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Article

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Appendix: Time Series Properties of the Real Exchange Rates between the
Member States of the European Monetary Union

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Appendix Table 1 – Panel Unit Root Tests of the first Differences of Consumer Price Indices

Test Specification				Results												
				1960:1 - 1972:12			1973:1 - 1998:12			1999:1 - 2017:5						
Test	H0	H1	Autoregression Parameter β	Lags / Selection	Periods	P-value	Accepted hypothesis	Periods	P-value	Accepted hypothesis	Periods	P-value	Accepted hypothesis			
Breitung	All Panels contain unit roots	All Panels are stationary	Uniform ρ	12	12	155	0.000	H1	12	311	0.000	H1	12	222	0.000	H1
Herwartz	Panels contain unit roots	Panels are stationary	Panel-specific ρ	AIC	12	155	0.004	H1	12	311	0.090	H0	12	222	0.028	H1
Hadri	All panels are stationary	Some panels contain unit roots	-	12	12	155	0.022	H1	12	311	0.000	H1	12	222	0.000	H1

Legend Appendix Table 1: The significance level for the rejection of the H0 is 5%. All Panels as strongly balanced. Panel-specific linear trends are added. In all tests a correction for cross-sectional dependence of the panels is applied. A Bartlett Kernel with 12 lag is used to estimate the long-run variance in the Hadri tests.

Appendix Table 2 – Unit Root Tests of the Levels of Consumer Price Indices

Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Austria	Number observations	145	156	157	155	312	312	312	308	220	220	220	217
	Lags	11	11	9	1	9	9	12	4	12	12	10	3
	Test statistic: z(t)	0.84	-2.10	0.18	-5.92	-2.50	-2.22	0.5471	-3.88	-3.99	-3.00	0.1173	-4.79
	Structural break at obs.	-	-	-	133	-	-	-	417	-	-	-	614
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	Yes	No	No	No
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H1	H0	H0	H0
Belgium	Number observations	144	156	157	153	312	312	312	308	220	220	220	218
	Lags	12	12	9	3	11	11	12	4	3	3	10	2
	Test statistic: z(t)	-0.54	-1.60	0.28	-3.29	-1.92	-2.06	0.58	-4.70	-2.12	-1.86	0.23	-4.31
	Structural break at obs.	-	-	-	133	-	-	-	259	-	-	-	612
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Finland	Number observations	151	156	157	153	312	312	312	312	220	220	220	217
	Lags	5	5	9	3	1	1	12	0	7	7	10	3
	Test statistic: z(t)	-3.22	-2.45	0.10	-3.67	-2.57	-2.66	0.59	-3.17	-2.17	-1.62	0.14	-2.83
	Structural break at obs.	-	-	-	49	-	-	-	378	-	-	-	608
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	Yes	No	No	No
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0	H0	H0
France	Number observations	152	156	157	153	312	312	312	309	220	220	220	220
	Lags	4	4	9	0	8	8	12	4	8	8	10	0
	Test statistic: z(t)	-0.40	-0.19	0.31	-4.31	-1.10	-0.30	0.62	-5.75	0.14	-0.68	0.42	-4.49
	Structural break at obs.	-	-	-	67	-	-	-	241	-	-	-	626
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1	H0	H0	H1	H0
Germany	Number observations	150	156	157	155	312	312	312	309	220	220	220	219
	Lags	6	6	9	1	12	12	12	3	12	12	10	1
	Test statistic: z(t)	1.09	0.15	0.18	-3.67	-2.13	-2.06	0.41	-2.62	-2.45	-2.22	0.26	-3.94
	Structural break at obs.	-	-	-	114	-	-	-	239	-	-	-	626
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality effect	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Greece	Number observations	145	156	157	156	312	312	312	308	220	220	220	217
	Lags	11	11	9	0	12	12	12	4	11	11	10	3
	Test statistic: z(t)	-1.19	-3.22	0.157	-4.49	-0.09	1.95	0.453	-1.73	1.26	-0.38	0.437	-8.07
	Structural break at obs.	-	-	-	-	-	-	-	369	-	-	-	627
	5% significance level	-3.44	-3.44	0.146	-5.08	-3.43	-3.43	0.146	-5.08	-3.43	-3.43	0.146	-5.08
	10% significance level	-3.14	-3.14	0.119	-4.82	-3.13	-3.13	0.119	-4.82	-3.13	-3.13	0.119	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H1

Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland	Number observations	145	156	157	153	312	312	312	308	220	220	220	219
	Lags	11	11	9	3	10	10	12	4	8	8	10	1
	Test statistic: z(t)	0.40	0.88	0.36	-3.37	-1.51	-1.39	0.61	-5.68	-1.62	-1.64	0.47	-4.70
	Structural break at obs.	-	-	-	89	-	-	-	252	-	-	-	586
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-	0.12	-4.82	-3.13	-	0.12	-4.82	-3.13	-	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	Yes
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1	H0	H0	H1	H0
Italy	Number observations	153	156	157	154	312	312	312	309	220	220	220	218
	Lags	3	3	9	2	7	7	12	3	3	3	10	2
	Test statistic: z(t)	-1.11	-0.83	0.23	-1.88	-0.77	-0.39	0.62	-5.13	-0.34	0.13	0.38	-4.16
	Structural break at obs.	-	-	-	94	-	-	-	237	-	-	-	622
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	Yes	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1	H0	H0	H1	H0
Luxembourg	Number observations	155	156	157	156	312	312	312	309	220	220	220	217
	Lags	1	1	9	0	10	10	12	3	11	11	10	3
	Test statistic: z(t)	-1.03	-1.26	0.29	-3.63	-1.04	-1.02	0.57	-3.38	-0.06	-2.98	0.33	-5.13
	Structural break at obs.	-	-	-	114	-	-	-	269	-	-	-	626
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H1
Netherlands	Number observations	146	156	157	155	312	312	312	308	220	220	220	217
	Lags	10	10	9	1	10	10	12	4	10	10	10	3
	Test statistic: z(t)	-0.48	-2.44	0.337	-4.51	-2.93	-4.10	0.510	-5.10	-1.17	-2.04	0.238	-3.12
	Structural break at obs.	-	-	-	119	-	-	-	422	-	-	-	623
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	Yes	Yes	No	Yes	Yes	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H1	H0	H0	H1	H0
Portugal	Number observations	145	156	157	153	312	312	312	308	220	220	220	218
	Lags	11	11	9	3	10	10	12	4	12	12	10	2
	Test statistic: z(t)	0.35	-0.19	0.406	-3.26	1.05	1.37	0.605	-2.76	-2.16	-1.34	0.451	-2.89
	Structural break at obs.	-	-	-	88	-	-	-	276	-	-	-	555
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain	Number observations	153	156	157	155	312	312	312	312	220	220	220	217
	Lags	3	3	9	1	9	9	12	0	12	12	10	3
	Test statistic: z(t)	-2.04	-2.14	0.181	-4.03	-1.06	-0.68	0.610	-4.60	-1.11	-0.49	0.466	-2.22
	Structural break at obs.	-	-	-	54	-	-	-	205	-	-	-	567
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0

Legend Appendix Table 2: The significance level for the rejection of the H0 is 5%. The table displays the results for seasonally unadjusted monthly consumer price indices. If seasonally adjusted data lead to a different

accepted hypothesis, this is indicated with a "Yes" under "Seasonality". Seasonal adjustment is based on the Holt-Winters seasonal smoothing method. ADF: Augmented Dickey-Fuller Test (H_0 = unit root possibly with drift, H_1 = stationary around linear trend), lags chosen according to Akaike's information criterion (AIC). PP: Phillips-Perron test (H_0 = unit root possibly with drift, H_1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike's information criterion (AIC). Critical values for the PP are the same as for the ADF. KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H_0 = stationary around linear trend, H_1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H_0 = unit root, H_1 stationarity with a break in the intercept or trend).

Appendix Table 3 – Unit Root Tests of the First Differences of Consumer Price Indices

Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Austria	Number observations	143	155	156	152	312	312	312	308	220	220	220	217
	Lags	12	12	14	3	12	12	23	4	12	12	8	3
	Test statistic: z(t)	-3.73	-12.05	0.11	-9.22	-2.57	-14.79	0.10	-8.97	-3.28	-15.47	0.043	-10.99
	Structural break at obs	-	-	-	31	-	-	-	238	-	-	-	612
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	HO	H1	H0	H1	HO	H1	H0	H1
Belgium	Number observations	144	155	156	153	312	312	312	308	220	220	220	220
	Lags	11	11	17	2	12	12	10	4	2	2	9	0
	Test statistic: z(t)	-2.13	-9.08	0.12	-10.33	-2.93	-14.60	0.12	-6.26	-7.39	-12.15	0.05	-12.44
	Structural break at obs	-	-	-	79	-	-	-	234	-	-	-	584
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	HO	H1	H0	H1	HO	H1	H0	H1	H1	H1	H0	H1
Finland	Number observations	151	155	156	152	312	312	312	312	220	220	220	218
	Lags	4	4	11	3	12	12	10	0	12	12	24	2
	Test statistic: z(t)	-3.79	-12.21	0.07	-5.08	-3.38	-16.84	0.13	-17.00	-2.64	-13.31	0.08	-10.51
	Structural break at obs	-	-	-	55	-	-	-	237	-	-	-	554
	5% significance level	-3.44	-2.89	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-2.58	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	Yes	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	HO	HO	H1	H0	H1	HO	H1	H0	H1
France	Number observations	152	155	156	153	312	312	312	308	220	220	220	220
	Lags	3	3	10	2	12	12	12	3	12	12	9	3
	Test statistic: z(t)	-5.03	-11.03	0.12	-6.53	-3.59	-12.46	0.16	-6.57	-3.60	-17.03	0.06	-16.18
	Structural break at obs	-	-	-	46	-	-	-	281	-	-	-	583
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	Yes	No	No	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H1	H1	H1	H1	H0	H1
Germany	Number observations	143	155	156	152	312	312	312	310	220	220	220	220
	Lags	12	12	8	3	12	12	10	2	12	12	6	0
	Test statistic: z(t)	-1.16	-8.87	0.18	-7.56	-2.14	-13.36	0.16	-8.73	-3.14	-21.77	0.06	-20.83
	Structural break at obs	-	-	-	90	-	-	-	347	-	-	-	584
	5% significance level	-3.44	-2.89	0.15	-5.08	-3.43	-2.88	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-2.58	0.12	-4.82	-3.13	-2.57	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality effect	No	No	No	No	No	No	Yes	No	No	No	No	No
	Accepted Hypothesis	HO	H1	H1	H1	HO	H1	H1	H1	HO	H1	H0	H1

Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland	Number observations	145	155	156	152	312	312	312	308	220	220	220	220
	Lags	10	10	6	3	12	12	33	4	12	12	9	0
	Test statistic: z(t)	-3.03	-4.97	0.12	-5.60	-2.86	-22.96	0.09	-8.78	-3.29	-12.74	0.06	-13.18
	Structural break at obs	-	-	-	65	-	-	-	270	-	-	-	585
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-	0.12	-4.82	-3.13	-	0.12	-4.82	-3.13	-	0.12	-4.82
	Seasonality	Yes	No	No	No	Yes	No	No	No	No	No	No	No
	Accepted Hypothesis	H0	H1	H0	H1	H0	H1	H0	H1	H0	H1	H0	H1
Italy	Number observations	153	155	156	154	312	312	312	310	220	220	220	219
	Lags	2	2	8	1	12	12	10	2	12	12	10	1
	Test statistic: z(t)	-4.98	-7.30	0.18	-6.58	-4.09	-11.46	0.13	-8.40	-3.20	-13.67	0.09	-7.87
	Structural break at obs	-	-	-	60	-	-	-	279	-	-	-	645
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	Yes	No	No	No	No	No	No	Yes	No	Yes	No	No
	Accepted Hypothesis	H1	H1	H1	H1	H1	H1	H0	H1	H0	H1	H0	H1
Luxembourg	Number observations	155	155	156	155	312	312	312	310	220	220	220	217
	Lags	0	0	7	0	12	12	12	2	12	12	8	3
	Test statistic: z(t)	-13.25	-13.25	0.08	-13.76	-2.62	-14.55	0.08	-6.41	-4.80	-28.91	0.04	-10.65
	Structural break at obs	-	-	-	74	-	-	-	305	-	-	-	643
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	Yes	No	No	No	Yes	No	No	No	Yes	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	H0	H1	H0	H1	H1	H1	H0	H1
Netherlands	Number observations	143	155	156	155	312	312	312	308	220	220	220	218
	Lags	12	12	7	0	12	12	29	4	12	12	16	2
	Test statistic: z(t)	-3.66	-16.87	0.061	-15.03	-1.56	-13.29	0.191	-8.91	-2.67	-12.07	0.055	-16.02
	Structural break at obs	-	-	-	50	-	-	-	347	-	-	-	506
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	Yes	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	H0	H1	H1	H0	H0	H1	H0	H1
Portugal	Number observations	143	155	156	153	312	312	312	308	220	220	220	217
	Lags	12	12	12	2	12	12	19	4	12	12	14	3
	Test statistic: z(t)	-3.79	-14.84	0.053	-9.19	-4.38	-16.14	0.127	-10.95	-2.65	-12.76	0.038	-13.41
	Structural break at obs	-	-	-	132	-	-	-	304	-	-	-	603
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	No	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H0	H1
Spain	Number observations	153	155	156	155	312	312	312	312	220	220	220	217
	Lags	2	2	6	0	12	12	36	0	12	12	15	3
	Test statistic: z(t)	-6.27	-9.34	0.140	-10.27	-3.95	-16.30	0.093	-17.49	-3.85	-11.99	0.053	-9.80
	Structural break at obs	-	-	-	64	-	-	-	213	-	-	-	637
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Seasonality	No	No	No	No	No	No	Yes	No	No	No	No	No
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Legend Appendix Table 3: The significance level for the rejection of the H0 is 5%. The table displays the results for seasonally unadjusted consumer price indices. If seasonally adjusted data lead to the opposite H0-decision, this is indicated with a "Yes" under "Seasonality". Seasonal adjustment is based on the Holt-Winters seasonal smoothing method. ADF: Augmented Dickey-Fuller Test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags chosen according to Akaike's information criterion (AIC). PP: Phillips-Perron test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike's information criterion (AIC). KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H0 = stationary around linear trend, H1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H0 = unit root, H1 stationarity with a break in the intercept or trend).

Appendix Table 4 – Panel Unit Root Tests of Nominal Exchange Rates Levels

Panel Unit Root Tests: Nominal Exchange Rate												
Test Specification					Results							
					1960:1 - 1972:12			1973:1 - 1998:12				
Test	H0	H1	Autoregression Parameter ρ	Lags / Selection	Panel	Periods	P-value	Accepted Hypothesis	Panel	Periods	P-value	Accepted Hypothesis
Breitung	Panels contain unit roots	Panels are stationary	Uniform ρ	12	65	156	1.000	H0	65	311	1.000	H0
Herwartz	Panels contain unit roots	Panels are stationary	Panel-specific ρ	AIC	65	156	0.155	H0	65	311	0.985	H0
Hadri	All panels are stationary	Some panels contain unit roots	-	12	65	156	0.000	H1	65	311	0.000	H1

Legend Appendix Table 4: The significance level for the rejection of the H0 is 5%. All Panels as strongly balanced. Panel-specific linear trends are allowed. In all tests a correction for cross-sectional dependence of the panels is applied. A Bartlett Kernel with 12 lag is used to estimate the long-run variance in the Hadri tests. The number of panels is 11 factorial minus 1 = 65 since Luxemburg and Belgium formed a monetary union from 1922 to 2002 (Union Économique Belgo-Luxembourgoise).

Appendix Table 5 – Panel Unit Root Tests of the First Differences of Nominal Exchange Rates

Panel Unit Root Tests: First Differences of Nominal Exchange Rate												
Test Specification					Results							
					1960:1 - 1972:12			1973:1 - 1998:12				
Test	H0	H1	Autoregression Parameter ρ	Lags / Selection	Panel	Periods	P-value	Accepted Hypothesis	Panel	Periods	P-value	Accepted Hypothesis
Breitung	All Panels contain unit roots	All Panels are stationary	Uniform ρ	12	65	155	0.000	H1	65	311	0.000	H1
Herwartz	Panels contain unit roots	Panels are stationary	Panel-specific ρ	AIC	65	155	0.020	H1	65	311	0.001	H1
Hadri	All panels are stationary	Some panels contain unit roots	-	12	65	155	0.448	H0	65	311	0.000	H1

Legend Appendix Table 5: The significance level for the rejection of the H0 is 5%. All Panels as strongly balanced. Estimations without linear trends. In all tests a correction for cross-sectional dependence of the panels is applied. A Bartlett Kernel with 12 lag is used to estimate the long-run variance in the Hadri tests. The number of panels is 11 factorial minus 1 = 65 since Luxemburg and Belgium formed a monetary union from 1922 to 2002 (Union Économique Belgo-Luxembourgoise).

Appendix Table 6 – Unit Root Tests of the Nominal Exchange Rate Levels

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Belgium / Austria	Number observations	143	156	157	155	312	312	312	308
	Lags	13	13	9	1	6	6	12	4
	Test statistic: z(t)	-3.63	-3.25	0.21	-6.04	-1.70	-1.79	0.33	-6.73
	Structural break at obs.	-	-	-	43	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H0	H1	H1	H0	H0	H1	H1
Finland / Austria	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	12	12	12	0
	Test statistic: z(t)	-1.80	-2.01	0.32	-9.10	-2.66	-2.10	0.32	-4.26
	Structural break at obs.	-	-	-	94	-	-	-	383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
France / Austria	Number observations	153	156	157	155	312	312	312	312
	Lags	3	3	9		2	2	12	
	Test statistic: z(t)	-2.79	-2.85	0.29	-6.69	-3.71	-3.67	0.05	-4.40
	Structural break at obs.	-			116				219
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H1	H0
Germany / Austria	Number observations	153	156	157	153	312	312	312	308
	Lags	3	3	9	3	11	11	12	4
	Test statistic: z(t)	-1.93	-2.25	0.28	-5.40	-1.50	-1.62	0.50	-3.75
	Structural break at obs.	-	-	-	117	-	-	-	289
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Greece / Austria	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	6	6	12	4
	Test statistic: z(t)	-1.94	-2.07	0.19	-4.26	-2.41	-3.00	0.27	-4.55
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Ireland / Austria	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	12	12	12	4
	Test statistic: z(t)	-2.41	-2.57	0.10	-4.85	-2.46	-2.22	0.36	-3.97
	Structural break at obs.	-	-	-	95	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Italy / Austria	Number observations	153	156	157	155	312	312	312	308
	Lags	3	3	9	1	2	2	12	4
	Test statistic: z(t)	-1.70	-1.90	0.32	-4.77	-2.86	-2.88	0.25	-5.02
	Structural break at obs.	-	-	-	31	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Austria	Number observations	144	156	157	155	312	312	312	309
	Lags	12	12	9	1	5	5	12	3
	Test statistic: z(t)	-3.99	-3.11	0.23	-6.11	-1.93	-2.04	0.42	-6.68
	Structural break at obs.	-	-	-	26	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H0	H1	H1	H0	H0	H1	H1
Netherlands / Austria	Number observations	143	156	157	154	312	312	312	309
	Lags	13	13	8	2	12	12	12	3
	Test statistic: z(t)	-1.26	-4.22	0.33	-7.31	0.32	-1.85	0.37	-3.84
	Structural break at obs.	-	-	-	106	-	-	-	289
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H1	H1	H0	H0	H1	H0
Portugal / Austria	Number observations	145	156	157	153	312	312	312	310
	Lags	11	11	9	3	2	2	12	2
	Test statistic: z(t)	-2.58	-1.94	0.40	-5.50	-2.04	-2.23	0.40	-3.40
	Structural break at obs.	-	-	-	65	-	-	-	345
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Spain / Austria	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	2	2	12	0
	Test statistic: z(t)	-1.71	-1.71	0.29	-5.91	-2.58	-2.61	0.17	-3.78
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Finland / Belgium	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	12	12	12	0
	Test statistic: z(t)	-1.87	-2.02	0.34	-9.89	-1.99	-1.66	0.39	-3.32
	Structural break at obs.	-	-	-	94	-	-	-	383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
France / Belgium	Number observations	153	156	157	155	312	312	312	308
	Lags	3	3	9		11	11	12	
	Test statistic: z(t)	-2.38	-2.39	0.30	-5.24	-2.47	-2.47	0.24	-4.38
	Structural break at obs.	-			116				231
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Germany / Belgium	Number observations	153	156	157	155	312	312	312	308
	Lags	3	3	9	1	13	13	12	4
	Test statistic: z(t)	-1.92	-1.97	0.21	-4.01	-2.64	-2.48	0.12	-4.65
	Structural break at obs.	-	-	-	117	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0
Greece / Belgium	Number observations	146	156	157	156	312	312	312	308
	Lags	10	10	9	0	6	6	12	4
	Test statistic: z(t)	-0.89	-1.77	0.24	-4.28	-2.61	-3.03	0.11	-3.53
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0
Ireland / Belgium	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	11	11	12	4
	Test statistic: z(t)	-2.19	-2.31	0.15	-4.65	-1.70	-1.52	0.39	-3.91
	Structural break at obs.	-	-	-	95	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Italy / Belgium	Number observations	150	156	157	154	312	312	312	308
	Lags	6	6	9	2	6	6	12	4
	Test statistic: z(t)	-1.43	-1.32	0.36	-4.16	-2.04	-2.13	0.32	-3.79
	Structural break at obs.	-	-	-	31	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Belgium	Number observations	154	156	157	156	312	312	312	310
	Lags	2	2	9	0	4	4	12	2
	Test statistic: z(t)	-3.60	-4.01	0.16	-4.98	-3.10	-3.22	0.20	-3.47
	Structural break at obs.	-	-	-	74	-	-	-	313
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H1	H0	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Belgium	Number observations	148	156	157	154	312	312	312	308
	Lags	8	8	9	2	2	2	12	4
	Test statistic: z(t)	-2.75	-3.74	0.14	-5.12	-2.32	-2.39	0.22	-5.23
	Structural break at obs.	-	-	-	50	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H0	H1	H0	H0	H1	H1
Portugal / Belgium	Number observations	145	156	157	153	312	312	312	308
	Lags	11	11	9	3	2	2	12	4
	Test statistic: z(t)	-1.18	-1.52	0.39	-4.30	-2.28	-2.43	0.26	-3.73
	Structural break at obs.	-	-	-	75	-	-	-	242
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Belgium	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	2	2	12	0
	Test statistic: z(t)	-1.48	-1.45	0.33	-7.35	-2.23	-2.24	0.31	-4.16
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
France / Finland	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9		2	2	12	
	Test statistic: z(t)	-2.28	-2.43	0.20	-7.45	-2.15	-2.04	0.34	-4.12
	Structural break at obs.	-			94				383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Germany / Finland	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	12	12	12	0
	Test statistic: z(t)	-1.42	-1.60	0.37	-7.19	-2.41	-1.86	0.39	-3.95
	Structural break at obs.	-	-	-	94	-	-	-	383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Greece / Finland	Number observations	154	156	157	156	312	312	312	309
	Lags	2	2	9	0	5	5	12	3
	Test statistic: z(t)	-1.95	-2.26	0.27	-10.8	-1.48	-1.75	0.45	-4.32
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland / Finland	Number observations	152	156	157	154	312	312	312	309
	Lags	4	4	9	2	12	12	12	3
	Test statistic: z(t)	-1.68	-2.47	0.39	-4.96	-3.62	-3.21	0.10	-3.87
	Structural break at obs.	-	-	-	94	-	-	-	320
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H1	H0	H0	H0
Italy / Finland	Number observations	154	156	157	156	312	312	312	309
	Lags	2	2	9	0	5	5	12	3
	Test statistic: z(t)	-2.39	-2.68	0.25	-11.8	-4.12	-3.97	0.13	-4.14
	Structural break at obs.	-	-	-	94	-	-	-	208
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H0	H0
Luxembourg / Finland	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	12	12	12	0
	Test statistic: z(t)	-1.78	-1.95	0.35	-9.60	-2.08	-1.70	0.41	-3.56
	Structural break at obs.	-	-	-	94	-	-	-	383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Netherlands / Finland	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	12	12	12	0
	Test statistic: z(t)	-1.76	-2.01	0.35	-8.97	-2.43	-1.76	0.36	-3.98
	Structural break at obs.	-	-	-	94	-	-	-	383
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Portugal / Finland	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	4	4	12	4
	Test statistic: z(t)	-1.71	-1.63	0.37	-9.19	-1.33	-1.55	0.53	-3.83
	Structural break at obs.	-	-	-	94	-	-	-	379
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Spain / Finland	Number observations	152	156	157	155	312	312	312	309
	Lags	4	4	9	1	2	2	12	3
	Test statistic: z(t)	-3.25	-5.39	0.14	-4.63	-2.59	-2.62	0.20	-3.42
	Structural break at obs.	-	-	-	58	-	-	-	275
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H0	H0	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Germany / France	Number observations	151	156	157	153	312	312	312	311
	Lags	5	5	9	3	11	11	12	1
	Test statistic: z(t)	-1.95	-1.80	0.30	-8.01	-3.85	-3.09	0.28	-4.21
	Structural break at obs.	-	-	-	116	-	-	-	238
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Greece / France	Number observations	148	156	157	156	312	312	312	312
	Lags	8	8	9	0	2	2	12	0
	Test statistic: z(t)	-3.13	-2.56	0.12	-5.26	-3.11	-3.31	0.27	-5.34
	Structural break at obs.	-	-	-	-	-	-	-	-
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H0	H1	H0	H0	H1	H1
Ireland / France	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	12	12	12	4
	Test statistic: z(t)	-2.10	-2.04	0.13	-3.76	-2.07	-2.00	0.43	-4.25
	Structural break at obs.	-	-	-	95	-	-	-	251
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0
Italy / France	Number observations	154	156	157	154	312	312	312	309
	Lags	2	2	9	2	2	2	12	3
	Test statistic: z(t)	-3.40	-3.11	0.06	-5.65	-2.39	-2.52	0.30	-4.81
	Structural break at obs.	-	-	-	116	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H0	H1	H0	H0	H1	H0
Luxembourg / France	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	11	11	12	4
	Test statistic: z(t)	-2.15	-2.18	0.32	-5.65	-2.48	-2.45	0.30	-4.33
	Structural break at obs.	-	-	-	116	-	-	-	231
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Netherlands / France	Number observations	154	156	157	156	312	312	312	311
	Lags	2	2	9	0	9	9	12	1
	Test statistic: z(t)	-2.37	-2.61	0.35	-5.93	-3.64	-3.40	0.13	-4.70
	Structural break at obs.	-	-	-	116	-	-	-	219
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H1	H0	H0	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / France	Number observations	153	156	157	153	312	312	312	312
	Lags	3	3	9	3	2	2	12	0
	Test statistic: z(t)	-1.71	-1.77	0.39	-3.62	-2.13	-2.25	0.43	-4.50
	Structural break at obs.	-	-	-	116	-	-	-	205
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / France	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	3	3	12	0
	Test statistic: z(t)	-1.99	-2.03	0.16	-5.71	-2.59	-2.81	0.22	-4.51
	Structural break at obs.	-	-	-	95	-	-	-	343
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Greece / Germany	Number observations	145	156	157	156	312	312	312	308
	Lags	11	11	9	0	6	6	11	4
	Test statistic: z(t)	-0.57	-0.87	0.29	-3.78	-3.04	-3.78	0.13	-4.63
	Structural break at obs.	-	-	-	-	-	-	-	-
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H0	H0
Ireland / Germany	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	12	12	12	4
	Test statistic: z(t)	-2.25	-2.36	0.24	-5.19	-2.01	-1.72	0.47	-4.09
	Structural break at obs.	-	-	-	95	-	-	-	243
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Italy / Germany	Number observations	152	156	157	155	312	312	312	308
	Lags	4	4	9	1	2	2	12	4
	Test statistic: z(t)	-0.98	-0.86	0.36	-3.49	-2.25	-2.25	0.37	-5.23
	Structural break at obs.	-	-	-	84	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1
Luxembourg / Germany	Number observations	150	156	157	155	312	312	312	308
	Lags	6	6	9	1	3	3	12	4
	Test statistic: z(t)	-1.90	-2.23	0.19	-4.13	-2.58	-2.35	0.12	-5.26
	Structural break at obs.	-	-	-	117	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H1

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Germany	Number observations	154	156	157	156	312	312	312	309
	Lags	2	2	9	0	8	8	12	3
	Test statistic: z(t)	-2.91	-3.00	0.17	-5.48	-2.23	-2.50	0.34	-4.61
	Structural break at obs.	-	-	-	117	-	-	-	208
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Portugal / Germany	Number observations	154	156	157	153	312	312	312	310
	Lags	2	2	9	3	2	2	12	2
	Test statistic: z(t)	-3.20	-2.71	0.27	-4.27	-2.41	-2.62	0.27	-3.41
	Structural break at obs.	-	-	-	91	-	-	-	210
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Germany	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	2	2	12	0
	Test statistic: z(t)	-1.33	-1.27	0.34	-4.46	-2.17	-2.22	0.30	-4.22
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Ireland / Greece	Number observations	148	156	157	153	312	312	312	308
	Lags	8	8	9	3	6	6	12	4
	Test statistic: z(t)	-1.93	-2.03	0.17	-6.44	-1.25	-1.55	0.54	-6.35
	Structural break at obs.	-	-	-	95	-	-	-	307
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H1
Italy / Greece	Number observations	148	156	157	156	312	312	312	308
	Lags	8	8	9	0	8	8	12	4
	Test statistic: z(t)	-1.91	-2.21	0.18	-3.75	-1.74	-1.99	0.42	-4.92
	Structural break at obs.	-	-	-	70	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Greece	Number observations	146	156	157	156	312	312	312	308
	Lags	10	10	9	0	2	2	12	4
	Test statistic: z(t)	-0.95	-1.55	0.25	-4.03	-3.24	-3.35	0.09	-3.79
	Structural break at obs.	-	-	-	123	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Greece	Number observations	153	156	157	156	312	312	312	308
	Lags	3	3	9	0	6	6	12	4
	Test statistic: z(t)	-1.25	-1.78	0.26	-4.84	-2.88	-3.54	0.19	-3.86
	Structural break at obs.	-	-	-	123	-	-	-	307
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H0
Portugal / Greece	Number observations	144	156	157	153	312	312	312	308
	Lags	12	12	9	3	6	6	12	4
	Test statistic: z(t)	-0.48	-0.95	0.38	-3.99	-2.41	-3.47	0.31	-4.05
	Structural break at obs.	-	-	-	76	-	-	-	301
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H0
Spain / Greece	Number observations	151	156	157	153	312	312	312	310
	Lags	5	5	9	3	4	4	12	2
	Test statistic: z(t)	-1.36	-1.60	0.22	-6.00	-1.63	-2.07	0.36	-3.90
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Italy / Ireland	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	9	9	12	4
	Test statistic: z(t)	-2.09	-2.09	0.16	-4.94	-2.30	-3.33	0.26	-4.83
	Structural break at obs.	-	-	-	95	-	-	-	319
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Ireland	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	11	11	12	4
	Test statistic: z(t)	-2.28	-2.38	0.15	-4.63	-1.67	-1.48	0.42	-3.88
	Structural break at obs.	-	-	-	95	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Netherlands / Ireland	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	11	11	12	4
	Test statistic: z(t)	-2.29	-2.68	0.15	-5.43	-1.83	-1.80	0.40	-3.89
	Structural break at obs.	-	-	-	95	-	-	-	243
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / Ireland	Number observations	154	156	157	156	312	312	312	308
	Lags	2	2	9	0	11	11	12	4
	Test statistic: z(t)	-2.01	-1.90	0.30	-5.40	-1.05	-1.18	0.55	-4.52
	Structural break at obs.	-	-	-	95	-	-	-	270
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Spain / Ireland	Number observations	143	156	157	153	312	312	312	308
	Lags	13	13	9	3	11	11	12	4
	Test statistic: z(t)	-1.70	-1.72	0.30	-3.49	-2.14	-2.58	0.22	-3.73
	Structural break at obs.	-	-	-	54	-	-	-	331
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Italy	Number observations	153	156	157	156	312	312	312	308
	Lags	3	3	9	0	6	6	12	4
	Test statistic: z(t)	-1.45	-1.21	0.37	-3.61	-1.89	-2.03	0.34	-3.79
	Structural break at obs.	-	-	-	34	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Netherlands / Italy	Number observations	153	156	157	156	312	312	312	309
	Lags	3	3	9	0	5	5	12	3
	Test statistic: z(t)	-1.41	-1.65	0.36	-3.82	-2.38	-2.41	0.30	-4.94
	Structural break at obs.	-	-	-	36	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Portugal / Italy	Number observations	154	156	157	153	312	312	312	308
	Lags	2	2	9	3	11	11	12	4
	Test statistic: z(t)	-1.48	-1.23	0.40	-3.96	-1.86	-1.73	0.50	-4.14
	Structural break at obs.	-	-	-	52	-	-	-	270
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Italy	Number observations	154	156	157	156	312	312	312	309
	Lags	2	2	9	0	3	3	12	3
	Test statistic: z(t)	-1.72	-1.79	0.20	-6.28	-3.38	-3.42	0.17	-4.23
	Structural break at obs.	-	-	-	95	-	-	-	273
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0

Unit Root Tests of the Nominal Exchange Rate									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Luxembourg	Number observations	143	156	157	154	312	312	312	312
	Lags	13	13	9	2	2	2	12	0
	Test statistic: z(t)	-4.16	-4.19	0.08	-5.63	-2.66	-2.71	0.33	-4.83
	Structural break at obs.	-	-	-	40	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H0	H0	H1	H0
Portugal / Luxembourg	Number observations	151	156	157	153	312	312	312	312
	Lags	5	5	9	3	2	2	12	0
	Test statistic: z(t)	-1.60	-1.93	0.38	-3.95	-2.32	-2.48	0.25	-4.21
	Structural break at obs.	-	-	-	65	-	-	-	206
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Luxembourg	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	2	2	12	0
	Test statistic: z(t)	-1.43	-1.43	0.34	-7.31	-2.20	-2.24	0.33	-4.28
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Portugal / Netherlands	Number observations	145	156	157	153	312	312	312	310
	Lags	11	11	9	3	2	2	12	2
	Test statistic: z(t)	-2.85	-2.26	0.38	-4.87	-2.18	-2.35	0.35	-3.38
	Structural break at obs.	-	-	-	65	-	-	-	211
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Netherlands	Number observations	154	156	157	156	312	312	312	312
	Lags	2	2	9	0	2	2	12	0
	Test statistic: z(t)	-1.46	-1.58	0.32	-5.66	-2.04	-2.17	0.24	-4.00
	Structural break at obs.	-	-	-	95	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0
Spain / Portugal	Number observations	154	156	157	156	312	312	312	310
	Lags	2	2	9	0	11	11	12	2
	Test statistic: z(t)	-1.43	-1.27	0.36	-5.78	-1.38	-1.65	0.48	-4.51
	Structural break at obs.	-	-	-	95	-	-	-	221
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0

Legend Appendix Table 6: The significance level for the rejection of the H0 is 5%. The table displays the results for seasonally unadjusted monthly nominal exchange rates. ADF: Augmented Dickey-Fuller Test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags chosen according to Akaike's information criterion (AIC). PP: Phillips-Perron test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike's information criterion (AIC). Critical values for the PP are the same as for the ADF. KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H0 = stationary around linear trend, H1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H0 = unit root, H1 stationarity with a break in the intercept or trend).

Appendix Table 7 – Unit Root Tests of the First Differences of Nominal Exchange Rate Levels

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Belgium / Austria	Number observations	146	155	156	152	312	312	312	309
	Lags	9	9	43	3	5	5	23	3
	Test statistic: z(t)	-6.15	-10.87	0.14	-8.76	-7.42	-15.99	0.06	-8.91
	Structural break at obs.	-	-	-	31	-	-	-	271
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Finland / Austria	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	8	0	11	11	3	0
	Test statistic: z(t)	-9.84	-13.43	0.05	-13.68	-4.08	-16.93	0.06	-17.25
	Structural break at obs.	-	-	-	94	-	-	-	377
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
France / Austria	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	25		1	1	57	
	Test statistic: z(t)	-8.08	-10.95	0.07	-11.19	-12.41	-16.68	0.09	-10.02
	Structural break at obs.	-	-	-	115	-	-	-	251
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Germany / Austria	Number observations	151	155	156	153	312	312	312	309
	Lags	4	4	18	2	13	13	10	3
	Test statistic: z(t)	-6.02	-10.51	0.07	-9.10	-4.53	-19.37	0.03	-11.01
	Structural break at obs.	-	-	-	116	-	-	-	235
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Austria	Number observations	142	155	156	155	312	312	312	309
	Lags	13	13	12	0	5	5	17	3
	Test statistic: z(t)	-2.80	-12.41	0.09	-12.37	-8.48	-16.74	0.05	-12.13
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H0	H1	H1	H1	H0	H1
Ireland / Austria	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	12	0	13	13	5	3
	Test statistic: z(t)	-9.29	-11.85	0.05	-12.13	-4.73	-17.68	0.12	-11.09
	Structural break at obs.	-	-	-	105	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Italy / Austria	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	18	0	1	1	13	3
	Test statistic: z(t)	-8.95	-10.93	0.07	-11.25	-12.63	-17.00	0.11	-10.14
	Structural break at obs.	-	-	-	31	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Austria	Number observations	142	155	156	152	312	312	312	310
	Lags	13	13	31	3	4	4	19	2
	Test statistic: z(t)	-4.04	-10.30	0.12	-8.42	-8.22	-15.81	0.05	-12.02
	Structural break at obs.	-	-	-	31	-	-	-	210
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Austria	Number observations	143	155	156	152	312	312	312	308
	Lags	12	12	21	3	13	13	12	4
	Test statistic: z(t)	-5.98	-14.76	0.09	-8.53	-5.30	-22.89	0.14	-11.52
	Structural break at obs.	-	-	-	32	-	-	-	233
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Austria	Number observations	142	155	156	153	312	312	312	311
	Lags	13	13	14	2	3	3	12	1
	Test statistic: z(t)	-3.28	-12.34	0.07	-10.01	-10.09	-17.97	0.04	-14.33
	Structural break at obs.	-	-	-	67	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H0	H1	H1	H1	H0	H1
Spain / Austria	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	14	0	1	1	8	0
	Test statistic: z(t)	-8.56	-11.25	0.09	-11.65	-12.54	-18.68	0.04	-18.95
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Finland / Belgium	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	9	0	11	11	10	0
	Test statistic: z(t)	-9.56	-13.32	0.05	-13.59	-4.23	-16.62	0.06	-16.87
	Structural break at obs.	-	-	-	94	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
France / Belgium	Number observations	153	155	156	155	312	312	312	309
	Lags	2	2	2		10	10	7	
	Test statistic: z(t)	-7.12	-10.70	0.04	-11.15	-5.15	-15.70	0.06	-10.98
	Structural break at obs.	-			116				219
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Germany / Belgium	Number observations	153	155	156	153	312	312	312	309
	Lags	2	2	4		12	12	10	3
	Test statistic: z(t)	-7.11	-9.47	0.09	-8.02	-4.94	-14.74	0.05	-7.63
	Structural break at obs.	-	-	-	116	-	-	-	277
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Belgium	Number observations	146	155	156	153	312	312	312	309
	Lags	9	9	13	2	5	5	19	3
	Test statistic: z(t)	-4.91	-12.56	0.05	-8.40	-8.13	-16.82	0.05	-11.07
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / Belgium	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	16	0	13	13	46	3
	Test statistic: z(t)	-8.87	-11.62	0.06	-12.14	-4.25	-18.12	0.09	-11.10
	Structural break at obs.	-	-	-	97	-	-	-	271
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Belgium	Number observations	150	155	156	154	312	312	312	309
	Lags	5	5	5	1	5	5	16	3
	Test statistic: z(t)	-4.39	-9.07	0.04	-9.04	-7.56	-17.46	0.14	-9.65
	Structural break at obs.	-	-	-	41	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Belgium	Number observations	152	155	156	152	312	312	312	311
	Lags	3	3	10	3	3	3	17	1
	Test statistic: z(t)	-7.77	-12.71	0.05	-8.25	-9.41	-15.30	0.09	-13.01
	Structural break at obs.	-	-	-	120	-	-	-	289
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Belgium	Number observations	142	155	156	152	312	312	312	312
	Lags	13	13	8	3	1	1	13	0
	Test statistic: z(t)	-4.18	-15.08	0.04	-8.05	-12.98	-17.52	0.05	-17.91
	Structural break at obs.	-	-	-	28	-	-	-	268
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Belgium	Number observations	145	155	156	153	312	312	312	309
	Lags	10	10	12	2	1	1	12	3
	Structural break at obs.	-	-	-	80	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Belgium	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	4	0	1	1	11	0
	Test statistic: z(t)	-8.58	-11.53	0.08	-12.13	-12.39	-18.45	0.05	-18.72
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
France / Finland	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	8		1	1	8	
	Test statistic: z(t)	-9.31	-12.98	0.05	-13.19	-11.45	-16.74	0.04	-17.02
	Structural break at obs.	-			94				377
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Germany / Finland	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	9	0	11	11	9	0
	Test statistic: z(t)	-9.73	-13.25	0.06	-13.72	-3.99	-16.24	0.05	-16.43
	Structural break at obs.	-	-	-	94	-	-	-	377
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Finland	Number observations	152	155	156	152	312	312	312	310
	Lags	3	3	7	3	4	4	17	2
	Test statistic: z(t)	-7.58	-14.05	0.08	-8.60	-9.21	-16.56	0.05	-11.99
	Structural break at obs.	-	-	-		-	-	-	
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland / Finland	Number observations	152	155	156	154	312	312	312	310
	Lags	3	3	6	1	13	13	24	2
	Test statistic: z(t)	-7.50	-20.02	0.05	-12.77	-3.84	-18.10	0.06	-9.72
	Structural break at obs.	-	-	-	94	-	-	-	277
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Finland	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	8	0	2	2	12	0
	Test statistic: z(t)	-9.78	-13.88	0.04	-14.15	-8.87	-15.88	0.07	-16.21
	Structural break at obs.	-	-	-	94	-	-	-	223
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Finland	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	7	0	11	11	11	0
	Test statistic: z(t)	-9.66	-13.37	0.04	-13.66	-4.09	-16.53	0.06	-16.84
	Structural break at obs.	-	-	-	94	-	-	-	377
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Finland	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	9	0	1	1	10	0
	Test statistic: z(t)	-9.52	-13.56	0.05	-13.86	-11.83	-17.03	0.06	-17.50
	Structural break at obs.	-	-	-	94	-	-	-	377
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Finland	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	12	0	13	13	15	3
	Test statistic: z(t)	-8.73	-12.42	0.07	-12.76	-4.24	-17.08	0.07	-11.08
	Structural break at obs.	-	-	-	91	-	-	-	400
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Finland	Number observations	152	155	156	154	312	312	312	310
	Lags	3	3	6	1	1	1	18	2
	Test statistic: z(t)	-7.83	-19.51	0.03	-12.39	-12.62	-16.62	0.04	-11.91
	Structural break at obs.	-	-	-	96	-	-	-	400
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Germany / France	Number observations	151	155	156	153	312	312	312	308
	Lags	4	4	6	2	10	10	9	4
	Test statistic: z(t)	-4.98	-9.81	0.04	-8.10	-4.59	-15.95	0.03	-9.17
	Structural break at obs.	-	-	-	116	-	-	-	251
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Greece / France	Number observations	144	155	156	155	312	312	312	309
	Lags	11	11	10	0	1	1	6	3
	Test statistic: z(t)	-4.08	-13.41	0.07	-13.69	-13.47	-17.85	0.02	-9.63
	Structural break at obs.	-	-	-	-	-	-	-	-
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / France	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	6	0	13	13	12	3
	Test statistic: z(t)	-8.30	-11.57	0.06	-12.26	-4.94	-19.57	0.09	-9.97
	Structural break at obs.	-	-	-	116	-	-	-	273
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / France	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	1	0	1	1	18	0
	Test statistic: z(t)	-7.70	-11.66	0.04	-12.31	-13.75	-18.83	0.12	-19.31
	Structural break at obs.	-	-	-	116	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / France	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	7	0	10	10	7	3
	Test statistic: z(t)	-8.41	-11.47	0.04	-12.25	-5.12	-15.27	0.05	-10.55
	Structural break at obs.	-	-	-	116	-	-	-	219
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / France	Number observations	154	155	156	152	312	312	312	308
	Lags	1	1	9	3	8	8	11	4
	Test statistic: z(t)	-8.57	-12.68	0.04	-7.47	-5.49	-15.89	0.04	-9.36
	Structural break at obs.	-	-	-	116	-	-	-	219
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / France	Number observations	153	155	156	153	312	312	312	309
	Lags	2	2	16	2	1	1	13	3
	Test statistic: z(t)	-8.32	-11.02	0.07	-8.79	-13.30	-17.46	0.05	-10.45
	Structural break at obs.	-	-	-	116	-	-	-	225
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / France	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	87	0	2	2	10	0
	Test statistic: z(t)	-8.73	-11.44	0.31	-11.81	-10.94	-19.44	0.03	-19.61
	Structural break at obs.	-	-	-	89	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H1	H1	H1	H1	H0	H1
Greece / Germany	Number observations	148	155	156	155	312	312	312	309
	Lags	7	7	13	0	5	5	18	3
	Test statistic: z(t)	-3.99	-12.32	0.10	-12.89	-8.76	-16.63	0.04	-11.60
	Structural break at obs.	-	-	-	-	-	-	-	-
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / Germany	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	12	0	11	11	19	3
	Test statistic: z(t)	-8.87	-12.29	0.04	-12.39	-4.20	-17.48	0.10	-10.52
	Structural break at obs.	-	-	-	95	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Germany	Number observations	152	155	156	155	312	312	312	309
	Lags	3	3	8	0	1	1	14	3
	Test statistic: z(t)	-5.52	-10.37	0.08	-10.93	-12.40	-16.60	0.11	-9.67
	Structural break at obs.	-	-	-	117	-	-	-	392
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Germany	Number observations	150	155	156	152	312	312	312	309
	Lags	5	5	4	3	2	2	11	3
	Test statistic: z(t)	-6.02	-9.84	0.06	-7.54	-9.16	-15.79	0.04	-7.96
	Structural break at obs.	-	-	-	116	-	-	-	271
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Germany	Number observations	154	155	156	155	312	312	312	310
	Lags	1	1	52	0	13	13	12	2
	Test statistic: z(t)	-8.51	-12.34	0.14	-12.98	-5.22	-18.01	0.09	-11.87
	Structural break at obs.	-	-	-	117	-	-	-	207
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Germany	Number observations	154	155	156	153	312	312	312	311
	Lags	1	1	15	2	3	3	11	1
	Test statistic: z(t)	-8.88	-11.63	0.08	-8.94	-9.86	-17.73	0.04	-14.20
	Structural break at obs.	-	-	-	114	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Germany	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	6	0	1	1	7	0
	Test statistic: z(t)	-8.03	-11.39	0.10	-12.20	-12.76	-18.56	0.04	-18.79
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / Greece	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	12	0	11	11	19	3
	Test statistic: z(t)	-8.87	-12.29	0.04	-12.39	-4.20	-17.48	0.10	-10.52
	Structural break at obs.	-	-	-	95	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Greece	Number observations	152	155	156	155	312	312	312	309
	Lags	3	3	8	0	1	1	14	3
	Test statistic: z(t)	-5.52	-10.37	0.08	-10.93	-12.40	-16.60	0.11	-9.67
	Structural break at obs.	-	-	-	117	-	-	-	392
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Greece	Number observations	150	155	156	152	312	312	312	309
	Lags	5	5	4	3	2	2	11	3
	Test statistic: z(t)	-6.02	-9.84	0.06	-7.54	-9.16	-15.79	0.04	-7.96
	Structural break at obs.	-	-	-	116	-	-	-	271
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Greece	Number observations	154	155	156	155	312	312	312	310
	Lags	1	1	52	0	13	13	12	2
	Test statistic: z(t)	-8.51	-12.34	0.14	-12.98	-5.22	-18.01	0.09	-11.87
	Structural break at obs.	-	-	-	117	-	-	-	207
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Greece	Number observations	154	155	156	153	312	312	312	311
	Lags	1	1	15	2	3	3	11	1
	Test statistic: z(t)	-8.88	-11.63	0.08	-8.94	-9.86	-17.73	0.04	-14.20
	Structural break at obs.	-	-	-	114	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Greece	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	6	0	1	1	7	0
	Test statistic: z(t)	-8.03	-11.39	0.10	-12.20	-12.76	-18.56	0.04	-18.79
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Ireland	Number observations	154	155	156	155	312	312	312	308
	Lags	1	1	7	0	8	8	41	4
	Test statistic: z(t)	-8.47	-11.63	0.05	-12.15	-8.07	-19.44	0.08	-10.36
	Structural break at obs.	-	-	-	97	-	-	-	393
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Ireland	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	31	0	13	13	119	3
	Test statistic: z(t)	-8.69	-11.60	0.08	-12.02	-4.47	-18.26	0.14	-10.63
	Structural break at obs.	-	-	-	97	-	-	-	269
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Ireland	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	10	0	13	13	90	3
	Test statistic: z(t)	-9.62	-12.93	0.06	-13.28	-4.64	-18.53	0.12	-10.25
	Structural break at obs.	-	-	-	109	-	-	-	262
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of Nominal Exchange Rates									
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / Ireland	Number observations	154	155	156	155	312	312	312	308
	Lags	1	1	9	0	13	13	2	4
	Test statistic: z(t)	-8.75	-11.48	0.06	-11.80	-4.25	-18.87	0.08	-11.26
	Structural break at obs.	-	-	-	97	-	-	-	232
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Ireland	Number observations	143	155	156	153	312	312	312	308
	Lags	12	12	9	2	13	13		4
	Test statistic: z(t)	-2.96	-10.65	0.10	-6.19	-5.02	-19.88		-10.39
	Structural break at obs.	-	-	-	103	-	-	-	283
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H0	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Italy	Number observations	153	155	156	155	312	312	312	309
	Lags	2	2	8	0	5	5	15	3
	Test statistic: z(t)	-6.32	-10.87	0.05	-11.43	-7.73	-17.33	0.13	-9.50
	Structural break at obs.	-	-	-	41	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Italy	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	7	0	4	4	19	3
	Test statistic: z(t)	-8.76	-14.06	0.03	-14.34	-7.86	-17.75	0.14	-9.15
	Structural break at obs.	-	-	-	26	-	-	-	392
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Italy	Number observations	154	155	156	153	312	312	312	308
	Lags	1	1	13	2	10	10	7	4
	Test statistic: z(t)	-9.08	-11.87	0.07	-9.02	-4.57	-18.07	0.12	-9.70
	Structural break at obs.	-	-	-	44	-	-	-	242
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Italy	Number observations	154	155	156	155	312	312	312	309
	Lags	1	1	11	0	2	2	8	3
	Test statistic: z(t)	-8.97	-12.28	0.08	-13.00	-9.99	-19.61	0.09	-9.96
	Structural break at obs.	-	-	-	95	-	-	-	284
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

		Unit Root Tests of the First Differences of Nominal Exchange Rates							
Period		1960:1 - 1972:12				1973:1 - 1998:12			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Luxembourg	Number observations	142	155	156	152	312	312	312	312
	Lags	13	13	7	3	1	1	21	0
	Test statistic: z(t)	-4.02	-14.50	0.03	-7.25	-12.79	-16.86	0.07	-17.19
	Structural break at obs.	-	-	-	28	-	-	-	274
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Luxembourg	Number observations	151	155	156	153	312	312	312	309
	Lags	4	4	12	2	1	1	13	3
	Test statistic: z(t)	-6.72	-12.15	0.06	-10.10	-13.63	-17.69	0.04	-10.88
	Structural break at obs.	-	-	-	92	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Luxembourg	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	6	0	1	1	12	0
	Test statistic: z(t)	-8.76	-11.56	0.08	-12.17	-12.61	-18.34	0.04	-18.62
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Netherlands	Number observations	145	155	156	152	312	312	312	308
	Lags	10	10	12	3	13	13	11	4
	Test statistic: z(t)	-6.04	-14.51	0.07	-9.63	-4.17	-17.86	0.06	-10.02
	Structural break at obs.	-	-	-	124	-	-	-	227
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Netherlands	Number observations	154	155	156	155	312	312	312	312
	Lags	1	1	10	0	1	1	10	0
	Test statistic: z(t)	-9.15	-12.31	0.07	-12.80	-13.34	-18.67	0.05	-18.94
	Structural break at obs.	-	-	-	95	-	-	-	390
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Portugal	Number observations	154	155	156	155	312	312	312	308
	Lags	1	1	9	0	10	10	14	4
	Test statistic: z(t)	-8.43	-11.75	0.09	-12.38	-5.35	-17.55	0.05	-11.11
	Structural break at obs.	-	-	-	90	-	-	-	236
	5% significance level	-3.44	-3.44	0.15	-5.08	-3.43	-3.43	0.15	-5.08
	10% significance level	-3.14	-3.14	0.12	-4.82	-3.13	-3.13	0.12	-4.82
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1

Legend Appendix Table 7: The significance level for the rejection of the H0 is 5%. The significance level for the rejection of the H0 is 5%. The table displays the results for the first differences of monthly nominal

exchange rates. ADF: Augmented Dickey-Fuller Test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags chosen according to Akaike’s information criterion (AIC). PP: Phillips–Perron test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike’s information criterion (AIC). Critical values for the PP are the same as for the ADF. KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H0 = stationary around linear trend, H1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H0 = unit root, H1 stationarity with a break in the intercept or trend).

Appendix Table 8 – Panel Unit Root Tests of the First Differences of Real Exchange Rates Levels

Test Specification				Results												
				1960:1 - 1972:12			1973:1 - 1998:12			1999:1 - 2017:5						
Test	H0	H1	Autoregression Parameter Rho	Lags / Selection	Panel	Periods	P-value	Accepted Hypothesis	Panel	Periods	P-value	Accepted Hypothesis	Panel	Periods	P-value	Accepted Hypothesis
Breitung	All Panels contain unit roots	All Panels are stationary	Uniform ρ	12	66	155	0.000	H1	66	311	0.000	H1	66	222	0.000	H1
Herwartz	Panels contain unit roots	Panels are stationary	Panel-specific ρ	AIC	66	155	0.000	H1	66	311	0.000	H1	66	222	0.000	H1
Hadri	All panels are stationary	Some panels contain unit roots	-	12	66	155	0.333	H0	66	311	0.317	H0	66	222	0.000	H1

Legend Appendix Table 8: The significance level for the rejection of the H0 is 5%. All Panels as strongly balanced. Panel-specific linear trends are not allowed. In all tests a correction for cross-sectional dependence of the panels is applied. A Bartlett Kernel with 12 lag is used to estimate the long-run variance in the Hadri tests.

Appendix Table 9 – Unit Root Tests of the Real Exchange Rate Levels

Period		Unit Root Tests of the Real Exchange Rate											
		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Belgium / Austria	Number observations	143	156	157	155	312	312	312	308	220	220	220	218
	Lags	13	13	9	1	6	6	12	4	13	13	10	2
	Test statistic: z(t)	-3.79	-3.21	0.69	-5.00	-1.51	-1.53	2.11	-6.60	-2.35	-3.24	0.68	-4.63
	Structural break at obs.	-	-	-	26	-	-	-	264	-	-	-	645
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H1	H1	H1	H1	H0	H0	H1	H1	H0	H1	H1	H0	
Finland / Austria	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	12	12	12	0	9	9	10	3
	Test statistic: z(t)	-0.58	-0.73	1.06	-6.00	-2.05	-1.54	0.89	-4.72	0.15	0.05	1.69	-3.27
	Structural break at obs.	-	-	-	94	-	-	-	383	-	-	-	577
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0	
France / Austria	Number observations	153	156	157	155	312	312	312	312	220	220	220	217
	Lags	3	3	9	3	2	2	12	12	13	13	10	3
	Test statistic: z(t)	-1.24	-1.35	1.16	-6.88	-2.37	-2.37	2.05	-3.87	1.47	1.73	1.84	-2.83
	Structural break at obs.	-	-	-	116	-	-	-	219	-	-	-	518
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0	
Germany / Austria	Number observations	153	156	157	153	312	312	312	308	220	220	220	217
	Lags	3	3	9	3	11	11	12	4	13	13	10	3
	Test statistic: z(t)	-1.77	-2.08	0.34	-5.94	-2.51	-2.52	2.06	-3.37	0.28	0.22	2.03	-4.88
	Structural break at obs.	-	-	-	117	-	-	-	381	-	-	-	547
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H1	
Greece / Austria	Number observations	154	156	157	156	312	312	312	308	220	220	220	217
	Lags	2	2	9	0	6	6	12	4	13	13	10	3
	Test statistic: z(t)	-0.08	-0.15	1.37	-3.60	-2.65	-3.10	0.67	-3.34	-1.06	-1.24	0.74	-2.95
	Structural break at obs.	-	-	-	133	-	-	-	307	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H0	H0	H0	H1	H0	
Ireland / Austria	Number observations	154	156	157	156	312	312	312	308	220	220	220	218
	Lags	2	2	9	0	12	12	12	4	8	8	10	2
	Test statistic: z(t)	-1.93	-2.03	0.58	-4.19	-2.48	-2.24	0.36	-4.28	-1.83	-1.36	0.56	-3.65
	Structural break at obs.	-	-	-	95	-	-	-	243	-	-	-	587
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0	H0	H0	H1	H0	

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Italy / Austria	Number observations	153	156	157	155	312	312	312	308	220	220	220	218
	Lags	3	3	9	1	2	2	12	4	10	10	10	2
	Test statistic: z(t)	-1.75	-1.94	0.32	-4.61	-3.02	-3.04	0.35	-5.05	-0.72	-0.71	0.51	-3.31
	Structural break at obs.	-	-	-	31	-	-	-	393	-	-	-	645
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H1	H1	H0	H1	H0	H0	H1	H0
Luxembourg / Austria	Number observations	144	156	157	155	312	312	312	309	220	220	220	217
	Lags	12	12	9	1	5	5	12	3	13	13	10	3
	Test statistic: z(t)	-3.11	-2.34	1.32	-5.40	-1.84	-1.82	2.22	-6.69	-3.56	-4.30	1.22	-4.07
	Structural break at obs.	-	-	-	26	-	-	-	262	-	-	-	651
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H0	H1	H1	H0	H0	H1	H1	H1	H1	H1	H0
Netherlands / Austria	Number observations	143	156	157	154	312	312	312	309	220	220	220	217
	Lags	13	13	9	2	12	12	12	3	12	12	10	3
	Test statistic: z(t)	1.05	-0.29	1.54	-6.80	-1.45	-1.51	2.41	-3.81	-0.90	-2.00	1.29	-3.73
	Structural break at obs.	-	-	-	28	-	-	-	289	-	-	-	506
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
Portugal / Austria	Number observations	145	156	157	153	312	312	310	310	220	220	220	217
	Lags	11	11	9	3	2	2	12	2	9	9	10	3
	Test statistic: z(t)	1.48	0.23	1.20	-3.46	-2.15	-2.32	0.41	-3.29	-1.85	-1.92	0.49	-2.60
	Structural break at obs.	-	-	-	107	-	-	-	361	-	-	-	507
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0	H0	H0	H1	H0
Spain / Austria	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	2	2	12	0	11	11	10	3
	Test statistic: z(t)	-1.68	-1.64	0.67	-5.23	-2.59	-2.62	0.18	-4.01	-2.52	-2.38	1.02	-1.93
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H0	H0	H0	H0	H1	H0
Finland / Belgium	Number observations	154	156	157	156	312	312	312	312	220	220	220	220
	Lags	2	2	9	0	12	12	12	0	9	9	10	0
	Test statistic: z(t)	-0.70	-0.83	0.90	-5.87	-2.10	-1.78	0.45	-3.86	-0.22	-0.24	1.73	-3.92
	Structural break at obs.	-	-	-	94	-	-	-	383	-	-	-	529
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H0	H0	H0	H0	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
France / Belgium	Number observations	153	156	157	155	312	312	312	308	220	220	220	218
	Lags	3	3	9		11	11	12		13	13	10	2
	Test statistic: z(t)	-1.37	-1.42	0.72	-5.75	-2.28	-2.29	0.56	-4.13	0.44	0.60	2.01	-3.45
	Structural break at obs.	-	-	-	116	-	-	-	239	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
Germany / Belgium	Number observations	153	156	157	155	312	312	312	308	220	220	220	219
	Lags	3	3	9	1	13	13	12	4	13	13	10	1
	Test statistic: z(t)	-1.67	-1.75	0.56	-4.43	-2.16	-2.08	0.79	-4.03	-0.60	-0.61	2.05	-3.71
	Structural break at obs.	-	-	-	117	-	-	-	262	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Greece / Belgium	Number observations	146	156	157	156	312	312	312	308	220	220	220	218
	Lags	10	10	9	0	6	6	12	4	13	13	10	2
	Test statistic: z(t)	1.11	0.57	1.29	-3.63	-1.88	-2.23	0.84	-3.23	-1.08	-1.74	0.70	-3.17
	Structural break at obs.	-	-	-	133	-	-	-	307	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Ireland / Belgium	Number observations	154	156	157	156	312	312	312	308	220	220	220	220
	Lags	2	2	9	0	11	11	12	4	9	9	10	0
	Test statistic: z(t)	-1.93	-2.04	0.29	-4.20	-1.48	-1.27	1.00	-4.30	-1.79	-1.13	0.62	-3.68
	Structural break at obs.	-	-	-	95	-	-	-	243	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0	H0	H1
Italy / Belgium	Number observations	150	156	157	154	312	312	312	308	220	220	220	220
	Lags	6	6	9	2	6	6	12	4	2	2	10	0
	Test statistic: z(t)	-1.89	-2.00	0.50	-3.92	-1.58	-1.66	0.82	-4.10	-0.12	-0.15	0.82	-2.79
	Structural break at obs.	-	-	-	31	-	-	-	393	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Luxembourg / Belgium	Number observations	154	156	157	156	312	312	312	310	220	220	220	217
	Lags	2	2	9	0	4	4	12	2	13	13	10	3
	Test statistic: z(t)	-1.25	-1.45	1.52	-4.94	-2.89	-2.87	1.18	-3.69	-3.41	-7.12	0.96	-3.60
	Structural break at obs.	-	-	-	125	-	-	-	381	-	-	-	512
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Belgium	Number observations	148	156	157	154	312	312	312	308	220	220	220	217
	Lags	8	8	9	2	2	2	12	4	11	11	10	3
	Test statistic: z(t)	-0.94	-0.40	1.56	-4.88	-2.33	-2.39	0.23	-5.20	-0.45	-1.40	1.38	-3.10
	Structural break at obs.	-	-	-	55	-	-	-	262	-	-	-	566
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H0	H1	H0	H0	H1	H0
Portugal / Belgium	Number observations	145	156	157	153	312	312	312	308	220	220	220	217
	Lags	11	11	9	3	2	2	12	4	12	12	10	3
	Test statistic: z(t)	1.35	0.73	1.38	-3.27	-1.45	-1.60	1.18	-2.79	-1.52	-1.85	0.47	-3.33
	Structural break at obs.	-	-	-	40	-	-	-	210	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Belgium	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	2	2	12	0	12	12	10	3
	Test statistic: z(t)	-1.73	-1.68	0.81	-5.70	-1.96	-1.96	1.45	-4.43	-2.21	-2.21	0.97	-2.05
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	507
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
France / Finland	Number observations	154	156	157	156	312	312	312	312	220	220	220	219
	Lags	2	2	9	0	2	2	12	0	3	3	10	1
	Test statistic: z(t)	-1.72	-1.86	0.64	-7.35	-2.17	-2.06	0.34	-4.59	-0.97	-1.05	0.61	-4.19
	Structural break at obs.	-	-	-	94	-	-	-	383	-	-	-	522
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H0	H0	H0	H0	H1	H0
Germany / Finland	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	12	12	12	0	13	13	10	3
	Test statistic: z(t)	-0.26	-0.37	0.99	-4.13	-2.44	-1.86	0.39	-4.64	-2.75	-2.49	0.82	-3.43
	Structural break at obs.	-	-	-	94	-	-	-	382	-	-	-	528
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0	H0	H0	H1	H0
Greece / Finland	Number observations	154	156	157	156	312	312	312	309	220	220	220	217
	Lags	2	2	9	0	5	5	12	3	13	13	10	3
	Test statistic: z(t)	-1.95	-2.27	0.27	-10.41	-1.19	-1.45	0.53	-4.30	-1.31	-1.33	1.21	-3.27
	Structural break at obs.	-	-	-	94	-	-	-	381	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H1	H0	H0	H1	H0	H0	H0	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland / Finland	Number observations	152	156	157	154	312	312	312	309	220	220	220	217
	Lags	4	4	9	2	12	12	12	3	8	8	10	3
	Test statistic: z(t)	-0.61	-1.26	0.94	-3.08	-2.68	-2.17	0.94	-3.89	-2.28	-2.16	0.53	-4.01
	Structural break at obs.	-	-	-	94	-	-	-	320	-	-	-	585
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Italy / Finland	Number observations	154	156	157	156	312	312	312	309	220	220	220	217
	Lags	2	2	9	0	5	5	12	3	9	9	10	3
	Test statistic: z(t)	-0.90	-1.03	1.25	-9.88	-3.23	-3.04	0.74	-4.05	-1.55	-1.58	1.22	-3.95
	Structural break at obs.	-	-	-	94	-	-	-	377	-	-	-	520
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H1	H0	H0	H0	H1	H0
Luxembourg / Finland	Number observations	154	156	157	156	312	312	312	312	220	220	220	218
	Lags	2	2	9	0	12	12	12	0	9	9	10	2
	Test statistic: z(t)	-0.95	-1.12	0.71	-5.48	-2.21	-1.89	0.52	-4.25	-1.62	-1.78	1.76	-4.35
	Structural break at obs.	-	-	-	94	-	-	-	383	-	-	-	524
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
Netherlands / Finland	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	12	12	12	0	13	13	10	3
	Test statistic: z(t)	0.01	-0.02	1.29	-5.32	-2.52	-1.89	0.42	-4.47	-1.92	-2.54	0.72	-2.82
	Structural break at obs.	-	-	-	94	-	-	-	383	-	-	-	577
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H0	H0	H0	H0	H1	H0
Portugal / Finland	Number observations	154	156	157	156	312	312	312	308	220	220	220	217
	Lags	2	2	9	0	4	4	12	4	12	12	10	3
	Test statistic: z(t)	0.09	0.10	1.16	-4.47	-0.82	-1.06	0.74	-4.46	-1.64	-1.97	0.99	-3.12
	Structural break at obs.	-	-	-	94	-	-	-	379	-	-	-	509
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Finland	Number observations	152	156	157	155	312	312	312	309	220	220	220	217
	Lags	4	4	9	1	2	2	12	3	13	13	10	3
	Test statistic: z(t)	0.15	-0.28	1.61	-4.51	-1.87	-1.90	1.07	-3.44	-1.89	-1.98	1.46	-2.95
	Structural break at obs.	-	-	-	94	-	-	-	275	-	-	-	519
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Germany / France	Number observations	151	156	157	153	312	312	312	311	220	220	220	217
	Lags	5	5	9	3	11	11	12	1	13	13	10	3
	Test statistic: z(t)	-1.04	-0.91	0.81	-8.52	-3.81	-3.07	0.33	-4.22	-1.66	-2.63	0.44	-3.81
	Structural break at obs.	-	-	-	116	-	-	-	219	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H0	H0	H0	H0	H0	H0
Greece / France	Number observations	148	156	157	156	312	312	312	312	220	220	220	217
	Lags	8	8	9	0	2	2	12	0	13	13	10	3
	Test statistic: z(t)	-2.18	-1.61	0.88	-2.84	-2.65	-2.84	0.65	-4.38	-1.34	-1.38	1.59	-3.68
	Structural break at obs.	-	-	-	116	-	-	-	302	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Ireland / France	Number observations	154	156	157	156	312	312	312	308	220	220	220	218
	Lags	2	2	9	0	12	12	12	4	13	13	10	2
	Test statistic: z(t)	-2.01	-1.97	0.19	-3.72	-1.75	-1.60	1.15	-4.22	-3.38	-2.96	0.65	-4.74
	Structural break at obs.	-	-	-	116	-	-	-	251	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H1	H1	H1	H0
Italy / France	Number observations	154	156	157	154	312	312	312	309	220	220	220	218
	Lags	2	2	9	2	2	2	12	3	12	12	10	2
	Test statistic: z(t)	-1.77	-1.57	1.27	-4.53	-1.90	-2.03	0.79	-5.13	-2.13	-2.09	2.03	-3.97
	Structural break at obs.	-	-	-	116	-	-	-	393	-	-	-	650
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1	H0	H0	H1	H0
Luxembourg / France	Number observations	154	156	157	156	312	312	312	308	220	220	220	217
	Lags	2	2	9	0	11	11	12	4	13	13	10	3
	Test statistic: z(t)	-1.89	-1.94	0.37	-6.52	-2.13	-2.14	0.90	-4.07	-1.73	-1.62	2.09	-4.52
	Structural break at obs.	-	-	-	116	-	-	-	239	-	-	-	608
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H1	H0	H0	H1	H0	H0	H0	H1	H0
Netherlands / France	Number observations	154	156	157	156	312	312	312	311	220	220	220	217
	Lags	2	2	9	0	9	9	12	1	12	12	10	3
	Test statistic: z(t)	-0.08	0.04	1.43	-6.01	-3.31	-3.10	0.63	-4.14	-1.54	-1.88	1.36	-3.98
	Structural break at obs.	-	-	-	116	-	-	-	236	-	-	-	542
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H1	H0	H0	H0	H1	H0

		Unit Root Tests of the Real Exchange Rate											
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / France	Number observations	153	156	157	153	312	312	312	312	220	220	220	217
	Lags	3	3	9	3	2	2	12	0	8	8	10	3
	Test statistic: z(t)	0.46	0.30	1.23	-4.40	-1.61	-1.72	0.98	-4.50	-2.37	-2.59	1.63	-2.79
	Structural break at obs.	-	-	-	116	-	-	-	205	-	-	-	635
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0	
Spain / France	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	3	3	12	0	13	13	10	3
	Test statistic: z(t)	-1.13	-1.07	1.14	-5.90	-2.31	-2.43	1.41	-4.66	-2.76	-2.68	1.90	-2.75
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0	
Greece / Germany	Number observations	145	156	157	156	312	312	312	308	220	220	220	217
	Lags	11	11	9	0	6	6	12	4	13	13	10	3
	Test statistic: z(t)	0.41	0.77	1.18	-3.35	-2.57	-3.26	0.49	-4.46	-1.39	-1.49	1.46	-3.45
	Structural break at obs.	-	-	-	133	-	-	-	307	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H0	H0	H0	H1	H0	
Ireland / Germany	Number observations	154	156	157	156	312	312	312	308	220	220	220	219
	Lags	2	2	9	0	12	12	12	4	13	13	10	1
	Test statistic: z(t)	-1.39	-1.38	0.86	-4.86	-1.87	-1.58	0.87	-3.99	-2.98	-2.90	0.65	-3.76
	Structural break at obs.	-	-	-	95	-	-	-	243	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H1	H1	H1	H0	
Italy / Germany	Number observations	152	156	157	155	312	312	312	308	220	220	220	218
	Lags	4	4	9	1	2	2	12	4	13	13	10	2
	Test statistic: z(t)	-0.85	-0.71	0.37	-3.97	-2.01	-2.01	0.61	-5.64	-2.41	-2.84	1.78	-2.37
	Structural break at obs.	-	-	-	117	-	-	-	393	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H1	H0	H0	H1	H0	
Luxembourg / Germany	Number observations	150	156	157	155	312	312	312	308	220	220	220	217
	Lags	6	6	9	1	3	3	12	4	13	13	10	3
	Test statistic: z(t)	-1.26	-1.39	1.08	-4.31	-1.75	-1.64	1.42	-4.19	-3.48	-2.36	2.04	-5.06
	Structural break at obs.	-	-	-	117	-	-	-	262	-	-	-	655
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H1	H0	H1	H1	

		Unit Root Tests of the Real Exchange Rate											
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Germany	Number observations	154	156	157	156	312	312	312	309	220	220	220	217
	Lags	2	2	9	0	8	8	12	3	13	13	10	3
	Test statistic: z(t)	-1.36	-1.27	1.34	-5.81	-1.45	-1.80	1.26	-3.79	-2.84	-2.40	1.37	-3.67
	Structural break at obs.	-	-	-	117	-	-	-	342	-	-	-	566
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0	
Portugal / Germany	Number observations	154	156	157	153	312	312	312	310	220	220	220	217
	Lags	2	2	9	3	2	2	12	2	13	13	10	3
	Test statistic: z(t)	-0.88	-0.90	1.26	-4.43	-1.85	-2.05	0.89	-3.53	-2.34	-2.89	1.40	-3.10
	Structural break at obs.	-	-	-	91	-	-	-	210	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H1	H1	H0	
Spain / Germany	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	2	2	12	0	13	13	10	3
	Test statistic: z(t)	-1.47	-1.42	0.52	-3.76	-2.15	-2.19	1.00	-4.54	-2.86	-2.90	1.75	-2.38
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H1	H1	H0	
Ireland / Greece	Number observations	148	156	157	153	312	312	312	308	220	220	220	218
	Lags	8	8	9	3	6	6	12	4	12	12	10	2
	Test statistic: z(t)	-1.29	-1.27	0.78	-2.77	-1.39	-1.67	0.67	-3.09	-1.95	-1.98	0.95	-5.20
	Structural break at obs.	-	-	-	95	-	-	-	234	-	-	-	587
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H1	
Italy / Greece	Number observations	148	156	157	156	312	312	312	308	220	220	220	217
	Lags	8	8	9	0	8	8	12	4	13	13	10	3
	Test statistic: z(t)	-0.63	-0.25	1.43	-3.35	-1.74	-2.00	0.45	-5.26	-1.21	-2.13	1.02	-4.06
	Structural break at obs.	-	-	-	70	-	-	-	393	-	-	-	643
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H1	H0	H0	H1	H0	
Luxembourg / Greece	Number observations	146	156	157	156	312	312	312	308	220	220	220	218
	Lags	10	10	9	0	2	2	12	4	13	13	10	2
	Test statistic: z(t)	0.56	0.14	1.03	-3.69	-2.24	-2.33	1.12	-3.44	-1.10	-2.58	0.56	-3.79
	Structural break at obs.	-	-	-	133	-	-	-	307	-	-	-	638
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0	

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Greece	Number observations	153	156	157	156	312	312	312	308	220	220	220	217
	Lags	3	3	9	0	6	6	12	4	12	12	10	3
	Test statistic: z(t)	0.96	0.92	1.49	-4.07	-1.88	-2.42	1.07	-3.39	-1.48	-1.59	1.06	-3.47
	Structural break at obs.	-	-	-	133	-	-	-	307	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Portugal / Greece	Number observations	144	156	157	153	312	312	312	308	220	220	220	218
	Lags	12	12	9	3	6	6	12	4	13	13	10	2
	Test statistic: z(t)	1.45	2.06	1.42	-2.85	-2.31	-3.35	0.57	-3.93	-1.32	-1.85	0.82	-3.18
	Structural break at obs.	-	-	-	133	-	-	-	210	-	-	-	655
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H1	H0	H0	H0	H1	H0
Spain / Greece	Number observations	151	156	157	153	312	312	312	310	220	220	220	218
	Lags	5	5	9	3	4	4	12	2	13	13	10	2
	Test statistic: z(t)	-0.54	-0.41	1.29	-6.66	-1.95	-2.29	0.62	-3.96	-1.94	-3.71	0.22	-3.68
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	642
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H1	H0	H0
Italy / Ireland	Number observations	154	156	157	156	312	312	312	308	220	220	220	220
	Lags	2	2	9	0	9	9	12	4	8	8	10	0
	Test statistic: z(t)	-1.93	-1.84	0.59	-3.04	-2.49	-3.35	0.41	-4.62	-2.28	-1.75	0.50	-4.46
	Structural break at obs.	-	-	-	121	-	-	-	319	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H1	H0	H0	H0	H0	H1	H0
Luxembourg / Ireland	Number observations	154	156	157	156	312	312	312	308	220	220	220	218
	Lags	2	2	9	0	11	11	12	4	8	8	10	2
	Test statistic: z(t)	-2.36	-2.48	0.16	-4.47	-1.43	-1.25	1.13	-3.96	-1.19	-0.82	0.78	-4.17
	Structural break at obs.	-	-	-	95	-	-	-	243	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0	H1	H0
Netherlands / Ireland	Number observations	154	156	157	156	312	312	312	308	220	220	220	217
	Lags	2	2	9	0	11	11	12	4	13	13	10	3
	Test statistic: z(t)	-0.47	-0.50	1.36	-5.42	-1.50	-1.40	1.18	-4.53	-2.16	-1.93	0.47	-3.10
	Structural break at obs.	-	-	-	95	-	-	-	243	-	-	-	587
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / Ireland	Number observations	154	156	157	156	312	312	312	308	220	220	220	218
	Lags	2	2	9	0	11	11	12	4	12	12	10	2
	Test statistic: z(t)	-0.11	-0.10	1.20	-4.86	-1.10	-1.22	0.55	-3.55	-4.12	-1.52	0.73	-3.57
	Structural break at obs.	-	-	-	95	-	-	-	221	-	-	-	587
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Ireland	Number observations	143	156	157	153	312	312	312	308	220	220	220	217
	Lags	13	13	9	3	11	11	12	4	12	12	10	3
	Test statistic: z(t)	-1.36	-1.04	1.11	-3.54	-2.22	-2.62	0.24	-3.67	-1.35	-0.87	1.39	-4.83
	Structural break at obs.	-	-	-	109	-	-	-	343	-	-	-	588
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H0	H0	H0	H0	H1	H1
Luxembourg / Italy	Number observations	153	156	157	156	312	312	312	308	220	220	220	217
	Lags	3	3	9	0	6	6	12	4	13	13	10	3
	Test statistic: z(t)	-2.23	-2.17	0.89	-2.96	-1.39	-1.51	0.96	-4.17	-0.30	-4.06	1.78	-6.15
	Structural break at obs.	-	-	-	26	-	-	-	393	-	-	-	516
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H1	H1	H1
Netherlands / Italy	Number observations	153	156	157	156	312	312	312	309	220	220	220	217
	Lags	3	3	9	0	5	5	12	3	11	11	10	3
	Test statistic: z(t)	0.17	0.20	1.14	-3.82	-1.84	-1.84	0.89	-5.26	-0.78	-2.18	1.03	-3.52
	Structural break at obs.	-	-	-	36	-	-	-	392	-	-	-	647
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H1	H0	H0	H1	H0
Portugal / Italy	Number observations	154	156	157	153	312	312	312	308	220	220	220	217
	Lags	2	2	9	3	11	11	12	4	13	13	10	3
	Test statistic: z(t)	0.30	0.31	0.94	-3.20	-1.85	-1.72	0.51	-3.67	-2.16	-2.72	0.51	-3.25
	Structural break at obs.	-	-	-	36	-	-	-	384	-	-	-	583
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Italy	Number observations	154	156	157	156	312	312	312	309	220	220	220	217
	Lags	2	2	9	0	3	3	12	3	12	12	10	3
	Test statistic: z(t)	-1.28	-1.30	0.79	-6.64	-3.58	-3.61	0.39	-4.29	-2.23	-2.05	1.57	-3.00
	Structural break at obs.	-	-	-	95	-	-	-	273	-	-	-	531
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H1	H1	H0	H0	H0	H0	H1	H0

Unit Root Tests of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Luxembourg	Number observations	143	156	157	154	312	312	312	312	220	220	220	217
	Lags	13	13	9	2	2	2	12	0	13	13	10	3
	Test statistic: z(t)	-1.08	-0.11	1.62	-5.00	-2.60	-2.65	0.60	-4.82	-1.05	-2.90	1.73	-4.88
	Structural break at obs.	-	-	-	55	-	-	-	262	-	-	-	548
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H1	H0	H0	H1	H1
Portugal / Luxembourg	Number observations	151	156	157	153	312	312	312	312	220	220	220	217
	Lags	5	5	9	3	2	2	12	0	13	13	10	3
	Test statistic: z(t)	0.55	0.43	1.48	-3.87	-1.36	-1.50	1.40	-4.17	-0.91	-2.82	0.70	-3.16
	Structural break at obs.	-	-	-	40	-	-	-	206	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Luxembourg	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	2	2	12	0	13	13	10	3
	Test statistic: z(t)	-1.60	-1.58	0.99	-5.33	-1.96	-1.98	1.53	-4.63	-1.35	-2.03	0.87	-2.94
	Structural break at obs.	-	-	-	95	-	-	-	393	-	-	-	531
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H1	H0	H0	H1	H0	H0	H0	H1	H0
Portugal / Netherlands	Number observations	145	156	157	153	312	312	312	310	220	220	220	217
	Lags	11	11	9	3	2	2	12	2	12	12	10	3
	Test statistic: z(t)	-1.40	-2.05	0.51	-3.82	-1.39	-1.56	1.17	-3.23	-1.78	-2.35	0.95	-3.35
	Structural break at obs.	-	-	-	110	-	-	-	345	-	-	-	635
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H1	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Netherlands	Number observations	154	156	157	156	312	312	312	312	220	220	220	217
	Lags	2	2	9	0	2	2	12	0	11	11	10	3
	Test statistic: z(t)	-1.36	-1.47	0.35	-4.65	-1.82	-1.90	1.42	-4.23	-1.67	-1.78	1.49	-2.69
	Structural break at obs.	-	-	-	95	-	-	-	392	-	-	-	531
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0	H1	H0
Spain / Portugal	Number observations	154	156	157	156	312	312	312	310	220	220	220	217
	Lags	2	2	9	0	11	11	12	2	13	13	10	3
	Test statistic: z(t)	-1.13	-1.03	0.42	-4.17	-1.60	-1.81	0.50	-4.20	-1.30	-1.62	1.71	-3.31
	Structural break at obs.	-	-	-	95	-	-	-	221	-	-	-	572
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H0	H0	H0	H0	H0	H0	H1	H0	H0	H0	H1	H0

Legend Appendix Table 9: The significance level for the rejection of the H0 is 5%. The table displays the results for seasonally unadjusted monthly real exchange rates. Linear trends are not allowed ADF: Augmented Dickey-Fuller Test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags chosen according to Akaike’s information criterion (AIC). PP: Phillips–Perron test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike’s information criterion (AIC). Critical values for the PP are the same as for the ADF. KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H0 = stationary around linear trend, H1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H0 = unit root, H1 stationarity with a break in the intercept or trend).

Appendix Table 10 – Unit Root Tests of the First Differences of Real Exchange Rates

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Belgium / Austria	Number observations	146	155	156	152	312	312	312	309	220	220	220	217
	Lags	9	9	79	3	5	5	24	3	13	13	8	3
	Test statistic: z(t)	-5.88	-10.83	0.29	-8.70	-7.38	-15.99	0.13	-8.80	-4.49	-18.56	0.06	-11.06
	Structural break at obs.	-	-	-	43	-	-	-	230	-	-	-	627
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Finland / Austria	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	8	0	11	11	4	0	13	13	11	3
	Test statistic: z(t)	-9.80	-13.40	0.19	-13.62	-4.06	-16.95	0.10	-17.07	-2.83	-15.84	0.20	-11.57
	Structural break at obs.	-	-	-	94	-	-	-	400	-	-	-	548
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H0	H1
France / Austria	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	19		1	1	31		13	13	9	3
	Test statistic: z(t)	-8.08	-10.96	0.19	-11.07	-12.41	-16.69	0.10	-9.94	-3.26	-19.06	0.50	-10.81
	Structural break at obs.	-	-	-	114	-	-	-	219	-	-	-	506
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H1	H1
Germany / Austria	Number observations	151	155	156	153	312	312	312	309	220	220	220	217
	Lags	4	4	19	2	13	13	10	3	13	13	11	3
	Test statistic: z(t)	-6.03	-10.54	0.13	-8.61	-4.15	-18.96	0.39	-10.79	-4.08	-22.22	0.14	-13.95
	Structural break at obs.	-	-	-	116	-	-	-	208	-	-	-	547
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Austria	Number observations	142	155	156	155	312	312	312	309	220	220	220	217
	Lags	13	13	12	0	5	5	17	3	13	13	11	3
	Test statistic: z(t)	-2.77	-12.26	0.19	-12.33	-8.41	-16.73	0.19	-12.13	-3.48	-18.02	0.57	-16.07
	Structural break at obs.	-	-	-	67	-	-	-	268	-	-	-	614
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	HO	H1	H0	H1	H1	H1	H0	H1	H1	H1	H1	H1
Ireland / Austria	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	12	0	13	13	5	3	13	13	30	3
	Test statistic: z(t)	-9.31	-11.88	0.07	-12.12	-4.73	-17.70	0.11	-10.77	-2.00	-16.44	0.53	-9.40
	Structural break at obs.	-	-	-	97	-	-	-	212	-	-	-	585
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H1	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Italy / Austria	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	19	0	1	1	13	3	13	13	8	3
	Test statistic: z(t)	-8.92	-10.92	0.19	-11.27	-12.60	-16.98	0.15	-9.78	-2.85	-17.14	0.72	-13.77
	Structural break at obs.	-	-	-	31	-	-	-	377	-	-	-	633
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	HO	H1	H1	H1	HO	H1	HO	H1	HO	H1
Luxembourg / Austria	Number observations	142	155	156	152	312	312	312	310	220	220	220	217
	Lags	13	13	24	3	4	4	20	2	13	13	7	3
	Test statistic: z(t)	-3.78	-10.23	0.22	-8.17	-8.14	-15.79	0.18	-11.86	-4.33	-31.13	0.41	-11.64
	Structural break at obs.	-	-	-	31	-	-	-	235	-	-	-	544
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	HO	H1	H1	H1	HO	H1	H1	H1	HO	H1
Netherlands / Austria	Number observations	143	155	156	152	312	312	312	308	220	220	220	217
	Lags	12	12	22	3	13	13	12	4	13	13	15	3
	Test statistic: z(t)	-5.77	-14.52	0.33	-8.55	-5.10	-22.58	0.32	-11.54	-3.53	-12.95	0.21	-15.28
	Structural break at obs.	-	-	-	68	-	-	-	233	-	-	-	523
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	HO	H1	H1	H1	HO	H1	H1	H1	HO	H1
Portugal / Austria	Number observations	142	155	156	153	312	312	312	311	220	220	220	217
	Lags	13	13	15	2	3	3	12	1	13	13	12	3
	Test statistic: z(t)	-2.67	-11.27	0.41	-10.06	-10.02	-17.94	0.17	-14.26	-2.31	-14.53	0.75	-11.03
	Structural break at obs.	-	-	-	67	-	-	-	390	-	-	-	569
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	HO	H1	HO	H1	H1	H1	HO	H1	HO	H1	HO	H1
Spain / Austria	Number observations	154	155	156	155	312	312	312	312	220	220	220	218
	Lags	1	1	13	0	1	1	8	0	13	13	15	2
	Test statistic: z(t)	-8.58	-11.28	0.11	-11.63	-12.56	-18.71	0.05	-18.80	-2.21	-13.65	0.84	-17.17
	Structural break at obs.	-	-	-	89	-	-	-	390	-	-	-	584
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	HO	H1	H1	H1	HO	H1	HO	H1	HO	H1
Finland / Belgium	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	9	0	11	11	11	0	13	13	11	3
	Test statistic: z(t)	-9.46	-13.23	0.27	-13.57	-4.17	-16.62	0.15	-16.75	-3.05	-16.26	0.12	-9.85
	Structural break at obs.	-	-	-	96	-	-	-	227	-	-	-	549
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	HO	H1	H1	H1	HO	H1	H1	H1	HO	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
France / Belgium	Number observations	153	155	156	155	312	312	312	309	220	220	220	219
	Lags	2	2	4		10	10	7		13	13	6	1
	Test statistic: z(t)	-7.01	-10.62	0.22	-10.84	-5.16	-15.73	0.06	-10.89	-3.47	-20.39	0.18	-14.24
	Structural break at obs.	-			119				219				504
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Germany / Belgium	Number observations	153	155	156	153	312	312	312	309	220	220	220	219
	Lags	2	2	4	2	12	12	10	3	13	13	2	1
	Test statistic: z(t)	-7.14	-9.50	0.09	-7.67	-4.94	-14.77	0.05	-7.38	-4.01	-21.14	0.03	-13.79
	Structural break at obs.	-	-	-	116	-	-	-	213	-	-	-	627
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Belgium	Number observations	146	155	156	153	312	312	312	309	220	220	220	217
	Lags	9	9	14	2	5	5	19	3	13	13	10	3
	Test statistic: z(t)	-4.53	-12.36	0.28	-8.23	-8.11	-16.83	0.09	-11.00	-3.23	-18.78	0.39	-17.99
	Structural break at obs.	-	-	-	134	-	-	-	276	-	-	-	613
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / Belgium	Number observations	154	155	156	155	312	312	312	309	220	220	220	220
	Lags	1	1	19	0	13	13	46	3	13	13	12	0
	Test statistic: z(t)	-8.84	-11.60	0.14	-12.18	-4.27	-18.14	0.09	-10.51	-1.88	-15.98	0.79	-16.55
	Structural break at obs.	-	-	-	97	-	-	-	227	-	-	-	574
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Italy / Belgium	Number observations	150	155	156	154	312	312	312	309	220	220	220	220
	Lags	5	5	7	1	5	5	16	3	1	1	8	0
	Test statistic: z(t)	-4.05	-8.84	0.45	-8.63	-7.53	-17.47	0.15	-9.57	####	-16.21	0.45	-16.67
	Structural break at obs.	-	-	-	42	-	-	-	227	-	-	-	584
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Belgium	Number observations	152	155	156	152	312	312	312	311	220	220	220	218
	Lags	3	3	10	3	3	3	18	1	13	13	7	2
	Test statistic: z(t)	-7.80	-12.75	0.05	-8.12	-9.42	-15.34	0.13	-12.88	-4.13	-33.44	0.23	-12.90
	Structural break at obs.	-	-	-	46	-	-	-	219	-	-	-	590
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Belgium	Number observations	142	155	156	152	312	312	312	312	220	220	220	218
	Lags	13	13	8	3	1	1	13	0	13	13	15	2
	Test statistic: z(t)	-4.25	-15.16	0.05	-8.02	-13.00	-17.55	0.05	-17.85	-3.51	-12.82	0.12	-15.44
	Structural break at obs.	-	-	-	28	-	-	-	277	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Belgium	Number observations	145	155	156	153	312	312	312	309	220	220	220	217
	Lags	10	10	12	2	1	1	12	3	13	13	13	3
	Test statistic: z(t)	-4.92	-12.97	0.36	-9.84	-13.65	-17.86	0.11	-10.50	-2.98	-14.13	0.50	-16.36
	Structural break at obs.	-	-	-	80	-	-	-	231	-	-	-	572
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H1	H1
Spain / Belgium	Number observations	154	155	156	155	312	312	312	312	220	220	220	218
	Lags	1	1	5	0	1	1	11	0	13	13	14	2
	Test statistic: z(t)	-8.54	-11.50	0.18	-11.96	-12.40	-18.47	0.08	-18.67	-2.90	-13.65	0.61	-20.48
	Structural break at obs.	-	-	-	89	-	-	-	219	-	-	-	507
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H1	H1
France / Finland	Number observations	154	155	156	155	312	312	312	312	220	220	220	220
	Lags	1	1	8		1	1	8		13	13	6	0
	Test statistic: z(t)	-9.32	-13.00	0.08	-13.17	-11.42	-16.71	0.13	-17.00	-2.55	-16.68	0.16	-17.37
	Structural break at obs.	-	-	-	96	-	-	-	400	-	-	-	554
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H0	H1
Germany / Finland	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	8	0	11	11	9	0	13	13	11	3
	Test statistic: z(t)	-9.65	-13.19	0.26	-13.65	-3.93	-16.26	0.16	-16.25	-3.15	-17.03	0.13	-12.48
	Structural break at obs.	-	-	-	94	-	-	-	400	-	-	-	554
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Greece / Finland	Number observations	152	155	156	152	312	312	312	310	220	220	220	217
	Lags	3	3	7	3	4	4	17	2	13	13	10	3
	Test statistic: z(t)	-7.59	-14.08	0.11	-8.06	-9.08	-16.50	0.25	-11.93	-3.09	-18.08	0.30	-14.99
	Structural break at obs.	-	-	-	94	-	-	-	356	-	-	-	610
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Ireland / Finland	Number observations	152	155	156	154	312	312	312	310	220	220	220	218
	Lags	3	3	6	1	13	13	22	2	13	13	24	2
	Test statistic: z(t)	-7.44	-19.96	0.16	-12.69	-3.79	-18.09	0.11	-9.73	-1.97	-18.10	0.51	-9.05
	Structural break at obs.	-	-	-	94	-	-	-	207	-	-	-	573
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H1	H1
Italy / Finland	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	8	0	2	2	12	0	13	13	12	3
	Test statistic: z(t)	-9.78	-13.89	0.11	-14.15	-8.76	-15.78	0.20	-16.22	-2.58	-15.27	0.27	-11.30
	Structural break at obs.	-	-	-	96	-	-	-	205	-	-	-	554
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H0	H1
Luxembourg / Finland	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	7	0	11	11	11	0	13	13	1	3
	Test statistic: z(t)	-9.57	-13.29	0.24	-13.60	-4.03	-16.53	0.17	-16.70	-3.53	-28.84	0.09	-7.88
	Structural break at obs.	-	-	-	96	-	-	-	400	-	-	-	558
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Finland	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	9	0	1	1	10	0	13	13	15	2
	Test statistic: z(t)	-9.43	-13.47	0.30	-13.77	-11.80	-17.01	0.14	-17.29	-3.65	-11.10	0.08	-19.01
	Structural break at obs.	-	-	-	94	-	-	-	377	-	-	-	548
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Finland	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	20	0	13	13	15	3	13	13	13	3
	Test statistic: z(t)	-8.54	-12.25	0.38	-12.66	-4.00	-16.86	0.33	-11.01	-2.38	-14.15	0.37	-13.39
	Structural break at obs.	-	-	-	91	-	-	-	400	-	-	-	560
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H0	H1
Spain / Finland	Number observations	152	155	156	154	312	312	312	310	220	220	220	218
	Lags	3	3	6	1	1	1	18	2	13	13	15	2
	Test statistic: z(t)	-7.77	-19.43	0.11	-12.38	-12.63	-16.64	0.06	-11.74	-2.62	-11.74	0.46	-17.72
	Structural break at obs.	-	-	-	96	-	-	-	400	-	-	-	560
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Germany / France	Number observations	151	155	156	153	312	312	312	308	220	220	220	217
	Lags	4	4	7	2	10	10	9	4	13	13	10	3
	Test statistic: z(t)	-4.92	-9.80	0.14	-7.15	-4.60	-15.98	0.03	-9.05	-2.80	-23.12	0.33	-13.95
	Structural break at obs.	-	-	-	115	-	-	-	219	-	-	-	508
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H0	H1
Greece / France	Number observations	144	155	156	155	312	312	312	309	220	220	220	217
	Lags	11	11	10	0	1	1	6	3	13	13	10	3
	Test statistic: z(t)	-4.11	-13.45	0.07	-13.62	-13.47	-17.86	0.05	-9.61	-3.63	-21.06	0.31	-15.87
	Structural break at obs.	-	-	-	133	-	-	-	315	-	-	-	618
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / France	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	6	0	13	13	12	3	13	13	14	3
	Test statistic: z(t)	-8.33	-11.60	0.06	-11.92	-4.95	-19.61	0.10	-9.75	-2.35	-18.12	0.55	-7.32
	Structural break at obs.	-	-	-	97	-	-	-	225	-	-	-	581
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Italy / France	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	1	0	1	1	18	0	13	13	7	3
	Test statistic: z(t)	-7.73	-11.70	0.04	-11.85	-13.75	-18.84	0.13	-19.06	-3.19	-20.58	0.24	-12.42
	Structural break at obs.	-	-	-	114	-	-	-	387	-	-	-	583
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / France	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	2	0	10	10	7	3	13	13	7	3
	Test statistic: z(t)	-8.32	-11.39	0.23	-11.66	-5.13	-15.30	0.05	-10.41	-4.19	-35.00	0.12	-11.31
	Structural break at obs.	-	-	-	116	-	-	-	219	-	-	-	548
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / France	Number observations	154	155	156	152	312	312	312	308	220	220	220	217
	Lags	1	1	10	3	8	8	11	4	13	13	15	3
	Test statistic: z(t)	-8.50	-12.60	0.32	-7.15	-5.50	-15.91	0.04	-9.39	-3.48	-13.23	0.26	-14.62
	Structural break at obs.	-	-	-	115	-	-	-	219	-	-	-	507
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / France	Number observations	153	155	156	153	312	312	312	309	220	220	220	217
	Lags	2	2	20	2	1	1	13	3	13	13	11	3
	Test statistic: z(t)	-8.03	-10.84	0.51	-8.63	-13.30	-17.47	0.10	-10.04	-2.92	-16.70	0.45	-13.46
	Structural break at obs.	-	-	-	120	-	-	-	391	-	-	-	603
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H1	H1	H1	H1	H0	H1	H1	H1	H0	H1
Spain / France	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	79	0	2	2	10	0	13	13	15	3
	Test statistic: z(t)	-8.76	-11.48	0.31	-11.81	-10.93	-19.45	0.07	-19.53	-2.79	-11.78	0.51	-13.25
	Structural break at obs.	-	-	-	89	-	-	-	387	-	-	-	587
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Greece / Germany	Number observations	148	155	156	155	312	312	312	309	220	220	220	217
	Lags	7	7	14	0	5	5	18	3	13	13	12	3
	Test statistic: z(t)	-3.91	-12.24	0.28	-12.82	-8.75	-16.65	0.08	-11.61	-3.56	-18.26	0.36	-18.08
	Structural break at obs.	-	-	-	116	-	-	-	268	-	-	-	626
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Ireland / Germany	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	12	0	11	11	20	3	13	13	21	0
	Test statistic: z(t)	-8.86	-12.29	0.13	-12.41	-4.21	-17.51	0.11	-10.27	-2.39	-18.22	0.58	-20.05
	Structural break at obs.	-	-	-	95	-	-	-	227	-	-	-	582
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Italy / Germany	Number observations	152	155	156	155	312	312	312	309	220	220	220	217
	Lags	3	3	8	0	1	1	14	3	13	13	3	3
	Test statistic: z(t)	-5.35	-10.28	0.28	-10.66	-12.40	-16.61	0.11	-9.36	-2.66	-23.00	0.60	-10.33
	Structural break at obs.	-	-	-	26	-	-	-	376	-	-	-	577
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Luxembourg / Germany	Number observations	150	155	156	152	312	312	312	309	220	220	220	217
	Lags	5	5	4	3	2	2	11	3	13	13	8	3
	Test statistic: z(t)	-6.04	-9.87	0.06	-7.33	-9.18	-15.82	0.04	-7.77	-4.07	-30.68	0.25	-13.57
	Structural break at obs.	-	-	-	114	-	-	-	283	-	-	-	592
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Germany	Number observations	154	155	156	155	312	312	312	310	220	220	220	217
	Lags	1	1	42	0	13	13	12	2	13	13	13	3
	Test statistic: z(t)	-8.54	-12.37	0.15	-12.81	-5.17	-17.97	0.12	-11.91	-3.40	-16.74	0.17	-12.97
	Structural break at obs.	-	-	-	110	-	-	-	207	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Germany	Number observations	154	155	156	153	312	312	312	311	220	220	220	217
	Lags	1	1	16	2	3	3	11	1	13	13	13	3
	Test statistic: z(t)	-8.78	-11.57	0.25	-8.89	-9.85	-17.74	0.07	-14.07	-2.28	-15.24	0.49	-15.94
	Structural break at obs.	-	-	-	114	-	-	-	390	-	-	-	603
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Spain / Germany	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	6	0	1	1	7	0	13	13	15	3
	Test statistic: z(t)	-8.02	-11.40	0.17	-12.08	-12.76	-18.56	0.09	-18.66	-2.38	-12.81	0.64	-18.29
	Structural break at obs.	-	-	-	95	-	-	-	376	-	-	-	638
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Ireland / Greece	Number observations	148	155	156	153	312	312	312	309	220	220	220	217
	Lags	7	7	11	2	5	5	15	3	13	13	8	3
	Test statistic: z(t)	-4.17	-13.22	0.09	-8.79	-8.25	-16.80	0.19	-11.49	-2.78	-16.98	0.25	-17.35
	Structural break at obs.	-	-	-	103	-	-	-	315	-	-	-	613
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H0	H1
Italy / Greece	Number observations	148	155	156	153	312	312	312	309	220	220	220	217
	Lags	7	7	9	2	5	5	4	3	13	13	10	3
	Test statistic: z(t)	-4.41	-14.58	0.10	-8.98	-7.27	-17.86	0.09	-10.69	-3.91	-19.73	0.21	-18.33
	Structural break at obs.	-	-	-	60	-	-	-	327	-	-	-	618
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Luxembourg / Greece	Number observations	146	155	156	155	312	312	312	309	220	220	220	217
	Lags	9	9	24	0	13	13	21	3	13	13	6	3
	Test statistic: z(t)	-4.24	-11.92	0.33	-12.23	-5.19	-17.45	0.08	-10.76	-3.36	-27.59	0.19	-12.40
	Structural break at obs.	-	-	-	133	-	-	-	271	-	-	-	614
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Greece	Number observations	153	155	156	153	312	312	312	309	220	220	220	217
	Lags	2	2	9	2	5	5	13	3	13	13	13	3
	Test statistic: z(t)	-8.25	-13.89	0.31	-8.64	-8.51	-18.07	0.10	-11.61	-3.09	-15.55	0.20	-18.78
	Structural break at obs.	-	-	-	126	-	-	-	227	-	-	-	622
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Greece	Number observations	142	155	156	153	312	312	312	308	220	220	220	217
	Lags	13	13	11	2	13	13	13	4	13	13	9	3
	Test statistic: z(t)	-3.19	-13.02	0.57	-8.83	-5.72	-19.48	0.05	-11.30	-3.74	-18.79	0.21	-14.71
	Structural break at obs.	-	-	-	90	-	-	-	284	-	-	-	613
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H1	H1	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Greece	Number observations	151	155	156	153	312	312	312	311	220	220	220	217
	Lags	4	4	13	2	3	3	9	1	13	13	7	3
	Test statistic: z(t)	-6.22	-12.96	0.10	-8.64	-10.43	-20.04	0.17	-15.59	-3.79	-24.60	0.12	-11.65
	Structural break at obs.	-	-	-	72	-	-	-	284	-	-	-	610
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Italy / Ireland	Number observations	154	155	156	155	312	312	312	308	220	220	220	217
	Lags	1	1	7	0	8	8	40	4	13	13	11	3
	Test statistic: z(t)	-8.50	-11.67	0.05	-12.17	-8.02	-19.43	0.16	-10.24	-2.47	-15.89	0.53	-7.28
	Structural break at obs.	-	-	-	97	-	-	-	271	-	-	-	582
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Luxembourg / Ireland	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	26	0	13	13	131	3	13	13	4	3
	Test statistic: z(t)	-8.68	-11.59	0.16	-12.06	-4.48	-18.28	0.15	-10.11	-2.00	-22.87	0.60	-7.39
	Structural break at obs.	-	-	-	97	-	-	-	227	-	-	-	579
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1
Netherlands / Ireland	Number observations	154	155	156	155	312	312	312	309	220	220	220	218
	Lags	1	1	10	0	13	13	91	3	13	13	16	2
	Test statistic: z(t)	-9.60	-12.91	0.16	-13.23	-4.66	-18.56	0.12	-9.95	-2.60	-11.71	0.46	-14.33
	Structural break at obs.	-	-	-	97	-	-	-	221	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H0	H1	H1	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Portugal / Ireland	Number observations	154	155	156	155	312	312	312	308	220	220	220	217
	Lags	1	1	4	0	13	13	3	4	13	13	11	3
	Test statistic: z(t)	-8.58	-11.35	0.26	-11.84	-4.22	-18.83	0.15	-10.91	-3.03	-15.24	0.48	-15.09
	Structural break at obs.	-	-	-	97	-	-	-	210	-	-	-	585
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H1	H1
Spain / Ireland	Number observations	143	155	156	153	312	312	312	308	220	220	220	218
	Lags	12	12	9	2	13	13	1	4	13	13	13	2
	Test statistic: z(t)	-2.97	-10.69	0.10	-5.89	-4.99	-19.88	0.06	-10.11	-2.56	-15.05	0.28	-16.21
	Structural break at obs.	-	-	-	96	-	-	-	313	-	-	-	637
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	HO	H1	H0	H1
Luxembourg / Italy	Number observations	153	155	156	155	312	312	312	309	220	220	220	217
	Lags	2	2	9	0	5	5	15	3	13	13	7	3
	Test statistic: z(t)	-6.03	-10.63	0.44	-11.01	-7.72	-17.34	0.13	-9.29	-4.71	-35.93	0.04	-12.38
	Structural break at obs.	-	-	-	41	-	-	-	227	-	-	-	536
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Netherlands / Italy	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	6	0	4	4	19	3	13	13	16	3
	Test statistic: z(t)	-8.62	-13.89	0.32	-14.25	-7.84	-17.75	0.15	-8.89	-3.71	-13.30	0.13	-12.52
	Structural break at obs.	-	-	-	26	-	-	-	229	-	-	-	511
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Italy	Number observations	154	155	156	153	312	312	312	308	220	220	220	217
	Lags	1	1	15	2	10	10	7	4	13	13	13	3
	Test statistic: z(t)	-8.65	-11.55	0.54	-8.98	-4.58	-18.10	0.12	-9.54	-2.77	-14.82	0.18	-16.64
	Structural break at obs.	-	-	-	68	-	-	-	324	-	-	-	572
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H1	H1	H1	H1	H0	H1	HO	H1	H0	H1
Spain / Italy	Number observations	154	155	156	155	312	312	312	309	220	220	220	217
	Lags	1	1	11	0	2	2	10	3	13	13	15	3
	Test statistic: z(t)	-9.00	-12.32	0.08	-12.83	-9.92	-19.56	0.17	-9.85	-3.53	-12.79	0.27	-14.34
	Structural break at obs.	-	-	-	89	-	-	-	234	-	-	-	583
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Unit Root Tests of the First Differences of the Real Exchange Rate													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Test		ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA	ADF	PP	KPSS	ZA
Netherlands / Luxembourg	Number observations	142	155	156	152	312	312	312	312	220	220	220	217
	Lags	13	13	7	3	1	1	22	0	13	13	13	3
	Test statistic: z(t)	-4.14	-14.60	0.04	-7.16	-12.82	-16.89	0.09	-17.20	-4.76	-18.18	0.06	-15.89
	Structural break at obs.	-	-	-	28	-	-	-	274	-	-	-	524
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Luxembourg	Number observations	151	155	156	153	312	312	312	309	220	220	220	217
	Lags	4	4	12	2	1	1	13	3	13	13	7	3
	Test statistic: z(t)	-6.58	-12.04	0.33	-10.11	-13.63	-17.71	0.08	-10.39	-4.06	-29.62	0.14	-11.75
	Structural break at obs.	-	-	-	80	-	-	-	227	-	-	-	572
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Luxembourg	Number observations	154	155	156	155	312	312	312	312	220	220	220	217
	Lags	1	1	1	0	1	1	12	0	13	13	10	3
	Test statistic: z(t)	-8.73	-11.55	0.18	-12.05	-12.61	-18.35	0.09	-18.49	-3.42	-21.97	0.34	-16.67
	Structural break at obs.	-	-	-	89	-	-	-	219	-	-	-	590
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Portugal / Netherlands	Number observations	145	155	156	152	312	312	312	308	220	220	220	217
	Lags	10	10	12	3	13	13	11	4	13	13	15	3
	Test statistic: z(t)	-5.24	-13.96	0.20	-9.66	-4.12	-17.84	0.13	-9.83	-2.95	-13.04	0.19	-14.56
	Structural break at obs.	-	-	-	124	-	-	-	392	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Netherlands	Number observations	154	155	156	155	312	312	312	312	220	220	220	218
	Lags	1	1	10	0	1	1	10	0	13	13	16	2
	Test statistic: z(t)	-9.12	-12.30	0.18	-12.68	-13.35	-18.69	0.08	-18.85	-3.18	-10.38	0.30	-19.42
	Structural break at obs.	-	-	-	89	-	-	-	377	-	-	-	586
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1
Spain / Portugal	Number observations	154	155	156	155	312	312	312	308	220	220	220	218
	Lags	1	1	3	0	10	10	14	4	13	13	12	2
	Test statistic: z(t)	-8.27	-11.64	0.30	-12.25	-5.20	-17.40	0.23	-10.55	-3.50	-20.66	0.13	-12.93
	Structural break at obs.	-	-	-	90	-	-	-	239	-	-	-	530
	5% significance level	-2.89	-2.89	0.46	-4.80	-2.88	-2.88	0.46	-4.80	-2.88	-2.88	0.46	-4.80
	10% significance level	-2.58	-2.58	0.35	-4.58	-2.57	-2.57	0.35	-4.58	-2.57	-2.57	0.35	-4.58
	Accepted Hypothesis	H1	H1	H0	H1	H1	H1	H0	H1	H1	H1	H0	H1

Legend Appendix Table 10: The significance level for the rejection of the H0 is 5%. The table displays the results for seasonally unadjusted monthly first differences of real exchange rates. ADF: Augmented Dickey-Fuller Test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags chosen according to Akaike's information criterion (AIC). PP: Phillips-Perron test (H0 = unit root possibly with drift, H1 = stationary around linear trend), lags are Newey-West lags and chosen according to Akaike's information criterion (AIC). Critical values for the PP are the same as for the ADF. KPSS: Kwiatkowski-Phillips-Schmidt-Shin test for stationarity (H0 = stationary around linear trend, H1 = unit root). ZA: Zivot-Andrews Unit Root test allowing for a single break in intercept or trend (H0 = unit root, H1 stationarity with a break in the intercept or trend).

Appendix Table 11 – Augmented Engle-Granger Cointegration Tests of Real Exchange Rates

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Belgium / Austria	Number observations	156	156	299	308	195	195
	Lags	0	0	12	3	24	24
	Test statistic: z(t)	-3.10	-3.52	-3.13	-2.43	-2.34	-2.32
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Finland / Austria	Number observations	156	156	298	298	207	204
	Lags	0	0	13	13	12	15
	Test statistic: z(t)	-2.15	-2.39	-2.31	-1.49	-2.57	-2.04
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
France / Austria	Number observations	155	154	299	311	212	207
	Lags	1	2	12	0	7	12
	Test statistic: z(t)	-3.20	-4.58	-3.90	-2.97	-0.99	-0.78
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H1	H0	H0	H0	H0
Germany / Austria	Number observations	156	156	299	299	207	206
	Lags	0	0	12	12	12	13
	Test statistic: z(t)	-3.47	-3.86	-2.36	-2.00	-1.15	-1.43
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0
Greece / Austria	Number observations	144	150	299	305	204	204
	Lags	12	6	12	6	15	15
	Test statistic: z(t)	-3.34	-3.55	-3.28	-2.01	-1.29	-1.44
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Ireland / Austria	Number observations	153	153	287	307	207	203
	Lags	3	3	24	4	12	16
	Test statistic: z(t)	-2.41	-2.46	-3.04	-1.25	-1.72	-1.30
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Italy / Austria	Number observations	155	156	299	290	207	207
	Lags	1	0	12	21	12	12
	Test statistic: z(t)	-1.56	-2.67	-2.78	-1.41	-1.47	-1.22
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Luxembourg / Austria	Number observations	156	156	299	299	207	206
	Lags	0	0	12	12	12	13
	Test statistic: z(t)	-3.06	-3.39	-4.01	-3.03	-1.29	-0.95
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Netherlands / Austria	Number observations	155	155	299	309	207	207
	Lags	1	1	12	2	12	12
	Test statistic: z(t)	-4.33	-5.14	-0.30	-2.60	-2.53	-2.50
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0
Portugal / Austria	Number observations	155	144	311	311	207	207
	Lags	1	12	0	0	12	12
	Test statistic: z(t)	-2.79	-1.72	-3.10	-3.12	-2.09	-2.17
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Austria	Number observations	155	156	285	307	207	205
	Lags	1	0	26	4	12	14
	Test statistic: z(t)	-2.84	-2.45	-3.66	-1.30	-1.14	-1.18
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Finland / Belgium	Number observations	156	156	299	299	199	199
	Lags	0	0	12	12	20	20
	Test statistic: z(t)	-2.03	-1.56	-2.37	-1.84	-3.12	-3.09
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
France / Belgium	Number observations	156	156	299	299	195	195
	Lags	0	0	12	12	24	24
	Test statistic: z(t)	-1.51	-2.33	-4.19	-2.37	-1.98	-1.66
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H1	H0	H0	H0
Germany / Belgium	Number observations	152	155	310	311	206	206
	Lags	4	1	1	0	13	13
	Test statistic: z(t)	-1.50	-2.81	-1.59	-1.18	-3.45	-3.77
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H1	H0	H0
Greece / Belgium	Number observations	150	150	299	307	193	195
	Lags	6	6	12	4	26	24
	Test statistic: z(t)	-4.51	-4.65	-3.23	-2.21	-1.68	-1.24
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0
Ireland / Belgium	Number observations	155	155	299	299	219	199
	Lags	1	1	12	12	0	20
	Test statistic: z(t)	-2.15	-2.18	-3.44	-1.34	-2.14	-1.08
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Italy / Belgium	Number observations	155	156	290	290	219	219
	Lags	1	0	21	21	0	0
	Test statistic: z(t)	-1.66	-1.87	-3.52	-4.08	-1.80	-1.24
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H1	H0	H0
Luxembourg / Belgium	Number observations	156	156	311	311	193	194
	Lags	0	0	0	0	26	25
	Test statistic: z(t)	-3.99	-3.62	-2.79	-3.05	-2.38	-1.94
	5% significance level	-3.84	-3.38	-3.81	-3.36	-3.82	-3.36
	10% significance level	-3.54	-3.07	-3.52	-3.06	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Netherlands / Belgium	Number observations	154	154	295	295	207	207
	Lags	2	2	16	16	12	12
	Test statistic: z(t)	-4.75	-4.79	-1.13	-1.39	-2.85	-2.99
	Structural break at obs.						
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0
Portugal / Belgium	Number observations	144	153	311	311	207	206
	Lags	12	3	0	0	12	13
	Test statistic: z(t)	-1.57	-1.78	-2.54	-2.43	-2.34	-2.46
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
	Spain / Belgium	Number observations	154	155	310	310	205	205
Lags		2	1	1	1	14	14
Test statistic: z(t)		-2.36	-1.60	-1.98	-2.09	-1.72	-0.88
5% significance level		-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
10% significance level		-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
Decision		H0	H0	H0	H0	H0	H0
France / Finland		Number observations	156	156	310	309	207	207
	Lags	0	0	1	2	12	12
	Test statistic: z(t)	-0.35	-0.95	-2.40	-2.42	-1.50	-2.49
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
	Germany / Finland	Number observations	144	154	298	299	205	195
Lags		12	2	13	12	14	24
Test statistic: z(t)		-1.43	-1.24	-2.99	-2.22	-1.55	-2.34
5% significance level		-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
10% significance level		-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
Decision		H0	H0	H0	H0	H0	H0
Greece / Finland		Number observations	150	150	299	310	207	207
	Lags	6	6	12	1	12	12
	Test statistic: z(t)	-2.43	-2.53	-2.75	-1.84	-1.97	-2.20
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Ireland / Finland	Number observations	155	156	299	299	206	207
	Lags	1	0	12	12	13	12
	Test statistic: z(t)	0.20	0.22	-1.83	-2.01	-1.79	-2.20
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Italy / Finland	Number observations	156	156	310	299	207	207
	Lags	0	0	1	12	12	12
	Test statistic: z(t)	-2.83	-2.98	-3.03	-2.38	-1.88	-2.49
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Luxembourg / Finland	Number observations	151	156	297	299	204	207
	Lags	5	0	14	12	15	12
	Test statistic: z(t)	-1.25	-1.38	-3.41	-2.55	-1.14	-2.54
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Netherlands / Finland	Number observations	156	156	299	299	207	207
	Lags	0	0	12	12	12	12
	Test statistic: z(t)	-2.76	-2.05	-1.65	-1.56	-2.62	-2.63
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Portugal / Finland	Number observations	150	156	311	308	205	195
	Lags	6	0	0	3	14	24
	Test statistic: z(t)	-0.50	-1.03	-2.76	-2.46	-2.28	-2.57
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Finland	Number observations	156	156	306	310	207	207
	Lags	0	0	5	1	12	12
	Test statistic: z(t)	-3.48	-3.57	-2.37	-2.73	-1.50	-2.05
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Germany / France	Number observations	154	154	311	311	206	207
	Lags	2	2	1	0	13	12
	Test statistic: z(t)	-1.65	-2.06	-2.59	-1.59	-3.38	-1.12
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H1	H0	H0
Greece / France	Number observations	150	150	299	311	207	207
	Lags	6	6	12	0	12	12
	Test statistic: z(t)	-2.87	-2.84	-3.47	-3.44	-3.03	-1.28
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Ireland / France	Number observations	156	156	305	305	207	207
	Lags	0	0	6	6	12	12
	Test statistic: z(t)	-1.49	-1.09	-2.65	-2.19	-2.75	-2.34
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Italy / France	Number observations	155	156	311	311	196	196
	Lags	1	0	0	0	23	23
	Test statistic: z(t)	-2.12	-2.09	-4.21	-2.54	-1.64	-1.57
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H1	H0	H0	H0
Luxembourg / France	Number observations	144	144	297	307	206	206
	Lags	12	12	14	4	13	13
	Test statistic: z(t)	-2.50	-2.93	-4.63	-1.47	-2.67	-1.61
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H1	H0	H0	H0
Netherlands / France	Number observations	156	156	304	305	207	207
	Lags	0	0	7	6	12	12
	Test statistic: z(t)	-3.71	-3.57	-2.49	-2.24	-3.21	-2.17
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Portugal / France	Number observations	156	156	311	311	207	207
	Lags	0	0	0	0	12	12
	Test statistic: z(t)	-2.17	-1.97	-2.64	-1.85	-3.21	-3.28
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / France	Number observations	155	156	311	311	206	207
	Lags	1	0	0	0	13	12
	Test statistic: z(t)	-2.73	-1.09	-1.98	-2.15	-2.84	-1.56
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Greece / Germany	Number observations	150	150	301	305	196	203
	Lags	6	6	10	6	23	16
	Test statistic: z(t)	-3.12	-3.09	-2.75	-2.68	-1.38	-1.36
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Ireland / Germany	Number observations	156	155	308	309	196	195
	Lags	0	1	3	2	23	24
	Test statistic: z(t)	-2.52	-2.95	-2.28	-1.72	-1.45	-1.65
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Italy / Germany	Number observations	155	155	311	311	206	206
	Lags	1	1	0	0	13	13
	Test statistic: z(t)	-1.63	-1.97	-1.55	-1.41	-2.43	-1.88
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Luxembourg / Germany	Number observations	153	144	311	311	206	206
	Lags	3	12	0	0	13	13
	Test statistic: z(t)	-3.30	-3.14	-1.86	-1.74	-2.96	-2.68
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Netherlands / Germany	Number observations	156	156	310	311	204	206
	Lags	0	0	1	0	15	13
	Test statistic: z(t)	-4.32	-3.45	-3.03	-3.22	-2.88	-2.76
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H0	H0	H0	H0	H0
Portugal / Germany	Number observations	156	156	311	311	207	207
	Lags	0	0	0	0	12	12
	Test statistic: z(t)	-2.63	-2.48	-2.99	-2.89	-2.64	-2.52
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Germany	Number observations	156	156	311	311	196	207
	Lags	0	0	0	0	23	12
	Test statistic: z(t)	-3.24	-0.74	-1.99	-1.99	-1.15	-1.06
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Ireland / Greece	Number observations	144	144	301	309	207	207
	Lags	12	12	10	2	12	12
	Test statistic: z(t)	-1.76	-2.74	-1.78	-1.99	-3.50	-3.51
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H1
Italy / Greece	Number observations	155	150	299	299	206	207
	Lags	1	6	12	12	13	12
	Test statistic: z(t)	-1.09	-2.54	-2.46	-1.36	-4.50	-1.07
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H1	H0
Luxembourg / Greece	Number observations	147	150	299	299	202	206
	Lags	9	6	12	12	17	13
	Test statistic: z(t)	-3.25	-4.25	-4.14	-3.32	-2.46	-1.13
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H1	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Netherlands / Greece	Number observations	156	150	305	307	207	207
	Lags	0	6	6	4	12	12
	Test statistic: z(t)	-4.94	-3.48	-2.22	-2.05	-3.52	-1.49
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H0	H0	H0	H0	H0
Portugal / Greece	Number observations	156	146	299	299	207	207
	Lags	0	10	12	12	12	12
	Test statistic: z(t)	-2.90	-1.58	-3.57	-2.54	-3.16	-1.81
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Greece	Number observations	156	150	304	311	207	207
	Lags	0	6	7	0	12	12
	Test statistic: z(t)	-2.25	-2.31	-2.55	-2.11	-2.72	-1.47
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Italy / Ireland	Number observations	156	156	304	306	207	203
	Lags	0	0	7	5	12	16
	Test statistic: z(t)	-1.19	-1.04	-1.68	-2.13	-2.75	-1.08
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Luxembourg / Ireland	Number observations	155	154	299	301	202	203
	Lags	1	2	12	10	17	16
	Test statistic: z(t)	-3.26	-2.66	-2.88	-1.28	-1.49	-0.93
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Netherlands / Ireland	Number observations	156	151	299	299	207	206
	Lags	0	5	12	12	12	13
	Test statistic: z(t)	-5.39	-2.67	-1.73	-0.76	-2.93	-1.25
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Portugal / Ireland	Number observations	156	156	305	307	207	207
	Lags	0	0	6	4	12	12
	Test statistic: z(t)	-3.60	-3.21	-1.51	-1.12	-2.92	-1.57
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Ireland	Number observations	155	155	302	302	207	205
	Lags	1	1	9	9	12	14
	Test statistic: z(t)	-2.52	-1.16	-3.02	-1.39	-2.11	-1.89
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Luxembourg / Italy	Number observations	155	153	310	310	195	195
	Lags	1	3	1	1	24	24
	Test statistic: z(t)	-2.95	-2.04	-2.12	-2.12	-2.70	-1.60
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Netherlands / Italy	Number observations	156	156	299	299	207	207
	Lags	0	0	12	12	12	12
	Test statistic: z(t)	-3.05	-2.01	-2.18	-2.38	-2.95	-1.87
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Portugal / Italy	Number observations	152	156	311	311	207	207
	Lags	4	0	0	0	12	12
	Test statistic: z(t)	-0.50	-0.98	-2.85	-1.75	-3.08	-3.00
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Italy	Number observations	156	156	302	301	201	201
	Lags	0	0	9	10	18	18
	Test statistic: z(t)	-2.00	-1.86	-2.72	-2.51	-1.87	-0.97
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Augmented Engle-Granger Cointegration Tests for Real Exchange Rate Components							
Period		1960:1 - 1972:12		1973:1 - 1998:12		1999:1 - 2017:5	
Test		With Trend	Without Trend	With Trend	Without Trend	With Trend	Without Trend
Netherlands / Luxembourg	Number observations	153	156	299	299	204	204
	Lags	3	0	12	12	15	15
	Test statistic: z(t)	-5.56	-5.16	-1.69	-1.81	-3.35	-2.69
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H1	H1	H0	H0	H0	H0
Portugal / Luxembourg	Number observations	153	153	311	311	196	205
	Lags	3	3	0	0	23	14
	Test statistic: z(t)	-2.15	-1.98	-2.71	-2.20	-2.16	-2.77
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Luxembourg	Number observations	154	150	309	309	206	207
	Lags	2	6	2	2	13	12
	Test statistic: z(t)	-2.51	-0.97	-1.74	-1.76	-1.76	-1.12
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Portugal / Netherlands	Number observations	153	153	311	311	207	207
	Lags	3	3	0	0	12	12
	Test statistic: z(t)	-3.07	-1.94	-2.64	-2.05	-1.73	-1.70
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Netherlands	Number observations	155	156	305	311	203	207
	Lags	1	0	6	0	16	12
	Test statistic: z(t)	-2.92	-2.11	-0.88	-1.79	-1.72	-1.24
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0
Spain / Portugal	Number observations	155	153	311	311	207	207
	Lags	1	3	0	0	12	12
	Test statistic: z(t)	-3.01	-0.93	-2.58	-2.31	-2.38	-2.77
	5% significance level	-4.20	-3.80	-4.16	-3.77	-3.82	-3.36
	10% significance level	-3.89	-3.49	-3.86	-3.47	-3.53	-3.06
	Decision	H0	H0	H0	H0	H0	H0

Appendix Table 12 – Johanssen Cointegration Tests of Real Exchange Rates

Johansen Cointegration Tests for Real Exchange Rate Components												
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5		
Belgium / Austria	Number observations	154				311				221		
	Lags	3				13				13		
	Cointegration rank at significance level 5%	-				0				0		
	Trace statistics	52.202	27.991	6.680		15.929	7.249	0.886		10.670	1.117	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	1.000	0.737	0.737	1.000	1.000	0.978	0.978	1.000	0.963	0.963
	Cointegration vector	CPI(AUT)	CPI(BEL)	e(AUT/BEL)	Constant	CPI(AUT)	CPI(BEL)	e(AUT/BEL)	Constant	CPI(AUT)	CPI(BEL)	e(AUT/BEL)
	Coefficient	1.000	-1.025	13.494	-5.813	1.000	-1.242	-0.533	1.075	1.000	-0.965	-
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-
	Adjustment factor	-0.003	0.001	-0.017	-	0.007	0.009	0.004	-	-0.055	0.022	-
	Economically sensible	Yes	Yes	-	-	No	Yes	Yes	-	Yes	Yes	-
	VECM residual auto-correlation at lag	2				1				1		
	Jarque-Bera: p-value	0.000				0.000				0.176		
	Heteroskedasticity test of VECM residuals	Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value
	CPI(AUT)	ARCH(1)	0.000	0.0		ARCH(1)	0.164	0.4		ARCH(1)	0.000	0.0
	GARCH(1)	0.000			)	0.701			GARCH(1)	0.126		
CPI(BEL)	ARCH(1)	0.082	0.000		ARCH(1)	0.137	0.215		ARCH(1)	0.044	0.000	
	GARCH(1)	0.000			)	0.649			GARCH(1)	0.004		
e(AUT/BEL)	ARCH(1)	0.082	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.126			GARCH(1)	-	-	
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5		
Finland / Austria	Number observations	155				311				221		
	Lags	2				13				13		
	Cointegration rank at significance level 5%	0				2				0		
	Trace statistics	12.189	5.288	0.887		46.143	18.908	0.808		11.085	0.313	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	1.000	0.932	0.166	1.221	1.221	1.064	1.064	1.000	0.954	0.952
	Cointegration vector	CPI(AUT)	CPI(FIN)	e(AUT/FIN)	Constant	CPI(AUT)	CPI(FIN)	e(AUT/FIN)	Constant	CPI(AUT)	CPI(FIN)	e(AUT/FIN)
	Coefficient	1.000	-0.531	0.211	-2.058	1.000	-0.525	3.420	-1.908	1.000	-1.232	-
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-
	Adjustment factor	-0.024	0.027	-0.108	-	-0.001	0.002	-0.011	-	-0.007	0.039	-
	Economically sensible	Yes	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-
	VECM residual auto-correlation at lag	3				3				1		
	Jarque-Bera: p-value	0.000				0.000				0.001		
	Heteroskedasticity test of VECM residuals	Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value
	CPI(AUT)	ARCH(1)	0.006	0.005		ARCH(1)	0.036	0.058		ARCH(1)	0.027	0.056
	GARCH(1)	0.338			)	0.430			GARCH(1)	0.626		
CPI(FIN)	ARCH(1)	0.006	0.000		ARCH(1)	0.020	0.000		ARCH(1)	0.027	0.898	
	GARCH(1)	0.338			)	0.000			GARCH(1)	0.626		
e(AUT/FIN)	ARCH(1)	0.000	0.000		ARCH(1)	0.016	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-	

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
France / Austria	Number observations	156				311				221			
	Lags	1				13				14			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	27.402	11.201	3.699		56.589	13.488	0.816		9.620	1.615	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.934	0.952	1.099	1.099	1.091	1.091	1.005	1.000	0.964	0.964
	Cointegration vector	CPI(AUT)	CPI(FRA)	e(AUT/FRA)	Constant	CPI(AUT)	CPI(FRA)	e(AUT/FRA)	Constant	CPI(AUT)	CPI(FRA)	e(AUT/FRA)	Constant
	Coefficient	1.000	-1.083	-0.298	-0.076	1.000	-1.245	-1.478	1.045	1.000	-0.822	-	-0.906
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.072	-0.031	0.092		-0.005	-0.008	0.096		-0.001	-0.010	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	Yes	No	-	-
	VECM residual auto-correlation at lag	1				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.001			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.002	0.003		ARCH(1)	0.142	0.323		ARCH(1)	0.140	0.312		
	GARCH(1)	0.578			)	0.778			GARCH(1)	0.731			
CPI(FRA)	ARCH(1)	0.138	0.258		ARCH(1)	0.054	0.000		ARCH(1)	0.837	0.871		
	GARCH(1)	0.565			)	0.059			GARCH(1)	0.806			
e(AUT/FRA)	ARCH(1)	0.000	0.000		ARCH(1)	0.017	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-		
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Germany / Austria	Number observations	151				311				221			
	Lags	6				13				20			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	39.103	13.597	1.446		47.171	17.834	4.188		6.582	2.396	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.968	0.768	1.000	1.000	0.956	0.936	1.000	0.987	0.987	0.964
	Cointegration vector	CPI(AUT)	CPI(GER)	e(AUT/GER)	Constant	CPI(AUT)	CPI(GER)	e(AUT/GER)	Constant	CPI(AUT)	CPI(GER)	e(AUT/GER)	Constant
	Coefficient	1.000	-0.736	-3.550	-1.123	1.000	-0.892	3.994	-0.463	1.000	-1.326	-	1.468
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	-0.012	-0.011	0.005		-0.007	0.013	-0.032		-0.030	0.014	-	-
	Economically sensible	Yes	No	Yes	-	Yes	Yes	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				3				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.000	0.000		ARCH(1)	0.155	0.223		ARCH(1)	0.027	0.027		
	GARCH(1)	0.011			)	0.473			GARCH(1)	0.501			
CPI(GER)	ARCH(1)	0.000	0.000		ARCH(1)	0.002	0.000		ARCH(1)	0.621	0.855		
	GARCH(1)	0.011			)	0.000			GARCH(1)	0.910			
e(AUT/GER)	ARCH(1)	0.001	0.002		ARCH(1)	0.006	0.000		ARCH(1)	-	-		
	GARCH(1)	0.436			)	0.007			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components												
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5		
Greece / Austria	Number observations	153				311				221		
	Lags	4				15				13		
	Cointegration rank at significance level 5%					1				0		
	Trace statistics	25.029	11.852	2.607		33.199	13.516	5.548		6.522	2.256	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	1.000	0.992	0.604	1.060	1.060	1.049	1.049	1.001	1.000	0.965
	Cointegration vector	CPI(AUT)	CPI(GRC)	e(AUT/GRC)	Constant	CPI(AUT)	CPI(GRC)	e(AUT/GRC)	Constant	CPI(AUT)	CPI(GRC)	e(AUT/GRC)
	Coefficient	1.000	-1.435	-1.029	0.461	1.000	-0.548	-0.464	-2.171	1.000	-0.272	-
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-
	Adjustment factor	0.007	0.055	-0.005	-	-0.016	-0.003	0.069	-	0.000	-0.011	-
	Economically sensible	No	Yes	No	-	Yes	No	Yes	-	Yes	No	-
	VECM residual auto-correlation at lag	2				4				1		
	Jarque-Bera: p-value	0.000				0.000				0.000		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
	CPI(AUT)	ARCH(1)	0.000	0.000		ARCH(1)	0.363			ARCH(1)	0.000	0.000
	GARCH(1)	0.000			)	0.515			GARCH(1)	0.000		
CPI(GRC)	ARCH(1)	0.651	0.023		ARCH(1)	0.184	0.000		ARCH(1)	0.143	0.002	
	GARCH(1)	0.151			)	0.000			GARCH(1)	0.253		
e(AUT/GRC)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-	
Ireland / Austria	Number observations	155				311				221		
	Lags	2				13				14		
	Cointegration rank at significance level 5%	0				0				0		
	Trace statistics	26.267	14.991	5.075		28.755	8.949	0.242		9.767	1.530	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.007	1.000	1.000	0.136	1.004	1.004	1.000	1.000	1.000	0.994	0.971
	Cointegration vector	CPI(AUT)	CPI(IRL)	e(AUT/IRL)	Constant	CPI(AUT)	CPI(IRL)	e(AUT/IRL)	Constant	CPI(AUT)	CPI(IRL)	e(AUT/IRL)
	Coefficient	1.000	-0.173	-2.091	0.600	1.000	5.131	22.544	-25.067	1.000	-4.136	-
	Economically sensible	Yes	Yes	Yes	-	Yes	No	No	-	Yes	Yes	-
	Adjustment factor	0.000	0.003	-0.003	-	0.000	0.001	-0.002	-	-0.001	0.001	-
	Economically sensible	Yes	Yes	No	-	No	-	-	-	Yes	Yes	-
	VECM residual auto-correlation at lag	3				3				2		
	Jarque-Bera: p-value	0.000				0.000				0.005		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
	CPI(AUT)	ARCH(1)	0.003	0.004		ARCH(1)	0.479			ARCH(1)	0.146	0.000
	GARCH(1)	0.352			)	0.080	0.079		GARCH(1)	0.000	0.000	
CPI(IRL)	ARCH(1)	0.810	0.967		ARCH(1)	0.000	0.000		ARCH(1)	0.145	0.227	
	GARCH(1)	0.995			)	0.000			GARCH(1)	0.610		
e(AUT/IRL)	ARCH(1)	0.000	0.000		ARCH(1)	0.026	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-	

Johansen Cointegration Tests for Real Exchange Rate Components																
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5						
Italy / Austria	Number observations	155				311				221						
	Lags	2				15				24						
	Cointegration rank at significance level 5%	0				0				0						
	Trace statistics	20.364	9.128	2.689		28.199	12.527	1.289		12.758	2.091	-	-			
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-			
	4 largest moduli of eigenvalues	1.000	1.000	0.910	-0.144	1.308	1.308	1.051	-1.051	1.000	0.998	0.998	0.996			
	Cointegration vector	CPI(AUT)	CPI(ITA)	e(AUT/ITA)	Constant	CPI(AUT)	CPI(ITA)	e(AUT/ITA)	Constant	CPI(AUT)	CPI(ITA)	e(AUT/ITA)	Constant			
	Coefficient	1.000	-0.696	3.259	-7.742	1.000	2.863	-6.020	-17.817	1.000	4.434	-	-23.982			
	Economically sensible	Yes	Yes	No	-	Yes	No	Yes	-	Yes	No	-	-			
	Adjustment factor	-0.039	-0.010	-0.015	-	0.000	0.000	0.001	-	0.001	0.000	-	-			
Economically sensible	Yes	No	-	-	Yes	-	Yes	-	No	-	-	-				
VECM residual auto-correlation at lag	3				1				2							
Jarque-Bera: p-value	0.000				0.000				0.046							
Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value					
		ARCH(1)				0.000				0.000			ARCH(1)	0.152	0.358	ARCH(1)	0.152	0.842
	CPI(AUT)	GARCH(1)	0.000		0.000	ARCH(1)	0.486		0.227	ARCH(1)	0.000		0.000	ARCH(1)	0.152	0.842
		GARCH(1)	0.486				GARCH(1)				0.000				GARCH(1)		0.842
	CPI(ITA)	GARCH(1)	0.000		0.000	ARCH(1)	0.002		0.000	ARCH(1)	0.002		0.000	ARCH(1)	-	-
		GARCH(1)	0.486				GARCH(1)				0.000				GARCH(1)	
e(AUT/ITA)	GARCH(1)	0.000	0.227	ARCH(1)	0.000	0.000	ARCH(1)	0.000	0.000	ARCH(1)	-	-				
	GARCH(1)	0.000			GARCH(1)			0.000			GARCH(1)		-			
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5						
Luxembourg / Austria	Number observations	154				311				221						
	Lags	3				13				15						
	Cointegration rank at significance level 5%	-				0				0						
	Trace statistics	50.925	24.739	8.946		21.418	10.811	2.202		13.501	3.181	-	-			
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-			
	4 largest moduli of eigenvalues	1.000	1.000	0.757	0.235	1.000	1.000	0.989	0.986	1.000	1.000	0.955	0.955			
	Cointegration vector	CPI(AUT)	CPI(LUX)	e(AUT/LUX)	Constant	CPI(AUT)	CPI(LUX)	e(AUT/LUX)	Constant	CPI(AUT)	CPI(LUX)	e(AUT/LUX)	Constant			
	Coefficient	1.000	-1.043	8.104	-3.327	1.000	-1.154	-0.517	0.649	1.000	-0.418	-	-2.763			
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-			
	Adjustment factor	0.006	0.014	-0.025	-	0.015	0.021	0.030	-	0.003	-0.007	-	-			
Economically sensible	No	Yes	-	-	No	Yes	Yes	-	No	No	-	-				
VECM residual auto-correlation at lag	2				4				2							
Jarque-Bera: p-value	0.000				0.000				0.000							
Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value					
		ARCH(1)				0.152				0.000			ARCH(1)	0.169	0.210	ARCH(1)	0.326	0.025
	CPI(AUT)	GARCH(1)	0.842		0.000	ARCH(1)	0.428		0.000	ARCH(1)	0.109		0.000	ARCH(1)	0.090	0.000
		GARCH(1)	0.008				GARCH(1)				0.007				GARCH(1)		0.000	GARCH(1)	0.000
	CPI(LUX)	GARCH(1)	0.000		0.000	ARCH(1)	0.000		0.000	ARCH(1)	0.000		0.000	ARCH(1)	-	-
		GARCH(1)	0.194				GARCH(1)				0.000				GARCH(1)	
e(AUT/LUX)	GARCH(1)	0.000	0.000	ARCH(1)	0.000	0.000	ARCH(1)	0.000	0.000	ARCH(1)	-	-				
	GARCH(1)	0.000			GARCH(1)			0.000			GARCH(1)		-			

Johansen Cointegration Tests for Real Exchange Rate Components												
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5		
Netherlands / Austria	Number observations	153				311				221		
	Lags	4				13				18		
	Cointegration rank at significance level 5%	-				1				1		
	Trace statistics	50.739	25.777	4.475		42.806	14.698	6.054		20.411	0.894	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	1.000	0.794	0.503	1.000	1.000	0.968	0.960	1.016	1.000	0.985
	Cointegration vector	CPI(AUT)	CPI(NLD)	e(AUT/NLD)	Constant	CPI(AUT)	CPI(NLD)	e(AUT/NLD)	Constant	CPI(AUT)	CPI(NLD)	e(AUT/NLD)
	Coefficient	1.000	-0.770	-2.651	-0.414	1.000	-3.538	-16.988	10.918	1.000	-1.178	-
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-
	Adjustment factor	-0.044	-0.019	0.083		0.004	-0.001	0.005		-0.025	0.037	-
	Economically sensible	Yes	No	Yes	-	No	No	Yes	-	Yes	Yes	-
	VECM residual autocorrelation at lag	3				3				1		
	Jarque-Bera: p-value	0.000				0.000				0.000		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
CPI(AUT)	ARCH(1) GARCH(1)	0.000 0.007	0.000		ARCH(1))	0.389 0.932	0.689		ARCH(1) GARCH(1)	0.240 0.000	0.000	
CPI(NLD)	ARCH(1) GARCH(1)	0.147 0.000	0.000		ARCH(1))	0.089 0.104	0.000		ARCH(1) GARCH(1)	0.828 0.785	0.903	
e(AUT/NLD)	ARCH(1) GARCH(1)	0.000 0.022	0.000		ARCH(1))	0.098 0.000	0.000		ARCH(1) GARCH(1)	- -	-	
Portugal / Austria	Number observations	156				311				221		
	Lags	1				13				14		
	Cointegration rank at significance level 5%	0				-				0		
	Trace statistics	28.757	11.587	3.604		36.832	17.782	5.841		9.587	1.923	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.003	1.000	1.000	0.955	1.318	1.179	1.044	1.044	1.000	0.982	0.930
	Cointegration vector	CPI(AUT)	CPI(PRT)	e(AUT/PRT)	Constant	CPI(AUT)	CPI(PRT)	e(AUT/PRT)	Constant	CPI(AUT)	CPI(PRT)	e(AUT/PRT)
	Coefficient	1.000	-5.129	-14.916	35.603	1.000	-0.747	-0.776	-1.284	1.000	-1.261	-
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-
	Adjustment factor	-0.001	-0.003	0.001		-0.007	0.004	0.054		-0.005	0.009	-
	Economically sensible	Yes	No	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-
	VECM residual autocorrelation at lag	3				1				2		
	Jarque-Bera: p-value	0.000				0.000				0.000		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
CPI(AUT)	ARCH(1) GARCH(1)	0.002 0.511	0.004		ARCH(1))	0.044 0.553	0.042		ARCH(1) GARCH(1)	0.525 0.838	0.775	
CPI(PRT)	ARCH(1) GARCH(1)	0.205 0.001	0.000		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	0.910 0.863	0.957	
e(AUT/PRT)	ARCH(1) GARCH(1)	0.012 0.000	0.000		ARCH(1))	0.000 0.551	0.000		ARCH(1) GARCH(1)	- -	-	

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Austria	Number observations	156				311				221			
	Lags	1				15				14			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	22.333	4.817	1.276		38.005	17.775	4.861		13.005	3.000	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.936	0.989	1.040	1.040	1.035	1.035	1.000	0.997	0.968	0.968
	Cointegration vector	CPI(AUT)	CPI(ESP)	e(AUT/ESP)	Constant	CPI(AUT)	CPI(ESP)	e(AUT/ESP)	Constant	CPI(AUT)	CPI(ESP)	e(AUT/ESP)	Constant
	Coefficient	1.000	-0.378	0.530	-3.356	1.000	-1.754	-4.388	2.836	1.000	-0.083	-	-4.330
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.006	0.073	-0.058	-	-0.002	-0.002	0.004	-	0.000	-0.008	-	-
	Economically sensible	Yes	Yes	-	-	Yes	No	Yes	-	No	No	-	-
	VECM residual auto-correlation at lag	2				1				1			
	Jarque-Bera: p-value	0.000				0.000				0.055			
Heteroskedasticity test of VECM residuals	Prozess	Single significance e: p-value	Joint significance: p-value		Prozess	Single significance e: p-value	Joint significance: p-value		Prozess	Single significance e: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.002	0.004		ARCH(1)	0.088	0.142		ARCH(1)	0.140	0.323		
	GARCH(1)	0.446				0.684			GARCH(1)	0.730			
CPI(ESP)	ARCH(1)	0.428	0.008		ARCH(1)	0.004	0.000		ARCH(1)	0.276	0.000		
	GARCH(1)	0.134				0.000			GARCH(1)	0.000			
e(AUT/ESP)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.338			GARCH(1)	-	-		
Finland / Belgium	Number observations	155				311				221			
	Lags	2				13				19			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	18.282	5.164	0.220		41.558	11.357	3.883		14.906	0.503	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.977	0.274	1.108	1.108	1.048	1.048	1.000	0.976	0.964	0.964
	Cointegration vector	CPI(BEL)	CPI(FIN)	e(BEL/FIN)	Constant	CPI(BEL)	CPI(FIN)	e(BEL/FIN)	Constant	CPI(BEL)	CPI(FIN)	e(BEL/FIN)	Constant
	Coefficient	1.000	-1.635	-0.700	1.446	1.000	-0.457	-0.185	-2.356	1.000	-1.278	-	1.314
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.007	0.001	0.016	-	-0.003	-0.018	0.051	-	0.017	0.048	-	-
	Economically sensible	Yes	Yes	Yes	-	Yes	No	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	1				0				1			
	Jarque-Bera: p-value	0.000				0.000				0.216			
Heteroskedasticity test of VECM residuals	Prozess	Single significance e: p-value	Joint significance: p-value		Prozess	Single significance e: p-value	Joint significance: p-value		Prozess	Single significance e: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.051	0.000		ARCH(1)	0.411	0.000		ARCH(1)	0.241	0.003		
	GARCH(1)	0.000				0.000			GARCH(1)	0.111			
CPI(FIN)	ARCH(1)	0.051	0.000		ARCH(1)	0.060	0.000		ARCH(1)	0.195	0.389		
	GARCH(1)	0.000				0.000			GARCH(1)	0.757			
e(AUT/FIN)	ARCH(1)	0.000	0.000		ARCH(1)	0.001	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
France / Belgium	Number observations	156				311				221			
	Lags	1				14				13			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	42.136	5.111	0.960		55.526	29.877	7.028		6.707	1.333	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.982	0.964	1.035	1.035	1.031	1.030	1.000	0.997	0.968	0.968
	Cointegration vector	CPI(BEL)	CPI(FRA)	e(BEL/FRA)	Constant	CPI(BEL)	CPI(FRA)	e(BEL/FRA)	Constant	CPI(BEL)	CPI(FRA)	e(BEL/FRA)	Constant
	Coefficient	1.000	-1.141	-0.204	0.026	1.000	-0.905	-3.049	-0.528	1.000	-11.799	-	52.588
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.031	-0.016	0.024		-0.002	-0.003	0.016		0.000	0.000	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	0				1				1			
	Jarque-Bera: p-value	0.000				0.000				0.614			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.007	0.000		ARCH(1)	0.255	0.000		ARCH(1)	0.153	0.000	
	GARCH(1)	0.000				0.000			GARCH(1)	0.010			
CPI(FRA)	ARCH(1)	0.073	0.007		ARCH(1)	0.002	0.000		ARCH(1)	0.684			
	GARCH(1)	0.180				0.019			GARCH(1)	0.965	0.907		
e(AUT/FRA)	ARCH(1)	0.073	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.180				0.000			GARCH(1)	-	-		
Germany / Belgium	Number observations	151				311				221			
	Lags	6				13				13			
	Cointegration rank at significance level 5%	-				0				1			
	Trace statistics	49.525	23.034	6.484		18.572	7.639	0.474		15.418	1.272	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.985	0.780	1.026	1.026	1.000	1.000	1.000	0.958	0.928	0.928
	Cointegration vector	CPI(BEL)	CPI(GER)	e(BEL/GER)	Constant	CPI(BEL)	CPI(GER)	e(BEL/GER)	Constant	CPI(BEL)	CPI(GER)	e(BEL/GER)	Constant
	Coefficient	1.000	-1.223	-0.553	0.886	1.000	-0.649	-0.753	-1.537	1.000	-1.360	-	1.667
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.038	-0.032	0.048		-0.008	-0.002	0.004		-0.031	0.081	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				1				1			
	Jarque-Bera: p-value	0.000				0.000				0.020			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.684	0.000		ARCH(1)	0.159	0.000		ARCH(1)	0.106	0.000	
	GARCH(1)	0.965				0.000			GARCH(1)	0.000			
CPI(GER)	ARCH(1)	0.883	0.985		ARCH(1)	0.054	0.155		ARCH(1)	0.574	0.378		
	GARCH(1)	0.963				0.984			GARCH(1)	0.428			
e(AUT/GER)	ARCH(1)	0.090	0.228		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.842				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Greece / Belgium	Number observations	133				311				221			
	Lags	24				13				13			
	Cointegration rank at significance level 5%					2				0			
	Trace statistics	18.612	4.807	0.982		54.266	15.879	3.291		5.400	0.868	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.135	1.135	1.085	1.085	1.218	1.218	1.078	1.078	1.003	1.000	0.951	0.951
	Cointegration vector	CPI(BEL)	CPI(GRC)	e(BEL/GRC)	Constant	CPI(BEL)	CPI(GRC)	e(BEL/GRC)	Constant	CPI(BEL)	CPI(GRC)	e(BEL/GRC)	Constant
	Coefficient	1.000	-1.422	-0.584	-1.025	1.000	-0.563	-0.547	-2.141	1.000	-0.423	-	-2.724
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.035	0.312	-0.063	-	-0.014	-0.021	0.019	-	0.000	-0.016	-	-
	Economically sensible	Yes	Yes	No	-	Yes	No	Yes	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				3				0			
	Jarque-Bera: p-value	0.021				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.251	0.484		ARCH(1)	0.340	0.003		ARCH(1)	0.150	0.000		
	GARCH(1)	0.895				0.013			GARCH(1)	0.004			
CPI(GRC)	ARCH(1)	0.324	0.000		ARCH(1)	0.130	0.000		ARCH(1)	0.223	0.059		
	GARCH(1)	0.000				0.000			GARCH(1)	0.406			
e(AUT/GRC)	ARCH(1)	0.343	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.030				0.000			GARCH(1)	-	-		
Ireland / Belgium	Number observations	153				311				221			
	Lags	4				10				14			
	Cointegration rank at significance level 5%	1				2				0			
	Trace statistics	43.460	13.750	2.845		41.526	17.232	2.004		10.108	1.561	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.997	0.646	1.025	1.025	1.000	1.000	1.000	0.995	0.955	0.955
	Cointegration vector	CPI(BEL)	CPI(IRL)	e(BEL/IRL)	Constant	CPI(BEL)	CPI(IRL)	e(BEL/IRL)	Constant	CPI(BEL)	CPI(IRL)	e(BEL/IRL)	Constant
	Coefficient	1.000	-0.835	0.396	-1.872	1.000	-0.438	0.982	-2.426	1.000	-3.160	-	10.197
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	-0.011	-0.014	0.004	-	0.005	0.002	-0.052	-	-0.001	0.002	-	-
	Economically sensible	Yes	No	-	-	No	Yes	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				4				1			
	Jarque-Bera: p-value	0.000				0.000				0.810			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.005	0.000		ARCH(1)	0.311	0.000		ARCH(1)	0.203	0.090		
	GARCH(1)	0.000				0.000			GARCH(1)	0.450			
CPI(IRL)	ARCH(1)	0.637	0.893		ARCH(1)	0.004	0.000		ARCH(1)	0.203	0.000		
	GARCH(1)	0.960				0.000			GARCH(1)	0.450			
e(AUT/IRL)	ARCH(1)	0.637	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.960				0.001			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components												
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5		
Italy / Belgium	Number observations	153				311				221		
	Lags	4				14				3		
	Cointegration rank at significance level 5%	1				-				0		
	Trace statistics	41.018	12.750	1.541		54.122	24.769	4.458		14.242	0.943	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	1.000	0.975	0.729	1.136	1.136	1.104	1.104	1.000	0.998	0.306
	Cointegration vector	CPI(BEL)	CPI(ITA)	e(BEL/ITA)	Constant	CPI(BEL)	CPI(ITA)	e(BEL/ITA)	Constant	CPI(BEL)	CPI(ITA)	e(BEL/ITA)
	Coefficient	1.000	-1.073	1.669	-3.490	1.000	-0.477	0.026	-2.256	1.000	-0.142	-
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-
	Adjustment factor	-0.022	-0.004	-0.004	-	-0.028	0.014	-0.147	-	-0.001	-0.004	-
	Economically sensible	Yes	No	-	-	Yes	Yes	-	-	Yes	No	-
	VECM residual autocorrelation at lag	3				0				1		
	Jarque-Bera: p-value	0.000				0.000				0.272		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
CPI(AUT)	ARCH(1)	0.033	0.000		ARCH(1)	0.837	0.975		ARCH(1)	0.166	0.000	
	GARCH(1)	0.000			)	0.953			GARCH(1)	0.032		
CPI(ITA)	ARCH(1)	0.502	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.315	0.000	
	GARCH(1)	0.000			)	0.000			GARCH(1)	0.000	0.000	
e(AUT/ITA)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-	
Luxembourg / Belgium	Number observations	221				221				221		
	Lags	0				0				19		
	Cointegration rank at significance level 5%	-				-				0		
	Trace statistics	14.242	0.943	4.458		14.242	0.943	4.458		13.078	2.477	-
	5% critical values	15.410	3.760	3.760		15.410	3.760	3.760		15.410	3.760	-
	4 largest moduli of eigenvalues	1.000	0.998	0.306	0.157	1.000	0.998	0.306	0.157	1.000	0.961	0.961
	Cointegration vector	CPI(BEL)	CPI(LUX)	e(BEL/LUX)	Constant	CPI(BEL)	CPI(LUX)	e(BEL/LUX)	Constant	CPI(BEL)	CPI(LUX)	e(BEL/LUX)
	Coefficient	1.000	-0.142	-4.158	-2.256	1.000	-0.142	-4.158	-2.256	1.000	-0.964	-
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-
	Adjustment factor	-0.001	-0.004	-0.147	-	-0.001	-0.004	-0.147	-	-0.045	0.056	-
	Economically sensible	Yes	No	No	-	Yes	No	No	-	Yes	Yes	-
	VECM residual autocorrelation at lag	25				25				5		
	Jarque-Bera: p-value	0.272				0.272				0.000		
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value
CPI(AUT)	ARCH(1)	0.315	0.000		ARCH(1)	0.315	0.000		ARCH(1)	0.316	0.000	
	GARCH(1)	0.000			)	0.000			GARCH(1)	0.061	0.000	
CPI(LUX)	ARCH(1)	0.315	0.000		ARCH(1)	0.315	0.000		ARCH(1)	0.064	0.000	
	GARCH(1)	0.000			)	0.000			GARCH(1)	0.000	0.000	
e(AUT/LUX)	ARCH(1)	0.315	0.000		ARCH(1)	0.315	0.000		ARCH(1)	-	-	
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-	

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Netherlands / Belgium	Number observations	133				311				221			
	Lags	24				14				13			
	Cointegration rank at significance level 5%	-				0				0			
	Trace statistics	68.305	30.693	9.809		24.603	8.999	4.283		12.622	0.938	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.078	1.078	1.034	1.034	1.095	1.095	1.000	1.000	1.000	0.968	0.920	0.920
	Cointegration vector	CPI(BEL)	CPI(NLD)	e(BEL/NLD)	Constant	CPI(BEL)	CPI(NLD)	e(BEL/NLD)	Constant	CPI(BEL)	CPI(NLD)	e(BEL/NLD)	Constant
	Coefficient	1.000	-0.687	4.837	0.568	1.000	-0.934	-0.970	-0.293	1.000	-1.232	-	1.099
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.052	0.115	-0.128	-	-0.028	-0.002	0.019	-	-0.006	0.033	-	-
	Economically sensible	Yes	Yes	-	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual autocorrelation at lag	1				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.258 0.003	0.000		ARCH(1))	0.224 0.000	0.000		ARCH(1) GARCH(1)	0.000 0.000	0.000		
CPI(NLD)	ARCH(1) GARCH(1)	0.282 0.000	0.000		ARCH(1))	0.028 0.064	0.000		ARCH(1) GARCH(1)	0.000 0.000	0.000		
e(AUT/NLD)	ARCH(1) GARCH(1)	0.043 0.640	0.061		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	- -	-		
Portugal / Belgium	Period	1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
	Number observations	146				311				221			
	Lags	11				13				14			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	31.770	12.322	4.452		45.022	24.626	9.520		6.698	0.823	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.039	1.039	1.000	1.000	1.193	1.127	1.127	1.114	1.000	0.992	0.942	0.942
	Cointegration vector	CPI(BEL)	CPI(PRT)	e(BEL/PRT)	Constant	CPI(BEL)	CPI(PRT)	e(BEL/PRT)	Constant	CPI(BEL)	CPI(PRT)	e(BEL/PRT)	Constant
	Coefficient	1.000	-0.024	-3.060	3.916	1.000	-0.143	0.328	-3.679	1.000	-1.503	-	2.315
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.005	0.028	0.009	-	-0.008	0.030	-0.108	-	-0.003	0.006	-	-
	Economically sensible	No	Yes	Yes	-	Yes	Yes	-	-	Yes	Yes	-	-
	VECM residual autocorrelation at lag	1				1				0			
	Jarque-Bera: p-value	0.000				0.000				0.000			
Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1) GARCH(1)	0.531 0.072	0.005		ARCH(1))	0.529 0.900	0.774		ARCH(1) GARCH(1)	0.135 0.133	0.000		
CPI(PRT)	ARCH(1) GARCH(1)	0.168 0.362	0.070		ARCH(1))	0.001 0.000	0.000		ARCH(1) GARCH(1)	0.471 0.865	0.745		
e(AUT/PRT)	ARCH(1) GARCH(1)	0.168 0.362	0.000		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	- -	-		

		Johansen Cointegration Tests for Real Exchange Rate Components											
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Belgium	Number observations	156				311				221			
	Lags	1				15				19			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	30.979	7.669	0.424		50.044	26.635	7.669		15.273	2.700	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.995	0.942	1.254	1.254	1.010	1.010	1.007	1.000	0.989	0.989
	Cointegration vector	CPI(BEL)	CPI(ESP)	e(BEL/ESP)	Constant	CPI(BEL)	CPI(ESP)	e(BEL/ESP)	Constant	CPI(BEL)	CPI(ESP)	e(BEL/ESP)	Constant
	Coefficient	1.000	-0.047	0.878	-3.737	1.000	-0.405	-0.030	-2.640	1.000	-0.432	-	-2.655
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.018	0.018	-0.025	-	-0.015	-0.016	-0.070	-	0.000	-0.018	-	-
	Economically sensible	No	Yes	-	-	Yes	No	No	-	Yes	No	-	-
	VECM residual autocorrelation at lag	1				3				1			
	Jarque-Bera: p-value	0.000				0.000				0.004			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
		CPI(AUT)	ARCH(1) 0.011 GARCH(1) 0.000	0.000		ARCH(1) 0.309) 0.000	0.000	0.000		ARCH(1) 0.307 GARCH(1) 0.070	0.001	0.001	
	CPI(ESP)	ARCH(1) 0.250 GARCH(1) 0.178	0.008		ARCH(1) 0.001) 0.000	0.000	0.000		ARCH(1) 0.095 GARCH(1) 0.000	0.000	0.000		
	e(AUT/ESP)	ARCH(1) 0.000 GARCH(1) 0.000	0.000		ARCH(1) 0.000) 0.946	0.000	0.000		ARCH(1) - GARCH(1) -	-	-		
France / Finland	Number observations	155				311				221			
	Lags	2				14				16			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	28.768	6.583	2.300		51.766	22.053	4.456		13.052	3.271	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.961	0.078	1.099	1.099	1.077	1.077	1.000	0.960	0.960	0.932
	Cointegration vector	CPI(FIN)	CPI(FRA)	e(FIN/FRA)	Constant	CPI(FIN)	CPI(FRA)	e(FIN/FRA)	Constant	CPI(FIN)	CPI(FRA)	e(FIN/FRA)	Constant
	Coefficient	1.000	-1.131	-0.692	0.320	1.000	-0.703	-0.120	-1.421	1.000	-0.946	-	-0.296
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.009	-0.017	0.078	-	-0.012	-0.004	-0.015	-	-0.028	-0.016	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	No	-	Yes	No	-	-
	VECM residual autocorrelation at lag	0				1				2			
	Jarque-Bera: p-value	0.000				0.000				0.297			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
		CPI(AUT)	ARCH(1) 0.027 GARCH(1) 0.626	0.000		ARCH(1) 0.096) 0.000	0.000	0.000		ARCH(1) 0.243 GARCH(1) 0.723	0.446	0.446	
	CPI(FRA)	ARCH(1) 0.037 GARCH(1) 0.008	0.000		ARCH(1) 0.723) 0.307	0.154	0.154		ARCH(1) 0.523 GARCH(1) 0.865	0.768	0.768		
	e(AUT/FRA)	ARCH(1) 0.000 GARCH(1) 0.000	0.000		ARCH(1) 0.499) 0.000	0.000	0.000		ARCH(1) - GARCH(1) -	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Germany / Finland	Number observations	155				311				221			
	Lags	2				13				16			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	24.335	8.297	2.638		54.095	21.005	3.982		7.422	0.278	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.012	1.000	1.000	0.087	1.192	1.192	1.053	1.053	1.000	0.940	0.932	0.932
	Cointegration vector	CPI(FIN)	CPI(GER)	e(FIN/GER)	Constant	CPI(FIN)	CPI(GER)	e(FIN/GER)	Constant	CPI(FIN)	CPI(GER)	e(FIN/GER)	Constant
	Coefficient	1.000	-1.906	-0.184	3.620	1.000	1.246	8.352	-10.041	1.000	-1.027	-	0.095
	Economically sensible	Yes	Yes	Yes	-	Yes	No	No	-	Yes	Yes	-	-
	Adjustment factor	-0.016	-0.016	0.000		-0.001	0.000	-0.004		-0.037	-0.021	-	-
	Economically sensible	Yes	No	No	-	Yes	-	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	2				3				1			
	Jarque-Bera: p-value	0.000				0.000				0.369			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.794	0.963		ARCH(1)	0.058	0.000		ARCH(1)	0.668	0.898		
	GARCH(1)	0.947				0.000			GARCH(1)	0.941			
CPI(GER)	ARCH(1)	0.802	0.969		ARCH(1)	0.058	0.000		ARCH(1)	0.170	0.363		
	GARCH(1)	0.974				0.000			GARCH(1)	0.809			
e(AUT/GER)	ARCH(1)	0.000	0.000		ARCH(1)	0.096	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Greece / Finland	Number observations	155				311				221			
	Lags	2				15				13			
	Cointegration rank at significance level 5%	-				-				0			
	Trace statistics	13.568	4.989	1.063		46.814	20.200	5.682		8.256	2.358	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.935	0.083	1.323	1.323	1.071	1.071	1.000	0.982	0.938	0.936
	Cointegration vector	CPI(FIN)	CPI(GRC)	e(FIN/GRC)	Constant	CPI(FIN)	CPI(GRC)	e(FIN/GRC)	Constant	CPI(FIN)	CPI(GRC)	e(FIN/GRC)	Constant
	Coefficient	1.000	-1.448	-0.423	-1.196	1.000	-0.061	0.166	-4.212	1.000	-0.430	-	-2.700
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.004	0.035	0.057		-0.007	-0.003	-0.002		-0.009	-0.027	-	-
	Economically sensible	No	Yes	Yes	-	Yes	No	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	1				3				0			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.170	0.000		ARCH(1)	0.137	0.000		ARCH(1)	0.967	0.999		
	GARCH(1)	0.809				0.000			GARCH(1)	0.987			
CPI(GRC)	ARCH(1)	0.548	0.000		ARCH(1)	0.044	0.000		ARCH(1)	0.238	0.080		
	GARCH(1)	0.003				0.000			GARCH(1)	0.445			
e(AUT/GRC)	ARCH(1)	0.000	0.000		ARCH(1)	0.260	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.007			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Ireland / Finland	Number observations	153				311				221			
	Lags	4				13				18			
	Cointegration rank at significance level 5%	0				2				0			
	Trace statistics	29.305	7.248	2.221		38.360	15.654	2.585		14.079	3.603	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.995	0.649	1.187	1.187	1.021	1.021	1.000	0.990	0.981	0.981
	Cointegration vector	CPI(FIN)	CPI(IRL)	e(FIN/IRL)	Constant	CPI(FIN)	CPI(IRL)	e(FIN/IRL)	Constant	CPI(FIN)	CPI(IRL)	e(FIN/IRL)	Constant
	Coefficient	1.000	-1.819	-3.227	1.807	1.000	-0.650	-0.640	-1.600	1.000	-2.151	-	5.470
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.001	-0.003	0.004		-0.010	-0.007	0.014		-0.001	0.003	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	3				2				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.036	0.000		ARCH(1)	0.020	0.000		ARCH(1)	0.212	0.011	
CPI(IRL)	GARCH(1)	0.539	0.826		ARCH(1)	0.020	0.000		ARCH(1)	0.213	0.390		
e(AUT/IRL)	ARCH(1)	0.000	0.000		ARCH(1)	0.082	0.000		ARCH(1)	0.905	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Italy / Finland	Number observations	155				311				221			
	Lags	2				18				16			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	26.637	5.868	0.460	0.058	50.616	25.998	10.419		14.271	3.319	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.884	0.058	1.230	1.069	1.069	1.048	1.002	1.000	0.964	0.964
	Cointegration vector	CPI(FIN)	CPI(ITA)	e(FIN/ITA)	Constant	CPI(FIN)	CPI(ITA)	e(FIN/ITA)	Constant	CPI(FIN)	CPI(ITA)	e(FIN/ITA)	Constant
	Coefficient	1.000	-1.140	-0.274	-0.336	1.000	-0.731	-0.454	-1.276	1.000	-0.665	-	-1.591
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.111	-0.023	0.129		-0.019	-0.001	0.017		-0.024	-0.016	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				0				2			
	Jarque-Bera: p-value	0.000				0.000				0.943			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.124	0.000		ARCH(1)	0.073	0.000		ARCH(1)	0.117	0.292	
CPI(ITA)	GARCH(1)	0.593	0.571		ARCH(1)	0.002	0.000		ARCH(1)	0.274	0.202		
e(AUT/ITA)	ARCH(1)	0.738	0.000	0.000	ARCH(1)	0.005	0.000		ARCH(1)	0.665	-		
	GARCH(1)	0.000				0.020			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Luxembourg / Finland	Number observations	155				311				221			
	Lags	2				15				13			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	18.871	6.002	1.378		48.729	16.480	5.320		11.805	3.061	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.995	0.094	1.160	1.160	1.065	1.065	1.000	0.965	0.965	0.932
	Cointegration vector	CPI(FIN)	CPI(LUX)	e(FIN/LUX)	Constant	CPI(FIN)	CPI(LUX)	e(FIN/LUX)	Constant	CPI(FIN)	CPI(LUX)	e(FIN/LUX)	Constant
	Coefficient	1.000	3.161	-2.040	-13.026	1.000	-3.086	-0.850	9.044	1.000	-0.670	-	-1.566
	Economically sensible	Yes	No	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.001	0.003	0.008	-	0.005	0.000	0.011	-	-0.020	-0.030	-	-
Economically sensible	No	-	Yes	-	No	Yes	Yes	-	Yes	No	-	-	
VECM residual auto-correlation at lag	1				0				6				
Jarque-Bera: p-value	0.000				0.000				0.000				
Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.799	0.955		ARCH(1)	0.012	0.000		ARCH(1)	0.796	0.007		
	GARCH(1)	0.915				0.000			GARCH(1)	0.037			
CPI(LUX)	ARCH(1)	0.783	0.944		ARCH(1)	0.011	0.000		ARCH(1)	0.116	0.000		
	GARCH(1)	0.887				0.000			GARCH(1)	0.000			
e(AUT/LUX)	ARCH(1)	0.000	0.000		ARCH(1)	0.009	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Netherlands / Finland	Number observations	155				311				221			
	Lags	2				13				13			
	Cointegration rank at significance level 5%	0				2				0			
	Trace statistics	18.950	6.668	0.597		48.703	21.611	3.694		12.147	2.573	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.978	0.086	1.234	1.234	1.040	1.040	1.000	0.977	0.888	0.888
	Cointegration vector	CPI(FIN)	CPI(NLD)	e(FIN/NLD)	Constant	CPI(FIN)	CPI(NLD)	e(FIN/NLD)	Constant	CPI(FIN)	CPI(NLD)	e(FIN/NLD)	Constant
	Coefficient	1.000	-0.849	0.054	0.438	1.000	-0.919	-6.618	-0.403	1.000	-1.100	-	0.506
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.000	0.031	0.009	-	0.001	0.000	0.008	-	-0.002	0.025	-	-
Economically sensible	Yes	Yes	-	-	No	No	Yes	-	Yes	Yes	-	-	
VECM residual auto-correlation at lag	1				1				1				
Jarque-Bera: p-value	0.000				0.000				0.000				
Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.116	0.000		ARCH(1)	0.034	0.000		ARCH(1)	0.763	0.886		
	GARCH(1)	0.000				0.000			GARCH(1)	0.866			
CPI(NLD)	ARCH(1)	0.227	0.000		ARCH(1)	0.003	0.000		ARCH(1)	0.763	0.000		
	GARCH(1)	0.000				0.123			GARCH(1)	0.866			
e(AUT/NLD)	ARCH(1)	0.000	0.000		ARCH(1)	0.010	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Portugal / Finland	Number observations	155				311				221			
	Lags	2				13				17			
	Cointegration rank at significance level 5%	0				2				0			
	Trace statistics	23.183	6.687	0.774		52.661	26.600	3.286		8.861	2.522	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.005	1.000	1.000	0.087	1.124	1.124	1.000	1.000	1.000	0.995	0.962	0.928
	Cointegration vector	CPI(FIN)	CPI(PRT)	e(FIN/PRT)	Constant	CPI(FIN)	CPI(PRT)	e(FIN/PRT)	Constant	CPI(FIN)	CPI(PRT)	e(FIN/PRT)	Constant
	Coefficient	1.000	0.523	-0.784	-1.146	1.000	-0.312	0.150	-3.062	1.000	-0.180	-	-3.921
	Economically sensible	Yes	No	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.001	0.014	0.006	-	-0.014	-0.001	-0.052	-	-0.003	-0.009	-	-
	Economically sensible	No	-	Yes	-	Yes	No	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	1				0				1			
	Jarque-Bera: p-value	0.000				0.000				0.001			
	Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value	
CPI(AUT)		ARCH(1) 0.241 GARCH(1) 0.111	0.000		ARCH(1) 0.029) 0.000	0.000			ARCH(1) 0.722 GARCH(1) 0.785	0.823			
CPI(PRT)		ARCH(1) 0.283 GARCH(1) 0.023	0.000		ARCH(1) 0.000) 0.000	0.000			ARCH(1) 0.277 GARCH(1) 0.535	0.141			
e(AUT/PRT)		ARCH(1) 0.000 GARCH(1) 0.000	0.000		ARCH(1) 0.000) 0.000	0.000			ARCH(1) - GARCH(1) -	-			
Period													
1960:1 - 1972:12		1973:1 - 1998:12				1999:1 - 2017:5							
Number observations	155				311				221				
Lags	2				15				17				
Cointegration rank at significance level 5%	1				-				1				
Trace statistics	31.343	6.855	0.622		58.344	26.357	6.057		16.196	3.454	-	-	
5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-	
4 largest moduli of eigenvalues	1.000	1.000	0.766	0.124	1.000	1.000	0.989	0.989	1.002	1.000	0.999	0.983	
Cointegration vector	CPI(FIN)	CPI(ESP)	e(FIN/ESP)	Constant	CPI(FIN)	CPI(ESP)	e(FIN/ESP)	Constant	CPI(FIN)	CPI(ESP)	e(FIN/ESP)	Constant	
Coefficient	1.000	-0.640	-0.672	-1.168	1.000	-0.516	-0.022	-2.270	1.000	-0.441	-	-2.640	
Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-	
Adjustment factor	-0.052	0.081	0.216	-	-0.017	-0.004	-0.030	-	-0.013	-0.026	-	-	
Economically sensible	Yes	Yes	Yes	-	Yes	No	No	-	Yes	No	-	-	
VECM residual auto-correlation at lag	1				2				2				
Jarque-Bera: p-value	0.000				0.000				0.862				
Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		
	CPI(AUT)	ARCH(1) 0.365 GARCH(1) 0.060	0.000		ARCH(1) 0.024) 0.000	0.000			ARCH(1) 0.008 GARCH(1) 0.011	0.000			
	CPI(ESP)	ARCH(1) 0.422 GARCH(1) 0.416	0.183		ARCH(1) 0.000) 0.000	0.000			ARCH(1) 0.193 GARCH(1) 0.000	0.000			
	e(AUT/ESP)	ARCH(1) 0.000 GARCH(1) 0.000	0.000		ARCH(1) 0.008) 0.011	0.000			ARCH(1) - GARCH(1) -	-			
	Period												
	1960:1 - 1972:12		1973:1 - 1998:12				1999:1 - 2017:5						

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Germany / France	Number observations	155				311				221			
	Lags	2				13				14			
	Cointegration rank at significance level 5%	1				1				0			
	Trace statistics	35.422	11.206	1.509		53.833	12.219	1.224		12.481	3.850	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.991	0.126	1.177	1.177	1.078	1.002	1.009	1.000	0.979	0.979
	Cointegration vector	CPI(FRA)	CPI(GER)	e(FRA/GER)	Constant	CPI(FRA)	CPI(GER)	e(FRA/GER)	Constant	CPI(FRA)	CPI(GER)	e(FRA/GER)	Constant
	Coefficient	1.000	-1.545	1.256	4.214	1.000	-0.795	-1.358	-0.855	1.000	-1.141	-	0.682
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.005	0.007	-0.002	-	0.003	0.002	0.118	-	0.037	0.036	-	-
	Economically sensible	No	Yes	-	-	No	Yes	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	3				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.091			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.000	0.000		ARCH(1)	0.156	0.013		ARCH(1)	0.485	0.085		
	GARCH(1)	0.000				0.140			GARCH(1)	0.153			
CPI(GER)	ARCH(1)	0.790	0.579		ARCH(1)	0.000	0.000		ARCH(1)	0.156	0.170		
	GARCH(1)	0.492				0.000			GARCH(1)	0.571			
e(AUT/GER)	ARCH(1)	0.122	0.000		ARCH(1)	0.001	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Greece / France	Number observations	156				311				221			
	Lags	1				15				16			
	Cointegration rank at significance level 5%	-				-				0			
	Trace statistics	26.313	8.417	1.593		45.859	24.226	8.547		11.006	2.279	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.930	0.979	1.239	1.239	1.186	1.186	1.000	0.986	0.986	0.981
	Cointegration vector	CPI(FRA)	CPI(GRC)	e(FRA/GRC)	Constant	CPI(FRA)	CPI(GRC)	e(FRA/GRC)	Constant	CPI(FRA)	CPI(GRC)	e(FRA/GRC)	Constant
	Coefficient	1.000	-1.422	-0.139	-1.891	1.000	-2.019	-1.739	5.251	1.000	-0.540	-	-2.173
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.017	0.061	-0.002	-	0.001	0.002	-0.001	-	-0.041	-0.030	-	-
	Economically sensible	No	Yes	No	-	No	Yes	No	-	Yes	No	-	-
	VECM residual auto-correlation at lag	2				3				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.055	0.034		ARCH(1)	0.001	0.000		ARCH(1)	0.794	0.915		
	GARCH(1)	0.559				0.058			GARCH(1)	0.852			
CPI(GRC)	ARCH(1)	0.540	0.197		ARCH(1)	0.053	0.000		ARCH(1)	0.218	0.014		
	GARCH(1)	0.428				0.000			GARCH(1)	0.291			
e(AUT/GRC)	ARCH(1)	0.540	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.428				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Ireland / France	Number observations	149				311				221			
	Lags	8				10				17			
	Cointegration rank at significance level 5%	0				-				-			
	Trace statistics	26.756	14.187	4.099		51.748	23.520	8.210		16.479	6.996	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.999	0.967	1.049	1.040	1.040	1.022	1.011	1.011	1.000	0.998
	Cointegration vector	CPI(FRA)	CPI(IRL)	e(FRA/IRL)	Constant	CPI(FRA)	CPI(IRL)	e(FRA/IRL)	Constant	CPI(FRA)	CPI(IRL)	e(FRA/IRL)	Constant
	Coefficient	1.000	1.134	-6.514	-0.605	1.000	-1.340	0.765	1.437	1.000	-0.138	-	-4.070
	Economically sensible	Yes	No	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.002	0.001	0.001		0.002	0.004	-0.013		-0.001	-0.010	-	-
	Economically sensible	No	-	Yes	-	No	Yes	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				0				1			
	Jarque-Bera: p-value	0.000				0.000				0.315			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.008	0.000		ARCH(1)	0.143	0.036		ARCH(1)	0.000	0.000		
	GARCH(1)	0.000				0.222			GARCH(1)	0.000	0.000		
CPI(IRL)	ARCH(1)	0.008	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.402	0.423		
	GARCH(1)	0.000				0.002			GARCH(1)	0.525			
e(AUT/IRL)	ARCH(1)	0.008	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Italy / France	Number observations	155				311				221			
	Lags	2				7				20			
	Cointegration rank at significance level 5%	1				1				-			
	Trace statistics	30.945	8.113	1.372		34.309	11.013	0.379		17.894	3.858	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.978	0.057	1.000	1.000	0.990	0.800	1.000	0.985	0.985	0.978
	Cointegration vector	CPI(FRA)	CPI(ITA)	e(FRA/ITA)	Constant	CPI(FRA)	CPI(ITA)	e(FRA/ITA)	Constant	CPI(FRA)	CPI(ITA)	e(FRA/ITA)	Constant
	Coefficient	1.000	-0.817	-0.505	-0.738	1.000	-0.398	-0.294	-2.814	1.000	-0.788	-	-0.980
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.038	0.035	0.068		-0.003	-0.002	0.021		-0.091	0.048	-	-
	Economically sensible	No	Yes	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	0				2				4			
	Jarque-Bera: p-value	0.000				0.000				0.680			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.000	0.000		ARCH(1)	0.078	0.049		ARCH(1)	0.188	0.192		
	GARCH(1)	0.000				0.412			GARCH(1)	0.499			
CPI(ITA)	ARCH(1)	0.378	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.056	0.027		
	GARCH(1)	0.000				0.000			GARCH(1)	0.487			
e(AUT/ITA)	ARCH(1)	0.000	0.000		ARCH(1)	0.003	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Luxembourg / France	Number observations	156				311				221			
	Lags	1				7				19			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	33.677	6.370	1.513		45.663	24.275	4.192		12.911	2.530	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.981	0.978	1.000	1.000	0.983	0.917	1.006	1.000	0.993	0.993
	Cointegration vector	CPI(FRA)	CPI(LUX)	e(FRA/LUX)	Constant	CPI(FRA)	CPI(LUX)	e(FRA/LUX)	Constant	CPI(FRA)	CPI(LUX)	e(FRA/LUX)	Constant
	Coefficient	1.000	-1.159	0.137	1.019	1.000	-1.260	-1.894	1.125	1.000	-0.753	-	-1.118
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.019	0.036	0.027	-	0.003	0.004	0.019	-	0.031	0.088	-	-
	Economically sensible	No	Yes	-	-	No	Yes	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	1				2				2			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.066	0.003		ARCH(1)	0.093	0.001		ARCH(1)	0.000	0.000	
CPI(LUX)	ARCH(1)	0.066	0.000		ARCH(1)	0.001	0.000		ARCH(1)	0.016	0.000		
	GARCH(1)	0.139			GARCH(1)	0.000			GARCH(1)	0.000	0.000		
e(AUT/LUX)	ARCH(1)	0.066	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.139			GARCH(1)	0.000			GARCH(1)	-	-		
Netherlands / France	Number observations	156				311				221			
	Lags	1				13				14			
	Cointegration rank at significance level 5%	1				1				0			
	Trace statistics	34.645	12.371	4.698		49.922	13.352	2.318		11.096	4.329	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.954	0.993	1.084	1.084	1.065	1.065	1.000	0.985	0.946	0.946
	Cointegration vector	CPI(FRA)	CPI(NLD)	e(FRA/NLD)	Constant	CPI(FRA)	CPI(NLD)	e(FRA/NLD)	Constant	CPI(FRA)	CPI(NLD)	e(FRA/NLD)	Constant
	Coefficient	1.000	-0.714	-0.115	-0.425	1.000	-0.641	-1.805	-1.525	1.000	-1.019	-	0.139
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.022	0.093	0.011	-	0.005	-0.001	0.093	-	0.004	0.021	-	-
	Economically sensible	No	Yes	Yes	-	No	No	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	1				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.059	0.002		ARCH(1)	0.268	0.156		ARCH(1)	0.434	0.000	
GARCH(1)		0.098			GARCH(1)	0.416			GARCH(1)	0.009	0.000		
CPI(NLD)	ARCH(1)	0.094	0.007		ARCH(1)	0.008	0.000		ARCH(1)	0.325	0.002		
	GARCH(1)	0.319			GARCH(1)	0.004			GARCH(1)	0.076			
e(AUT/NLD)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000			GARCH(1)	0.942			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Portugal / France	Number observations	156				311				221			
	Lags	1				8				14			
	Cointegration rank at significance level 5%	1				-				1			
	Trace statistics	32.578	10.536	4.204		44.237	19.237	4.182		17.187	3.563	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.009	1.000	1.000	0.956	1.000	1.000	0.996	0.909	1.000	0.964	0.950	0.950
	Cointegration vector	CPI(FRA)	CPI(PRT)	e(FRA/PRT)	Constant	CPI(FRA)	CPI(PRT)	e(FRA/PRT)	Constant	CPI(FRA)	CPI(PRT)	e(FRA/PRT)	Constant
	Coefficient	1.000	5.802	7.287	-13.576	1.000	-0.672	-0.086	-1.421	1.000	-0.723	-	-1.291
	Economically sensible	Yes	No	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.000	0.001	0.000	-	0.004	0.024	-0.015	-	-0.047	0.011	-	-
	Economically sensible	No	-	-	-	No	Yes	No	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				1				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.055	0.000		ARCH(1)	0.144	0.004		ARCH(1)	0.451	0.749		
	GARCH(1)	0.031											
CPI(PRT)	ARCH(1)	0.014	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.451	0.000		
	GARCH(1)	0.000											
e(AUT/PRT)	ARCH(1)	0.014	0.000		ARCH(1)	0.027	0.000		ARCH(1)	-	-	-	
	GARCH(1)	0.000											
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / France	Number observations	156				311				221			
	Lags	1				15				14			
	Cointegration rank at significance level 5%	1				1				-			
	Trace statistics	40.738	14.917	1.728		36.011	10.750	4.475		19.899	8.572	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.970	0.928	1.145	1.145	1.138	1.138	1.002	1.002	1.000	0.973
	Cointegration vector	CPI(FRA)	CPI(ESP)	e(FRA/ESP)	Constant	CPI(FRA)	CPI(ESP)	e(FRA/ESP)	Constant	CPI(FRA)	CPI(ESP)	e(FRA/ESP)	Constant
	Coefficient	1.000	-0.581	-0.755	-1.213	1.000	-0.396	-0.226	-2.844	1.000	-0.729	-	-1.245
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.019	0.000	0.065	-	-0.003	-0.008	0.002	-	-0.010	0.033	-	-
	Economically sensible	No	No	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	0				2				3			
	Jarque-Bera: p-value	0.000				0.000				0.311			
	Heteroskedasticity test of VECM residuals	Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value		Prozess	Single significanc e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.167	0.064		ARCH(1)	0.292	0.561		ARCH(1)	0.000	0.000		
	GARCH(1)	0.288											
CPI(ESP)	ARCH(1)	0.471	0.323		ARCH(1)	0.000	0.000		ARCH(1)	0.205	0.000		
	GARCH(1)	0.442											
e(AUT/ESP)	ARCH(1)	0.471	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-	-	
	GARCH(1)	0.442											

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Greece Germany	Number observations	133				311				221			
	Lags	24				15				16			
	Cointegration rank at significance level 5%					0				0			
	Trace statistics	50.622	16.170	5.233		27.748	11.922	2.961		6.320	2.364	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.141	1.141	1.051	1.051	1.224	1.224	1.025	1.025	1.001	1.000	0.930	0.930
	Cointegration vector	CPI(GER)	CPI(GRC)	e(GER/GRC)	Constant	CPI(GER)	CPI(GRC)	e(GER/GRC)	Constant	CPI(GER)	CPI(GRC)	e(GER/GRC)	Constant
	Coefficient	1.000	-1.021	0.400	-4.388	1.000	-0.663	-0.612	-1.669	1.000	-0.388	-	-2.888
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.009	0.612	0.181	-	-0.003	0.036	0.171	-	-0.004	-0.027	-	-
	Economically sensible	No	Yes	-	-	Yes	Yes	Yes	-	Yes	No	-	-
	VECM residual auto-correlation at lag	1				4				1			
	Jarque-Bera: p-value	0.000				0.000				0.078			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)		ARCH(1)	0.407	0.686		ARCH(1)	0.001	0.000		ARCH(1)	0.486	0.383	
		GARCH(1)	0.901			)	0.000			GARCH(1)	0.492		
CPI(GRC)		ARCH(1)	0.407	0.000		ARCH(1)	0.348	0.000		ARCH(1)	0.325	0.068	
		GARCH(1)	0.901			)	0.000			GARCH(1)	0.492		
e(AUT/GRC)		ARCH(1)	0.407	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-	
	GARCH(1)	0.901			)	0.000			GARCH(1)	-	-		
Ireland Germany	Number observations	149				311				221			
	Lags	8				15				19			
	Cointegration rank at significance level 5%	2				1				0			
	Trace statistics	51.533	21.646	3.739		39.833	14.586	0.890		11.768	1.992	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.973	0.973	1.331	1.012	1.012	1.008	1.000	0.995	0.990	0.990
	Cointegration vector	CPI(GER)	CPI(IRL)	e(GER/IRL)	Constant	CPI(GER)	CPI(IRL)	e(GER/IRL)	Constant	CPI(GER)	CPI(IRL)	e(GER/IRL)	Constant
	Coefficient	1.000	-0.706	-0.159	-1.850	1.000	-0.947	-5.161	-0.632	1.000	-5.669	-	21.536
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.086	0.008	0.229	-	0.000	-0.002	0.006	-	-0.001	0.001	-	-
	Economically sensible	Yes	Yes	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	2				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.628			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)		ARCH(1)	0.651	0.895		ARCH(1)	0.000	0.000		ARCH(1)	0.113	0.028	
		GARCH(1)	0.934			)	0.000			GARCH(1)	0.318		
CPI(IRL)		ARCH(1)	0.651	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.164	0.005	
		GARCH(1)	0.934			)	0.000			GARCH(1)	0.090		
e(AUT/IRL)		ARCH(1)	0.651	0.000		ARCH(1)	0.039	0.000		ARCH(1)	-	-	
	GARCH(1)	0.934			)	0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Italy / Germany	Number observations	155				311				221			
	Lags	2				14				13			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	29.129	5.433	1.998		37.080	15.268	2.158		14.833	6.692	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.975	0.051	1.192	1.192	1.168	1.168	1.000	0.986	0.910	0.910
	Cointegration vector	CPI(GER)	CPI(ITA)	e(GER/ITA)	Constant	CPI(GER)	CPI(ITA)	e(GER/ITA)	Constant	CPI(GER)	CPI(ITA)	e(GER/ITA)	Constant
	Coefficient	1.000	-0.353	1.620	-5.849	1.000	0.214	0.081	-5.430	1.000	-0.975	-	-0.112
	Economically sensible	Yes	Yes	No	-	Yes	No	No	-	Yes	Yes	-	-
	Adjustment factor	-0.018	-0.011	-0.006	-	-0.001	-0.003	0.018	-	-0.003	0.011	-	-
	Economically sensible	Yes	No	-	-	Yes	-	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	4				1				1			
	Jarque-Bera: p-value	0.000				0.000				0.999			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.680	0.733		ARCH(1)	0.342	0.000		ARCH(1)	0.093	0.002		
	GARCH(1)	0.735							GARCH(1)	0.046			
CPI(ITA)	ARCH(1)	0.342	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.085	0.000		
	GARCH(1)	0.000							GARCH(1)	0.000			
e(AUT/ITA)	ARCH(1)	0.342	0.000		ARCH(1)	0.001	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000							GARCH(1)	-	-		
Luxembourg / Germany	Number observations	155				311				221			
	Lags	2				13				19			
	Cointegration rank at significance level 5%	1				0				-			
	Trace statistics	41.324	14.961	5.314		17.434	6.356	0.536		16.167	6.448	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.981	0.053	1.043	1.043	1.028	1.000	1.000	0.963	0.963	0.957
	Cointegration vector	CPI(GER)	CPI(LUX)	e(GER/LUX)	Constant	CPI(GER)	CPI(LUX)	e(GER/LUX)	Constant	CPI(GER)	CPI(LUX)	e(GER/LUX)	Constant
	Coefficient	1.000	-1.509	-5.129	3.951	1.000	-1.131	-0.885	0.528	1.000	-0.703	-	-1.381
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.005	0.006	0.003	-	0.002	0.012	0.027	-	-0.122	0.003	-	-
	Economically sensible	No	Yes	Yes	-	No	Yes	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	2				2				2			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.893	0.908		ARCH(1)	0.000	0.000		ARCH(1)	0.288	0.565		
	GARCH(1)	0.805				0.197			GARCH(1)	0.873			
CPI(LUX)	ARCH(1)	0.297	0.057		ARCH(1)	0.004	0.000		ARCH(1)	0.041	0.000		
	GARCH(1)	0.376				0.000			GARCH(1)	0.000			
e(AUT/LUX)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.197				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Netherlands / Germany	Number observations	144				311				221			
	Lags	13				13				16			
	Cointegration rank at significance level 5%	1				1				0			
	Trace statistics	33.072	14.978	4.964		57.030	11.390	1.578		13.603	2.712	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.076	1.050	1.050	1.000	1.000	1.000	0.985	0.985	1.000	0.961	0.961	0.944
	Cointegration vector	CPI(GER)	CPI(NLD)	e(GER/NLD)	Constant	CPI(GER)	CPI(NLD)	e(GER/NLD)	Constant	CPI(GER)	CPI(NLD)	e(GER/NLD)	Constant
	Coefficient	1.000	-0.612	0.587	-1.717	1.000	-1.529	-9.153	2.174	1.000	-0.929	-	-0.309
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.033	-0.046	0.026	-	0.001	0.001	0.029	-	-0.013	0.039	-	-
	Economically sensible	Yes	No	-	-	No	Yes	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	0				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.886 0.980	0.981		ARCH(1))	0.009 0.000	0.000		ARCH(1) GARCH(1)	0.051 0.071	0.004		
CPI(NLD)	ARCH(1) GARCH(1)	0.075 0.292	0.075		ARCH(1))	0.004 0.005	0.000		ARCH(1) GARCH(1)	0.051 0.071	0.000		
e(AUT/NLD)	ARCH(1) GARCH(1)	0.009 0.000	0.000		ARCH(1))	0.001 0.000	0.000		ARCH(1) GARCH(1)	- -	- -		
Portugal / Germany	Number observations	133				311				221			
	Lags	24				13				13			
	Cointegration rank at significance level 5%	2				2				0			
	Trace statistics	81.864	21.356	2.940		31.187	16.289	3.333		8.038	1.382	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.271	1.271	1.101	1.101	1.354	1.104	1.060	1.060	1.000	0.986	0.920	0.906
	Cointegration vector	CPI(GER)	CPI(PRT)	e(GER/PRT)	Constant	CPI(GER)	CPI(PRT)	e(GER/PRT)	Constant	CPI(GER)	CPI(PRT)	e(GER/PRT)	Constant
	Coefficient	1.000	-1.233	-1.404	0.719	1.000	-0.625	-0.687	-1.846	1.000	-0.881	-	-0.560
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.013	-0.002	0.162	-	-0.003	-0.012	0.041	-	-0.009	0.012	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	Yes	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				0				4			
	Jarque-Bera: p-value	0.002				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.388 0.998	0.684		ARCH(1))	0.002 0.000	0.000		ARCH(1) GARCH(1)	0.135 0.680	0.250		
CPI(PRT)	ARCH(1) GARCH(1)	0.388 0.998	0.000		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	0.585 0.849	0.777		
e(AUT/PRT)	ARCH(1) GARCH(1)	0.127 0.026	0.000		ARCH(1))	0.004 0.079	0.000		ARCH(1) GARCH(1)	- -	- -		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Germany	Number observations	154				311				221			
	Lags	3				15				24			
	Cointegration rank at significance level 5%	0				-				-			
	Trace statistics	19.739	8.259	2.925		40.192	20.016	4.803		22.155	3.772	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.009	1.000	1.000	0.523	1.247	1.247	1.043	1.043	1.027	1.027	1.003	1.000
	Cointegration vector	CPI(GER)	CPI(ESP)	e(GER/ESP)	Constant	CPI(GER)	CPI(ESP)	e(GER/ESP)	Constant	CPI(GER)	CPI(ESP)	e(GER/ESP)	Constant
	Coefficient	1.000	-0.426	-0.199	-2.410	1.000	1.261	4.234	-9.467	1.000	-0.294	-	-3.272
	Economically sensible	Yes	Yes	Yes	-	Yes	No	No	-	Yes	Yes	-	-
	Adjustment factor	0.022	0.019	0.027	-	0.001	0.003	-0.009	-	0.012	-0.022	-	-
	Economically sensible	No	Yes	Yes	-	No	-	-	-	No	No	-	-
	VECM residual auto-correlation at lag	1				1				0			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.451	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.408	0.000		
	GARCH(1)	0.996							GARCH(1)	0.000			
CPI(ESP)	ARCH(1)	0.800	0.935		ARCH(1)	0.001	0.000		ARCH(1)	0.309	0.000		
	GARCH(1)	0.884							GARCH(1)	0.090			
e(AUT/ESP)	ARCH(1)	0.000	0.000		ARCH(1)	0.001	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000							GARCH(1)	-	-		
Ireland / Greece	Number observations	143				311				221			
	Lags	14				15				14			
	Cointegration rank at significance level 5%	1				-				-			
	Trace statistics	45.668	15.251	1.647		58.448	31.760	11.906		25.933	11.141	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.076	1.076	1.036	1.036	1.054	1.054	1.000	1.000	1.000	0.984	0.984	0.980
	Cointegration vector	CPI(GRC)	CPI(IRL)	e(GRC/IRL)	Constant	CPI(GRC)	CPI(IRL)	e(GRC/IRL)	Constant	CPI(GRC)	CPI(IRL)	e(GRC/IRL)	Constant
	Coefficient	1.000	-0.544	0.000	0.751	1.000	-1.146	-0.966	0.490	1.000	-1.041	-	0.208
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.230	-0.034	0.027	-	-0.009	0.017	-0.017	-	-0.027	-0.001	-	-
	Economically sensible	Yes	No	Yes	-	Yes	Yes	No	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				2				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value		Prozess	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.620	0.125		ARCH(1)	0.036	0.000		ARCH(1)	0.387	0.320		
	GARCH(1)	0.410				0.265			GARCH(1)	0.586			
CPI(IRL)	ARCH(1)	0.620	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.067	0.121		
	GARCH(1)	0.410				0.001			GARCH(1)	0.595			
e(AUT/IRL)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000							GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Italy / Greece	Number observations	143				311				221			
	Lags	14				15				14			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	29.297	7.444	0.299		56.465	28.109	11.580		13.415	2.169	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.006	1.006	1.000	1.000	1.064	1.064	1.046	1.046	1.003	1.000	0.999	0.966
	Cointegration vector	CPI(GRC)	CPI(ITA)	e(GRC/ITA)	Constant	CPI(GRC)	CPI(ITA)	e(GRC/ITA)	Constant	CPI(GRC)	CPI(ITA)	e(GRC/ITA)	Constant
	Coefficient	1.000	-0.581	1.074	2.108	1.000	-1.147	-1.301	0.526	1.000	-1.548	-	2.619
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.135	0.038	0.006		-0.003	0.007	-0.008		0.027	0.014	-	-
	Economically sensible	Yes	Yes	-	-	Yes	Yes	No	-	No	Yes	-	-
	VECM residual auto-correlation at lag	1				2				2			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.550 0.183	0.083		ARCH(1))	0.094 0.336	0.000		ARCH(1) GARCH(1)	0.137 0.057	0.000		
CPI(ITA)	ARCH(1) GARCH(1)	0.550 0.183	0.000		ARCH(1))	0.001 0.000	0.000		ARCH(1) GARCH(1)	0.240 0.000	0.000		
e(AUT/ITA)	ARCH(1) GARCH(1)	0.005 0.000	0.000		ARCH(1))	0.000 0.381	0.000		ARCH(1) GARCH(1)	- -	-		
Luxembourg / Greece	Number observations	155				311				221			
	Lags	2				15				13			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	32.822	10.840	1.723		35.896	18.403	7.129		6.058	1.925	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.938	0.329	1.203	1.203	1.105	1.105	1.007	1.000	0.980	0.958
	Cointegration vector	CPI(GRC)	CPI(LUX)	e(GRC/LUX)	Constant	CPI(GRC)	CPI(LUX)	e(GRC/LUX)	Constant	CPI(GRC)	CPI(LUX)	e(GRC/LUX)	Constant
	Coefficient	1.000	-0.916	-0.052	2.328	1.000	-1.654	-0.946	3.344	1.000	-1.664	-	3.188
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.140	-0.033	-0.030		0.004	0.007	0.009		0.012	0.005	-	-
	Economically sensible	Yes	No	No	-	No	Yes	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	2				3				5			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.524 0.106	0.001		ARCH(1))	0.180 0.443	0.015		ARCH(1) GARCH(1)	0.118 0.290	0.032		
CPI(LUX)	ARCH(1) GARCH(1)	0.524 0.106	0.000		ARCH(1))	0.021 0.000	0.000		ARCH(1) GARCH(1)	0.024 0.000	0.000		
e(AUT/LUX)	ARCH(1) GARCH(1)	0.000 0.000	0.000		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	- -	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Netherlands / Greece	Number observations	133				311				221			
	Lags	24				15				13			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	18.953	6.406	0.166		37.228	16.170	5.414		9.119	1.623	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.044	1.044	1.026	1.026	1.102	1.102	1.100	1.100	1.000	1.000	0.965	0.956
	Cointegration vector	CPI(GRC)	CPI(NLD)	e(GRC/NLD)	Constant	CPI(GRC)	CPI(NLD)	e(GRC/NLD)	Constant	CPI(GRC)	CPI(NLD)	e(GRC/NLD)	Constant
	Coefficient	1.000	-0.608	-0.833	-0.896	1.000	-1.457	-1.087	2.271	1.000	-3.515	-	12.019
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.079	-0.124	-0.030	-	0.007	0.004	0.070	-	0.004	0.002	-	-
	Economically sensible	Yes	No	No	-	No	Yes	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	3				1				0			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.124	0.000		ARCH(1)	0.157	0.000		ARCH(1)	0.426	0.325	
CPI(NLD)	ARCH(1)	0.001	0.000		ARCH(1)	0.127	0.000		ARCH(1)	0.044	0.000		
e(AUT/NLD)	ARCH(1)	0.260	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000			GARCH(1)	0.000			GARCH(1)	-	-		
Portugal / Greece	Number observations	135				311				221			
	Lags	22				21				14			
	Cointegration rank at significance level 5%	-				-				0			
	Trace statistics	63.882	24.725	4.483		44.366	16.238	7.576		8.240	2.326	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.190	1.190	1.159	1.128	1.053	1.053	1.045	1.045	1.000	0.980	0.975	0.954
	Cointegration vector	CPI(GRC)	CPI(PRT)	e(GRC/PRT)	Constant	CPI(GRC)	CPI(PRT)	e(GRC/PRT)	Constant	CPI(GRC)	CPI(PRT)	e(GRC/PRT)	Constant
	Coefficient	1.000	0.112	1.402	0.623	1.000	-0.439	3.453	-3.386	1.000	-0.481	-	-2.447
	Economically sensible	Yes	No	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.001	0.162	0.004	-	-0.003	-0.003	-0.002	-	-0.008	-0.003	-	-
	Economically sensible	No	-	-	-	Yes	No	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				3				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value		Process	Single significance: e: p-value	Joint significance: p-value	
	CPI(AUT)	ARCH(1)	0.041	0.000		ARCH(1)	0.192	0.000		ARCH(1)	0.144	0.021	
CPI(PRT)	ARCH(1)	0.041	0.000		ARCH(1)	0.002	0.000		ARCH(1)	0.216	0.000		
e(AUT/PRT)	ARCH(1)	0.041	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000			GARCH(1)	0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Greece	Number observations	156				311				221			
	Lags	1				15				14			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	23.534	6.553	1.484		54.241	15.184	5.021		10.639	2.790	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.904	0.978	1.078	1.078	1.037	1.037	1.000	0.976	0.973	0.973
	Cointegration vector	CPI(GRC)	CPI(ESP)	e(GRC/ESP)	Constant	CPI(GRC)	CPI(ESP)	e(GRC/ESP)	Constant	CPI(GRC)	CPI(ESP)	e(GRC/ESP)	Constant
	Coefficient	1.000	-0.421	-0.218	0.018	1.000	-0.836	-0.500	-0.941	1.000	-1.315	-	1.538
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	-0.091	-0.043	0.105		-0.012	-0.010	-0.028		0.013	0.017	-	-
	Economically sensible	Yes	No	Yes	-	Yes	No	No	-	No	Yes	-	-
	VECM residual auto-correlation at lag	4				3				2			
	Jarque-Bera: p-value	0.000				0.000				0.009			
	Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.431 0.074	0.001		ARCH(1))	0.051 0.000	0.000		ARCH(1) GARCH(1)	0.073 0.252	0.006		
CPI(ESP)	ARCH(1) GARCH(1)	0.479 0.435	0.362		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	0.218 0.000	0.000		
e(AUT/ESP)	ARCH(1) GARCH(1)	0.000 0.000	0.000		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	- -	-		
Italy / Ireland	Number observations	155				311				221			
	Lags	2				10				14			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	21.146	10.772	3.368		29.807	12.018	5.168		15.183	3.348	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.007	1.000	1.000	0.637	1.003	1.000	1.000	0.985	1.000	0.990	0.952	0.952
	Cointegration vector	CPI(IRL)	CPI(ITA)	e(IRL/ITA)	Constant	CPI(IRL)	CPI(ITA)	e(IRL/ITA)	Constant	CPI(IRL)	CPI(ITA)	e(IRL/ITA)	Constant
	Coefficient	1.000	0.698	5.379	-3.431	1.000	-1.164	-0.320	0.773	1.000	0.641	-	-7.745
	Economically sensible	Yes	No	No	-	Yes	Yes	Yes	-	Yes	No	-	-
	Adjustment factor	0.001	0.000	0.001		0.005	0.006	-0.001		-0.004	0.000	-	-
	Economically sensible	No	-	-	-	No	Yes	No	-	Yes	-	-	-
	VECM residual auto-correlation at lag	2				1				3			
	Jarque-Bera: p-value	0.000				0.000				0.712			
	Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1) GARCH(1)	0.837 0.996	0.976		ARCH(1))	0.570 0.000	0.000		ARCH(1) GARCH(1)	0.348 0.933	0.622		
CPI(ITA)	ARCH(1) GARCH(1)	0.416 0.514	0.122		ARCH(1))	0.000 0.000	0.000		ARCH(1) GARCH(1)	0.295 0.304	0.039		
e(AUT/ITA)	ARCH(1) GARCH(1)	0.416 0.514	0.000		ARCH(1))	0.441 0.077	0.000		ARCH(1) GARCH(1)	- -	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Portugal / Ireland	Number observations	155				311				221			
	Lags	2				24				18			
	Cointegration rank at significance level 5%	-				-				0			
	Trace statistics	38.768	16.327	5.262		71.298	24.341	6.338		11.995	2.194	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.002	1.000	1.000	0.643	1.044	1.044	1.014	1.014	1.000	0.988	0.988	0.978
	Cointegration vector	CPI(IRL)	CPI(PRT)	e(IRL/PRT)	Constant	CPI(IRL)	CPI(PRT)	e(IRL/PRT)	Constant	CPI(IRL)	CPI(PRT)	e(IRL/PRT)	Constant
	Coefficient	1.000	-0.471	0.205	-1.743	1.000	-0.289	0.787	-2.974	1.000	-0.495	-	-2.363
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.005	0.029	0.004	-	-0.015	0.049	-0.116	-	-0.011	-0.001	-	-
	Economically sensible	No	Yes	-	-	Yes	Yes	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	3				3				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.702			ARCH(1)	0.000			ARCH(1)	0.177			
	GARCH(1)	0.990	0.924		)	0.004	0.000		GARCH(1)	0.765	0.314	
CPI(PRT)	ARCH(1)	0.702	0.000		ARCH(1)	0.014	0.000		ARCH(1)	0.588		0.302	
	GARCH(1)	0.990			)	0.000	0.000		GARCH(1)	0.377		
e(AUT/PRT)	ARCH(1)	0.702	0.000		ARCH(1)	0.014	0.000		ARCH(1)	-	-		
	GARCH(1)	0.990			)	0.000	0.000		GARCH(1)	-	-	
Spain / Ireland	Number observations	148				311				221			
	Lags	9				20				14			
	Cointegration rank at significance level 5%	1				1				-			
	Trace statistics	54.269	9.756	1.652		46.296	15.197	6.984		17.649	5.978	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.127	1.127	1.000	1.000	1.070	1.070	1.068	1.042	1.000	0.994	0.979	0.951
	Cointegration vector	CPI(IRL)	CPI(ESP)	e(IRL/ESP)	Constant	CPI(IRL)	CPI(ESP)	e(IRL/ESP)	Constant	CPI(IRL)	CPI(ESP)	e(IRL/ESP)	Constant
	Coefficient	1.000	-1.341	56.408	-12.970	1.000	-1.663	1.686	2.891	1.000	-4.548	-	16.899
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.000	0.001	-0.017	-	0.003	0.003	0.016	-	0.001	0.001	-	-
	Economically sensible	Yes	Yes	-	-	No	Yes	-	-	No	Yes	-	-
	VECM residual auto-correlation at lag	0				1				2			
	Jarque-Bera: p-value	0.000				0.000				0.562			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.216			ARCH(1)	0.000			ARCH(1)	0.095			
	GARCH(1)	0.000	0.000		)	0.141	0.000		GARCH(1)	0.762	0.193	
CPI(ESP)	ARCH(1)	0.514	0.203		ARCH(1)	0.022	0.000		ARCH(1)	0.074	0.000	0.000	
	GARCH(1)	0.357			)	0.000	0.000		GARCH(1)	0.000		
e(AUT/ESP)	ARCH(1)	0.514	0.000		ARCH(1)	0.016	0.000		ARCH(1)	-	-		
	GARCH(1)	0.357			)	0.000	0.000		GARCH(1)	-	-	

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Luxembourg / Italy	Number observations	155				311				221			
	Lags	2				15				14			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	24.806	9.167	1.901		62.539	27.569	5.697		9.626	3.914	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.991	0.415	1.274	1.274	1.066	1.066	1.000	0.985	0.985	0.945
	Cointegration vector	CPI(ITA)	CPI(LUX)	e(ITA/LUX)	Constant	CPI(ITA)	CPI(LUX)	e(ITA/LUX)	Constant	CPI(ITA)	CPI(LUX)	e(ITA/LUX)	Constant
	Coefficient	1.000	-1.128	2.335	4.964	1.000	-2.261	0.066	5.406	1.000	-0.894	-	-0.472
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.005	0.019	0.001	-	0.000	0.021	-0.054	-	-0.025	0.017	-	-
	Economically sensible	No	Yes	-	-	Yes	Yes	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	2				2				4			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.336	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.584	0.076		
	GARCH(1)	0.000				0.000			GARCH(1)	0.124			
CPI(LUX)	ARCH(1)	0.452	0.664		ARCH(1)	0.008	0.000		ARCH(1)	0.100			
	GARCH(1)	0.799				0.000			GARCH(1)	0.000	0.000		
e(AUT/LUX)	ARCH(1)	0.001	0.000		ARCH(1)	0.011	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		
Netherlands / Italy	Number observations	155				311				221			
	Lags	2				13				16			
	Cointegration rank at significance level 5%	0				1				0			
	Trace statistics	29.294	13.221	3.944		37.910	14.682	5.630		9.914	3.026	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.942	0.397	1.323	1.323	1.032	1.032	1.030	1.030	1.000	0.993
	Cointegration vector	CPI(ITA)	CPI(NLD)	e(ITA/NLD)	Constant	CPI(ITA)	CPI(NLD)	e(ITA/NLD)	Constant	CPI(ITA)	CPI(NLD)	e(ITA/NLD)	Constant
	Coefficient	1.000	-1.120	10.837	19.917	1.000	-5.089	1.885	17.450	1.000	-1.266	-	1.281
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.002	0.007	-0.005	-	-0.002	0.000	-0.029	-	0.006	0.021	-	-
	Economically sensible	No	Yes	-	-	Yes	Yes	-	-	No	Yes	-	-
	VECM residual auto-correlation at lag	2				3				2			
	Jarque-Bera: p-value	0.000				0.000				0.067			
	Heteroskedasticity test of VECM residuals	Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value		Process	Single significance e: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.415	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.385	0.652		
	GARCH(1)	0.000				0.000			GARCH(1)	0.917			
CPI(NLD)	ARCH(1)	0.197	0.000		ARCH(1)	0.067	0.007		ARCH(1)	0.385	0.000		
	GARCH(1)	0.000				0.332			GARCH(1)	0.917			
e(AUT/NLD)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.000			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Portugal / Italy	Number observations	133				311				221			
	Lags	24				23				13			
	Cointegration rank at significance level 5%	-				2				0			
	Trace statistics	106.369	41.017	16.456		50.178	21.841	3.538		8.931	4.171	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.331	1.301	1.107	1.107	1.067	1.067	1.035	1.035	1.000	0.976	0.964	0.964
	Cointegration vector	CPI(ITA)	CPI(PRT)	e(ITA/PRT)	Constant	CPI(ITA)	CPI(PRT)	e(ITA/PRT)	Constant	CPI(ITA)	CPI(PRT)	e(ITA/PRT)	Constant
	Coefficient	1.000	0.097	20.238	-17.559	1.000	-0.460	0.578	-2.325	1.000	-0.909	-	-0.432
	Economically sensible	Yes	No	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.001	0.070	-0.001	-	-0.005	-0.013	-0.061	-	-0.017	0.008	-	-
	Economically sensible	No	-	-	-	Yes	No	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	1				5				1			
Jarque-Bera: p-value	0.000				0.000				0.000				
Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.007	0.027		ARCH(1)	0.004	0.000		ARCH(1)	0.252	0.516		
	GARCH(1)	0.946				0.000			GARCH(1)	0.951			
CPI(PRT)	ARCH(1)	0.007	0.000		ARCH(1)	0.010	0.000		ARCH(1)	0.530	0.815		
	GARCH(1)	0.946				0.000			GARCH(1)	0.945			
e(AUT/PRT)	ARCH(1)	0.007	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.946				0.000			GARCH(1)	-	-		
Period													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Italy	Number observations	155				311				221			
	Lags	2				19				14			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	26.016	5.956	0.095		55.578	23.134	4.339		13.116	2.951	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.988	0.282	2.013	1.018	1.018	1.000	1.004	1.000	0.964	0.964
	Cointegration vector	CPI(ITA)	CPI(ESP)	e(ITA/ESP)	Constant	CPI(ITA)	CPI(ESP)	e(ITA/ESP)	Constant	CPI(ITA)	CPI(ESP)	e(ITA/ESP)	Constant
	Coefficient	1.000	-0.600	-0.029	-0.791	1.000	-0.741	0.127	-1.274	1.000	-0.624	-	-1.775
	Economically sensible	Yes	Yes	Yes	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	0.030	0.114	-0.012	-	-0.005	-0.006	-0.058	-	-0.008	-0.027	-	-
	Economically sensible	No	Yes	No	-	Yes	No	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	0				1				2			
Jarque-Bera: p-value	0.000				0.000				0.762				
Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value		
CPI(AUT)	ARCH(1)	0.393	0.000		ARCH(1)	0.000	0.000		ARCH(1)	0.235	0.000		
	GARCH(1)	0.000				0.000			GARCH(1)	0.000	0.000		
CPI(ESP)	ARCH(1)	0.018	0.000		ARCH(1)	0.001	0.000		ARCH(1)	0.121	0.000		
	GARCH(1)	0.000				0.000			GARCH(1)	0.000			
e(AUT/ESP)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000				0.043			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Netherlands / Luxembourg	Number observations	156				311				221			
	Lags	1				13				13			
	Cointegration rank at significance level 5%	-				0				0			
	Trace statistics	48.931	21.367	6.923		28.561	8.452	3.696		11.766	2.523	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.807	0.950	1.023	1.023	1.000	1.000	1.000	0.972	0.922	0.922
	Cointegration vector	CPI(LUX)	CPI(NLD)	e(LUX/NLD)	Constant	CPI(LUX)	CPI(NLD)	e(LUX/NLD)	Constant	CPI(LUX)	CPI(NLD)	e(LUX/NLD)	Constant
	Coefficient	1.000	-0.614	0.537	-0.933	1.000	-0.984	-0.903	-0.050	1.000	-1.294	-	1.397
	Economically sensible	Yes	Yes	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.024	0.268	-0.098	-	-0.038	0.006	0.043	-	0.006	0.032	-	-
	Economically sensible	No	Yes	-	-	Yes	Yes	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	3				0				1			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.326	0.000		ARCH(1)	0.074	0.000		ARCH(1)	0.215	0.000		
	GARCH(1)	0.109			)	0.000			GARCH(1)	0.083			
CPI(NLD)	ARCH(1)	0.074	0.000		ARCH(1)	0.084	0.000		ARCH(1)	0.197	0.429		
	GARCH(1)	0.000			)	0.081			GARCH(1)	0.961			
e(AUT/NLD)	ARCH(1)	0.074	0.000		ARCH(1)	0.001	0.000		ARCH(1)	-	-		
	GARCH(1)	0.000			)	0.000			GARCH(1)	-	-		
Portugal / Luxembourg	Number observations	155				311				221			
	Lags	2				21				13			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	34.807	11.046	3.834		61.051	17.186	7.725		10.503	3.152	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.006	1.000	1.000	0.059	1.334	1.136	1.057	1.057	1.000	0.976	0.959	0.959
	Cointegration vector	CPI(LUX)	CPI(PRT)	e(LUX/PRT)	Constant	CPI(LUX)	CPI(PRT)	e(LUX/PRT)	Constant	CPI(LUX)	CPI(PRT)	e(LUX/PRT)	Constant
	Coefficient	1.000	3.287	12.969	-30.866	1.000	1.026	2.048	-8.670	1.000	-1.033	-	0.112
	Economically sensible	Yes	No	No	-	Yes	No	No	-	Yes	Yes	-	-
	Adjustment factor	0.001	0.004	-0.001	-	-0.004	-0.023	-0.028	-	-0.014	0.016	-	-
	Economically sensible	No	-	-	-	Yes	-	-	-	Yes	Yes	-	-
	VECM residual auto-correlation at lag	3				0				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)	ARCH(1)	0.775	0.909		ARCH(1)	0.007	0.000		ARCH(1)	0.089	0.000		
	GARCH(1)	0.866			)	0.000			GARCH(1)	0.000			
CPI(PRT)	ARCH(1)	0.539	0.074		ARCH(1)	0.011	0.000		ARCH(1)	0.264	0.535		
	GARCH(1)	0.161			)	0.000			GARCH(1)	0.979			
e(AUT/PRT)	ARCH(1)	0.000	0.000		ARCH(1)	0.000	0.000		ARCH(1)	-	-		
	GARCH(1)	0.503			)	0.045			GARCH(1)	-	-		

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Luxemb- ourg	Number observations	155				311				221			
	Lags	2				19				19			
	Cointegration rank at significance level 5%	0				-				-			
	Trace statistics	20.926	8.101	1.440		67.118	17.256	5.314		17.787	4.232	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.000	1.000	0.994	0.067	1.295	1.295	1.177	1.177	1.037	1.000	0.977	
	Cointegration vector	CPI(LUX)	CPI(ESP)	e(LUX/ESP)	Constant	CPI(LUX)	CPI(ESP)	e(LUX/ESP)	Constant	CPI(LUX)	CPI(ESP)	e(LUX/ESP)	
	Coefficient	1.000	0.352	1.289	-4.722	1.000	-0.373	0.054	-2.751	1.000	-0.492	-2.373	
	Economically sensible	Yes	No	No	-	Yes	Yes	No	-	Yes	Yes	-	
	Adjustment factor	0.008	0.007	-0.012	-	-0.025	-0.032	-0.137	-	-0.008	-0.020	-	
	Economically sensible	No	-	-	-	Yes	No	-	-	Yes	No	-	
	VECM residual auto-correlation at lag	1				3				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	Prozess	Single significance: e: p-value	Joint significance: p-value		
ARCH(1)			0.795				0.947			ARCH(1)		0.016	0.000	ARCH(1)	0.123	0.000
CPI(AUT)		ARCH(1)	0.577	0.624		CPI(ESP)	ARCH(1)	0.002	0.000	CPI(NLD)	ARCH(1)	0.286	0.000
		GARCH(1)	0.706				GARCH(1)	0.000	0.000		GARCH(1)	0.004	0.000
e(AUT/ESP)		ARCH(1)	0.577	0.000		e(NLD/PRT)	ARCH(1)	0.001	0.005	e(NLD/PRT)	ARCH(1)	-	-
		GARCH(1)	0.706				GARCH(1)	0.968			GARCH(1)	-	-

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Portugal / Nether- lands	Number observations	134				311				221			
	Lags	23				13				13			
	Cointegration rank at significance level 5%	1				-				0			
	Trace statistics	39.159	8.474	2.649		57.226	20.514	6.137		6.497	1.617	-	
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	
	4 largest moduli of eigenvalues	1.096	1.096	1.037	1.037	1.467	1.076	1.076	1.034	1.000	0.998	0.993	
	Cointegration vector	CPI(NLD)	CPI(PRT)	e(NLD/PRT)	Constant	CPI(NLD)	CPI(PRT)	e(NLD/PRT)	Constant	CPI(NLD)	CPI(PRT)	e(NLD/PRT)	
	Coefficient	1.000	1.530	2.018	-7.840	1.000	2.659	4.851	-14.889	1.000	-1.363	-1.756	
	Economically sensible	Yes	No	No	-	Yes	No	No	-	Yes	Yes	-	
	Adjustment factor	0.007	0.030	-0.006	-	0.000	0.001	-0.021	-	0.002	0.007	-	
	Economically sensible	No	-	-	-	Yes	-	-	-	No	Yes	-	
	VECM residual auto-correlation at lag	0				2				0			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Prozess	Single significance: e: p-value	Joint significance: p-value		Prozess	Single significance: e: p-value	Joint significance: p-value	Prozess	Single significance: e: p-value	Joint significance: p-value		
ARCH(1)			0.336				0.000			ARCH(1)		0.154	0.000	ARCH(1)	0.591	0.690
CPI(AUT)		ARCH(1)	0.003	0.000		CPI(PRT)	ARCH(1)	0.000	0.000	CPI(NLD)	ARCH(1)	0.170	0.000
		GARCH(1)	0.003				GARCH(1)	0.000	0.000		GARCH(1)	0.000	0.000
e(AUT/PRT)		ARCH(1)	0.154	0.000		e(NLD/PRT)	ARCH(1)	0.000	0.000	e(NLD/PRT)	ARCH(1)	-	-
		GARCH(1)	0.089				GARCH(1)	0.345			GARCH(1)	-	-

Johansen Cointegration Tests for Real Exchange Rate Components													
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Netherlands	Number observations	156				311				221			
	Lags	1				19				16			
	Cointegration rank at significance level 5%	0				2				0			
	Trace statistics	19.204	9.838	1.385		41.292	17.756	2.698		14.794	2.330	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.000	1.000	0.924	0.959	1.222	1.222	1.042	1.042	1.001	1.001	1.000	0.994
	Cointegration vector	CPI(NLD)	CPI(ESP)	e(NLD/ESP)	Constant	CPI(NLD)	CPI(ESP)	e(NLD/ESP)	Constant	CPI(NLD)	CPI(ESP)	e(NLD/ESP)	Constant
	Coefficient	1.000	-0.319	1.254	-4.377	1.000	-0.103	0.587	-3.845	1.000	-0.261	-	-3.543
	Economically sensible	Yes	Yes	No	-	Yes	Yes	No	-	Yes	Yes	-	-
	Adjustment factor	-0.010	0.025	-0.046	-	-0.010	0.012	-0.184	-	-0.005	-0.009	-	-
	Economically sensible	Yes	Yes	-	-	Yes	Yes	-	-	Yes	No	-	-
	VECM residual auto-correlation at lag	1				1				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)		ARCH(1)	0.066		ARCH(1)	0.091	0.143		ARCH(1)	0.027		0.000	
		GARCH(1)	0.000	0.000		GARCH(1)	0.668			GARCH(1)	0.711	0.204	0.061
CPI(ESP)		ARCH(1)	0.462	0.655	ARCH(1)	0.010	0.000		ARCH(1)	0.704			
		GARCH(1)	0.777			GARCH(1)	0.000	0.000			GARCH(1)	0.256	0.061
e(AUT/ESP)		ARCH(1)	0.000	0.000	ARCH(1)	0.027	0.032		ARCH(1)	-	-	-	
	GARCH(1)	0.000		GARCH(1)		0.711		GARCH(1)		-	-	-	
Period		1960:1 - 1972:12				1973:1 - 1998:12				1999:1 - 2017:5			
Spain / Portugal	Number observations	156				311				221			
	Lags	1				21				15			
	Cointegration rank at significance level 5%	0				-				0			
	Trace statistics	24.941	11.440	2.068		44.887	20.492	3.943		14.288	4.536	-	-
	5% critical values	29.680	15.410	3.760		29.680	15.410	3.760		15.410	3.760	-	-
	4 largest moduli of eigenvalues	1.004	1.000	1.000	0.942	1.066	1.066	1.039	1.039	1.003	1.000	0.987	0.987
	Cointegration vector	CPI(PRT)	CPI(ESP)	e(PRT/ESP)	Constant	CPI(PRT)	CPI(ESP)	e(PRT/ESP)	Constant	CPI(PRT)	CPI(ESP)	e(PRT/ESP)	Constant
	Coefficient	1.000	1.042	2.874	1.688	1.000	-0.753	-0.338	-1.523	1.000	-0.959	-	-0.178
	Economically sensible	Yes	No	No	-	Yes	Yes	Yes	-	Yes	Yes	-	-
	Adjustment factor	0.007	0.003	-0.002	-	-0.008	-0.005	0.004	-	0.012	0.049	-	-
	Economically sensible	No	-	-	-	Yes	No	Yes	-	No	Yes	-	-
	VECM residual auto-correlation at lag	0				2				3			
	Jarque-Bera: p-value	0.000				0.000				0.000			
	Heteroskedasticity test of VECM residuals	Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value		Process	Single significance: p-value	Joint significance: p-value	
CPI(AUT)		ARCH(1)	0.471		ARCH(1)	0.001	0.000		ARCH(1)	0.000	0.000	0.000	
		GARCH(1)	0.865	0.000		GARCH(1)	0.000			GARCH(1)	0.001	0.000	0.000
CPI(ESP)		ARCH(1)	0.267	0.016	ARCH(1)	0.034	0.000		ARCH(1)	0.365		0.000	
		GARCH(1)	0.203			GARCH(1)	0.000	0.000			GARCH(1)	0.000	0.000
e(AUT/ESP)		ARCH(1)	0.000	0.000	ARCH(1)	0.000	0.000		ARCH(1)	-	-	-	
	GARCH(1)	0.000		GARCH(1)		0.001		GARCH(1)		-	-	-	

Legend Appendix Table 12: Under “Cointegration rank at significance level 5%” a hyphen “-“ indicates full rank of matrix Π , i.e. stationarity in levels of all variables. VEC lag selection according to Akaike’s information criterion over a range of 24 month. A constant and orthogonalized seasonal indicators following Johansen (1995) are allowed. The 4 largest moduli of the eigenvalues of the VEC companion matrix are displayed. The modulus of a real eigenvalue is its absolute value. The modulus of a complex eigenvalue, $a+bi$, is calculated according to $(a^2+b^2)^{0.5}$. The companion matrix of a VEC with n endogenous variables and r cointegrating equations has $n - r$ unit eigenvalues. If the process is stable, the moduli of the remaining r eigenvalues are strictly less than unity. If there are moduli larger than unity, the dynamic process is unstable and the assumptions of the JC test are not fulfilled. The Jarque-Bera (1987) test is used to test for the H_0 of a joint normal distribution of the VEC residuals. A Wald tests is used to test for the joint significance of Arch and c parameters.