Systematic Bias and Nontransparency in US Social Security Administration Forecasts
Online Appendix
Replication of Figures

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Contents

1 Demographic Forecasts: Life Expectancy

1.1 Observed Life Expectancy

Figure 1: Observed Period Life Expectancy. As described in the text, "period life expectancy" for a year is a single-number summary of all the age-specific mortality rates for that same year and is interpreted as the average number of years a person could expect to live if he or she experienced the mortality rates of a given year over the course of their life.

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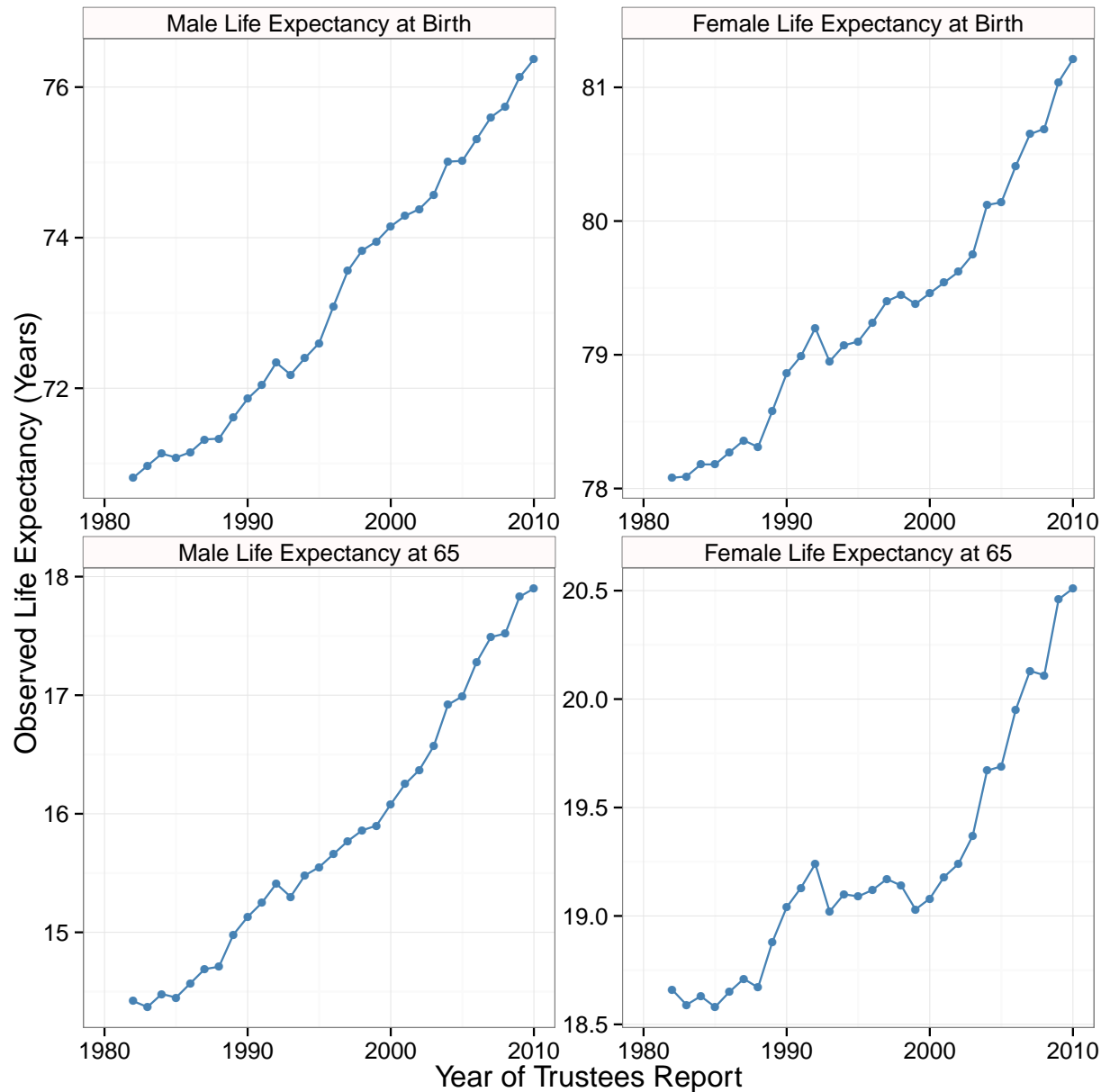
1.2 2010 and 2005 Life Expectancy Forecasts

Figure 2: Forecast Error of Life Expectancy in 2010 by Trustees Report. Dots colored green when truth falls within SSA uncertainty intervals. Dots colored red when the truth falls outside SSA uncertainty intervals.
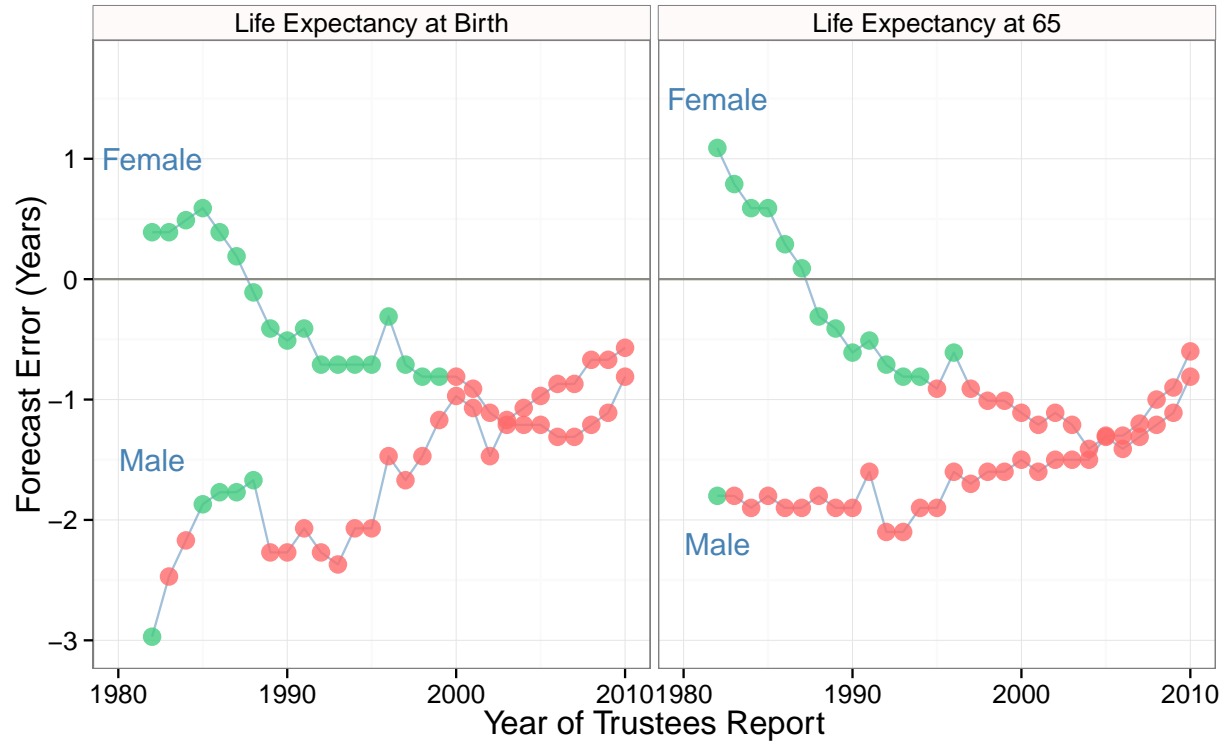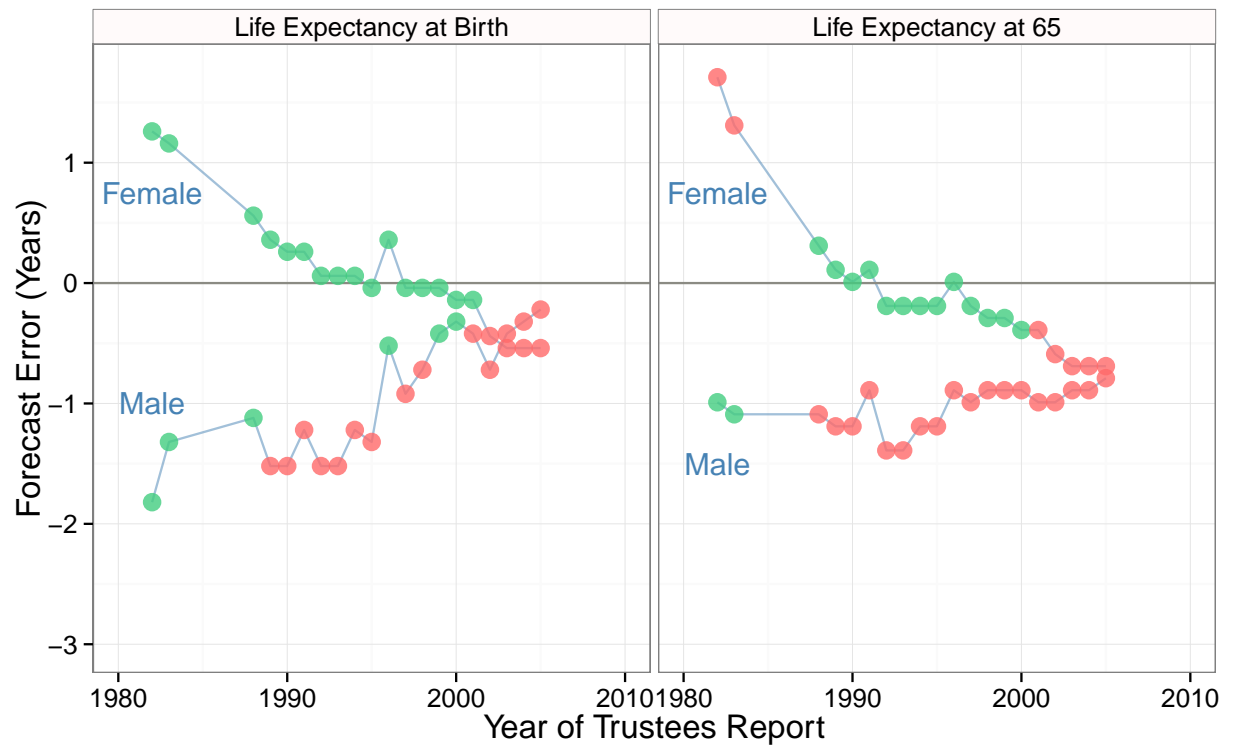
Figure 3: Forecast Error of Life Expectancy in 2005 by Trustees Report. Dots colored green when truth falls within SSA uncertainty intervals. Dots colored red when the truth falls outside SSA uncertainty intervals.

1.3 Confidence Interval Coverage

Figure 4: Uncertainty Interval Coverage. Green indicates uncertainty interval covered the truth, red indicates that it did not, and gray indicates that SSA did not provide an interval. Contemporaneous forecast error is possible because of the time lag (typically three to four years) in finalizing mortality data.
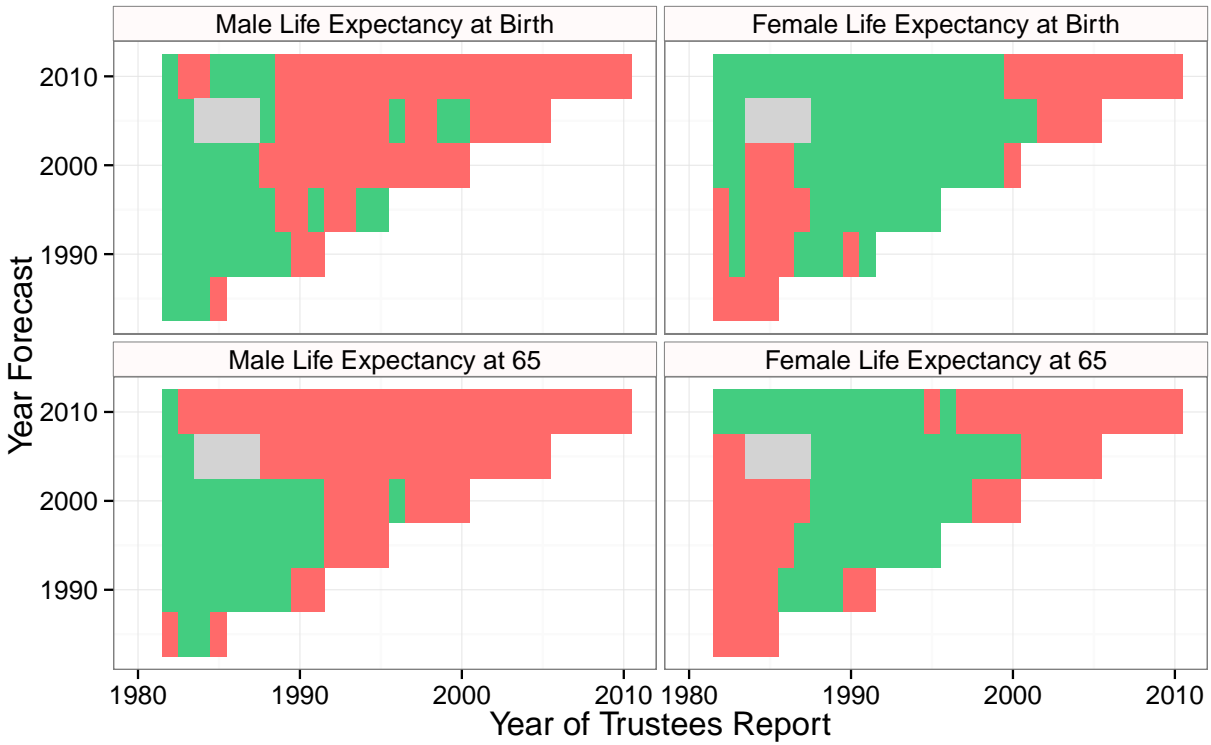
2 Financial Forecasts

2.1 Cost of Mortality Forecasting Errors

Figure 5: Cost of Mortality Forecasting Errors (in billions of 2010 dollars). Each panel of the figure corresponds to a Trustees Report. Within each panel, we plot the forecast error in total Social Security expenditures (dark orange lines) and the forecast error in total Social Security expenditures due to mortality forecasting errors (blue lines). Finally, we represent the Great Recession as a vertical light orange region.
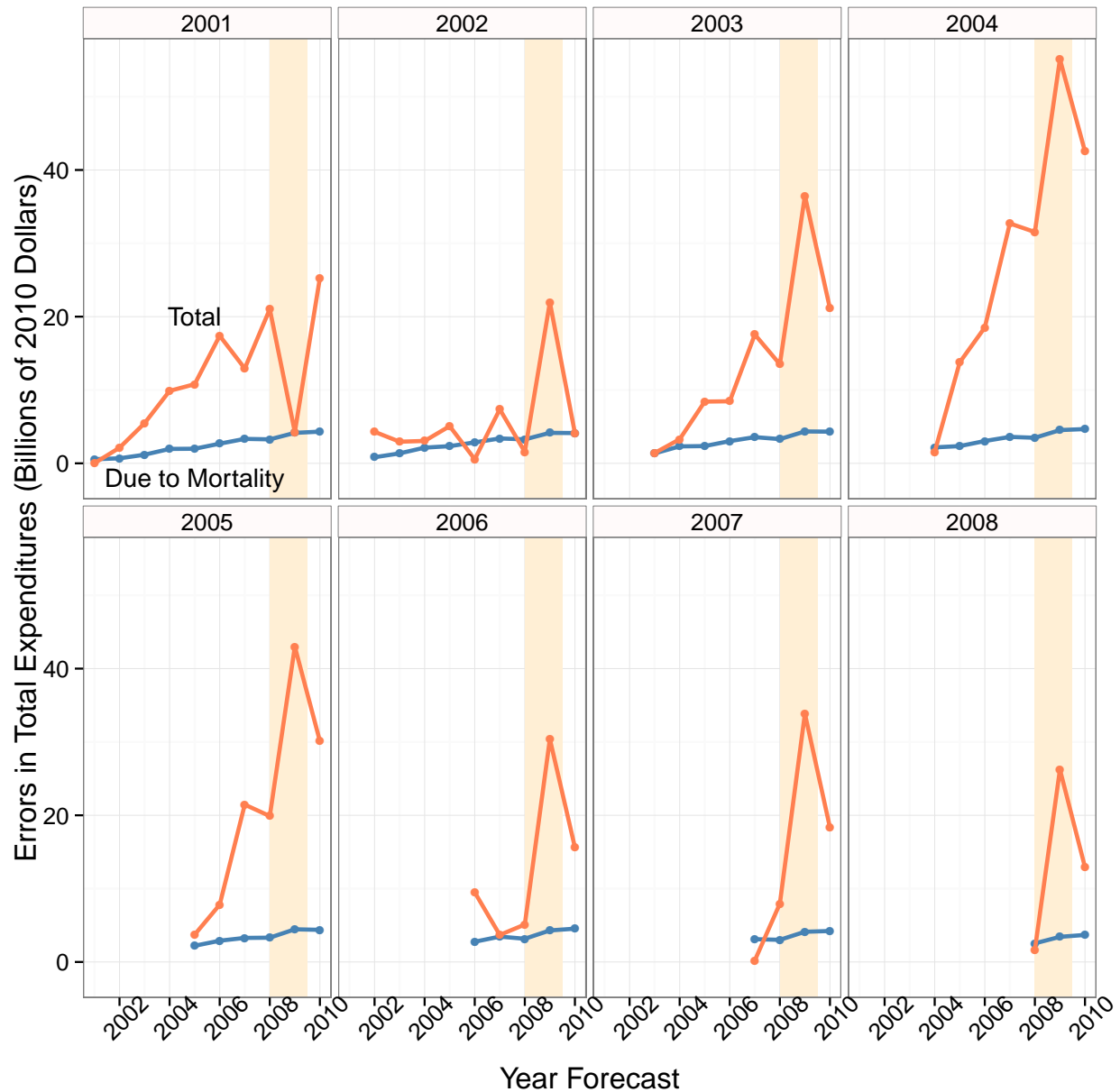
2.2 Cost Rate Forecasting Errors

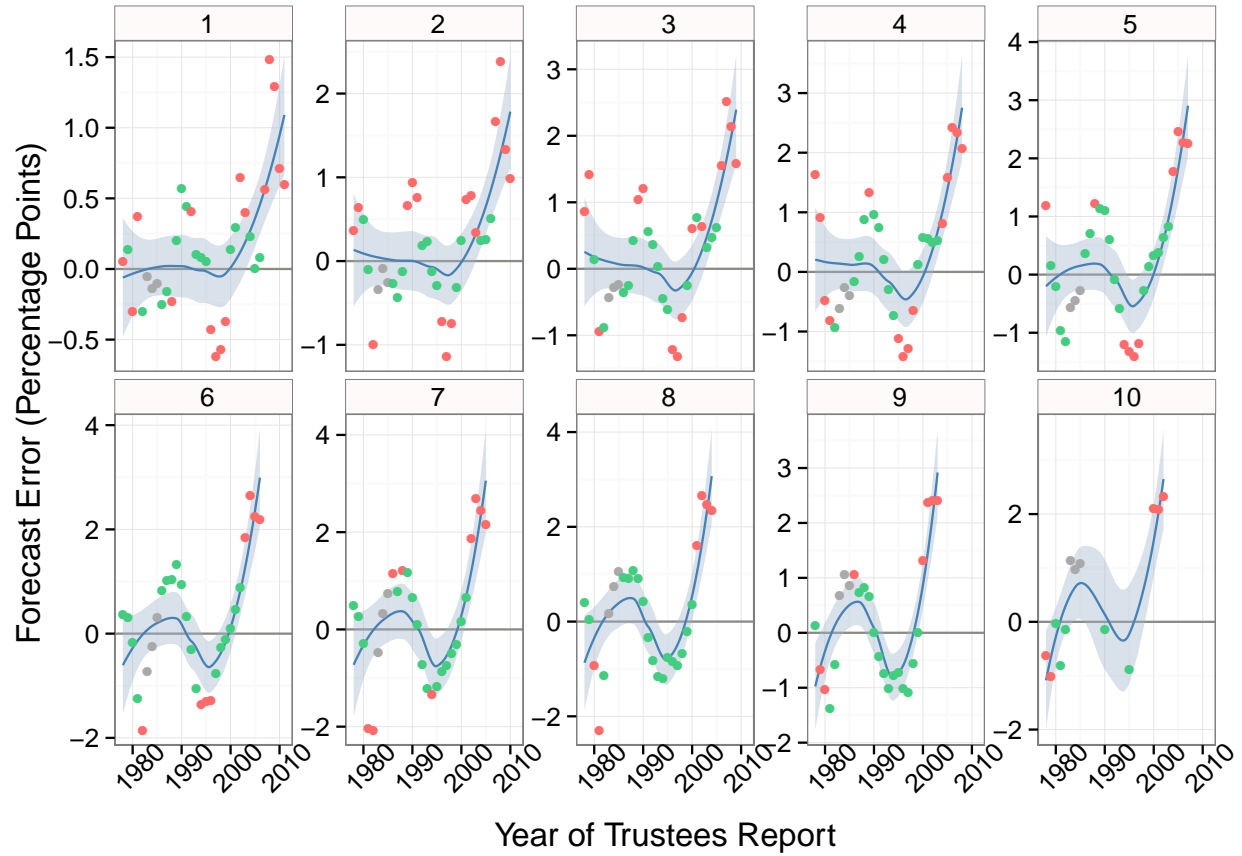Figure 6: Cost Rate Forecasting Errors. Forecast errors in the cost rate (vertically) by the year of the forecast (horizontally) by how many years into the future the forecast is made (in the title of each panel). Cost rate forecasting errors are overestimates if positive and underestimates if negative. Points are green if the error is within SSA's uncertainty interval and red otherwise.
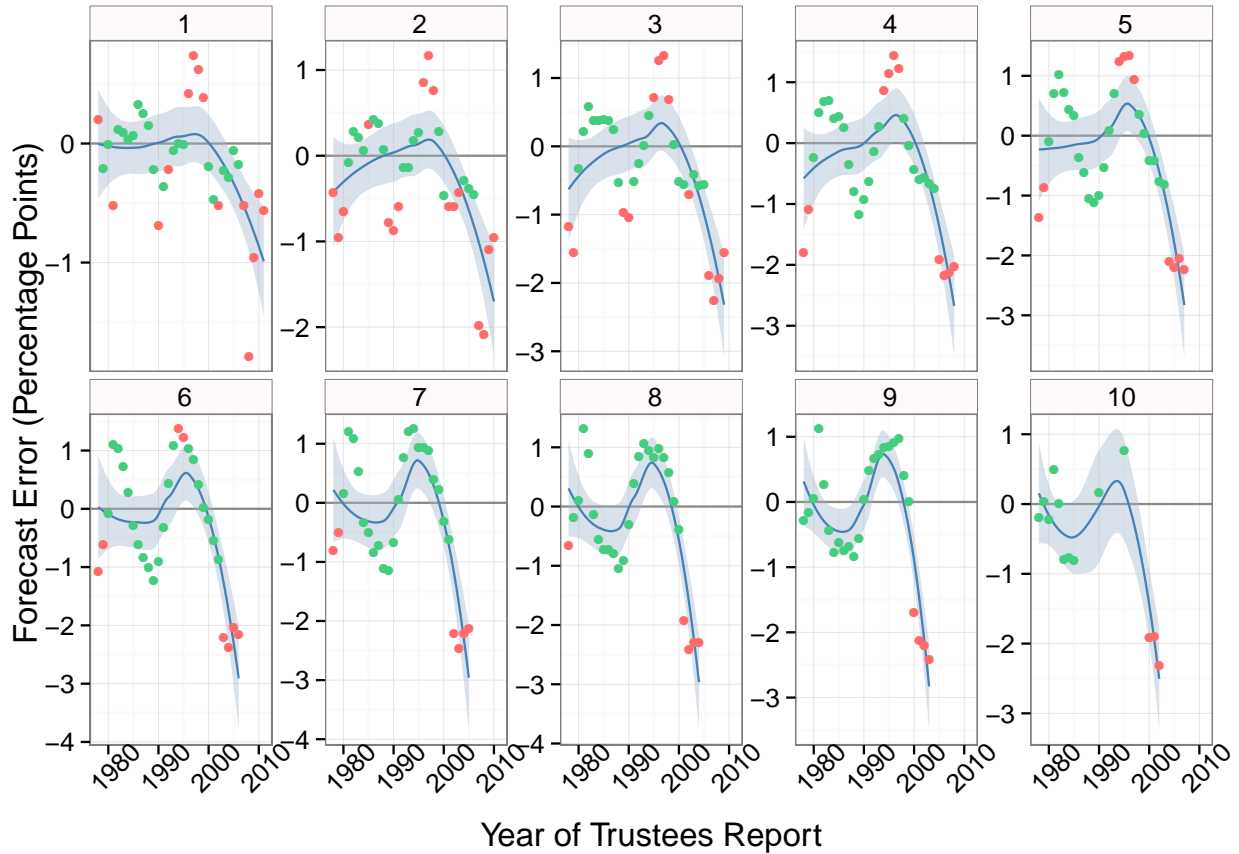
2.3   Trust Fund Balance Forecasting Errors

Figure 7: Balance Forecasting Errors. Forecast errors in balance (vertically) by the year of the forecast (horizontally) by how many years into the future the forecast is made (in the title of each panel). Positive errors overestimate Trust Fund assets; negative errors underestimate them. Points are green if the error is within SSA's uncertainty interval and red otherwise.

2.4 Trust Fund Ratio Forecasting Errors

Figure 8: Trust Fund Ratio Forecasting Errors. Forecast errors in the trust fund ratio (vertically) by the year of the Trustees Report forecast (horizontally) by how many years into the future the forecast is made (in the title of each panel). Positive errors overestimate Trust Fund assets; negative errors underestimate them. Points are green if the error is within SSA's uncertainty interval and red otherwise.
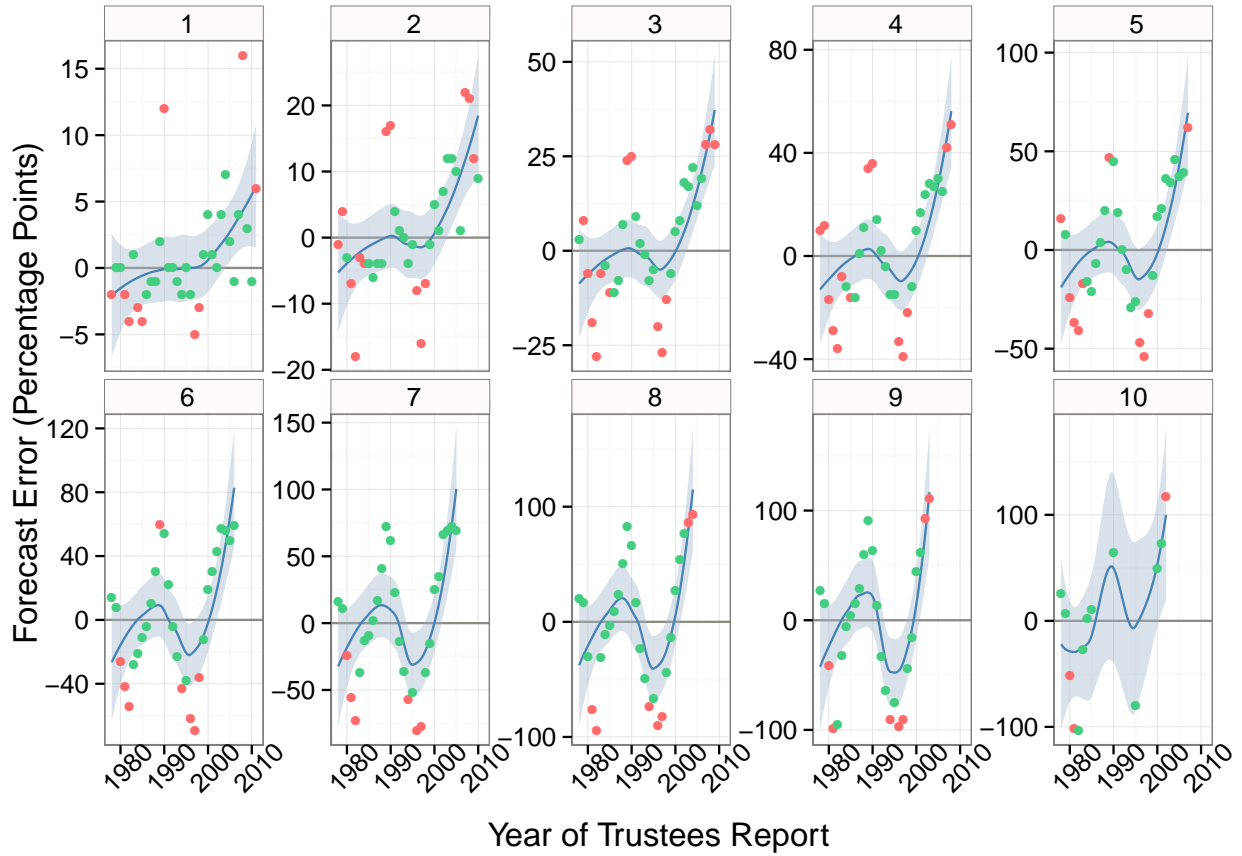
3 Demographic Forecasts using SSA Data: Life Expectancy

3.1 Observed Life Expectancy

Figure 9: Observed Period Life Expectancy (SSA). As described in the text, "period life expectancy" for a year is a single-number summary of all the age-specific mortality rates for that same year and is interpreted as the average number of years a person could expect to live if he or she experienced the mortality rates of a given year over the course of their life.
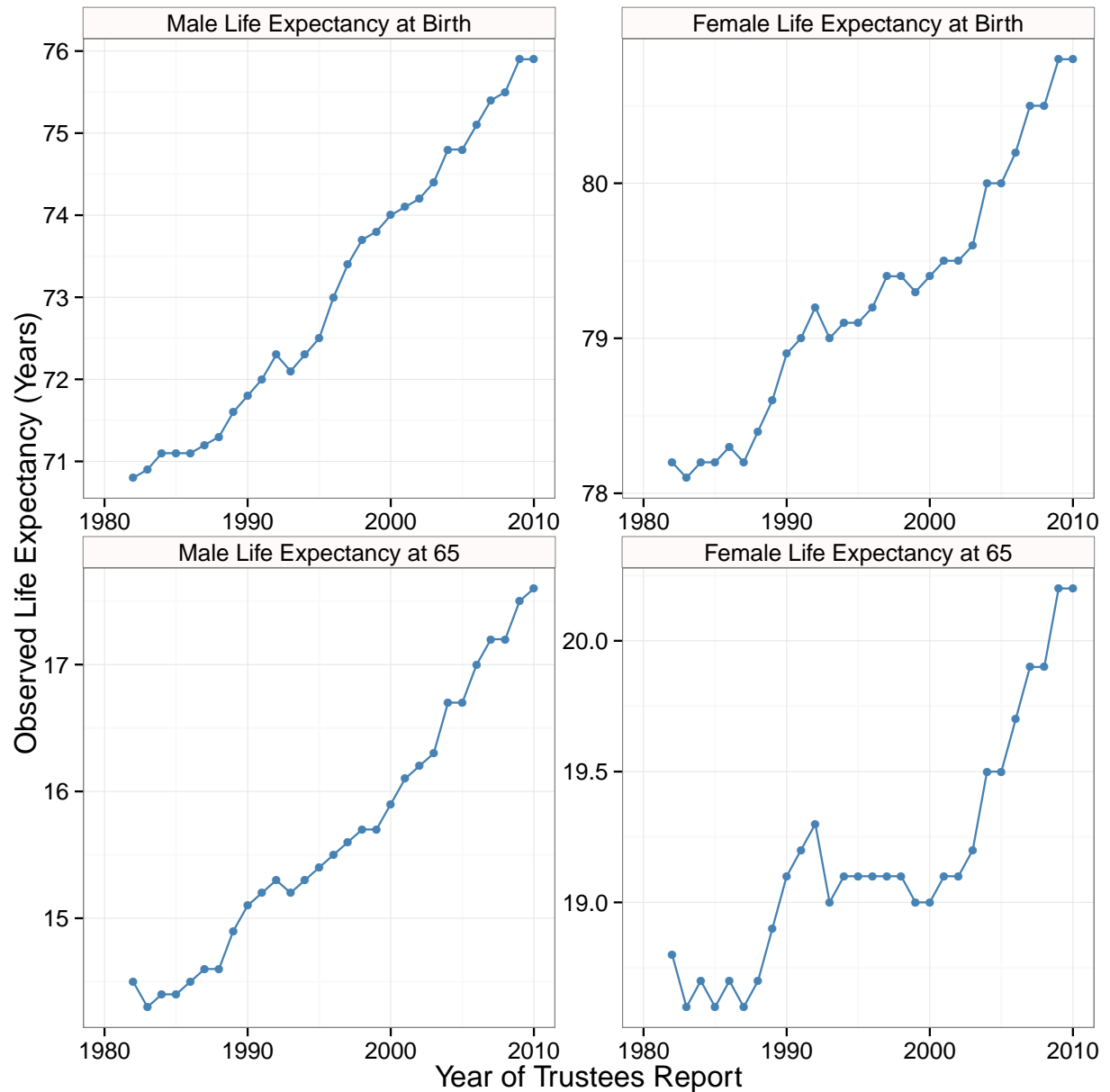
3.2 2010 and 2005 Life Expectancy Forecasts

Figure 10: Forecast Error of Life Expectancy in 2010 by Trustees Report (observed data from SSA). Dots colored green when truth falls within SSA uncertainty intervals. Dots colored red when the truth falls outside SSA uncertainty intervals.
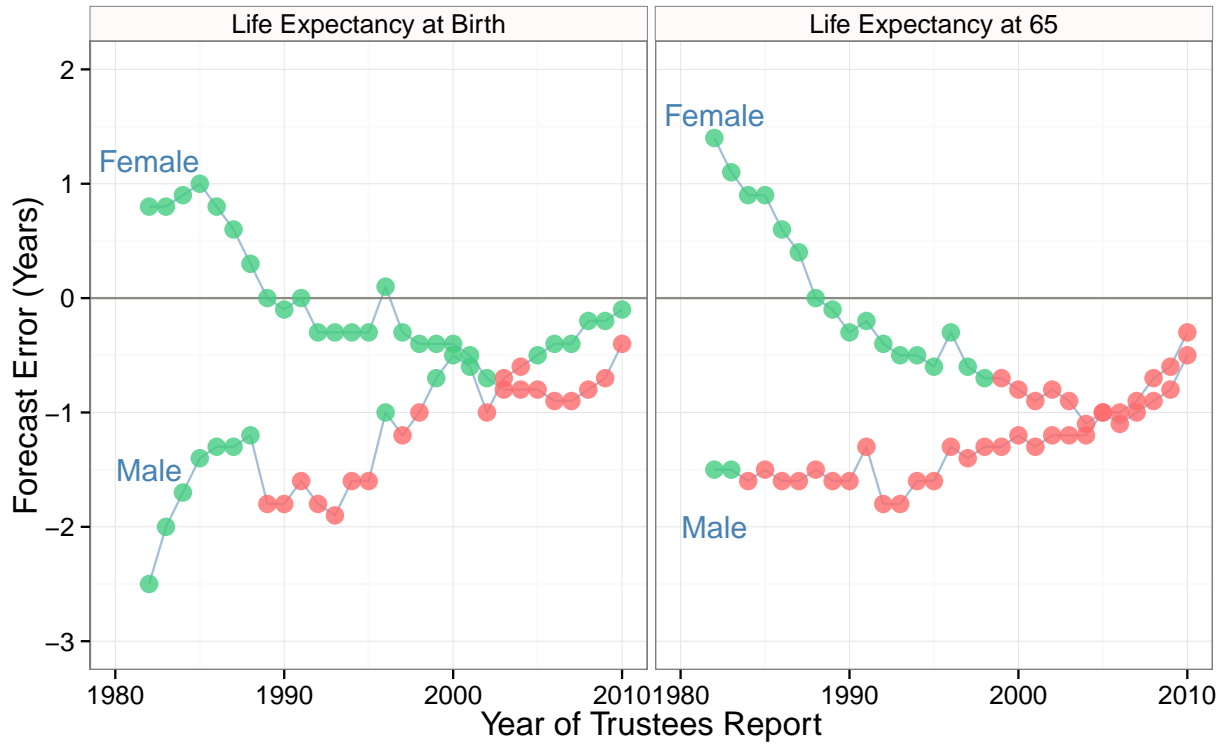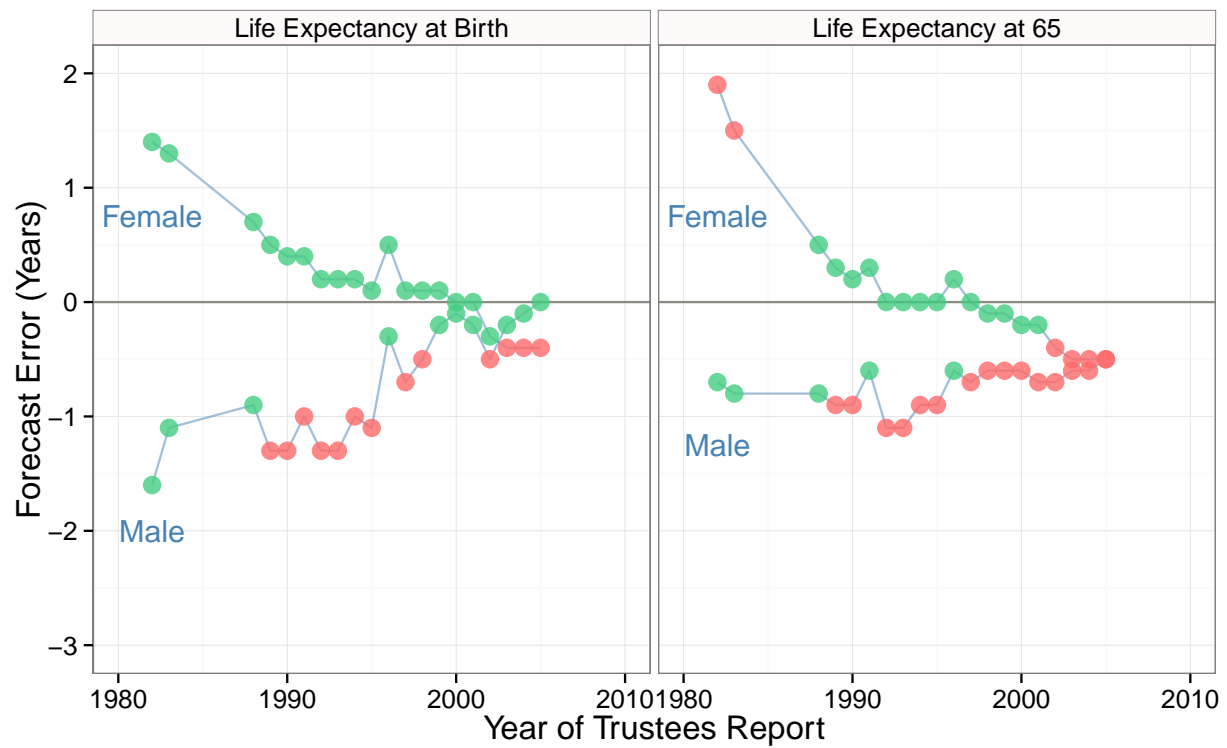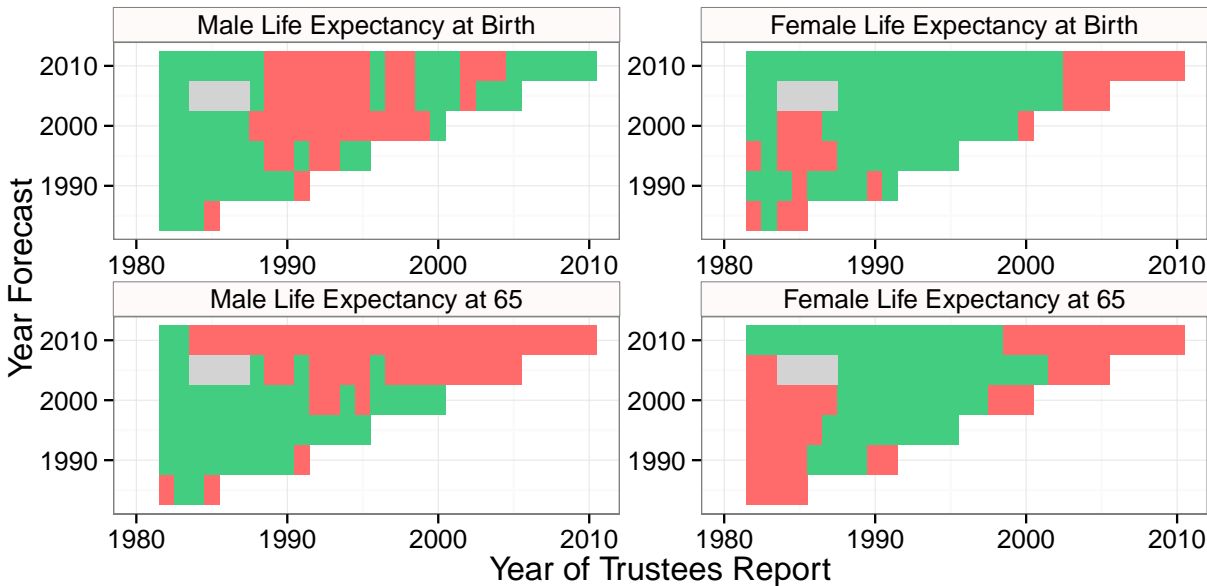
Figure 11: Forecast Error of Life Expectancy in 2005 by Trustees Report (observed data from SSA). Dots colored green when truth falls within SSA uncertainty intervals. Dots colored red when the truth falls outside SSA uncertainty intervals.

## 3.3 Confidence Interval Coverage

Figure 12: Uncertainty Interval Coverage (observed data from SSA). Green indicates uncertainty interval covered the truth, red indicates that it did not, and gray indicates that SSA did not provide an interval.

# 4 Life Expectancy Forecast Errors for 1985–2010

4.1 All Life Expectancy Forecast Errors using HMD Data

Figure 13: Life Expectancy Forecasts: Errors by Trustees Report Year by Forecast Year. Larger dots indicate forecasts nearer to the date the forecast was made. Smoothed line weighted by proximity to year forecast.
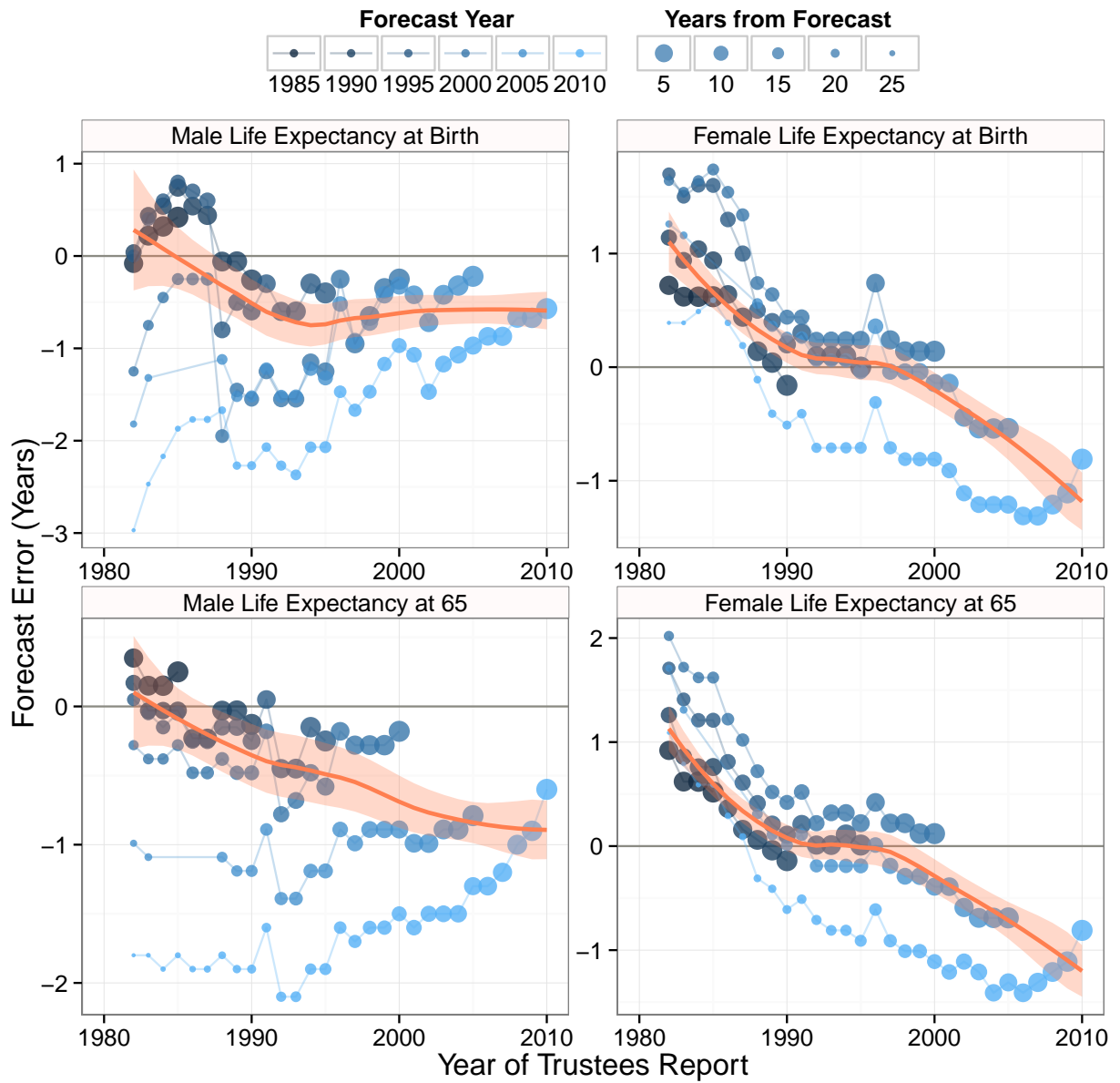
4.2 All Life Expectancy Forecast Errors using SSA Data

Figure 14: Life Expectancy Forecasts: Errors by Trustees Report Year by Forecast Year (observed data from SSA). Larger dots indicate forecasts nearer to the date the forecast was made. Smoothed line weighted by proximity to year forecast.
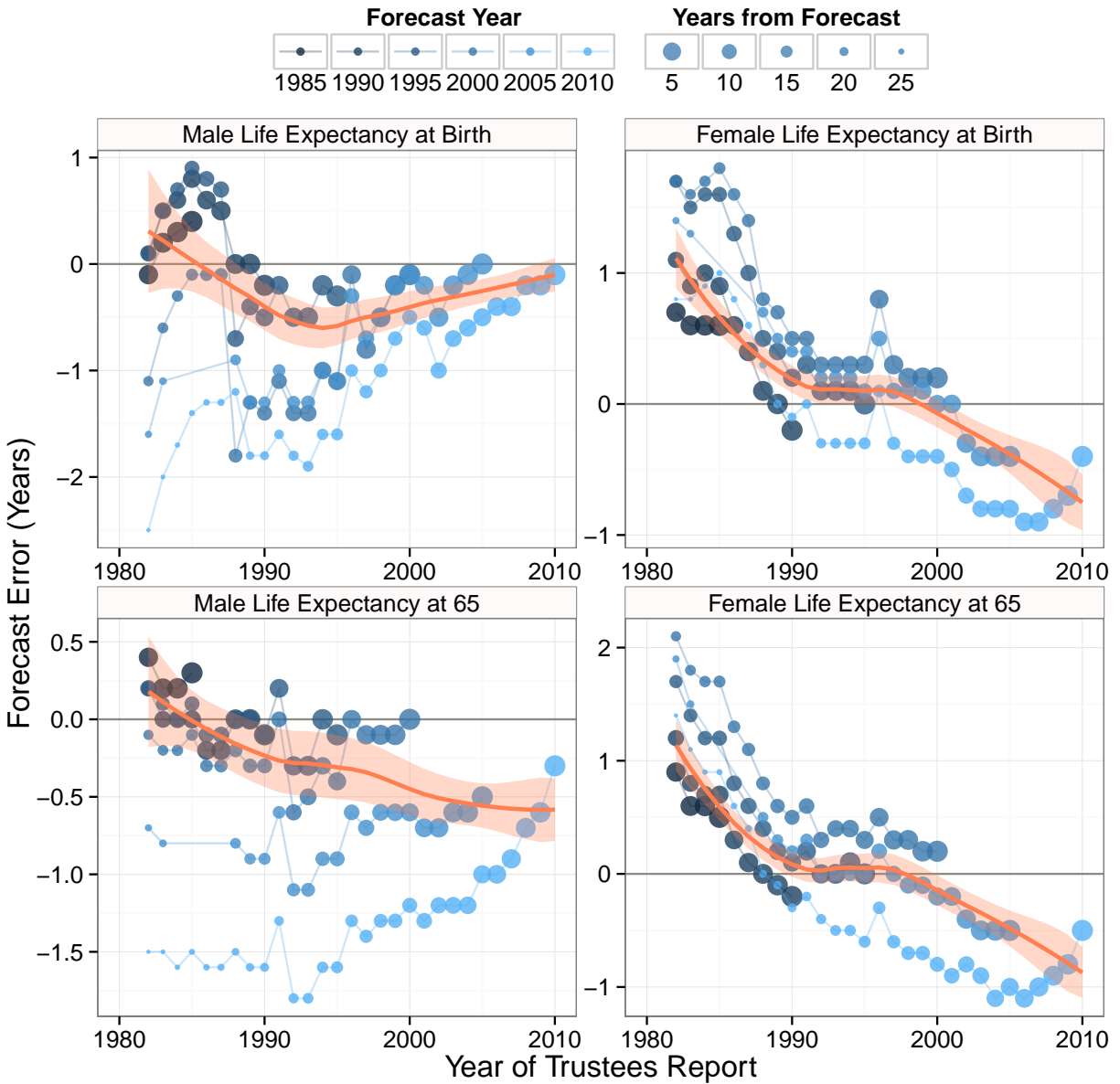
5 Total Fertility Rate Forecast Errors

Figure 15: Clockwise from top left: a) Observed total fertility rate from Human Fertility Database; b) Forecast error of total fertility rate for 2005 and 2010 by Trustees Report. Dots are colored green when truth falls within SSA uncertainty intervals. Dots are colored red when the truth falls outside SSA uncertainty intervals; c) Errors by trustees report year by forecast year. Larger dots indicate forecasts nearer to the date the forecast was made. Smoothed line weighted by proximity to year forecast; d) Uncertainty interval coverage. Green indicates uncertainty interval covered the truth and red indicates that it did not.
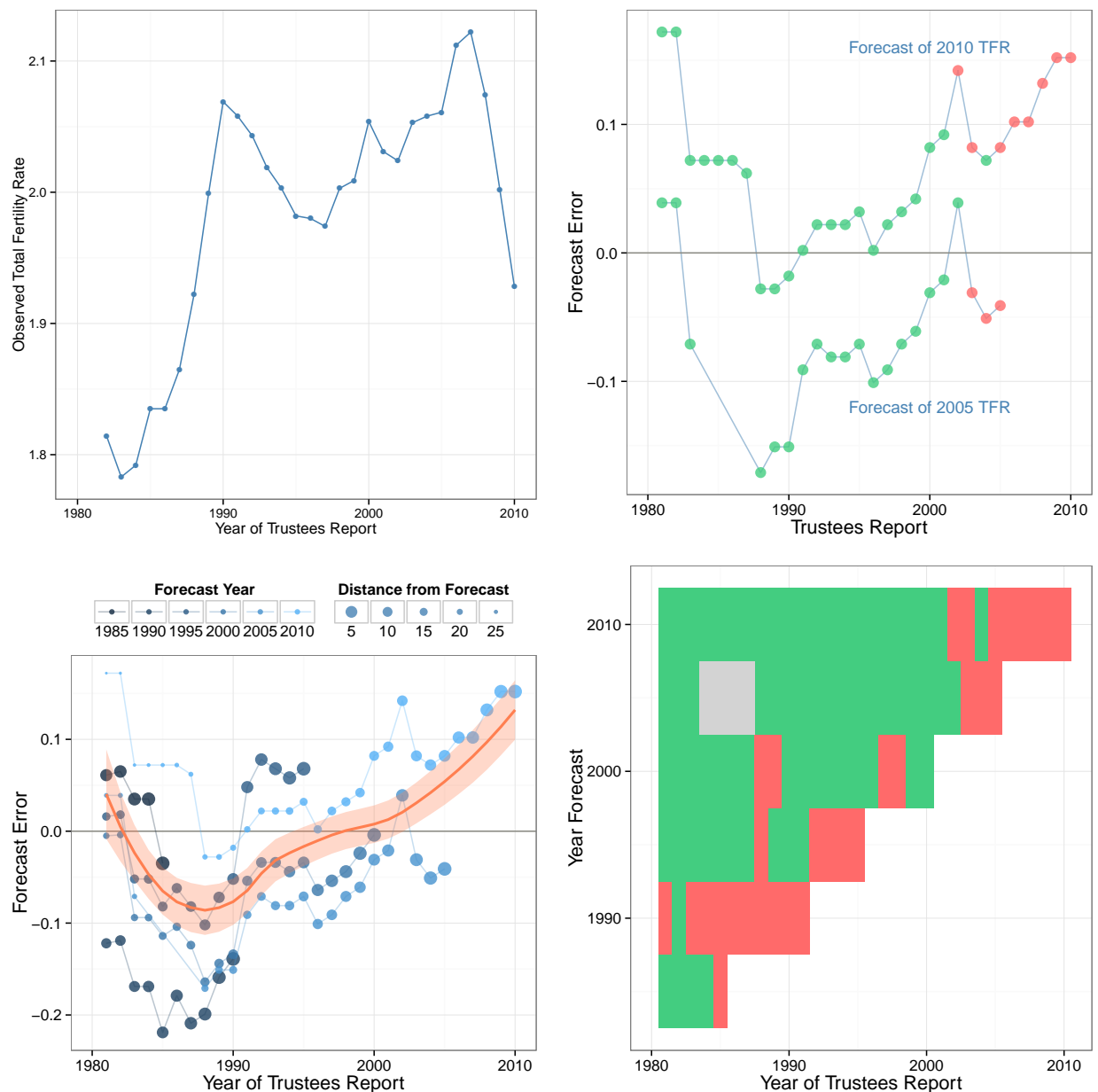
Figure 16: Clockwise from top left: a) Observed total fertility rate from SSA; b) Forecast error of total fertility rate for 2005 and 2010 by Trustees Report. Dots are colored green when truth falls within SSA uncertainty intervals. Dots are colored red when the truth falls outside SSA uncertainty intervals; c) Errors by trustees report year by forecast year. Larger dots indicate forecasts nearer to the date the forecast was made. Smoothed line weighted by proximity to year forecast; d) Uncertainty interval coverage. Green indicates uncertainty interval covered the truth and red indicates that it did not.
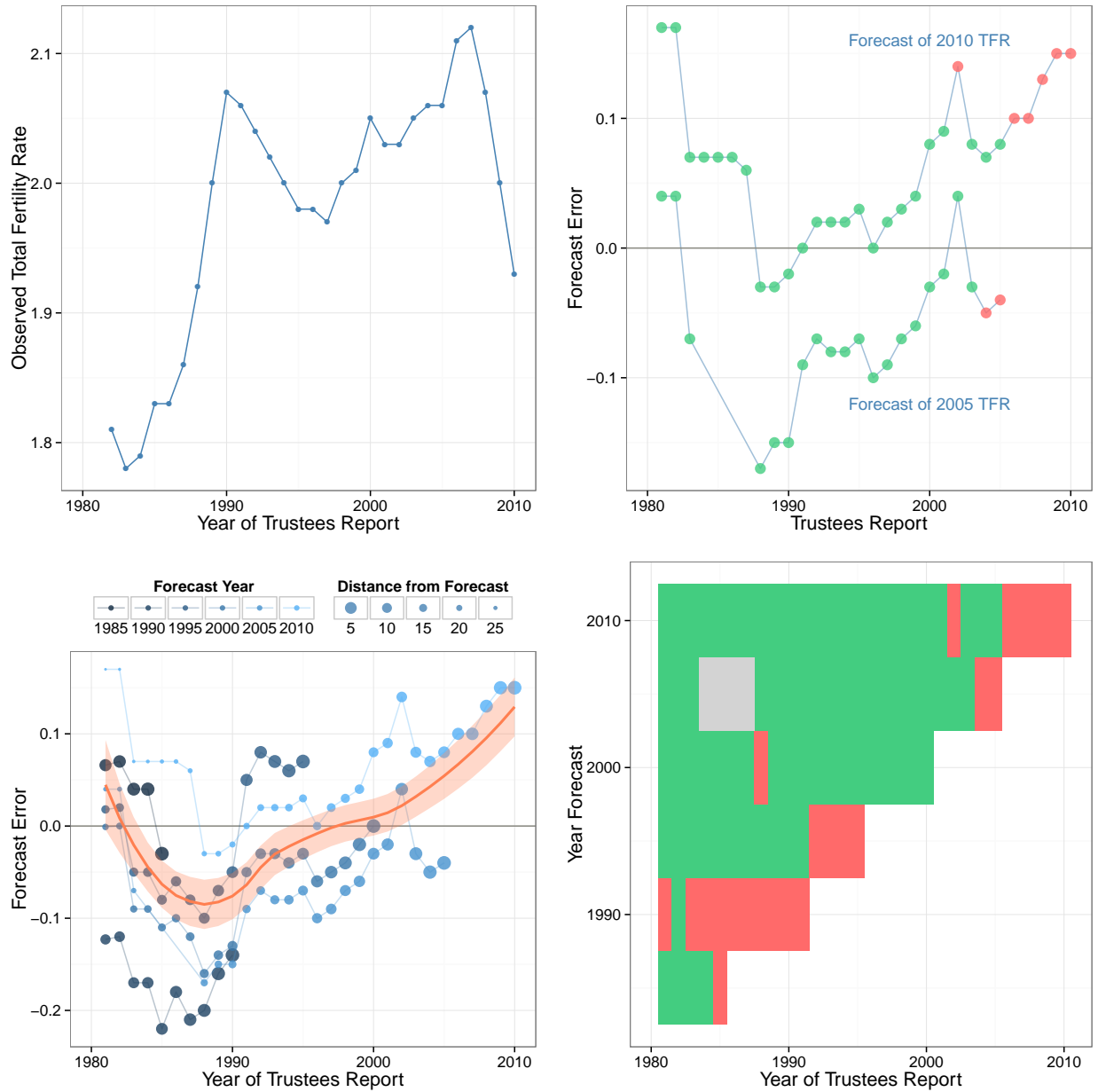
6 Migration Forecast Errors

Figure 17: Forecast Error of Legal Migration in 2005 (panel a) and 2010 (panel b) by Year of Trustees Report. Dots colored green when truth falls within SSA uncertainty intervals. Dots colored red when the truth falls outside SSA uncertainty intervals.