

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 | 15.8 | 0.5 | (15.7) | (34.9) | (18.9) | 0.5 | 7.2 | 26.9 |
| 10YR BASIS | (48.7) | (61.3) | (73.8) | (82.0) | 36.4 | 51.2 | 59.2 | 68.7 |
| 30YR BASIS | (5.7) | (15.5) | (29.8) | (43.3) | (7.1) | 3.6 | 11.3 | 23.7 |
| 2/10 | (74.9) | (57.7) | (37.1) | (16.9) | 77.9 | 59.4 | 46.4 | 25.8 |
| 2/5 | (31.7) | (8.6) | 13.1 | 31.4 | 36.0 | 10.5 | (4.1) | (24.8) |
| 2/30 | (85.1) | (71.1) | (52.7) | (32.8) | 87.2 | 72.4 | 61.2 | 41.8 |
| 5/10 | (92.9) | (83.5) | (68.0) | (50.2) | 94.4 | 84.9 | 75.5 | 59.1 |
| 5/30 | (95.0) | (87.6) | (73.7) | (56.4) | 95.9 | 88.3 | 80.6 | 65.0 |
| 10/30 | (95.4) | (90.9) | (79.9) | (63.7) | 95.3 | 90.7 | 85.5 | 71.7 |
| TUF1^ | 0.8 | 20.1 | 34.5 | 46.0 | (3.8) | (26.9) | (36.4) | (51.6) |

^ 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 | 0.02 | 0.00 | 0.02 | 0.12 | 0.04 | 0.00 | 0.01 | 0.07 |
| 10YR BASIS | 0.24 | 0.38 | 0.55 | 0.67 | 0.13 | 0.26 | 0.35 | 0.47 |
| 30YR BASIS | 0.00 | 0.02 | 0.09 | 0.19 | 0.00 | 0.00 | 0.01 | 0.06 |
| 2/10 | 0.56 | 0.33 | 0.14 | 0.03 | 0.61 | 0.35 | 0.22 | 0.07 |
| 2/5 | 0.10 | 0.01 | 0.02 | 0.10 | 0.13 | 0.01 | 0.00 | 0.06 |
| 2/30 | 0.72 | 0.51 | 0.28 | 0.11 | 0.76 | 0.52 | 0.37 | 0.17 |
| 5/10 | 0.86 | 0.70 | 0.46 | 0.25 | 0.89 | 0.72 | 0.57 | 0.35 |
| 5/30 | 0.90 | 0.77 | 0.54 | 0.32 | 0.92 | 0.78 | 0.65 | 0.42 |
| 10/30 | 0.91 | 0.83 | 0.64 | 0.41 | 0.91 | 0.82 | 0.73 | 0.51 |
| TUF1^ | 0.00 | 0.04 | 0.12 | 0.21 | 0.00 | 0.07 | 0.13 | 0.27 |

^ 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 | 97.2 | 89.4 | 77.6 | (98.7) | (96.5) | (92.4) | (82.3) |
| 5yr Yield | 97.2 | 100.0 | 97.1 | 89.3 | (94.8) | (98.8) | (98.1) | (92.6) |
| 10yr Yield | 89.4 | 97.1 | 100.0 | 97.2 | (85.4) | (94.9) | (98.0) | (97.9) |
| 30yr Yield | 77.6 | 89.3 | 97.2 | 100.0 | (72.6) | (86.5) | (92.5) | (97.7) |
| ZT | (98.7) | (94.8) | (85.4) | (72.6) | 100.0 | 96.2 | 91.2 | 80.2 |
| ZF | (96.5) | (98.8) | (94.9) | (86.5) | 96.2 | 100.0 | 98.5 | 92.7 |
| ZN | (92.4) | (98.1) | (98.0) | (92.5) | 91.2 | 98.5 | 100.0 | 97.2 |
| ZB | (82.3) | (92.6) | (97.9) | (97.7) | 80.2 | 92.7 | 97.2 | 100.0 |
| emini SP | 91.9 | 86.7 | 75.3 | 61.3 | (93.3) | (80.8) | (68.2) | (41.6) |
| Dow Futures | 80.5 | 73.9 | 61.4 | 45.6 | (84.1) | (78.9) | (73.3) | (59.0) |
| USDJPY | 83.5 | 75.5 | 61.5 | 48.1 | (85.7) | (78.8) | (68.8) | (56.0) |
| EURUSD | (19.5) | (11.9) | 0.4 | 8.4 | 18.5 | 15.1 | 3.0 | (4.4) |
| EURJPY | 89.8 | 84.8 | 75.7 | 64.5 | (92.7) | (86.6) | (82.2) | (71.3) |
| Crude | (10.4) | 5.5 | 21.2 | 37.6 | 7.4 | (7.7) | (16.1) | (34.1) |

| 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 | | 0.95 | 0.80 | 0.60 | 0.97 | 0.93 | 0.85 | 0.68 |
| 5yr Yield | 0.95 | | 0.94 | 0.80 | 0.90 | 0.98 | 0.96 | 0.86 |
| 10yr Yield | 0.80 | 0.94 | | 0.95 | 0.73 | 0.90 | 0.96 | 0.96 |
| 30yr Yield | 0.60 | 0.80 | 0.95 | | 0.53 | 0.75 | 0.86 | 0.95 |
| ZT | 0.97 | 0.90 | 0.73 | 0.53 | | 0.93 | 0.83 | 0.64 |
| ZF | 0.93 | 0.98 | 0.90 | 0.75 | 0.93 | | 0.97 | 0.86 |
| ZN | 0.85 | 0.96 | 0.96 | 0.86 | 0.83 | 0.97 | | 0.94 |
| ZB | 0.68 | 0.86 | 0.96 | 0.95 | 0.64 | 0.86 | 0.94 | |
| emini SP | 0.85 | 0.75 | 0.57 | 0.38 | 0.87 | 0.65 | 0.46 | 0.17 |
| Dow Futures | 0.65 | 0.55 | 0.38 | 0.21 | 0.71 | 0.62 | 0.54 | 0.35 |
| USDJPY | 0.70 | 0.57 | 0.38 | 0.23 | 0.74 | 0.62 | 0.47 | 0.31 |
| EURUSD | 0.04 | 0.01 | 0.00 | 0.01 | 0.03 | 0.02 | 0.00 | 0.00 |
| EURJPY | 0.81 | 0.72 | 0.57 | 0.42 | 0.86 | 0.75 | 0.68 | 0.51 |
| Crude | 0.01 | 0.00 | 0.04 | 0.14 | 0.01 | 0.01 | 0.03 | 0.12 |



| SYM NAME | Symbol | Daily Correlations US Cash Treasuries | | | Daily Correlations US Bonds/Notes (CBOT) | | | Symbol | SYM NAME |
|------------|--------|--|---------|---------|---|-------|-------|--------|------------|
| | | 2yr | 5yr | 10yr | ZT | ZF | ZN | | |
| Schatz(2Y) | DGZ7 | (81.87) | (89.04) | (93.18) | 77.95 | 87.18 | 89.68 | DGZ7 | Schatz(2Y) |
| Bobl(5Y) | DLZ7 | (74.77) | (83.62) | (90.76) | 69.93 | 81.64 | 86.20 | DLZ7 | Bobl(5Y) |
| Bund(10Y) | DBZ7 | (61.07) | (73.28) | (84.30) | 55.92 | 71.99 | 79.81 | DBZ7 | Bund(10Y) |

| SYM NAME | Symbol | Daily R-Squared US Cash Treasuries | | | Daily R-Squared US Bonds/Notes (CBOT) | | | Symbol | SYM NAME |
|------------|--------|---------------------------------------|------|------|--|------|------|--------|------------|
| | | 2yr | 5yr | 10yr | ZT | ZF | ZN | | |
| Schatz(2Y) | DGZ7 | 0.67 | 0.79 | 0.87 | 0.97 | 0.76 | 0.80 | DGZ7 | Schatz(2Y) |
| Bobl(5Y) | DLZ7 | 0.56 | 0.70 | 0.82 | 0.49 | 0.67 | 0.74 | DLZ7 | Bobl(5Y) |
| Bund(10Y) | DBZ7 | 0.37 | 0.54 | 0.71 | 0.31 | 0.52 | 0.64 | DBZ7 | Bund(10Y) |

| Daily Correlations | | | | | |
|--------------------|--------|--------|--------|--------|--------------|
| Symbol | CLA | HOA | RBA | NGA | Sym Name |
| CLA | 100.0 | 95.5 | 82.1 | 2.4 | Crude Oil |
| HOA | 95.5 | 100.0 | 92.4 | (4.3) | Heating Oil |
| RBA | 82.1 | 92.4 | 100.0 | (15.7) | unleaded Gas |
| NGA | 2.4 | (4.3) | (15.7) | 100.0 | Nat Gas |
| DJIA | (14.4) | (19.0) | (11.8) | (26.4) | Dow Cash |
| SPC5 | (1.0) | 0.7 | 14.3 | (26.6) | S&P 500 Cash |
| EURUSD | 65.1 | 48.5 | 20.3 | (8.3) | € / \$ |
| EURJPY | 35.9 | 40.1 | 43.6 | (32.5) | € / ¥ |
| USDJPY | (13.6) | 0.3 | 21.0 | (19.3) | \$ / ¥ |

| Daily R-Squared | | | | | |
|-----------------|------|------|------|------|--------------|
| Symbol | CLA | HOA | RBA | NGA | Sym Name |
| CLA | | 0.91 | 0.67 | 0.00 | Crude Oil |
| HOA | 0.91 | | 0.85 | 0.00 | Heating Oil |
| RBA | 0.67 | 0.85 | | 0.02 | unleaded Gas |
| NGA | 0.00 | 0.00 | 0.02 | | Nat Gas |
| DJIA | 0.02 | 0.04 | 0.01 | 0.07 | Dow Cash |
| SPC5 | 0.00 | 0.00 | 0.02 | 0.07 | S&P 500 Cash |
| EURUSD | 0.42 | 0.24 | 0.04 | 0.01 | € / \$ |
| EURJPY | 0.13 | 0.16 | 0.19 | 0.11 | € / ¥ |
| USDJPY | 0.02 | 0.00 | 0.04 | 0.04 | \$ / ¥ |

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 = $((\text{FVA?} * 1.5) - \text{TYA?})$
 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 | 23.7 | (18.3) | 30.2 |
| Dow Futures | 37.3 | (1.8) | 42.0 |
| USDJPY | 17.3 | (17.3) | 21.1 |
| EURUSD | 5.5 | (7.3) | (19.8) |
| EURJPY | 24.2 | (27.0) | 12.0 |
| Crude | (71.9) | (29.8) | (31.6) |
| TUF1^ | (61.9) | (20.4) | 4.5 |
| 2/10 | (55.8) | (8.4) | (32.3) |
| 2/5 | (65.0) | (41.2) | (38.7) |
| 2/30 | (52.7) | 4.5 | (27.6) |
| 5/10 | (37.8) | 18.2 | (21.0) |
| 5/30 | (38.3) | 24.4 | (17.9) |
| 10/30 | (37.9) | 32.6 | (13.0) |
| ZT | (18.9) | 36.4 | (18.9) |
| ZF | 0.5 | 51.2 | 0.5 |
| ZN | 7.2 | 59.2 | 7.2 |
| ZB | 26.9 | 68.7 | 26.9 |

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| Daily R-Squared Treasury Basis | | | |
|-----------------------------------|-----------|------------|------------|
| | 5YR BASIS | 10YR BASIS | 30YR BASIS |
| emini SP | 0.06 | 0.03 | 0.09 |
| Dow Futures | 0.14 | 0.00 | 0.18 |
| USDJPY | 0.03 | 0.03 | 0.04 |
| EURUSD | 0.00 | 0.01 | 0.04 |
| EURJPY | 0.06 | 0.07 | 0.01 |
| Crude | 0.52 | 0.09 | 0.10 |
| TUF1^ | 0.38 | 0.04 | 0.00 |
| 2/10 | 0.31 | 0.01 | 0.10 |
| 2/5 | 0.42 | 0.17 | 0.15 |
| 2/30 | 0.28 | 0.00 | 0.08 |
| 5/10 | 0.14 | 0.03 | 0.04 |
| 5/30 | 0.15 | 0.06 | 0.03 |
| 10/30 | 0.14 | 0.11 | 0.02 |
| ZT | 0.04 | 0.13 | 0.04 |
| ZF | 0.00 | 0.26 | 0.00 |
| ZN | 0.01 | 0.35 | 0.01 |
| ZB | 0.07 | 0.47 | 0.07 |

^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 | | 85.0 | 98.0 | 91.6 | 87.6 | 79.3 | 62.1 | 91.4 | 49.1 | 92.6 | (34.4) |
| 2/5 | 85.0 | | 73.7 | 56.8 | 49.5 | 37.7 | 38.1 | 85.1 | 77.6 | 70.7 | (41.5) |
| 2/30 | 98.0 | 73.7 | | 97.2 | 95.2 | 89.8 | 68.1 | 88.5 | 37.1 | 91.6 | (34.8) |
| 5/10 | 91.6 | 56.8 | 97.2 | | 99.2 | 95.3 | 68.1 | 78.2 | 17.8 | 90.9 | (22.2) |
| 5/30 | 87.6 | 49.5 | 95.2 | 99.2 | | 98.4 | 70.3 | 75.3 | 12.5 | 85.8 | (26.0) |
| 10/30 | 79.3 | 37.7 | 89.8 | 95.3 | 98.4 | | 71.6 | 69.0 | 4.6 | 76.0 | (30.6) |
| NOB1^ | 62.1 | 38.1 | 68.1 | 68.1 | 70.3 | 71.6 | | | | | |
| NOB2^ | 91.4 | 85.1 | 88.5 | 78.2 | 75.3 | 69.0 | | | | | |
| TUF^ | 49.1 | 77.6 | 37.1 | 17.8 | 12.5 | 4.6 | | | | | |
| FYT1^ | 92.6 | 70.7 | 91.6 | 90.9 | 85.8 | 76.0 | | | | | |
| FYT2^ | (34.4) | (41.5) | (34.8) | (22.2) | (26.0) | (30.6) | | | | | |

| 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 | | 0.72 | 0.96 | 0.84 | 0.77 | 0.63 | 0.39 | 0.84 | 0.24 | 0.86 | 0.12 |
| 2/5 | 0.72 | | 0.54 | 0.32 | 0.24 | 0.14 | 0.14 | 0.72 | 0.60 | 0.50 | 0.17 |
| 2/30 | 0.96 | 0.54 | | 0.94 | 0.91 | 0.81 | 0.46 | 0.78 | 0.14 | 0.84 | 0.12 |
| 5/10 | 0.84 | 0.32 | 0.94 | | 0.98 | 0.91 | 0.46 | 0.61 | 0.03 | 0.83 | 0.05 |
| 5/30 | 0.77 | 0.24 | 0.91 | 0.98 | | 0.97 | 0.49 | 0.57 | 0.02 | 0.74 | 0.07 |
| 10/30 | 0.63 | 0.14 | 0.81 | 0.91 | 0.97 | | 0.51 | 0.48 | 0.00 | 0.58 | 0.09 |
| NOB1^ | 0.39 | 0.14 | 0.46 | 0.46 | 0.49 | 0.51 | | | | | |
| NOB2^ | 0.84 | 0.72 | 0.78 | 0.61 | 0.57 | 0.48 | | | | | |
| TUF^ | 0.24 | 0.60 | 0.14 | 0.03 | 0.02 | 0.00 | | | | | |
| FYT1^ | 0.86 | 0.50 | 0.84 | 0.83 | 0.74 | 0.58 | | | | | |
| FYT2^ | 0.12 | 0.17 | 0.12 | 0.05 | 0.07 | 0.09 | | | | | |

^ See notes page

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|----|------------|
| 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^ |