Appendices for

DEMOGRAPHIC FORECASTS AND FISCAL POLICY RULES

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Appendix 1: POLICY RULE EFFECTS WITH A ONE PER CENT VAT INCREASE

Table A1: Public debt and taxes in 2060 with one-percent VAT increases

	Base policy	VAT increased in all cases in 2015	VAT increased when gap > 3 %	VAT increased when debt/GDP forecast to exceed 90 % within 50 years	VAT increased when either gap > 3 % and/or debt/GDP forecast to exceed 90 % within 50 years
Normal debt and normal taxes	37,5	49,0	38,5	45,0	45,0
Normal debt and high taxes	5, 0	22,5	8,0	6,5	9,0
Normal debt, total	42,5	71,5	46,5	51,5	54,0
High debt and normal taxes	28,0	8,0	25,5	17,0	16,5
High debt and high taxes	29,5	20,5	28,0	31,5	29,5
High debt, total	57,5	28,5	53,5	48,5	46,0
Normal taxes, total	65,5	57,0	64,0	62,0	61,5
High taxes, total	34,5	43,0	36,0	38,0	38,5

APPENDIX 2: PREDICTIVE DISTRIBUTIONS OF SUSTAINABILITY GAPS AND FORECASTED DEBT/GDP RATIOS

Figure A1. Predictive distribution of sustainability gaps. Horizontal axis shows the year the gap is evaluated.
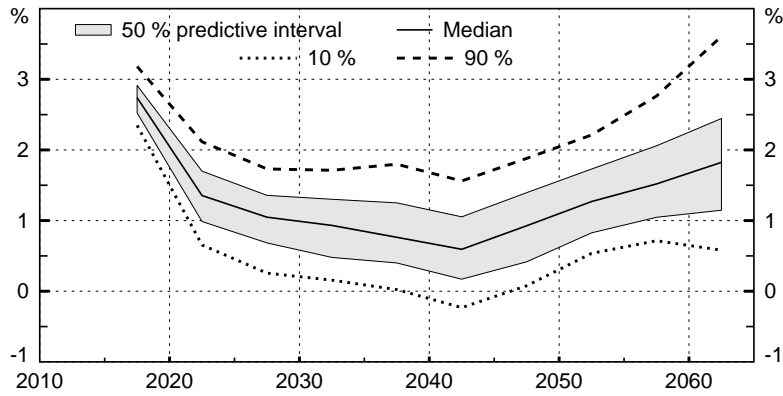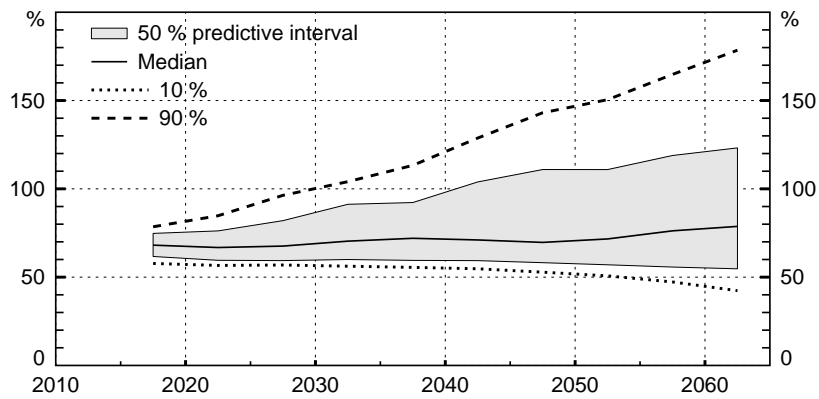

Figure A2. Predictive distribution of highest forecasted debt/GDP-ratio within 50 years. (Horizontal axis shows the year the forecast is made)

APPENDIX 3:   MODEL OUTCOMES WITH PERFECT FORESIGHT AND WITH REVISED
FORECASTS

Figure A1. Ratio of the 80% range of perfect foresight values to the 80% range of revised forecast
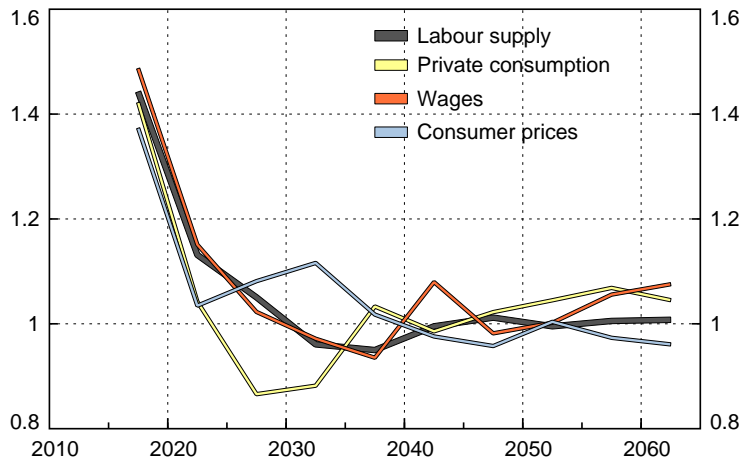values of selected variables. 2015 – 2060.

Table A2

Tax revenues/GDP

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	45.16	45.27	45.42	45.57	45.67
2020	45.77	45.88	46.05	46.21	46.36
2030	46.06	46.28	46.56	46.79	47.01
2040	45.96	46.29	46.75	47.17	47.71
2050	45.68	46.13	46.60	47.38	47.94
2060	45.74	46.33	46.93	47.61	48.48

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	44.40	44.53	44.67	44.83	44.95
2020	45.07	45.21	45.36	45.51	45.69
2030	45.35	45.57	45.82	46.09	46.30
2040	45.21	45.61	46.07	46.56	46.96
2050	44.93	45.39	45.88	46.67	47.33
2060	44.89	45.57	46.15	46.91	47.76

Public debt / GDP

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	55.87	56.30	56.88	57.70	58.44
2020	55.32	56.11	57.21	58.21	59.28
2030	54.03	56.34	58.45	60.18	62.21
2040	53.04	56.71	60.57	64.63	68.16
2050	48.50	54.93	62.65	70.32	77.17
2060	39.24	52.44	62.18	75.47	89.19

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	55.06	55.61	56.24	56.86	57.40
2020	53.94	54.64	55.38	56.12	56.74
2030	50.86	52.44	54.00	55.73	57.56
2040	46.37	49.44	52.92	57.19	62.26
2050	36.85	43.56	50.72	61.02	69.05
2060	20.86	32.17	46.17	62.95	78.05

Labour supply 2010=1

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	1.002	1.007	1.011	1.015	1.019
2020	0.995	1.006	1.017	1.024	1.031
2030	0.997	1.019	1.042	1.061	1.080
2040	1.004	1.035	1.068	1.103	1.123
2050	0.995	1.038	1.085	1.130	1.162
2060	0.963	1.027	1.095	1.151	1.211

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	1.000	1.008	1.015	1.019	1.024
2020	0.997	1.007	1.019	1.027	1.038
2030	1.003	1.025	1.045	1.064	1.083
2040	1.009	1.037	1.072	1.106	1.127
2050	0.999	1.042	1.090	1.135	1.165
2060	0.965	1.032	1.103	1.154	1.215

Wage rate: 2010=1;

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	0.985	0.989	0.994	0.999	1.004
2020	0.992	0.999	1.009	1.018	1.026
2030	0.992	1.008	1.022	1.039	1.059
2040	0.986	1.000	1.026	1.054	1.079
2050	0.971	0.992	1.025	1.070	1.101
2060	0.963	0.987	1.024	1.068	1.121

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	0.981	0.987	0.994	1.001	1.009
2020	0.990	1.000	1.009	1.019	1.029
2030	0.992	1.007	1.021	1.037	1.057
2040	0.984	1.001	1.027	1.053	1.085
2050	0.976	0.995	1.028	1.068	1.105
2060	0.961	0.988	1.023	1.070	1.131

Consumer prices: 2010=1

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	0.995	0.996	0.998	1.000	1.001
2020	0.993	0.995	0.996	0.998	1.000
2030	0.988	0.990	0.993	0.996	0.999
2040	0.981	0.985	0.990	0.996	1.002
2050	0.974	0.979	0.987	0.995	1.004
2060	0.970	0.977	0.985	0.996	1.011

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	0.992	0.994	0.997	0.999	1.000
2020	0.991	0.993	0.995	0.997	0.999
2030	0.986	0.989	0.991	0.995	0.998
2040	0.980	0.984	0.989	0.994	1.001
2050	0.973	0.978	0.986	0.994	1.003
2060	0.969	0.975	0.983	0.996	1.008

Private consumption/GDP: 2010=1

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	1.013	1.016	1.020	1.024	1.027
2020	1.026	1.029	1.033	1.037	1.042
2030	1.041	1.045	1.052	1.057	1.062
2040	1.046	1.053	1.064	1.072	1.079
2050	1.049	1.060	1.075	1.086	1.097
2060	1.044	1.068	1.092	1.107	1.116

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	1.003	1.010	1.016	1.023	1.028
2020	1.019	1.024	1.030	1.034	1.041
2030	1.037	1.042	1.047	1.051	1.056
2040	1.041	1.051	1.060	1.068	1.074
2050	1.042	1.054	1.073	1.084	1.094
2060	1.033	1.063	1.085	1.104	1.116

Private production/GDP: 2010=1

a) Periodically updated forecasts

	d_1	Q_1	Md	Q_3	d_9
2015	0.992	0.995	0.998	1.002	1.006
2020	0.983	0.988	0.992	0.998	1.002
2030	0.969	0.980	0.989	0.997	1.004
2040	0.957	0.973	0.990	1.006	1.015
2050	0.949	0.974	0.996	1.018	1.033
2060	0.927	0.970	0.999	1.021	1.041

b) Perfect foresight

	d_1	Q_1	Md	Q_3	d_9
2015	0.992	0.996	1.001	1.006	1.012
2020	0.984	0.990	0.996	1.002	1.007
2030	0.973	0.984	0.993	1.000	1.008
2040	0.959	0.979	0.993	1.007	1.018
2050	0.953	0.976	0.998	1.019	1.034
2060	0.933	0.973	1.003	1.028	1.045

Table A3. Predictive distributions of selected variables

	Tax revenues		Publ debt/GDP		Private production/GDP	
	E	σ	E	σ	E	σ
Periodically updated forecasts						
d_1	45.98	0.33	51.68	1.51	0.967	0.006
Q_1	46.20	0.43	55.40	2.99	0.981	0.009
Md	46.44	0.56	60.18	5.13	0.993	0.014
Q_3	46.83	0.80	65.01	7.88	1.005	0.022
d_9	47.19	1.08	68.53	11.99	1.013	0.029
Prefect foresight						
d_1	45.24	0.36	44.39	2.26	0.968	0.007
Q_1	45.48	0.43	48.56	3.49	0.983	0.009
Md	45.74	0.58	52.39	6.28	0.996	0.014
Q_3	46.15	0.84	58.12	9.60	1.008	0.020
d_9	46.50	1.03	63.07	13.56	1.018	0.027

	Labour supply		Wages		Consumer prices		Private consumption	
	E	σ	E	σ	E	σ	E	σ
Periodically updated forecasts								
d_1	1.000	0.015	0.985	0.011	0.984	0.003	1.044	0.013
Q_1	1.025	0.022	0.999	0.015	0.987	0.004	1.050	0.016
Md	1.056	0.037	1.019	0.022	0.991	0.007	1.058	0.023
Q_3	1.087	0.055	1.041	0.033	0.995	0.009	1.064	0.029
d_9	1.106	0.069	1.065	0.044	1.001	0.011	1.070	0.032
Prefect foresight								
d_1	1.004	0.015	0.986	0.010	0.983	0.002	1.038	0.010
Q_1	1.029	0.023	1.001	0.014	0.986	0.004	1.046	0.015
Md	1.060	0.038	1.021	0.021	0.990	0.006	1.055	0.023
Q_3	1.091	0.052	1.042	0.031	0.995	0.009	1.061	0.029
d_9	1.111	0.068	1.068	0.046	1.000	0.011	1.066	0.036

How to read Table A3: There are 200 simulated paths. Thus, for each budget item, there are 200 expected values (E) for the period 2015 – 2060. There are also 200 standard deviations (σ), each describing variation within one path during the period 2015 – 2060. The expected values are sorted into ascending order, and their distributions are described by deciles d1 and d9, quartiles Q1 and Q3 and the median Md. The standard deviations are sorted in a similar fashion. Sorting is carried out separately for each budget item, and expected values and standard deviations are sorted separately.