Double\_up | NLLA Double\_up(#0):  $[4.7711, 3.0268, 0.3840, 0.1417, 0.00074, 0.00197\overline{4}, 0.0000, 0.2629, 0.1130, 0.0000]$ 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0285 alpha data 45000 alpha fit -0.029042500 -0.0295Order Three Moms COV/Var 40000 -0.030037500 alpha = -0.030535000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Double\_up | NLLA Double\_up(#1): [4.3028, 3.1767, 0.3222, 0.1808, 0.001047, 0.001581, 0.0000, 0.2249, 0.1350, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 45000 -0.029 42500 alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit 30 40 50 40 50 70 20 60 70 20 30 60

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#2): [4.1556, 2.7498, 0.3358, 0.1467, 0.0007068, 0.001579, 0.0000, 0.2322, 0.1140, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms COV/Var -0.02940000 -0.03037500 alpha = -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)-0.03330000 (0, 3)

-0.034

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#3): [4.0297, 3.2122, 0.3188, 0.1732, 0.0007253, 0.001823, 0.0000, 0.2199, 0.1340, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.028alpha data alpha\_fit 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#4): [3.7119, 3.5187, 0.2667, 0.2356, 0.001108, 0.001277, 0.0000, 0.1896, 0.1698, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027545000 -0.028042500 -0.0285COV/Var 40000 -0.029037500 alpha = -0.029535000 -0.0300(3, 0)32500 -0.0305(2, 1)(1, 2)alpha data 30000 -0.0310(0, 3)alpha fit

-0.0315

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#5): [3.7263, 3.2239, 0.2799, 0.1906, 0.0008792, 0.001493, 0.0000, 0.1949, 0.1407, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027045000 alpha fit -0.027542500 -0.0280Order Three Moms COV/Var 40000 -0.028537500 -0.0290alpha 35000 -0.0295(3, 0)-0.030032500 (2, 1)(1, 2)-0.030530000 (0, 3)

-0.0310

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#6): [4.1042, 3.1234, 0.3037, 0.1866, 0.001042, 0.001474, 0.0000, 0.2127, 0.1390, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028 45000 alpha fit 42500 -0.029 alpha = COV/Var40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.03220 30 40 50 20 40 50 60 70 60 70 30

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#7): [3.6463, 3.3386, 0.2619, 0.2163, 0.001072, 0.001321, 0.0000, 0.1855, 0.1573, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#8): [3.8755, 4.1001, 0.2282, 0.3141, 0.00186, 0.0009219, 0.0000, 0.1699, 0.2193, 0.0000] 1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029 Order Three Moms alpha = COV/Var40000 37500 -0.030 35000 -0.031 (3, 0)32500 (2, 1)alpha data (1, 2)-0.03230000 (0, 3)alpha fit

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#9): [2.9886, 4.9395, 0.1347, 0.4025, 0.002049, 0.0007637, 0.0000, 0.1095, 0.2768, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data alpha fit 45000 -0.02942500 **Order Three Moms** alpha = COV/Var-0.03040000 37500 -0.031 35000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#10): [4.3218, 3.1935, 0.3224, 0.1836, 0.001083, 0.001587, 0.0000, 0.2253, 0.1373, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.03320 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#11): [3.5664, 3.6871, 0.2344, 0.2586, 0.001351, 0.001167, 0.0000, 0.1693, 0.1841, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028545000 -0.029042500 -0.0295alpha = COV/Var40000 -0.030037500 -0.030535000 -0.0310(3, 0)-0.031532500 (2, 1)alpha data (1, 2)-0.032030000 (0, 3)alpha fit -0.032520 40 50 30 40 20 30 60 70 50 60 70

Time

Time

**Order Three Moms** 

Double\_up | NLLA Double\_up(#12): [3.6569, 4.4605, 0.2036, 0.3445, 0.001933, 0.0009158, 0.0000, 0.1543, 0.2382, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 **Order Three Moms** alpha = COV/Var-0.02940000 37500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000

-0.032

20

30

40

Time

50

60

70

(0, 3)

70

20

30

40

Time

50

Double\_up | NLLA Double\_up(#13): [2.9651, 3.9581, 0.1650, 0.3099, 0.001576, 0.0007832, 0.0000, 0.1256, 0.2149, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.0275alpha\_data -0.028045000 alpha\_fit -0.028542500 = COV/Var-0.029040000 -0.029537500 alpha -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310

(1, 2)

(0, 3)

70

40

Time

30

50

60

-0.0315

20

30

40

Time

50

60

70

Order Three Moms

30000

Double\_up | NLLA Double\_up(#14): [4.2051, 3.4704, 0.3358, 0.1984, 0.000752, 0.001792, 0.0000, 0.2326, 0.1502, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 70 20 30 20 60 60 70 Time Time 47500 -0.026 alpha data alpha fit 45000 -0.027 42500 alpha = COV/Var40000 -0.02837500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 -0.031(0, 3)

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#15): [3.7261, 4.0509, 0.2322, 0.2929, 0.001551, 0.001122, 0.0000, 0.1688, 0.2058, 0.0000] 1200 33.0 1150 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)40 50 20 30 40 50 20 30 60 70 60 70 Time Time -0.0270alpha\_data 45000 -0.0275alpha\_fit -0.028042500 COV/Var -0.028540000 -0.029037500 alpha : -0.029535000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)30000 -0.0310(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#16): [4.0692, 3.1072, 0.2938, 0.1954, 0.001121, 0.001308, 0.0000, 0.2062, 0.1429, 0.0000]1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02642500 -0.027alpha = COV/Var40000 -0.028 37500 35000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)-0.03127500

20

30

40

Time

50

60

70

Order Three Moms

20

30

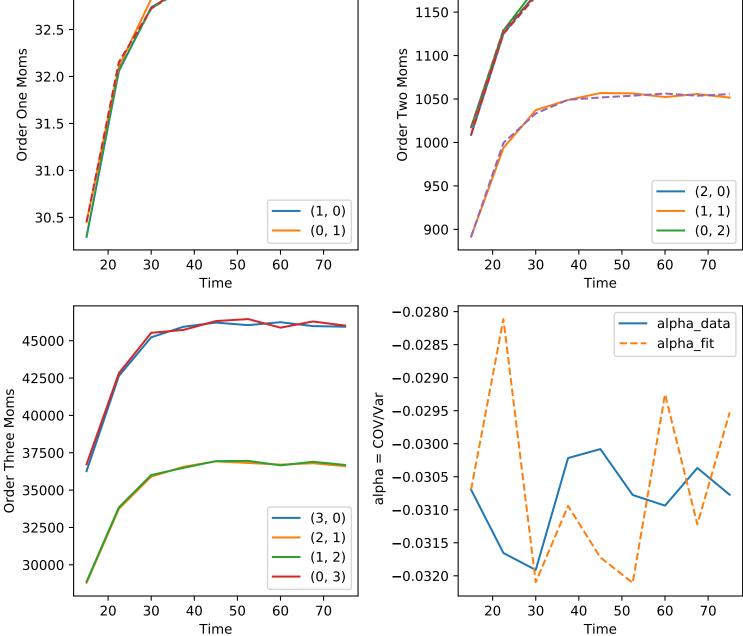
40

Time

50

60

Double\_up | NLLA Double\_up(#17): [2.3584, 4.7050, 0.0457, 0.4296, 0.002491, 9.746e-10, 0.0000, 0.0539, 0.2872, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time



Double\_up | NLLA Double\_up(#18): [3.0949, 4.4228, 0.1525, 0.3683, 0.00194, 0.0005556, 0.0000, 0.1207, 0.2520, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02645000 alpha fit 42500 -0.027alpha = COV/Var40000 -0.02837500 -0.02935000 (3, 0)32500 -0.030(2, 1)(1, 2)30000 -0.031(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#19): [4.4089, 3.1129, 0.3421, 0.1756, 0.0009061, 0.001619, 0.0000, 0.2372, 0.1329, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.027alpha fit 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.02937500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#20): [3.4000, 3.8445, 0.2203, 0.2671, 0.001341, 0.001191, 0.0000, 0.1601, 0.1885, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 alpha = COV/Var -0.029540000 37500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#21): [4.1264, 3.3993, 0.2917, 0.2212, 0.001224, 0.001375, 0.0000, 0.2057, 0.1620, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.027alpha fit 42500 -0.028alpha = COV/Var40000 -0.02937500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032 (0, 3)

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#22): [3.9337, 3.0529, 0.3016, 0.1856, 0.0009026, 0.00143, 0.0000, 0.2111, 0.1387, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 -0.028alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#23): [4.5634, 2.5340, 0.4204, 0.0588, 2.551e-13, 0.00253, 0.0000, 0.2820, 0.0627, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

Order Three Moms

20

30

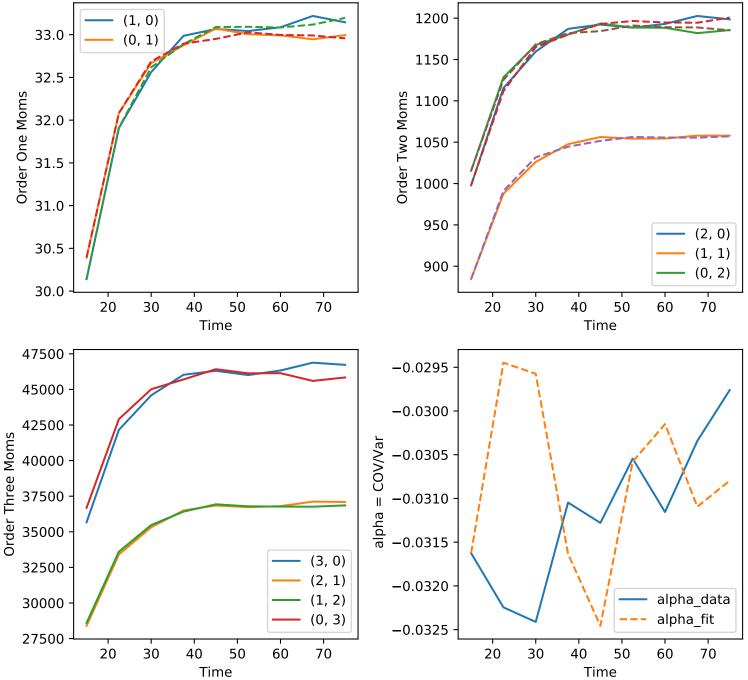
40

Time

50

60

Double\_up | NLLA Double\_up(#24): [2.7197, 3.7321, 0.1426, 0.2917, 0.001535, 0.0007515, 0.0000, 0.1095, 0.2026, 0.0000]



Double\_up | NLLA Double\_up(#25): [3.7581, 2.6181, 0.3030, 0.1293, 0.0005604, 0.001636, 0.0000, 0.2073, 0.1022, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032

(0, 3)

70

30

20

40

Time

50

60

70

30

20

40

Time

50

Double\_up | NLLA Double\_up(#26): [3.9890, 3.0370, 0.3101, 0.1671, 0.0008013, 0.00163, 0.0000, 0.2147, 0.1270, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.027547500 alpha data -0.0280alpha fit 45000 -0.028542500 COV/Var -0.029040000 -0.029537500 alpha : -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 -0.0315(0, 3)27500

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#27): [3.3240, 3.4083, 0.1991, 0.2521, 0.001497, 0.0008631, 0.0000, 0.1464, 0.1764, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha data -0.028545000 alpha\_fit -0.029042500 Order Three Moms = COV/Var -0.029540000 37500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315

(0, 3)

70

40

Time

30

20

50

60

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#28): [4.5415, 2.7929, 0.4000, 0.1057, 0.0002935, 0.002224, 0.0000, 0.2718, 0.0919, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)50 50 20 30 40 60 70 20 30 40 60 70 Time Time 47500 alpha data -0.028 alpha fit 45000 42500 -0.029 alpha = COV/Var40000 37500 -0.03035000 -0.031 (3, 0)32500

(2, 1) (1, 2)

(0, 3)

70

-0.032

20

30

40

Time

50

60

70

Order Three Moms

30000

30

20

40

Time

50

Double\_up | NLLA Double\_up(#29): [3.2862, 3.2487, 0.2281, 0.2245, 0.001075, 0.001094, 0.0000, 0.1630, 0.1608, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 40 50 60 70 20 30 40 50 20 30 60 70 Time Time 47500 -0.027545000 -0.028042500 Order Three Moms COV/Var -0.028540000 -0.029037500 alpha -0.029535000 (3, 0)-0.030032500 (2, 1)-0.0305alpha data (1, 2)30000 alpha fit (0, 3)-0.031027500 40 50 20 30 40 20 30 60 70 50 60 70

Time

Time

Double\_up | NLLA Double up(#30): [4.2637, 3.7064, 0.3037, 0.2361, 0.001265, 0.001492, 0.0000, 0.2146, 0.1713, 0.0000]1200 33.0 1150 32.5 owd - 1050 1050 1000 Order One Moms 32.0 31.5 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 45000 -0.02842500 -0.029alpha = COV/Var40000 37500 -0.030 35000 -0.031(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit

40

Time

30

20

50

60

70

Order Three Moms

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#31): [3.7536, 3.6582, 0.2366, 0.2601, 0.001533, 0.001076, 0.0000, 0.1717, 0.1836, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0290 alpha data 45000 alpha fit -0.029542500 alpha = COV/Var-0.030040000 37500 -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.0320

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#32): [4.2529, 3.2719, 0.3291, 0.1853, 0.0009027, 0.001656, 0.0000, 0.2289, 0.1390, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#33): [3.4331, 3.9019, 0.2376, 0.2771, 0.001155, 0.001236, 0.0000, 0.1704, 0.1981, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.025alpha data 45000 alpha fit -0.02642500 -0.027alpha = COV/Var40000 -0.02837500 35000 -0.029(3, 0)32500 (2, 1)-0.030 (1, 2)30000 (0, 3)

-0.031

20

30

40

Time

50

60

70

Order Three Moms

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#34): [4.0820, 3.7447, 0.3005, 0.2297, 0.001075, 0.001628, 0.0000, 0.2110, 0.1680, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)

-0.032

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#35): [4.3249, 3.0270, 0.3306, 0.1768, 0.0009334, 0.001534, 0.0000, 0.2292, 0.1341, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#36): [4.0919, 3.2197, 0.3073, 0.1839, 0.0009942, 0.001592, 0.0000, 0.2150, 0.1370, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0290alpha data 45000 alpha fit -0.029542500 -0.0300Order Three Moms COV/Var 40000 -0.030537500 alpha = -0.031035000 -0.0315(3, 0)32500 -0.0320(2, 1)(1, 2)30000 -0.0325

(0, 3)

70

20

30

40

Time

50

70

60

40

Time

30

50

60

27500

Double\_up | NLLA Double\_up(#37): [4.5455, 3.0375, 0.3823, 0.1340, 0.0005351, 0.002114, 0.0000, 0.2614, 0.1091, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.029045000 -0.029542500 -0.0300Order Three Moms COV/Var 40000 -0.030537500 -0.0310alpha 35000 -0.0315(3, 0)32500 -0.0320(2, 1)alpha data (1, 2)-0.032530000 alpha fit (0, 3)-0.0330

20

30

40

Time

50

70

60

27500

20

40

Time

30

50

60

Double\_up | NLLA Double\_up(#38): [4.2152, 3.9778, 0.2995, 0.2650, 0.001291, 0.001486, 0.0000, 0.2127, 0.1916, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.027 45000 -0.028 42500 alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#39): [3.5581, 3.9445, 0.2250, 0.2867, 0.001489, 0.001109, 0.0000, 0.1646, 0.2024, 0.0000]1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.0280alpha fit 42500 -0.0285Order Three Moms alpha = COV/Var 40000 -0.029037500 -0.029535000 -0.0300(3, 0)-0.030532500 (2, 1)(1, 2)30000 -0.0310(0, 3)-0.031527500

20

40

Time

30

50

60

70

20

30

40

Time

50

60

Double up | NLLA Double up(#40):  $[3.2768, 3.6842, 0.2089, 0.2814, \overline{0.001395}, 0.00089\overline{63}, 0.0000, 0.1540, 0.1983, 0.0000]$ 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.026alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 (3, 0)-0.030 32500 (2, 1)(1, 2)30000

-0.031

20

30

40

Time

50

60

70

(0, 3)

70

30

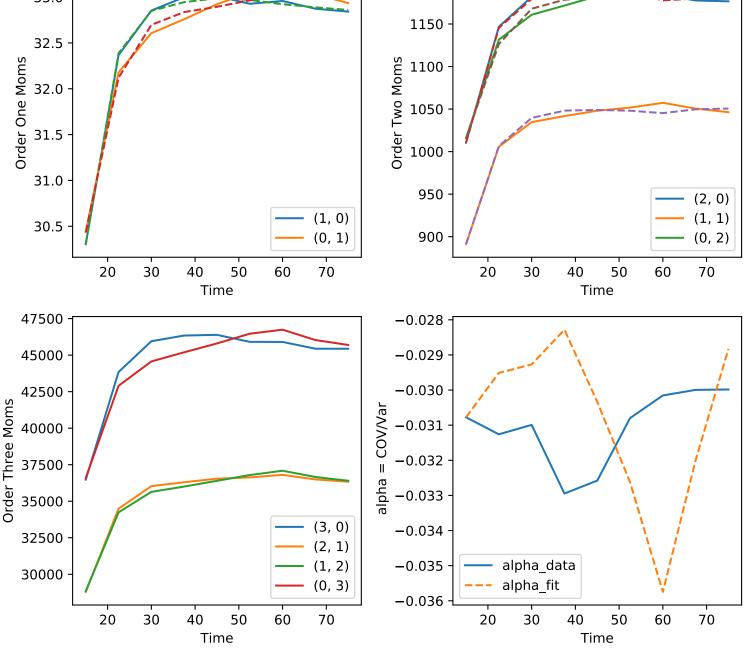
20

40

Time

50

Double\_up | NLLA Double\_up(#41):  $[4.3599, 4.1051, 0.2495, 0.3215, \overline{0.002242}, 0.0007795, 0.0000, 0.1885, 0.2219, 0.0000]$ 1200 33.0 1150 32.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)30 40 50 20 30 40 50 20 60 70 60 70 Time Time 47500 -0.02845000 -0.029-0.03042500



Double\_up | NLLA Double\_up(#42): [2.8995, 4.3424, 0.1190, 0.3671, 0.002149, 0.000406, 0.0000, 0.0998, 0.2486, 0.0000]1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02942500 alpha = COV/Var-0.030 40000 37500 -0.03135000 -0.032(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit

40

Time

30

20

50

60

70

Order Three Moms

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#43): [4.0921, 3.5811, 0.2908, 0.2411, 0.001239, 0.001308, 0.0000, 0.2063, 0.1742, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 20 30 40 50 60 70 70 60 Time Time 47500 alpha data -0.02645000 alpha\_fit -0.02742500 alpha = COV/Var-0.028 40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.033

30

20

40

Time

50

60

70

Order Three Moms

27500

20

30

40

Time

50

60

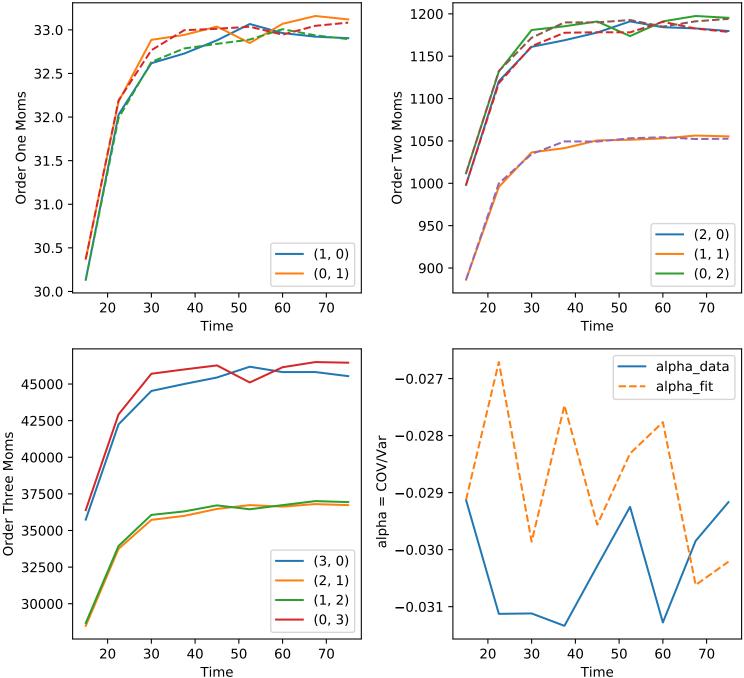
Double\_up | NLLA Double\_up(#44): [4.3504, 3.1933, 0.3327, 0.1897, 0.00105, 0.001512, 0.0000, 0.2342, 0.1413, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 40 50 40 50 20 30 60 20 30 70 60 70 Time Time 47500 -0.02745000 -0.02842500 -0.029alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit 27500 20 30 40 50 40 50 60 70 60 70 20 30

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#45): [3.2540, 4.3144, 0.1762, 0.3465, 0.001796, 0.0007402, 0.0000, 0.1347, 0.2395, 0.0000] 1200 33.0 1150



Double\_up | NLLA Double\_up(#46): [3.7108, 3.7083, 0.2528, 0.2715, 0.001346, 0.001077, 0.0000, 0.1831, 0.1935, 0.0000] (1, 0)1200 33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha data -0.026alpha fit 45000 -0.02742500 alpha = COV/Var-0.028 40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)-0.03230000

(0, 3)

70

40

Time

20

30

50

60

-0.033

20

30

40

Time

50

60

70

**Order Three Moms** 

Double\_up | NLLA Double\_up(#47): [4.2653, 3.0076, 0.3501, 0.1466, 0.000606, 0.001867, 0.0000, 0.2402, 0.1152, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data -0.0280alpha\_fit 45000 -0.028542500 COV/Var -0.029040000 -0.029537500 alpha -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#48):  $[4.5251, 3.4841, 0.3210, 0.2388, 0.001468, 0.0012\overline{14}, 0.0000, 0.2303, 0.1717, 0.0000]$ 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 30 40 50 60 70 20 60 70 Time Time alpha data 45000 alpha fit -0.02742500 alpha = COV/Var-0.02840000 37500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#49): [3.6247, 3.8278, 0.2459, 0.2598, 0.001266, 0.001322, 0.0000, 0.1763, 0.1857, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#50):  $[2.9882, 4.2085, 0.1576, 0.3328, \overline{0.001703}, 0.0008\overline{392}, 0.0000, 0.1215, 0.2319, 0.0000]$ 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)40 50 60 70 40 50 20 30 20 30 60 70 Time Time 47500 -0.029 alpha data alpha fit 45000 42500 -0.030Order Three Moms alpha = COV/Var40000 -0.03137500 35000 -0.032 (3, 0)32500 (2, 1)(1, 2)30000 -0.033(0, 3)

20

30

40

Time

50

60

70

40

Time

20

30

50

60

Double\_up | NLLA Double\_up(#51): [4.1407, 3.0227, 0.3278, 0.1572, 0.0006994, 0.001815, 0.0000, 0.2245, 0.1235, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 Order Three Moms -0.029 alpha = COV/Var40000 37500 -0.030 35000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#52):  $[3.6347, 3.7322, 0.2178, 0.2831, \overline{0.001675}, 0.00085\overline{46}, 0.0000, 0.1608, 0.1972, 0.0000]$ 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#53): [4.1216, 3.8370, 0.2823, 0.2610, 0.001375, 0.00135, 0.0000, 0.2012, 0.1874, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)alpha data 30000 (1, 2)(0, 3)-0.032alpha fit 27500 20 30 40 50 20 30 40 60 70 50 60 70

Time

Time

Double\_up | NLLA Double\_up(#54): [4.6805, 2.2954, 0.4184, 0.0457, 3.565e-05, 0.00242, 0.0000, 0.2778, 0.0533, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#55): [4.4195, 2.6194, 0.3633, 0.1264, 0.0006723, 0.001725, 0.0000, 0.2509, 0.1018, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 40 50 40 50 20 30 30 60 70 60 70 Time Time -0.02647500 alpha data alpha fit 45000 -0.02742500 -0.028alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)-0.03230000

(0, 3)

70

20

30

40

Time

50

60

70

Order Three Moms

27500

20

30

40

Time

50

Double\_up | NLLA Double\_up(#56): [3.5378, 4.0716, 0.2501, 0.2767, 0.001128, 0.001441, 0.0000, 0.1790, 0.1992, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)40 50 40 50 20 30 70 20 30 60 60 70 Time Time 47500 -0.02845000 42500 -0.029 alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

Order Three Moms

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#57): [3.7831, 4.0496, 0.2466, 0.2892, 0.001518, 0.001189, 0.0000, 0.1801, 0.2042, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02845000 42500 -0.029alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#58): [4.0125, 2.8714, 0.3229, 0.1578, 0.0007508, 0.001553, 0.0000, 0.2252, 0.1205, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha\_data -0.02745000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000

(0, 3)

70

27500

20

30

40

Time

50

60

-0.033

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#59): [3.7652, 4.5684, 0.2345, 0.3384, 0.001597, 0.001282, 0.0000, 0.1715, 0.2407, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.02845000 -0.02942500 alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 (0, 3)-0.033alpha fit

40

Time

30

20

50

60

70

**Order Three Moms** 

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#60): [4.7531, 3.1153, 0.3571, 0.1845, 0.001182, 0.001494, 0.0000, 0.2506, 0.1376, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 50 20 30 40 60 70 20 30 40 60 70 Time Time -0.027alpha\_data 45000 alpha\_fit -0.02842500 alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 40 70

30

50

Time

60

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#61): [3.5995, 3.8684, 0.2047, 0.2993, 0.001769, 0.0008198, 0.0000, 0.1520, 0.2079, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha fit 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#62): [3.8297, 3.7958, 0.2707, 0.2529, 0.001237, 0.001395, 0.0000, 0.1937, 0.1823, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 45000 -0.02942500 alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#63): [4.2631, 3.1485, 0.3370, 0.1585, 0.0006853, 0.001887, 0.0000, 0.2300, 0.1232, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#64): [3.7603, 3.2393, 0.2515, 0.2356, 0.001366, 0.0009417, 0.0000, 0.1812, 0.1676, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 45000 -0.02742500 alpha = COV/Var-0.028 40000 alpha\_data 37500 alpha\_fit -0.029 35000 (3, 0)32500 -0.030 (2, 1)(1, 2)30000

(0, 3)

70

-0.031

20

30

40

Time

50

60

70

Order Three Moms

27500

20

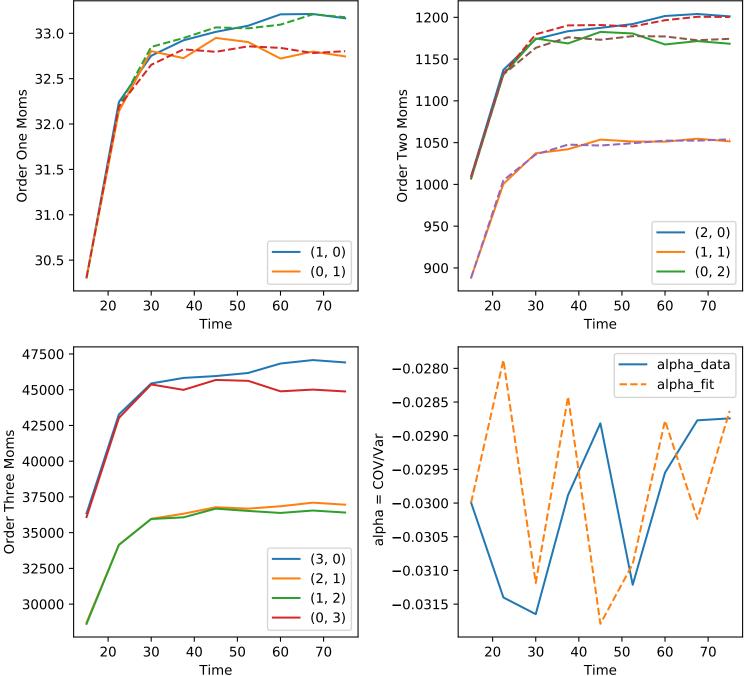
30

40

Time

50

Double\_up | NLLA Double\_up(#65):
[2.9299, 5.5770, 0.0975, 0.4803, 0.002543, 0.0004212, 0.0000, 0.0898, 0.3238, 0.0000]



Double\_up | NLLA Double\_up(#66): [3.3048, 3.7321, 0.2260, 0.2559, 0.001115, 0.00131, 0.0000, 0.1616, 0.1844, 0.0000]1200 -33.0 1150 32.5 Suppose Works 32.0 31.5 31.0 Order Two Moms 1100 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02747500 alpha\_data 45000 alpha\_fit -0.02842500 alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)27500 20 30 40 50 20 40 50 70 60 70 30 60

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#67): [4.0490, 3.3563, 0.2933, 0.2130, 0.001139, 0.001373, 0.0000, 0.2074, 0.1552, 0.0000] 1200 33.0 1150 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data 45000 -0.027alpha fit 42500 -0.028 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#68): [4.1043, 3.6451, 0.2631, 0.2564, 0.001618, 0.001117, 0.0000, 0.1900, 0.1818, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 20 30 40 50 20 30 60 70 60 70 Time Time 47500 -0.028545000 -0.0290-0.029542500 alpha = COV/Var-0.030040000 -0.030537500 -0.031035000 (3, 0)-0.031532500 (2, 1)-0.0320alpha data (1, 2)30000 alpha fit (0, 3)-0.032540 50 50 60 70 20 30 60 70 20 30 40

Time

Time

**Order Three Moms** 

Double\_up | NLLA Double\_up(#69):  $[2.6618, 4.6670, 0.0813, 0.4231, \overline{0.002411}, 0.0001\overline{475}, 0.0000, 0.0775, 0.2862, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)30 40 50 40 50 20 60 20 30 70 60 70 Time Time 47500 -0.028 alpha\_data alpha\_fit 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#70): [4.6785, 2.5818, 0.4147, 0.0822, 0.0002091, 0.002298, 0.0000, 0.2793, 0.0773, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 alpha = COV/Var -0.029540000 37500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#71): [3.2437, 4.0133, 0.1804, 0.3086, 0.001714, 0.000819, 0.0000, 0.1368, 0.2130, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 40 50 40 20 30 20 30 60 70 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290COV/Var 40000 -0.029537500 -0.0300alpha 35000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)20

30

40

Time

50

70

60

Order Three Moms

40

Time

30

20

50

60

Double up | NLLA Double up(#72): [2.9227, 3.5645, 0.1677, 0.2706, 0.001449, 0.000801, 0.0000, 0.1253, 0.1883, 0.0000]1200 -(1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#73): [3.9566, 3.5099, 0.2850, 0.2261, 0.001138, 0.001411, 0.0000, 0.2016, 0.1650, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.028545000 alpha\_fit -0.029042500 Order Three Moms COV/Var 40000 -0.029537500 -0.0300alpha : 35000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#74): [3.3642, 4.3845, 0.1690, 0.3603, 0.002059, 0.0005947, 0.0000, 0.1325, 0.2464, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)

(1, 2)

(0, 3)

70

-0.032

20

30

40

Time

50

60

70

30000

20

30

40

Time

50

Double up | NLLA Double up(#75): [4.3601, 3.1065, 0.3554, 0.1752, 0.00079, 0.001668, 0.0000, 0.2485, 0.1341, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)40 50 40 50 20 30 20 30 60 70 60 70 Time Time 47500 alpha data -0.026alpha fit 45000 -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#76): [3.5273, 3.6968, 0.2497, 0.2671, 0.001186, 0.001159, 0.0000, 0.1809, 0.1919, 0.0000] (1, 0)1200 33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.025alpha data alpha fit 45000 -0.02642500 -0.027alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

Order Three Moms

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#77): [3.0425, 4.0057, 0.1584, 0.3183, 0.001722, 0.0007044, 0.0000, 0.1213, 0.2193, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.029 37500 35000 -0.030(3, 0)32500 (2, 1)

-0.031

20

30

40

Time

50

60

70

(1, 2)

(0, 3)

70

30000

20

30

40

Time

50

Double\_up | NLLA Double\_up(#78):  $[4.8528, 2.9306, 0.4136, 0.1338, \overline{0.0005675}, 0.002\overline{009}, 0.0000, 0.2843, 0.1090, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 20 20 30 30 60 70 60 70 Time Time -0.02645000 -0.02742500 -0.028Order Three Moms alpha = COV/Var40000 -0.029alpha data 37500 alpha fit -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

-0.033

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#79): [3.3329, 3.8207, 0.1962, 0.2862, 0.001553, 0.0009068, 0.0000, 0.1448, 0.1993, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time -0.028045000 -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.0295-0.030037500 alpha -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315alpha data (1, 2)30000 alpha fit (0, 3)

-0.0320

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#80): [4.0196, 2.5150, 0.3225, 0.1228, 0.0006327, 0.001601, 0.0000, 0.2209, 0.0980, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)(0, 2)900 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.028045000 -0.0285-0.029042500 = COV/Var -0.029540000 -0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)alpha data (1, 2)-0.031530000

(0, 3)

70

40

Time

30

20

50

60

-0.0320

20

30

alpha fit

Time

50

60

40

70

Three Moms

Double\_up | NLLA Double\_up(#81): [2.5896, 4.0246, 0.0821, 0.3654, 0.002294, 3.686e-05, 0.0000, 0.0767, 0.2448, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.02845000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.031 35000 (3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit

40

Time

30

20

50

60

70

30

20

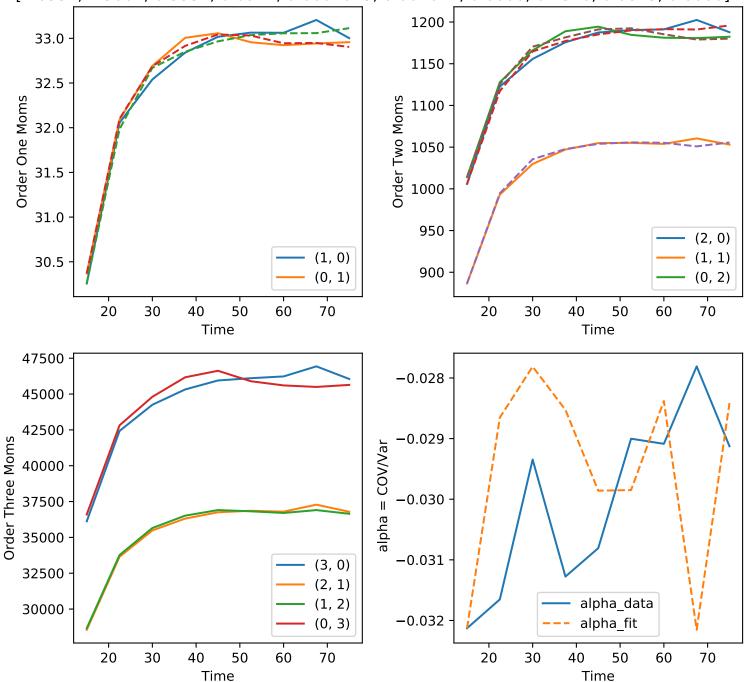
40

Time

50

60

Double\_up | NLLA Double\_up(#82): [4.0552, 2.5067, 0.3531, 0.0927, 0.0002075, 0.002027, 0.0000, 0.2370, 0.0815, 0.0000]



Double\_up | NLLA Double\_up(#83): [4.1216, 3.3379, 0.3066, 0.2128, 0.001069, 0.001409, 0.0000, 0.2156, 0.1565, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 40 50 40 30 20 30 60 70 20 60 70 Time Time 47500 alpha data -0.0270alpha fit 45000 -0.027542500 -0.028040000 -0.028537500 alpha = -0.029035000 -0.0295(3, 0)32500 (2, 1)-0.0300(1, 2)30000 -0.0305(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#84): [3.4108, 3.8495, 0.2188, 0.2829, 0.001372, 0.001076, 0.0000, 0.1593, 0.2003, 0.0000] (1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027alpha data alpha fit 45000 -0.02842500 **Order Three Moms** alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03230 40 50 20 30 40 50 70 20 60 70 60

Time

Double\_up | NLLA Double\_up(#85): [3.3064, 4.0227, 0.2234, 0.2735, 0.001179, 0.001385, 0.0000, 0.1606, 0.1952, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha\_fit 42500 -0.0290COV/Var 40000 -0.029537500 alpha = ( -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)

-0.0315

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#86): [4.6304, 3.3345, 0.3763, 0.1653, 0.0007158, 0.002063, 0.0000, 0.2586, 0.1302, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 -0.028 alpha\_data alpha\_fit 45000 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)30000

(0, 3)

70

20

30

40

Time

50

60

-0.032

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#87): [4.1230, 4.1716, 0.2915, 0.2762, 0.001281, 0.00155, 0.0000, 0.2070, 0.1988, 0.0000] 1200 33.0 1150 32.5 order One Moms 31.5 31.0 1100 Order Two Moms 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 50 20 30 40 60 70 20 30 40 60 70 Time Time alpha data 45000 alpha fit -0.02842500 alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032 27500

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#88): [3.3740, 3.5687, 0.2374, 0.2399, 0.00105, 0.001302, 0.0000, 0.1686, 0.1732, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.028045000 -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.029537500 -0.0300-0.030535000 (3, 0)-0.031032500 (2, 1)-0.0315alpha data (1, 2)30000 alpha fit (0, 3)-0.032040 50 20 30 40 20 30 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#89): [4.0962, 3.3553, 0.3065, 0.1971, 0.0009736, 0.001617, 0.0000, 0.2138, 0.1470, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha\_fit 42500 Order Three Moms -0.029 alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#90): [4.7142, 2.9010, 0.3916, 0.1269, 0.0005326, 0.002071, 0.0000, 0.2657, 0.1050, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028045000 -0.0285 42500 Order Three Moms COV/Var -0.029040000 -0.029537500 alpha -0.030035000 (3, 0)-0.030532500 (2, 1)alpha data (1, 2)30000 -0.0310

(0, 3)

70

50

60

-0.0315

20

30

27500

20

30

40

Time

alpha fit

Time

50

60

70

Double\_up | NLLA Double\_up(#91): [3.9647, 3.8156, 0.2796, 0.2502, 0.001235, 0.001476, 0.0000, 0.1987, 0.1815, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.028545000 alpha fit -0.029042500 COV/Var -0.0295 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 -0.0320(0, 3)

20

30

40

Time

50

60

70

Order Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#92):  $[3.2858, 3.8969, 0.2258, 0.2753, \overline{0.001128}, 0.0012\overline{61}, 0.0000, 0.1628, 0.1970, 0.0000]$ 33.5 (1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)50 50 20 40 60 70 20 30 40 70 30 60 Time Time 47500 alpha\_data -0.026alpha fit 45000 -0.02742500 **Three Moms** alpha = COV/Var40000 -0.02837500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)-0.03130000 (0, 3)30 40 50 20 40 50 60 70 20 60 70 30

Time

Double\_up | NLLA Double\_up(#93): [3.4211, 3.4197, 0.2461, 0.2332, 0.0009684, 0.001203, 0.0000, 0.1734, 0.1680, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02645000 -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030(3, 0)-0.03132500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit 27500 -0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#94): [4.7197, 2.7098, 0.3765, 0.1221, 0.0007557, 0.00182, 0.0000, 0.2572, 0.0980, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 42500 -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)alpha data 30000 (0, 3)alpha fit

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#95): [3.0897, 3.6291, 0.1886, 0.2623, 0.001374, 0.001002, 0.0000, 0.1390, 0.1843, 0.0000]1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.029045000 alpha fit -0.029542500 COV/Var -0.030040000 -0.030537500 alpha -0.031035000 -0.0315(3, 0)32500 (2, 1)-0.0320(1, 2)30000 (0, 3)-0.0325

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

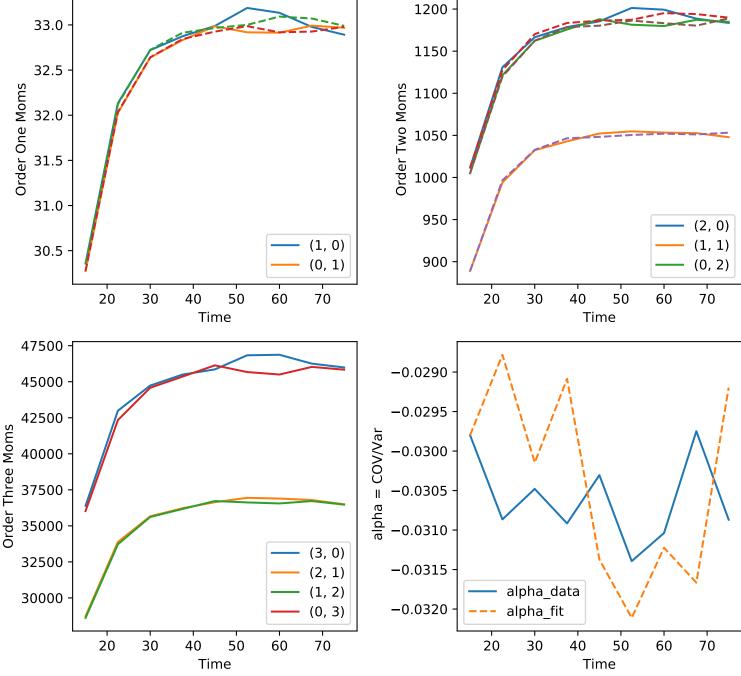
30

20

50

60

Double\_up | NLLA Double\_up(#96): [3.9545, 3.1321, 0.3048, 0.1734, 0.0008679, 0.001641, 0.0000, 0.2127, 0.1307, 0.0000] 1200 33.0 1150 32.5 **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 60 70 20 30 40 50 60 70 Time Time 47500 -0.029045000 -0.029542500 = COV/Var-0.030040000 37500 -0.0305alpha 35000 -0.0310(3, 0)32500



Double\_up | NLLA Double\_up(#97): [3.6223, 3.6409, 0.2572, 0.2326, 0.00106, 0.00147, 0.0000, 0.1813, 0.1692, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)40 50 40 50 30 20 30 20 60 70 60 70 Time Time 47500 45000 -0.02942500 alpha = COV/Var-0.030 40000 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.03320 30 40 50 40 50 70 60 70 20 30 60

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#98): [4.0962, 3.3249, 0.3025, 0.2141, 0.001095, 0.001373, 0.0000, 0.2133, 0.1571, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.027045000 alpha fit -0.027542500 -0.0280COV/Var 40000 -0.028537500 -0.0290alpha : 35000 -0.0295(3, 0)32500 (2, 1)-0.0300(1, 2)30000 -0.0305(0, 3)

20

30

40

Time

50

60

70

Order Three Moms

27500

20

40

Time

30

50

60

Double\_up | NLLA Double\_up(#99): [3.9457, 3.4155, 0.2717, 0.2274, 0.001266, 0.001255, 0.0000, 0.1925, 0.1639, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027545000 alpha fit -0.0280 42500 -0.028540000 -0.029037500 alpha = -0.029535000 -0.0300(3, 0)32500 -0.0305(2, 1)(1, 2)30000 -0.0310(0, 3)

20

30

40

Time

50

60

70

**Order Three Moms** 

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#100): [3.4016, 3.6363, 0.2016, 0.2704, 0.001574, 0.0009307, 0.0000, 0.1485, 0.1897, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 70 20 30 40 50 70 60 60 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290Order Three Moms COV/Var 40000 -0.029537500 -0.0300alpha 35000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#101): [3.4527, 3.9979, 0.2074, 0.2975, 0.001597, 0.0009944, 0.0000, 0.1537, 0.2079, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.0280alpha\_data 45000 alpha fit -0.028542500 Order Three Moms -0.0290COV/Var 40000 -0.029537500 alpha -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.031527500

20

30

40

Time

50

60

70

20

40

Time

30

50

60

Double\_up | NLLA Double\_up(#102): [4.3356, 3.3667, 0.3104, 0.2057, 0.001267, 0.001473, 0.0000, 0.2191, 0.1509, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.029545000 -0.030042500 Order Three Moms = COV/Var -0.030540000 -0.031037500 -0.031535000 (3, 0)-0.032032500 (2, 1)alpha data (1, 2)30000 -0.0325(0, 3)alpha fit 27500 -0.033040 50 20 50 70 20 30 60 70 30 40 60

Time

Double\_up | NLLA Double\_up(#103): [4.1105, 3.9291, 0.2827, 0.2733, 0.001372, 0.001309, 0.0000, 0.2016, 0.1956, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02745000 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032 (1, 2)alpha data 30000 (0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#104): [3.3548, 3.5326, 0.2381, 0.2410, 0.001082, 0.001218, 0.0000, 0.1709, 0.1728, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026 alpha data 45000 alpha fit -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#105): [4.0188, 3.4813, 0.3151, 0.2094, 0.0008178, 0.001645, 0.0000, 0.2193, 0.1562, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02645000 -0.02742500 Order Three Moms alpha = COV/Var40000 -0.028 alpha data 37500 alpha\_fit -0.02935000 (3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#106): [3.4322, 3.8065, 0.2079, 0.3004, 0.001601, 0.0007935, 0.0000, 0.1547, 0.2106, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.026 alpha data alpha fit 45000 -0.02742500 Order Three Moms -0.028 alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)-0.03230000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#107): [3.9957, 3.5845, 0.2589, 0.2609, 0.001582, 0.001013, 0.0000, 0.1878, 0.1847, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 40 50 60 70 40 50 20 30 30 20 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)27500 20 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#108): [4.4572, 3.3572, 0.3377, 0.1835, 0.0009702, 0.001782, 0.0000, 0.2333, 0.1386, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290Order Three Moms COV/Var 40000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)-0.0320

20

30

40

Time

50

60

70

27500

20

40

Time

30

50

60

Double\_up | NLLA Double\_up(#109): [3.5902, 3.8026, 0.2442, 0.2673, 0.001241, 0.001227, 0.0000, 0.1750, 0.1917, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 40 50 40 50 20 30 70 20 30 60 60 70 Time Time 47500 -0.027alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)27500 -0.03320 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#110): [3.1766, 3.5515, 0.1861, 0.2771, 0.001536, 0.0007571, 0.0000, 0.1390, 0.1936, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.028 alpha data 45000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031 (3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#111): [4.0552, 3.0978, 0.3240, 0.1687, 0.0006801, 0.001747, 0.0000, 0.2229, 0.1304, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.02745000 alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#112): [3.1053, 4.7159, 0.1664, 0.3647, 0.00173, 0.0009766, 0.0000, 0.1275, 0.2528, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.029045000 42500 -0.0295**Order Three Moms** COV/Var 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)32500 -0.0315(2, 1)alpha data (1, 2)30000 -0.0320(0, 3)alpha fit 40 50 20 30 40 20 30 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#113): [3.7912, 4.0068, 0.2246, 0.3029, 0.001791, 0.0009225, 0.0000, 0.1665, 0.2109, 0.0000]1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028545000 -0.029042500 -0.0295Order Three Moms 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)32500 -0.0315(2, 1)alpha data (1, 2)30000 -0.0320(0, 3)alpha fit

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#114): [3.0654, 3.9992, 0.1597, 0.3196, 0.001776, 0.0007066, 0.0000, 0.1237, 0.2205, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.0285alpha data alpha fit 45000 -0.029042500 **Order Three Moms** = COV/Var -0.029540000 -0.030037500 -0.0305 35000 (3, 0)32500 -0.0310(2, 1)(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#115): [3.9612, 3.1344, 0.3032, 0.1804, 0.0009058, 0.001564, 0.0000, 0.2120, 0.1353, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028alpha data 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#116): [3.3620, 4.0297, 0.1917, 0.3062, 0.00172, 0.0008617, 0.0000, 0.1445, 0.2115, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 Order Three Moms = COV/Var -0.029540000 -0.030037500 -0.030535000 (3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)40 50 20 30 40 50 60 20 30 60 70 70 Time Time

Double up | NLLA Double up(#117):  $[3.3400, 5.0384, 0.1562, 0.4119, 0.002174, 0.0007\overline{3}66, 0.0000, 0.1241, 0.2821, 0.0000]$ 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha\_data -0.02745000 alpha\_fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 -(3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)27500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#118): [4.1357, 3.2490, 0.3078, 0.1928, 0.001041, 0.00154, 0.0000, 0.2154, 0.1434, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 alpha data 45000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.033 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#119):  $[3.4706, 3.6305, 0.1964, 0.2822, 0.001742, 0.0007\overline{3}09, 0.0000, 0.1468, 0.1955, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 -0.029 **Order Three Moms** alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

-0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#120): [2.9716, 4.1967, 0.1278, 0.3507, 0.00206, 0.0004643, 0.0000, 0.1035, 0.2384, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.029045000 alpha\_fit 42500 -0.0295Order Three Moms COV/Var 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.032040 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#121): [2.9076, 4.6894, 0.1202, 0.3961, 0.002084, 0.0005314, 0.0000, 0.0986, 0.2708, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028alpha data 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#122): [3.8982, 3.0958, 0.3046, 0.1902, 0.0008083, 0.001448, 0.0000, 0.2126, 0.1426, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms 32.0 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)40 50 60 70 40 50 20 30 20 30 60 70 Time Time -0.02547500 45000 -0.02642500 -0.027**Order Three Moms** alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit -0.032

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#123): [2.7692, 4.3715, 0.1167, 0.3721, 0.001999, 0.0004322, 0.0000, 0.0965, 0.2533, 0.0000] 1200 33.0 1150 32.5 onder Two Mom om 1050 1000 Order One Moms 32.0 31.5 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var-0.02940000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#124): [4.7228, 2.6740, 0.3977, 0.1018, 0.0004631, 0.002116, 0.0000, 0.2694, 0.0881, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)(0, 2)900 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.028 alpha fit 45000 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#125): [3.3591, 3.3029, 0.2274, 0.2410, 0.001263, 0.001002, 0.0000, 0.1657, 0.1727, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data 45000 alpha\_fit -0.02842500 -0.029 Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)30000 -0.033(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#126):  $[2.8193, 4.1146, 0.1369, 0.3302, 0.001776, 0.0006\overline{1}99, 0.0000, 0.1083, 0.2253, 0.0000]$ 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031 (3, 0)32500 (2, 1)-0.032 alpha data (1, 2)30000 (0, 3)alpha fit

40

Time

30

20

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#127): [4.6835, 3.0792, 0.3383, 0.2017, 0.001346, 0.001234, 0.0000, 0.2389, 0.1479, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 45000 42500 -0.028 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 35000 -0.030 (3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.031(0, 3)alpha fit 30 40 50 20 30 40 20 60 70 50 60 70 Time Time

Double\_up | NLLA Double\_up(#128): [4.6965, 3.1797, 0.3565, 0.1760, 0.001088, 0.001688, 0.0000, 0.2484, 0.1334, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02945000 42500 -0.030**Order Three Moms** alpha = COV/Var40000 -0.03137500 35000 -0.032(3, 0)32500 (2, 1)-0.033 alpha data (1, 2)30000 (0, 3)alpha fit 20 30 40 50 40 50 60 70 60 70 20 30

Time

Double\_up | NLLA Double\_up(#129): [4.1346, 3.1202, 0.3552, 0.1474, 0.000354, 0.002087, 0.0000, 0.2414, 0.1194, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 31.5 **Order Two Moms** 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.02745000 42500 -0.028 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit -0.03230 40 50 20 40 70 20 60 70 30 50 60

Time

Double\_up | NLLA Double\_up(#130): [3.3720, 4.0753, 0.1915, 0.3072, 0.001718, 0.0009432, 0.0000, 0.1438, 0.2139, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0295 alpha data 45000 alpha fit -0.030042500 **Order Three Moms** -0.0305COV/Var 40000 -0.031037500 alpha -0.031535000 -0.0320(3, 0)32500 (2, 1)-0.0325(1, 2)30000 (0, 3)-0.0330

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#131): [4.3936, 3.6451, 0.3297, 0.2241, 0.001048, 0.001685, 0.0000, 0.2301, 0.1673, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)30 40 50 20 40 50 20 60 70 30 60 70 Time Time 47500 alpha\_data alpha\_fit 45000 -0.02742500 Order Three Moms -0.028alpha = COV/Var40000 -0.02937500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03230 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#132): [3.6372, 3.7356, 0.2035, 0.2941, 0.001891, 0.0006694, 0.0000, 0.1533, 0.2023, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029 Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit

40

Time

30

20

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#133): [3.9699, 2.8041, 0.3261, 0.1337, 0.0005912, 0.001782, 0.0000, 0.2249, 0.1058, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)40 50 40 50 30 70 20 30 20 60 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#134): [4.0201, 3.6821, 0.2631, 0.2714, 0.001559, 0.001021, 0.0000, 0.1907, 0.1926, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 -0.0270alpha\_data 45000 alpha fit -0.027542500 -0.0280Order Three Moms = COV/Var 40000 -0.0285-0.029037500 -0.029535000 (3, 0)-0.030032500 (2, 1)-0.0305(1, 2)30000 (0, 3)-0.031040 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#135): [3.3404, 3.9308, 0.2018, 0.2960, 0.00152, 0.0009571, 0.0000, 0.1493, 0.2077, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028 45000 alpha fit 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#136): [3.8783, 3.4536, 0.2712, 0.2334, 0.001272, 0.001208, 0.0000, 0.1942, 0.1673, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit 42500 -0.028 alpha = COV/Var40000 37500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 (0, 3)-0.03120 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#137): [4.1031, 3.5816, 0.2710, 0.2540, 0.001593, 0.001119, 0.0000, 0.1971, 0.1811, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#138): [4.3473, 3.2406, 0.3282, 0.1896, 0.0009579, 0.001606, 0.0000, 0.2269, 0.1425, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.02937500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#139): [3.1953, 3.8933, 0.1876, 0.2964, 0.001537, 0.0008982, 0.0000, 0.1400, 0.2070, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)40 50 40 50 20 30 20 30 60 70 60 70 Time Time 47500 alpha\_data -0.028 alpha\_fit 45000 42500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03230 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#140): [3.6966, 3.6890, 0.2831, 0.2218, 0.00077, 0.00177, 0.0000, 0.1957, 0.1660, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2). 50 40 50 40 30 20 30 60 70 20 60 70 Time Time 47500 -0.027alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)27500 20 30 40 50 20 40 50 60 70 60 70 30 Time Time

Double\_up | NLLA Double\_up(#141): [3.6652, 3.2154, 0.2703, 0.1947, 0.0009358, 0.001459, 0.0000, 0.1892, 0.1436, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)alpha data 30000 (0, 3)alpha fit -0.03327500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#142): [4.6830, 3.2481, 0.3989, 0.1676, 0.0005395, 0.002013, 0.0000, 0.2736, 0.1333, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 -0.024alpha\_data alpha\_fit 45000 -0.02542500 -0.026**Order Three Moms** alpha = COV/Var40000 -0.02737500 -0.02835000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)-0.031

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#143): [3.9481, 3.7509, 0.2951, 0.2381, 0.0009942, 0.001544, 0.0000, 0.2070, 0.1735, 0.0000]1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data 45000 -0.025alpha fit 42500 -0.026Order Three Moms alpha = COV/Var40000 -0.02737500 -0.02835000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)-0.031

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#144): [3.6687, 3.5782, 0.2692, 0.2295, 0.0009865, 0.001437, 0.0000, 0.1898, 0.1667, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)40 50 60 70 40 50 20 30 20 30 60 70 Time Time 47500 45000 -0.02742500 **Order Three Moms** alpha = COV/Var-0.02840000 alpha\_data 37500 -0.029alpha fit 35000 -0.030 (3, 0)32500 (2, 1)(1, 2)-0.03130000

(0, 3)

70

20

30

40

Time

50

60

70

30

20

40

Time

50

Double\_up | NLLA Double\_up(#145): [3.5268, 3.8697, 0.2183, 0.2839, 0.001547, 0.001074, 0.0000, 0.1608, 0.2007, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.0290alpha data alpha fit 45000 -0.029542500 Order Three Moms = COV/Var-0.030040000 -0.030537500 35000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 (0, 3)-0.032040 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#146): [4.1473, 3.2802, 0.3162, 0.1991, 0.0009452, 0.001544, 0.0000, 0.2204, 0.1490, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)40 50 40 50 20 30 60 20 30 70 60 70 Time Time 47500 -0.026 alpha data alpha fit 45000 -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#147): [3.6326, 3.9137, 0.2312, 0.2733, 0.001441, 0.001154, 0.0000, 0.1669, 0.1915, 0.0000]1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.029 37500 35000 -0.030 (3, 0)32500 (2, 1)(1, 2)30000 -0.031(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#148): [5.1341, 2.3989, 0.4660, 0.0558, 6.358e-05, 0.002489, 0.0000, 0.3125, 0.0623, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.027alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#149):  $[4.6390, 2.5386, 0.4174, 0.0788, 0.0001774, 0.002\overline{2}72, 0.0000, 0.2827, 0.0744, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 40 50 40 20 30 60 70 20 30 60 70 Time Time 47500 alpha data -0.028 alpha fit 45000 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#150): [3.7574, 3.2848, 0.2866, 0.2019, 0.00091, 0.001432, 0.0000, 0.2019, 0.1481, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit 42500 -0.028alpha = COV/Var40000 37500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 (0, 3)-0.03120 30 40 50 20 30 40 50 60 70 60 70

Time

Time

**Order Three Moms** 

Double\_up | NLLA Double\_up(#151): [3.2139, 4.5669, 0.1450, 0.3861, 0.002198, 0.0004624, 0.0000, 0.1179, 0.2627, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)

-0.032

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#152): [4.5462, 3.2465, 0.3546, 0.1850, 0.0009244, 0.001689, 0.0000, 0.2463, 0.1403, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha\_data 45000 -0.027alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 35000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#153): [3.6081, 3.4728, 0.2574, 0.2221, 0.001069, 0.00139, 0.0000, 0.1824, 0.1608, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30 40 50 20 30 40 50 20 60 70 60 70 Time Time 47500 -0.028045000 -0.028542500 COV/Var -0.029040000 -0.029537500 alpha = -0.030035000 (3, 0)-0.030532500 (2, 1)(1, 2)alpha data -0.031030000 (0, 3)alpha fit -0.031540 50 20 50 70 20 30 60 70 30 40 60

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#154): [4.6332, 3.1686, 0.3499, 0.1818, 0.001048, 0.001605, 0.0000, 0.2427, 0.1370, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 20 30 60 70 20 60 70 Time Time -0.0270alpha data 45000 alpha fit -0.027542500 -0.0280Order Three Moms = COV/Var 40000 -0.028537500 -0.0290alpha 35000 -0.0295(3, 0)32500 -0.0300(2, 1)(1, 2)30000 -0.0305(0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#155): [4.1479, 3.2639, 0.3179, 0.1920, 0.0009676, 0.001612, 0.0000, 0.2231, 0.1444, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 60 70 20 30 20 60 70 Time Time 47500 -0.02845000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#156): [3.6286, 3.2875, 0.2660, 0.2070, 0.0009577, 0.001421, 0.0000, 0.1867, 0.1526, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#157): [3.4696, 3.3677, 0.2378, 0.2408, 0.001216, 0.001059, 0.0000, 0.1716, 0.1725, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027 alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#158): [3.2645, 4.3624, 0.1651, 0.3544, 0.001968, 0.0006736, 0.0000, 0.1289, 0.2437, 0.0000]1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032 (1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#159): [4.4372, 2.9963, 0.3734, 0.1291, 0.0004361, 0.002121, 0.0000, 0.2526, 0.1060, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#160): [3.7287, 4.1603, 0.2366, 0.2892, 0.001446, 0.001351, 0.0000, 0.1699, 0.2059, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02942500 Order Three Moms alpha = COV/Var-0.030 40000 37500 -0.031 35000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit 20 30 40 50 20 40 70 60 70 30 50 60

Time

Double up | NLLA Double up(#161): [3.9255, 3.1714, 0.3000, 0.1850, 0.0008879, 0.00159, 0.0000, 0.2092, 0.1397, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 20 30 40 50 70 60 70 Time Time 47500 alpha data -0.029045000 alpha fit -0.029542500 Order Three Moms = COV/Var-0.030040000 -0.030537500 35000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320(0, 3)27500 40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#162): [3.7500, 3.0335, 0.2674, 0.1895, 0.001076, 0.001301, 0.0000, 0.1880, 0.1393, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)40 50 50 20 30 40 60 70 20 30 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.0295-0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.032040 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#163): [4.9176, 3.1248, 0.3815, 0.1597, 0.0009691, 0.001859, 0.0000, 0.2629, 0.1241, 0.0000] 1200 33.0 1150 32.5 Order Two Mom 1050 1000 Order One Moms 32.0 31.5 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 alpha data 45000 alpha fit -0.029 42500 Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 -0.032(2, 1)30000 (1, 2)(0, 3)-0.03327500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#164): [4.1888, 3.6014, 0.2979, 0.2490, 0.001345, 0.001224, 0.0000, 0.2136, 0.1786, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time -0.026alpha data 45000 alpha fit -0.02742500 Order Three Moms alpha = COV/Var-0.02840000 37500 -0.02935000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#165): [3.1785, 3.5810, 0.1913, 0.2841, 0.001506, 0.0007491, 0.0000, 0.1428, 0.1992, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#166): [4.0590, 3.7964, 0.2792, 0.2548, 0.001374, 0.001381, 0.0000, 0.1997, 0.1838, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.029alpha fit 42500 Order Three Moms -0.030alpha = COV/Var40000 37500 -0.031 35000 -0.032 (3, 0)32500 (2, 1)(1, 2)30000 -0.033(0, 3)20 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#167): [4.9977, 2.4426, 0.4363, 0.0701, 0.000244, 0.002289, 0.0000, 0.2927, 0.0691, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026 alpha data 45000 alpha fit -0.027 42500 Order Three Moms alpha = COV/Var-0.02840000 37500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#168): [4.0684, 3.7124, 0.3132, 0.2065, 0.0008492, 0.001932, 0.0000, 0.2171, 0.1557, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 -0.0295alpha\_data alpha\_fit 45000 -0.030042500 **Order Three Moms** = COV/Var -0.030540000 37500 -0.0310alpha 35000 -0.0315 (3, 0)32500 (2, 1)-0.0320(1, 2)30000 (0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#169): [3.5088, 3.6505, 0.1969, 0.2875, 0.001858, 0.0006441, 0.0000, 0.1495, 0.1977, 0.0000] 1200 33.0 1150 32.5 32.0 and 31.5 31.0 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 Order Three Moms -0.0295COV/Var 40000 -0.030037500 -0.0305alpha = 35000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 -0.0320(0, 3)

20

30

50

60

40

Time

70

27500

20

40

Time

30

50

60

Double\_up | NLLA Double\_up(#170): [3.6068, 3.6037, 0.2454, 0.2491, 0.001263, 0.001205, 0.0000, 0.1765, 0.1784, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha\_data -0.028045000 alpha\_fit -0.028542500 Order Three Moms COV/Var -0.029040000 -0.029537500 alpha -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.031540 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#171): [4.6028, 3.1819, 0.3386, 0.1918, 0.001133, 0.001497, 0.0000, 0.2358, 0.1433, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0270alpha data 45000 alpha fit -0.027542500 -0.0280**Order Three Moms** = COV/Var 40000 -0.0285-0.029037500 alpha -0.029535000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)30000 (0, 3)-0.031040 50 20 30 40 50 60 70 20 30 60 70

Time

Double up | NLLA Double up(#172): [4.6781, 2.9790, 0.3986, 0.1202, 0.000479, 0.002251, 0.0000, 0.2720, 0.1015, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.03037500 -0.03135000 -0.032(3, 0)32500 (2, 1)-0.033 (1, 2)30000 (0, 3)-0.03420 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#173): [3.7274, 3.1408, 0.3141, 0.1852, 0.0005249, 0.001598, 0.0000, 0.2176, 0.1411, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.025 45000 -0.02642500 -0.027**Order Three Moms** alpha = COV/Var40000 -0.02837500 -0.029-0.03035000 (3, 0)-0.03132500 (2, 1)alpha\_data (1, 2)-0.03230000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#174): [3.0055, 3.9382, 0.1472, 0.3135, 0.001798, 0.0006733, 0.0000, 0.1134, 0.2155, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha\_fit -0.029 42500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#175): [4.0901, 3.1567, 0.3033, 0.1848, 0.001028, 0.001508, 0.0000, 0.2120, 0.1375, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.02845000 alpha\_fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03330 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#176): [3.5333, 3.8674, 0.2169, 0.2905, 0.001555, 0.001008, 0.0000, 0.1592, 0.2053, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 70 20 30 40 50 20 30 60 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 Order Three Moms COV/Var -0.029540000 -0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)(1, 2)-0.0315 30000 (0, 3)20 40 50 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#177): [3.5083, 3.9157, 0.2279, 0.2802, 0.001381, 0.00114, 0.0000, 0.1657, 0.1980, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 20 30 40 50 60 70 60 70 Time Time 47500 alpha data -0.028alpha\_fit 45000 42500 Order Three Moms -0.029 alpha = COV/Var 40000 37500 -0.03035000 -0.031 (3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 40 50 60 70 60 70 30 Time Time

Double\_up | NLLA Double\_up(#178): [3.6299, 3.9363, 0.2538, 0.2710, 0.001196, 0.001326, 0.0000, 0.1819, 0.1937, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.02745000 alpha\_fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#179): [3.1891, 4.2089, 0.2018, 0.3110, 0.00133, 0.001138, 0.0000, 0.1476, 0.2194, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 Order Three Moms -0.028alpha = COV/Var 40000 -0.029 37500 35000 -0.030(3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#180): [3.8225, 2.7115, 0.2932, 0.1483, 0.0008059, 0.001467, 0.0000, 0.2028, 0.1129, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)(0, 2)900 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.0285alpha\_data alpha\_fit 45000 -0.029042500 Three Moms -0.0295COV/Var 40000 -0.030037500 alpha -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)

-0.0320

20

30

40

Time

50

60

70

50

60

70

20

30

40

Double\_up | NLLA Double\_up(#181): [4.3794, 2.9056, 0.3571, 0.1415, 0.0006828, 0.001851, 0.0000, 0.2459, 0.1125, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028 45000 alpha fit 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#182): [3.8828, 3.9301, 0.2626, 0.2684, 0.001301, 0.001327, 0.0000, 0.1866, 0.1915, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02745000 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 35000 -0.030(3, 0)32500 (2, 1)(1, 2)alpha data 30000 -0.031(0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#183): [3.9978, 3.8887, 0.3014, 0.2715, 0.001075, 0.001354, 0.0000, 0.2142, 0.1966, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.024 alpha data 45000 alpha fit -0.02542500 **Order Three Moms** -0.026alpha = COV/Var40000 -0.02737500 -0.02835000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)-0.03120 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#184): [2.9814, 4.2989, 0.1577, 0.3438, 0.001707, 0.0007783, 0.0000, 0.1217, 0.2383, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.029537500 -0.0300-0.030535000 (3, 0)-0.031032500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.032027500

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#185): [5.1926, 2.2845, 0.4717, 0.0343, 9.894e-13, 0.002578, 0.0000, 0.3144, 0.0475, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#186): [3.3307, 4.2577, 0.1930, 0.3252, 0.00162, 0.0009467, 0.0000, 0.1438, 0.2262, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 45000 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.029 37500 35000 -0.030 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit 30 40 50 20 40 70 20 60 70 30 50 60

Time

Double\_up | NLLA Double\_up(#187): [3.8421, 3.3470, 0.2720, 0.2123, 0.001129, 0.001354, 0.0000, 0.1916, 0.1542, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 42500 -0.029Order Three Moms alpha = COV/Var40000 alpha\_data 37500 -0.030 alpha\_fit 35000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#188): [3.2845, 4.5801, 0.2022, 0.3374, 0.001429, 0.001246, 0.0000, 0.1483, 0.2380, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02745000 -0.02842500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit 30 40 50 20 40 70 20 60 70 30 50 60

Time

Double\_up | NLLA Double\_up(#189): [3.6550, 4.2542, 0.1848, 0.3559, 0.002234, 0.0005144, 0.0000, 0.1450, 0.2432, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha\_fit -0.028542500 -0.0290Order Three Moms COV/Var 40000 -0.029537500 -0.0300alpha 35000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#190): [4.2653, 3.0253, 0.3153, 0.1819, 0.001133, 0.001392, 0.0000, 0.2220, 0.1352, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data -0.0280alpha\_fit 45000 -0.028542500 Order Three Moms -0.0290COV/Var 40000 -0.029537500 -0.0300 alpha 35000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)27500 -0.032020 40 50 30 40 50 70 20 30 60 70 60

Time

Double\_up | NLLA Double\_up(#191): [3.9071, 2.9696, 0.3049, 0.1695, 0.0008111, 0.00155, 0.0000, 0.2125, 0.1288, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 alpha data 45000 alpha fit 42500 -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031 (3, 0)32500 (2, 1)(1, 2)30000 -0.032 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#192): [4.1197, 2.9426, 0.3148, 0.1760, 0.0009935, 0.001408, 0.0000, 0.2217, 0.1317, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms -0.028alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.031 32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#193): [2.9230, 3.8450, 0.1449, 0.3077, 0.00179, 0.0005927, 0.0000, 0.1134, 0.2104, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 45000 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.030 37500 -0.031 35000 (3, 0)32500 (2, 1)-0.032(1, 2)alpha data 30000 (0, 3)alpha fit -0.03320 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#194): [3.7133, 3.6464, 0.2638, 0.2374, 0.001128, 0.001447, 0.0000, 0.1870, 0.1725, 0.0000] 1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit 42500 -0.0290Order Three Moms alpha = COV/Var -0.029540000 37500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315 (0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#195): [4.1078, 3.5301, 0.2884, 0.2238, 0.001266, 0.00142, 0.0000, 0.2042, 0.1622, 0.0000]1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit 20 30 40 50 40 50 70 60 70 20 30 60

Time

Double\_up | NLLA Double\_up(#196): [2.8200, 4.4510, 0.0945, 0.3911, 0.002384, 0.0001894, 0.0000, 0.0851, 0.2627, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.028545000 -0.029042500 -0.0295Order Three Moms = COV/Var 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)-0.031532500 (2, 1)alpha data (1, 2)-0.032030000 (0, 3)alpha fit -0.0325

50

40

Time

20

30

70

60

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#197):  $[3.4122, 3.7806, 0.2144, 0.2749, 0.001474, 0.0010\overline{37}, 0.0000, 0.1578, 0.1934, 0.0000]$ 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0285 45000 -0.029042500 -0.0295**Order Three Moms** COV/Var 40000 -0.030037500 alpha = -0.030535000 -0.0310(3, 0)32500 -0.0315(2, 1)alpha data (1, 2)30000 -0.0320(0, 3)alpha fit 40 50 50 70 20 30 60 70 20 30 40 60

Time

Double\_up | NLLA Double\_up(#198): [3.5627, 4.3166, 0.2230, 0.3237, 0.00153, 0.00108, 0.0000, 0.1641, 0.2270, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.025 alpha data 45000 alpha fit -0.02642500 alpha = COV/Var40000 -0.027 37500 -0.02835000 -0.029(3, 0)32500 (2, 1)(1, 2)-0.030 30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70 Time Time

Order Three Moms

Double\_up | NLLA Double\_up(#199): [3.0857, 4.5323, 0.1519, 0.3612, 0.001903, 0.000741, 0.0000, 0.1191, 0.2475, 0.0000]1200 33.0 1150 32.5 32.0 and 31.5 and 31.0 1100 Order Two Moms 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 30 40 50 20 40 20 30 60 70 60 70 Time Time -0.028045000 -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.029537500 -0.0300albha 35000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)alpha data 30000 -0.0315(0, 3)alpha fit 27500 -0.032020 40 50 30 40 20 30 60 70 50 60 70 Time Time

Double\_up | NLLA Double\_up(#200): [4.3234, 3.6502, 0.3019, 0.2564, 0.001486, 0.00117, 0.0000, 0.2182, 0.1831, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#201): [4.0448, 3.4685, 0.2844, 0.2342, 0.001277, 0.001258, 0.0000, 0.2026, 0.1695, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data -0.027 alpha\_fit 45000 42500 Order Three Moms -0.028alpha = COV/Var40000 37500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 -0.031(0, 3)30 40 50 20 40 50 60 70 20 60 70 30

Time

Double\_up | NLLA Double\_up(#202): [3.8946, 4.1031, 0.2632, 0.2860, 0.001419, 0.001323, 0.0000, 0.1903, 0.2033, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#203): [4.4935, 2.1137, 0.4058, 0.0383, 4.861e-12, 0.002287, 0.0000, 0.2701, 0.0474, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30 40 50 20 30 40 50 20 60 70 60 70 Time Time 47500 -0.028045000 -0.028542500 Order Three Moms -0.0290COV/Var 40000 -0.029537500 alpha -0.030035000 (3, 0)-0.030532500 (2, 1)(1, 2)alpha data 30000 -0.0310(0, 3)alpha fit 27500 20 40 50 50 60 70 30 60 70 20 30 40

Time

Double\_up | NLLA Double\_up(#204): [3.7334, 3.1482, 0.2579, 0.2046, 0.001187, 0.001267, 0.0000, 0.1825, 0.1495, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.029042500 -0.0295Order Three Moms COV/Var 40000 -0.030037500 alpha : -0.030535000 (3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#205): [5.2839, 2.4392, 0.4818, 0.0569, 0.0001608, 0.00244, 0.0000, 0.3263, 0.0606, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026 alpha data 45000 alpha fit -0.02742500 alpha = COV/Var -0.02840000 -0.02937500 35000 -0.030(3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double up | NLLA Double up(#206): [4.1935, 2.6910, 0.3205, 0.1512, 0.0009374, 0.00141, 0.0000, 0.2233, 0.1147, 0.0000] 1200 -33.0 1150 32.5 Suppose of 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0275 alpha data 45000 alpha fit -0.028042500 -0.0285**Order Three Moms** COV/Var 40000 -0.029037500 -0.0295alpha 35000 -0.0300(3, 0)32500 -0.0305(2, 1)(1, 2)30000 -0.0310(0, 3)27500 -0.031540 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#207): [4.7810, 2.7651, 0.4122, 0.1058, 0.0004273, 0.002176, 0.0000, 0.2807, 0.0913, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#208): [3.2666, 3.7443, 0.1770, 0.3045, 0.001788, 0.0006398, 0.0000, 0.1349, 0.2114, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.028047500 alpha\_data -0.0285alpha\_fit 45000 -0.029042500 Order Three Moms = COV/Var -0.029540000 -0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.032027500

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#209): [4.1288, 3.1577, 0.3012, 0.1926, 0.00111, 0.001403, 0.0000, 0.2116, 0.1419, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028045000 -0.028542500 **Order Three Moms** COV/Var -0.029040000 -0.029537500 alpha -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)alpha data 30000 (0, 3)-0.0315alpha fit 40 50 20 30 40 20 30 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#210): [4.6863, 3.3202, 0.3391, 0.2239, 0.001394, 0.001227, 0.0000, 0.2412, 0.1624, 0.0000]1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)40 50 40 50 20 30 60 20 30 70 60 70 Time Time 47500 -0.02645000 -0.02742500 **Order Three Moms** alpha = COV/Var40000 -0.02837500 -0.029 35000 (3, 0)-0.03032500 (2, 1)alpha data (1, 2)30000 -0.031(0, 3)alpha fit 30 40 50 20 30 40 20 60 70 50 60 70 Time Time

Double\_up | NLLA Double\_up(#211): [4.5611, 3.0211, 0.3960, 0.1208, 0.0002629, 0.002327, 0.0000, 0.2662, 0.1032, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031 (3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit 30 40 50 20 30 40 20 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#212): [3.9337, 3.4736, 0.2864, 0.2276, 0.001139, 0.001333, 0.0000, 0.2034, 0.1648, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 70 20 30 20 60 60 70 Time Time -0.025alpha data 45000 alpha fit -0.02642500 -0.027Order Three Moms alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#213): [3.4588, 3.6094, 0.2007, 0.2726, 0.001669, 0.0007891, 0.0000, 0.1491, 0.1888, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 20 20 30 30 60 70 60 70 Time Time 47500 alpha\_data alpha fit 45000 -0.02942500 Order Three Moms alpha = COV/Var-0.030 40000 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#214): [4.0436, 2.9043, 0.3088, 0.1593, 0.0009037, 0.001507, 0.0000, 0.2153, 0.1196, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 -0.031 35000 (3, 0)32500 (2, 1)-0.032 (1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#215): [3.8514, 3.4994, 0.2574, 0.2497, 0.001419, 0.001098, 0.0000, 0.1858, 0.1786, 0.0000]1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#216): [2.7069, 4.7143, 0.1038, 0.3993, 0.002097, 0.000468, 0.0000, 0.0885, 0.2716, 0.0000]1200 33.0 1150 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 20 30 60 20 30 70 60 70 Time Time 47500 alpha\_data alpha\_fit 45000 -0.02842500 **Order Three Moms** -0.029alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.03320 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#217): [3.8785, 2.9821, 0.3342, 0.1451, 0.000392, 0.001899, 0.0000, 0.2289, 0.1151, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.028 42500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double up | NLLA Double up(#218): [3.8895, 3.5765, 0.2575, 0.2681, 0.001495, 0.000972, 0.0000, 0.1871, 0.1908, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.027alpha fit 45000 -0.02842500 alpha = COV/Var40000 -0.02937500 -0.030 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#219): [3.8319, 3.1720, 0.2615, 0.2119, 0.001251, 0.001148, 0.0000, 0.1851, 0.1524, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.027545000 -0.028042500 -0.028540000 -0.029037500 alpha = -0.029535000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)alpha data 30000 -0.0310(0, 3)alpha fit 40 50 20 30 40 20 30 60 70 50 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#220): [4.7710, 2.8564, 0.4014, 0.1228, 0.0005194, 0.002038, 0.0000, 0.2735, 0.1014, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 45000 42500 -0.028 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 35000 -0.030(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.031(0, 3)alpha fit

40

Time

20

30

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#221): [4.0290, 2.4060, 0.3488, 0.0855, 0.000289, 0.001982, 0.0000, 0.2359, 0.0756, 0.0000] 1200 33.0 1150 32.5 order One Moms 31.5 31.0 **Order Two Moms** 1100 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 40 50 20 30 40 60 70 20 30 60 70 Time Time 47500 -0.0290alpha data alpha fit 45000 -0.029542500 Order Three Moms -0.0300= COV/Var 40000 -0.030537500 35000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 (0, 3)-0.032027500 40 50 20 30 40 50 20 30 60 70 60 70

Time

Double\_up | NLLA Double\_up(#222): [3.8544, 3.3989, 0.2939, 0.2019, 0.0008666, 0.001616, 0.0000, 0.2047, 0.1505, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.028 42500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03227500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double up(#223): [4.3691, 2.7894, 0.3699, 0.1227, 0.0004944, 0.001974, 0.0000, 0.2530, 0.1011, 0.0000]1200 33.0 1150 32.5 32.0 and 31.5 and 31.0 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.03327500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#224): [5.4212, 2.4098, 0.4922, 0.0375, 2.058e-15, 0.002705, 0.0000, 0.3276, 0.0509, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#225): [4.0870, 2.9909, 0.3072, 0.1697, 0.0009823, 0.001496, 0.0000, 0.2143, 0.1271, 0.0000] (1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha data -0.029alpha fit 45000 42500 **Order Three Moms** -0.030alpha = COV/Var40000 -0.03137500 35000 -0.032(3, 0)32500 (2, 1)(1, 2)30000 -0.033(0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#226): [3.5833, 4.0030, 0.2285, 0.2807, 0.001407, 0.001266, 0.0000, 0.1650, 0.1998, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.029045000 -0.029542500 Order Three Moms COV/Var -0.030040000 37500 -0.0305 alpha 35000 -0.0310(3, 0)32500 (2, 1)-0.0315alpha data (1, 2)30000 (0, 3)alpha fit 27500 20 40 50 50 60 70 30 60 70 20 30 40

Time

Double\_up | NLLA Double\_up(#227): [2.7799, 4.4247, 0.1153, 0.3784, 0.002082, 0.000382, 0.0000, 0.0974, 0.2565, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032 (1, 2)alpha data 30000 (0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#228): [4.6045, 2.9355, 0.3702, 0.1478, 0.0007914, 0.001806, 0.0000, 0.2552, 0.1162, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.02940000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#229): [2.7317, 4.4161, 0.1010, 0.3771, 0.002184, 0.0002964, 0.0000, 0.0880, 0.2530, 0.0000]1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290**Order Three Moms** COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000

-0.0315

20

30

40

Time

50

60

70

(0, 3)

70

40

Time

30

20

50

Double\_up | NLLA Double\_up(#230): [3.9173, 3.3917, 0.2674, 0.2250, 0.001303, 0.001264, 0.0000, 0.1902, 0.1624, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 **Order Three Moms** alpha = COV/Var-0.02940000 37500 -0.030 35000 -0.031 (3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#231): [4.2454, 3.2464, 0.3243, 0.2001, 0.001028, 0.001499, 0.0000, 0.2280, 0.1494, 0.0000] 1200 -(1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)60 40 50 70 40 50 20 30 20 30 60 70 Time Time 47500 alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.030 35000 -0.031 (3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#232): [3.2209, 4.0426, 0.1913, 0.3115, 0.001577, 0.0009047, 0.0000, 0.1438, 0.2178, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 45000 -0.02942500 Order Three Moms alpha = COV/Var -0.030 40000 -0.03137500 35000 -0.032(3, 0)32500 -0.033(2, 1)alpha data (1, 2)30000 (0, 3)-0.034alpha fit 27500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#233): [5.5504, 2.5134, 0.5074, 0.0372, 3.857e-13, 0.002847, 0.0000, 0.3384, 0.0517, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data 45000 alpha\_fit -0.02942500 -0.030Order Three Moms alpha = COV/Var40000 -0.03137500 -0.03235000 (3, 0)-0.033 32500 (2, 1)(1, 2)30000 -0.034(0, 3)30 40 50 20 40 50 70 20 60 70 30 60

Time

Double\_up | NLLA Double\_up(#234): [5.3191, 2.7572, 0.4627, 0.0882, 0.0003116, 0.002447, 0.0000, 0.3113, 0.0825, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000

(0, 3)

70

20

30

40

Time

50

60

70

20

30

40

Time

50

Double\_up | NLLA Double\_up(#235): [4.0525, 3.1325, 0.3030, 0.1810, 0.0009843, 0.001521, 0.0000, 0.2115, 0.1346, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 **Order Three Moms** = COV/Var-0.029540000 -0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)(1, 2)-0.031530000 (0, 3)-0.0320

40

Time

30

20

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#236): [4.1304, 3.5279, 0.3077, 0.2168, 0.001032, 0.001536, 0.0000, 0.2155, 0.1588, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0270 alpha data 45000 alpha fit -0.027542500 **Order Three Moms** -0.0280COV/Var 40000 -0.028537500 alpha -0.029035000 (3, 0)-0.029532500 (2, 1)(1, 2)-0.030030000 (0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#237): [4.0944, 3.7267, 0.2825, 0.2476, 0.001318, 0.001351, 0.0000, 0.2003, 0.1779, 0.0000] 1200 -33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028 alpha fit 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#238): [4.3655, 2.8606, 0.3506, 0.1476, 0.0007768, 0.001717, 0.0000, 0.2432, 0.1157, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031 (3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#239): [4.0706, 4.3804, 0.2610, 0.3133, 0.00163, 0.001245, 0.0000, 0.1896, 0.2201, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)50 40 50 40 20 30 60 70 20 30 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#240): [2.8952, 3.7263, 0.1395, 0.3041, 0.001791, 0.0005031, 0.0000, 0.1092, 0.2068, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 30 40 50 40 20 20 30 60 70 60 70 Time Time -0.028047500 alpha data alpha fit 45000 -0.028542500 Three Moms COV/Var -0.029040000 -0.029537500 alpha : 35000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#241): [4.3774, 3.2047, 0.3443, 0.1758, 0.0008676, 0.001724, 0.0000, 0.2389, 0.1337, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#242): [3.6801, 3.4175, 0.2643, 0.2100, 0.00103, 0.001497, 0.0000, 0.1856, 0.1542, 0.0000] 1200 -33.0 1150 32.5 order One Moms 31.5 31.0 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0295 45000 42500 -0.0300 Order Three Moms COV/Var 40000 -0.030537500 alpha = -0.031035000 (3, 0)32500 -0.0315(2, 1)alpha data (1, 2)30000 -0.0320(0, 3)alpha fit 27500 40 50 20 30 70 20 30 60 70 40 50 60

Time

Double\_up | NLLA Double\_up(#243): [5.2628, 2.4834, 0.4301, 0.0791, 0.0006714, 0.00214, 0.0000, 0.2917, 0.0721, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.0295alpha fit 42500 -0.0300Order Three Moms COV/Var 40000 -0.030537500 alpha = -0.031035000 (3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320(0, 3)40 50 20 30 40 50 70 20 30 60 70 60

Time

Double\_up | NLLA Double\_up(#244): [2.9055, 4.2641, 0.1162, 0.3666, 0.002199, 0.0003016, 0.0000, 0.0982, 0.2475, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 50 40 40 20 30 60 70 20 30 60 70 Time Time 47500 alpha data -0.028 alpha fit 45000 -0.029 42500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#245): [4.3657, 3.8526, 0.2877, 0.2649, 0.001628, 0.001255, 0.0000, 0.2068, 0.1881, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028545000 -0.029042500 -0.0295**Order Three Moms** COV/Var 40000 -0.0300-0.030537500 alpha -0.031035000 -0.0315(3, 0)32500 (2, 1)-0.0320alpha data (1, 2)30000 -0.0325(0, 3)alpha fit 40 50 50 60 70 20 30 60 70 20 30 40

Time

Double\_up | NLLA Double\_up(#246): [4.4513, 3.4256, 0.3658, 0.1836, 0.0006976, 0.001929, 0.0000, 0.2529, 0.1410, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.026 45000 alpha fit -0.02742500 Order Three Moms alpha = COV/Var-0.02840000 -0.02937500 35000 -0.030(3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#247): [3.8571, 3.5119, 0.2746, 0.2332, 0.001162, 0.001303, 0.0000, 0.1945, 0.1685, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)-0.03330000 (0, 3)alpha fit 30 40 50 20 30 40 20 60 70 50 60 70

Time

Time

**Order Three Moms** 

Double\_up | NLLA Double\_up(#248): [4.2508, 3.5139, 0.3124, 0.2239, 0.001099, 0.001468, 0.0000, 0.2183, 0.1644, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02745000 42500 -0.028alpha = COV/Var40000 -0.029 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)alpha data (1, 2)-0.03230000 (0, 3)alpha fit 20 30 40 50 40 50 60 70 60 70 20 30

Time

Time

**Order Three Moms** 

Double up | NLLA Double up(#249):  $[3.0788, 3.3350, 0.2129, 0.2271, 0.0009974, 0.001\overline{138}, 0.0000, 0.1517, 0.1628, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 20 30 40 50 60 70 70 60 Time Time 47500 alpha data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#250): [3.7835, 3.5114, 0.2734, 0.2183, 0.001041, 0.001511, 0.0000, 0.1919, 0.1601, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290**Order Three Moms** 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#251): [3.8210, 3.5178, 0.2794, 0.2283, 0.001073, 0.001384, 0.0000, 0.1974, 0.1659, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.02745000 alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 35000 -0.030 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#252):  $[3.3555, 4.3718, 0.2059, 0.3174, 0.001469, 0.0012\overline{16}, 0.0000, 0.1510, 0.2232, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 70 60 Time Time 47500 -0.0275alpha\_data 45000 alpha\_fit -0.028042500 -0.0285Order Three Moms = COV/Var-0.029040000 -0.029537500 alpha -0.0300 35000 (3, 0)-0.030532500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.0315 40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#253): [3.3234, 4.2564, 0.2014, 0.3148, 0.001487, 0.001126, 0.0000, 0.1481, 0.2213, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 Order Three Moms = COV/Var -0.029540000 -0.030037500 -0.030535000 (3, 0)-0.031032500 (2, 1)(1, 2)30000 -0.0315(0, 3)-0.032020 40 50 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#254):  $[2.6047,\, 4.3094,\, 0.0924,\, 0.3813,\, \overline{0}.002149,\, 0.0002\overline{4}17,\, 0.0000,\, 0.0819,\, 0.2584,\, 0.0000]$ 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 -0.029Order Three Moms alpha = COV/Var40000 alpha\_data -0.03037500 alpha\_fit 35000 -0.031 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.03330 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#255): [4.6532, 3.0291, 0.3797, 0.1420, 0.0006614, 0.002011, 0.0000, 0.2592, 0.1142, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.02845000 alpha\_fit 42500 Order Three Moms -0.029 alpha = COV/Var40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#256): [4.5717, 3.7646, 0.3411, 0.2202, 0.001149, 0.001795, 0.0000, 0.2386, 0.1628, 0.0000] 1200 -33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.033 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#257): [4.3636, 3.5463, 0.2918, 0.2413, 0.001538, 0.001178, 0.0000, 0.2085, 0.1715, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027545000 alpha fit -0.028042500 Order Three Moms -0.0285COV/Var 40000 -0.029037500 alpha = -0.029535000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)30000 -0.0310(0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#258): [3.9066, 3.9781, 0.2647, 0.2764, 0.001379, 0.001329, 0.0000, 0.1903, 0.1982, 0.0000]1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 30.5 (2, 0)(1, 0)(1, 1)900 30.0 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)30000 alpha data (1, 2)(0, 3)alpha fit -0.03327500 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#259): [4.9384, 3.0335, 0.3432, 0.1804, 0.001448, 0.001373, 0.0000, 0.2395, 0.1326, 0.0000] 1200 33.0 1150 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 20 30 20 60 70 60 70 Time Time 47500 -0.028 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit 20 30 40 50 40 60 70 60 70 20 30 50

Time

Double up | NLLA Double up(#260): [3.8787, 3.5200, 0.2642, 0.2495, 0.001346, 0.001111, 0.0000, 0.1896, 0.1784, 0.0000]1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30 40 50 40 50 20 60 20 30 70 60 70 Time Time 47500 -0.026alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03227500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#261): [4.8518, 3.3928, 0.3853, 0.1697, 0.0007902, 0.002094, 0.0000, 0.2634, 0.1335, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit 42500 -0.0290Order Three Moms alpha = COV/Var40000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#262): [2.8974, 3.9897, 0.1432, 0.3313, 0.00179, 0.0005871, 0.0000, 0.1128, 0.2290, 0.0000] 33.5 (1, 0)1200 (0, 1)33.0 1150 32.5 Order Two Moms 1050 1000 Order One Moms 32.0 31.5 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)50 50 20 30 40 60 70 20 30 40 70 60 Time Time 47500 alpha\_data -0.028alpha\_fit 45000 -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03320 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#263): [5.2708, 2.4414, 0.4354, 0.0857, 0.0006676, 0.002016, 0.0000, 0.2967, 0.0762, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time -0.028 alpha\_data 45000 alpha\_fit -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#264): [3.8822, 3.5133, 0.2906, 0.2206, 0.0009693, 0.001525, 0.0000, 0.2036, 0.1627, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data alpha\_fit 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.02940000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032 (0, 3)27500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#265): [3.9486, 2.8166, 0.3161, 0.1483, 0.0006841, 0.001654, 0.0000, 0.2181, 0.1157, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data 45000 alpha\_fit -0.029 42500 Order Three Moms alpha = COV/Var-0.030 40000 37500 -0.03135000 (3, 0)32500 -0.032 (2, 1)(1, 2)30000 (0, 3)-0.03330 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#266): [3.7345, 3.3851, 0.2491, 0.2334, 0.001361, 0.001117, 0.0000, 0.1792, 0.1666, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 (0, 3)alpha fit -0.03327500 20 30 40 50 20 40 70 60 70 30 50 60

Time

Double\_up | NLLA Double\_up(#267): [2.8955, 4.3291, 0.1614, 0.3330, 0.001554, 0.0009527, 0.0000, 0.1234, 0.2319, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02847500 alpha\_data alpha\_fit 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#268): [3.6279, 3.9051, 0.2125, 0.3014, 0.001782, 0.00083, 0.0000, 0.1592, 0.2097, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.02845000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 -0.031 35000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 (0, 3)-0.03320 30 40 50 20 40 50 60 70 60 70 30 Time Time

Double\_up | NLLA Double\_up(#269): [4.8627, 2.0637, 0.4400, 0.0372, 0.0001172, 0.002254, 0.0000, 0.2965, 0.0466, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 20 30 40 50 20 30 60 70 60 70 Time Time 47500 alpha\_data -0.0280alpha\_fit 45000 -0.028542500 **Order Three Moms** = COV/Var-0.029040000 -0.029537500 35000 -0.0300(3, 0)32500 -0.0305(2, 1)(1, 2)30000 -0.0310 (0, 3)

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#270): [4.3886, 2.8272, 0.3586, 0.1309, 0.0006324, 0.001842, 0.0000, 0.2456, 0.1042, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.02845000 42500 Order Three Moms -0.029 alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit

40

Time

30

20

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#271): [2.7238, 3.9399, 0.1376, 0.3030, 0.001656, 0.0006825, 0.0000, 0.1082, 0.2057, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 42500 -0.029 **Order Three Moms** alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)alpha data 30000 (0, 3)alpha fit -0.032

40

Time

50

20

30

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#272): [3.2270, 3.8009, 0.2119, 0.2674, 0.001245, 0.001229, 0.0000, 0.1540, 0.1914, 0.0000]1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 45000 -0.02942500 Order Three Moms alpha = COV/Var-0.03040000 37500 -0.031 35000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#273): [2.6095, 4.2285, 0.1095, 0.3546, 0.001907, 0.0004281, 0.0000, 0.0914, 0.2405, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280 45000 -0.028542500 **Order Three Moms** -0.0290COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)alpha data 30000 (0, 3)-0.0315alpha fit 27500

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#274): [4.8045, 2.6387, 0.3765, 0.1251, 0.0008802, 0.001705, 0.0000, 0.2589, 0.0995, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#275): [4.3620, 2.9837, 0.3582, 0.1445, 0.0006173, 0.001897, 0.0000, 0.2458, 0.1148, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)27500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#276): [4.0548, 3.6406, 0.3084, 0.2500, 0.001052, 0.001307, 0.0000, 0.2188, 0.1813, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02542500 -0.026**Order Three Moms** alpha = COV/Var40000 -0.02737500 -0.02835000 -0.029(3, 0)32500 (2, 1)-0.030alpha data (1, 2)30000 (0, 3)alpha fit -0.03120 30 40 50 40 50 60 70 60 70 20 30

Time

Double\_up | NLLA Double\_up(#277): [3.9682, 4.1526, 0.2628, 0.2913, 0.001517, 0.001304, 0.0000, 0.1906, 0.2069, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02845000 -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit 30 40 50 20 40 20 60 70 30 50 60 70

Time

Double\_up | NLLA Double\_up(#278): [4.4426, 3.3828, 0.3291, 0.2259, 0.001205, 0.001325, 0.0000, 0.2327, 0.1657, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.026 45000 alpha fit 42500 -0.027**Order Three Moms** alpha = COV/Var40000 -0.028 37500 -0.02935000 (3, 0)32500 -0.030(2, 1)(1, 2)30000 -0.031(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#279): [4.4275, 3.2708, 0.3240, 0.1993, 0.001207, 0.00147, 0.0000, 0.2280, 0.1472, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290= COV/Var40000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)-0.032027500 40 50 20 30 40 50 20 30 60 70 60 70

Time

Time

Double\_up | NLLA Double\_up(#280): [3.9519, 3.1099, 0.3123, 0.1771, 0.0007888, 0.001596, 0.0000, 0.2176, 0.1340, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)30.5 (1, 1)900 (0, 1)(0, 2)40 50 40 50 30 70 20 30 20 60 60 70 Time Time 47500 -0.02845000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit

40

Time

50

30

20

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#281): [3.9311, 3.0993, 0.3064, 0.1631, 0.0007488, 0.001729, 0.0000, 0.2114, 0.1244, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 **Order Three Moms** COV/Var -0.029540000 -0.030037500 alpha -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.0320

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#282): [3.4986, 3.5386, 0.2356, 0.2478, 0.001242, 0.001127, 0.0000, 0.1694, 0.1766, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.02937500 -0.030 35000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#283): [4.7712, 4.1820, 0.3299, 0.2925, 0.001607, 0.001345, 0.0000, 0.2360, 0.2085, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time -0.025alpha\_data 45000 alpha\_fit -0.02642500 -0.027alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03230 40 50 20 30 40 50 60 70 20 60 70

Time

Time

Double\_up | NLLA Double\_up(#284): [3.7992, 2.7355, 0.3118, 0.1465, 0.0005468, 0.001586, 0.0000, 0.2142, 0.1142, 0.0000]1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha\_data -0.02645000 alpha\_fit 42500 -0.027alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000

(0, 3)

70

20

30

40

Time

50

60

70

40

Time

20

30

50

60

Double\_up | NLLA Double\_up(#285): [3.5155, 3.9087, 0.2271, 0.2864, 0.001398, 0.00111, 0.0000, 0.1652, 0.2033, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 40 50 40 20 30 60 70 20 30 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 42500 -0.028alpha = COV/Var40000 -0.029 37500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Double\_up | NLLA Double\_up(#286): [3.9158, 3.3541, 0.3043, 0.2018, 0.0008657, 0.001585, 0.0000, 0.2134, 0.1504, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 30 20 30 20 60 70 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#287): [3.1401, 3.1854, 0.1934, 0.2416, 0.001383, 0.000772, 0.0000, 0.1424, 0.1700, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 45000 -0.02842500 **Order Three Moms** -0.029 alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit -0.03330 40 50 40 50 70 20 60 70 20 30 60

Time

Double up | NLLA Double up(#288): [4.2216, 3.6281, 0.3025, 0.2516, 0.001322, 0.001267, 0.0000, 0.2164, 0.1820, 0.0000]1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)40 50 60 70 40 50 30 20 30 20 60 70 Time Time 47500 -0.025alpha data alpha fit 45000 -0.02642500 -0.027Order Three Moms alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03227500 20 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#289): [4.2918, 3.8279, 0.3172, 0.2577, 0.001209, 0.001432, 0.0000, 0.2253, 0.1868, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.025 45000 alpha fit -0.02642500 **Order Three Moms** alpha = COV/Var-0.02740000 -0.02837500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)-0.03130000 (0, 3)20 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#290): [4.7967, 2.9609, 0.4079, 0.1315, 0.0005952, 0.002067, 0.0000, 0.2809, 0.1078, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.026alpha data alpha fit 45000 -0.02742500 **Order Three Moms** -0.028alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)-0.03230000 (0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#291): [2.7089, 4.4072, 0.0977, 0.3780, 0.00218, 0.000343, 0.0000, 0.0854, 0.2554, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha data alpha\_fit 45000 -0.02942500 Order Three Moms alpha = COV/Var-0.030 40000 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)20 30 40 50 20 40 50 60 70 60 70 30 Time Time

Double\_up | NLLA Double\_up(#292): [3.4167, 3.9541, 0.2001, 0.2984, 0.001649, 0.000932, 0.0000, 0.1490, 0.2082, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028 alpha fit 42500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#293): [4.3396, 3.2815, 0.3444, 0.1861, 0.0007823, 0.001703, 0.0000, 0.2375, 0.1410, 0.0000] 1200 -(1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha\_fit -0.02642500 -0.027**Order Three Moms** alpha = COV/Var40000 -0.02837500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 -0.031(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#294): [4.3730, 2.7377, 0.3380, 0.1432, 0.0009015, 0.001578, 0.0000, 0.2341, 0.1110, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 45000 -0.02942500 **Order Three Moms** alpha = COV/Var-0.030 40000 37500 -0.03135000 -0.032(3, 0)32500 (2, 1)(1, 2)alpha\_data 30000 -0.033

(0, 3)

70

20

30

40

Time

50

30

20

40

Time

50

60

alpha fit

70

Double\_up | NLLA Double\_up(#295): [3.5227, 3.5550, 0.2543, 0.2217, 0.001005, 0.001502, 0.0000, 0.1797, 0.1617, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 40 50 40 20 30 60 70 20 30 60 70 Time Time 47500 alpha data alpha fit 45000 -0.02942500 alpha = COV/Var-0.030 40000 37500 -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)30000 (0, 3)-0.03327500 20 30 40 50 20 40 50 70 60 70 30 60

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#296): [3.8838, 3.4245, 0.2982, 0.2015, 0.0008379, 0.001655, 0.0000, 0.2073, 0.1502, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#297): [4.1454, 2.8596, 0.3382, 0.1470, 0.0006224, 0.001703, 0.0000, 0.2321, 0.1147, 0.0000] 1200 33.0 1150 32.5 32.0 and 31.5 order One 31.0 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026 alpha data 45000 alpha fit -0.02742500 Order Three Moms -0.028alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#298): [3.9510, 3.3576, 0.2822, 0.2167, 0.001162, 0.001377, 0.0000, 0.1993, 0.1587, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.027alpha data 45000 alpha fit -0.02842500 alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#299): [3.3629, 3.6228, 0.2048, 0.2673, 0.001495, 0.0008836, 0.0000, 0.1507, 0.1861, 0.0000](1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.028 45000 -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit

40

Time

20

30

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#300): [3.3026, 4.4115, 0.1978, 0.3220, 0.001517, 0.001221, 0.0000, 0.1460, 0.2273, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data -0.029545000 alpha fit -0.030042500 Order Three Moms = COV/Var -0.030540000 37500 -0.031035000 -0.0315(3, 0)32500 -0.0320(2, 1)30000 (1, 2)-0.0325(0, 3)27500 50 20 30 40 50 60 70 20 30 40 60 70

Time

Double\_up | NLLA Double\_up(#301): [3.3937, 4.0831, 0.2013, 0.3039, 0.001621, 0.0009679, 0.0000, 0.1502, 0.2111, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.028alpha fit 42500 **Order Three Moms** -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#302): [4.3132, 2.9421, 0.3588, 0.1438, 0.0005941, 0.001852, 0.0000, 0.2464, 0.1137, 0.0000] 1200 33.0 1150 32.5 32.0 one Woms 31.5 31.0 **Order Two Moms** 1100 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02747500 alpha\_data alpha\_fit 45000 -0.028 42500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)27500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#303): [4.4971, 2.9558, 0.3834, 0.1360, 0.0004737, 0.002011, 0.0000, 0.2618, 0.1104, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027 alpha data 45000 alpha fit -0.02842500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#304):  $[3.8858, 3.3004, 0.2926, 0.2120, 0.00101, 0.0014\overline{3}3, 0.0000, 0.2069, 0.1574, 0.0000]$ 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027alpha\_data 45000 alpha\_fit -0.02842500 -0.029Order Three Moms alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)-0.03330000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#305): [3.8057, 3.2973, 0.2728, 0.2086, 0.001098, 0.001376, 0.0000, 0.1925, 0.1525, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0285alpha data 45000 alpha fit -0.029042500 Order Three Moms COV/Var -0.029540000 -0.030037500 alpha : -0.030535000 (3, 0)-0.031032500 (2, 1)(1, 2)30000 -0.0315(0, 3)27500 20 40 50 20 30 50 60 70 30 60 70 40

Time

Double\_up | NLLA Double\_up(#306): [5.1169, 2.1970, 0.4625, 0.0205, 2.439e-13, 0.002644, 0.0000, 0.3075, 0.0385, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.029 45000 -0.03042500 **Order Three Moms** alpha = COV/Var -0.03140000 -0.03237500 35000 -0.033(3, 0)32500 -0.034(2, 1)alpha data (1, 2)30000 -0.035(0, 3)alpha fit

40

Time

30

20

50

60

70

30

20

40

Time

50

60

Double up | NLLA Double up(#307): [3.9836, 3.6408, 0.2786, 0.2522, 0.001284, 0.001273, 0.0000, 0.1988, 0.1824, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 -0.032(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#308): [3.9739, 3.1565, 0.2859, 0.2067, 0.001189, 0.001271, 0.0000, 0.2033, 0.1515, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 alpha data 45000 alpha fit 42500 -0.029alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)-0.032 30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Time

**Order Three Moms** 

Double\_up | NLLA Double\_up(#309): [3.7897, 3.2041, 0.2709, 0.2028, 0.001046, 0.001334, 0.0000, 0.1896, 0.1484, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)50 60 70 50 40 40 20 30 20 30 60 70 Time Time 47500 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit 30 40 50 20 40 70 20 60 70 30 50 60

Time

Double up | NLLA Double up(#310): [4.9398, 2.2927, 0.4535, 0.0416, 6.23e-11, 0.002514, 0.0000, 0.3038, 0.0524, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.028 42500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double up | NLLA Double up(#311): [4.8152, 2.6925, 0.4234, 0.0887, 0.0002484, 0.002355, 0.0000, 0.2854, 0.0822, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 50 20 30 40 60 70 20 30 40 60 70 Time Time -0.0280alpha\_data 45000 alpha\_fit -0.028542500 -0.0290Order Three Moms = COV/Var40000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)-0.031530000 (0, 3)-0.032020 40 50 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#312): [4.1467, 3.6237, 0.2944, 0.2455, 0.001277, 0.001304, 0.0000, 0.2095, 0.1774, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 35000 -0.030(3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70

Time

Double up | NLLA Double up(#313): [3.3200, 3.6641, 0.1772, 0.3119, 0.001928, 0.0004482, 0.0000, 0.1377, 0.2153, 0.0000](1, 0)1200 33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.02745000 -0.02842500 **Order Three Moms** alpha = COV/Var-0.02940000 -0.03037500 35000 -0.031(3, 0)32500 -0.032(2, 1)alpha\_data (1, 2)30000 -0.033(0, 3)alpha fit

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#314): [3.8675, 4.4594, 0.2311, 0.3418, 0.001804, 0.001057, 0.0000, 0.1716, 0.2401, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data -0.02845000 alpha\_fit 42500 Order Three Moms -0.029alpha = COV/Var40000 37500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032 30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#315): [3.7713, 3.0461, 0.2671, 0.2016, 0.001185, 0.001148, 0.0000, 0.1903, 0.1461, 0.0000] 1200 33.0 1150 32.5 32.0 and 31.5 31.0 **Order Two Moms** 1100 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 50 20 30 40 60 70 20 30 40 60 70 Time Time 47500 alpha data -0.028alpha\_fit 45000 42500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)30000 (1, 2)(0, 3)-0.03227500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double up | NLLA Double up(#316): [2.6949, 4.5170, 0.1265, 0.3784, 0.001782, 0.0006043, 0.0000, 0.1016, 0.2606, 0.0000]1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.026 alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03220 30 40 50 20 40 50 60 70 60 70 30

Time

Double\_up | NLLA Double\_up(#317): [3.5552, 3.6973, 0.2334, 0.2663, 0.001377, 0.001074, 0.0000, 0.1698, 0.1885, 0.0000] (1, 0)1200 33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.02845000 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)alpha data (1, 2)30000 -0.033(0, 3)alpha fit 30 40 50 40 70 20 60 70 20 30 50 60

Time

Double\_up | NLLA Double\_up(#318): [3.9583, 3.2397, 0.2923, 0.2127, 0.001092, 0.001265, 0.0000, 0.2069, 0.1549, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.025 45000 -0.02642500 -0.027Order Three Moms alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)-0.03132500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit -0.033 27500 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#319): [3.4232, 3.2616, 0.2483, 0.2078, 0.0009298, 0.001343, 0.0000, 0.1744, 0.1520, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)(0, 2)900 50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 -0.0275 alpha\_data alpha\_fit 45000 -0.028042500 -0.028540000 -0.029037500 -0.0295alpha -0.030035000 (3, 0)-0.030532500 (2, 1)-0.0310(1, 2)30000 (0, 3)

-0.0315

20

30

40

Time

50

60

70

Three Moms

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#320): [3.8661, 3.5033, 0.2900, 0.2060, 0.0009017, 0.001654, 0.0000, 0.2017, 0.1527, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0275alpha data 45000 alpha fit -0.028042500 -0.0285**Order Three Moms** alpha = COV/Var40000 -0.029037500 -0.0295-0.030035000 (3, 0)-0.030532500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#321): [4.9762, 2.7822, 0.4470, 0.0890, 0.0001186, 0.0025, 0.0000, 0.2998, 0.0840, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.027545000 -0.028042500 Order Three Moms -0.028540000 -0.029037500 alpha = -0.029535000 -0.0300(3, 0)32500 -0.0305(2, 1)alpha data (1, 2)30000 -0.0310(0, 3)alpha fit 40 50 20 30 40 20 30 60 70 50 60 70 Time Time

Double\_up | NLLA Double\_up(#322): [3.6212, 3.8498, 0.2216, 0.2832, 0.001609, 0.0009852, 0.0000, 0.1631, 0.1978, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit -0.02842500 **Order Three Moms** alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.033

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#323): [3.5876, 4.6092, 0.1731, 0.3832, 0.002331, 0.0005355, 0.0000, 0.1384, 0.2603, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.0285 42500 -0.0290Order Three Moms = COV/Var40000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 -0.0310(2, 1)(1, 2)-0.031530000 (0, 3)

-0.0320

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double up(#324): [4.6888, 3.2982, 0.3966, 0.1487, 0.0004759, 0.00226, 0.0000, 0.2694, 0.1207, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms -0.029alpha = COV/Var40000 -0.03037500 -0.031 35000 (3, 0)32500 -0.032(2, 1)(1, 2)30000 -0.033 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#325): [4.5718, 2.7196, 0.4040, 0.0934, 0.0002311, 0.002278, 0.0000, 0.2726, 0.0834, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02745000 alpha fit 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 35000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#326): [4.0622, 3.0719, 0.3410, 0.1585, 0.0005005, 0.001823, 0.0000, 0.2339, 0.1239, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 20 30 40 50 60 70 60 70 Time Time 47500 -0.02645000 -0.02742500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit

-0.033

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#327): [3.1717, 3.6966, 0.1915, 0.2679, 0.001437, 0.0009605, 0.0000, 0.1414, 0.1869, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 45000 -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032alpha\_data (1, 2)30000

(0, 3)

70

30

20

40

Time

50

60

alpha fit

Time

50

60

70

40

20

Double\_up | NLLA Double\_up(#328): [4.2067, 2.6508, 0.3573, 0.1135, 0.0004137, 0.001931, 0.0000, 0.2428, 0.0946, 0.0000] 1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280 alpha data 45000 alpha fit -0.028542500 **Order Three Moms** -0.0290COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 -0.0315(0, 3)

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#329): [3.6024, 3.1689, 0.2667, 0.1891, 0.0008629, 0.001422, 0.0000, 0.1852, 0.1385, 0.0000]1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028045000 -0.028542500 **Order Three Moms** alpha = COV/Var -0.029040000 37500 -0.029535000 -0.0300(3, 0)32500 -0.0305(2, 1)alpha data (1, 2)30000 -0.0310(0, 3)alpha fit 40 50 20 30 40 20 30 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#330): [4.1337, 1.9112, 0.3782, 0.0359, 4.771e-10, 0.002057, 0.0000, 0.2534, 0.0439, 0.0000] (1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 42500 -0.028**Order Three Moms** alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.032 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#331): [2.5715, 4.9932, 0.0507, 0.4548, 0.002699, 1.081e-13, 0.0000, 0.0589, 0.3035, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02945000 42500 -0.030**Order Three Moms** alpha = COV/Var40000 -0.03137500 -0.032 35000 (3, 0)32500 -0.033(2, 1)alpha data (1, 2)30000 (0, 3)-0.034alpha fit 30 40 50 40 60 70 20 60 70 20 30 50

Time

Double\_up | NLLA Double\_up(#332): [3.5077, 3.3179, 0.2062, 0.2499, 0.001673, 0.000749, 0.0000, 0.1531, 0.1733, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.029045000 alpha fit 42500 -0.0295**Order Three Moms** = COV/Var-0.030040000 -0.030537500 -0.031035000 (3, 0)-0.031532500 (2, 1)(1, 2)-0.032030000 (0, 3)-0.032520 40 50 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#333): [2.9228, 3.9248, 0.1475, 0.3276, 0.001816, 0.0004927, 0.0000, 0.1167, 0.2245, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)40 50 60 70 40 50 30 20 30 20 60 70 Time Time -0.02747500 alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.03227500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#334): [3.7373, 4.1243, 0.2279, 0.3071, 0.001686, 0.001032, 0.0000, 0.1684, 0.2152, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#335): [3.7708, 3.6160, 0.2604, 0.2452, 0.001228, 0.001312, 0.0000, 0.1855, 0.1775, 0.0000]1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)27500 20 30 40 50 20 30 40 50 70 60 70 60

Time

Double\_up | NLLA Double\_up(#336): [4.3977, 3.6279, 0.3353, 0.2067, 0.0009862, 0.001794, 0.0000, 0.2334, 0.1540, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#337): [4.2782, 4.1136, 0.2684, 0.3095, 0.001876, 0.001028, 0.0000, 0.1982, 0.2172, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)(0, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 alpha data 45000 alpha fit 42500 -0.029**Order Three Moms** alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#338): [4.4221, 2.5995, 0.3852, 0.0995, 0.0002848, 0.002094, 0.0000, 0.2603, 0.0875, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02745000 -0.02842500 **Order Three Moms** alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)alpha data 30000 (0, 3)alpha fit

20

40

Time

50

60

70

30

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#339): [2.9648, 4.4002, 0.1306, 0.3854, 0.002104, 0.0003099, 0.0000, 0.1079, 0.2620, 0.0000]1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 alpha\_data 37500 alpha fit -0.029 35000 (3, 0)32500 -0.030(2, 1)(1, 2)30000 (0, 3)-0.03127500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#340): [3.5787, 3.9601, 0.1978, 0.3203, 0.001916, 0.0006283, 0.0000, 0.1503, 0.2205, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data alpha fit 45000 -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#341): [4.3385, 3.8261, 0.3526, 0.2037, 0.0006393, 0.002164, 0.0000, 0.2412, 0.1565, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.0275alpha\_data 45000 alpha\_fit -0.028042500 -0.0285Order Three Moms = COV/Var40000 -0.029037500 -0.0295-0.030035000 (3, 0)-0.030532500 (2, 1)-0.0310(1, 2)30000 (0, 3)

-0.0315

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#342): [3.1099, 4.5864, 0.1583, 0.3731, 0.00187, 0.0007644, 0.0000, 0.1239, 0.2584, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 50 40 40 20 30 60 70 20 30 60 70 Time Time 47500 alpha data -0.028alpha fit 45000 42500 -0.029alpha = COV/Var40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 (0, 3)-0.03227500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#343): [4.2114, 3.5390, 0.3113, 0.2084, 0.001076, 0.001659, 0.0000, 0.2180, 0.1538, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.0290alpha\_data 45000 alpha\_fit -0.029542500 Order Three Moms = COV/Var -0.030040000 -0.030537500 -0.031035000 (3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320(0, 3)40 50 20 30 40 50 20 30 60 70 60 70

Time

Double up | NLLA Double up(#344): [4.1988, 4.0208, 0.2826, 0.2760, 0.001497, 0.001348, 0.0000, 0.2029, 0.1972, 0.0000]1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027545000 alpha fit -0.028042500 -0.0285**Order Three Moms** = COV/Var40000 -0.029037500 -0.029535000 -0.0300(3, 0)-0.030532500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.031540 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#345): [4.0778, 3.4732, 0.3051, 0.2276, 0.001056, 0.001403, 0.0000, 0.2156, 0.1668, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.02547500 45000 -0.02642500 -0.027Order Three Moms alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit -0.03227500 20 30 40 50 20 40 60 70 30 50 60 70 Time Time

Double\_up | NLLA Double\_up(#346): [3.9039, 2.6844, 0.3029, 0.1538, 0.0008554, 0.001372, 0.0000, 0.2118, 0.1164, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 30 40 50 40 20 20 30 60 70 60 70 Time Time 47500 -0.0275alpha data alpha fit 45000 -0.0280-0.028542500 Order Three Moms = COV/Var -0.029040000 -0.029537500 -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 (0, 3)-0.0315

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#347): [3.5993, 3.9450, 0.2284, 0.2767, 0.00143, 0.001237, 0.0000, 0.1651, 0.1965, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data alpha fit 45000 -0.029 42500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.031 35000 (3, 0)32500 (2, 1)-0.032 (1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#348): [3.4575, 4.2380, 0.1821, 0.3449, 0.00198, 0.0005983, 0.0000, 0.1403, 0.2354, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.026 alpha fit 42500 -0.027Order Three Moms alpha = COV/Var40000 -0.028 37500 -0.02935000 -0.030(3, 0)32500 (2, 1)(1, 2)30000 -0.031(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#349): [3.8354, 3.6932, 0.2726, 0.2346, 0.001152, 0.001507, 0.0000, 0.1931, 0.1706, 0.0000] 1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0285alpha data 45000 alpha fit -0.029042500 -0.0295Order Three Moms = COV/Var 40000 -0.0300-0.030537500 alpha -0.031035000 -0.0315(3, 0)32500 (2, 1)-0.0320(1, 2)30000 (0, 3)-0.032527500 20 40 50 20 30 40 50 60 70 30 60 70

Time

Double\_up | NLLA Double\_up(#350): [3.4105, 3.3849, 0.2111, 0.2623, 0.001579, 0.0007567, 0.0000, 0.1582, 0.1840, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)50 40 50 40 20 30 20 30 60 70 60 70 Time Time 47500 alpha data -0.0285alpha\_fit 45000 -0.029042500 **Order Three Moms** -0.0295COV/Var 40000 -0.030037500 alpha = -0.030535000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320(0, 3)

-0.0325

40

Time

30

20

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#351): [4.0915, 3.3078, 0.3247, 0.1886, 0.0007713, 0.001681, 0.0000, 0.2251, 0.1420, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.02935000 -(3, 0)-0.03032500 (2, 1)(1, 2)30000 -0.031(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#352): [5.0109, 2.4286, 0.4508, 0.0498, 8.171e-05, 0.002547, 0.0000, 0.3018, 0.0573, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)40 50 40 50 20 30 20 30 60 70 60 70 Time Time 47500 alpha\_data -0.028 alpha fit 45000 42500 alpha = COV/Var -0.029 40000 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#353): [4.3268, 2.9316, 0.3473, 0.1563, 0.0007415, 0.001643, 0.0000, 0.2399, 0.1203, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30 40 50 20 30 40 50 20 60 70 60 70 Time Time 47500 -0.026545000 -0.027042500 -0.0275**Order Three Moms** 40000 -0.028037500 -0.0285alpha 35000 -0.0290(3, 0)-0.029532500 (2, 1)-0.0300alpha data (1, 2)30000 (0, 3)alpha fit -0.0305

50

40

Time

20

30

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#354): [4.6887, 2.4897, 0.4067, 0.0936, 0.0003225, 0.002011, 0.0000, 0.2750, 0.0826, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.025alpha data 45000 alpha fit -0.02642500 Order Three Moms alpha = COV/Var-0.02740000 -0.02837500 35000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)-0.03120 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#355): [4.6446, 2.7903, 0.4037, 0.1032, 0.0002997, 0.00226, 0.0000, 0.2723, 0.0904, 0.0000]1200 33.0 1150 32.5 order Two Order Two 1050 1000 Order One Moms 32.0 31.5 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0280alpha data 45000 alpha fit -0.028542500 -0.0290 Order Three Moms = COV/Var 40000 -0.029537500 -0.030035000 (3, 0)32500 -0.0310(2, 1)(1, 2)30000 -0.0315(0, 3)40 50 20 30 40 50 20 30 60 70 60 70

Time

Double up | NLLA Double up(#356): [4.2585, 3.0860, 0.3503, 0.1561, 0.000634, 0.001889, 0.0000, 0.2415, 0.1228, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha\_data -0.02645000 alpha\_fit -0.02742500 Order Three Moms -0.028COV/Var 40000 -0.02937500 alpha = -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03330 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#357): [4.1236, 3.2911, 0.3076, 0.2044, 0.00099, 0.00148, 0.0000, 0.2142, 0.1517, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.027 45000 alpha fit 42500 -0.028alpha = COV/Var40000 37500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 (0, 3)-0.03120 30 40 50 20 40 50 60 70 60 70 30

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#358): [3.7407, 3.5620, 0.2440, 0.2476, 0.001419, 0.001052, 0.0000, 0.1761, 0.1735, 0.0000] 1200 33.0 1150 32.5 Order One Moms 32.0 31.5 **Order Two Moms** 1100 1050 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.027545000 -0.028042500 -0.0285Order Three Moms = COV/Var 40000 -0.029037500 -0.0295-0.030035000 (3, 0)-0.030532500 (2, 1)-0.0310alpha data (1, 2)30000 alpha fit (0, 3)-0.031540 50 20 30 40 20 30 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#359): [3.7346, 3.6035, 0.2474, 0.2436, 0.001384, 0.00124, 0.0000, 0.1783, 0.1740, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0290alpha data 45000 alpha fit -0.029542500 -0.0300Order Three Moms COV/Var 40000 -0.030537500 alpha -0.031035000 -0.0315(3, 0)32500 (2, 1)-0.0320(1, 2)30000 (0, 3)-0.032540 50 20 30 40 50 60 70 20 30 60 70 Time Time

Double\_up | NLLA Double\_up(#360): [4.5474, 2.9340, 0.3932, 0.1304, 0.0004413, 0.002058, 0.0000, 0.2698, 0.1072, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha data -0.027alpha fit 45000 42500 -0.028Order Three Moms alpha = COV/Var40000 -0.02937500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#361): [3.5360, 3.1227, 0.2438, 0.2102, 0.001188, 0.001094, 0.0000, 0.1747, 0.1507, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028045000 alpha fit -0.028542500 **Order Three Moms** -0.0290COV/Var 40000 -0.029537500 alpha = -0.030035000 -0.0305(3, 0)32500 (2, 1)-0.0310(1, 2)30000 -0.0315(0, 3)40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#362): [4.1375, 3.4596, 0.2659, 0.2375, 0.001639, 0.001093, 0.0000, 0.1925, 0.1675, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02945000 42500 -0.030 Order Three Moms alpha = COV/Var40000 -0.03137500 -0.03235000 (3, 0)-0.03332500 (2, 1)alpha data (1, 2)30000 -0.034(0, 3)alpha fit 30 40 50 40 50 70 20 60 70 20 30 60

Time

Double\_up | NLLA Double\_up(#363): [4.4951, 3.2211, 0.3471, 0.1773, 0.0009586, 0.001705, 0.0000, 0.2410, 0.1341, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double up | NLLA Double up(#364):  $[4.6847, 2.2196, 0.4118, 0.0567, 0.0002442, 0.002\overline{1}78, 0.0000, 0.2771, 0.0588, 0.0000]$ 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time -0.0285alpha\_data 45000 alpha\_fit -0.029042500 -0.0295Order Three Moms COV/Var 40000 -0.030037500 alpha = -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.0320

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#365): [3.9045, 3.6773, 0.2800, 0.2357, 0.001154, 0.001456, 0.0000, 0.1984, 0.1705, 0.0000]1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 40 50 40 20 30 20 30 60 70 60 70 Time Time 47500 -0.0280alpha data alpha fit 45000 -0.028542500 -0.0290Order Three Moms alpha = COV/Var40000 -0.029537500 -0.0300-0.030535000 (3, 0)-0.031032500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.032040 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#366): [3.5356, 3.8069, 0.2045, 0.2812, 0.001713, 0.0008993, 0.0000, 0.1520, 0.1948, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 -0.03037500 -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)30000 -0.033 (0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#367): [4.4571, 2.7501, 0.3737, 0.1149, 0.0004657, 0.002012, 0.0000, 0.2534, 0.0957, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 20 30 40 50 60 70 60 70 Time Time -0.02745000 -0.02842500 Order Three Moms -0.029alpha = COV/Var40000 -0.03037500 -0.03135000 (3, 0)32500 -0.032(2, 1)alpha data (1, 2)30000 -0.033 (0, 3)alpha fit

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#368): [3.4755, 2.8775, 0.2666, 0.1614, 0.0007621, 0.001457, 0.0000, 0.1855, 0.1209, 0.0000]1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0285alpha data 45000 alpha fit -0.029042500 -0.0295COV/Var 40000 -0.030037500 -0.0305alpha 35000 -0.0310(3, 0)32500 -0.0315(2, 1)(1, 2)30000 -0.0320

(0, 3)

70

-0.0325

20

30

40

Time

50

60

70

Order Three Moms

27500

20

40

Time

30

50

Double\_up | NLLA Double\_up(#369): [4.4644, 2.3851, 0.3803, 0.0963, 0.0004662, 0.001845, 0.0000, 0.2598, 0.0829, 0.0000] 1200 33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.027alpha fit 42500 Order Three Moms -0.028 alpha = COV/Var40000 37500 -0.02935000 -0.030 (3, 0)32500 (2, 1)(1, 2)30000 -0.031(0, 3)40 20 30 40 50 20 30 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#370): [4.0044, 4.2554, 0.2929, 0.2899, 0.001193, 0.001498, 0.0000, 0.2097, 0.2082, 0.0000] (1, 0)1200 (0, 1)33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.024alpha data alpha fit 45000 -0.02542500 **Order Three Moms** -0.026alpha = COV/Var40000 -0.02737500 -0.02835000 -0.029(3, 0)32500 (2, 1)-0.030(1, 2)30000 -0.031(0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#371): [3.9414, 3.8122, 0.2615, 0.2673, 0.001474, 0.001216, 0.0000, 0.1888, 0.1906, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028alpha data 45000 alpha fit -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)-0.03232500 (2, 1)(1, 2)30000 -0.033(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#372): [3.7677, 3.5144, 0.2785, 0.2216, 0.0009512, 0.00149, 0.0000, 0.1948, 0.1629, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#373): [4.1209, 2.9647, 0.3450, 0.1277, 0.0004462, 0.002093, 0.0000, 0.2345, 0.1050, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)50 30 40 50 40 20 20 30 60 70 60 70 Time Time 47500 -0.029545000 -0.030042500 Order Three Moms COV/Var -0.0305 40000 37500 alpha = -0.031035000 (3, 0)-0.031532500 (2, 1)alpha data (1, 2)30000 -0.0320(0, 3)alpha fit

50

60

70

40

Time

20

30

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#374): [3.8226, 3.8969, 0.2389, 0.2819, 0.001587, 0.001109, 0.0000, 0.1736, 0.1991, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02942500 Order Three Moms alpha = COV/Var40000 -0.030 37500 -0.03135000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 70 60 70 60

Time

Double\_up | NLLA Double\_up(#375): [3.2985, 3.6476, 0.2256, 0.2555, 0.001194, 0.001123, 0.0000, 0.1637, 0.1808, 0.0000] 1200 -33.0 1150 32.5 1100 Order Two Moms Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 Order Three Moms -0.029alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.03230000 (1, 2)alpha data (0, 3)alpha fit -0.03327500 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#376): [4.3160, 2.9221, 0.3699, 0.1353, 0.0004624, 0.001989, 0.0000, 0.2536, 0.1099, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 alpha\_data 45000 alpha\_fit -0.02642500 Order Three Moms alpha = COV/Var-0.028 40000 37500 -0.03035000 (3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)30 40 50 20 30 40 50 60 70 20 60 70

Time

Double\_up | NLLA Double\_up(#377): [4.2517, 2.9383, 0.3423, 0.1559, 0.0007055, 0.001659, 0.0000, 0.2360, 0.1200, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.026alpha data alpha\_fit 45000 -0.027 42500 Order Three Moms alpha = COV/Var40000 -0.02837500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 -0.031(0, 3)

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#378):  $[3.3772, 3.1044, 0.2287, 0.2162, 0.001181, 0.0010\overline{32}, 0.0000, 0.1638, 0.1551, 0.0000]$ 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)50 20 30 40 50 60 70 20 30 40 60 70 Time Time -0.027alpha\_data 45000 alpha\_fit -0.02842500 Order Three Moms alpha = COV/Var-0.02940000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)-0.032 (1, 2)30000 (0, 3)-0.033 20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#379): [4.2680, 3.4475, 0.3223, 0.1951, 0.001028, 0.001709, 0.0000, 0.2257, 0.1451, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.0295 45000 -0.030042500 **Order Three Moms** = COV/Var-0.0305 40000 -0.031037500 35000 -0.0315(3, 0)32500 -0.0320(2, 1)alpha data (1, 2)30000 -0.0325(0, 3)alpha fit 40 50 50 60 70 20 30 60 70 20 30 40

Time

Double\_up | NLLA Double\_up(#380): [4.4467, 3.2460, 0.3363, 0.1981, 0.00102, 0.001521, 0.0000, 0.2342, 0.1483, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 alpha fit -0.02742500 **Order Three Moms** alpha = COV/Var40000 -0.028 37500 -0.029 35000 (3, 0)32500 (2, 1)-0.030(1, 2)30000 (0, 3)20 30 40 50 20 30 40 50 60 70 60 70 Time Time

Double\_up | NLLA Double\_up(#381): [4.4988, 2.9850, 0.3902, 0.1238, 0.0002373, 0.002248, 0.0000, 0.2615, 0.1051, 0.0000] 1200 33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms alpha = COV/Var40000 -0.028 37500 -0.02935000 (3, 0)32500 -0.030 (2, 1)(1, 2)30000 (0, 3)-0.03127500

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#382): [4.1129, 2.8420, 0.3039, 0.1607, 0.0009997, 0.001462, 0.0000, 0.2114, 0.1212, 0.0000] 1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 (0, 1)900 (0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.0285alpha\_data 45000 alpha\_fit -0.029042500 -0.0295Order Three Moms = COV/Var 40000 -0.0300-0.030537500 -0.031035000 (3, 0)-0.031532500 (2, 1)-0.0320(1, 2)30000 (0, 3)-0.0325

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#383): [4.0504, 3.5454, 0.2573, 0.2699, 0.00169, 0.0008478, 0.0000, 0.1883, 0.1894, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)30 40 50 40 50 20 60 20 30 70 60 70 Time Time 47500 -0.02745000 -0.02842500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.03035000 (3, 0)32500 (2, 1)-0.031alpha data (1, 2)30000 (0, 3)alpha fit -0.03230 40 50 20 40 70 20 60 70 30 50 60 Time Time

Double\_up | NLLA Double\_up(#384): [3.3695, 3.7691, 0.2196, 0.2748, 0.00132, 0.001056, 0.0000, 0.1598, 0.1943, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30 40 50 60 70 20 30 40 50 20 60 70 Time Time 47500 -0.0270alpha data 45000 alpha fit -0.027542500 -0.0280Order Three Moms COV/Var -0.028540000 -0.029037500 alpha -0.029535000 -0.0300(3, 0)32500 (2, 1)-0.0305(1, 2)30000 -0.0310(0, 3)27500 40 50 20 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#385): [3.9219, 3.8592, 0.2768, 0.2578, 0.001216, 0.001438, 0.0000, 0.1965, 0.1864, 0.0000] 1200 -33.0 1150 32.5 32.0 31.5 31.0 1100 **Order Two Moms** 1050 1000 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 20 30 40 50 60 70 20 30 40 50 60 70 Time Time 45000 -0.02842500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.030 35000 -0.031(3, 0)32500 (2, 1)alpha data (1, 2)30000 -0.032(0, 3)alpha fit 27500 20 30 40 50 20 40 60 70 30 50 60 70

Time

Double\_up | NLLA Double\_up(#386): [3.3640, 3.5880, 0.2227, 0.2555, 0.001265, 0.001096, 0.0000, 0.1612, 0.1818, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02745000 -0.02842500 **Order Three Moms** alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032alpha data (1, 2)30000 (0, 3)alpha fit 20 30 40 50 20 40 60 70 30 50 60 70

Time

Double\_up | NLLA Double\_up(#387): [4.4628, 3.4197, 0.3365, 0.2028, 0.001085, 0.001642, 0.0000, 0.2355, 0.1514, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.02845000 alpha fit 42500 -0.029Order Three Moms alpha = COV/Var40000 -0.030 37500 35000 -0.031(3, 0)32500 (2, 1)(1, 2)30000 -0.032(0, 3)20 30 40 50 20 30 40 50 60 70 60 70

Time

Double\_up | NLLA Double\_up(#388): [3.7676, 3.5578, 0.2590, 0.2345, 0.00129, 0.001331, 0.0000, 0.1859, 0.1693, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.02945000 -0.03042500 **Order Three Moms** alpha = COV/Var-0.03140000 37500 -0.03235000 -0.033(3, 0)32500 (2, 1)alpha data (1, 2)-0.03430000 alpha\_fit (0, 3)20 30 40 50 40 70 60 70 20 30 50 60

Time

Double\_up | NLLA Double\_up(#389): [4.2700, 3.1217, 0.3374, 0.1591, 0.0007504, 0.001828, 0.0000, 0.2319, 0.1229, 0.0000] 1200 33.0 1150 32.5 Order One Moms 1100 **Order Two Moms** 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.027alpha data 45000 alpha fit -0.02842500 Order Three Moms alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#390): [2.9781, 3.5157, 0.1531, 0.2873, 0.001768, 0.0004967, 0.0000, 0.1193, 0.1970, 0.0000] 1200 33.0 1150 32.5 Order Two Moms 1100 Order One Moms 32.0 1050 31.5 1000 31.0 950 30.5 (2, 0)(1, 0)(1, 1)900 30.0 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 -0.0280alpha\_data 45000 alpha fit -0.028542500 -0.0290Order Three Moms = COV/Var 40000 -0.029537500 -0.030035000 -0.0305(3, 0)-0.031032500 (2, 1)-0.031530000 (1, 2)(0, 3)-0.032027500

20

30

40

Time

50

70

60

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#391): [5.6334, 2.5132, 0.5067, 0.0432, 5.227e-05, 0.002756, 0.0000, 0.3371, 0.0550, 0.0000] 1200 -33.0 1150 32.5 1100 Order One Moms Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data 45000 -0.027alpha fit 42500 -0.028alpha = COV/Var40000 -0.02937500 -0.03035000 -0.031(3, 0)32500 (2, 1)-0.032(1, 2)30000 (0, 3)-0.03327500

20

30

40

Time

50

60

70

Order Three Moms

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#392): [3.9081, 2.8555, 0.2975, 0.1683, 0.0009454, 0.001378, 0.0000, 0.2090, 0.1259, 0.0000] 1200 -33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.028 45000 -0.02942500 **Order Three Moms** alpha = COV/Var40000 -0.03037500 35000 -0.031(3, 0)32500 (2, 1)alpha\_data (1, 2)-0.03230000 (0, 3)alpha fit 20 30 40 50 20 30 40 60 70 50 60 70

Time

Double\_up | NLLA Double\_up(#393): [3.5315, 4.5841, 0.1770, 0.3822, 0.002216, 0.0005792, 0.0000, 0.1405, 0.2616, 0.0000]1200 33.0 1150 32.5 1100 **Order Two Moms** Order One Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.028545000 alpha fit -0.029042500 Order Three Moms COV/Var -0.029540000 -0.030037500 alpha -0.030535000 -0.0310(3, 0)32500 (2, 1)-0.0315(1, 2)30000 (0, 3)-0.0320

20

30

40

Time

50

60

70

40

Time

30

20

50

60

Double\_up | NLLA Double\_up(#394): [4.2600, 3.1560, 0.3249, 0.1869, 0.0008924, 0.001593, 0.0000, 0.2242, 0.1420, 0.0000] 1200 -33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 0)(1, 1)30.5 900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time -0.026alpha\_data 45000 alpha\_fit -0.02742500 Order Three Moms alpha = COV/Var40000 -0.028 37500 -0.02935000 (3, 0)-0.03032500 (2, 1)(1, 2)30000 (0, 3)-0.031

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#395): [4.2725, 3.2726, 0.3219, 0.2075, 0.001062, 0.00142, 0.0000, 0.2258, 0.1535, 0.0000] 1200 -33.0 1150 32.5 Order One Moms 1100 Order Two Moms 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time alpha data -0.026 45000 alpha fit 42500 -0.027alpha = COV/Var40000 -0.02837500 -0.02935000 -0.030(3, 0)32500 (2, 1)-0.031(1, 2)30000 (0, 3)-0.03220 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms

Double\_up | NLLA Double\_up(#396): [2.9304, 3.8460, 0.1481, 0.3079, 0.001715, 0.000649, 0.0000, 0.1144, 0.2122, 0.0000] 1200 33.0 1150 32.5 Order One Moms Order Two Moms 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)20 30 40 50 60 70 20 30 40 50 70 60 Time Time 47500 alpha data 45000 alpha fit -0.029042500 -0.0295Order Three Moms COV/Var 40000 -0.030037500 alpha -0.030535000 (3, 0)-0.031032500 (2, 1)(1, 2)-0.031530000 (0, 3)20 40 50 30 40 50 60 70 20 30 60 70

Time

Double\_up | NLLA Double\_up(#397):  $[4.4921, 2.6721, 0.4040, 0.0882, 0.0001148, 0.002\overline{3}27, 0.0000, 0.2720, 0.0815, 0.0000]$ (1, 0)1200 (0, 1)33.0 1150 32.5 32.5 Order One Moms 31.5 Order Two Moms 1100 1050 1000 31.0 950 (2, 0)30.5 (1, 1)900 (0, 2)30.0 20 40 50 60 70 40 50 30 20 30 60 70 Time Time -0.02747500 alpha data alpha fit 45000 -0.028 42500 Order Three Moms alpha = COV/Var-0.029 40000 37500 -0.03035000 -0.031 (3, 0)32500 (2, 1)(1, 2)-0.03230000 (0, 3)

20

30

40

Time

50

60

70

27500

20

30

40

Time

50

60

Double\_up | NLLA Double\_up(#398): [4.8520, 2.9181, 0.4221, 0.1229, 0.0004294, 0.002161, 0.0000, 0.2885, 0.1036, 0.0000] 1200 (1, 0)33.0 (0, 1)1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)(1, 1)30.5 900 (0, 2)20 30 40 50 60 70 20 30 40 50 60 70 Time Time 47500 -0.027 alpha data alpha fit 45000 -0.028 42500 **Order Three Moms** alpha = COV/Var40000 -0.029 37500 -0.030 35000 (3, 0)32500 -0.031(2, 1)(1, 2)30000 (0, 3)-0.032

20

30

40

Time

50

60

70

30

20

40

Time

50

60

Double\_up | NLLA Double\_up(#399): [3.5800, 3.5999, 0.2462, 0.2450, 0.001198, 0.00124, 0.0000, 0.1762, 0.1754, 0.0000]1200 33.0 1150 32.5 Order One Moms **Order Two Moms** 1100 32.0 1050 31.5 1000 31.0 950 (2, 0)30.5 (1, 0)(1, 1)900 (0, 1)(0, 2)30.0 50 20 30 40 50 60 70 20 30 40 60 70 Time Time 47500 alpha\_data alpha\_fit 45000 -0.028 42500 alpha = COV/Var-0.029 40000 37500 -0.030 35000 (3, 0)-0.03132500 (2, 1)(1, 2)30000 -0.032(0, 3)27500 20 30 40 50 20 30 40 50 60 70 60 70

Time

Time

Order Three Moms