

The Morning Email: Correlations & R-Squared

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One contract may be correlating with another but does that mean there's causation? Is one causing the other?

That's what the R-Squared is for. Read R-Squared as follows: let's say, CLA and DJIA have an R-Squared of 0.44. That means there's a 44% chance that one is causing the market movement of the other.

You will always see a positive number for the R-Squared. If a correlation is a (negative) number, for example, (87.9) that means the two commodities are mirroring each other, not correlating. For example, today (which is 06/06/2007) the RBA and DJIA have a (87.9)% correlation. The R-Squared is 0.77. Therefore the two instruments are mirroring each other 88% of the time, and there's a 77% chance that one is causing the other.

Want something added? Let me know: jgoulding@ghco.com

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Symbol	Daily Correlations US Cash Treasuries (Yield)				Daily Correlations US Bonds/Notes (CBOT)			
	2yr Yield	5yr Yield	10yr Yield	30yr Yield	ZT	ZF	ZN	ZB
5YR BASIS	(11.0)	(62.9)	(83.5)	(90.3)	15.1	70.0	80.3	90.9
10YR BASIS	(10.3)	(62.6)	(83.4)	(84.9)	(6.1)	46.4	63.5	75.2
30YR BASIS	(28.2)	(75.2)	(91.2)	(93.0)	17.6	66.8	78.8	84.5
2/10	(42.4)	23.8	64.4	74.0	42.1	(22.1)	(50.3)	(73.6)
2/5	(34.5)	33.0	69.2	76.4	35.3	(28.8)	(55.5)	(76.1)
2/30	(38.2)	26.6	67.0	77.8	36.9	(27.5)	(54.1)	(77.1)
5/10	(50.1)	11.1	55.0	67.3	48.4	(12.5)	(41.2)	(66.7)
5/30	(39.1)	20.6	62.0	75.0	36.2	(25.2)	(50.3)	(74.1)
10/30	(20.9)	32.3	67.3	80.4	16.5	(41.1)	(59.4)	(79.1)
TUF1^	(10.4)	45.8	74.7	83.2	(2.3)	(59.0)	(75.1)	(88.6)

^ See notes page

Symbol	Daily R-Squared US Cash Treasuries (Yield)				Daily R-Squared US Bonds/Notes (CBOT)			
	2yr Yield	5yr Yield	10yr Yield	30yr Yield	ZT	ZF	ZN	ZB
5YR BASIS	0.01	0.40	0.70	0.81	0.02	0.49	0.64	0.83
10YR BASIS	0.01	0.39	0.69	0.72	0.00	0.21	0.40	0.57
30YR BASIS	0.08	0.57	0.83	0.87	0.03	0.45	0.62	0.71
2/10	0.18	0.06	0.41	0.55	0.18	0.05	0.25	0.54
2/5	0.12	0.11	0.48	0.58	0.12	0.08	0.31	0.58
2/30	0.15	0.07	0.45	0.61	0.14	0.08	0.29	0.60
5/10	0.25	0.01	0.30	0.45	0.23	0.02	0.17	0.44
5/30	0.15	0.04	0.38	0.56	0.13	0.06	0.25	0.55
10/30	0.04	0.10	0.45	0.65	0.03	0.17	0.35	0.63
TUF1^	0.01	0.21	0.56	0.69	0.00	0.35	0.56	0.78

^ See notes page

Symbol	Daily Correlations US Cash Treasuries (Yield)				Daily Correlations US Bonds/Notes (CBOT)			
	2yr Yield	5yr Yield	10yr Yield	30yr Yield	ZT	ZF	ZN	ZB
2yr Yield	100.0	77.2	42.0	28.3	(94.8)	(73.9)	(53.4)	(26.6)
5yr Yield	77.2	100.0	89.1	80.1	(71.4)	(93.9)	(91.3)	(78.3)
10yr Yield	42.0	89.1	100.0	98.1	(37.9)	(84.6)	(95.5)	(96.2)
30yr Yield	28.3	80.1	98.1	100.0	(26.1)	(78.8)	(92.4)	(98.2)
ZT	(94.8)	(71.4)	(37.9)	(26.1)	100.0	78.5	56.8	29.6
ZF	(73.9)	(93.9)	(84.6)	(78.8)	78.5	100.0	94.4	81.4
ZN	(53.4)	(91.3)	(95.5)	(92.4)	56.8	94.4	100.0	94.8
ZB	(26.6)	(78.3)	(96.2)	(98.2)	29.6	81.4	94.8	100.0
emini SP	(23.2)	(76.4)	(95.0)	(96.9)	32.6	70.8	82.3	89.7
Dow Futures	(34.7)	(80.2)	(92.7)	(94.2)	29.2	76.8	85.1	89.1
USDJPY	9.3	(39.1)	(61.3)	(64.3)	(7.0)	35.8	56.0	62.5
EURUSD	(53.5)	(44.9)	(31.5)	(32.6)	52.1	53.3	34.5	29.8
EURJPY	(27.6)	(68.0)	(80.2)	(83.8)	29.1	70.9	77.4	80.2
Crude	(27.1)	4.6	14.3	16.2	21.5	(5.6)	(14.5)	(22.8)

Symbol	Daily R-Squared US Cash Treasuries (Yield)				Daily R-Squared US Bonds/Notes (CBOT)			
	2yr Yield	5yr Yield	10yr Yield	30yr Yield	ZT	ZF	ZN	ZB
2yr Yield		0.60	0.18	0.08	0.90	0.55	0.29	0.07
5yr Yield	0.60		0.79	0.64	0.51	0.88	0.83	0.61
10yr Yield	0.18	0.79		0.96	0.14	0.72	0.91	0.93
30yr Yield	0.08	0.64	0.96		0.07	0.62	0.85	0.96
ZT	0.90	0.51	0.14	0.07		0.62	0.32	0.09
ZF	0.55	0.88	0.72	0.62	0.62		0.89	0.66
ZN	0.29	0.83	0.91	0.85	0.32	0.89		0.90
ZB	0.07	0.61	0.93	0.96	0.09	0.66	0.90	
emini SP	0.05	0.58	0.90	0.94	0.11	0.50	0.68	0.80
Dow Futures	0.12	0.64	0.86	0.89	0.09	0.59	0.72	0.79
USDJPY	0.01	0.15	0.38	0.41	0.00	0.13	0.31	0.39
EURUSD	0.29	0.20	0.10	0.11	0.27	0.28	0.12	0.09
EURJPY	0.08	0.46	0.64	0.70	0.08	0.50	0.60	0.64
Crude	0.07	0.00	0.02	0.03	0.05	0.00	0.02	0.05



		Daily Correlations			Daily Correlations				
		US Cash Treasuries			US Bonds/Notes (CBOT)				
SYM NAME	Symbol	2yr	5yr	10yr	ZT	ZF	ZN	Symbol	SYM NAME
Schatz(2Y)	DGZ7	(6.72)	(55.16)	(68.99)	5.86	53.09	62.71	DGZ7	Schatz(2Y)
Bobl(5Y)	DLZ7	(8.08)	(58.58)	(74.52)	7.37	57.38	68.35	DLZ7	Bobl(5Y)
Bund(10Y)	DBZ7	(4.53)	(56.13)	(73.38)	5.76	56.20	68.65	DBZ7	Bund(10Y)

		Daily R-Squared			Daily R-Squared				
		US Cash Treasuries			US Bonds/Notes (CBOT)				
SYM NAME	Symbol	2yr	5yr	10yr	ZT	ZF	ZN	Symbol	SYM NAME
Schatz(2Y)	DGZ7	0.00	0.30	0.48	0.97	0.28	0.39	DGZ7	Schatz(2Y)
Bobl(5Y)	DLZ7	0.01	0.34	0.56	0.01	0.33	0.47	DLZ7	Bobl(5Y)
Bund(10Y)	DBZ7	0.00	0.32	0.54	0.00	0.32	0.47	DBZ7	Bund(10Y)

Daily Correlations					
Symbol	CLA	HOA	RBA	NGA	Sym Name
CLA	100.0	82.5	79.4	(66.5)	Crude Oil
HOA	82.5	100.0	98.1	(66.2)	Heating Oil
RBA	79.4	98.1	100.0	(61.0)	unleaded Gas
NGA	(66.5)	(66.2)	(61.0)	100.0	Nat Gas
DJIA	(20.1)	(65.4)	(71.3)	33.9	Dow Cash
SPC5	(23.9)	(65.8)	(68.4)	46.0	S&P 500 Cash
EURUSD	18.5	(16.2)	(23.5)	(43.3)	€ / \$
EURJPY	(17.3)	(62.1)	(62.6)	15.2	€ / ¥
USDJPY	(30.9)	(52.8)	(47.9)	46.0	\$ / ¥

Daily R-Squared					
Symbol	CLA	HOA	RBA	NGA	Sym Name
CLA		0.68	0.63	0.44	Crude Oil
HOA	0.68		0.96	0.44	Heating Oil
RBA	0.63	0.96		0.37	unleaded Gas
NGA	0.44	0.44	0.37		Nat Gas
DJIA	0.04	0.43	0.51	0.11	Dow Cash
SPC5	0.06	0.43	0.47	0.21	S&P 500 Cash
EURUSD	0.03	0.03	0.06	0.19	€ / \$
EURJPY	0.03	0.39	0.39	0.02	€ / ¥
USDJPY	0.10	0.28	0.23	0.21	\$ / ¥

1) ALL Correlations are based on 10 day historical
 2) CQG quotes prices in 32nds. That means you won't see ""32" on the end of my equations. I don't need to multiply by 32 to see the correct quote.

TUF1 = Cash2yr Yield - 5 Year Futures
 CQG Equation = $\text{SHARESCALE}(\text{BUSP02}-(\text{FVA}?.5), \text{INTEGER1}) * 32$? Where FVA? is the 5yr electronic lead month futures contract.

FYT1 = $(\text{FV} * 1.5) - \text{TY}$
 CQG Equation = $((\text{FVA}?.5) - \text{TYA}?)$
 Where: FV = 5 yr electronic futures; TY = 10 yr electronic futures

FYT2 = $(5 \text{ yr cash} - (\text{TY}?.7))$
 CQG Equation = $(\text{BUS05P} - (\text{TYA}?.7))$
 Where: 5 yr cash = OTR; TY = 10 yr electronic futures

NOB1 = $(10 \text{ yr cash} - (\text{US}?.7))$
 CQG Equation = $(\text{BUS10P} - (\text{USA}?.7))$
 Where: US = 30 yr electronic futures; 10 yr cash = OTR

NOB2 = $(\text{TY} - (\text{US}?.7))$
 CQG Equation = $(\text{TYA} - (\text{USA}?.7))$
 Where: TY = 10 yr electronic futures; US = 30 yr electronic futures

FAQ

Q: Why do I have a column titled 'q' in certain places?

A: Those are q formulas I use within CQG. CQG is the engine behind my morning emails. They provide the quotes, I provide the formulas.

Q: Why are certain cells colored?

A: They help me identify what formula's need to be changed by hand and which are automated. There are over 9,000 formula's working behind the scenes to deliver the morning emails. I need some kind of system assist me in identifying certain formula's that need to be adjusted on new issues, rolls etc. I also use a color pattern for the treasuries to help with quick visual interpretation.

Sym Name = Symbol Name

BASIS is conversion factor.

Basis = Cash Price - (Futures Price * Conversion Factor)

Daily Correlations Treasury Basis^			
	5YR BASIS	10YR BASIS	30YR BASIS
emini SP	86.5	89.3	95.7
Dow Futures	88.6	85.4	95.0
USDJPY	54.8	56.1	63.2
EURUSD	45.8	22.3	34.4
EURJPY	83.5	68.6	84.1
Crude	(38.2)	(8.4)	(2.8)
TUF1^	(91.2)	(56.8)	(66.1)
2/10	(74.0)	(74.5)	(67.2)
2/5	(76.5)	(77.3)	(69.2)
2/30	(79.7)	(75.1)	(71.2)
5/10	(67.1)	(67.3)	(61.3)
5/30	(78.2)	(69.6)	(69.1)
10/30	(88.0)	(68.0)	(75.0)
ZT	15.1	(6.1)	15.1
ZF	70.0	46.4	70.0
ZN	80.3	63.5	80.3
ZB	90.9	75.2	90.9

q

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Daily R-Squared Treasury Basis			
	5YR BASIS	10YR BASIS	30YR BASIS
emini SP	0.75	0.80	0.92
Dow Futures	0.79	0.73	0.90
USDJPY	0.30	0.31	0.40
EURUSD	0.21	0.05	0.12
EURJPY	0.70	0.47	0.71
Crude	0.15	0.01	0.00
TUF1^	0.83	0.32	0.44
2/10	0.55	0.56	0.45
2/5	0.59	0.60	0.48
2/30	0.64	0.56	0.51
5/10	0.45	0.45	0.38
5/30	0.61	0.49	0.48
10/30	0.77	0.46	0.56
ZT	0.02	0.00	0.02
ZF	0.49	0.21	0.49
ZN	0.64	0.40	0.64
ZB	0.83	0.57	0.83

^See Notes Page

Daily Correlations											
US Cash Treasuries Spreads (Yield)											
Symbol	2/10	2/5	2/30	5/10	5/30	10/30	NOB1^	NOB2^	TUF^	FYT1^	FYT2^
2/10		98.2	99.1	97.2	94.8	84.8	52.0	95.2	83.3	87.3	(61.7)
2/5	98.2		96.2	90.9	88.5	78.8	45.6	92.4	83.2	83.2	(64.9)
2/30	99.1	96.2		97.7	97.9	91.1	55.4	97.4	86.9	82.7	(68.7)
5/10	97.2	90.9	97.7		97.9	87.9	57.4	93.9	79.2	87.8	(54.6)
5/30	94.8	88.5	97.9	97.9		95.8	59.9	96.3	85.4	78.2	(68.1)
10/30	84.8	78.8	91.1	87.9	95.8		59.2	92.8	87.9	59.1	(82.2)
NOB1^	52.0	45.6	55.4	57.4	59.9	59.2					
NOB2^	95.2	92.4	97.4	93.9	96.3	92.8					
TUF^	83.3	83.2	86.9	79.2	85.4	87.9					
FYT1^	87.3	83.2	82.7	87.8	78.2	59.1					
FYT2^	(61.7)	(64.9)	(68.7)	(54.6)	(68.1)	(82.2)					

Daily R-Squared											
US Cash Treasuries Spreads (Yield)											
Symbol	2/10	2/5	2/30	5/10	5/30	10/30	NOB1^	NOB2^	TUF^	FYT1^	FYT2^
2/10		0.96	0.98	0.94	0.90	0.72	0.27	0.91	0.69	0.76	0.38
2/5	0.96		0.92	0.83	0.78	0.62	0.21	0.85	0.69	0.69	0.42
2/30	0.98	0.92		0.95	0.96	0.83	0.31	0.95	0.76	0.68	0.47
5/10	0.94	0.83	0.95		0.96	0.77	0.33	0.88	0.63	0.77	0.30
5/30	0.90	0.78	0.96	0.96		0.92	0.36	0.93	0.73	0.61	0.46
10/30	0.72	0.62	0.83	0.77	0.92		0.35	0.86	0.77	0.35	0.68
NOB1^	0.27	0.21	0.31	0.33	0.36	0.35					
NOB2^	0.91	0.85	0.95	0.88	0.93	0.86					
TUF^	0.69	0.69	0.76	0.63	0.73	0.77					
FYT1^	0.76	0.69	0.68	0.77	0.61	0.35					
FYT2^	0.38	0.42	0.47	0.30	0.46	0.68					

^ See notes page

q	
6	5YR BASIS
2	10YR BASIS
9	30YR BASIS
45	2/10
47	2/5
46	2/30
48	5/10
49	5/30
44	10/30
4	TUF1^
50	FYT1^
3	FYT2^
1	NOB1^
33	NOB2^