Robust Estimation and Inference for Extremal Dependence in Time Series

Appendix D: Omitted Figures and Tables

Jonathan B. Hill*
Dept. of Economics
University of North Carolina - Chapel Hill

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*Dept. of Economics, University of North Carolina-Chapel Hill, www.unc.edu/∼jbhill, jbhill@email.unc.edu.

TABLE 1 - EVAR (n = 500)

Two-Tailed Median $\hat{q}_{m_n}(h) \pm \hat{K}_{m_n}(h)$									
	i. $y \overset{(\infty)}{\nrightarrow} x$			ii. $y \overset{(\text{weak})}{\rightarrow} x$			iii. $y \overset{(\text{strong})}{\rightarrow} x$		
h	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej
1	-.006±.06	.47	.01	.285±.22	.01	.94	.336±.20	.00	.98
2	-.002±.07	.52	.01	.281±.21	.04	.67	.300±.19	.02	.83
3	.007±.07	.63	.02	.240±.20	.06	.55	.235±.17	.03	.76
4	.002±.07	.67	.03	.193±.19	.07	.31	.178±.15	.05	.65

TABLE 2 - SAV (n = 500)

Two-Tailed Median $\hat{q}_{m_n}(h) \pm \hat{K}_{m_n}(h)$						
	i. $y \overset{(\infty)}{\nrightarrow} x$			ii. $y \overset{(\text{h})}{\rightarrow} x$		
h	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej
1	.002±.07	.46	.01	.126±.10	.04	.51
2	.002±.07	.59	.01	.102±.09	.08	.33
3	-.004±.06	.66	.02	.083±.08	.11	.26
4	-.006±.06	.73	.02	.065±.08	.18	.17

TABLE 3 - E-VAR (n = 1000)

Two-Tailed Median $\hat{q}_{m_n}(h) \pm \hat{K}_{m_n}(h)$									
h	i. $y \overset{(\infty)}{\nrightarrow} x$			ii. $y \overset{(\text{weak})}{\rightarrow} x$			iii. $y \overset{(\text{strong})}{\rightarrow} x$		
	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %
1	-.005±.056	.424	.06	.303±.166	.003	.97	.382±.182	.001	1.0
2	.001±.053	.543	.04	.289±.163	.024	.88	.327±.167	.008	.97
3	.000±.049	.631	.05	.234±.152	.038	.67	.248±.148	.010	.96
4	-.002±.052	.708	.03	.183±.140	.057	.51	.187±.132	.022	.89

Two-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$									
h	i. $y \overset{(\infty)}{\nrightarrow} x_1$			ii. $y \overset{(\text{weak})}{\rightarrow} x$			iii. $y \overset{(\text{strong})}{\rightarrow} x$		
	$\hat{r}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %	$\hat{r}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %	$\hat{r}_{m_n} \pm \hat{K}_{m_n}$	p-val	rej %
1	-.021±.039	.406	.01	.191±.055	.001	1.0	.270±.058	.000	1.0
2	-.002±.039	.539	.01	.176±.053	.000	1.0	.213±.055	.000	1.0
3	.000±.039	.640	.02	.128±.051	.000	.96	.149±.052	.000	1.0
4	.001±.039	.691	.02	.089±.050	.001	.94	.105±.050	.000	1.0

TABLE 4 - SAV (n = 1000)

	Two-Tailed Median $\hat{q}_{m_n}(h) \pm \hat{K}_{m_n}(h)$					
	i. $y \overset{(\infty)}{\nrightarrow} x$			ii. $y \overset{(h)}{\rightarrow} x$		
h	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej	$\hat{q}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej
1	.005±.051	..445	.000	.123±.078	.016	.975
2	.008±.053	.552	.000	.102±.072	.029	.754
3	-.008±.043	.564	.000	.083±.069	.053	.612
4	.001±.046	.617	.000	.054±.057	.092	.322
	Two-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$					
	i. $y \overset{(\infty)}{\nrightarrow} x_1$			ii. $y \overset{(h)}{\rightarrow} x$		
h	$\hat{r}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej	$\hat{r}_{m_n} \pm \hat{K}_{m_n}$	p-val	%rej
1	-.002±.04	.556	.000	.119±.06	.002	.978
2	-.000±.04	.628	.000	.105±.06	.002	.978
3	-.001±.04	.713	.000	.082±.05	.003	.921
4	.003±.04	.756	.000	.064±.05	.005	.843

Figure 1: Rolling Fractile Two-Tailed $\hat{r}_{m_n}(h)$
n = 500, h = 1...4

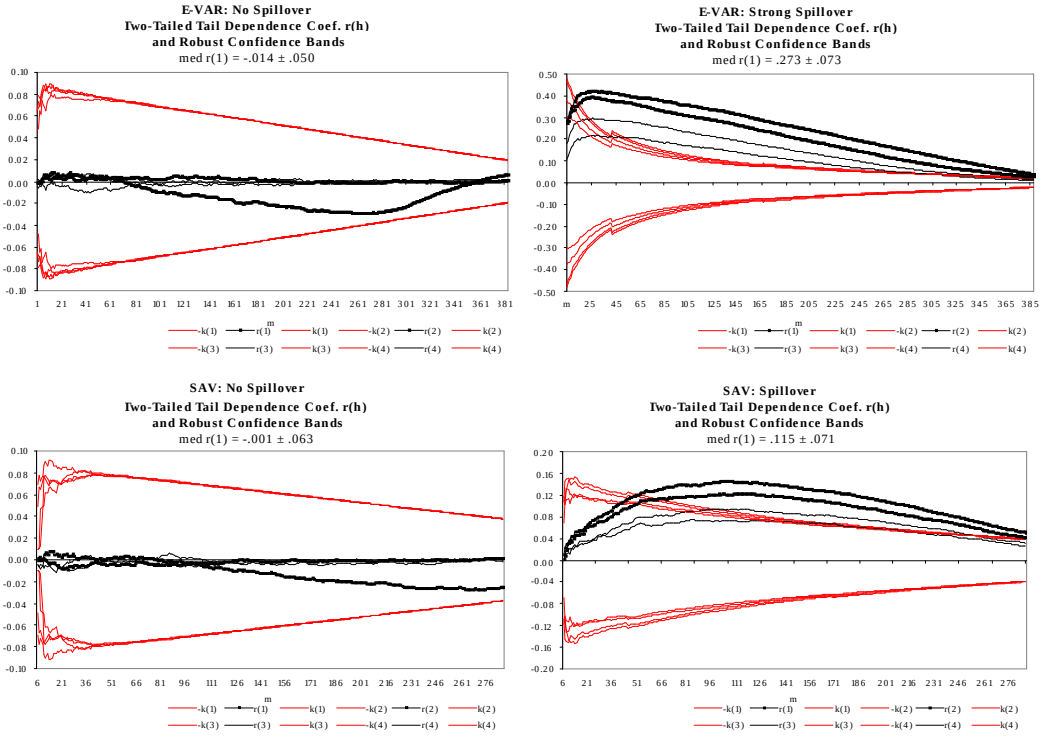


Figure 2: Rolling Fractile Two-Tailed $\hat{q}_{m_n}(h)$
n = 500, h = 1...4

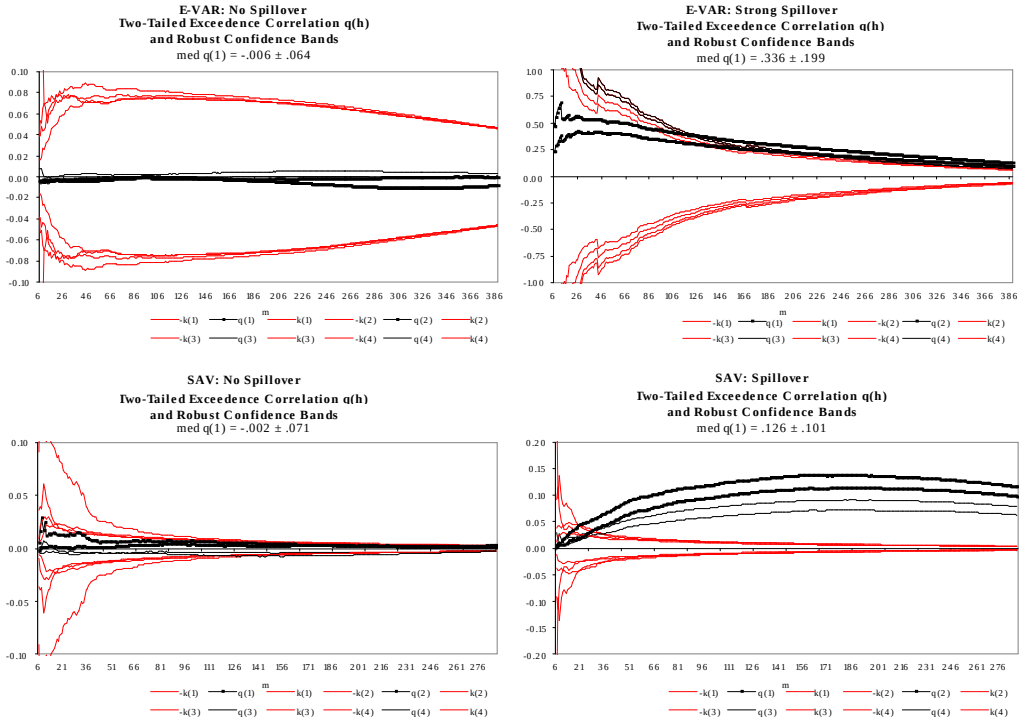


Figure 3: Two-Tailed Median $\hat{q}_{m_n}(h) \pm \hat{K}_{m_n}(h)$
n = 500, h = 1...20

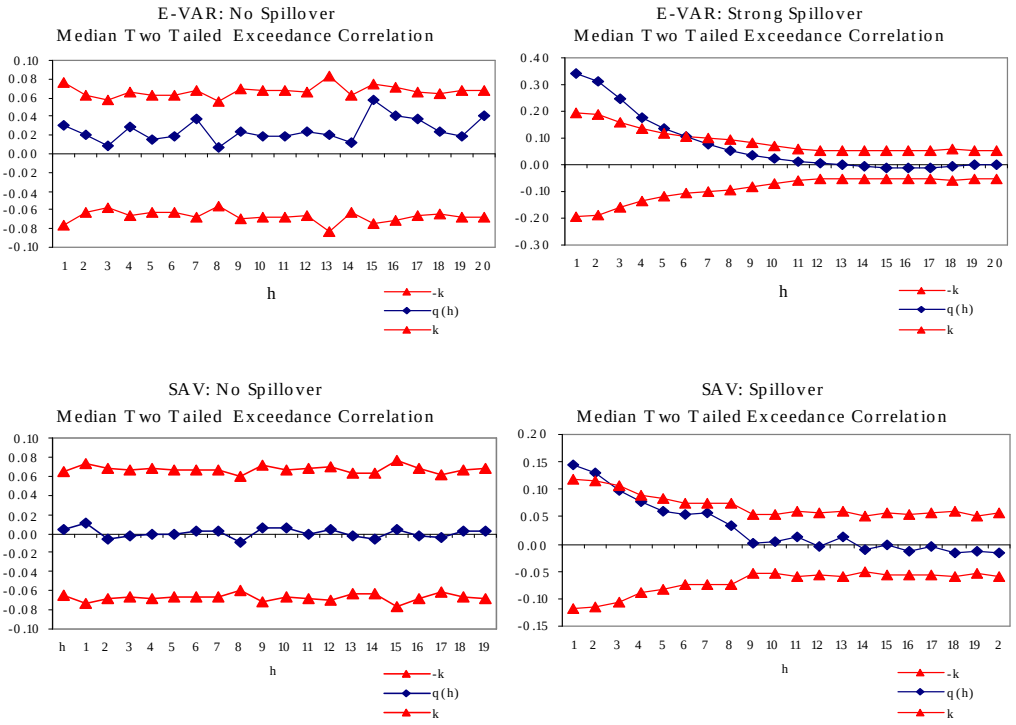
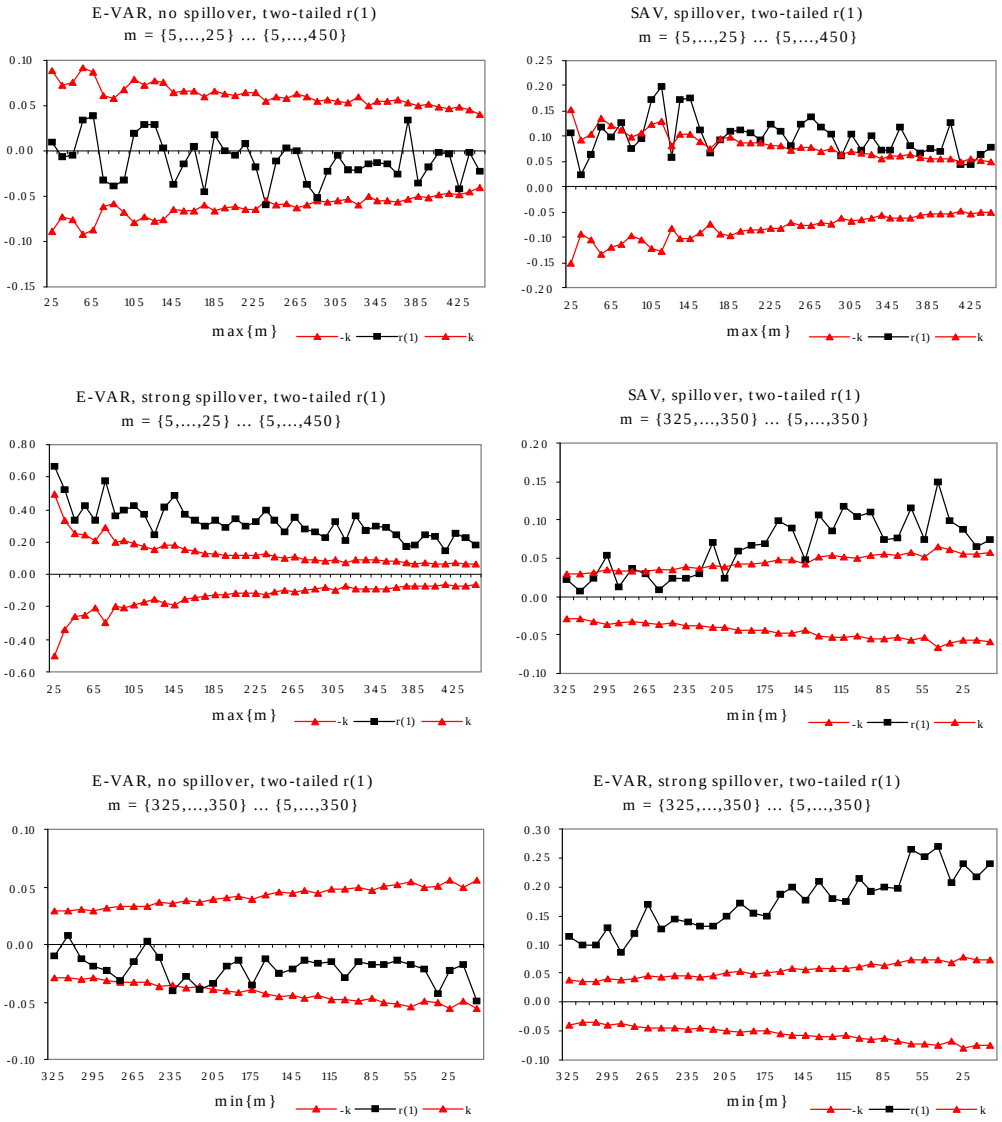


Figure 4: Rolling Window Two-Tailed Median $\hat{r}_{m_n}(1) \pm \hat{K}_{m_n}(1)$: n = 500



The above figures are plots of the median $\hat{r}_{m_n}(1)$ over rolling fractile windows M_n. The windows are $M_n = \{5, ..., 25\}$ to $M_n = \{5, ..., 450\}$, and $M_n = \{345, ..., 350\}$ to $M_n = \{5, ..., 350\}$.

Figure 5: Rolling Fractile Two-Tailed *Serial* $\hat{r}_{m_n}(1)$

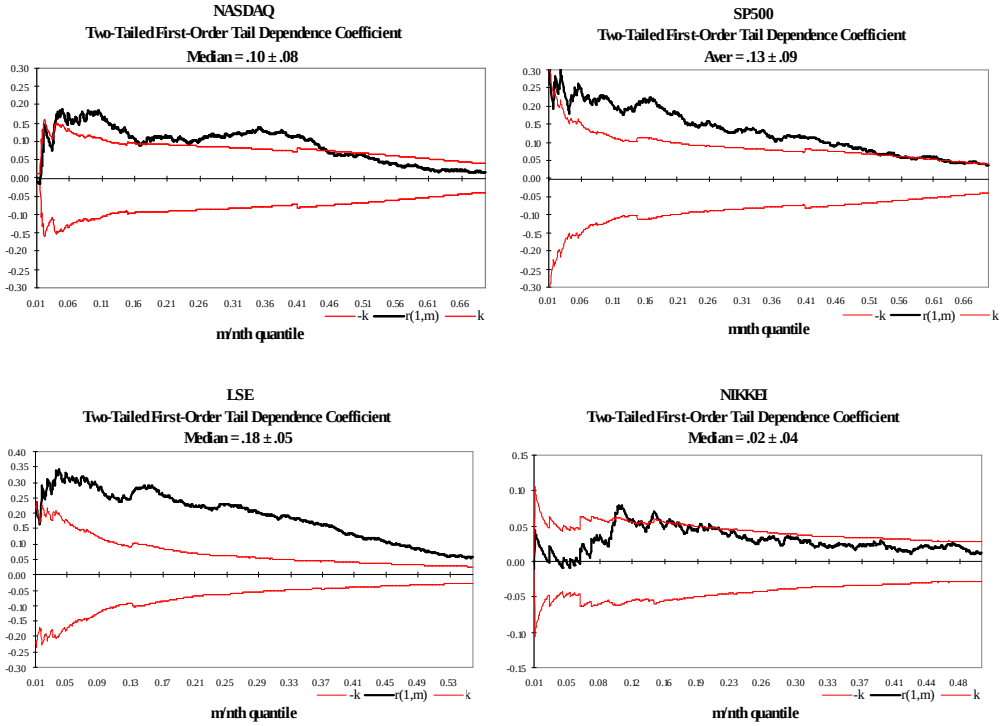


Figure 6: Equity-to-Equity Rolling Fractile Plots
Two-Tailed $\hat{r}_{m_n}(1) \pm \hat{K}_{m_n}$

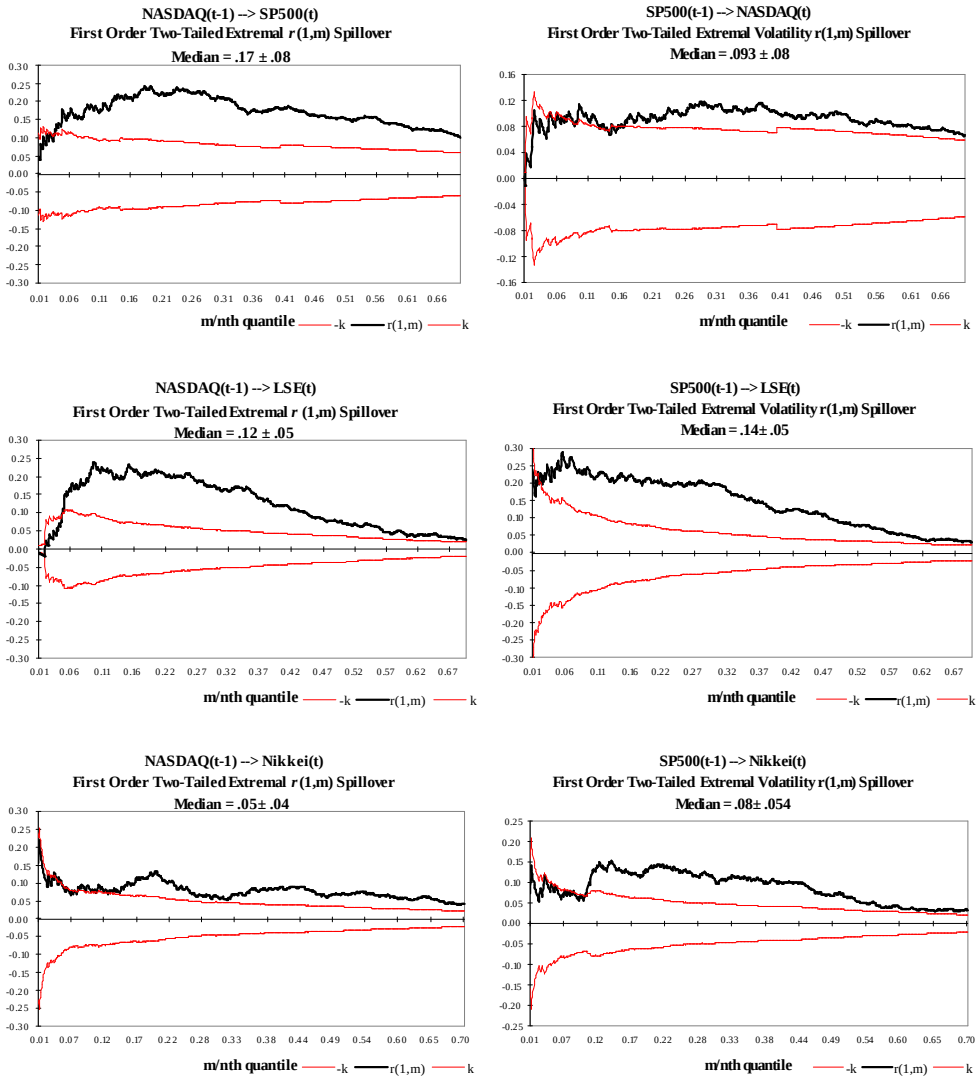
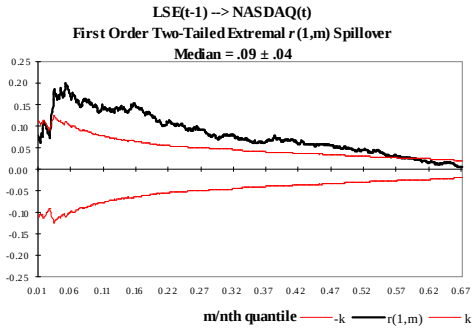
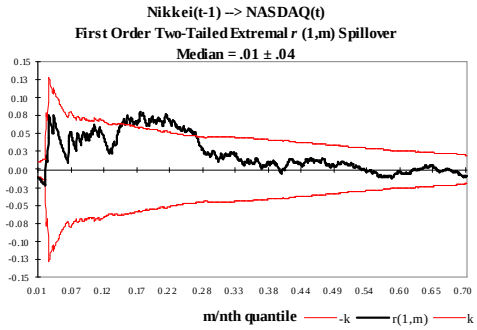
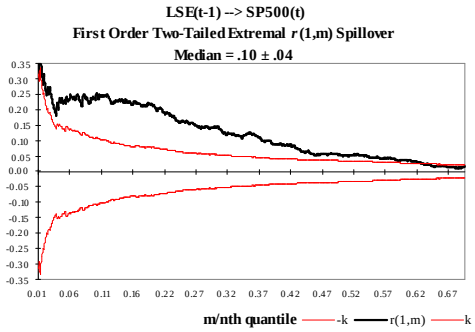
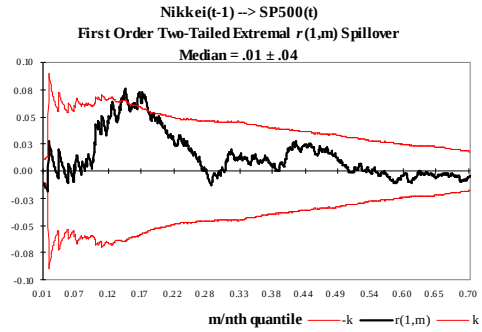


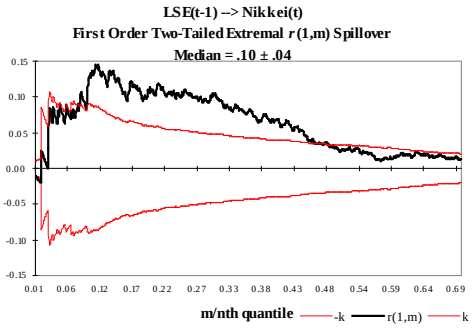
Figure 6 Cont.: Equity-to-Equity Rolling Fractile Plots
Two-Tailed $\hat{r}_{m_n}(1) \pm \hat{K}_{m_n}$











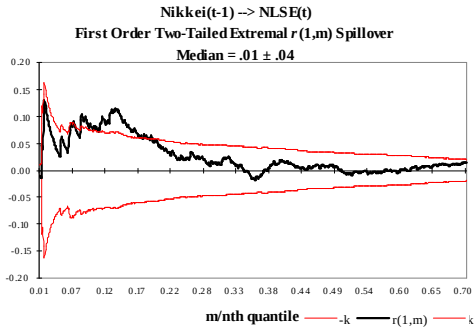
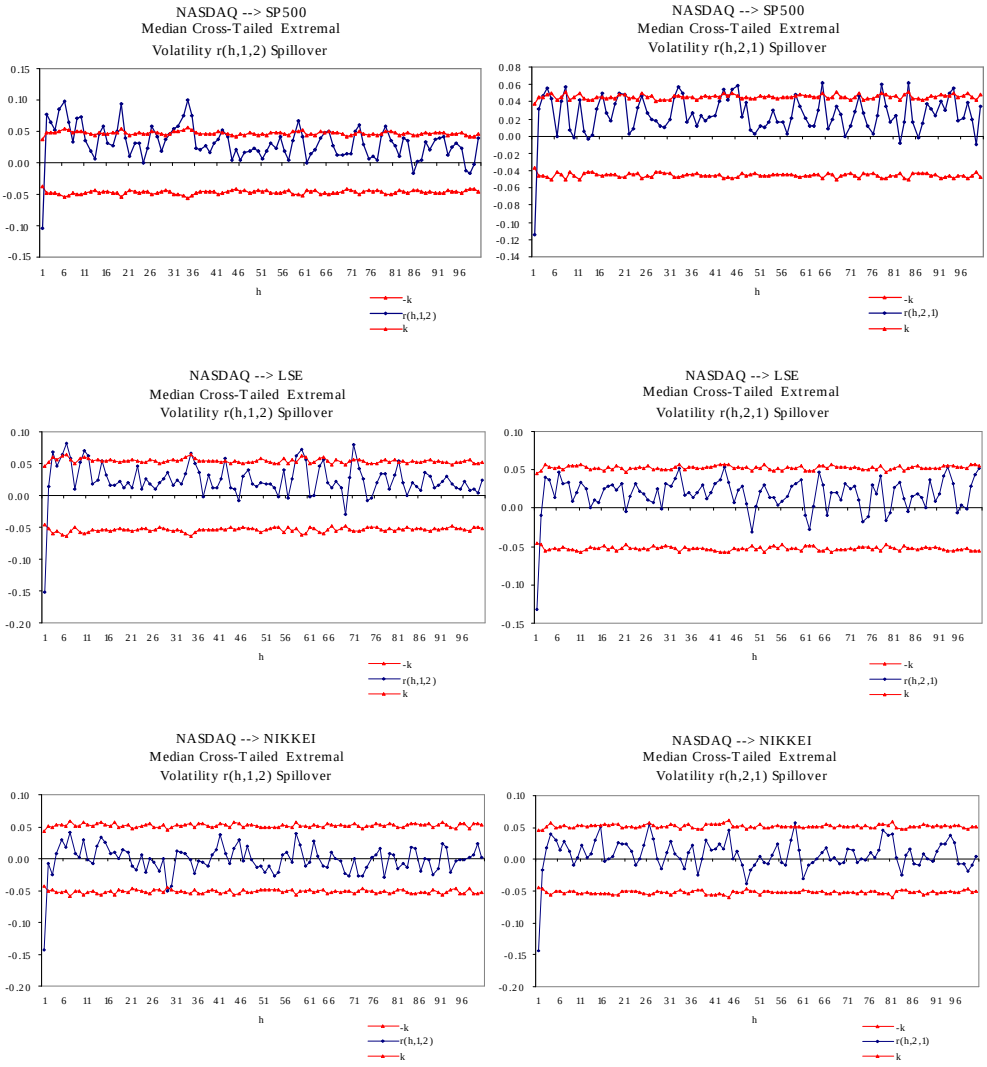
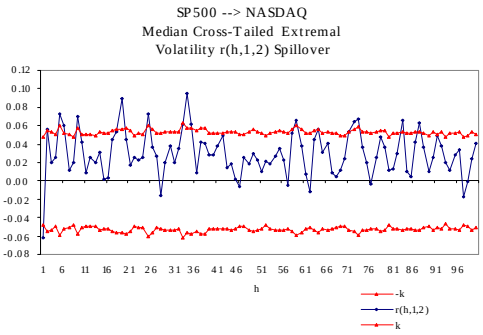


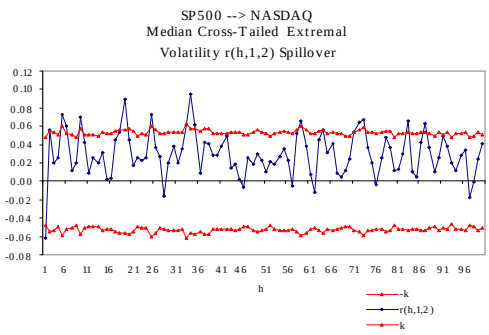
Figure 7: NASDAQ Cross-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$

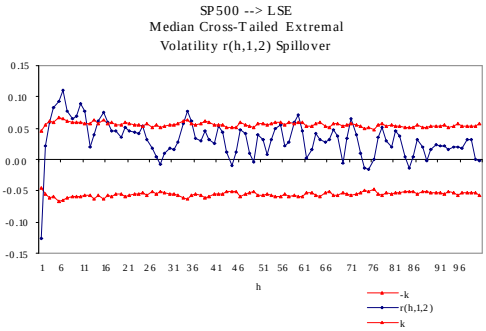


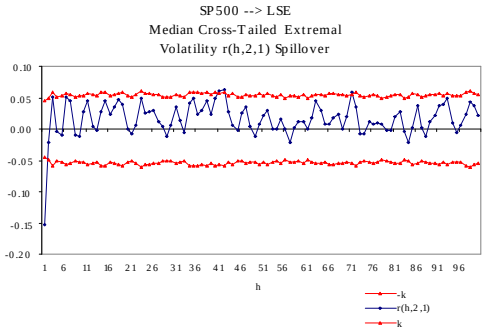
Note, $\hat{r}_{m_n}(h,1,2)$ measures *left-to-right* tail dependence, and $\hat{r}_{m_n}(h,2,1)$ measures *right-to-left* tail dependence.

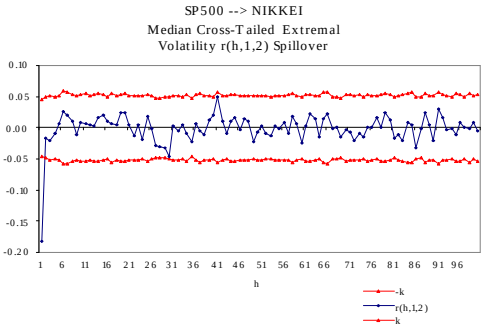
Figure 7 Cont.: SP500 Cross-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$











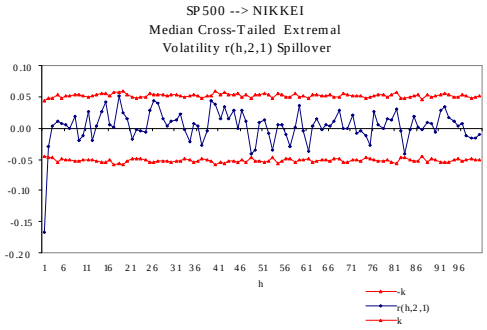
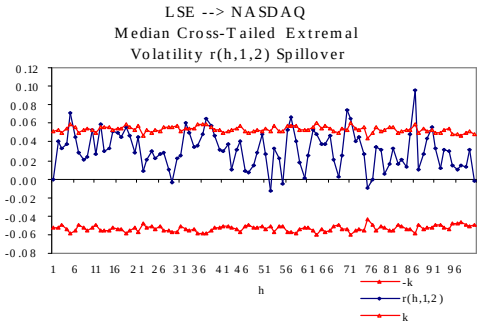
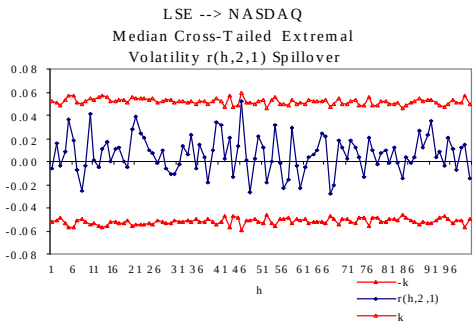
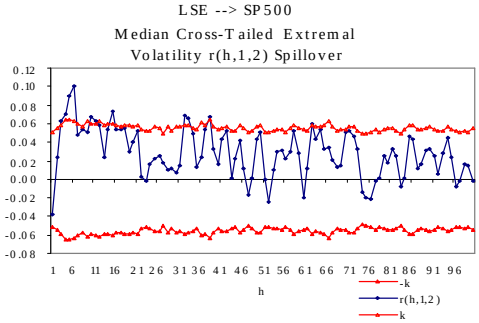
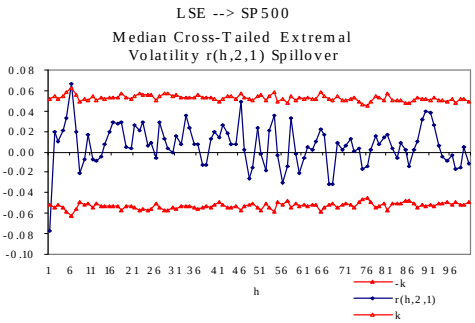


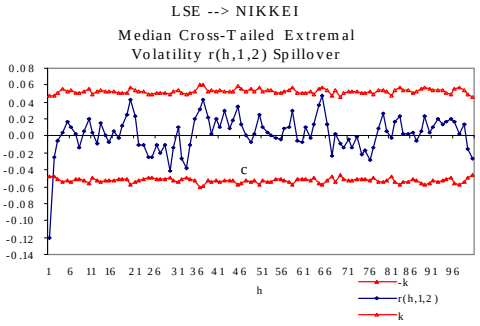
Figure 7 Cont.: LSE Cross-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$











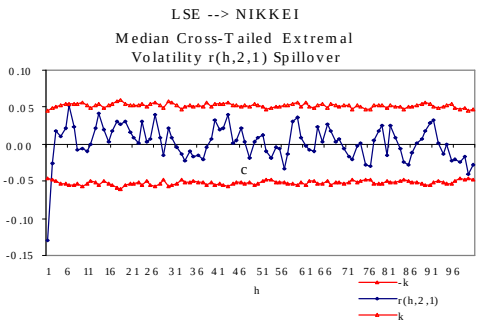


Figure 7 Cont.: NIKKEI Cross-Tailed Median $\hat{r}_{m_n}(h) \pm \hat{K}_{m_n}(h)$