              ) +
    scale_color_manual(values = c(Russia = "#D62828",
                                  World = "#004266",
                                  Ukraine = "#FCB322"
                                  )
                       ) +
    scale_y_continuous(expand = c(0, 0)) +
    scale_x_continuous(n.breaks = 6) +
    labs(title =
           str_c(subattribute,
                 "in <span style = 'color:#004266;'>the world</span>,
    <span style = 'color:#FCB322;'>Ukraine</span>, and
<span style = 'color:#D62828;'>Russia</span>
    from 1991 to 2020"),
         subtitle = "The values are between 0 and 1; higher is better",
         y = subattribute
         ) +
    theme_costum() +
  theme(plot.title = element_markdown())
}
```

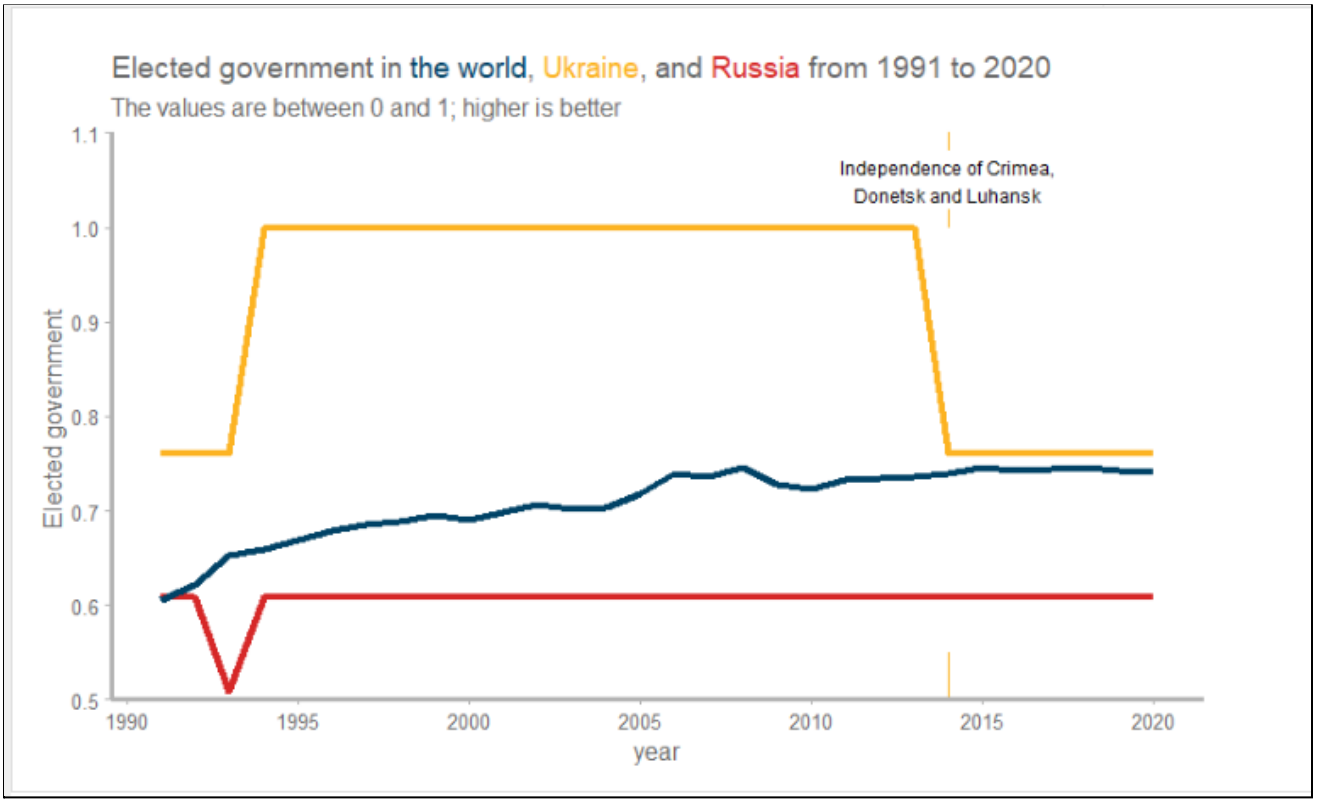
```{r}
graph_index("inclusive_suffrage_A1")
```


Inclusive suffrage in the world, Ukraine, and Russia from 1991 to 2020
The values are between 0 and 1; higher is better
Inclusive suffrage
0.95
0.90
0.85
0.80
0.75
1990
1995
2000
2005
2010
2015
2020
year

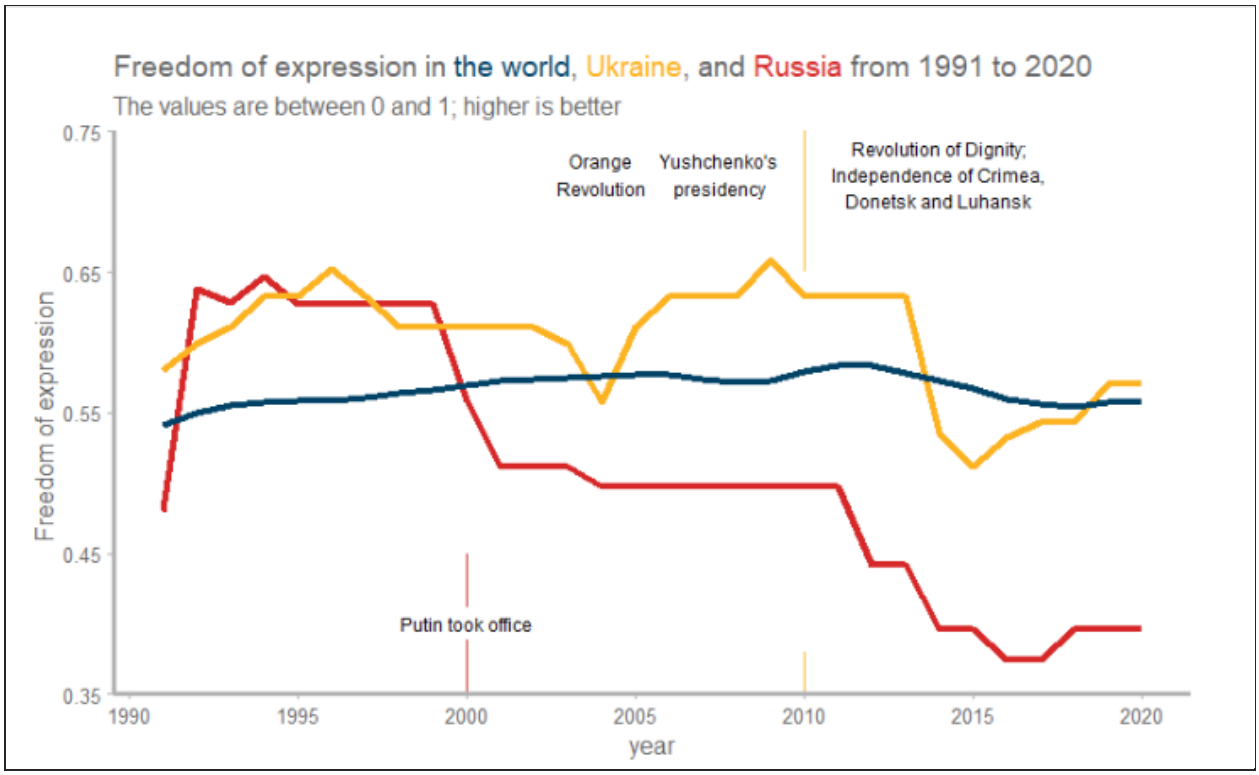
```{r}
Ukraine_seg = tibble(x = rep(2010, 2),
                     xend = rep(2010, 2),
                     y = c(0.35, 0.65),
                     yend = c(0.38, 0.75)
                     )

graph_index("free_political_parties_A1") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
) +
    geom_segment(aes(x = 2000,
                     y = 0.35,
                     xend = 2000,
                     yend = 0.41
    ),
    color = "#D62828"
    ) +
    geom_label(aes(x = 2010,
                   y = 0.7,
                   label = "Russophile Yanukovych became \n Ukraine's president"
    ),
    label.size = NA,
    size = 3
    ) +
    geom_label(aes(x = 2000,
                   y = 0.38,
                   label = "Putin became president",
    ),
    label.size = NA,
    size = 3
    )
```


Free political parties in the world, Ukraine, and Russia from 1991 to 2020
The values are between 0 and 1; higher is better
Free political parties
0.75
0.65
0.55
0.45
0.35
Russophile Yanukovych became Ukraine's president
Putin became president
1990
1995
2000
2005
2010
2015
2020
year

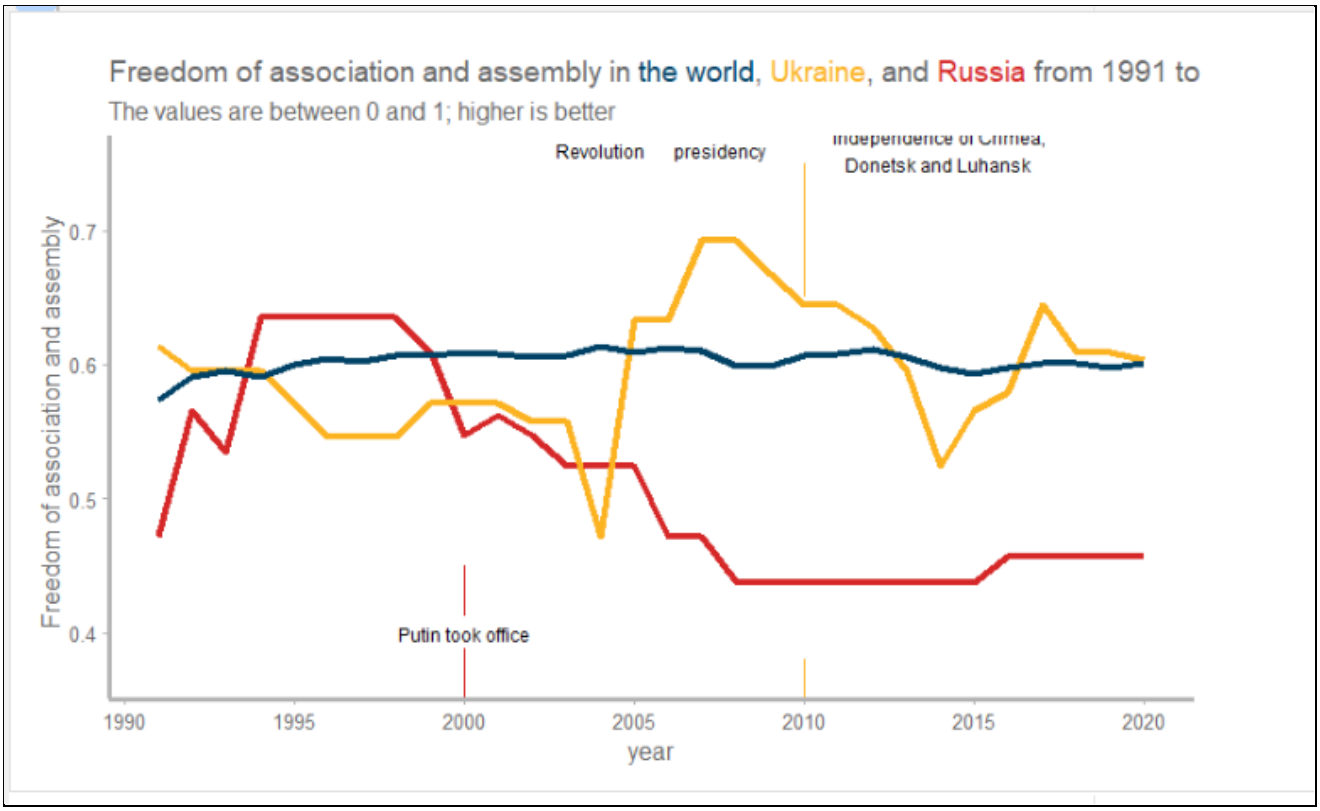
```{r}
graph_index("elected_government_A1") +
  geom_segment(aes(x = rep(2014,2),
                   y = c(1, 0.5),
                   xend = rep(2014,2),
                   yend = c(1.1, 0.55)
                   ),
               color = "#FCB322"
               ) +
  geom_label(aes(x = 2014,
                 y = 1.05,
                 label = "Independence of Crimea,\nDonetsk and Luhansk"
                 ),
             label.size = NA,
             size = 3
             )
```



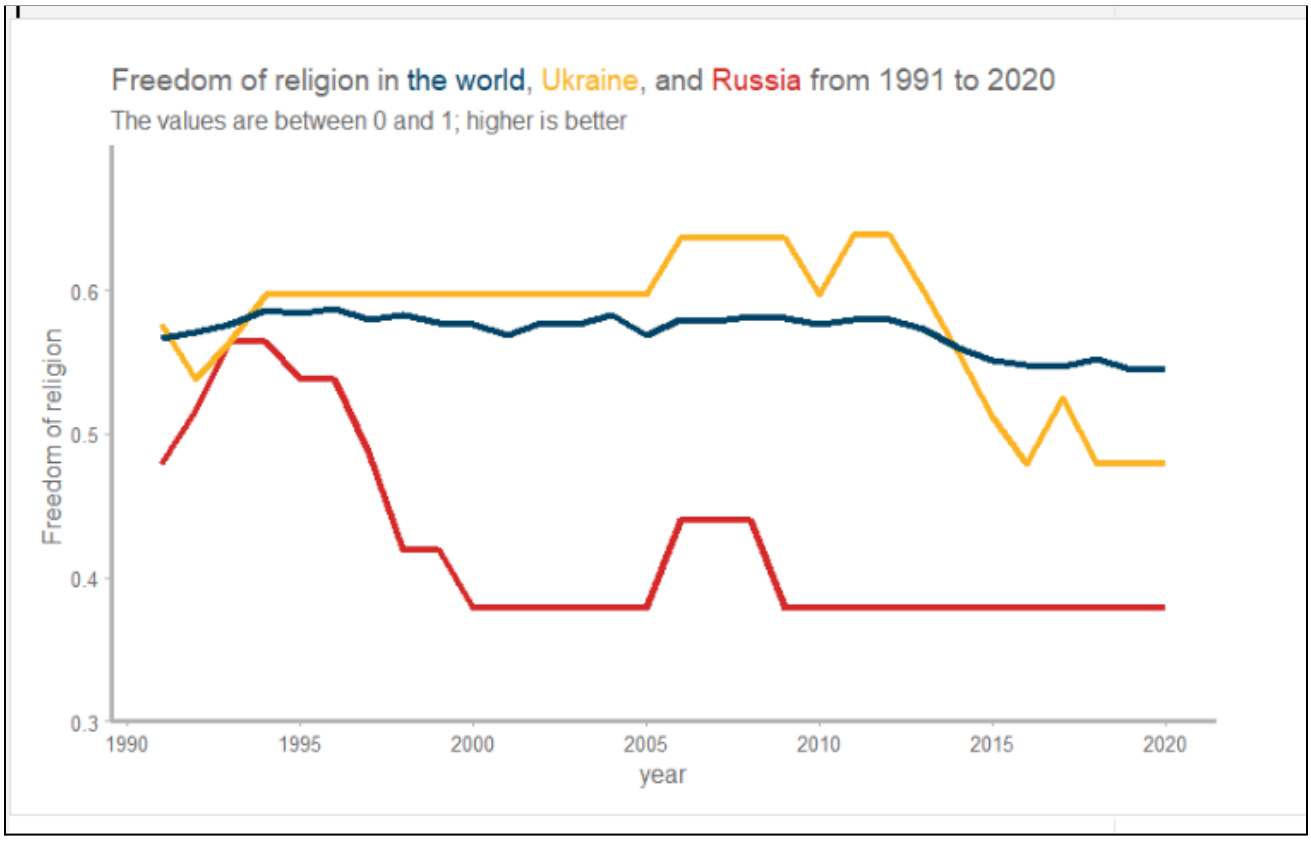
```{r}
Ukraine_seg = tibble(x = rep(c(2004, 2005, 2010, 2014), 2),
                     y = c(rep(0.67, 4), rep(0.35, 4)),
                     xend = rep(c(2004, 2005, 2010, 2014), 2),
                     yend = c(rep(0.78, 4), rep(0.38, 4))
                     )
graph_index("freedom_of_expression_A2") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
               ) +
  geom_segment(aes(x = 2000, y = 0.35, xend = 2000, yend = 0.45),
               color = "#D62828"
               ) +
  geom_label(aes(x = c(2004, 2007.5, 2014),
                 y = rep(0.72, 3),
                 label = c("Orange\nRevolution",
                           "Yushchenko's\npresidency",
                           "Revolution of Dignity;\nIndependence of Crimea,\nDonetsk and Luhansk")
                 ),
             label.size = NA,
             size = 3,
             label.padding = unit(0, "lines")
             ) +
  geom_label(aes(x = 2000, y = 0.4, label = "Putin took office"),
             label.size = NA,
             size = 3
             )
```


Freedom of expression in the world, Ukraine, and Russia from 1991 to 2020
The values are between 0 and 1; higher is better
Orange Revolution
Yushchenko's presidency
Revolution of Dignity; Independence of Crimea, Donetsk and Luhansk
Putin took office
Freedom of expression
0.75
0.65
0.55
0.45
0.35
1990
1995
2000
2005
2010
2015
2020
year

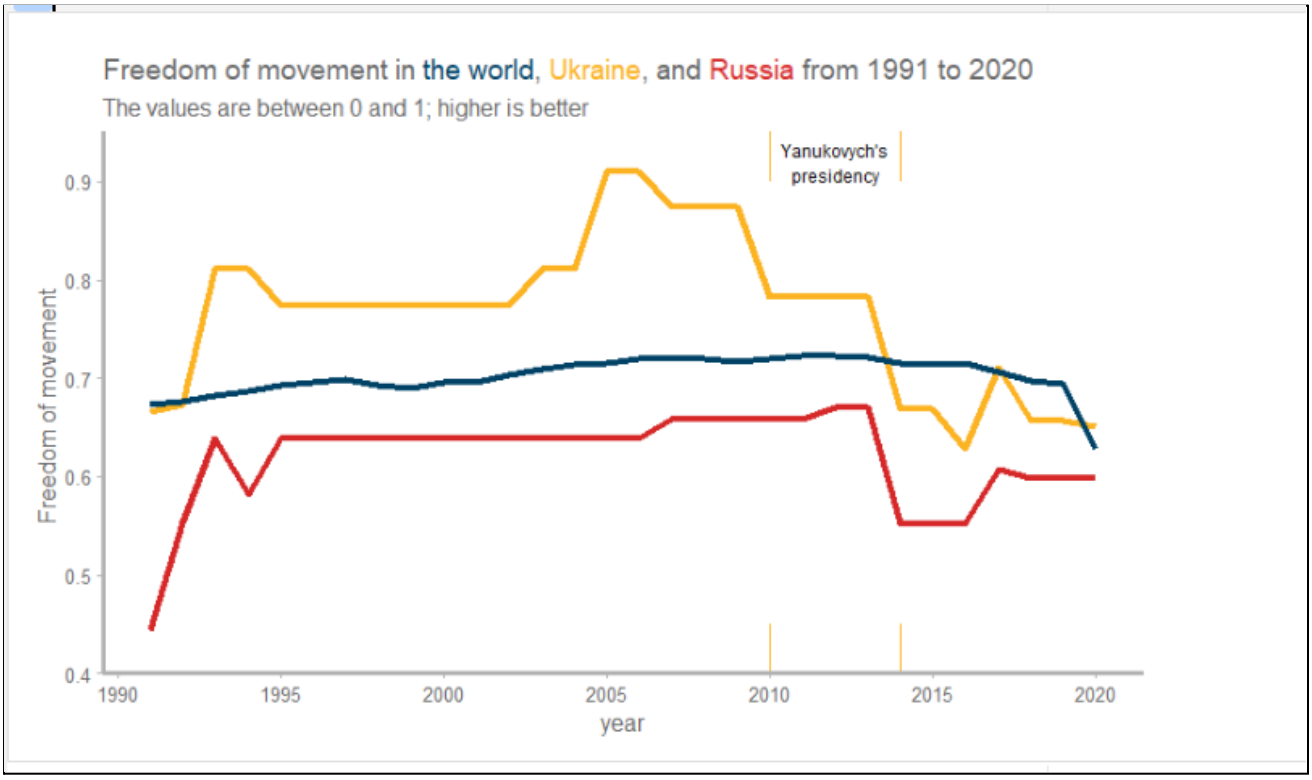
```{r}

Ukraine_seg = tibble(x = rep(c(2004, 2005, 2010, 2014), 2),
                     y = c(rep(0.7, 4), rep(0.35, 4)),
                     xend = rep(c(2004, 2005, 2010, 2014), 2),
                     yend = c(rep(0.84, 4), rep(0.4, 4))
                     )

graph_index("freedom_of_association_and_assembly_A2") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
) +
    geom_segment(aes(x = 2000, y = 0.35, xend = 2000, yend = 0.45),
                 color = "#D62828"
    ) +
    geom_label(aes(x = c(2004, 2007.5, 2014),
                   y = rep(0.77, 3),
                   label = c("Orange\nRevolution",
                             "Yushchenko's\npresidency",
                             "Revolution of Dignity;\nIndependence of Crimea,\nDonetsk and Luhansk ")
    ),
    label.size = NA,
    size = 3,
    label.padding = unit(0, "lines")
    ) +
    geom_label(aes(x = 2000, y = 0.4, label = "Putin took office"),
               label.size = NA,
               size = 3
    )
```


Freedom of association and assembly in the world, Ukraine, and Russia from 1991 to
The values are between 0 and 1; higher is better
Revolution
presidency
Donetsk and Luhansk
Freedom of association and assembly
0.7
0.6
0.5
0.4
Putin took office
1990
1995
2000
2005
2010
2015
2020
year

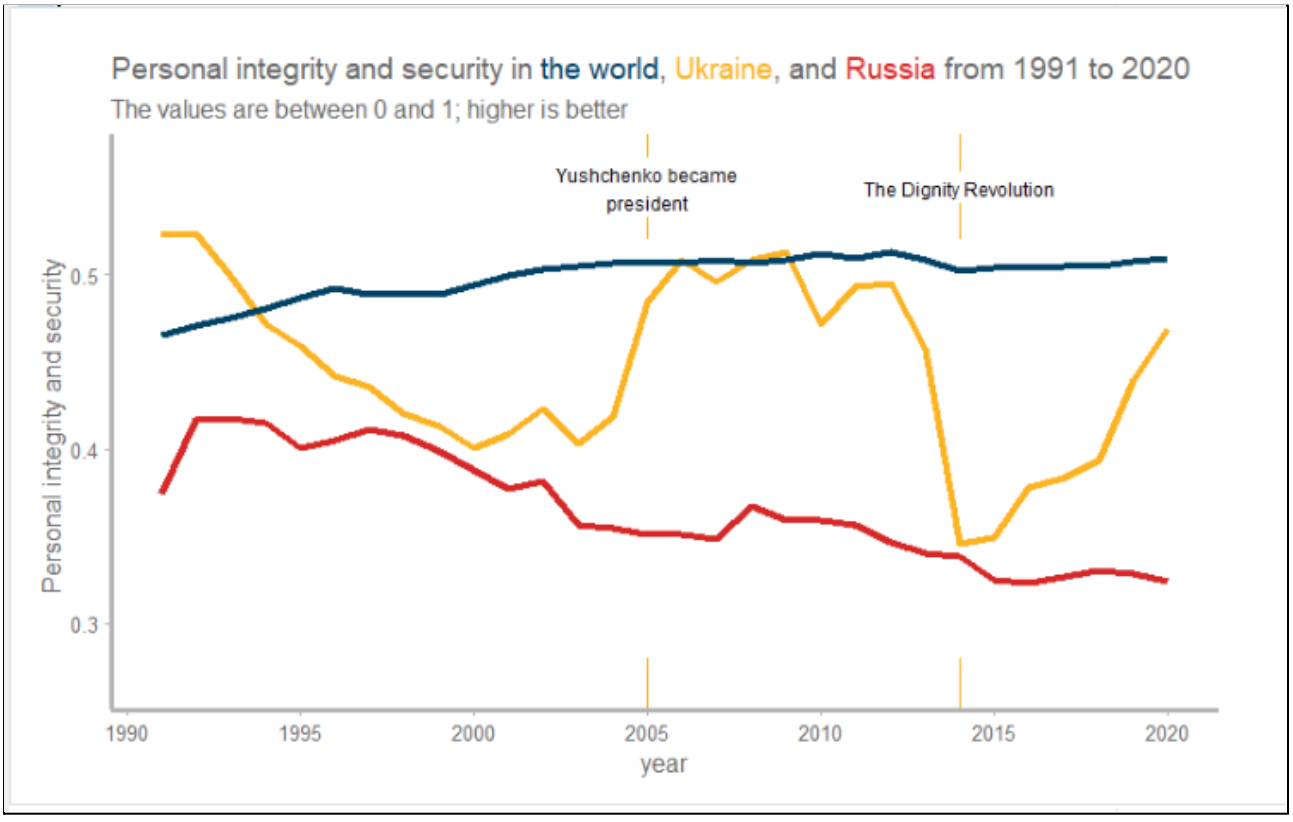
```{r}
graph_index("freedom_of_religion_A2") +
   expand_limits(y = c(0.3, 0.7))
```



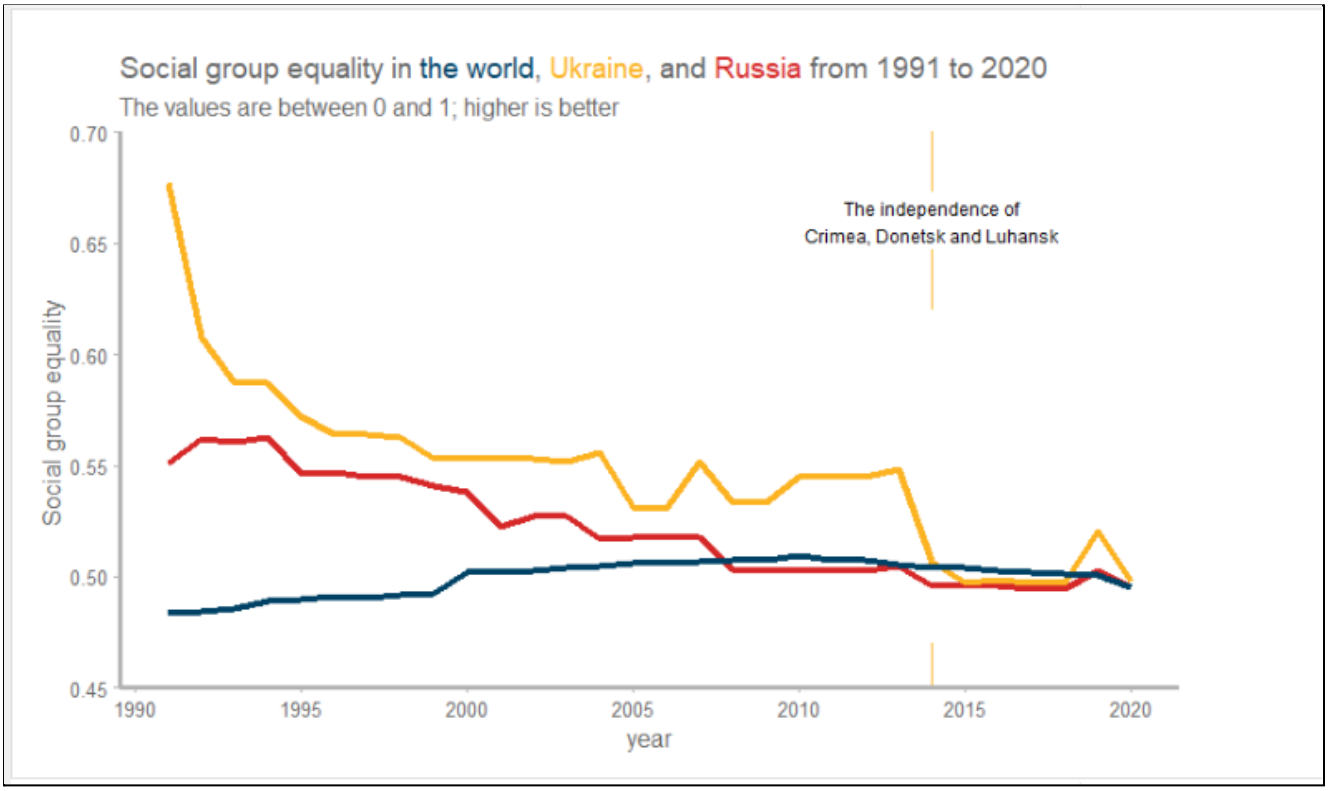
```{r}
graph_index("freedom_of_movement_A2") +
  geom_segment(aes(x = rep(c(2010, 2014), 2),
                   y = c(rep(0.9, 2), rep(0.4, 2)),
                   xend = rep(c(2010, 2014), 2),
                   yend = c(rep(0.95, 2), rep(0.45, 2))
                   ),
               color = "#FCB322"
              ) +
  geom_label(aes(x = 2012,
                 y = 0.92,
                 label = "Yanukovych's\npresidency"
                 ),
             label.size = NA,
             label.padding = unit(0, "lines"),
             size = 3
             )
```



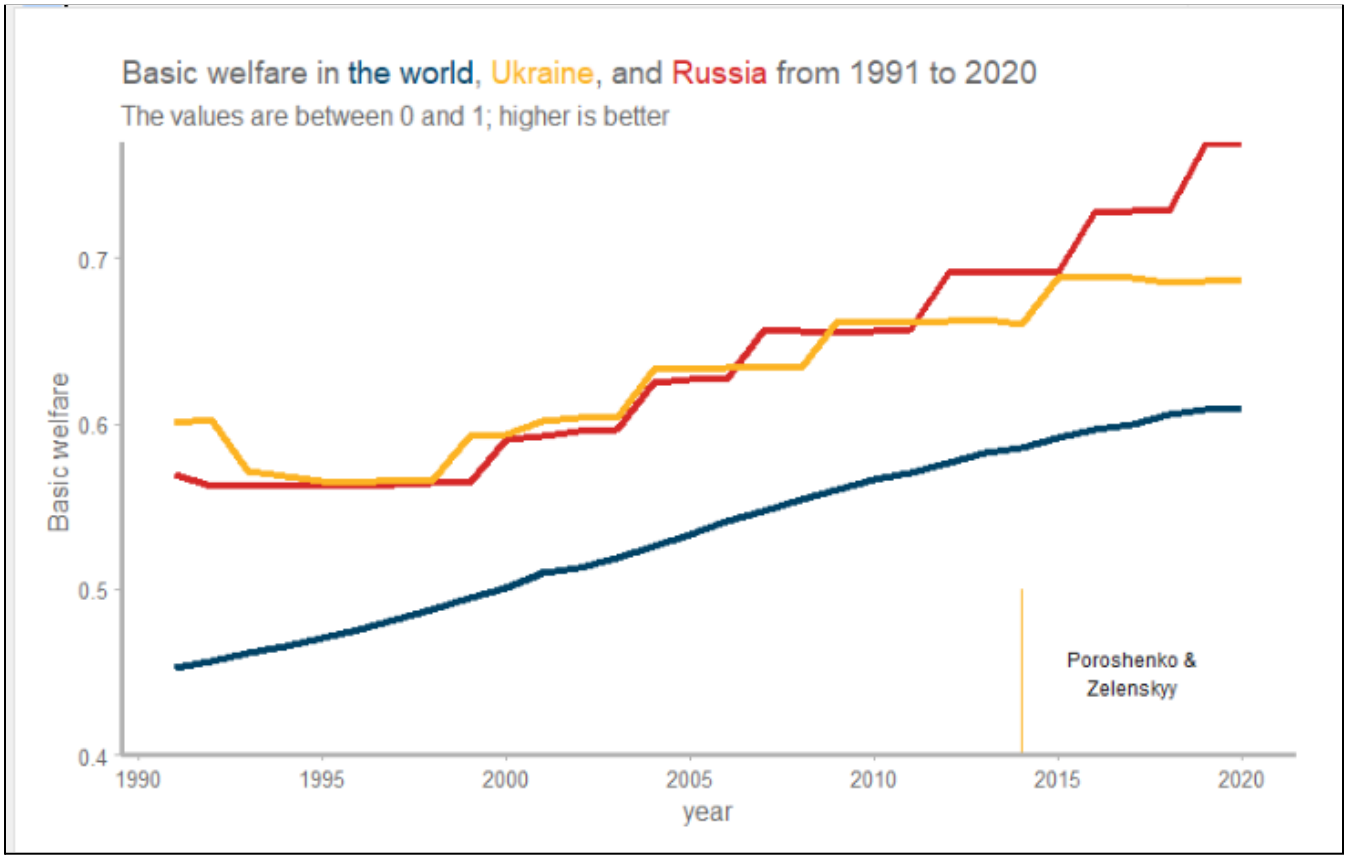
```{r}
graph_index("personal_integrity_and_security_A2") +
  geom_segment(aes(x = rep(c(2005, 2014), 2),
                   y = c(rep(0.52, 2), rep(0.25, 2)),
                   xend = rep(c(2005, 2014), 2),
                   yend = c(rep(0.58, 2), rep(0.28, 2))
                   ),
                 color = "#FCB322"
) +
    geom_label(aes(x = c(2005, 2014),
                   y = rep(0.55, 2),
                   label = c("Yushchenko became\npresident",
                             "The Dignity Revolution")
    ),
    label.size = NA,
    size = 3
    )
```



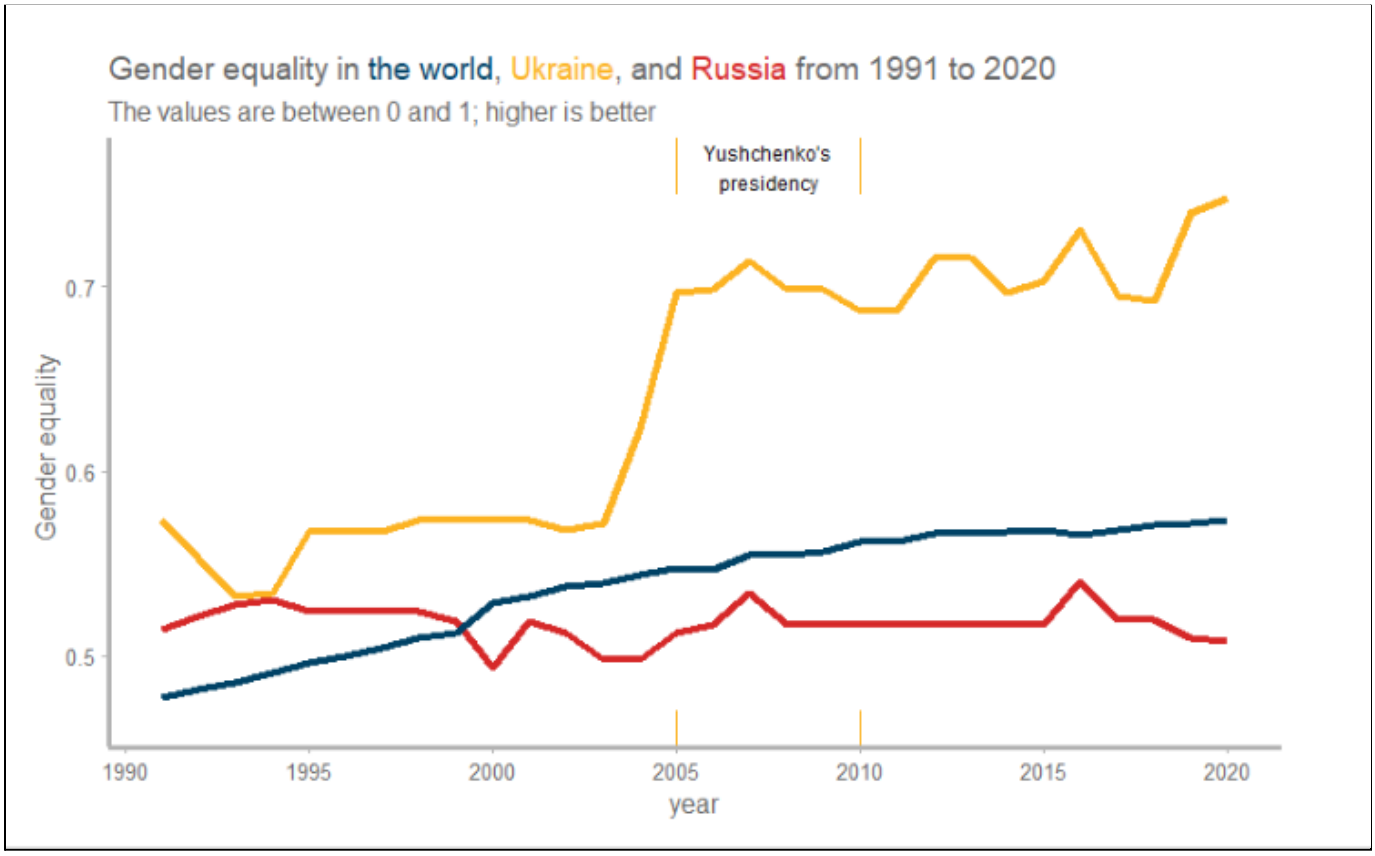
```{r}
graph_index("social_group_equality_A2") +
  geom_segment(aes(x = rep(2014, 2),
                   y = c(0.62, 0.45),
                   xend = rep(2014, 2),
                   yend = c(0.7, 0.47)
                   ),
               color = "#FCB322"
               ) +
  geom_label(aes(x = 2014,
                 y = 0.66,
                 label = "The independence of\nCrimea, Donetsk and Luhansk"
                 ),
             label.size = NA,
             size = 3
             )
```



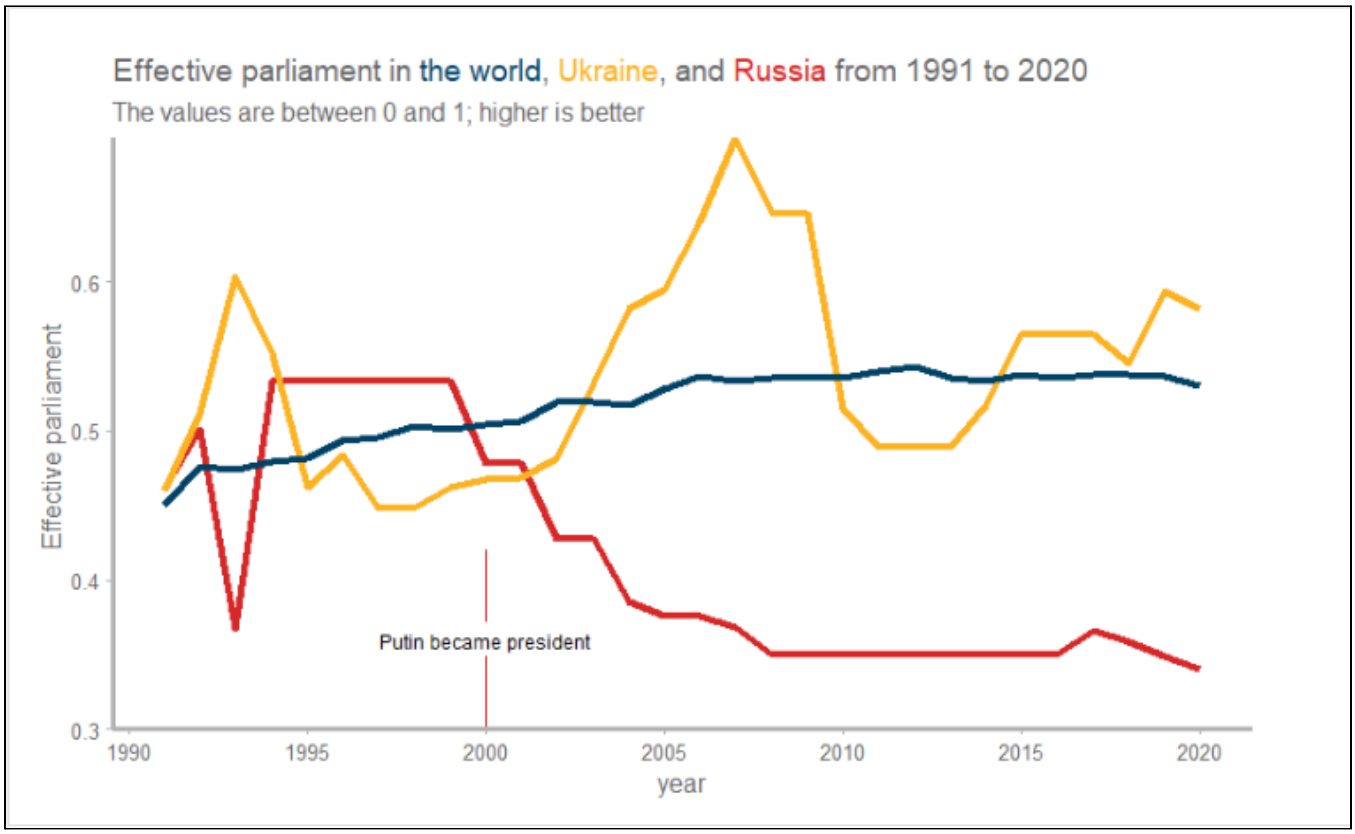
```{r}
graph_index("basic_welfare_A2") +
  geom_segment(aes(x = 2014,
                   y = 0.4,
                   xend = 2014,
                   yend = 0.5
                   ),
               color = "#FCB322"
               ) +
  geom_label(aes(x = 2017,
                 y = 0.45,
                 label = "Poroshenko &\nZelenskyy"
                 ),
             label.size = NA,
             size = 3,
             label.padding = unit(0, "lines")
             )
```



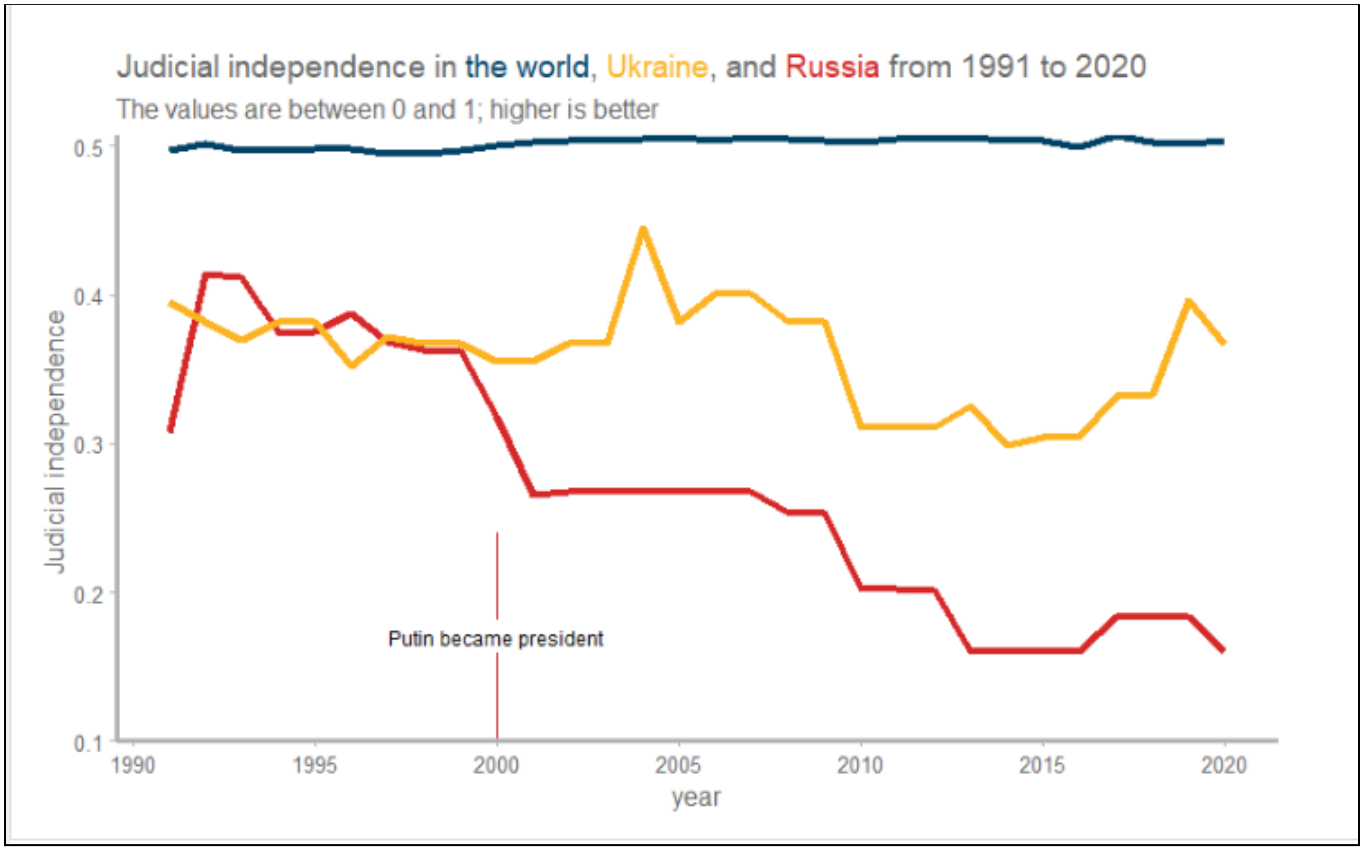
```{r}
graph_index("gender_equality_A2") +
  geom_segment(aes(x = rep(c(2005, 2010), 2),
                   y = c(rep(0.75, 2), rep(0.45, 2)),
                   xend = rep(c(2005, 2010), 2),
                   yend = c(rep(0.78, 2), rep(0.47, 2))
                   ),
               color = "#FCB322"
               ) +
  geom_label(aes(x = 2007.5,
                 y = 0.765,
                 label = "Yushchenko's\npresidency"
                 ),
             label.size = NA,
             size = 3,
             label.padding = unit(0, "lines")
             )
```



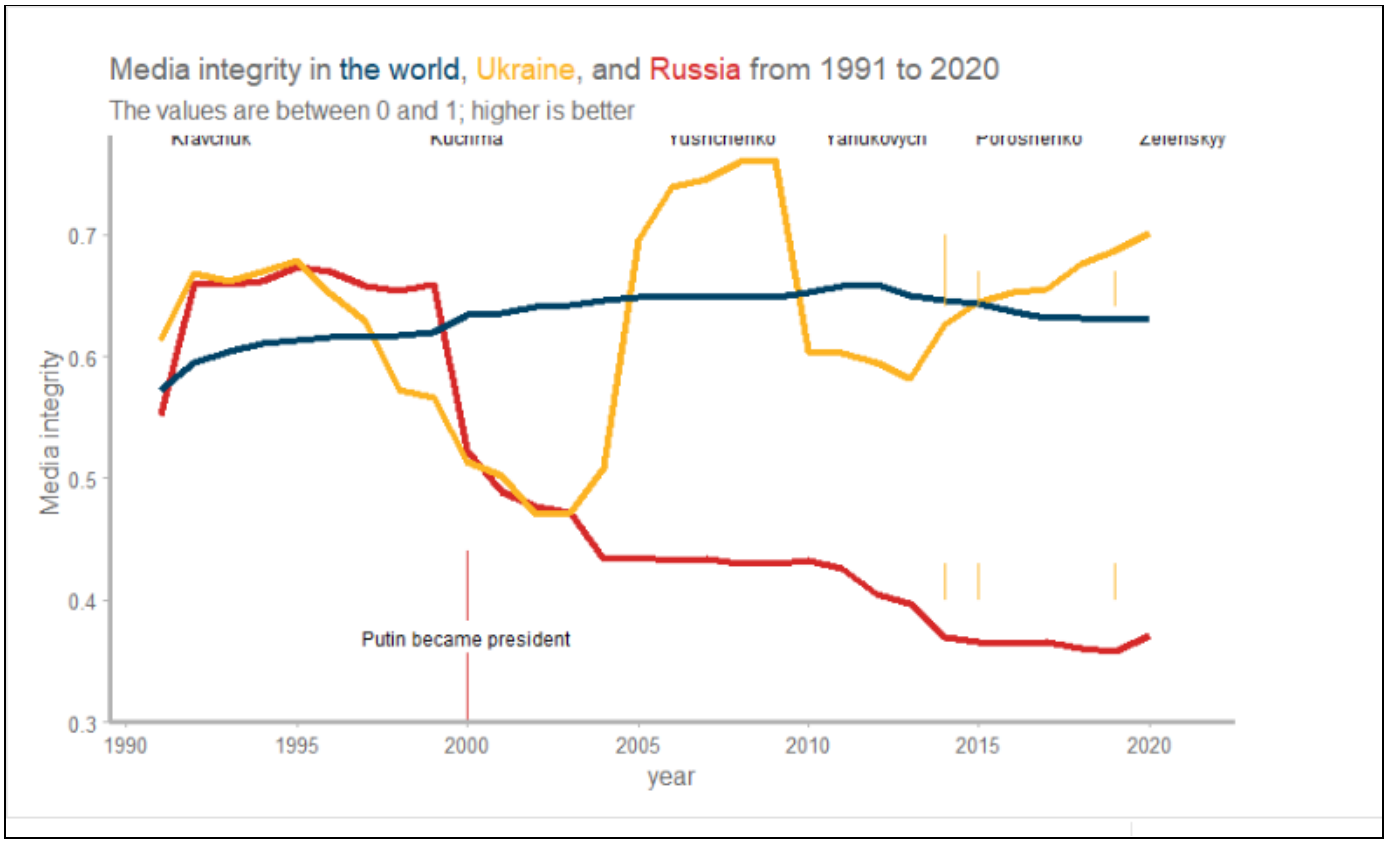
```{r}
graph_index("effective_parliament_A3") +
  geom_segment(aes(x = 2000, y = 0.3, xend = 2000, yend = 0.42),
               color = "#D62828"
) +
    geom_label(aes(x = 2000,
                   y = 0.36,
                   label = "Putin became president"
    ),
    label.size = NA,
    size = 3
    )
```



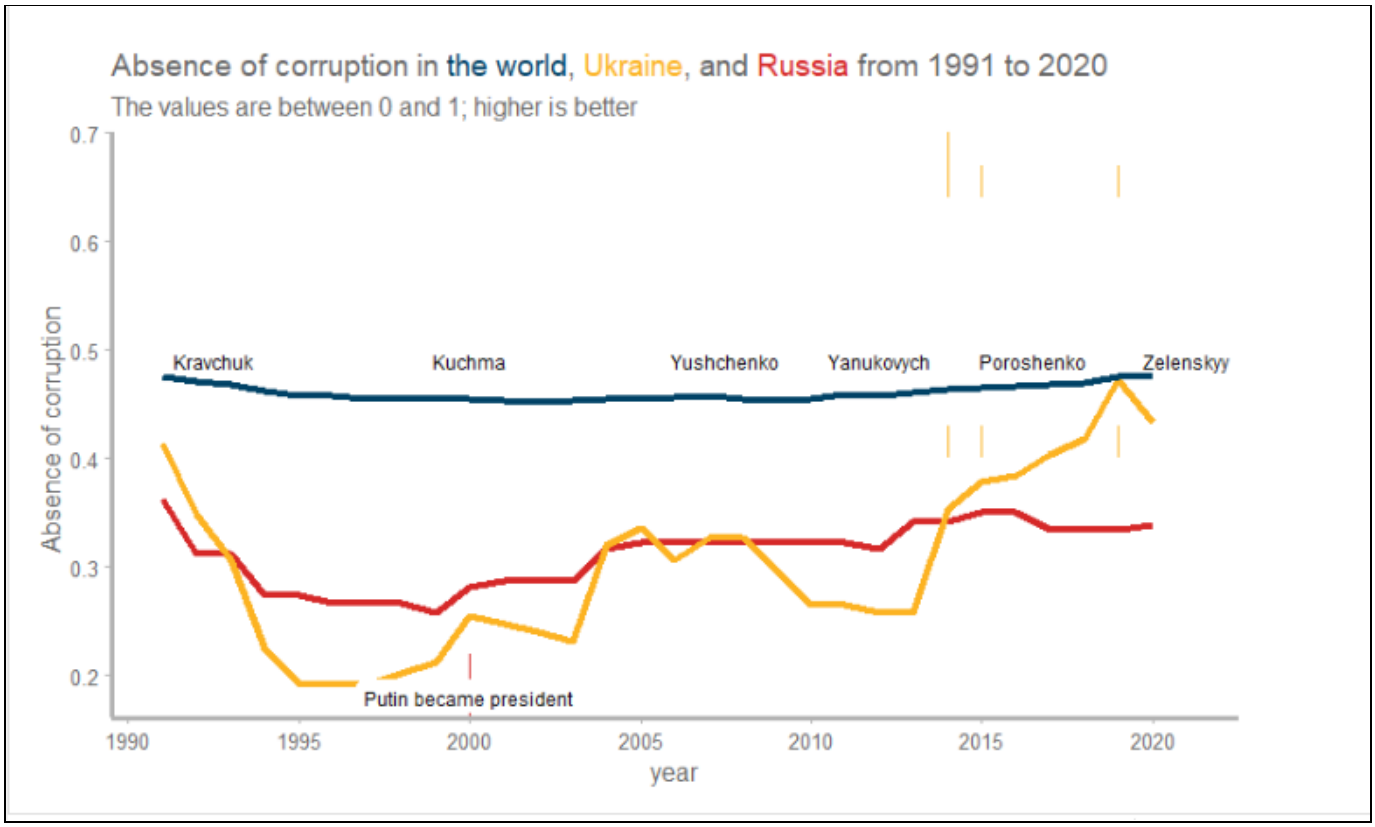
```{r}
graph_index("judicial_independence_A3") +
   geom_segment(aes(x = 2000, y = 0.1, xend = 2000, yend = 0.24),
                color = "#D62828"
   ) +
   geom_label(aes(x = 2000,
                  y = 0.17,
                  label = "Putin became president"
   ),
   label.size = NA,
   size = 3
   )
```



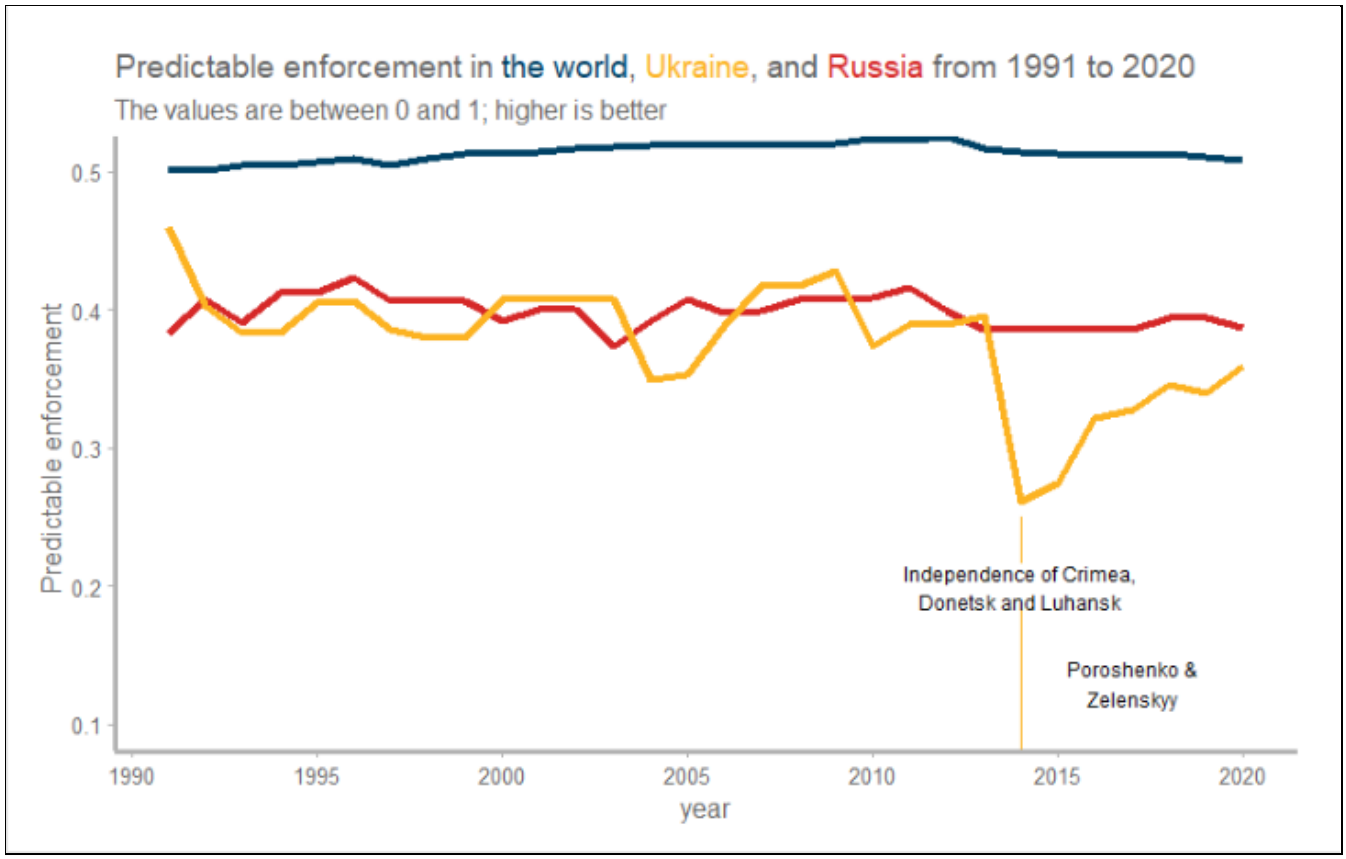
```{r}
Ukraine_seg <- tibble(x = rep(c(1994, 2005, 2010, 2014, 2019), 2),
                      y = c(rep(0.75, 5), rep(0.3, 5)),
                      xend = rep(c(1994, 2005, 2010, 2014, 2019), 2),
                      yend = c(rep(0.8, 5), rep(0.34, 5))
                      )
Ukraine_presidents <- tibble(x = c(1992.5, 2000, 2007.5, 2012, 2016.5, 2021),
                             y = rep(0.78, 6),
                             label = c("Kravchuk", "Kuchma", "Yushchenko",
"Yanukovych", "Poroshenko", "Zelenskyy")
                             )

graph_index("media_integrity_A3") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
               ) +
  geom_segment(aes(x = 2000, y = 0.3, xend = 2000, yend = 0.44),
               color = "#D62828"
               ) +
  geom_label(aes(x = 2000, y = 0.37,
                 label = "Putin became president"
                 ),
             label.size = NA,
             size = 3
             ) +
  geom_label(data = Ukraine_presidents,
             aes(x = x,
                 y = y,
                 label = label
                 ),
             label.size = NA,
             size = 3,
             label.padding = unit(0, "lines")
             )
```


Media integrity in the world, Ukraine, and Russia from 1991 to 2020
The values are between 0 and 1; higher is better
Kravchuk
Kuchma
Yushchenko
Yanukovych
Poroshenko
Zelenskyy
0.7
0.6
0.5
0.4
0.3
Media integrity
Putin became president
1990
1995
2000
2005
2010
2015
2020
year

```{r}

Ukraine_seg <- tibble(x = rep(c(1994, 2005, 2010, 2014, 2019), 2),
                      y = c(rep(0.48, 5), rep(0.16, 5)),
                      xend = rep(c(1994, 2005, 2010, 2014, 2019), 2),
                      yend = c(rep(0.5, 5), rep(0.18, 5))
                      )

graph_index("absence_of_corruption_A4") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
               ) +
  geom_segment(aes(x = 2000, y = 0.16, xend = 2000, yend = 0.22),
               color = "#D62828"
               ) +
  geom_label(aes(x = 2000, y = 0.18,
                 label = "Putin became president"
                 ),
             label.size = NA,
             size = 3
             ) +
  geom_label(data = Ukraine_presidents,
             aes(x = x, y = 0.49, label = label),
             label.size = NA,
             size = 3,
             label.padding = unit(0, "lines")
             )
```

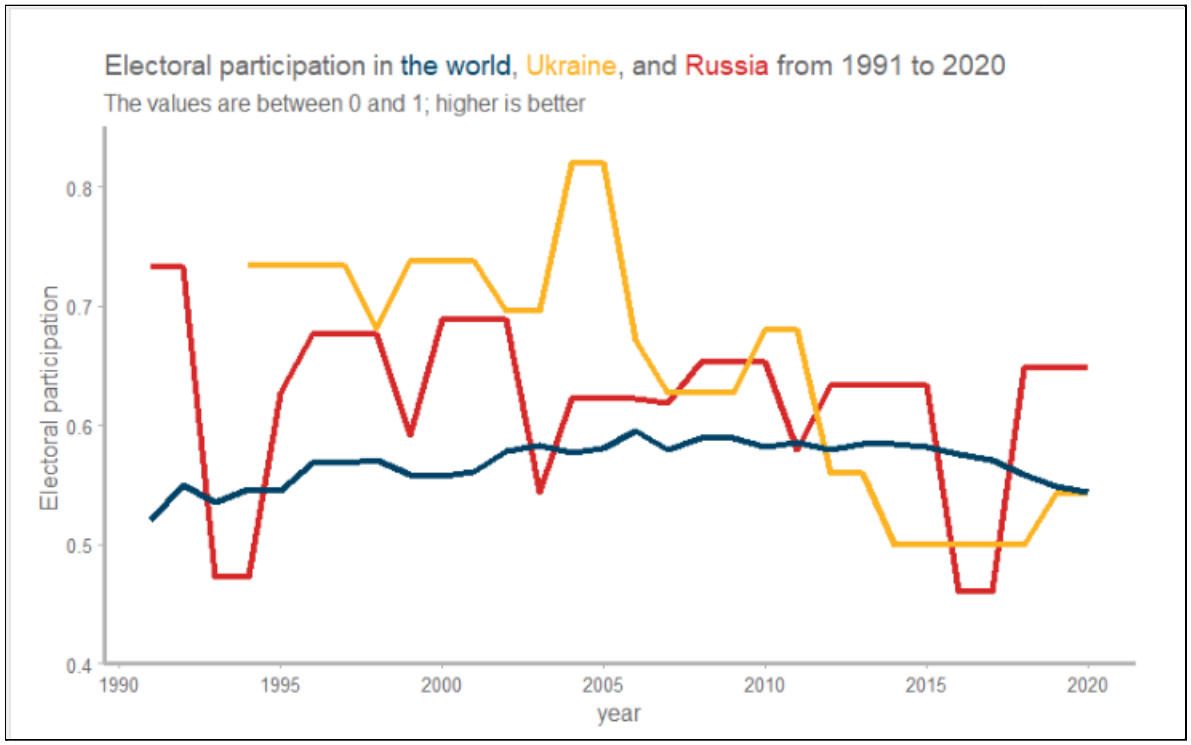

Absence of corruption in the world, Ukraine, and Russia from 1991 to 2020
The values are between 0 and 1; higher is better
Absence of corruption
0.7
0.6
0.5
0.4
0.3
0.2
Kravchuk
Kuchma
Yushchenko
Yanukovych
Poroshenko
Zelenskyy
Putin became president
1990
1995
2000
2005
2010
2015
2020
year

```{r}
graph_index("predictable_enforcement_A4") +
  geom_segment(aes(x = 2014,
                   y =  0.08,
                   xend = 2014,
                   yend =  0.25
                   ),
               color = "#FCB322"
               ) +
  geom_label(aes(x = c(2014, 2017),
                 y = c(0.2, 0.13),
                 label = c("Independence of Crimea,\nDonetsk and Luhansk",
                           "Poroshenko &\nZelenskyy")
                 ),
             label.size = NA,
             label.padding = unit(0, "lines"),
             size = 3
             )
```

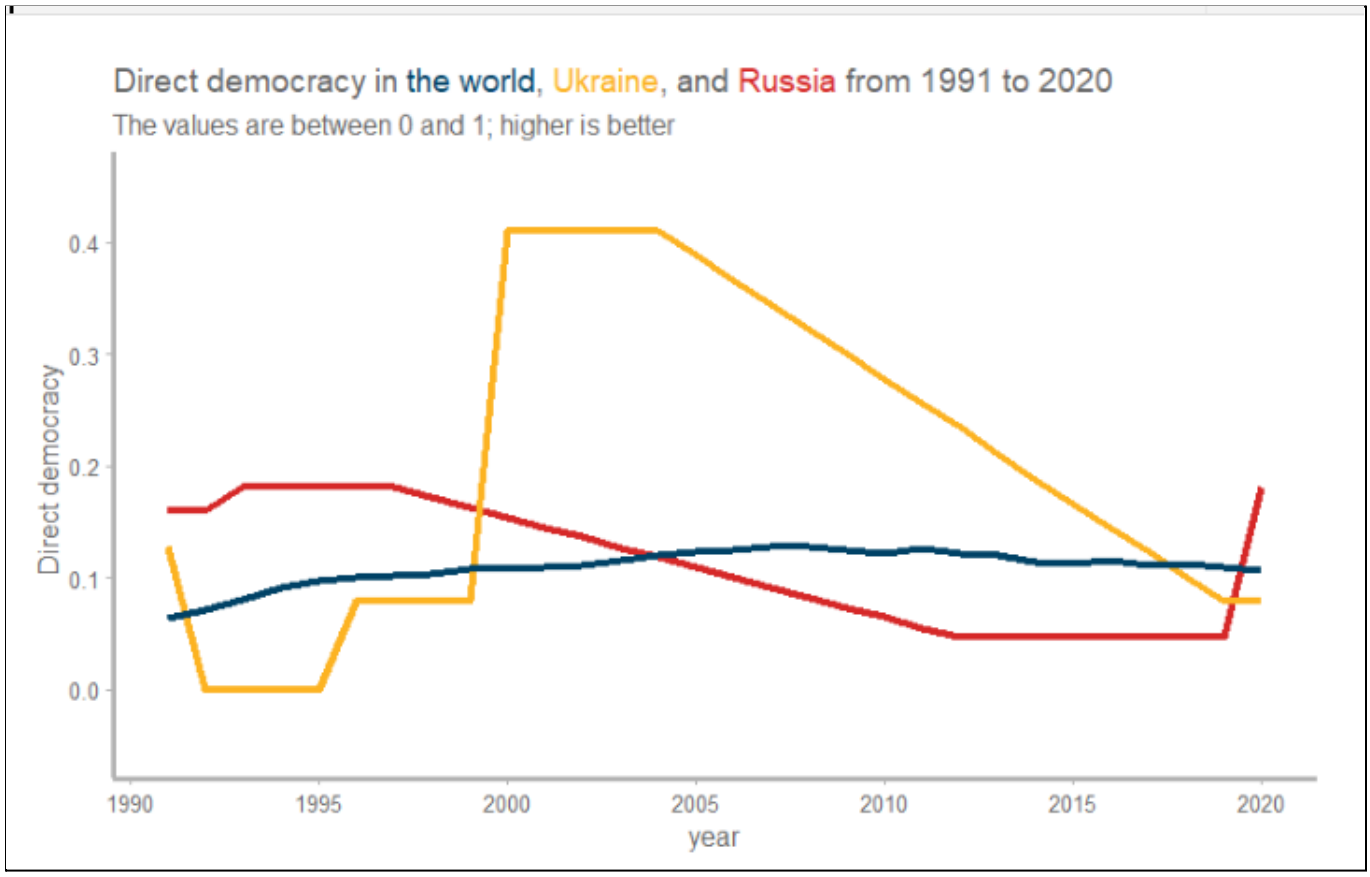


```{r}
Ukraine_seg = tibble(x = rep(c(2014, 2015, 2019), 2),
                     y = c(rep(0.64, 3), rep(0.4, 3)),
                     xend = rep(c(2014, 2015, 2019), 2),
                     yend = c(c(0.7, rep(0.67,2)), rep(0.43, 3))
                     )
graph_index("civil_society_participation_A5") +
  geom_segment(data = Ukraine_seg,
               aes(x = x, y = y, xend = xend, yend = yend),
               color = "#FCB322"
               ) +
  geom_segment(aes(x = 2000, y = 0.4, xend = 2000, yend = 0.44),
               color = "#D62828"
               ) +
  geom_label(aes(x = c(2014, 2017, 2020.5),
                 y = c(0.69, rep(0.65, 2)),
                 label = c("The Revolution of Dignity",
                           "Poroshenko",
                           "Zelenskyy")
                 ),
             label.size = NA,
             label.padding = unit(0, "lines"),
             size = 3
             ) +
  geom_label(aes(x = 2000, y = 0.42,
                 label = "Putin became president"
                 ),
             label.size = NA,
             size = 3
             )
```

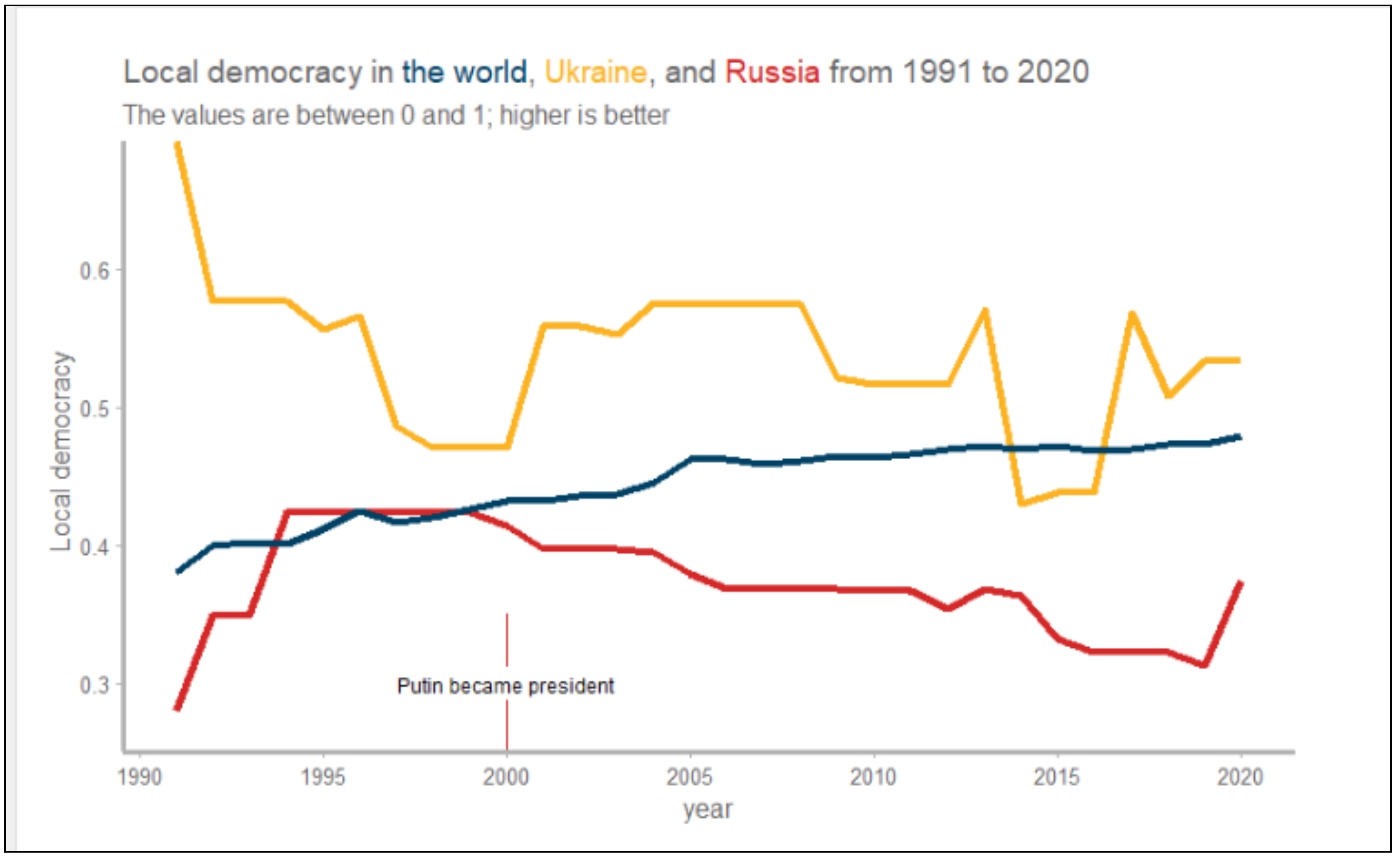

```{r}
graph_index("electoral_participation_A5") +
   expand_limits(y = c(0.4, 0.85))
```



```{r}
graph_index("direct_democracy_A5") +
  expand_limits(y = c(-0.08, 0.48))
```



```{r}
graph_index("local_democracy_A5") +
  geom_segment(aes(x = 2000, y = 0.25, xend = 2000, yend = 0.35),
               color = "#D62828"
               ) +
  geom_label(aes(x = 2000, y = 0.3,
                 label = "Putin became president"
                 ),
             label.size = NA,
             size = 3
             )
```



Conclusions

Throughout the entire notebook, we're able to see multiple democracy factors compared between Russia, Ukraine and the world.

These factors consist:

- Historical state of democracy: russia vs Ukraine
- Representative government
    - Clean elections
    - Inclusive Suffrage
    - Free political parties
    - Elected Government
- Fundamental rights
    - Freedom of expression
    - Freedom of association and assembly
    - Freedom of religion
    - Freedom of movement
    - Personal integrity and security
    - Social group equality
    - Basic Welfare
    - Gender Equality
- Checks on government
    - Effective parliament
    - Judicial independence
    - Media integrity
- Impartial administration
    - Absence of corruption
    - Predictable enforcement
- Participatory engagement
    - Civil society participation
    - Electoral participation
    - Direct democracy
    - Sub-national elections

In multiple graphs we were able to see a decrease in performance in Russia after 2000, however there were parameters like “Basic Welfare" that was better in Russia than Ukraine and the world, with a constant increase or plateau.

From author Ali A. Amiri:

> We saw throughout this notebook that after Putin took the helm in 2000, in comparison to the world and Ukraine, Russia’s state of democracy declined in most of the attributes and subattributes. On the other hand, Zelenskyy’s Ukraine improved significantly towards a full-fledged democracy. And guess what is the worst nightmare for a dictator? **A mature, strong, and thriving democracy in the neighborhood**. As a final word, Oksana Markarova, The Ukrainian ambassador to the US, made Putin’s motivation in invading Ukraine clear:
>
> > We’re not a threat to Russia unless being a democracy and living peacefully in your own country is a threat.[12]

References

[1] aliaamiri, "Russio_Ukrainian War," *Kaggle.com*, Mar. 19, 2022. https://www.kaggle.com/code/aliaamiri/russio-ukrainian-war/report (accessed Apr. 14, 2022).

Image Credits:

1. **Russia-Ukraine war: Here's how the crisis unfolded -- a timeline**

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.businesstoday.in%2Flatest%2Fworld%2Fstory%2Frussia-ukraine-war-heres-how-the-crisis-unfolded-a-timeline-323776-2022-02-24&psig=AOvVaw3n5MTvBG13_3ykDcQJM0Vk&ust=1650005849417000&source=images&cd=vfe&ved=0CAwQjRxqFwoTCIjInvf8kvcCFQAAAAAdAAAAABAD