

AE-13

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```
library(tidyverse)
```

```
-- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
v dplyr      1.1.4      v readr      2.1.5
v forcats    1.0.0      v stringr    1.5.1
v ggplot2    3.5.1      v tibble     3.2.1
v lubridate  1.9.3      v tidyr      1.3.1
v purrr      1.0.4
-- Conflicts ----- tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()     masks stats::lag()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become
```

```
library(tidymodels)
```

```
-- Attaching packages ----- tidymodels 1.3.0 --
v broom      1.0.7      v rsample     1.2.1
v dials      1.4.0      v tune        1.3.0
v infer      1.0.7      v workflows   1.2.0
v modeldata  1.4.0      v workflowsets 1.1.0
v parsnip    1.3.0      v yardstick   1.3.2
v recipes    1.1.1
-- Conflicts ----- tidymodels_conflicts() --
x scales::discard() masks purrr::discard()
x dplyr::filter()   masks stats::filter()
x recipes::fixed()  masks stringr::fixed()
x dplyr::lag()       masks stats::lag()
x yardstick::spec() masks readr::spec()
x recipes::step()    masks stats::step()
```

```
library(tidyquant)
```

Registered S3 method overwritten by 'quantmod':

```
  method      from
  as.zoo.data.frame zoo
-- Attaching core tidyquant packages ----- tidyquant 1.0.11 --
v PerformanceAnalytics 2.0.8      v TTR 0.24.4
v quantmod 0.4.27      v xts 0.14.1-- Conflicts -----
x zoo::as.Date()      masks base::as.Date()
x zoo::as.Date.numeric() masks base::as.Date.numeric()
x scales::col_factor() masks readr::col_factor()
x scales::discard()   masks purrr::discard()
x dplyr::filter()      masks stats::filter()
x xts::first()         masks dplyr::first()
x recipes::fixed()     masks stringr::fixed()
x dplyr::lag()         masks stats::lag()
x xts::last()          masks dplyr::last()
x PerformanceAnalytics::legend() masks graphics::legend()
x TTR::momentum()      masks dials::momentum()
x yardstick::spec()    masks readr::spec()
x quantmod::summary()  masks base::summary()
i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become
```

```
index_info <- tibble(
  Country = c("United States", "Germany", "China", "United Kingdom", "Canada", "Japan"),
  Ticker = c("^GSPC", "^GDAXI", "000001.SS", "^FTSE", "^GSPTSE", "^N225")
)
```

```
indexes <- index_info %>%
  mutate(Data = map(Ticker, ~ tq_get(.x, from = "2020-01-01", get = "stock.prices"))) %>%
  unnest(Data)
```

```
indexes <- indexes %>%
  filter(date >= as.Date("2025-01-20")) %>%
  group_by(Country) %>%
  mutate(Baseline = close[date == as.Date("2025-01-20")][1]) %>%
  ungroup() %>%
  mutate(Pct_Change = 100 * (close - Baseline) / Baseline)
```

```
ggplot(indexes, aes(x = date, y = Pct_Change, color = Country)) +
  geom_line(size = 1.1) +
  theme_minimal(base_size = 14) +
  scale_y_continuous(labels = scales::percent_format(scale = 1)) +
  labs(
    title = "Major Global Stock Indexes Since Jan 17, 2020",
    y = "Percent Change",
    x = NULL,
    caption = "Source: Yahoo Finance via tidyquant"
  ) +
  theme(legend.position = "right")
```

Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
i Please use `linewidth` instead.

Warning: Removed 62 rows containing missing values or values outside the scale range
(`geom_line()`).

