

| Day | Date | GLD | Futures | Daily Change: GLD | Daily Change: Futures |
|-----|-----------|------------|---------|-------------------|-----------------------|
| 1 | 4/20/2017 | 121.959999 | 1283.80 | | |
| 2 | 4/21/2017 | 122.309998 | 1289.10 | 0.349999 | 5.3 |
| 3 | 4/24/2017 | 121.480003 | 1277.50 | -0.829995 | -11.6 |
| 4 | 4/25/2017 | 120.250000 | 1267.20 | -1.230003 | -10.3 |
| 5 | 4/26/2017 | 120.839996 | 1264.20 | 0.589996 | -3 |
| 6 | 4/27/2017 | 120.389999 | 1265.90 | -0.449997 | 1.7 |
| 7 | 4/28/2017 | 120.769997 | 1268.30 | 0.379998 | 2.4 |
| 8 | 5/1/2017 | 119.669998 | 1255.50 | -1.099999 | -12.8 |
| 9 | 5/2/2017 | 119.650002 | 1257.00 | -0.019996 | 1.5 |
| 10 | 5/3/2017 | 117.980003 | 1248.50 | -1.669999 | -8.5 |
| 11 | 5/4/2017 | 116.790001 | 1228.60 | -1.190002 | -19.9 |
| 12 | 5/5/2017 | 117.010002 | 1226.90 | 0.220001 | -1.7 |
| 13 | 5/8/2017 | 116.750000 | 1227.10 | -0.260002 | 0.2 |
| 14 | 5/9/2017 | 116.050003 | 1216.10 | -0.699997 | -11 |
| 15 | 5/10/2017 | 116.040001 | 1218.90 | -0.010002 | 2.8 |
| 16 | 5/11/2017 | 116.500000 | 1224.20 | 0.459999 | 5.3 |
| 17 | 5/12/2017 | 116.830002 | 1227.70 | 0.330002 | 3.5 |
| 18 | 5/15/2017 | 117.139999 | 1230.00 | 0.309997 | 2.3 |
| 19 | 5/16/2017 | 117.650002 | 1236.40 | 0.510003 | 6.4 |
| 20 | 5/17/2017 | 119.790001 | 1258.70 | 2.139999 | 22.3 |
| 21 | 5/18/2017 | 118.809998 | 1252.80 | -0.980003 | -5.9 |
| 22 | 5/19/2017 | 119.400002 | 1253.60 | 0.590004 | 0.8 |
| 23 | 5/22/2017 | 119.900002 | 1264.80 | 0.5 | 11.2 |
| 24 | 5/23/2017 | 119.139999 | 1258.90 | -0.760003 | -5.9 |
| 25 | 5/24/2017 | 119.610001 | 1256.50 | 0.470002 | -2.4 |
| 26 | 5/25/2017 | 119.480003 | 1259.80 | -0.129998 | 3.3 |
| 27 | 5/26/2017 | 120.540001 | 1271.40 | 1.059998 | 11.6 |
| 28 | 5/30/2017 | 120.139999 | 1265.70 | -0.400002 | -5.7 |
| 29 | 5/31/2017 | 120.620003 | 1275.40 | 0.480004 | 9.7 |
| 30 | 6/1/2017 | 120.720001 | 1270.10 | 0.099998 | -5.3 |
| 31 | 6/2/2017 | 121.610001 | 1280.20 | 0.89 | 10.1 |
| 32 | 6/5/2017 | 121.730003 | 1282.70 | 0.120002 | 2.5 |
| 33 | 6/6/2017 | 123.099998 | 1297.50 | 1.369995 | 14.8 |
| 34 | 6/7/2017 | 122.449997 | 1293.20 | -0.650001 | -4.3 |
| 35 | 6/8/2017 | 121.650002 | 1279.50 | -0.799995 | -13.7 |
| 36 | 6/9/2017 | 120.540001 | 1271.40 | -1.110001 | -8.1 |
| 37 | 6/12/2017 | 120.360001 | 1268.90 | -0.18 | -2.5 |
| 38 | 6/13/2017 | 120.480003 | 1268.60 | 0.120002 | -0.3 |
| 39 | 6/14/2017 | 119.820000 | 1275.90 | -0.660003 | 7.3 |
| 40 | 6/15/2017 | 119.320000 | 1254.60 | -0.5 | -21.3 |
| 41 | 6/16/2017 | 119.339996 | 1256.50 | 0.019996 | 1.9 |
| 42 | 6/19/2017 | 118.430000 | 1246.70 | -0.909996 | -9.8 |
| 43 | 6/20/2017 | 118.180000 | 1243.50 | -0.25 | -3.2 |
| 44 | 6/21/2017 | 118.519997 | 1245.80 | 0.339997 | 2.3 |
| 45 | 6/22/2017 | 118.919998 | 1249.40 | 0.400001 | 3.6 |
| 46 | 6/23/2017 | 119.430000 | 1256.40 | 0.510002 | 7 |
| 47 | 6/26/2017 | 118.360001 | 1246.40 | -1.069999 | -10 |
| 48 | 6/27/2017 | 118.809998 | 1246.90 | 0.449997 | 0.5 |

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| 49 | 6/28/2017 | 118.900002 | 1249.10 | 0.090004 | 2.2 |
| 50 | 6/29/2017 | 118.320000 | 1245.80 | -0.580002 | -3.3 |
| 51 | 6/30/2017 | 118.019997 | 1242.30 | -0.300003 | -3.5 |
| 52 | 7/3/2017 | 116.089996 | 1219.20 | -1.930001 | -23.1 |
| 53 | 7/5/2017 | 116.519997 | 1221.70 | 0.430001 | 2.5 |
| 54 | 7/6/2017 | 116.470001 | 1223.30 | -0.049996 | 1.6 |
| 55 | 7/7/2017 | 115.279999 | 1209.70 | -1.190002 | -13.6 |
| 56 | 7/10/2017 | 115.470001 | 1213.20 | 0.190002 | 3.5 |
| 57 | 7/11/2017 | 115.620003 | 1214.70 | 0.150002 | 1.5 |
| 58 | 7/12/2017 | 116.029999 | 1219.10 | 0.409996 | 4.4 |
| 59 | 7/13/2017 | 115.820000 | 1217.30 | -0.209999 | -1.8 |
| 60 | 7/14/2017 | 116.769997 | 1227.50 | 0.949997 | 10.2 |
| 61 | 7/17/2017 | 117.290001 | 1233.70 | 0.520004 | 6.2 |
| 62 | 7/18/2017 | 118.110001 | 1241.90 | 0.82 | 8.2 |
| 63 | 7/19/2017 | 118.080002 | 1242.00 | -0.029999 | 0.1 |
| 64 | 7/20/2017 | 118.239998 | 1245.50 | 0.159996 | 3.5 |
| 65 | 7/21/2017 | 119.260002 | 1254.90 | 1.020004 | 9.4 |
| 66 | 7/24/2017 | 119.309998 | 1254.30 | 0.049996 | -0.6 |
| 67 | 7/25/2017 | 118.919998 | 1258.50 | -0.39 | 4.2 |
| 68 | 7/26/2017 | 119.879997 | 1255.60 | 0.959999 | -2.9 |
| 69 | 7/27/2017 | 119.790001 | 1266.50 | -0.089996 | 10.9 |
| 70 | 7/28/2017 | 120.690002 | 1275.30 | 0.900001 | 8.8 |
| 71 | 7/31/2017 | 120.750000 | 1273.40 | 0.059998 | -1.9 |
| 72 | 8/1/2017 | 120.650002 | 1279.40 | -0.099998 | 6 |
| 73 | 8/2/2017 | 120.400002 | 1278.40 | -0.25 | -1 |
| 74 | 8/3/2017 | 120.589996 | 1274.40 | 0.189994 | -4 |
| 75 | 8/4/2017 | 119.650002 | 1264.60 | -0.939994 | -9.8 |
| 76 | 8/7/2017 | 119.510002 | 1264.70 | -0.14 | 0.1 |
| 77 | 8/8/2017 | 119.860001 | 1262.60 | 0.349999 | -2.1 |
| 78 | 8/9/2017 | 121.309998 | 1279.30 | 1.449997 | 16.7 |
| 79 | 8/10/2017 | 122.209999 | 1290.10 | 0.900001 | 10.8 |
| 80 | 8/11/2017 | 122.790001 | 1294.00 | 0.580002 | 3.9 |
| 81 | 8/14/2017 | 121.919998 | 1290.40 | -0.870003 | -3.6 |
| 82 | 8/15/2017 | 120.980003 | 1279.70 | -0.939995 | -10.7 |
| 83 | 8/16/2017 | 121.870003 | 1282.90 | 0.89 | 3.2 |
| 84 | 8/17/2017 | 122.489998 | 1292.40 | 0.619995 | 9.5 |
| 85 | 8/18/2017 | 122.300003 | 1291.60 | -0.189995 | -0.8 |
| 86 | 8/21/2017 | 122.760002 | 1296.70 | 0.459999 | 5.1 |
| 87 | 8/22/2017 | 122.209999 | 1291.00 | -0.550003 | -5.7 |
| 88 | 8/23/2017 | 122.669998 | 1294.70 | 0.459999 | 3.7 |
| 89 | 8/24/2017 | 122.290001 | 1292.00 | -0.379997 | -2.7 |
| 90 | 8/25/2017 | 122.739998 | 1297.90 | 0.449997 | 5.9 |
| 91 | 8/28/2017 | 124.690002 | 1315.30 | 1.950004 | 17.4 |
| 92 | 8/29/2017 | 124.419998 | 1318.90 | -0.270004 | 3.6 |
| 93 | 8/30/2017 | 124.360001 | 1314.10 | -0.059997 | -4.8 |
| 94 | 8/31/2017 | 125.820000 | 1322.20 | 1.459999 | 8.1 |
| 95 | 9/1/2017 | 126.059998 | 1330.40 | 0.239998 | 8.2 |
| 96 | 9/5/2017 | 127.459999 | 1344.50 | 1.400001 | 14.1 |
| 97 | 9/6/2017 | 126.809998 | 1339.00 | -0.650001 | -5.5 |
| 98 | 9/7/2017 | 128.130005 | 1350.30 | 1.320007 | 11.3 |

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|-----|-----------|------------|---------|-----------|-------|
| 99 | 9/8/2017 | 127.970001 | 1351.20 | -0.160004 | 0.9 |
| 100 | 9/11/2017 | 126.190002 | 1335.70 | -1.779999 | -15.5 |
| 101 | 9/12/2017 | 126.559998 | 1332.70 | 0.369996 | -3 |
| 102 | 9/13/2017 | 125.610001 | 1328.00 | -0.949997 | -4.7 |
| 103 | 9/14/2017 | 126.160004 | 1329.30 | 0.550003 | 1.3 |
| 104 | 9/15/2017 | 125.529999 | 1325.20 | -0.630005 | -4.1 |
| 105 | 9/18/2017 | 124.360001 | 1310.80 | -1.169998 | -14.4 |
| 106 | 9/19/2017 | 124.620003 | 1310.60 | 0.260002 | -0.2 |
| 107 | 9/20/2017 | 123.620003 | 1316.40 | -1 | 5.8 |
| 108 | 9/21/2017 | 122.680000 | 1294.80 | -0.940003 | -21.6 |
| 109 | 9/22/2017 | 123.239998 | 1297.50 | 0.559998 | 2.7 |
| 110 | 9/25/2017 | 124.529999 | 1311.50 | 1.290001 | 14 |
| 111 | 9/26/2017 | 123.139999 | 1301.70 | -1.39 | -9.8 |
| 112 | 9/27/2017 | 121.980003 | 1287.80 | -1.159996 | -13.9 |
| 113 | 9/28/2017 | 122.209999 | 1288.70 | 0.229996 | 0.9 |
| 114 | 9/29/2017 | 121.580002 | 1284.80 | -0.629997 | -3.9 |
| 115 | 10/2/2017 | 120.769997 | 1275.80 | -0.810005 | -9 |
| 116 | 10/3/2017 | 120.830002 | 1274.60 | 0.060005 | -1.2 |
| 117 | 10/4/2017 | 121.169998 | 1276.80 | 0.339996 | 2.2 |
| 118 | 10/5/2017 | 120.519997 | 1273.20 | -0.650001 | -3.6 |
| 119 | 10/6/2017 | 121.089996 | 1274.90 | 0.569999 | 1.7 |
| 120 | 10/9/2017 | 122.080002 | 1285.63 | 0.990006 | 10.73 |

Standard Deviation of GLD σ_S

0.750008122

Standard Deviation of Futures σ_F

8.628781206

Correlation Coefficient ρ

0.857889613

$$h^* = \rho \frac{\sigma_S}{\sigma_F}$$

Hedge ratio given by above formula:

0.074567214

To see how many shares to own, divide size of
futures contract(100) by the hedge ratio:

1341.071957

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Day of Hedge

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