Generalized Autoregressive Score
Trees and Forests

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Table S.1: Out-of-sample performance of t-GAS models using QLIKE loss

	Benchmark	DRF	Tiny Tree	Tree	Forest
Benchmark					
DRF	-1.332				
Tiny Tree	-2.006	-0.789			
Tree	-5.277	-3.856	-5.594		
Forest	-3.652	-2.599	-0.871	3.154	
QLIKE	0.403	0.382	0.369	0.324	0.358

Table S.2: Out-of-sample performance of GARCH models using -logL loss

	Benchmark	DRF	Tiny Tree	Tree	Forest
Benchmark					
DRF	-3.025				
Tiny Tree	-2.300	0.350			
Tree	-5.777	-2.356	-5.818		
Forest	-6.703	-2.392	-2.183	1.594	
-logL	1.205	1.177	1.182	1.148	1.162

Figure S.1: Parameter estimates as a function of T10Y state variable for t Copula forest-based GAS
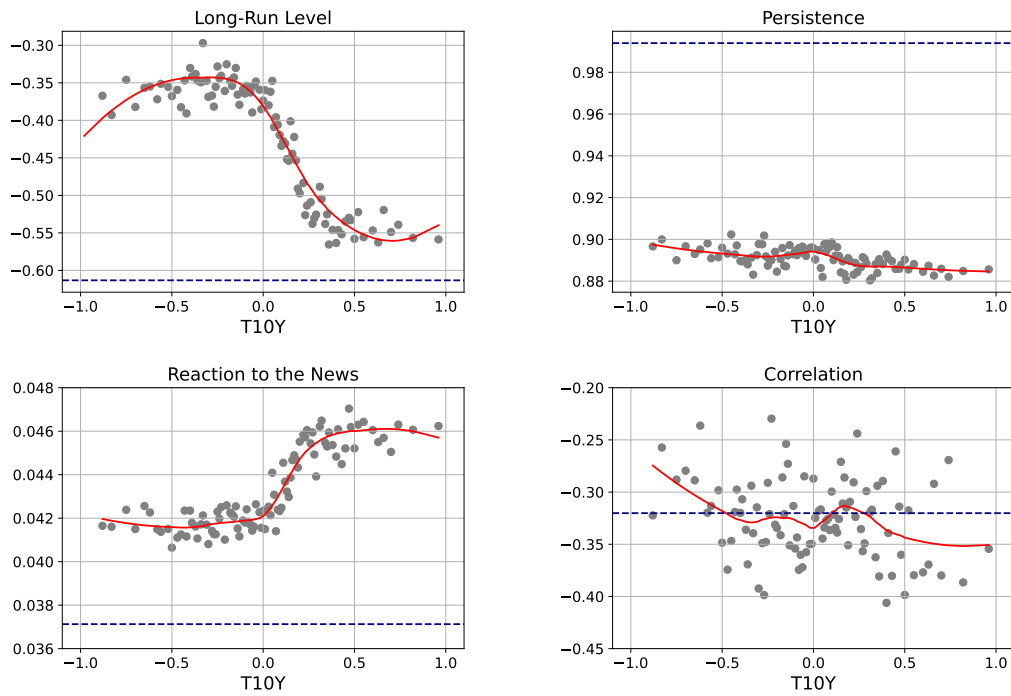

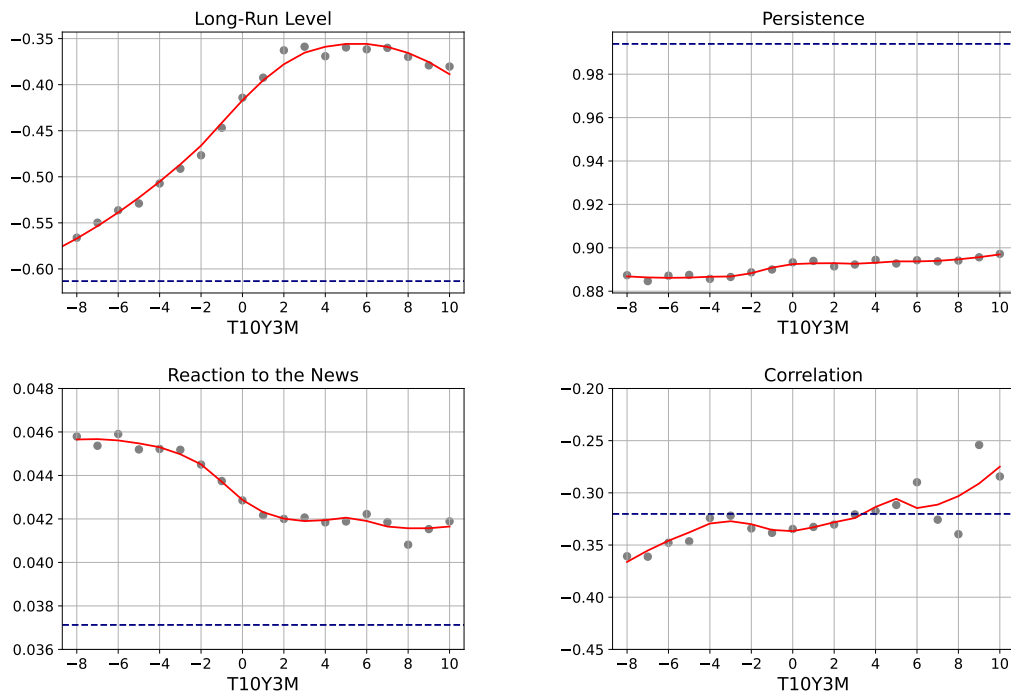Figure S.2: Parameter estimates as a function of T10Y3M state variable for t Copula forest-based GAS

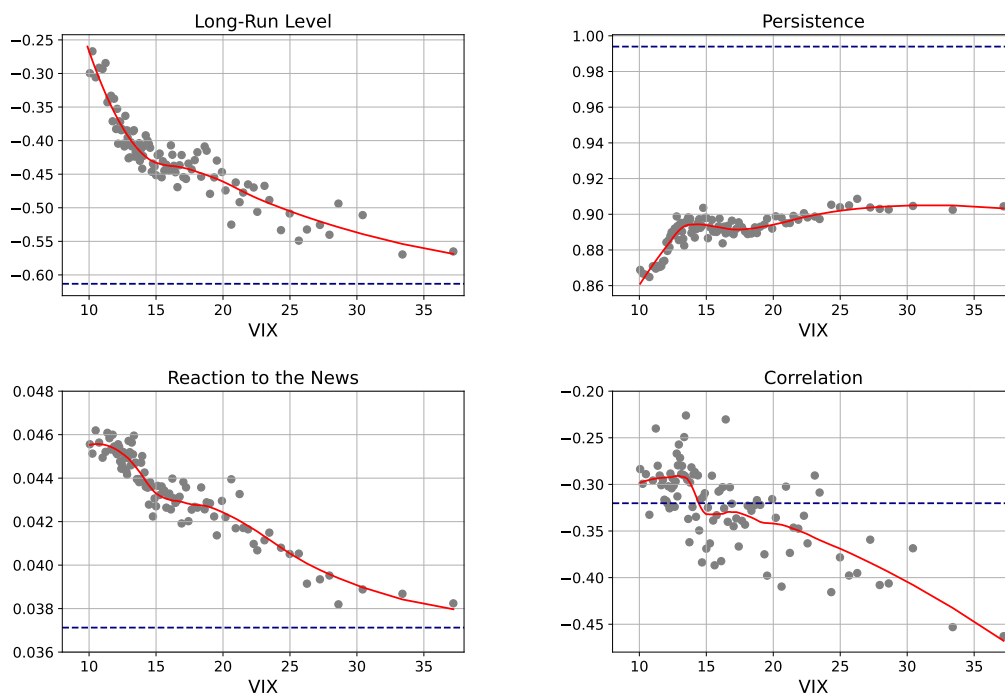Figure S.3: Parameter estimates as a function of VIX state variable for t Copula forest-based GAS

Figure S.4: **The estimated ACD tree model.** This figure depicts the tree structure for the ACD model. The tree's splits are based on SPX and T10Y, which refer to the S&P 500 return and 10 year bond return respectively.
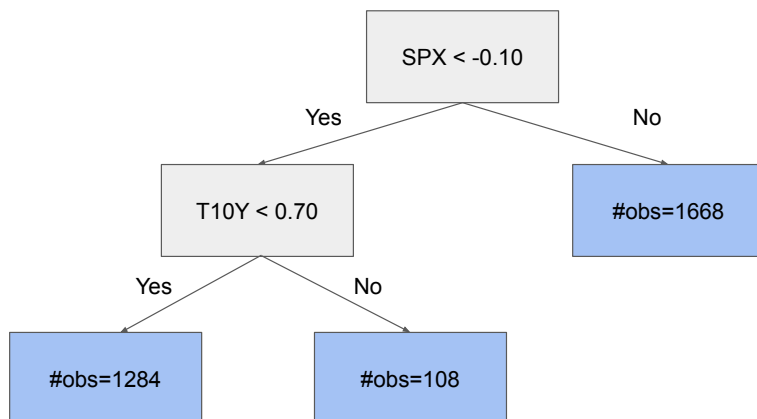
Figure S.5: Parameter estimates as a function of VIX state variable for ACD forest-based
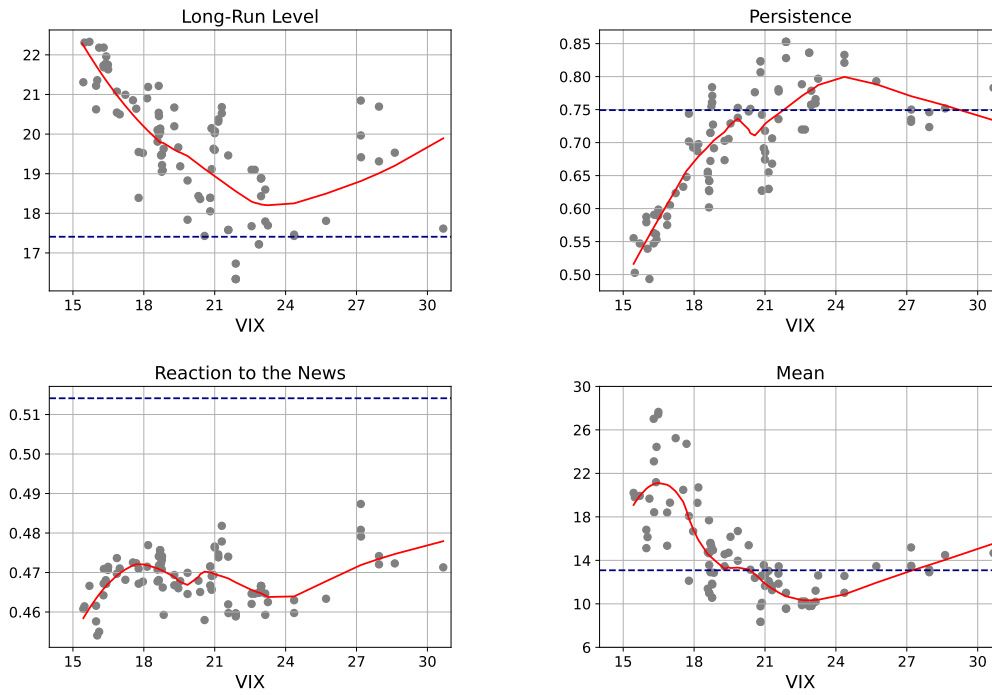

Figure S.6: Parameter estimates as a function of T10Y3M state variable for ACD forest-based
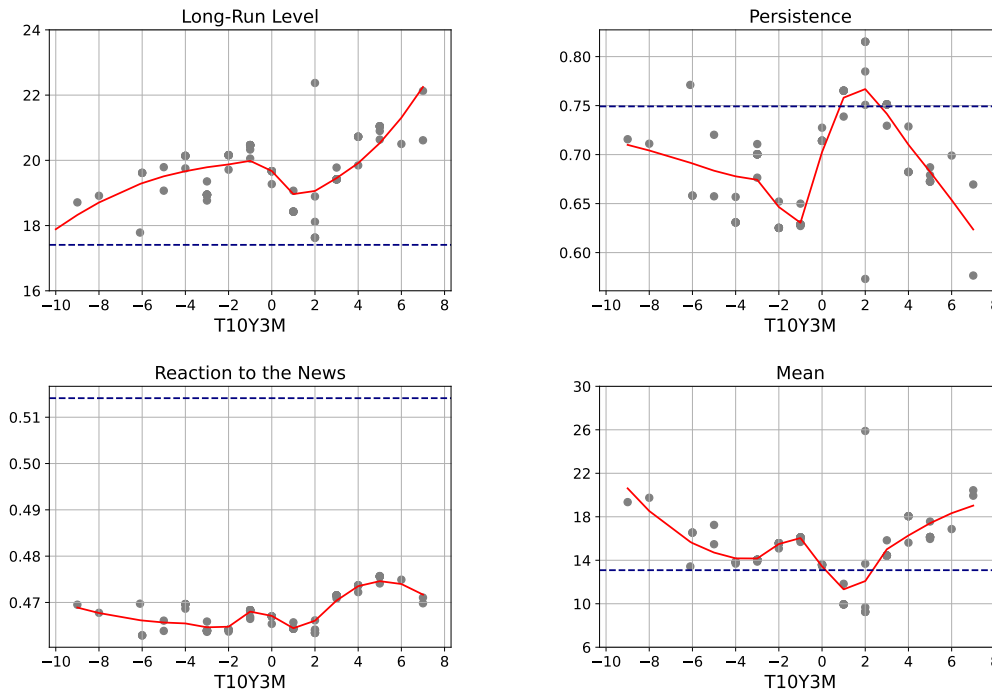
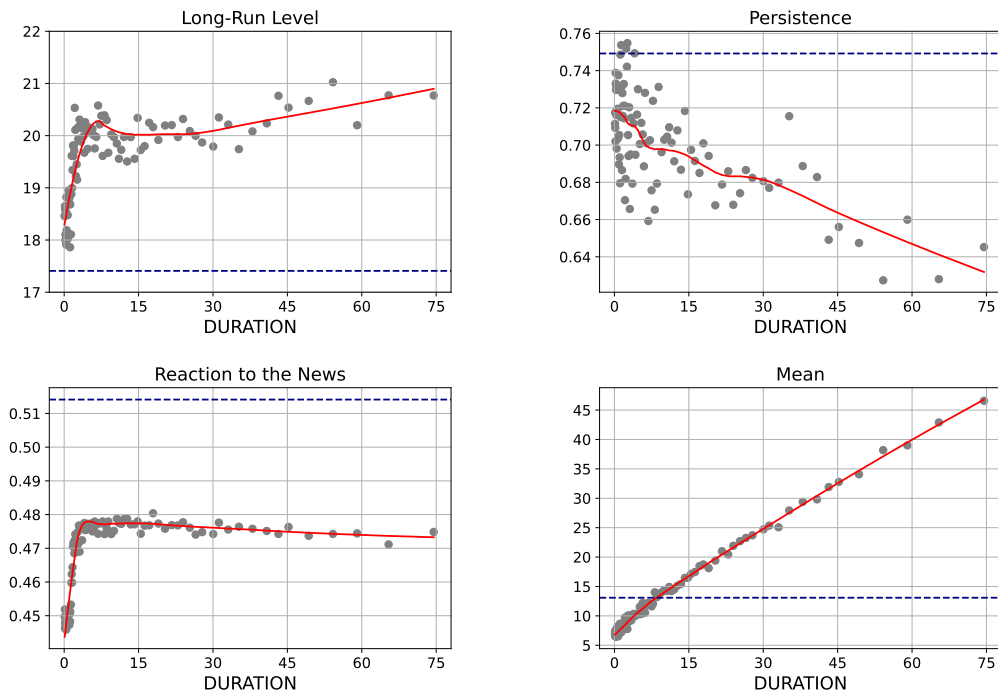Figure S.7: Parameter estimates as a function of DURATION state variable for ACD forest-based

Figure S.8: Parameter estimates as a function of LIQUIDITY state variable for ACD forest-based