

Table 4: Combined Specification Parameter Estimates (Controlling for Crises)

α	γ	β	λ_0	λ_1	λ_2	δ_0	$\delta_{1,s}$	$\delta_{1,l}$	δ_1	θ_0	$\theta_{1,s}$	$\theta_{1,l}$	θ_1	LLF	BIC
Panel A: Short-term component															
Proportional															
0.007	0.158***	0.841***	0.012	0.086	0.900***	-	0.027**	-	-	-	-0.013	-	-	-18567	37212
(0.014)	(0.019)	(0.018)	(0.020)	(0.150)	(0.173)		(0.011)				(0.020)				
Non-Proportional															
0.005*	0.166***	0.845***	0.011***	0.081***	0.907***	0.033***	-0.003***	-	-	0.009	-0.009	-	-	-18562	37221
(0.003)	(0.015)	(0.012)	(0.002)	(0.018)	(0.018)	(0.007)	(0.001)			(0.008)	(0.009)				
LRT	9.928***														
Panel B: Long-term component															
Proportional															
0.006**	0.160***	0.842***	0.011***	0.085***	0.902***	-	-	0.049***	-	-	-	-0.002***	-	-18558	37194
(0.003)	(0.015)	(0.013)	(0.003)	(0.018)	(0.020)			(0.009)				(0.001)			
Non-Proportional															
0.006*	0.161***	0.843***	0.011*	0.080***	0.907***	0.003	-	0.045***	-	-0.054	-	0.049	-	-18558	37212
(0.004)	(0.015)	(0.014)	(0.006)	(0.030)	(0.036)	(0.003)		(0.017)		(0.060)		(0.049)			
LRT	1.358														
Panel C: Both components (additive)															
Proportional															
0.006	0.161***	0.844***	0.012*	0.085**	0.901***	-	-0.005	0.054**	-	-	-0.012**	0.009	-	-18558	37212
(0.013)	(0.015)	(0.016)	(0.006)	(0.035)	(0.042)		(0.021)	(0.023)			(0.006)	(0.012)			
Non-Proportional															
0.006	0.162***	0.844***	0.011	0.081**	0.906***	0.008	-0.008	0.046***	-	-0.050	-0.002	0.048	-	-18557	37230
(0.003)	(0.016)	(0.014)	(0.007)	(0.036)	(0.043)	(0.006)	(0.007)	(0.012)		(0.067)	(0.002)	(0.041)			
LRT	0.990														
Panel D: Overall conditional variance (multiplicative)															
Proportional															
0.007	0.158***	0.839***	0.011**	0.080***	0.907***	-	-	-	0.042***	-	-	-	-0.014*	-18563	37203
(0.009)	(0.016)	(0.014)	(0.005)	(0.031)	(0.035)				(0.010)				(0.008)		
Non-Proportional															
0.006	0.162***	0.841***	0.011	0.080	0.908***	0.020	-	-	0.023	-0.005	-	-	-0.004	-18560	37217
(0.012)	(0.025)	(0.018)	(0.016)	(0.084)	(0.101)	(0.059)			(0.083)	(0.016)			(0.022)		
LRT	4.850*														

Notes: This table shows the results of the QMLE parameter estimates for the MF2-GARCH-in-mean model. The numbers in parentheses are Bollerslev–Wooldridge robust standard errors. ***, ** and * indicate significance at the 1%, 5% and 10% level. Each panel shows the results for a different specification, depending on which components of volatility are included. Each panel shows the proportional (no intercept) and non-proportional variant. The likelihood ratio test (LRT) statistic for the proportional variant against the non-proportional variant is also shown at the bottom of each panel. All specifications are estimated using daily U.S. market premium data for the period January 1964 to April 2025 inclusive. The moving average window size (m) which minmizes the Bayesian Information Criterion for all specifications is m=63