

Table C.1: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	0.6984	0.4037	0.3305	0.5655
$DOI \nRightarrow h_{Wheat\ 1}$	0.1789	0.6725	7.409	0.0066***
$DOI \nRightarrow h_{Wheat\ 2}$	0.264	0.6076	5.7748	0.0165**
$DOI \nRightarrow h_{Wheat\ 3}$	0.078	0.7802	4.3761	0.0368**
$DOI \nRightarrow h_{Wheat\ 4}$	0.1482	0.7004	2.2877	0.1308
$h_{S\&P500} \nRightarrow DOI$	0.4637	0.4962	1.2556	0.2628
$h_{Wheat\ 1} \nRightarrow DOI$	0.1384	0.71	0.0329	0.856
$h_{Wheat\ 2} \nRightarrow DOI$	0.1675	0.6825	0.0681	0.7942
$h_{Wheat\ 3} \nRightarrow DOI$	0.0559	0.8132	0.013	0.9092
$h_{Wheat\ 4} \nRightarrow DOI$	0.0218	0.8828	0.0501	0.8229

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.2: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	0.1926	0.661	0.2112	0.646
$DOI \nRightarrow h_{KC\ Wheat\ 1}$	0.0237	0.8777	3.8255	0.0508*
$DOI \nRightarrow h_{KC\ Wheat\ 2}$	1.1779	0.2782	3.7875	0.052*
$DOI \nRightarrow h_{KC\ Wheat\ 3}$	1.6943	0.1936	3.4444	0.0638*
$DOI \nRightarrow h_{KC\ Wheat\ 4}$	3.083	0.0797*	2.2693	0.1323
$h_{S\&P500} \nRightarrow DOI$	0.4634	0.4963	0.0019	0.965
$h_{KC\ Wheat\ 1} \nRightarrow DOI$	1.2516	0.2637	0.395	0.5299
$h_{KC\ Wheat\ 2} \nRightarrow DOI$	0.5703	0.4504	0.4462	0.5043
$h_{KC\ Wheat\ 3} \nRightarrow DOI$	0.3698	0.5433	0.441	0.5068
$h_{KC\ Wheat\ 4} \nRightarrow DOI$	0.0816	0.7753	0.4208	0.5167

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

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Table C.3: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	2.1014	0.1477	2.0613	0.1515
$DOI \nRightarrow h_{Corn\ 1}$	0.0516	0.8203	0.0749	0.7844
$DOI \nRightarrow h_{Corn\ 2}$	0.1115	0.7386	0.0142	0.905
$DOI \nRightarrow h_{Corn\ 3}$	0.3379	0.5613	0.1684	0.6816
$DOI \nRightarrow h_{Corn\ 4}$	0.5926	0.4417	0.5482	0.4593
$h_{S\&P500} \nRightarrow DOI$	0.7295	0.3934	0.0551	0.8145
$h_{Corn\ 1} \nRightarrow DOI$	0.1595	0.6898	0.6869	0.4075
$h_{Corn\ 2} \nRightarrow DOI$	0.0052	0.9426	0.7504	0.3866
$h_{Corn\ 3} \nRightarrow DOI$	0.0078	0.9295	0.6908	0.4061
$h_{Corn\ 4} \nRightarrow DOI$	0.5997	0.439	0.95	0.33

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.4: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	2.7821	0.0959*	1.3967	0.2376
$DOI \nRightarrow h_{Soybean\ 1}$	4.2716	0.0392**	0.0082	0.9278
$DOI \nRightarrow h_{Soybean\ 2}$	2.0718	0.1506	0.0142	0.9051
$DOI \nRightarrow h_{Soybean\ 3}$	1.3793	0.2407	0.0038	0.951
$DOI \nRightarrow h_{Soybean\ 4}$	1.061	0.3034	0.0464	0.8295
$h_{S\&P500} \nRightarrow DOI$	0.8205	0.3654	1.1153	0.2912
$h_{Soybean\ 1} \nRightarrow DOI$	3.9659	0.0469**	0.4862	0.4858
$h_{Soybean\ 2} \nRightarrow DOI$	0.0724	0.7879	0.2276	0.6335
$h_{Soybean\ 3} \nRightarrow DOI$	1.6926	0.1938	0.3492	0.5547
$h_{Soybean\ 4} \nRightarrow DOI$	0.2985	0.5851	0.6564	0.4181

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.5: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	1.1794	0.2779	0.7951	0.3728
$DOI \nRightarrow h_{Soybean\ oil\ 1}$	4.5376	0.0336**	0.5203	0.4709
$DOI \nRightarrow h_{Soybean\ oil\ 2}$	7.2189	0.0074***	0.4807	0.4883
$DOI \nRightarrow h_{Soybean\ oil\ 3}$	11.4546	8e-04***	0.3158	0.5743
$DOI \nRightarrow h_{Soybean\ oil\ 4}$	14.3106	2e-04***	0.1804	0.6711
$h_{S\&P500} \nRightarrow DOI$	0.0096	0.9222	1.0921	0.2963
$h_{Soybean\ oil\ 1} \nRightarrow DOI$	1.1946	0.2749	0.0377	0.8462
$h_{Soybean\ oil\ 2} \nRightarrow DOI$	0.8213	0.3652	0.0897	0.7646
$h_{Soybean\ oil\ 3} \nRightarrow DOI$	0.6366	0.4253	0.0879	0.7669
$h_{Soybean\ oil\ 4} \nRightarrow DOI$	0.4784	0.4894	0.0251	0.874

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.6: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	0.2731	0.6014	0.0266	0.8706
$DOI \nRightarrow h_{Oats\ 1}$	1.334	0.2486	13.3362	3e-04***
$DOI \nRightarrow h_{Oats\ 2}$	0.9766	0.3235	7.417	0.0066***
$DOI \nRightarrow h_{Oats\ 3}$	0.7199	0.3965	8.5758	0.0035***
$h_{S\&P500} \nRightarrow DOI$	0.0058	0.9394	0.59	0.4427
$h_{Oats\ 1} \nRightarrow DOI$	0.0909	0.7632	0.6418	0.4233
$h_{Oats\ 2} \nRightarrow DOI$	0.7679	0.3812	2.6317	0.1051
$h_{Oats\ 3} \nRightarrow DOI$	1.1302	0.2882	1.5137	0.2189

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.7: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	0.2941	0.5878	1.1159	0.2911
$DOI \nRightarrow h_{MPLS\ Wheat\ 1}$	1.3767	0.2413	1.286	0.2572
$DOI \nRightarrow h_{MPLS\ Wheat\ 2}$	1.4693	0.2261	1.1408	0.2858
$DOI \nRightarrow h_{MPLS\ Wheat\ 3}$	0.381	0.5374	1.5118	0.2192
$DOI \nRightarrow h_{MPLS\ Wheat\ 4}$	0.9431	0.332	2.9258	0.0876*
$h_{SP500} \nRightarrow DOI$	0.0181	0.8931	0.0543	0.8159
$h_{MPLS\ Wheat\ 1} \nRightarrow DOI$	1.1237	0.2897	0.5565	0.4559
$h_{MPLS\ Wheat\ 2} \nRightarrow DOI$	1.395	0.2382	0.0996	0.7525
$h_{MPLS\ Wheat\ 3} \nRightarrow DOI$	1.3174	0.2517	0.3285	0.5667
$h_{MPLS\ Wheat\ 4} \nRightarrow DOI$	0.5971	0.4401	0.5491	0.4589

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.8: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	1.465	0.2266	0.3865	0.5343
$DOI \nRightarrow h_{Soybean\ meal\ 1}$	12.1967	5e-04***	2.4357	0.119
$DOI \nRightarrow h_{Soybean\ meal\ 2}$	13.6749	2e-04***	4.6584	0.0312**
$DOI \nRightarrow h_{Soybean\ meal\ 3}$	8.4957	0.0037***	3.5464	0.06*
$DOI \nRightarrow h_{Soybean\ meal\ 4}$	5.9624	0.0149**	3.8891	0.0489**
$h_{SP500} \nRightarrow DOI$	0.7493	0.3871	0.7473	0.3876
$h_{Soybean\ meal\ 1} \nRightarrow DOI$	0.7985	0.3719	0.2626	0.6085
$h_{Soybean\ meal\ 2} \nRightarrow DOI$	3.0723	0.0802*	1e-04	0.9915
$h_{Soybean\ meal\ 3} \nRightarrow DOI$	1.9826	0.1597	0.0012	0.9728
$h_{Soybean\ meal\ 4} \nRightarrow DOI$	1.1547	0.283	4e-04	0.9836

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

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Table C.9: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	2.2317	0.1359	1.1965	0.2743
$DOI \nRightarrow h_{Rough\ rice\ 1}$	0.2627	0.6085	0.0322	0.8577
$DOI \nRightarrow h_{Rough\ rice\ 2}$	8.7391	0.0033***	1.178	0.2781
$DOI \nRightarrow h_{Rough\ rice\ 3}$	6.9474	0.0087***	0.0425	0.8367
$h_{SP500} \nRightarrow DOI$	0.0122	0.9122	0.0509	0.8216
$h_{Rough\ rice\ 1} \nRightarrow DOI$	0.12	0.7292	0.0943	0.7588
$h_{Rough\ rice\ 2} \nRightarrow DOI$	0.4333	0.5107	1.6167	0.2039
$h_{Rough\ rice\ 3} \nRightarrow DOI$	0.4766	0.4903	4.4728	0.0347**

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.10: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	1.2721	0.2598	1.0712	0.301
$DOI \nRightarrow h_{Coffee\ 1}$	0.0064	0.9365	1.1231	0.2896
$DOI \nRightarrow h_{Coffee\ 2}$	0.0033	0.9541	1.2154	0.2706
$DOI \nRightarrow h_{Coffee\ 3}$	0.0036	0.9524	1.2477	0.2643
$DOI \nRightarrow h_{Coffee\ 4}$	0.0204	0.8865	1.0197	0.3129
$h_{SP500} \nRightarrow DOI$	1.9783	0.1601	0.0129	0.9095
$h_{Coffee\ 1} \nRightarrow DOI$	0.0136	0.9071	0.7733	0.3795
$h_{Coffee\ 2} \nRightarrow DOI$	1e-04	0.9936	0.9088	0.3407
$h_{Coffee\ 3} \nRightarrow DOI$	0.1621	0.6873	1.1691	0.2799
$h_{Coffee\ 4} \nRightarrow DOI$	0.2235	0.6366	1.034	0.3095

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.11: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	1.5473	0.214	0.485	0.4864
$DOI \nRightarrow h_{Sugar\ 1}$	2.999	0.0839*	5.4274	0.0201**
$DOI \nRightarrow h_{Sugar\ 3}$	0.3576	0.5501	4.7986	0.0288**
$DOI \nRightarrow h_{Sugar\ 4}$	1.2963	0.2554	6.3003	0.0123**
$h_{S\&P500} \nRightarrow DOI$	0.356	0.5509	0.2785	0.5978
$h_{Sugar\ 1} \nRightarrow DOI$	0.1725	0.678	0.0965	0.7561
$h_{Sugar\ 3} \nRightarrow DOI$	0.0525	0.8188	0.0237	0.8776
$h_{Sugar\ 4} \nRightarrow DOI$	0.1538	0.6951	0.6184	0.4319

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.12: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	0.3793	0.5382	4.5162	0.0339**
$DOI \nRightarrow h_{Cocoa\ 1}$	0.9761	0.3236	10.2442	0.0014***
$DOI \nRightarrow h_{Cocoa\ 2}$	1.2817	0.2581	5.3516	0.0209**
$DOI \nRightarrow h_{Cocoa\ 3}$	1.5559	0.2128	4.1464	0.042**
$DOI \nRightarrow h_{Cocoa\ 4}$	1.7955	0.1808	7.725	0.0056***
$h_{S\&P500} \nRightarrow DOI$	0.658	0.4176	0.4676	0.4943
$h_{Cocoa\ 1} \nRightarrow DOI$	0.0806	0.7766	0.1038	0.7474
$h_{Cocoa\ 2} \nRightarrow DOI$	0.1138	0.736	0.0027	0.9587
$h_{Cocoa\ 3} \nRightarrow DOI$	0.1756	0.6753	1e-04	0.9939
$h_{Cocoa\ 4} \nRightarrow DOI$	0.3322	0.5646	0.2668	0.6057

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.13: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	3.4353	0.0643*	1.5061	0.2201
$DOI \nRightarrow h_{Cotton\ 1}$	0.7161	0.3978	0.5254	0.4688
$DOI \nRightarrow h_{Cotton\ 2}$	1.7318	0.1887	1.3222	0.2505
$DOI \nRightarrow h_{Cotton\ 3}$	3.7564	0.0531*	1.9164	0.1666
$DOI \nRightarrow h_{Cotton\ 4}$	2.7771	0.0962*	2.5564	0.1102
$h_{SP500} \nRightarrow DOI$	1.4659	0.2265	0.1362	0.7122
$h_{Cotton\ 1} \nRightarrow DOI$	1.6292	0.2023	0.2397	0.6246
$h_{Cotton\ 2} \nRightarrow DOI$	0.486	0.486	0.5944	0.441
$h_{Cotton\ 3} \nRightarrow DOI$	2.4746	0.1163	0.1408	0.7076
$h_{Cotton\ 4} \nRightarrow DOI$	0.372	0.5422	1.3787	0.2407

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively. * \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.14: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	1.9046	0.1681	0.3608	0.5482
$DOI \nRightarrow h_{Orange\ juice\ 2}$	1.1118	0.2921	0.0326	0.8568
$DOI \nRightarrow h_{Orange\ juice\ 3}$	1.4303	0.2322	0.0371	0.8473
$DOI \nRightarrow h_{Orange\ juice\ 4}$	0.7863	0.3756	0.0178	0.8939
$DOI \nRightarrow h_{Orange\ juice\ 5}$	0.1314	0.7171	0.1499	0.6987
$h_{SP500} \nRightarrow DOI$	0.7113	0.3994	0.8649	0.3526
$h_{Orange\ juice\ 2} \nRightarrow DOI$	0.7664	0.3817	1.0271	0.3111
$h_{Orange\ juice\ 3} \nRightarrow DOI$	0.5124	0.4744	1.3618	0.2436
$h_{Orange\ juice\ 4} \nRightarrow DOI$	0.2057	0.6503	1.3683	0.2424
$h_{Orange\ juice\ 5} \nRightarrow DOI$	0.1728	0.6778	2.0509	0.1525

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively. * \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.15: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	3.0273	0.0824*	0.7866	0.3754
$DOI \nRightarrow h_{Lumber\ 1}$	0.5018	0.479	0.0385	0.8446
$DOI \nRightarrow h_{Lumber\ 2}$	0.2793	0.5973	1.0295	0.3106
$h_{S\&P500} \nRightarrow DOI$	0.7331	0.3922	0.2473	0.6191
$h_{Lumber\ 1} \nRightarrow DOI$	1.1355	0.2871	1.3875	0.2392
$h_{Lumber\ 2} \nRightarrow DOI$	0.1871	0.6655	1.577	0.2095

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.16: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	0.0309	0.8604	1.1403	0.2859
$DOI \nRightarrow h_{Live\ cattle\ 1}$	7.4721	0.0065***	1.0174	0.3134
$DOI \nRightarrow h_{Live\ cattle\ 2}$	1.1388	0.2864	0.3114	0.577
$DOI \nRightarrow h_{Live\ cattle\ 3}$	1.4991	0.2213	0.01	0.9203
$DOI \nRightarrow h_{Live\ cattle\ 4}$	2.3047	0.1295	0.0287	0.8655
$h_{S\&P500} \nRightarrow DOI$	0.0612	0.8047	0.0107	0.9178
$h_{Live\ cattle\ 1} \nRightarrow DOI$	1.514	0.219	0.0712	0.7897
$h_{Live\ cattle\ 2} \nRightarrow DOI$	0.6312	0.4272	1.4101	0.2354
$h_{Live\ cattle\ 3} \nRightarrow DOI$	0	0.9993	1.5956	0.2069
$h_{Live\ cattle\ 4} \nRightarrow DOI$	0.0801	0.7773	2.6325	0.1051

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.17: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	1.4966	0.2217	2.54	0.1114
$DOI \nRightarrow h_{Feeder\ cattle\ 1}$	2.0707	0.1507	9.2854	0.0024***
$DOI \nRightarrow h_{Feeder\ cattle\ 2}$	0.242	0.623	1.7038	0.1922
$DOI \nRightarrow h_{Feeder\ cattle\ 3}$	0.5972	0.44	2.2265	0.136
$DOI \nRightarrow h_{Feeder\ cattle\ 4}$	0.0065	0.9359	0.6296	0.4277
$h_{SP500} \nRightarrow DOI$	1.329	0.2495	0.3064	0.5801
$h_{Feeder\ cattle\ 1} \nRightarrow DOI$	0.0146	0.904	0.4165	0.5188
$h_{Feeder\ cattle\ 2} \nRightarrow DOI$	0	0.9973	0.0153	0.9015
$h_{Feeder\ cattle\ 3} \nRightarrow DOI$	0.9885	0.3205	0.1037	0.7476
$h_{Feeder\ cattle\ 4} \nRightarrow DOI$	0.6942	0.4051	0.0055	0.941

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.18: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	2.3698	0.1243	0.4371	0.5087
$DOI \nRightarrow h_{Heating\ oil\ 1}$	0.8261	0.3638	1.9797	0.1598
$DOI \nRightarrow h_{Heating\ oil\ 2}$	2.2203	0.1368	1.9943	0.1583
$DOI \nRightarrow h_{Heating\ oil\ 3}$	1.1964	0.2745	1.8042	0.1796
$DOI \nRightarrow h_{Heating\ oil\ 4}$	0.6282	0.4283	1.7114	0.1912
$h_{SP500} \nRightarrow DOI$	1.7398	0.1877	1.5561	0.2126
$h_{Heating\ oil\ 1} \nRightarrow DOI$	1.679	0.1956	0.0328	0.8564
$h_{Heating\ oil\ 2} \nRightarrow DOI$	0.4512	0.5021	0.1955	0.6585
$h_{Heating\ oil\ 3} \nRightarrow DOI$	0.349	0.5549	0.0474	0.8277
$h_{Heating\ oil\ 4} \nRightarrow DOI$	0.7452	0.3884	0.0619	0.8035

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.19: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	0.026	0.8719	4.1347	0.0423**
$DOI \nRightarrow h_{Natural\ gas\ 1}$	3.9374	0.0477**	0.2665	0.6058
$DOI \nRightarrow h_{Natural\ gas\ 2}$	1.6799	0.1955	0.7857	0.3757
$DOI \nRightarrow h_{Natural\ gas\ 3}$	1.4992	0.2213	0.0744	0.7851
$DOI \nRightarrow h_{Natural\ gas\ 4}$	3.9634	0.047**	0.1265	0.7221
$h_{SP500} \nRightarrow DOI$	8.3415	0.004***	0.9307	0.335
$h_{Natural\ gas\ 1} \nRightarrow DOI$	2.1954	0.139	1.0538	0.3049
$h_{Natural\ gas\ 2} \nRightarrow DOI$	4.5425	0.0335**	1.7708	0.1837
$h_{Natural\ gas\ 3} \nRightarrow DOI$	1.291	0.2563	2.1153	0.1462
$h_{Natural\ gas\ 4} \nRightarrow DOI$	0.3433	0.5581	1.34	0.2474

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.20: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{SP500}$	1.8007	0.1802	0.2562	0.6129
$DOI \nRightarrow h_{Gold\ 1}$	5.6379	0.0179**	1.2777	0.2586
$DOI \nRightarrow h_{Gold\ 2}$	5.8363	0.016**	2.831	0.0928*
$DOI \nRightarrow h_{Gold\ 3}$	6.6513	0.0102**	1.5838	0.2086
$DOI \nRightarrow h_{Gold\ 4}$	7.5171	0.0063***	1.2857	0.2572
$h_{SP500} \nRightarrow DOI$	7.9053	0.0051***	0.0054	0.9415
$h_{Gold\ 1} \nRightarrow DOI$	1.1616	0.2816	0.0061	0.938
$h_{Gold\ 2} \nRightarrow DOI$	1.148	0.2844	0.0708	0.7902
$h_{Gold\ 3} \nRightarrow DOI$	0.8261	0.3638	0.0234	0.8784
$h_{Gold\ 4} \nRightarrow DOI$	1.4069	0.2361	0.0045	0.9466

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.

Table C.21: Granger causality test between conditional volatility and detrended open interest

Null Hypothesis	Pre-financialisation		Financialisation	
	F Statistic	p-value	F Statistic	p-value
$DOI \nRightarrow h_{S\&P500}$	3.6813	0.0555*	2.7551	0.0973*
$DOI \nRightarrow h_{Copper\ 1}$	0.0578	0.8101	0.2933	0.5883
$DOI \nRightarrow h_{Copper\ 2}$	0.5672	0.4517	0.4115	0.5214
$DOI \nRightarrow h_{Copper\ 3}$	0.6147	0.4333	0.5389	0.4631
$DOI \nRightarrow h_{Copper\ 4}$	0.738	0.3907	0.4247	0.5148
$h_{S\&P500} \nRightarrow DOI$	0.2597	0.6105	0.0318	0.8585
$h_{Copper\ 1} \nRightarrow DOI$	0.2382	0.6257	0.3772	0.5393
$h_{Copper\ 2} \nRightarrow DOI$	0.4414	0.5067	0.2455	0.6204
$h_{Copper\ 3} \nRightarrow DOI$	0.6185	0.4319	0.281	0.5962
$h_{Copper\ 4} \nRightarrow DOI$	1.2928	0.256	0.4155	0.5194

Note:

The table reports the results of the Granger causality test between the first difference of conditional volatility and the first difference of open interest during pre-financialisation period and financialisation period. h and DOI represent conditional volatility and detrended open interest respectively.

* \nRightarrow means “does not Granger-cause”. ***, **, and * denote statistical significance at 1%, 5%, and 10% level.