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Correction

Correction: The effects of oil prices on confidence and stock return in China, India and Russia

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A correction on

The effects of oil prices on confidence and stock return in China, India and Russia
By Melike E. Bildirici and Mesut M. Badur. Quantitative Finance and Economics, 2018, 2(4): 884–903. doi: 10.3934/QFE.2018.4.884

We would like to submit the following corrections to our recently published paper (Bildirici and Badur, 2018) due to the wrong version of the manuscript. The details are the following.

1. The Equation 1 has been updated.

$$x = \log\left(x_t\right) \tag{1}$$

2. The first paragraph in section 4.1 has been updated.

At the first stage, the results of Philips Perron (PP) and Elliott, Rothenberg and Stock (ERS) unit root tests were exhibited in Table 3. PP's results indicated that the lop_t , lbc_t , and lsr_t variables are integrated of order one and follow I (1) processes. At the second stage, Johansen's maximum likelihood procedure is utilized to determine the possible existence of cointegration between lop_t , lbc_t and lsr_t.

3. The table 3 has been updated.

Table 3. Unit Root and Johansen Cointegration Test Results.

Unit Root Tests for China				
Variables	PP	ERS	Johansen Cointegration Test	
lop_t	-1.369	0.1169	r=0	18.04
$dlop_t$	-10.856	7.856	r≤ 1	9.55
lbc_t	-1.023	0.0389	r≤ 2	1.67
$dlbc_t$	-4.856	5.896		
lsr_t	-1.236	0.304		
$dlsr_t$	-8.369	6.896		
Unit Root Tests for India				
Variables	PP	ERS	Johansen Cointegration Test	
lbc_t	-1.496	0.6141	r=0	27.96
$dlbc_t$	-4.986	7.012	r≤ 1	14.23
lsr_t	-2.085	0.945	r≤ 2	2.788
$dlsr_t$	-11.326	6.056		
Unit Root Tests for Russian				
Variables	PP	ERS	Johansen Cointegration Test	
lbc_t	-2.012	0.212	Model 1	
$dlbc_t$	-10.856	5.236	r=0	28.11
lsr_t	-1.896	0.0459	r≤ 1	11.08
$dlsr_t$	-11.569	4.996	r≤ 2	2.11

4. The section 4.2. has been updated.

4.2. MS-VAR Results and MS-Granger Causality Results[1]

5. The first, second, fifth and sixth paragraph in section 4.2 has been updated.

To determine the number of regimes, traditional VAR model was tested against a MS-VAR structure with two regimes. To analyze the relationship between oil prices, business confidence index and stock return, the MSIAH(3)-VARX(3) model for China and India, and MSIA(3)-VARX(3) model for Russia were selected as the optimal model. According to the results, the total durations of the high volatility regimes are lower than the other periods. The duration of the low volatility regimes (regime 2 and 3) are higher than the high volatility regimes.

In MSIAH(3)-VARX(3) and MSIA(3)-VARX(3) models, oil price was accepted as exogenous variable. Accordingly, by depending upon the statistical tests and information criteria, the optimum model was selected as MSIAH(3)-VARX(3). The results of the MSIAH(3)-VARX(3) model for China and India, and MSIA(3)-VARX(3) model for Russia were given between table 4–6.

The dependent variable of the second equation is lsr, the innovations of stock return. The overall effects of oil price on stock return are statistically significant. Standart error in regime 2 is differentiated from the others. Standart error of lbc is higher than lsr. But the other regimes exhibit different results. In these regimes, standart error of lbc is smaller than lsr. The dependent variable of the first equation is dlbc which is the innovations of business confidence index. In regime 1, the parameter estimates of the dlsr(-2) in the lbc vector is 0.009406 and statistically significant at 5% significance level.

[1] The variables in MS-VAR model are innovations of the variables and/or first differences. Ox 3 Software and MS-VAR130 packages were used.

The MS-VAR model for India has three regimes. Additionally, by depending upon the statistical tests and information criteria, the selected model has three regime with MSIAH(3)-VAR(3) model. The results of the MSIAH(3)-VAR(3) model for India are given in Table 5. The computed regime probabilities are Prob(s_t=1|s_{t-1}=1)=0.8698, Prob(s_t=2|s_{t-1}=2)=0.9793, Prob(s_t=3|s_{t-1}=3)=0.8104. Standart error of dlbc is lower than dlsr in all regimes.

6. The table 4, table 5, table 6, table 7 and table 8 has been updated.

7. The seventh paragraph in section 4.3 has been updated.

The results of unidirectional causality from oil price to stock return in all countries are similar to Ding et al (2017) and Qadan and Nama (2018)'s one.

Table 4. MSIAH(3)-VARX(3) Model for China.

	Regime 1		Regime 2		Regime 3	
Variables	dlbc	dlsr	dlbc	dlsr	dlbc	dlsr
c	0.00018(0.7715)	-0.04801(-6.1919)	0.000015(0.5602)	0.002560(1.0485)	0.000015(0.1268)	0.012881(2.898)
dlbc(-1)	1.389809(9.0535)	0.700727(0.1386)	1.691963(0.000240)	0.899149(0.2151)	1.519793(11.9288)	5.072676(1.1798)
dlbc(-2)	-1.32651(-6.8094)	-1.52701(-0.2397)	-1.400750(0.5602)	-2.811166(-0.4432)	-1.126094(-6.4556)	-5.433918(-0.933)
dlbc(-3)	0.930116(4.746)	6.173444(1.1009)	0.493194(4.4746)	5.039736(1.1097)	0.303518(2.4927)	4.598403(1.1121)
dlsr(-1)	0.005517(1.1292)	-0.63734(-3.9563)	0.000407(-22.0435)	0.080672(1.0126)	0.001844(2.4734)	0.238836(1.8604)
dlsr(-2)	0.009406(1.954)	-0.03222(-0.215)	-0.001582(10.765)	0.013497(0.1806)	0.002334(0.6352)	-0.021380(-0.1738)
dlsr(-3)	0.001208(1.884)	-0.01172(-0.575)	-0.003622(7.115)	0.022275(0. 8776)	0.011375(2.052)	-0.012633(-0.2453)
dlop(-1)	0.015738(2.3338)	-0.07309(-0.3355)	0.001741(2.0352)	0.068126(1.9888)	-0.001557(-0.4902)	0.131689(2.2116)
dlop(-2)	-0.02807(-4.0515)	-0.04881(-2.2249)	-0.000746(-2.3557)	-0.191293(-2.6967)	0.004737(1.3862)	-0.080023(-0.7108)
dlop(-3)	-0.00658(-0.9025)	0.40431(1.8087)	0.000298(-1.0434)	-0.144265(-2.0262)	-0.000487(-0.1615)	-0.194447(-1.8584)
se	0.001988	0.032292	0.3858	0.023923	0.001792	0.026031

Matrix of Transition Probabilities		Contemporaneous Correlation	Regime 1		Regime 2		Regime 3	
Pp0	0.6262	Variables	dlbc	dlsr	dlbc	dlsr	dbc	dlsr
Pp1	0.9032	dlbc	1		1		1	
Pp2	0.8844	dlsr	0.3206	1	0.0462	1	0.2674	1

log-likelihood: 1704.7785 linear system: 1596.6021; AIC criterion: -15.9588 linear system: -15.3717; HQ criterion: -15.5064 linear system: -15.2340; SC criterion: -14.8403 linear system: -15.0313 LR linearity test: 216.3529 Chi(42) =[0.0000] ** Chi(48)=[0.0000] ** DAVIES=[0.0000] **

StdResids: Vector portmanteau(12): Chi(36) = 46.8466 [0.1065] , Vector normality test : Chi(4) = 2.7351 [0.6031] , Vector hetero test: Chi(48) = 61.6074 [0.0897] F(48,530) , Vector hetero-X test: Chi(132)=167.3003 [0.0204] * F(132,450), *PredError:* Vector portmanteau(12): Chi(36) = 94.8802 [0.0000] ** , Vector normality test : Chi(4) = 38.1937 [0.0000] **, Vector hetero test: Chi(48) , = 92.3063 [0.0001] ** F(48,530) PredError: Vector hetero-X test: Chi(132) =208.6341 [0.0000] ** F(132,450).

VAR Error: Vector portmanteau(12): Chi(36) = 82.5645 [0.0000] ** , Vector normality test : Chi(4) = 62.5719 [0.0000] **, Vector hetero test: Chi(48) =117.4571 [0.0000] ** F(48,530), Vector hetero-X test: Chi(132) =274.9059 [0.0000] ** F(132,450)

Table 5. MSIAH(3)-VARX(3) Model for India.

	Regime 1		Regime 2		Regime 3	
Variables	dlbc	dlsr	dlbc	dlsr	dlbc	dlsr
c	-0.000019(-0.2573)	-0.042428(-4.4091)	-0.000007(-0.7286)	0.005250(2.7354)	0.000229(4.5667)	0.025038(4.8947)
dlbc(-1)	2.229636(17.6746)	27.025355(4.6861416)	2.082449(3.57163)	2.486088(11.022)	1.407974(2.14505)	4.69911(6.734)
dlbc(-2)	-2.334248(-10.2439)	-0.75331602(-12.809)	-1.744459(-1.81504)	-0.226998(-0.1688)	-1.054091(-11.0979)	-0.889873(-8.911)
dlbc(-3)	1.067992(6.0964)	0.41193782(8.588)	0.566004(10.9922)	-2.693326(-1.9628)	0.353757(6.5266)	4.17073(3.9634)
dlsr(-1)	0.003435(3.2816)	-0.287668(-1.5116)	-0.000297(-0.9327)	-0.043902(-0.5821)	0.002970(3.0566)	-0.090878(-0.7677)
dlsr(-2)	0.001203(0.9835)	-0.660432(-3.1621)	0.000147(2.4732)	-0.065353(-0.8764)	0.000221(0.1741)	0.490987(3.0971)
dlsr(-3)	0.003515(3.0228)	-0.373903(-1.7914)	0.000433(1.4188)	0.134859(1.8246)	0.004276(4.4171)	-0.313602(-2.3142)
dlop(-1)	0.000135(2.1155)	0.291169(2.3836)	0.000158(1.7083)	-0.024006(-0.4396)	0.004655(4.7678)	-0.094720(-0.7823)
dlop(-2)	-0.001189(-0.9314)	0.102625(0.5406)	0.000196(0.8845)	0.013128(2.2398)	-0.000310(-0.3428)	0.023387(2.1973)
dlop(-3)	0.001745(2.5507)	0.310009(2.1536)	0.0014486(1.883)	-0.041236(-0.4685)	0.045361(4.7811)	-0.092117(-1.7887)
se	0.000179	0.035289	0.000093	0.022828	0.000131	0.017039

Matrix of Transition Probabilities		Contemporaneous Correlation	Regime 1		Regime 2		Regime 3	
Pp0	0.8698	Variables	dlbc	dlsr	dlbc	dlsr	dlbc	dlsr
Pp1	0.9793	dlbc	1		1		1	
Pp2	0.8104	dsr	0.5121	1	0.1052	1	0.7648	1

log-likelihood: 2054.3273 linear system: 1950.5208; AIC criterion: -19.3690 linear system: -18.8246; HQ criterion: -18.9166 linear system: -18.6869; SC criterion: -18.2506 linear system: -18.4842 LR linearity test: 207.6130 Chi(42) =[0.0000] ** Chi(48)=[0.0000] ** DAVIES=[0.0000]**

StdResids: Vector portmanteau(12): Chi(36) = 62.5281 [0.0040]**, Vector normality test: Chi(4)=7.2953 [0.1211], Vector hetero test: Chi(48)=39.6083 [0.8004] F(48,530), Vector hetero-X test: Chi(132) =126.1108 [0.6281] F(132,450) *PredError:* Vector portmanteau(12): Chi(36) = 81.6130 [0.0000]**, Vector normality test: Chi(4) = 20.2064 [0.0005] **, Vector hetero test: Chi(48) =120.9946 [0.0000]** F(48,530), Vector hetero-X test: Chi(132)=272.7212 [0.0000] ** F(132,450)

VAR Error: Vector portmanteau(12): Chi(36) = 85.8260 [0.0000]**, Vector normality test: Chi(4) = 45.6596 [0.0000]**, Vector hetero test: Chi(48) =152.0039 [0.0000]** F(48,530), Vector hetero-X test: Chi(132) =338.4949 [0.0000]** F(132,450)

Table 6. MSIA(3)-VARX(3) Model for Russia.

	Regime 1		Regime 2		Regime 3	
Variables	dlbc	dlsr	dlbc	dlsr	dlbc	dlsr
c	-0.001297 (-4.3162)	-0.088656(-6.7326)	-0.000038(*-0.5799*)	0.003599(1.1972)	0.000044(0.5001)	0.018201(3.9975)
dlbc(-1)	-0.146022(-0.2926)	2.605803(1.8271)	1.097910(*12.3636*)	-0.168417(-0.0422)	1.136220(9.7254)	-1.5495236(-2.825)
dlbc(-2)	0.216201(0.4735)	-6.455709(-3.5553)	-0.734922(*-6.0578*)	-6.408451(-1.1427)	-0.318614(-1.8104)	2.707893(2.8501)
dlbc(-3)	-0.246033(-0.8717)	2.155987(1.8535)	0.242846(*2.5578*)	2.830235(0.7189)	-0.071881(-0.7243)	-1.2616269(-2.8029)
dlsr(-1)	0.008439(1.7201)	-0.380105(-1.7624)	-0.000832(*-0.3839*)	-0.157830(-1.685)	0.001856(0.9504)	0.015165(0.1671)
dlsr(-2)	0.012563(2.915)	-0.068682(-0.3602)	-0.001797(*-0.8602*)	-0.113603(-1.2302)	0.000527(0.2886)	0.093232(1.1347)
dlsr(-3)	0.018431(3.497)	-0.11385(-0.5185)	-0.001532(*-0.8004*)	0.277036(2.8601)	0.002023(1.199)	-0.245226(-3.0971)
dlop(-1)	0.036943(2.8399)	0.336683(0.8042)	0.003365(*1.2948*)	0.342113(3.7902)	0.001784(0.7007)	0.445668(4.3061)
dlop(-2)	-0.001151(-0.1058)	1.250838(2.8225)	0.000593(*0.2742*)	0.282696(2.9619)	0.001838(0.8112)	-0.287767(-2.7525)
dlop(-3)	0.01143(2.1919)	0.38773(0.44427)	0.010768(*1.4448*)	0.55233(2.0211)	0.011568(0.5963)	0. 56113(4.5251)
se	*0.000611*	0.02731	0.000611	0.027310	0.000611	0.027310

Matrix of Transition Probabilities		Contemporaneous Correlation	Regime 1		Regime 2		Regime 3	
Pp0	0.6492	Variables	dlbc	dlsr	dlbc	dlsr	dlbc	dlsr
Pp1	0.9125	dlbc	1		1		1	
Pp2	0.6854	dlsr	-0.5013	1	0.1492	1	0.5917	1

log-likelihood: 2070.0258 linear system: 1975.0766; AIC criterion: -19.0832 linear system: -18.9178; HQ criterion : -18.3357 linear system: -18.6818 SC criterion: -17.2353 linear system: -18.3343; LR linearity test: 189.8984 Chi(72) =[0.0000]** Chi(78)=[0.0000]** DAVIES=[0.0000]**. StdResids: Vector portmanteau(12): Chi(81) =103.2590 [0.0483]*, Vector normality test: Chi(6)=9.1410 [0.1658], Vector hetero test: Chi(108)=94.7195 [0.8153] F(108,992), StdResids: Vector hetero-X test: Chi(324)=317.9332 [0.5846] F(324,820), *PredError:* Vector portmanteau(12): Chi(81) =100.9987 [0.0656] , Vector normality test : Chi(6) = 39.6366 [0.0000] ** , Vector hetero test: Chi(108) =164.1054 [0.0004] ** F(108,992) , Vector hetero-X test: Chi(324),=469.4786 [0.0000]** F(324,820), *VAR Error:* Vector portmanteau(12): Chi(81)= 95.2465 [0.1332], Vector normality test: Chi(6)= 41.0304 [0.0000]**, Vector hetero test: Chi(108) =144.5896 [0.0108]* F(108,992), Vector hetero-X test: Chi(324)=433.3302 [0.0000] ** F(324,820)

Table 7. Traditional Granger causality results for China, India and the Russia.

	China		
	Δ lop→ Δ lsr	Δ lbc→ Δ lsr	Δ lop→ Δ bc
	Δ lsr → Δ lop	Δ lsr→ Δ lbc	Δ bci→ Δ lop
F stat.	7.31	13.82	0.785
	1.79	1.97	7.511
Direction of causality	dlop→dlsr	dlbc→ dlsr	dlbc→dlop
	India		
F stat.	0.6625	7.12	0.607
	8.0495	2.288	7.699
Direction of causality	dlsr →dlop	dlbc ↔ dlsr	dlbc→dlop
	Russia		
F stat.	0.308	2.97	0.604
	15.47	2.86	11.4784
Direction of causality	dlsr →dlop	dlbc ↔ dlsr	dlbc→dlop

Table 8. MS-Granger causality results for China, India and the Russia.

	Regime 1	Regime 2	Regime 3
	China		
Direction of causality	dlsr→ dlbc	dlsr→ dlbc	dlsr→ dlbc
Direction of causality	dlop→dlbc	dlop→dlbc	dlop ≠ dlbc
Direction of causality	dlop→dlsr	dlop→dlsr	dlop→dlsr
	India		
Direction of causality	dlbc ↔ dlsr	dlbc ↔ dlsr	dlbc ↔ dlsr
Direction of causality	dlop→dlbc	dlop→dlbc	dlop→dlbc
Direction of causality	dlop→dlsr	dlop→dlsr	dlop→dlsr
	Russia		
Direction of causality	dlbc ↔ dlsr	dlbc ≠ dlsr	dlbc→ dlsr
Direction of causality	dlop→dlbc	dlop ≠ dlbc	dlop ≠ dlbc
Direction of causality	dlop→dlsr	dlop→dlsr	dlop→dlsr

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