Complete results

Giacomo Lanfiuti Baldi

2024-08-21

Italian Data from WHO. 5-years ages classes from 0 to 80+.
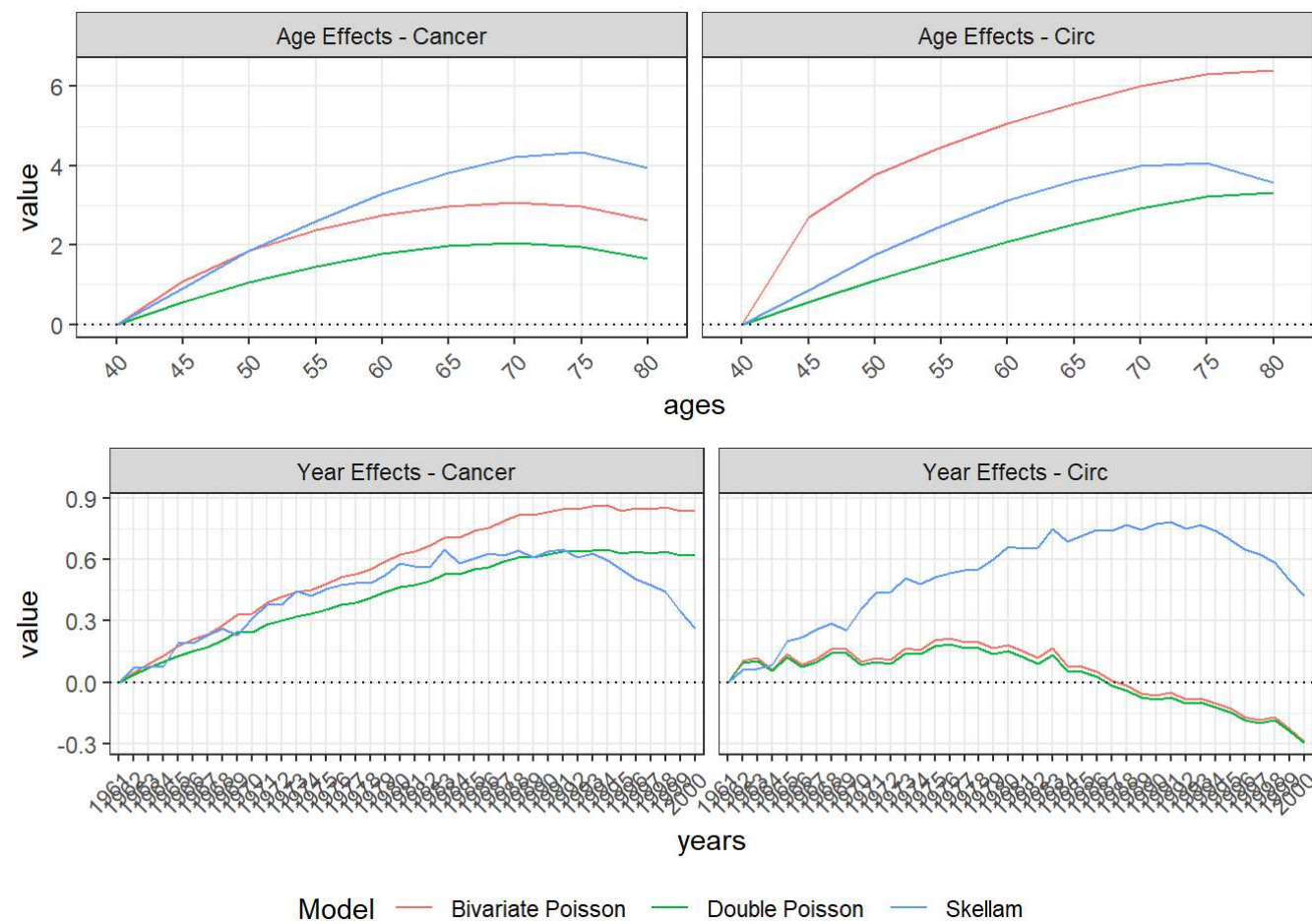
3 baseline period: 1961-2000 (40 years) 1971-2000 (30 years) 1981-2000 (20 years)

15 years of forecasting window: 2001-2015

Analysis for Adult-ages (40+):

PERIOD 1: Baseline 1961-2000, forecasting 2001-2015

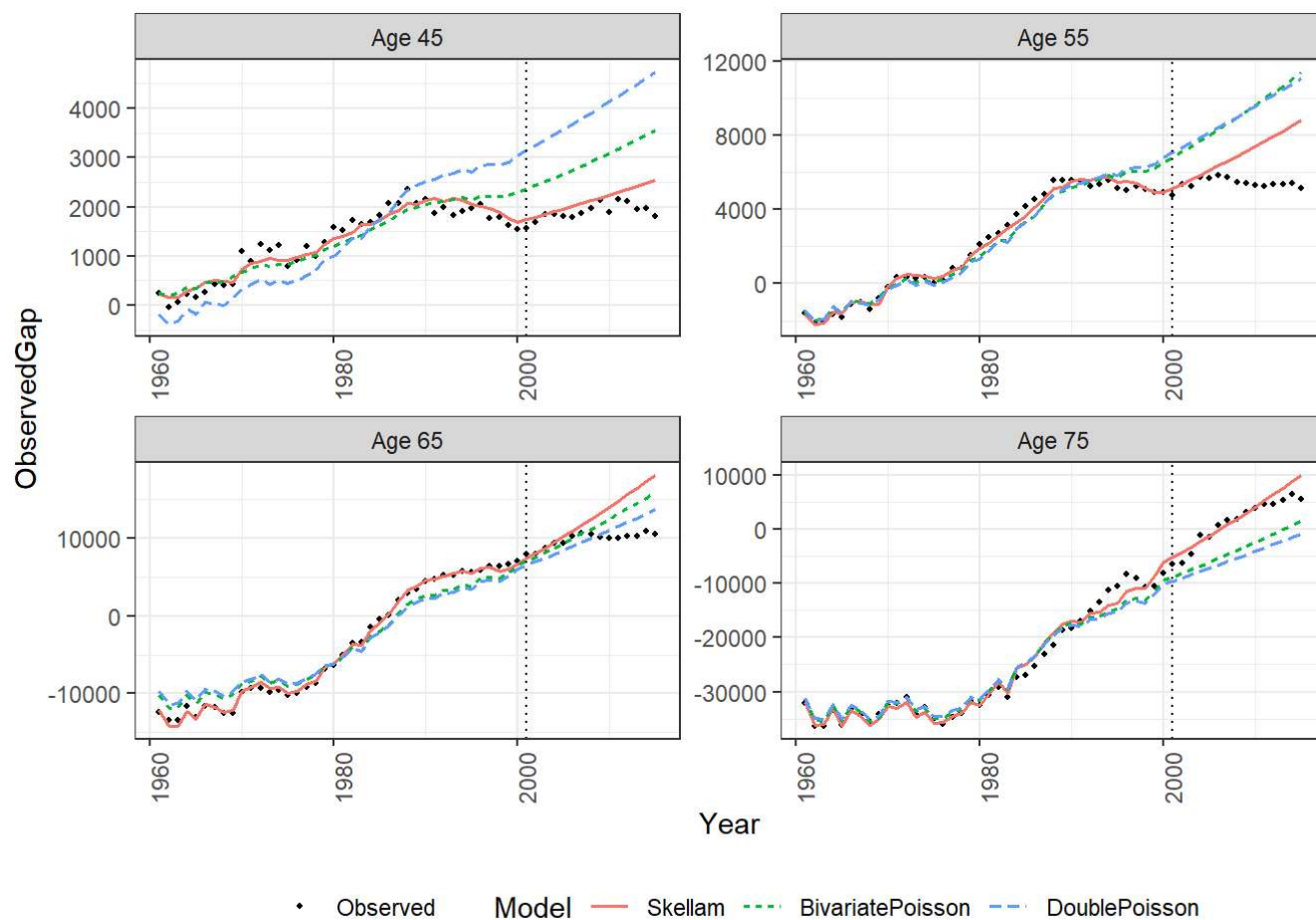Visualization estimated Age-Period Effects

Accuracy in-sample fitting:

```
##                          RMSE       MAE       MAPE
## Skellam              600.1253   364.5688  0.1815435
## Double Poisson      2085.5022  1379.9481  0.5727929
## Bivariate Poisson   1952.4122  1186.0621  0.3988497
```
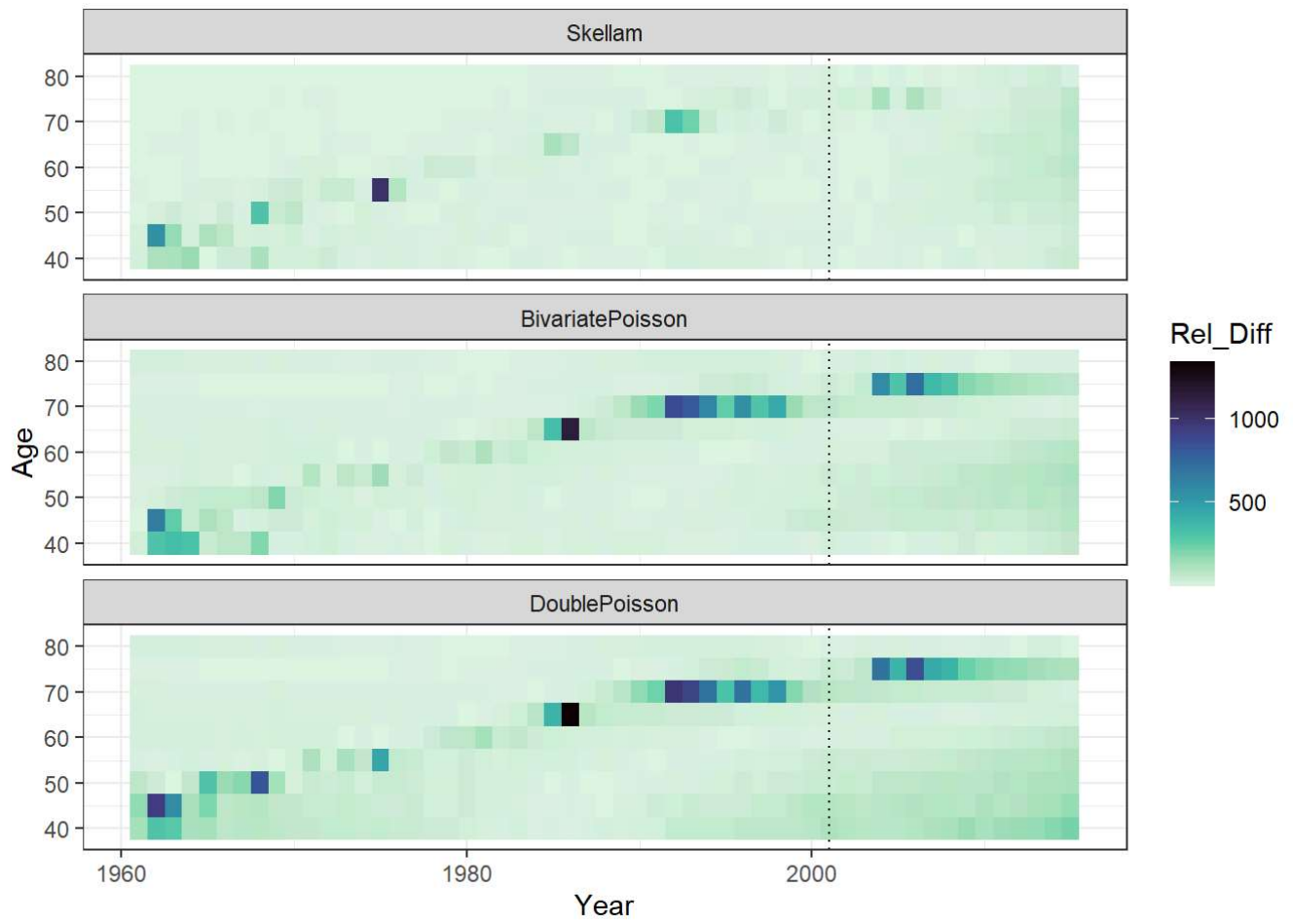
Accuracy out-of-sample fitting:

```
##                         RMSE      MAE       MAPE
## Skellam            2321.854 1488.011 0.2399693
## Double Poisson     3534.513 2950.762 0.8703805
## Bivariate Poisson  3109.655 2474.848 0.6075608
```

Plot of fitting and forecasting in-sample (till 2000) and out-of-sample (years>2000)
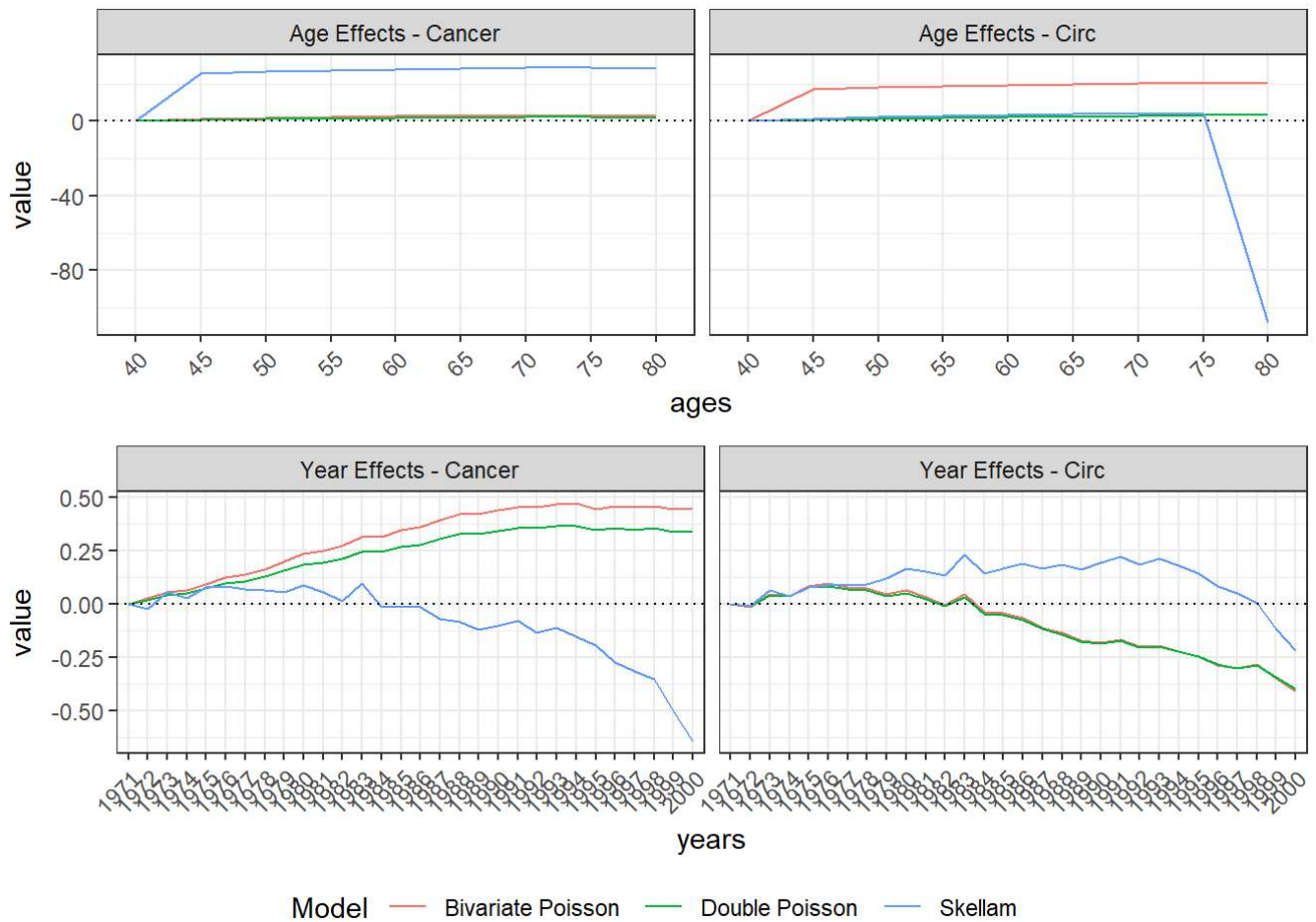
Heat map of absolute relative differences:

PERIOD 2: Baseline 1971-2000, forecasting 2001-2015
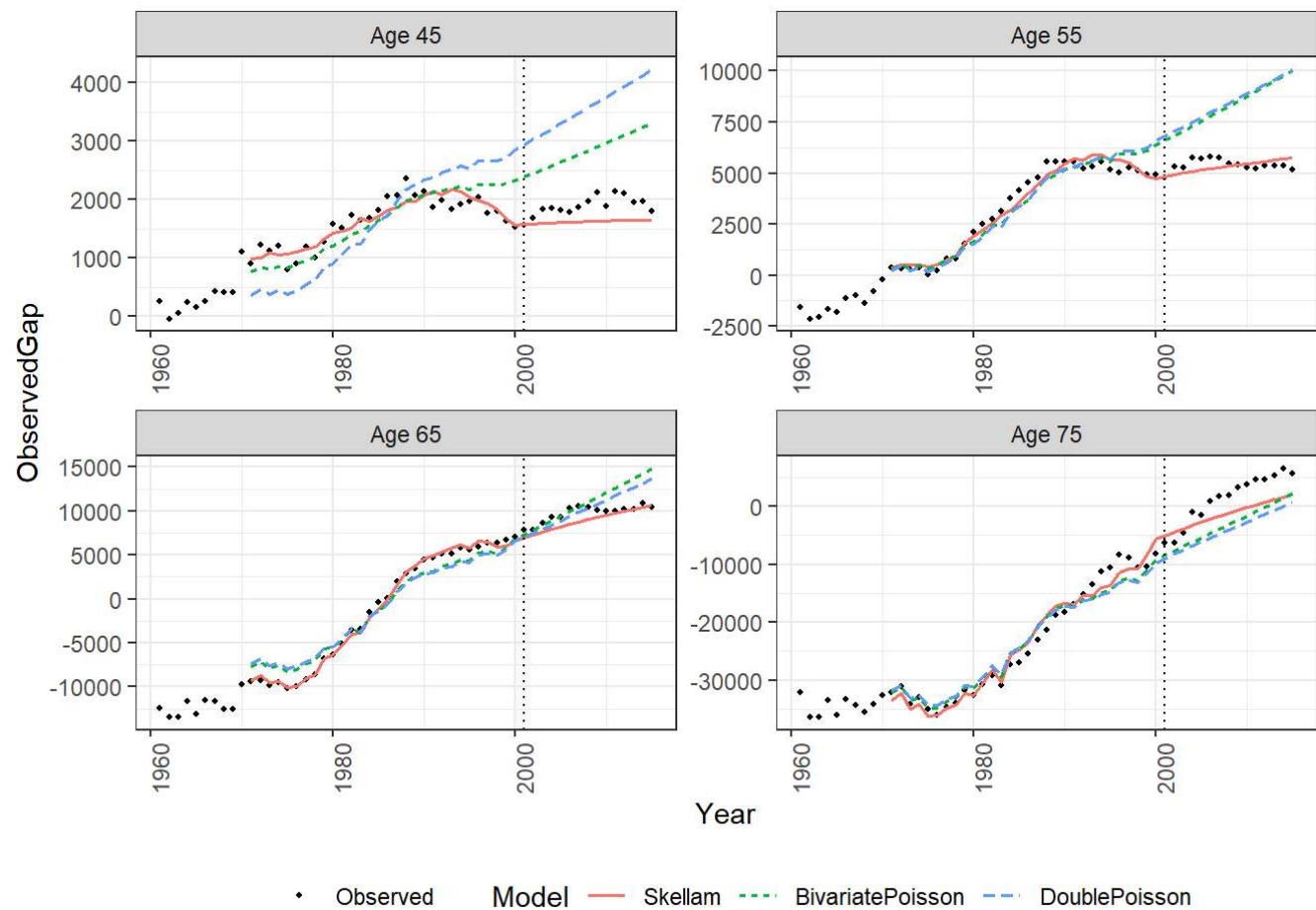
Visualization estimated Age-Period Effects:

Accuracy in-sample fitting:

```
##                        RMSE        MAE       MAPE
## Skellam            643.2253   393.1117  0.1798340
## Double Poisson    1864.2598  1280.8410  0.4180866
## Bivariate Poisson 1783.4724  1126.5290  0.3445522
```
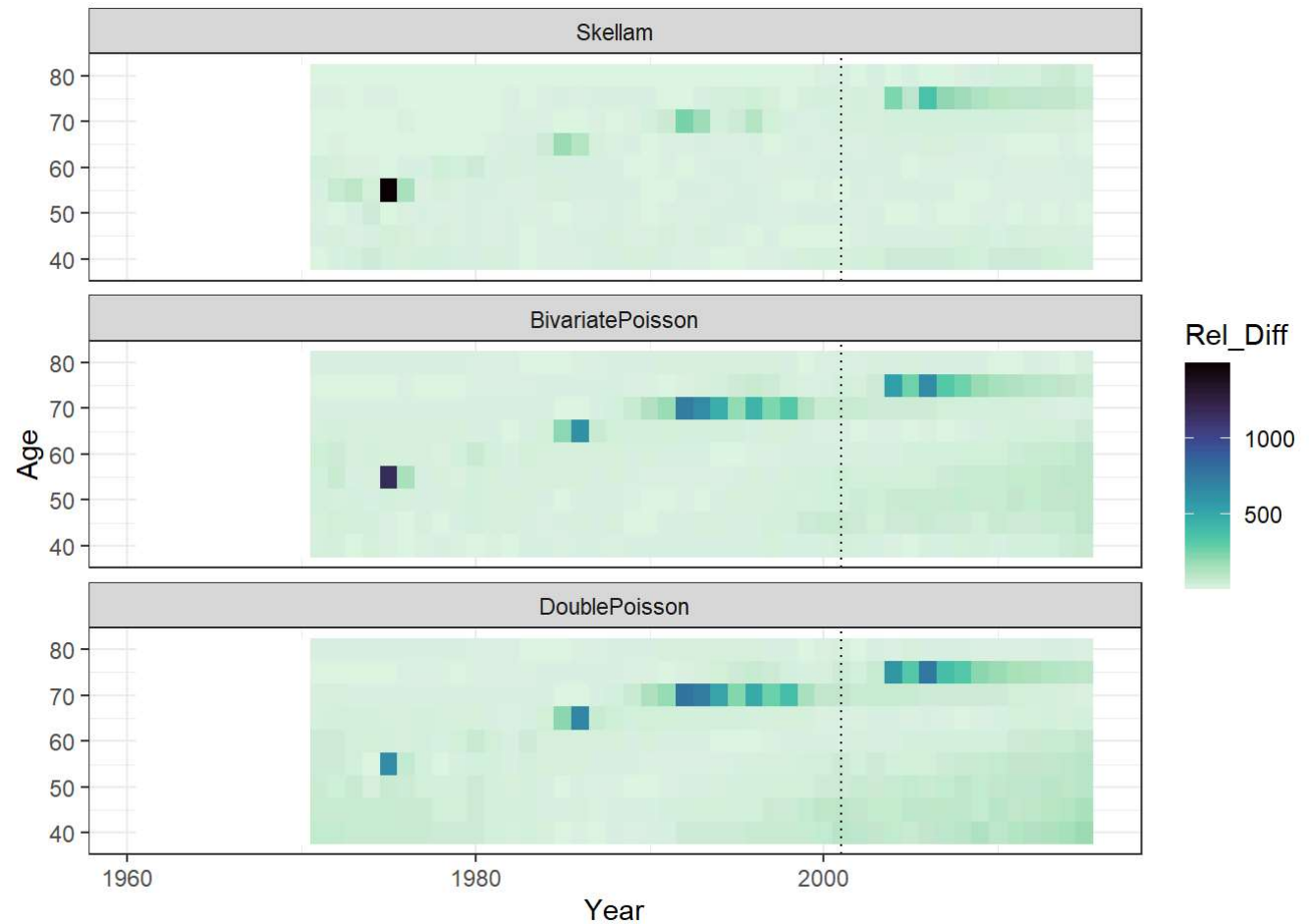
Accuracy out-of-sample fitting:

```
##                       RMSE       MAE       MAPE
## Skellam           1642.354  1067.496  0.2552004
## Double Poisson    2956.406  2469.650  0.7226544
## Bivariate Poisson 2634.367  2114.508  0.5254489
```

Plot of fitting and forecasting in-sample (till 2000) and out-of-sample (years>2000):
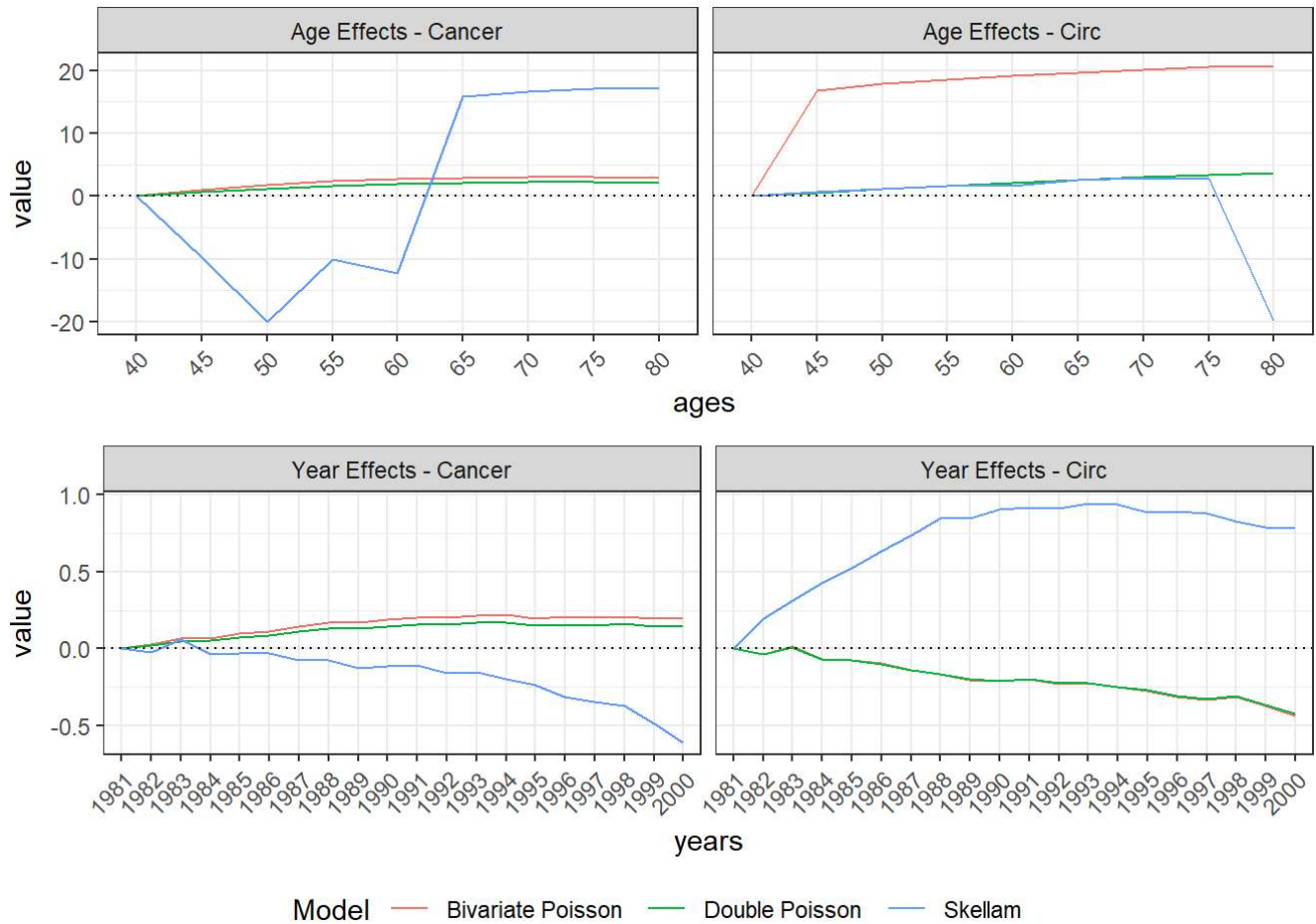

Heat map of absolute relative differences:

PERIOD 3: Baseline 1981-2000, forecasting 2001-2015
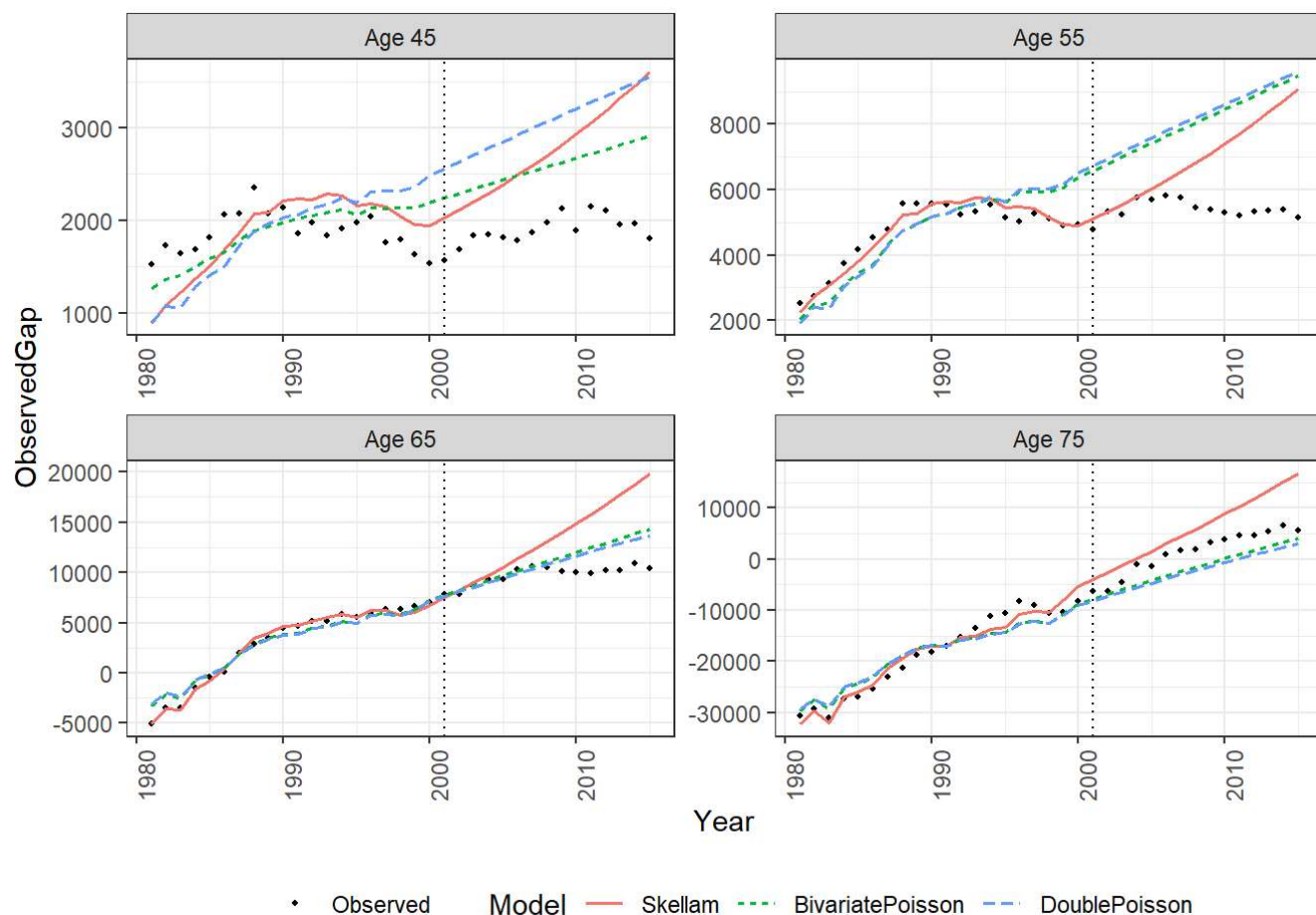
Visualization estimated Age-Period Effects:

Accuracy in-sample fitting:

```
##                      RMSE        MAE       MAPE
## Skellam          775.3621   522.9112  0.1986375
## Double Poisson  1529.9398  1050.0590  0.3018239
## Bivariate Poisson 1485.7062  964.0545  0.2502995
```

Accuracy out-of-sample fitting:

```
##                      RMSE        MAE       MAPE
## Skellam          3443.429  2282.455  0.4670706
## Double Poisson   2327.939  1973.183  0.5412349
## Bivariate Poisson 2183.590  1771.905  0.4121274
```

Plot of fitting and forecasting in-sample (till 2000) and out-of-sample (years>2000):

Heat map of absolute relative differences: