WEB APPENDIX: EXAMINING THE CROSS-NATIONAL AND LONGITUDINAL VARIATION IN ECONOMIC PERFORMANCE USING FUZZY-SETS

APPENDIX

REASONING BEHIND THE BREAKPOINTS FOR THE SETS ECONOMIC GROWTH, EMPLOYMENT AND DEBT

The first qualitative breakpoint 0 (fully out the set) of *economic growth* is set at ≤0%. Zero or negative economic growth is not conducive to a country's overall economic performance and, additionally, negatively affects the level of employment (directly) and the level of public debt (indirectly, as it is harder to curtail public debt when economic growth is negative). The second qualitative breakpoint 1 (fully in the set) is placed at ≥5%. Economic growth of 5 per cent or more implies an above average performance given the fact that for the countries under review here the annual economic growth averaged almost 3.2 percent between 1965 and 2005 (Armingeon et al 2011).

For *employment*, we place the first qualitative breakpoint 0 (fully out the set of employment) below 50%. The argument here is that having more than half of the population between 15 and 64 years of age out of a job signifies an unhealthy labour market that puts a strain on welfare state expenditure (the revenue base decreases and expenditures – like transfer payments to individuals – will increase). We set the second qualitative breakpoint 1 (fully in the set of employment) at 80% or higher. The reasoning behind this is that having 80 per cent or more of the population between 15 and 64 years of age in a job constitutes a real achievement given the number of people in that age group who are normally enrolled in education, the army or who are otherwise temporary or permanently unavailable for the labour market (sickness and health problems, imprisonment;) (Layard et al 1994).

Concerning gross *public debt*, we put the first qualitative breakpoint 0 (fully out of the set debt) at 38.4% of GDP. Econometric research demonstrates that a public debt ratio of 38.4 is optimal for fostering economic growth (Hsing and Smyth 1995). This finding implies that a debt level below 38.4% has a less positive effect on the level of economic growth. Nonetheless, we argue that less is (still) better, as a lower debt burden allows governments to use their revenues for something else than debt

management. We place the second quantitative breakpoint 1 (fully in the set of debt) at 100% of GDP. The argument is that if a country's debt ratio is 100 per cent or higher, it would mean that it cannot meet its liabilities (any more) in the near future.

References

Armingeon, Klaus, Sarah Engler, Panajotis Potolidis, Marlène Gerber, Philipp Leimgruber (2011). *Comparative Political Data Set I*. Berne: University of Berne.

Hsing, Yu, and David J. Smyth (1995). "In Search of an Optimal Debt Ratio for Economic Growth", *Contemporary Economic Policy*, 13:4, 51--9.

Layard, Richard, Stephan Nickell, and Richard Jackman (1994). *The Unemployment Crisis*. Oxford: Oxford University Press.

WEB APPENDIX A: FUZZY-SET SCORES OUTCOMES, 1975-2005

Table A1 Fuzzy-set membership scores 1975-1979

	Model A	Model B	Model C	Model D	Model E	Model F	Model G	Model H
Australia	**.54**	.46	.04	.46	.04	.04	.46	.04
Austria	**.54**	.39	.00	.46	.00	.00	.39	.00
Belgium	.26	.40	.26	.26	.37	.26	**.60**	.37
Canada	.49	**.51**	.11	.14	.11	.11	.14	.11
Denmark	**.50**	.15	.11	**.50**	.11	.11	.15	.11
Finland	.44	.33	.00	**.56**	.00	.00	.33	.00
France	**.50**	**.50**	.00	.46	.00	.00	.46	.00
Germany	**.52**	.48	.00	.44	.00	.00	.44	.00
Greece	.00	**1.00**	.00	.00	.00	.00	.00	.00
Ireland	.28	**.60**	.28	.28	.40	.28	.28	.28
Italy	.20	**.65**	.20	.20	.35	.20	.32	.32
Netherlands	.20	.48	.20	.20	.21	.20	**.52**	.21
New Zealand	.00	.00	.00	**.50**	.00	.01	**.50**	.01
Norway	**.75**	.25	.10	.04	.10	.04	.04	.04
Portugal	.46	**.54**	.00	.30	.00	.00	.30	.00
Spain	.21	.32	.00	.21	.00	.00	**.68**	.00
Sweden	.30	.07	.00	**.70**	.00	.00	.07	.00
UK	.42	.32	.39	**.58**	.32	.39	.32	.32
US	.47	**.53**	.13	.36	.13	.13	.36	.13

Note: A higher score indicates more correspondence to a particular model. The model in which the case is 'in' >.5) are indicated in **bold** face; cases that are neither in nor out of a set (i.e. .5) are indicated in *italics*.

Table A2 Fuzzy-set membership scores 1985-1989

	Model A	Model B	Model C	Model D	Model E	Model F	Model G	Model H
Australia	**.56**	.44	.20	.16	.20	.16	.16	.16
Austria	.43	**.54**	.28	.43	.28	.28	.46	.28
Belgium	.00	.00	.15	.00	**.60**	.15	.00	.40
Canada	.48	.34	**.52**	.24	.34	.24	.24	.24
Denmark	.38	.11	.38	.45	.11	**.55**	.11	.11
Finland	**.76**	.24	.00	.20	.00	.00	.20	.00
France	.33	**.60**	.00	.33	.00	.00	.40	.00
Germany	.44	**.52**	.05	.44	.05	.05	.48	.05
Greece	.16	.34	.16	.16	.27	.16	**.66**	.27
Ireland	.06	.23	.06	.06	**.74**	.06	.23	.26
Italy	.11	.15	.11	.11	**.62**	.11	.15	.38
Netherlands	.07	.26	.07	.07	**.58**	.07	.26	.42
New Zealand	.00	.00	.24	.00	.24	.41	.00	**.59**
Norway	.46	.11	.00	**.54**	.00	.00	.11	.00
Portugal	**.52**	.48	.33	.00	.33	.00	.00	.00
Spain	.00	**.84**	.00	.00	.16	.00	.16	.16
Sweden	**.54**	.00	.39	.46	.00	.39	.00	.00
UK	**.61**	.39	.12	.22	.12	.12	.22	.12
US	**.60**	.34	.40	.26	.34	.26	.26	.26

Note: See Table A1.

Table A3 Fuzzy-set membership scores 1995-1999

	Model A	Model B	Model C	Model D	Model E	Model F	Model G	Model H
Australia	**.62**	.38	.06	.14	.06	.06	.14	.06
Austria	.46	.46	.46	.47	.46	.47	**.51**	.49
Belgium	.00	.00	.20	.00	*.50*	.20	.00	*.50*
Canada	.06	.06	**.64**	.06	.36	.30	.06	.30
Denmark	.49	.19	**.51**	.48	.19	.48	.19	.19
Finland	.46	**.54**	.39	.06	.39	.06	.06	.06
France	.31	.46	.31	.31	.46	.31	**.54**	.46
Germany	.30	.30	.30	**.51**	.30	.34	.49	.34
Greece	.00	.00	.16	.00	**.60**	.16	.00	.40
Ireland	.30	**.59**	.30	.00	.41	.00	.00	.00
Italy	.00	.00	.09	.00	.38	.09	.00	**.62**
Netherlands	.31	.31	.41	.31	**.59**	.32	.31	.32
New Zealand	*.50*	*.50*	.41	.44	.41	.41	.44	.41
Norway	**.68**	.11	.00	.32	.00	.00	.11	.00
Portugal	**.56**	.40	.44	.20	.40	.20	.20	.20
Spain	.00	.45	.00	.00	**.55**	.00	.30	.30
Sweden	.31	.31	**.60**	.31	.33	.40	.31	.33
UK	**.56**	.34	.22	.44	.22	.22	.34	.22
US	.49	.21	**.51**	.24	.21	.24	.21	.21

Note: See Table A1.

Table A4 Fuzzy-set membership scores 2001-2005

	Model A	Model B	Model C	Model D	Model E	Model F	Model G	Model H
Australia	**.67**	.33	.00	.32	.00	.00	.32	.00
Austria	.33	.33	.33	.49	.33	**.51**	.39	.39
Belgium	.00	.00	.30	.00	.30	.33	.00	**.67**
Canada	.38	.27	**.51**	.38	.27	.49	.27	.27
Denmark	.34	.14	.20	**.66**	.14	.20	.14	.14
Finland	.49	.41	.20	**.51**	.20	.20	.41	.20
France	.30	.30	.30	.41	.30	.41	.48	**.52**
Germany	.15	.15	.15	**.51**	.15	.43	.49	.43
Greece	.00	.00	.29	.00	**.71**	.14	.00	.14
Ireland	**.52**	.48	.00	.00	.00	.00	.00	.00
Italy	.00	.00	.16	.00	.16	.21	.00	**.79**
Netherlands	.18	.18	.18	**.63**	.18	.37	.28	.28
New Zealand	**.74**	.23	.00	.26	.00	.00	.23	.00
Norway	.42	.13	.11	**.58**	.11	.11	.13	.11
Portugal	.10	.10	.10	**.54**	.10	.46	.40	.40
Spain	.37	**.63**	.29	.37	.29	.29	.37	.29
Sweden	.46	.19	.36	**.54**	.19	.36	.19	.19
UK	.47	.25	.07	**.53**	.07	.07	.25	.07
US	*.50*	.27	.38	*.50*	.27	.04	.27	.27

Note: See Table A1.

WEB APPENDIX B: FUZZY-SET SCORES CONDITIONS, 1975-2005

Table B1 Fuzzy-set membership scores, High Central Bank Independence

	1975-1979	1985-1989	1995-1999	2001-2005
Australia	**.75**	**.75**	**.75**	**.75**
Austria	.25	.00	.05	.25
Belgium	**1.00**	**1.00**	.25	.25
Canada	**.51**	**.51**	.25	.25
Denmark	**.51**	**.51**	**.51**	**.51**
Finland	**1.00**	**1.00**	**.65**	.25
France	**1.00**	**1.00**	.25	.25
Germany	.00	.00	.00	.05
Greece	**.51**	**.51**	.20	.25
Ireland	**.75**	**.75**	**.65**	.25
Italy	**1.00**	**1.00**	.25	.25
Netherlands	.25	.25	.25	.25
New Zealand	**1.00**	**1.00**	.25	.25
Norway	**1.00**	**1.00**	**1.00**	**1.00**
Portugal	**1.00**	**1.00**	.40	.25
Spain	**.75**	**.75**	.25	.25
Sweden	**1.00**	**1.00**	.25	.25
UK	**1.00**	**1.00**	.45	.25
US	.25	.25	.25	.25

Note: See Table A1.

Table B2 Fuzzy-set membership scores, Leftist government

	1975-1979	1985-1989	1995-1999	2001-2005
Australia	.17	**1.00**	.24	.00
Austria	**.88**	**.61**	.48	.00
Belgium	.20	.15	**.54**	**.54**
Canada	.00	.00	.00	.00
Denmark	**.90**	.00	**.78**	.14
Finland	.40	.46	**.52**	.47
France	.07	**.51**	**.51**	.29
Germany	**.75**	.00	.24	**.99**
Greece	.00	**.87**	**1.00**	**.66**
Ireland	.16	.10	.23	.00
Italy	.03	.31	.36	.05
Netherlands	.33	.01	.37	.12
New Zealand	.19	**1.00**	.01	**1.00**
Norway	**1.00**	**.69**	**.56**	.19
Portugal	.34	.05	**.67**	.23
Spain	.00	**1.00**	.27	.34
Sweden	.35	**1.00**	**1.00**	**1.00**
UK	**.87**	.00	**.53**	**1.00**
US	.00	.00	.00	.00

Note: See Table A1.

Table B3 Fuzzy-set membership scores, High Openness

	1975-1979	1985-1989	1995-1999	2001-2005
Australia	.29	.33	.40	.40
Austria	**.77**	**.95**	**.77**	**.95**
Belgium	**1.00**	**1.00**	**1.00**	**1.00**
Canada	.49	**.54**	**.78**	**.76**
Denmark	**.62**	**.69**	**.73**	**.88**
Finland	**.53**	**.51**	**.67**	**.71**
France	.39	.43	.48	**.53**
Germany	.39	.48	**.53**	**.70**
Greece	.40	.47	.48	**.51**
Ireland	**.96**	**1.00**	**1.00**	**1.00**
Italy	.45	.40	.49	**.53**
Netherlands	**.97**	**1.00**	**1.00**	**1.00**
New Zealand	**.55**	**.53**	**.58**	**.61**
Norway	**.77**	**.72**	**.72**	**.71**
Portugal	.47	**.68**	**.68**	**.68**
Spain	.29	.37	**.51**	**.57**
Sweden	**.57**	**.64**	**.75**	**.84**
UK	**.55**	**.52**	**.57**	**.55**
US	.17	.19	.24	.24

Note: See Table A1.

Table B4 Fuzzy-set membership scores, High Corporatism

	1975-1979	1985-1989	1995-1999	2001-2005
Australia	**.51**	**.60**	.25	.25
Austria	**1.00**	**.60**	**.75**	**.75**
Belgium	**.65**	**.68**	**.95**	**.75**
Canada	**.81**	.00	.00	.00
Denmark	**1.00**	**.56**	**.70**	**.51**
Finland	**.75**	**.52**	**.75**	**.51**
France	.25	.20	.25	.25
Germany	**.75**	**.60**	**.75**	**.75**
Greece	.25	.20	.25	.25
Ireland	**.75**	.36	**1.00**	**1.00**
Italy	.45	.20	**.75**	**.75**
Netherlands	**.75**	**.60**	**.75**	**.75**
New Zealand	.50	.24	.00	.00
Norway	**1.00**	**.76**	**.90**	**.75**
Portugal	.25	.20	**.65**	.35
Spain	.25	.20	.45	.40
Sweden	**1.00**	**.56**	**.51**	**.51**
UK	.00	.00	.00	.00
US	.00	.00	.00	.00

Note: See Table A1.

WEB APPENDIX C: TRUTH TABLES MODEL A (G*E*~D), 1975-2005

Table C1 Truth table model A, 1975-1979

Conditions						
CBI	LEFT	OPEN	CORP	Outcome	N	Consistency
1	0	0	0	0	5	.58
1	0	1	1	0	5	.59
1	0	0	1	0	2	.71
1	1	1	1	1	2	.91
0	0	0	0	0	1	.64
0	0	1	1	0	1	.71
0	1	1	1	1	1	.85
0	1	0	1	1	1	.94
1	1	1	0	-	1	.83
1	1	0	0	-	0	
0	0	1	0	-	0	
0	0	0	1	-	0	
1	0	1	0	-	0	
1	1	0	1	-	0	
0	1	1	0	-	0	
0	1	0	0	-	0	

Notes: **CBI** is the set central bank independence; **LEFT** is the set leftist partisanship; **CORP** is the set corporatism; **OPEN** is the set openness of the economy; **Outcome** is the outcome for model A (excellent economic performance); **Number** is the number of countries with membership in the respective configuration higher than 0.5; **Consistency** measures the degree to which a combination of conditions is sufficient for the outcome. The cut off point for presence of the outcome is .83, based on the drop in consistency after .83.

Table C2 Truth table model A, 1985-1989

Conditions						
CBI	LEFT	OPEN	CORP	Outcome	N	Consistency
1	0	1	0	0	4	.71
1	0	1	1	0	3	.64
1	1	0	0	0	3	.54
1	1	1	1	0	2	.70
0	0	0	0	1	1	.93
0	0	0	1	1	1	.91
0	0	1	1	1	1	.86
0	1	1	1	0	1	.67
1	0	0	0	1	1	.83
1	1	0	1	0	1	.78
1	1	1	0	0	1	.56
0	0	1	0	-	0	
0	1	0	0	-	0	
0	1	0	1	-	0	
0	1	1	0	-	0	
1	0	0	1	-	0	

Notes: See Table C1. The cut off point for presence of the outcome is .83, based on the drop in consistency after .83.

Table C3 Truth table model A, 1995-1999

Conditions					
CBI	LEFT	CORP	Outcome	N	Consistency
1	0	0	1	1	.78
1	1	1	1	3	.76
1	0	1	0	1	.69
0	1	1	0	3	.66
0	1	0	0	3	.64
0	0	0	0	4	.62
0	0	1	0	4	.53
1	1	0	-	0	

Notes: See Table C1. The cut off point for presence of the outcome is .76, based on the drop in consistency after .76. Openness in not included in the sufficiency analysis because it is a necessary condition.

Table C4 Truth table model A, 2001-2005

Conditions						
CBI	LEFT	OPEN	CORP	Outcome	N	Consistency
0	0	1	1	0	5	.49
0	0	1	0	0	4	.55
0	1	1	0	0	3	.73
0	1	1	1	0	3	.56
1	0	1	1	0	2	.64
0	0	0	0	0	1	.63
1	0	0	0	1	1	.78
0	0	0	1	-	0	
0	1	0	0	-	0	
0	1	0	1	-	0	
1	0	0	1	-	0	
1	0	1	0	-	0	
1	1	0	0	-	0	
1	1	0	1	-	0	
1	1	1	0	-	0	
1	1	1	1	-	0	

Notes: See Table C1. The cut off point for presence of the outcome is .78, based on the drop in consistency after .78.