

econ_history

2025-11-19

R Markdown

data source <https://infothek.ekir.de/pages/search.php?search=!collection73&collection=73&k=#>

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# DATA LOADING

religion_de_2023 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11339300, 13435100, 3782200, 2581700,
    691700, 1910200, 6420700, 1629500,
    8162000, 18190400, 4174300, 994400,
    4089500, 2180400, 2965700, 2122300,
    84669300, 68283700, 16385600
  ),
  Ev_Anzahl = c(
    2776500, 2092300, 468700, 323900,
    186200, 383700, 1817100, 206600,
    3033000, 3779200, 981600, 152000,
    639200, 224900, 1118400, 382900,
    18566600, 16391900, 2246700
  ),
  Ev_Prozent = c(
    24.5, 15.6, 12.4, 12.5,
    26.9, 20.1, 28.3, 12.7,
    37.2, 20.8, 23.5, 15.3,
    15.6, 10.3, 37.7, 18.0,
    21.9, 23.9, 13.7
  ),
  Kat_Anzahl = c(
    3219300, 5675100, 275400, 88500,
    59200, 157300, 1202400, 51200,
    1214500, 5954000, 1446600, 487200,
    141900, 65100, 157500, 150600,
  )
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20345900, 19573200, 772700
),

Kat_Prozent = c(
  28.4, 42.2, 7.3, 3.4,
  8.6, 8.2, 18.7, 3.1,
  14.9, 32.7, 34.7, 49.0,
  3.5, 3.0, 5.3, 7.1,
  24.0, 28.7, 4.7
),
Andere_Anzahl = c(
  5343400, 5667600, 3038100, 2169200,
  446400, 1369100, 3401300, 1371700,
  3914500, 8457100, 1746100, 355200,
  3308500, 1898400, 1689800, 1588800,
  45757400, 32390600, 13366800
),
Andere_Prozent = c(
  47.1, 42.2, 80.3, 84.0,
  64.5, 71.7, 53.0, 84.2,
  48.0, 46.5, 41.8, 35.7,
  80.9, 86.7, 57.0, 74.9,
  54.0, 47.4, 81.6
)
)

religion_de_2022 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11280300, 13369400, 3755300, 2573100,
    684900, 1892100, 6391400, 1628400,
    8142000, 18139000, 4159200, 992700,
    4086200, 2186600, 2953300, 2126800,
    84358800, 68002400, 16356400
  ),
  Ev_Anzahl = c(
    2857500, 2151300, 486900, 334900,
    194200, 403600, 1874400, 213600,
    3124900, 3900500, 1008900, 156700,
    659800, 232700, 1155900, 397000,
    19152800, 16827900, 2324900
  ),

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Ev_Prozent = c(
  25.1, 16.1, 13.0, 13.0,
  28.4, 21.3, 29.3, 13.1,
  38.4, 21.5, 24.3, 15.8,
  16.1, 10.6, 39.1, 18.6,
  22.7, 24.7, 14.2
),

Kat_Anzahl = c(
  3315500, 5818100, 281400, 93000,
  60900, 163800, 1244100, 52500,
  1244500, 6139900, 1491100, 504500,
  144800, 66800, 162900, 153800,
  20937600, 20145200, 792400
),

Kat_Prozent = c(
  29.4, 43.5, 7.5, 3.6,
  8.9, 8.7, 19.5, 3.2,
  15.3, 33.8, 35.9, 50.8,
  3.5, 3.1, 5.5, 7.2,
  24.8, 29.6, 4.8
),

Andere_Anzahl = c(
  5107300, 5400000, 2986900, 2145200,
  429800, 1324700, 3272800, 1362200,
  3770900, 8098800, 1659100, 331400,
  3281600, 1887100, 1634500, 1576000,
  44268400, 31029300, 13239100
),

Andere_Prozent = c(
  45.3, 40.4, 79.6, 83.4,
  62.8, 70.0, 51.2, 83.7,
  46.3, 44.6, 39.9, 33.4,
  80.3, 86.3, 55.3, 74.1,
  52.5, 45.6, 80.9
)
)

religion_de_2021 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11124600, 13177000, 3677500, 2537900,
    676500, 1853900, 6295000, 1611200,

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8027000,17924600,4106500,982300,
4043200,2169300,2922000,2108900,
83237100,67089500,16147600
),

Ev_Anzahl = c(
2934900,2209700,506700,343700,
201400,422600,1931500,221000,
3213600,4015800,1036800,161200,
678200,241400,1195400,410900,
19725300,17323400,2401900
),

Ev_Prozent = c(
26.4,16.8,13.8,13.5,
29.8,22.8,30.7,13.7,
40.0,22.4,25.2,16.4,
16.8,11.1,40.9,19.5,
23.7,25.8,14.9
),

Kat_Anzahl = c(
3425800,6021400,293100,93200,
62900,170600,1293400,54000,
1277400,6344800,1543900,523100,
148100,69100,167800,157200,
21645900,20831200,814700
),

Kat_Prozent = c(
30.8,45.7,8.0,3.7,
9.3,9.2,20.5,3.4,
15.9,35.4,37.6,53.2,
3.7,3.2,5.7,7.5,
26.0,31.0,5.0
),

Andere_Anzahl = c(
4763900,4945800,2877600,2101000,
412100,1260700,3070000,1336100,
3536000,7564000,1525800,298100,
3216700,1858700,1558300,1540800,
41865900,28593000,12931000
),

Andere_Prozent = c(
42.8,37.5,78.3,82.8,
60.9,68.0,48.8,82.9,
44.1,42.2,37.2,30.3,
79.6,85.7,53.3,73.1,
50.3,43.1,80.1
)
)

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religion_de_2020 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11103000, 13140200, 3664100, 2531100,
    680100, 1852500, 6293200, 1610800,
    8003400, 17925600, 4098400, 984000,
    4056900, 2180700, 2910900, 2120200,
    83155200, 66991200, 16163800
  ),
  Ev_Anzahl = c(
    2998500, 2260600, 525500, 352600,
    209500, 437600, 1986000, 228400,
    3291900, 4118900, 1062200, 165300,
    698200, 249300, 1227000, 424600,
    20236200, 17757500, 2478700
  ),
  Ev_Prozent = c(
    27.0, 17.2, 14.3, 13.9,
    30.8, 23.6, 31.6, 14.2,
    41.1, 23.0, 25.9, 16.8,
    17.2, 11.4, 42.2, 20.0,
    24.3, 26.5, 15.3
  ),
  Kat_Anzahl = c(
    3515800, 6162600, 306500, 90800,
    64900, 174800, 1333500, 54600,
    1302200, 6514200, 1584400, 536800,
    150400, 70600, 171700, 159700,
    22193300, 21360900, 832500
  ),
  Kat_Prozent = c(
    31.7, 46.9, 8.4, 3.6,
    9.5, 9.4, 21.2, 3.4,
    16.3, 36.3, 38.7, 54.6,
    3.7, 3.2, 5.9, 7.5,
    26.7, 31.9, 5.2
  ),
  Andere_Anzahl = c(
    4588800, 4716900, 2832100, 2087600,
    405800, 1240100, 2973700, 1327800,
    3409300, 7292500, 1451700, 281800,
  )
)

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3208400,1860800,1512200,1536000,
40725500,27872800,12852000
),

Andere_Prozent = c(
  41.3,35.9,77.3,82.5,
  59.7,66.9,47.3,82.4,
  42.6,40.7,35.4,28.6,
  79.1,85.3,52.0,72.4,
  49.0,41.6,79.5
)
)

religion_de_2019 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11100400,13124400,3669500,2521900,
    681200,1847300,6288100,1608100,
    7993600,17947200,4093900,986900,
    4072000,2194800,2903800,2133400,
    83166700,66967100,16199700
  ),
  Ev_Anzahl = c(
    3073800,2306100,541300,360100,
    214600,450000,2042000,232500,
    3366900,4211300,1078300,169400,
    715900,257000,1257400,436500,
    20713200,18169800,2543400
  ),
  Ev_Prozent = c(
    27.7,17.6,14.8,14.3,
    31.5,24.4,32.5,14.5,
    42.1,23.5,26.3,17.2,
    17.6,11.7,43.3,20.5,
    24.9,27.1,15.7
  ),
  Kat_Anzahl = c(
    3583400,6276600,312600,90200,
    67300,177600,1362800,54500,
    1321000,6633100,1614300,549200,
    151200,72000,173300,161400,
    22600400,21758500,841800
  ),

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Kat_Prozent = c(
  32.3,47.6,8.5,3.6,
  9.9,9.6,21.7,3.4,
  16.5,37.0,39.4,55.7,
  3.7,3.3,6.0,7.6,
  27.2,32.5,5.2
),
Andere_Anzahl = c(
  4443100,4522000,2815500,2071600,
  399300,1219600,2883300,1321200,
  3305700,7102800,1401300,268300,
  3204900,1865800,1473300,1535400,
  39853100,27037800,12814400
),
Andere_Prozent = c(
  40.0,34.6,76.7,82.1,
  58.6,66.0,45.9,82.2,
  41.4,39.6,34.2,27.2,
  78.7,85.0,50.7,72.0,
  47.9,40.4,79.1
)
)

religion_de_2018 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11069500,13076700,3644800,2511900,
    683000,1841200,6265500,1609700,
    7982400,17932700,4084800,990500,
    4077900,2208300,2896700,2143300,
    83019200,66823400,16515800
  ),
  Ev_Anzahl = c(
    3131600,2335400,559400,367600,
    223400,457900,2091000,237900,
    3433800,4302200,1094700,173000,
    730800,263500,1293000,445500,
    21140600,18535900,2604700
  ),
  Ev_Prozent = c(
    28.3,17.9,15.3,14.6,
    32.7,24.9,33.4,14.8,

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43.0,24.0,26.8,17.5,
17.9,11.9,44.6,20.8,
25.5,27.7,16.1
),

Kat_Anzahl = c(
  3646500,6377700,320900,90200,
  68900,182500,1394200,55200,
  1342200,6751200,1645700,562600,
  152300,73700,175700,163600,
  23002000,22146200,855900
),

Kat_Prozent = c(
  32.9,48.8,8.8,3.6,
  10.1,9.9,22.3,3.4,
  16.8,37.7,40.3,56.8,
  3.7,3.3,6.1,7.6,
  27.7,33.1,5.3
),

Andere_Anzahl = c(
  4293300,4363600,2764500,2054100,
  390700,1200900,2786000,1316600,
  3206500,6878800,1344400,254900,
  3194800,1871100,1427800,1534400,
  38876500,26141300,12735200
),

Andere_Prozent = c(
  38.8,33.4,75.8,81.8,
  57.2,65.2,44.4,81.8,
  40.2,38.4,32.9,25.7,
  78.3,84.7,49.3,71.6,
  46.8,39.1,78.6
)
)

religion_de_2017 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    11023400,12997200,3613500,2504000,
    681000,1830600,6243300,1611100,
    7962800,17912100,4073700,994200,
    4081300,2223100,2889800,2151200,
    82792400,66608000,16184200
)

```

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),
Ev_Anzahl = c(
  3179900,2378800,574600,374700,
  228400,467500,2121400,244000,
  3497100,4378500,1122800,176400,
  744700,271700,1316200,459400,
  21535900,18866800,2669000
),
Ev_Prozent = c(
  28.8,18.3,15.9,15.0,
  33.5,25.5,34.0,15.1,
  43.9,24.4,27.6,17.7,
  18.2,12.2,45.5,21.4,
  26.0,28.3,16.5
),
Kat_Anzahl = c(
  3688400,6447200,330600,84300,
  75900,194000,1423200,54800,
  1348400,6858500,1671200,572800,
  152300,75900,168500,165700,
  23311300,22447900,863400
),
Kat_Prozent = c(
  33.5,49.6,9.2,3.4,
  11.1,10.6,22.8,3.4,
  16.9,38.3,41.0,57.6,
  3.7,3.4,5.8,7.7,
  28.2,33.7,5.3
),
Andere_Anzahl = c(
  4155200,4171200,2708200,2045000,
  376800,1169000,2698700,1312300,
  3117400,6675100,1279700,245000,
  3184600,1875500,1405100,1526100,
  37945200,25293400,12651800
),
Andere_Prozent = c(
  37.7,32.1,74.9,81.7,
  55.3,63.9,43.2,81.5,
  39.1,37.3,31.4,24.6,
  78.0,84.2,48.6,70.9,
  45.8,38.0,78.2
)
)

religion_de_2015 <- data.frame(
  Bundesland = c(

```

```

"Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
"Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
"Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
"Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
"Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
),
Bevölkerung = c(
  10879600, 12843500, 3520000, 2484800,
  671500, 1787400, 6176200, 1612400,
  7926600, 17865500, 4052800, 995600,
  4084900, 2245500, 2858700, 2170700,
  82175700, 66057400, 16118300
),
Ev_Anzahl = c(
  3272000, 2438900, 597700, 390200,
  242100, 482600, 2200000, 254400,
  3621500, 4529400, 1156200, 183000,
  771300, 285300, 1365900, 481300,
  22271900, 19491700, 2780200
),
Ev_Prozent = c(
  30.1, 19.0, 17.0, 15.7,
  36.1, 27.0, 35.6, 15.8,
  45.7, 25.4, 28.5, 18.4,
  18.9, 12.7, 47.8, 22.2,
  27.1, 29.5, 17.2
),
Kat_Anzahl = c(
  3756600, 6571300, 330200, 81800,
  77200, 192000, 1446100, 54800,
  1365700, 7012800, 1711500, 595400,
  150600, 77600, 169700, 168600,
  23761800, 22898200, 863700
),
Kat_Prozent = c(
  34.5, 51.2, 9.4, 3.3,
  11.5, 10.7, 23.4, 3.4,
  17.2, 39.3, 42.2, 59.8,
  3.7, 3.5, 5.9, 7.8,
  28.9, 34.7, 5.4
),
Andere_Anzahl = c(
  3851000, 3833400, 2592100, 2012900,
  352200, 1112800, 2530100, 1303000,
  2939400, 6323300, 1185100, 217200,
  3162900, 1872400, 1323100, 1528000,
  36142000, 23667600, 12474400
)

```

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),
Andere_Prozent = c(
  35.4,29.8,73.6,81.0,
  52.5,62.3,41.0,80.8,
  37.1,35.4,29.2,21.8,
  77.4,83.8,46.3,70.1,
  44.0,35.8,77.4
)
)

religion_de_2014 <- data.frame(
  Bundesland = c(
    "Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
    "Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
    "Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
    "Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
    "Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
  ),
  Bevölkerung = c(
    10716600,12691600,3469800,2457900,
    661900,1762800,6093900,1599100,
    7826700,17638100,4011600,989000,
    4055300,2235500,2830900,2156800,
    81197500,65223100,15974400
  ),
  Ev_Anzahl = c(
    3324300,2464600,611800,396400,
    247600,492100,2236400,260100,
    3674400,4596800,1171500,185700,
    786800,293900,1393600,493400,
    22629300,19786900,2842400
  ),
  Ev_Prozent = c(
    31.0,19.4,17.6,16.1,
    37.4,27.9,36.7,16.3,
    46.9,26.1,29.2,18.8,
    19.4,13.1,49.2,22.9,
    27.9,30.3,17.8
  ),
  Kat_Anzahl = c(
    3779500,6612100,331400,80300,
    79000,191200,1452100,54500,
    1365200,7095700,1727600,605000,
    149800,78600,168400,169100,
    23939500,23075700,863700
  ),
  Kat_Prozent = c(

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35.3,52.1,9.6,3.3,
11.9,10.8,23.8,3.4,
17.4,40.2,43.1,61.2,
3.7,3.5,5.9,7.8,
29.5,35.4,5.4
),
Andere_Anzahl = c(
3612800,3614900,2526600,1981100,
335300,1079500,2405400,1284600,
2787200,5945500,1115200,198300,
3118700,1863400,1268900,1494300,
34628800,22360500,12268300
),
Andere_Prozent = c(
33.7,28.5,72.8,80.6,
50.7,61.2,39.5,80.3,
35.6,33.7,27.7,20.1,
76.9,83.3,44.8,69.3,
42.6,34.3,76.8
)
)

religion_de_2012 <- data.frame(
Bundesland = c(
"Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
"Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
"Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
"Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
"Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
),
Bevölkerung = c(
10569100,12519600,3375200,2449500,
654800,1734300,6016500,1600300,
7779000,17554300,3990300,994300,
4050200,2259400,2806500,2170500,
80523700,64618600,15905100
),
Ev_Anzahl = c(
3412800,2519900,633300,413400,
256300,516400,2311800,273200,
3792400,4742300,1205300,191600,
818300,314000,1440900,514100,
23356100,20389800,2966300
),
Ev_Prozent = c(
32.3,20.1,18.8,16.9,
39.1,29.8,38.4,17.1,
48.8,27.0,30.2,19.3,
)
)

```

```

20.2,13.9,51.3,23.7,
29.0,31.6,18.7
),

Kat_Anzahl = c(
3836500,6726100,326500,78700,
79100,185800,1471900,53800,
1374200,7246300,1765600,623600,
149100,80000,171400,171400,
24340000,23480600,859500
),

Kat_Prozent = c(
36.3,53.7,9.7,3.2,
12.1,10.7,24.5,3.4,
17.7,41.3,44.2,62.7,
3.7,3.5,6.1,7.9,
30.2,36.3,5.4
),

Andere_Anzahl = c(
3319700,3273600,2415400,1957400,
319400,1032100,2232800,1273300,
2612400,5565800,1019400,179000,
3082800,1865400,1194200,1484900,
32827600,20748300,12079300
),

Andere_Prozent = c(
31.4,26.1,71.6,79.9,
48.8,59.5,37.1,79.6,
33.6,31.7,25.5,18.0,
76.1,82.6,42.5,68.4,
40.8,32.1,75.9
)
)

religion_de_2011 <- data.frame(
Bundesland = c(
"Baden-Württemberg", "Bayern", "Berlin", "Brandenburg",
"Bremen", "Hamburg", "Hessen", "Mecklenburg-Vorpommern",
"Niedersachsen", "Nordrhein-Westfalen", "Rheinland-Pfalz", "Saarland",
"Sachsen", "Sachsen-Anhalt", "Schleswig-Holstein", "Thüringen",
"Deutschland insgesamt", "Westliche Bundesländer", "Östliche Bundesländer"
),
Bevölkerung = c(
10786200,12595900,3501900,2495600,
661300,1798800,6092100,1634700,
7913500,17842000,3999100,1013400,
4137100,2313300,2837600,2221200,
81843700,65539900,16303800
),

```

```

Ev_Anzahl = c(
  3443700, 2540600, 641300, 420100,
  262500, 515900, 2337400, 278600,
  2834500, 4800300, 1218100, 193900,
  828900, 322000, 1458700, 523400,
  22619600, 19605500, 3014200
),

Ev_Prozent = c(
  31.9, 20.2, 18.3, 16.8,
  39.7, 28.7, 38.4, 17.0,
  35.8, 26.9, 30.5, 19.1,
  20.0, 13.9, 51.4, 23.6,
  27.6, 29.9, 18.5
),

Kat_Anzahl = c(
  3858000, 6760600, 322200, 77900,
  81000, 183100, 1478300, 53700,
  1372800, 7302800, 1779800, 631800,
  148300, 80600, 169800, 172300,
  24472800, 23617800, 855000
),

Kat_Prozent = c(
  35.8, 53.7, 9.2, 3.1,
  12.2, 10.2, 24.3, 3.3,
  17.3, 40.9, 44.5, 62.3,
  3.6, 3.5, 6.0, 7.8,
  29.9, 36.0, 5.2
),

Andere_Anzahl = c(
  3484600, 3294600, 2538300, 1997700,
  317800, 1099900, 2276400, 1302400,
  3706300, 5738900, 1001200, 187700,
  3159900, 1910700, 1209100, 1525500,
  34751300, 22316600, 12434600
),

Andere_Prozent = c(
  32.3, 26.2, 72.5, 80.0,
  48.1, 61.1, 37.4, 79.7,
  46.8, 32.2, 25.0, 18.5,
  76.4, 82.6, 42.6, 68.7,
  42.5, 34.1, 76.3
)
)

gnp_de <- readxl::read_excel("82111-0010_de.xlsx")

## New names:
## * ' ' -> '...2'

```

```

## * `` -> '...3'
## * `` -> '...4'
## * `` -> '...5'
## * `` -> '...6'
## * `` -> '...7'
## * `` -> '...8'
## * `` -> '...9'
## * `` -> '...10'
## * `` -> '...11'
## * `` -> '...12'
## * `` -> '...13'
## * `` -> '...14'
## * `` -> '...15'
## * `` -> '...16'
## * `` -> '...17'
## * `` -> '...18'
## * `` -> '...19'
## * `` -> '...20'
## * `` -> '...21'
## * `` -> '...22'
## * `` -> '...23'
## * `` -> '...24'
## * `` -> '...25'
## * `` -> '...26'
## * `` -> '...27'
## * `` -> '...28'
## * `` -> '...29'
## * `` -> '...30'
## * `` -> '...31'
## * `` -> '...32'
## * `` -> '...33'

# DATA TRANSFORMATION
religion_de_2011$Jahr <- 2012
religion_de_2012$Jahr <- 2013
religion_de_2014$Jahr <- 2014
religion_de_2015$Jahr <- 2015
religion_de_2017$Jahr <- 2017
religion_de_2018$Jahr <- 2018
religion_de_2019$Jahr <- 2019
religion_de_2020$Jahr <- 2020
religion_de_2021$Jahr <- 2021
religion_de_2022$Jahr <- 2022
religion_de_2023$Jahr <- 2023

library(dplyr)

##
## Attaching package: 'dplyr'
##
## The following objects are masked from 'package:stats':
##
##     filter, lag
##

```

```

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

library(tidyr)

religion_data <- bind_rows(
  religion_de_2011, religion_de_2012, religion_de_2014, religion_de_2015, religion_de_2017,
  religion_de_2018, religion_de_2019, religion_de_2020, religion_de_2021, religion_de_2022,
  religion_de_2023
)

religion_data <- religion_data %>%
  mutate(
    'Bevölkerung' = rowSums(across(c(Ev_Anzahl, Kat_Anzahl, Andere_Anzahl))),
  )

gnp_raw <- gnp_de [-c(1:3),]
gnp_raw[1, 1] <- 'Jahr'

colnames(gnp_raw) <- as.character(as.vector(gnp_raw[1, ]))
gnp_raw <- gnp_raw[-1, ]
gnp_cleaned <- drop_na(gnp_raw)

gnp_cleaned <- gnp_cleaned %>%
  select(where(~ !any(grepl("e", .x, ignore.case = TRUE)))))

gnp_cleaned <- gnp_cleaned %>%
  # make all state columns numeric
  mutate(across(
    c(`Baden-Württemberg`, Bayern, Berlin, Brandenburg, Bremen, Hamburg,
      Hessen, `Mecklenburg-Vorpommern`, Niedersachsen, `Nordrhein-Westfalen`,
      `Rheinland-Pfalz`, Saarland, Sachsen, `Sachsen-Anhalt`,
      `Schleswig-Holstein`, Thüringen),
    as.numeric
  )) %>%
  # add West / East totals
  mutate(
    `Westliche Bundesländer` = rowSums(across(c(
      `Baden-Württemberg`, Bayern, Bremen, Hamburg, Hessen,
      Niedersachsen, `Nordrhein-Westfalen`, `Rheinland-Pfalz`,
      Saarland, `Schleswig-Holstein`
    )), na.rm = TRUE),
    `Östliche Bundesländer` = rowSums(across(c(
      Brandenburg, `Mecklenburg-Vorpommern`,
      Sachsen, `Sachsen-Anhalt`, Thüringen
    )), na.rm = TRUE)
  )

gnp_long <- gnp_cleaned %>%
  pivot_longer(
    cols = -Jahr,
    names_to = "Bundesland",

```

```

    values_to = "gnp"
  )

religion_data$Jahr <- as.numeric(religion_data$Jahr)
gnp_long$Jahr <- as.numeric(gnp_long$Jahr)

df_final <- religion_data %>%
  left_join(gnp_long, by = c("Bundesland", "Jahr")) %>%
  drop_na()

df_final <- df_final %>%
  mutate(
    'gnp_per_capita' = gnp * 1000000 / Bevölkerung
  )
df_final$gnp_per_capita <- as.numeric(df_final$gnp_per_capita)

df_final <- df_final %>%
  filter(!(Bundesland %in% c("Westliche Bundesländer", "Östliche Bundesländer")))

df_final <- df_final %>%
  arrange(Bundesland, Jahr) %>%
  group_by(Bundesland) %>%
  mutate(
    Ev_Prozent_lag = lag(Ev_Prozent, 1),
    Kat_Prozent_lag = lag(Kat_Prozent, 1),
    gnp_growth = log(gnp_per_capita) - log(lag(gnp_per_capita))
  ) %>%
  ungroup()

df_final <- df_final %>% drop_na(Ev_Prozent_lag, Kat_Prozent_lag)

# PANEL REGRESSION (FIXED EFFECTS)

library(plm)

## 
## Attaching package: 'plm'
##
## The following objects are masked from 'package:dplyr':
## 
##     between, lag, lead

model_lagged <- plm(
  log(gnp_per_capita) ~ Ev_Prozent_lag + Kat_Prozent_lag + factor(Jahr),
  data = df_final,
  index = c("Bundesland", "Jahr"),
  model = "within"
)
summary(model_lagged)

## Oneway (individual) effect Within Model

```

```

## 
## Call:
## plm(formula = log(gnp_per_capita) ~ Ev_Prozent_lag + Kat_Prozent_lag +
##       factor(Jahr), data = df_final, model = "within", index = c("Bundesland",
##       "Jahr"))
##
## Balanced Panel: n = 16, T = 10, N = 160
##
## Residuals:
##      Min.    1st Qu.     Median    3rd Qu.     Max. 
## -0.04707305 -0.00867206 -0.00056981  0.00908242  0.05307471
##
## Coefficients:
##                               Estimate Std. Error t-value Pr(>|t|)    
## Ev_Prozent_lag      0.0033773  0.0011728  2.8796  0.004641 ** 
## Kat_Prozent_lag     0.0093490  0.0011523  8.1132 2.890e-13 *** 
## factor(Jahr)2014   0.0289154  0.0064835  4.4598 1.728e-05 *** 
## factor(Jahr)2015   0.0558652  0.0064049  8.7222 9.751e-15 *** 
## factor(Jahr)2017   0.1297906  0.0065537 19.8043 < 2.2e-16 *** 
## factor(Jahr)2018   0.1621217  0.0070626 22.9551 < 2.2e-16 *** 
## factor(Jahr)2019   0.1996833  0.0074275 26.8843 < 2.2e-16 *** 
## factor(Jahr)2020   0.1827750  0.0078734 23.2143 < 2.2e-16 *** 
## factor(Jahr)2021   0.2539793  0.0083710 30.3405 < 2.2e-16 *** 
## factor(Jahr)2022   0.3295836  0.0090184 36.5456 < 2.2e-16 *** 
## factor(Jahr)2023   0.3893846  0.0101757 38.2662 < 2.2e-16 *** 
## --- 
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares:    1.7595
## Residual Sum of Squares: 0.043414
## R-Squared:              0.97533
## Adj. R-Squared:          0.9705
## F-statistic: 477.932 on 11 and 133 DF, p-value: < 2.22e-16

model_ab <- plm(
  log(gnp_per_capita) ~ lag(log(gnp_per_capita), 1) + Ev_Prozent_lag + Kat_Prozent_lag,
  data = df_final,
  model = "random",
  index = c("Bundesland", "Jahr"),
  effect = "twoways"
)

summary(model_ab)

## Twoways effects Random Effect Model
## (Swamy-Arora's transformation)
##
## Call:
## plm(formula = log(gnp_per_capita) ~ lag(log(gnp_per_capita),
##       1) + Ev_Prozent_lag + Kat_Prozent_lag, data = df_final, effect = "twoways",
##       model = "random", index = c("Bundesland", "Jahr"))
##
## Balanced Panel: n = 16, T = 8, N = 128
##

```

```

## Effects:
##           var   std.dev share
## idiosyncratic 0.0002312 0.0152056 0.248
## individual    0.0000000 0.0000000 0.000
## time         0.0007004 0.0264645 0.752
## theta: 0 (id) 0.8578 (time) 0 (total)
##
## Residuals:
##      Min.    1st Qu.     Median    3rd Qu.     Max.
## -0.0627090 -0.0104041 -0.0020303  0.0104482  0.0655463
##
## Coefficients:
##                               Estimate Std. Error z-value Pr(>|z|)
## (Intercept)            1.5400e-01 7.0836e-02 2.1741  0.0297 *
## lag(log(gnp_per_capita), 1) 9.8925e-01 6.7980e-03 145.5219 <2e-16 ***
## Ev_Prozent_lag        -1.9302e-04 1.5971e-04 -1.2086  0.2268
## Kat_Prozent_lag       -1.1817e-04 8.9519e-05 -1.3200  0.1868
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Total Sum of Squares: 7.1467
## Residual Sum of Squares: 0.034371
## R-Squared: 0.99519
## Adj. R-Squared: 0.99507
## Chisq: 25658.8 on 3 DF, p-value: < 2.22e-16

```