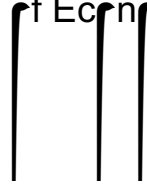De a men f Ec n mic and Finance

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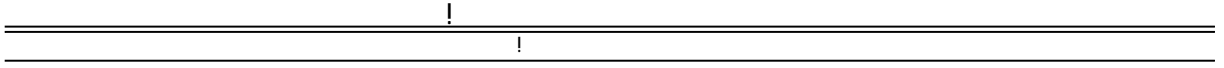$\times 1$

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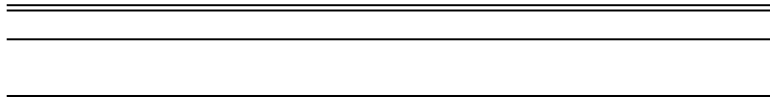
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Table 3: Structural Breaks Dates

Table 5: Benchmark model including ERIX (Returns)

Variables	Whole sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	ERIX	From
MAC	62.15	15.98	4.36	0.04	0.14	17.32	37.85
ISE.Wind	15.37	54.65	3.02	0.05	0.08	26.83	45.35
Crude Oil	5.95	4.36	85.58	0.51	0.89	2.71	14.42
Coal	0.04	0.14	0.62	98.76	0.35	0.08	1.24
Gas	0.12	0.12	1.00	0.10	98.60	0.07	1.40
ERIX	16.73	26.62	1.89	0.04	0.05	54.67	45.33
Directional to others	38.21	47.22	10.90	0.74	1.51	47.01	145.59
Net Directional Con.	0.36	1.87	-3.53	-0.50	0.11	1.68	24.26

	First Sub-sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	ERIX	From
MAC	53.87	14.14	9.31	0.36	0.02	22.30	46.13
ISE.Wind	14.15	56.86	7.58	0.73	0.15	20.55	43.14
Crude Oil	11.61	9.32	67.06	1.22	1.10	9.68	32.94
Coal	0.96	1.72	2.24	94.06	0.45	0.57	5.94
Gas	0.57	1.23	1.62	0.59	95.74	0.24	4.26
ERIX	22.39	19.61	7.48	0.26	0.07	50.19	49.81
Directional to others	49.68	46.03	28.23	3.15	1.79	53.34	182.22
Net Directional Con.	3.55	2.88	-4.71	-2.79	-2.47	3.53	30.37

	Second Sub-sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	ERIX	From
MAC	68.08	13.97	5.88	0.02	0.02	12.03	31.92

Table 6: Benchmark model including S&P500 (Returns)

Variables	Whole sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	S&P500	From
MAC	48.63	12.70	3.39	0.03	0.11	35.14	51.37
ISE.Wind	15.63	54.78	3.06	0.05	0.07	26.41	45.22
Crude Oil	5.67	4.24	82.00	0.50	0.84	6.75	18.00
Coal	0.04	0.14	0.63	98.74	0.36	0.09	1.26
Gas	0.11	0.11	0.99	0.10	98.48	0.22	1.52
S&P500	32.26	20.24	3.71	0.04	0.16	43.59	56.41
Directional to others	53.71	37.44	11.79	0.71	1.53	68.60	173.78

Table 7: Benchmark model including RENIXX (Returns)

Variables			Whole sample				
	MAC	ISE.Wind	Crude Oil	Coal	Gas	RENIXX	From
MAC	53.98	13.82	3.80	0.02	0.12	28.25	46.02
ISE.Wind	16.78	59.96	3.30	0.06	0.07	19.83	40.04
Crude Oil	5.91	4.30	84.70	0.51	0.88	3.71	15.30
Coal	0.04	0.15	0.62	98.83	0.35	0.01	1.17
Gas	0.12	0.10	1.00	0.09	98.62	0.07	1.38
RENIXX	29.87	16.78	2.57	0.05	0.08	50.65	49.35
Directional to others	52.72	35.14	11.29	0.74	1.50	51.87	153.26
Net Directional Con.	6.69	-4.90	-4.01	-0.43	0.12	2.52	25.54

			First Sub-sample				
	MAC	ISE.Wind	Crude Oil	Coal	Gas	RENIXX	From
MAC	50.69	12.34	8.80	0.34	0.02	27.81	49.31
ISE.Wind	14.58	61.77	7.65	0.65	0.09	15.27	38.23
Crude Oil	12.00	8.73	68.95	1.28	1.16	7.88	31.05
Coal	0.98	1.49	2.28	94.29	0.47	0.50	5.71
Gas	0.57	1.10	1.66	0.60	95.77	0.31	4.23
RENIXX	31.36	13.75	6.45	0.19	0.04	48.21	51.79
Directional to others	59.47	37.40	26.84	3.06	1.79	51.77	180.33
Net Directional Con.	10.16	-0.84	-4.21	-2.66	-2.44	-0.02	30.05

			Second Sub-sample				
	MAC	ISE.Wind	Crude Oil	Coal	Gas	RENIXX	From
MAC	60.17	11.55	4.05	0.02	0.01	24.19	39.83
ISE.Wind	13.97	60.84	3.97	0.07	0.09	21.06	39.16
Crude Oil	5.50	5.13	85.42	0.02	1.03	2.89	14.58
Coal	0.01	0.15	0.14	99.26	0.37	0.06	0.74
Gas	0.03	0.21	1.22	0.13	98.40	0.00	1.60
RENIXX	26.07	18.54	2.50	0.07	0.02	52.80	47.20
Directional to others	45.58	35.59	11.89	0.31	1.52	48.21	143.10
Net Directional Con.	5.75	-3.57	-2.69	-0.43	-0.08	1.01	23.85

			Third Sub-sample				
	MAC	ISE.Wind	Crude Oil	Coal	Gas	RENIXX	From
MAC	43.97	22.26	1.20	0.02	1.08	31.47	56.03
ISE.Wind	25.10	47.66	1.01	0.03	0.36	25.85	52.34
Crude Oil	3.36	3.42	88.21	1.27	0.93	2.80	11.79

Table 9: Benchmark model (Volatility)

Table 10: Benchmark model including ERIX (Volatility)

Table 11: Benchmark model including S&P500 (Volatility)

Variables	Whole sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	S&P500	From
MAC	56.78	0.85	0.35	0.04	0.04	41.93	43.22
ISE.Wind	1.22	95.52	0.06	0.00	0.00	3.19	4.48
Crude Oil	3.57	0.27	87.20	0.09	0.08	8.79	12.80
Coal	0.05	0.00	0.37	98.84	0.72	0.02	1.16
Gas	0.06	0.06	0.49	0.28	99.07	0.04	0.93
S&P500	36.33	1.50	1.25	0.01	0.03	60.89	39.11
Directional to others	41.21	2.68	2.53	0.42	0.88	53.97	101.69
Net Directional Con.	-2.00	-1.80	-10.27	-0.74	-0.05	14.87	**16.95**

	First Sub-sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	S&P500	From
MAC	46.42	13.65	5.31	0.03	0.14	34.45	53.58
ISE.Wind	14.87	46.92	6.20	0.06	0.22	31.73	53.08
Crude Oil	5.72	14.48	65.45	0.00	0.09	14.26	34.55
Coal	0.05	0.08	0.70	92.77	6.36	0.04	7.23
Gas	0.09	2.08	0.63	0.54	95.59	1.07	4.41
S&P500	26.22	23.74	6.75	0.04	0.23	43.01	56.99
Directional to others	46.95	54.03	19.60	0.68	7.04	81.55	209.85
Net Directional Con.	-6.63	0.95	-14.96	-6.55	2.63	24.57	**34.98**

	Second Sub-sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	S&P500	From
MAC	74.54	0.17	0.15	0.11	0.02	25.01	25.46
ISE.Wind	0.23	98.99	0.00	0.00	0.05	0.73	1.01
Crude Oil	1.93	0.06	93.78	0.03	0.27	4.04	6.22
Coal	0.31	0.00	0.03	98.20	1.44	0.02	1.80
Gas	0.12	0.15	0.26	0.06	99.28	0.13	0.72
S&P500	27.52	0.08	1.07	0.08	0.13	71.12	28.88
Directional to others	30.12	0.46	1.51	0.28	1.80	29.93	64.10
Net Directional Con.	4.65	-0.55	-4.71	-1.52	1.08	1.05	**10.68**

	Third Sub-sample						
	MAC	ISE.Wind	Crude Oil	Coal	Gas	S&P500	From
MAC	36.42	23.17	5.44	0.31	0.16	34.50	63.58
ISE.Wind	25.77	32.28	7.16	0.03	0.03	34.74	67.72
Crude Oil	15.21	15.33	50.87	0.15	0.03	18.40	49.13
Coal	0.17	0.17	0.47	98.61	0.53	0.05	1.39
Gas	0.03	0.65	0.11	0.07	99.06	0.08	0.94
S&P500	31.03	24.79	7.16	0.08	0.08	36.86	63.14
Directional to others	72.22	64.10	20.34	0.64	0.82	87.78	245.90
Net Directional Con.	8.64	-3.62	-28.79	-0.74	-0.12	24.64	**40.98**

Note: The table reports in each case the contributions from i to j. The row "Directional to others" shows the spillover effects from each variable to all others, while the last column, "From", reports the total spillover received by each variable from all others. The total connectedness is in bold.

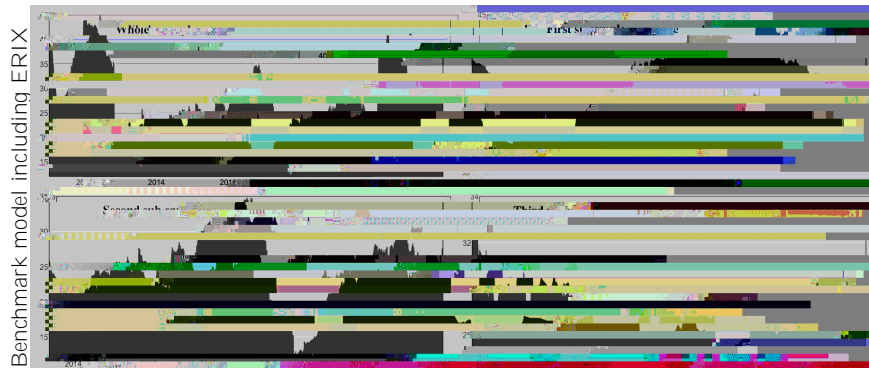Figure 1: Benchmark model overall spillover (Return System).

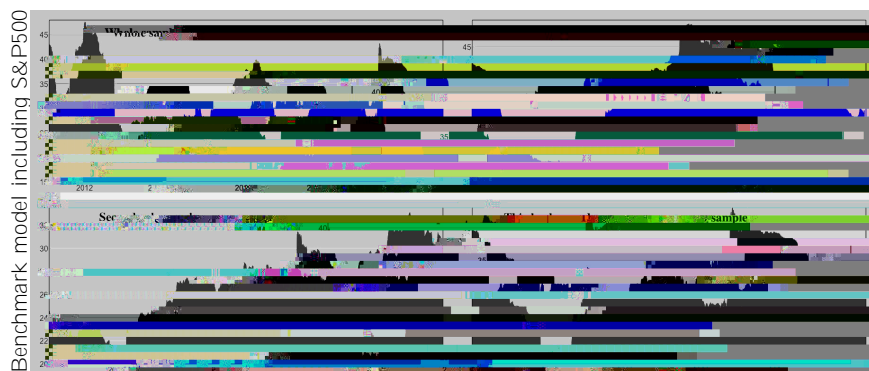Figure 2: Benchmark model including ERIX overall spillover (Return System).

Figure 3: Benchmark model including S&P500 overall spillover (Return System).

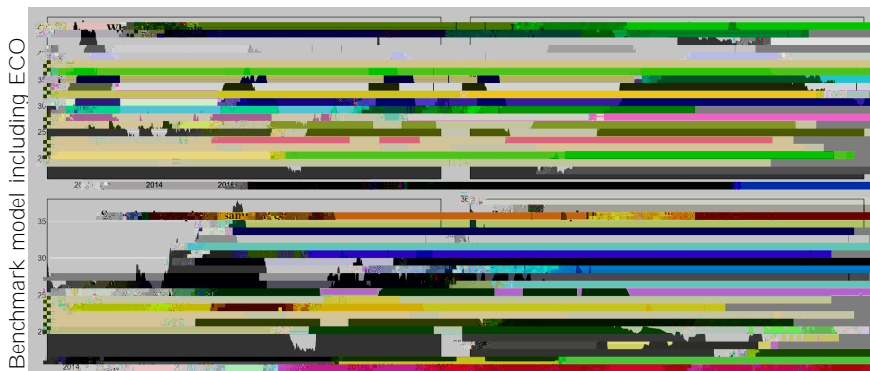Figure 4: Benchmark model including RENIXX overall spillover (Return System).

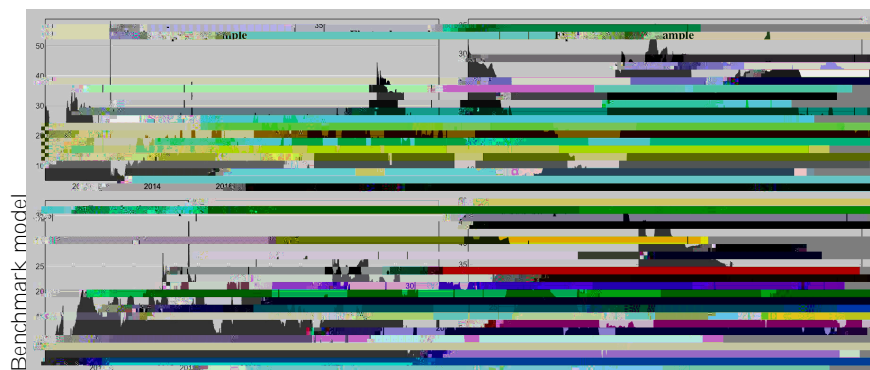Figure 5: Benchmark model including ECO overall spillover (Return System).

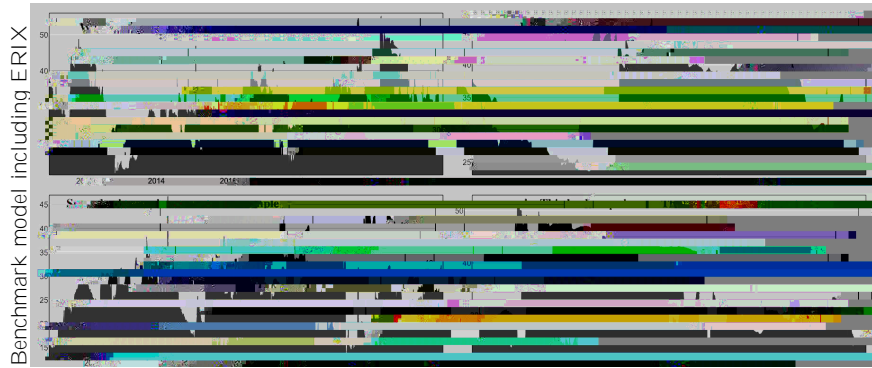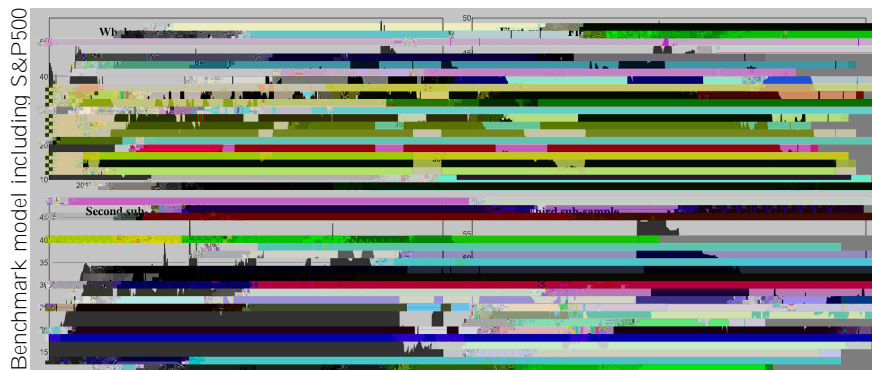Figure 6: Benchmark model overall spillover (Volatility System).

Figure 7: Benchmark model including ERIX overall spillover (Volatility System).

Figure 8: Benchmark model including S&P500 overall spillover (Volatility System).
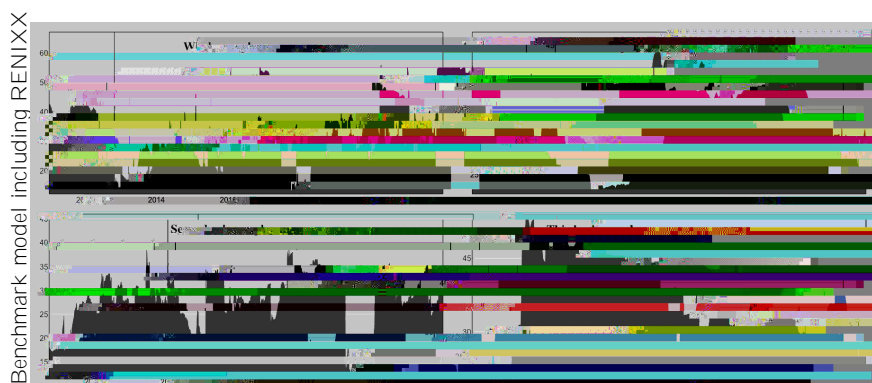

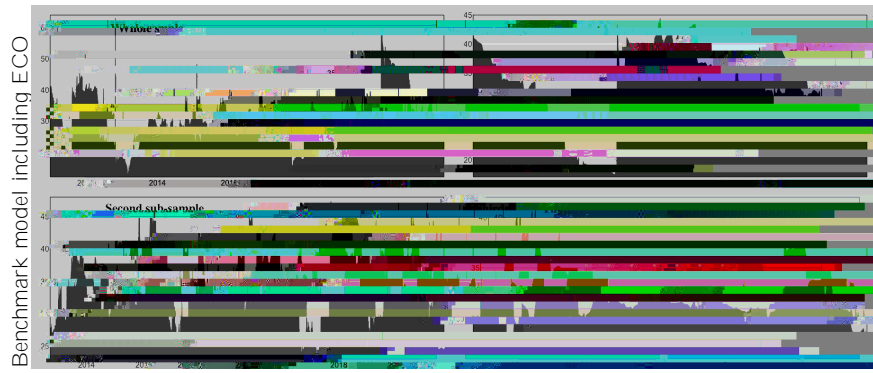Figure 9: Benchmark model including RENIXX overall spillover (Volatility System).

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Figure 10: Benchmark model including ECO overall spillover (Volatility System).