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Research article

Geopolitical crises and ESG market dynamics: The role of commodity prices, gold, and investor sentiment

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Supplementary

Appendix 1. Garch model equations.

Country	Mean equation	Variance equation:
USA	$R_{it} = c + \beta\ \Delta LVIX_{it} + u_t$ (1)	$\sigma^2{}_{it} = \alpha_0 + \sum_{i=1}^{p} \alpha_i u^2{}_{t-i} + \sum_{i=1}^{q} \beta_i \sigma^2{}_{t-i} + \gamma_1 X_t$ (2) With $X_t = (SENT, \Delta LWTI, \Delta LNG, \Delta LGOLD)$ If the elements of X_t are uncorrelated.
Canada	$R_{it} = c + \beta\ \Delta LSPTSXVIX_{it} + u_t$ (1)	$\sigma^2{}_{it} = \alpha_0 + \sum_{i=1}^{p} \alpha_i u^2{}_{t-i} + \sum_{i=1}^{q} \beta_i \sigma^2{}_{t-i} + \gamma_1 X_t$ (2) With $X_t = (SENT, \Delta LWTI, \Delta LNG, \Delta LGOLD)$ If the elements of X_t are uncorrelated.
United Kingdom	$R_{it} = c + \beta\ \Delta LEFAETFVOL_{it} + u_t$ (1)	$\sigma^2{}_{it} = \alpha_0 + \sum_{i=1}^{p} \alpha_i u^2{}_{t-i} + \sum_{i=1}^{q} \beta_i \sigma^2{}_{t-i} + \gamma_1 X_t$ (2) With $X_t = (SENT, \Delta LWTI, \Delta LNG, \Delta LGOLD)$ If the elements of X_t are uncorrelated.
France	$R_{it} = c + \beta\ \Delta LEFAETFVOL_{it} + u_t$ (1)	$\sigma^2{}_{it} = \alpha_0 + \sum_{i=1}^{p} \alpha_i u^2{}_{t-i} + \sum_{i=1}^{q} \beta_i \sigma^2{}_{t-i} + \gamma_1 X_t$ (2) $With\ X_t = (SENT, \Delta LWTI, \Delta LNG, \Delta LGOLD)$ If the elements of X_t are uncorrelated.
Italy	$R_{it} = c + \beta\ \Delta LEFAETFVOL_{it} + u_t$ (1)	$\sigma^2{}_{it} = \alpha_0 + \sum_{i=1}^{p} \alpha_i u^2{}_{t-i} + \sum_{i=1}^{q} \beta_i \sigma^2{}_{t-i} + \gamma_1 X_t$ (2) With $X_t = (SENT, \Delta LWTI, \Delta LNG, \Delta LGOLD)$ If the elements of X_t are uncorrelated.

Appendix 2. Summary Table – Variables and Data Sources.

Variable category	Variable / Index	Country	Proxy / Description	Source
ESG Index	S&P 500 ESG	United States	ESG benchmark for US firms	Bloomberg Terminal / S&P Global
	S&P/TSX 60 ESG	Canada	ESG benchmark for Canadian equities	TMX Group / Bloomberg Terminal
	FTSE4GOOD US 100	United Kingdom	ESG index of large UK-listed firms	FTSE Russell / Yahoo Finance
	CAC 40 ESG	France	ESG-filtered version of CAC 40	Euronext / Investing.com
	MIB ESG	Italy	ESG-filtered version of FTSE MIB	Borsa Italiana
Volatility Index	CBOE VIX	United States	Market-wide implied volatility index	CBOE / Bloomberg
	S&P/TSX Composite Volatility	Canada	Volatility index for TSX market	TMX Group / Investing.com
	EFA ETF Volatility (LEFAETFVOL)	UK, France, Italy (proxy)	Implied volatility from EFA ETF (MSCI EAFE exposure)	Bloomberg
Commodity Prices	WTI Oil Price	Global	Spot or futures price of West Texas Intermediate	Investing.com / Bloomberg
	Natural Gas Price	Global	Natural gas benchmark price	Investing.com / Bloomberg
	Gold Price	Global	Spot price per ounce of gold	Investing.com / Bloomberg

Appendix 3. R Unit Root Test Results for the US Case.

PP test in level

In level		**All the period**			**Pre war**			**Post war**		
		LSPESG	**LVIX**	**SENT**	**LSPESG**	**LVIX**	**SENT**	**LSPESG**	**LVIX**	**SENT**
With C	t-Statistic	-0,485363	-3,189816	15,13590	-1,762519	-2,713995	-10,94567	-0,742678	-2,30816	-10,409656
	Prob.	0.8905	**0,0217**	**0,000000**	0.3977	0.0743	**0,000000**	0,8311	0.1710	**0,000000**
		n0	**	***	n0	*	***	n0	n0	***
With C & T	t-Statistic	-1,816030	-3,389361	15,16044	-1,160328	-2,551476	-11,00041	-2,935315	-2,087252	-10,541424
	Prob.	0,6944	0,055	**0,000000**	0.9137	0,3033	**0,000000**	0,1550	0,5477	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
Without C & T	t-Statistic	2.113918	-0,495621	-7,870122	0,755356	-0,282577	-5,289590	2,151341	-0,448944	-5,056295
	Prob.	0,9920	0,5008	**0,000000**	0.8760	0.5824	**0,000000**	0,9925	0,5186	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLSP**	**ΔLVIX**	**ΔSENT**	**ΔLSP**	**ΔLVIX**	**ΔSENT**	**ΔLSP**	**ΔLVIX**	**ΔSENT**
With C	t-Statistic	-16,45414	-16,779386	-109,7127	-12,139931	-12,2444	-50,2169	-10,980633	-10,934350	-54,649901
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	16,43206	-16,84160	-109,8827	-12,513820	-12,4156	-49,98286	-10,937410	-10,817401	-54,838506
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-16,224343	-16,80562	-110,1266	-12,139945	-12,30045	-50,33806	-10,667071	-10,97188	-54,272579
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the LVIX series, we rely on the results of the regression with only the constant (the trend is not significant for the pre-war period).

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant

ADF test in level

In level		All the period			Pre war			Post war		
		LSPESG	**LVIX**	**SENT**	**LSPESG**	**LVIX**	**SENT**	**LSPESG**	**LVIX**	**SENT**
With C	t-Statistic	-0,564456	-3,278717	-15,12247	-1,817388	-2,749160	-10,955600	-0,734614	-2,323338	-10,380180
	Prob.	0,8747 n0	**0,0169** **	**0,000000** ***	0.3708 n0	0.0686 *	**0,000000** ***	0,8332 n0	0.1662 n0	**0,000000** ***
With C & T	t-Statistic	-1,898644	-3,42927	-15,152967	-1,348044	-2,593682	-11,009472	-2,729786	-2,107093	-10,541424
	Prob.	0,6524 n0	**0,0497** **	**0,000000** ***	0,8713 n0	0,2840 n0	**0,000000** ***	0,2266 n0	0,5367 n0	**0,000000** ***
Without C & T	t-Statistic	1,953103	-0,444069	-1,670124	0,650528	-0,263977	-1,678746	2,151341	-0,403544	-0,989073
	Prob.	0,9881 n0	0,5216 n0	**0,0897** *	0.8855 n0	0.5893 n0	0,0881 *	0,9925 n0	0,5365 n0	0,2877 n0
In first difference		**ΔLSP**	**ΔLVIX**	**ΔSENT**	**ΔLSP**	**ΔLVIX**	**ΔSENT**	**ΔLSP**	**ΔLVIX**	**ΔSENT**
With C	t-Statistic	-16,406498	-16,318478	-12,699054	-12,041297	-11,885597	-11,833389	-10,980633	-10,809045	-9,520687
	Prob.	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***
With C & T	t-Statistic	-16,383444	-16,30134	-12,673158	-12,128978	-11,895532	-11,788228	-10,937411	-10,817401	-9,534454
	Prob.	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***
Without C & T	t-Statistic	-16,205987	-16,34628	-12,724258	-12,051207	-11,930934	-11,880122	-10,673140	-10,847666	-9,563350
	Prob.	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***	**0,000000** ***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the LVIX series, we rely on the results of the regression with only the constant (the trend is not significant for the pre-war period).

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant *MacKinnon (1996) one-sided p-values

Appendix 4. R Unit Root Test Results for the Canadian Case.

PP test in level

In level		**All the period**			**Pre war**			**Post war**		
		LSPTSX ESG	**LSPTSX VIX**	**SENT**	**LSPTSX ESG**	**LSPTSX VIX**	**SENT**	**LSPTSX ESG**	**LSPTSX VIX**	**SENT**
With C	t-Statistic	-1,561056	-3,588573	-15,076138	-0,900008	-3,275846	-9,576119	-1,371814	-2,334733	-11,364092
	Prob.	0,5011	**0,0066**	**0,000000**	0.7857	**0.0180**	**0,000000**	0,5943	0.1628	**0,000000**
		n0	***	***	n0	**	***	n0	n0	***
With C & T	t-Statistic	-1,749316	-3,814994	-15,158043	-2,123474	-3,149727	-9,728766	-1,77628	-2,730159	-11,995243
	Prob.	0,7264	**0,0172**	**0,000000**	0.5277	0,0994	**0,000000**	0,7107	0,2265	**0,000000**
		n0	**	***	n0	*	***	n0	n0	***
Without C & T	t-Statistic	0,343261	-0,561828	-7,927315	-0,78253	-0,066495	-4,481699	1,40754	-0,694620	-5,932101
	Prob.	0,7835	0,4731	**0,000000**	0.3754	0.6588	**0,000000**	0,9599	0,4142	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLSPTSX ESG**	**ΔLSPTSXVIX**	**ΔSENT**	**ΔLSPTSX ESG**	**ΔLSPTSXVIX**	**ΔSENT**	**ΔLSPTSX ESG**	**ΔLSPTSXVIX**	**ΔSENT**
With C	t-Statistic	-13,061344	-19,902618	-101,998689	-9,02845	-13,192416	-81,442629	-9,638513	-14,940678	-46,925140
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-13,013409	-19,869348	-102,207144	-9,026293	-13,760366	-87,432497	-9,607831	-14,910814	-46,728063
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-13,08159	-19,928274	-101,851385	-9,020785	-13,254299	-77,841298	-9,574427	-14,970824	-47,231727
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Notes: () Significant at the 10%; () Significant at the 5%; () Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

ADF test in level

In level		All the period			Pre war			Post war		
		LSPTSXESG	LSPTSXVIX	SENT	LSPTSXESG	LSPTSXVIX	SENT	LSPTSXESG	LSPTSXVIX	SENT
With C	t-Statistic	-1,449725	-2,72603	-6,7678832	-1,289112	-3,30906	-9,456205	-1,370460	-1,683022	-11,239624
	Prob.	0,5676	0,071	**0,000000**	0,6334	**0.0164**	**0,000000**	0,5949	0.4374	**0,000000**
		n0	*	***	n0	**	***	n0	n0	***
With C & T	t-Statistic	-1,644506	-2,766027	-14,847089	-2,511038	-3,149727	-9,728766	-1,677536	-1,553357	-12,005903
	Prob.	0,7726	0,2114	**0,000000**	0,3224	0,0994	**0,000000**	0,7558	0,8057	**0,000000**
		n0	n0	***	n0	*	***	n0	n0	***
Without C & T	t-Statistic	0,365491	-0,626438	-2,680448	-0,691412	-0,122154	-1,849995	1,396512	-0,811173	-2,006073
	Prob.	0,7894	0,4452	**0,0074**	0,4157	0.6398	0,0615	0,9590	0,3628	**0,0433**
		n0	n0	***	n0	n0	*	n0	n0	***
In first difference		**ΔLSPTSXESG**	**ΔLSPTSXVIX**	**ΔSENT**	**ΔLSPTSXESG**	**ΔLSPTSXVIX**	**ΔSENT**	**ΔLSPTSXESG**	**ΔLSPTSXVIX**	**ΔSENT**
With C	t-Statistic	-12,087243	-16,947625	-21,942102	-9,028451	-12,590433	-13,946392	-9,350709	-13,832911	-16,372577
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-12,091924	-16,923394	-21,899493	-9,090880	-12,661467	-13,895220	-9,327055	-13,823736	-16,314446
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0.000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-12,101553	-16,966597	-21,984364	-9,020785	-12,639539	-13,999104	-9,223188	-13,843617	-16,437067
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**I(1)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the LVIX series, the results are based on the regression with only the constant term (the trend is not significant for the pre-war period).

Notes: *() Significant at the 10%; () Significant at the 5%; ()* Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

Appendix 5. R Unit Root Test Results for the UK Case.

PP test in level

In level		**All the period**			**Pre war**			**Post war**		
		LFTSE4GOOD	**LEFAETFVOL**	**SENT**	**LFTSE4GOOD**	**LEFAETFVOL**	**SENT**	**LFTSE4GOOD**	**LEFAETFVOL**	**SENT**
With C	t-Statistic	-0,264841	-3,509796	-15,079364	-1,607158	-3,637353	-10,467965	-0,652040	-2,600486	-10,702093
	Prob.	0,9267	**0,0085**	**0,000000**	0.4761	**0.0062**	**0,000000**	0,8537	0,0955	**0,000000**
		n0	***	***	n0	***	***	n0	*	***
With C & T	t-Statistic	-1,895028	-4,207000	-15,147111	-1,326513	-3,588583	-10,720007	-3,210032	-2,816719	-10,768588
	Prob.	0,6543	**0,0050**	**0,000000**	0.8769	**0,0346**	**0,000000**	0,0287	0,1941	**0,000000**
		n0	***	***	n0	**	***	*	n0	***
Without C & T	t-Statistic	2,350837	-0,455459	-13,618221	0,985587	-0,043999	-9,0389942	2,237221	-0,674413	-9,2934734
	Prob.	0,9957	0,5171	**0,000000**	0.9138	0.6664	**0,000000**	0,9940	0,4232	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**	**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**	**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-15,770927	-21,638010	-125,255285	-10,767662	-15,107130	-61,773012	-11,384228	-15,28305	-61,691413
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-15,751527	-21,589761	-126,916492	-11,015323	-15,323598	-60,917153	-11,339416	-15,347088	-63,595611
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,489107	-21,672909	-125,425280	-10,726157	-15,170906	-61,333377	-11,030394	-15,259648	-61,899147
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, the results are based on both the regression with a constant and the regression with a constant and trend for the pre-war period.

Note: *() Significant at the 10%;* ***() Significant at the 5%;*** *()* Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

ADF test in level

In level		All the period			Pre war			Post war		
		LFTSE4GOOD	LEFAETFVOL	SENT	LFTSE4GOOD	LEFAETFVOL	SENT	LFTSE4GOOD	LEFAETFVOL	SENT
With C	t-Statistic	-0,307628	-3,182130	-15,079364	-1,637394	-3,637353	-6,000138	-0,664563	-2,187611	-10,696088
	Prob.	0,9205	**0,0222**	**0,000000**	0,4607	**0,0062**	**0,000000**	0,8508	0,2119	**0,000000**
		n0	**	***	n0	***	***	n0	n0	***
With C & T	t-Statistic	-1,915865	-3,608134	-15,147111	-1,415521	-3,588583	-6,214862	-3,001752	-2,197161	-10,775892
	Prob.	0,6434	**0,0310**	**0,000000**	0,8522	**0,0346**	**0,000000**	0,1358	0,4868	**0,000000**
		n0	**	***	n0	**	***	n0	n0	***
Without C & T	t-Statistic	2,255266	-0,341436	-7,448457	0,899750	-0,124861	-4,383670	2,225675	-0,476990	-5,726723
	Prob.	0,9945	0,5614	**0,000000**	0,9008	0,6389	**0,000000**	0,9938	0,5073	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**	**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**	**ΔLFTSE4GOOD**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-15,765611	-14,731419	-10,908469	-10,780792	-10,505717	-22,035048	-11,384196	-14,793309	-10,765753
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-15,746218	-14,706215	-10,896865	-10,817734	-10,510629	-21,950092	-11,339430	-14,789113	-10,721742
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,502533	-14,757552	-10,929304	-10,756588	-13,740861	-22,117810	-11,020163	-14,839397	-10,810834
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, the results are based on both the regression with a constant and the regression with a constant and a trend for the pre-war period.

Note: *() Significant at the 10%;* ***() Significant at the 5%;*** *()* Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

Appendix 6. R Unit Root Test Results for French Case.

PP test in level

In level		**All the period**			**Pre war**			**Post war**		
		LCACESG	**LEFAETFVOL**	**SENT**	**LCACESG**	**LEFAETFVOL**	**SENT**	**LCACESG**	**LEFAETFVOL**	**SENT**
With C	t-Statistic	-1,024592	-3,509796	-14,468753	-1,054253	-3,637353	-9,648926	-1,039333	-2,600486	-10,622170
	Prob.	0,7450	**0,0085**	**0,000000**	0.7323	**0.0062**	**0,000000**	0,7378	0,0955	**0,000000**
		n0	***	***	n0	***	***	n0	*	***
With C & T	t-Statistic	-1,383361	-4,2070	-14,447922	-2,182062	-3,588583	-9,617712	-2,056688	-2,816719	-10,581811
	Prob.	0,8638	**0,0050**	**0,000000**	0.4952	**0,0346**	**0,000000**	0,5645	0,1941	**0,000000**
		n0	***	***	n0	**	***	n0	n0	***
Without C & T	t-Statistic	0,594934	-0,455459	-6,875514	-0,709702	-0,043999	-4,063961	1,900766	-0,674413	-4,966695
	Prob.	0,8443	0,5171	**0,000000**	0.4076	0.6664	**0,0001**	0,9862	0,4232	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-15,328021	-21,63801	-97,120444	-9,453093	-15,10713	-75,672737	-12,472506	-15,28305	-60,746525
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-15,3500882	-21,589761	-99,007782	-9,508872	-15,323598	-92,618924	-12,416776	-15,347088	-65,798946
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0.0001**	**0,000000**	**0,000000**	**0.0001**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,337347	-21,672909	-96,933205	-9,453655	-15,170906	-72,761426	-12,285699	-15,259648	-59,732928
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, we rely on the results of the regression with a constant and the regression with a constant and a trend for the pre-war period.

Note: *() Significant at the 10%;* ***() Significant at the 5%; ()*** Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

ADF test in level

In level		All the period			Pre war			Post war		
		LCACESG	**LEFAETFVOL**	**SENT**	**LCACESG**	**LEFAETFVOL**	**SENT**	**LCACESG**	**LEFAETFVOL**	**SENT**
With C	t-Statistic	-0,973864	-3,18213	-14,449998	-0,917882	-3,637353	-9,648926	-1,063299	-2,187611	-10,571342
	Prob.	0,7629	**0,0222**	**0,000000**	0.7800	**0.0062**	**0,000000**	0,7288	0,2119	**0,000000**
		n0	**	***	n0	***	***	n0	n0	***
With C & T	t-Statistic	-1,340935	-3,608134	-14,429032	-2,020755	-3,588583	-9,617712	-1,985096	-2,197161	-10,528878
	Prob.	0,8753	**0,0310**	**0,000000**	0.5843	**0,0346**	**0,000000**	0,6036	0,4868	**0,000000**
		n0	**	***	n0	**	***	n0	n0	***
Without C & T	t-Statistic	0,609817	-0,341436	-1,756881	-0,693529	-0,124861	-0,942439	1,751957	-0,476990	-1,377881
	Prob.	0,8475	0,5614	0,0750	0.4147	0.6389	0,3068	0,9806	0,5073	0,1557
		n0	n0	*	n0	n0	n0	n0	n0	n0
In first difference		**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLCACESG**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-15,328021	-14,73142	-13,459632	-9,602969	-10,505717	-10,460329	-12,549792	-14,793309	-10,854852
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-15,349477	-14,70621	-13,437558	-9,636006	-10,510629	-10,434609	-12,488895	-14,789113	-10,822345
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,337347	-14,75755	-13,484423	-9,609018	-13,740861	-10,497656	-12,348974	-14,839397	-10,895971
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, the results are based on the regression with a constant and the regression with both a constant and a trend for the pre-war period.

Note: *() Significant at the 10%;* ***() Significant at the 5%;*** *()* Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

Appendix 7. R Unit Root Test Results for the Italian Case.

PP test in level

In level		**All the period**			**Pre war**			**Post war**		
		LMIBESG	**LEFAETFVOL**	**SENT**	**LMIBESG**	**LEFAETFVOL**	**SENT**	**LMIBESG**	**LEFAETFVOL**	**SENT**
With C	t-Statistic	-0,231564	-3,509796	-10,667923	-1,963810	-3,637353	-6,732038	-0,938605	-2,600486	-8,208312
	Prob.	0,9312	**0,0085**	**0,000000**	0.3025	**0.0062**	**0,000000**	0,7731	0,0955	**0,000000**
		n0	***	***	n0	***	***	n0	*	***
With C & T	t-Statistic	-1,750102	-4,207	-10,664643	-1,820370	-3,588583	-6,931314	-2,078180	-2,816719	-8,293257
	Prob.	0,726	**0,005**	**0,000000**	0.6894	**0,0346**	**0,000000**	0,5527	0,1941	**0,000000**
		n0	***	***	n0	**	***	n0	n0	***
Without C & T	t-Statistic	1,453060	-0,455459	-10,298318	-0,059725	-0,043999	-6,675863	2,735661	-0,674413	-7,467883
	Prob.	0,9638	0,5171	**0,000000**	0.6611	0.6664	**0,000000**	0,9985	0,4232	**0,000000**
		n0	n0	***	n0	n0	***	n0	n0	***
In first difference		**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-16,046365	-21,63801	-42,571515	-10,618695	-15,10713	-25,671678	-12,834685	-15,28305	-23,742090
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-16,093218	-21,589761	-42,615099	-10,589465	-15,323598	-25,846552	-12,771631	-15,347088	-23,637097
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,96499	-21,672909	-42,679906	-10,663294	-15,170906	-25,801469	-12,300649	-15,259648	-23,862434
	Prob.	**0,000000**	**0,000000**	**0,0001**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, the analysis is based on the regression with a constant and the regression with both a constant and a trend during the pre-war period.

Note: (*) *Significant at the 10%;* ***(**) Significant at the 5%;*** **(***)** Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

ADF test in level

In level		All the period			Pre war			Post war		
		LMIBESG	**LEFAETFVOL**	**SENT**	**LMIBESG**	**LEFAETFVOL**	**SENT**	**LMIBESG**	**LEFAETFVOL**	**SENT**
With C	t-Statistic	-0,206041	-3,18213	-4,717773	-1,866661	-3,637353	-6,240067	-0,960888	-2,187611	-3,307853
	Prob.	0,9345	**0,0222**	**0,0001**	0.3471	**0.0062**	**0,000000**	0,7656	0,2119	**0,0165**
		n0	**	***	n0	***	***	n0	n0	**
With C & T	t-Statistic	-1,698302	-3,608134	-4,737924	-1,716007	-3,588583	-6,516139	-2,047722	-2,197161	-3,444564
	Prob.	0,7496	**0,031**	**0,0007**	0.7388	**0,0346**	**0,000000**	0,5695	0,4868	**0,0501**
		n0	**	***	n0	**	***	n0	n0	*
Without C & T	t-Statistic	1,451674	-0,341436	-4,506099	-0,061098	-0,124861	-6,202864	2,530080	-0,47699	-2,909482
	Prob.	0,9637	0,5614	**0,000000**	0.6606	0.6389	**0,000000**	0,9973	0,5073	**0,0039**
		n0	n0	***	n0	n0	n0	n0	n0	***
In first difference		**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**	**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**
With C	t-Statistic	-16,046697	-14,73142	-20,231482	-10,642200	-10,505717	-13,035218	-12,895389	-14,793309	-15,744638
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
With C & T	t-Statistic	-16,092340	-14,70621	-20,196944	-10,616472	-10,510629	-13,010381	-12,829057	-14,789113	-15,689592
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Without C & T	t-Statistic	-15,965598	-14,75755	-20,270714	-10,680933	-13,740861	-13,086522	-12,376456	-14,839397	-15,8074999
	Prob.	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**	**0,000000**
		***	***	***	***	***	***	***	***	***
Conclusion		**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**SL(2)**	**SL(2)**	**I(1)**	**I(1)**	**SL(2)**

Note: For the **LEFAETFVOL** series, the analysis is based on the regression with a constant and the regression with both a constant and a trend during the pre-war period.

Note: *() Significant at the 10%;* ***() Significant at the 5%;*** () Significant at the 1%; and (no) Not Significant.

*MacKinnon (1996) one-sided p-values.

Appendix 8. Correlation matrices.

USA

Panel A: Between the variables of interest

Correlation		**Pre war**				**Post war**	
P-value	**ΔLSPESG**	**ΔLVIX**	**SENT**		**ΔLSPESG**	**ΔLVIX**	**SENT**
ΔLSPESG	1,000			**ΔLSPTSXESG**	1,000		
	-----				-----		
ΔLVIX	-0,184	1,000		**ΔLSPTSXVIX**	-0,710	1,000	
	(0.035)	-----			**0,000**	-----	
SENT	0,026	-0,052	1,000	**SENT**	0,168	-0,203	1,000
	(0.771)	(0.553)	-----		(0.056)	(0,020)	-----

Panel B: Between the control variables and the SENT variable

Correlation		**Pre war**			**Post war**	
P-value	**ΔLWTI**	**LNG**	**ΔLGOLD**	**ΔLWTI**	**ΔLNG**	**ΔLGOLD**
SENT	0,046	0,063	-0,028	-0,115	0,080	-0,149
	(0.599)	(0,473)	(0.746)	(0,193)	(0.367)	(0,091)

Canada

Panel A: Between the variables of interest

Correlation		**Pre war**				**Post war**	
P-value	**ΔLSPTSXESG**	**LSPTSXVIX**	**SENT**		**ΔLSPTSXESG**	**ΔLSPTSXVIX**	**SENT**
ΔLSPTSXESG	1,000			**ΔLSPTSXESG**	1,000		
	-----				-----		
LSPTSXVIX	-0,205	1,000		**ΔLSPTSXVIX**	-0,413	1,000	
	(0.018)	-----			**0,000**	-----	
SENT	0,094	0,002	1,000	**SENT**	-0,076	0.025	1,000
	(0,284)	(0.981)	-----		(0,390)	(0.778)	-----

Panel B: Between the control variables and the SENT variable

Correlation		**Pre war**			**Post war**	
P-value	**ΔLWTI**	**LNG**	**ΔLGOLD**	**ΔLWTI**	**ΔLNG**	**ΔLGOLD**
SENT	0,143	-0,068	0.088	-0,005	0,016	0.007
	(0,102)	(0.440)	(0,315)	(0.956)	(0,856)	(0.938)

UK

Panel A: Between the variables of interest

Correlation	Pre war				Post war		
P-value	ΔLFTSE4GOOD	LEFAETFVOL	SENT		ΔLFTSE4GOOD	ΔLEFAETFVOL	SENT
ΔLFTSE4GOOD	1,000			**ΔLFTSE4GOOD**	1,000		
	-----				-----		
LEFAETFVOL	-0,173	1,000		**ΔLEFAETFVOL**	-0,347	1,000	
	(0,047)	-----			**(0.000)**	-----	
SENT	0,07	-0,185	1,000	**SENT**	0,011	0,025	1,000
	(0,428)	**(0.034)**	-----		(0,903)	(0.779)	-----

Panel B: Between the control variables and the SENT variable

Correlation	Pre war			Post war		
P-value	ΔLWTI	LNG	ΔLGOLD	ΔLWTI	ΔLNG	ΔLGOLD
SENT	-0,012	0,122	-0,059	-0,008	0,056	0,040
	(0,889)	(0.165)	(0,504)	(0.928)	(0,524)	(0.648)

France

Panel A: Between the variables of interest

Correlation	Pre war				Post war		
P-value	ΔLCACESG	LEFAETFVOL	SENT		ΔLCACESG	ΔLEFAETFVOL	SENT
ΔLCACESG	1,000			**ΔLCACESG**	1,000		
	-----				-----		
LEFAETFVOL	-0,234	1,000		**ΔLEFAETFVOL**	-0,023	1,000	
	(0,007)	-----			(0.796)	-----	
SENT	0,008	0.050	1,000	**SENT**	0,009	-0,034	1,000
	(0,928)	(0.571)	-----		(0,922)	(0.704)	-----

Panel B: Between the control variables and the SENT variable

Correlation	Pre war			Post war		
P-value	ΔLWTI	LNG	ΔLGOLD	ΔLWTI	ΔLNG	ΔLGOLD
SENT	-0,145	0,082	-0,013	-0,013	0,020	0.112
	(0,097064)	(0.351316)	(0,882240)	(0,883923)	(0,822205)	(0,203)

Italy

Panel A: Between the variables of interest

Correlation		**Pre war**				**Post war**	
P-value	**ΔLMIBESG**	**LEFAETFVOL**	**SENT**		**ΔLMIBESG**	**ΔLEFAETFVOL**	**SENT**
ΔLMIBESG	1			**ΔLMIBESG**	1		
	-----				-----		
LEFAETFVOL	-0,239143	1		**ΔLEFAETFVOL**	-0,270227	1	
	(0.005752)	-----			**(0,001875)**	-----	
SENT	0,156814	0,033223	1	**SENT**	0,199166	-0,04895827	1
	(0,072551)	(0,705301)	-----		**(0,023104)**	(0,58016)	-----

Panel B: Between the control variables and the SENT variable

Correlation		**Pre war**		**Post war**		
P-value	**ΔLWTI**	**LNG**	**ΔLGOLD**	**ΔLWTI**	**ΔLNG**	**ΔLGOLD**
SENT	-0,018198	-0,315998	0,009804	0,052169	0,106549	-0,013535
	(0,835926)	**(0,0002233)**	(0,911162)	(0,555544)	-0,227603	-0,878529