

Leveraged ETF-Trading:
The Johnny Walker-Strategy
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“Johnny Walker Red Label is the world’s best-selling Scotch, some 6.5 million coves a year are drunk; Johnny Walker Black Label is the world’s best selling premium whisky.”
(Johnny Walker, in Ch. MacLean, Pocket Whisky Book).

Abstract:

This working-paper analyzes an aggressive strategy which is based on short-selling of Leveraged-ETF's. The strategy exploits the volatility-drag of LETF's.
Revision-1 extends the results till 201.07.27.

The Money-destruction-trap:

Leveraged ETF's are one of the hottest recent finance products. They have been an instant success. They promise on a daily-basis 2x (Ultra) or -2x (Inverse-Ultra) the performance of the base ETF (which are usually tracking an index like Dow, S&P or Russel-2000). There are even Triple and Inverse-Triple ETF's available. Although these ETF's deliver indeed what they promise, they have in the long run severe side-effects. (<http://online.wsj.com/article/SB123578237239398181.html>).

Some authors have called LETF's the money-destruction-trap. The point is the promise of the daily-multiplier. But in the long run the effects of compounding come into play. If the base ETF has on day-1 a return of r_1 and on day-2 a return of r_2 the 2-days return is:

$$(1+r_1) * (1+r_2) - 1 = r_1 + r_2 + r_1 r_2. \quad (1)$$

The LETF has b -times the performance of the ETF.

$$(1+b*r_1) * (1+b*r_2) - 1 = b*r_1 + b*r_2 + b^2*r_1*r_2 \quad (2)$$

For the Ultra the formula becomes

$$2*r_1 + 2*r_2 + 4*r_1*r_2 \quad (3)$$

for the inverse-Ultra.

$$-2*r_1 - 2*r_2 + 4*r_1*r_2 \quad (4)$$

It's the final product term which makes the difference. If r_1 and r_2 have the same sign, the LETF outperforms over 2 days its base more than its daily multiplier, if r_1 and r_2

have different signs, the LETF is worse. The trend is the friend of the LETF. The roller coaster is the enemy.

For more than 2 days the formula gets quite evolved, but the general pattern is the same.

In [1] and [2] the authors have developed a general expression under the assumption that the base ETF follows a Brownian motion. The formula was developed in the 2 papers independently. But it's a simple exercise in Ito-Calculus.

$$L_t/L_0 = (S_t/S_0)^b \exp(-0.5 * (b^2 - b) * V_t) \quad (5)$$

L_t and L_0 is the price of the LETF at time t and 0. S_t is the base ETF and V_t is the variance of the base-ETF returns.

$(S_t/S_0)^b$ grows faster than $b*(S_t/S_0)$. With zero-variance the LETF would exponentially outperform the base times the multiplier. But the second term $\exp(-V_t)$ for an Ultra and $\exp(-3V_t)$ for the Inverse-Ultra is smaller than one. From this expression it's also clear, that the Inverse-Ultra, the Triple and the Inverse-Triple are hit harder from the variance.

The variance effect happens also in a perfect trading world. LETF's require additionally much higher rebalancing activities. The trading- and maintenance-costs are therefore considerable higher. The LETF manager must rebalance the fund each day against the current market movement. These additional costs are dragging the LETF further down.

Money does not disappear. If there is a money-trap or sink, there must be also a money-source.

The Johnny-Walker Red Label Strategy:

One goes the base ETF 2x-long and the Ultra 1x short. Actually the empirical multiplier was determined and this empirical ratio was used. But it's for most Ultras very close to 2.0. The LETF managers do a good job to maintain this ratio.

I have used the most primitive setting. One enters the trade with 2 Million \$ long on 2010-03-17 at the close and unwinds the position at 2011-08-31 at the close.

Nothing is done in between. Just wait for the swing. The same starting date was used in previous studies. In this way one can compare different strategies. There is no cheating by selecting especially profitable time-windows involved. Some of the previous strategies need a historic-time window and I do not consider the 2008 crash as representative. In this case one could extend the window for most ETF's pairs longer. Generally the strategies make fantastic wins in the large up and down swings of the 2008 crash, but loose in the strong 2009 recovery. I do not consider this time-frame representative for the immediate future. The starting date is not very favorable for the strategy. Johnny needs some time before he starts to walk.

The profitability of the strategy depends in all cases on the ratio between the trend (it does not matter in which direction) and the variance. Initially I wanted to select pairs

alongside from formula (5). The variance ratio between indexes is relative constant. The Russel-2000 has practically always a higher volatility/variance than the Dow. But the trend changes. The best selection criterion seems to be: select the index and the corresponding ETF-pair with the highest volatility (but see SLV below). It does not matter if there is for some time a trend. When the fat lady sings the variance has killed the Ultra.

A good pair is the base IWM (Russel-2000) versus its Ultra UWM. The final win is 90.000\$. The detailed monthly results can be found in Table-1 at the end.

The best considered pair was IYR (Down-Jones Real-Estate) and it's Ultra URE.

The wins-ordering was practically inline with the general volatility of the index. There was one pair – the Dow ETF DIA v. DDM - which resulted in a slight loss.

The Red Label seems to be a relative save bet with nice but not spectacular wins. The main effort is to find appropriate pairs with a high underlying volatility. But the strategy failed for SLV. SLV has a very high volatility, but it had also till May 2011 an extreme rally. In this rally the Red-Label would have been a disaster. Shortly after the Silver-crash in May 2011 it was profitable again. The profit was lost in the following rally and the pair is down with -152K.

The Red-Label Special Edition:

One can of course play the same with the Triple. 2 interesting pairs are IWM and its triple TNA. The overall win was 207.578 \$. But note that in this case one invests 2M\$ in the long and shorts only with 670K\$.

Another interesting pair is EEM (MSCI Emerging Markets) and its triple EDC. This pair has an almost straight-up performance. EEM versus its Ultra should be also interesting. But I have not found the ticker so far. It was generally not the purpose of this study to find the best possible pair. It's a study of the general behavior.

The Johnny-Walker Black Label Strategy:

One can play a similar strategy with the Inverse-Ultra or the Inverse-Triple. This strategy should be even more interesting, because the volatility enters with the factor -3 (instead of -1) in formula (5). In this case one goes both ETFs short.

The ranking between the Black-Label pairs is similar to the Red-Label. Just the effect is considerable larger.

The pair IWM v. the Inverse-Ultra TWM wins 288781\$. This is very close 3-times the win of the Red-Label pair IWM v. UWM. The factor-3 effect holds for almost all combinations. Although formula (5) is only a first approximation, it gets the overall picture right.

The selection process is thus identical to the Red-Label. Select an index with high-volatility. But beware of extreme trends. The Black Label silver pair SLV v. ZSL is a full disaster.

If the underlying index grows very fast, there is no way for the shorted Inverse-Ultra to compensate the loss of the base ETF. Especially if the shorted base grows more than 50% the Inverse-Ultra has to fall below Zero to compensate the loss on the base-side.

In [3] Euan Sinclair noted that one has to do a wing-protection with options for this strategy (Euan spoke generally about Johnny, he did not differentiate between labels). Generally the Black- is riskier than the Red-Label, but its also 3x more fun.

There is of course also a Black-Label Special-Edition. Play the same strategy with the Inverse-Triple. The inverse-triple performs somewhat better, but the effect is not as marked as between the Ultra and Triple. The best combination is EEM and EDZ (see Table 7). As said above. EEM and its inverse Ultra should also be a very good pair.

The Johnny-Walker Blue Label Strategy:

Although less known there is also a Johnny Walker Blue Label. This is for people who have too much money (and probably too less taste). The malts of this blend are up to 60 years old.

The enemy of the Ultras is the expression $\exp(\text{factor} \cdot \text{Volatility})$ in formula (5). The factor is -1 for Ultras and -3 for Inverse-Ultras. The second term is the volatility. Low-volatile Ultras are less hit then high-volatile ones. The Blue-Label strategy uses this fact. A good combination for this strategy is the Dow-Ultra DDM long versus the Russel-2000 Ultra UWM short. For the other strategies the LETF manager guaranties (within a small band) the multiplication factor. This factor is constant over time. The base and Ultra have usually a correlation of more than 0.99. There is no guarantee in this way for the Blue-Label pair. The multiplicator was found empirically to be 1.22. But this is just an average value. In strong rallies the Russel-2000 surpasses the Dow, in bad times there is a flight to quality and the Dow outperforms the Russel. The same holds for the Ultras. The win/loss of the strategy varies therefore considerably over time. But when the fat-lady sings the DDM does well and UWM is dead again. The Blue-Label wins a whopping 295.030\$. For comparison I run also the DIA against IWM. The multiplicator is similar to the Ultra-Pair. This strategy wins 59.000\$. If one multiplies by 2, one gets about 120.000\$. The remaining 175.000\$ to the 295.000\$ of the Blue-Label pair is the volatility effect. The small-cap Russel-2000 outperforms in the very long run the Dow (over the last 5 years this was not the case). The factor 1.22 gives some protection against the higher overall small-cap growth. Generally Dow versus Russel-2000 seems to be the best pair. The Russel-2000 and the Dow behave different, but they belong nevertheless to the same market. Dow and EEM are in this respect much riskier. An advantage of this strategy is the ratio of 1.22:1 of long to short. In other strategies it's 2:1 or 3:1.

The Blue Label Special-Edition:

Like for the other labels there is also a Blue-Label special edition. DDM versus the Russel-Tripel TNA. The empirical determined multiplication factor is 2.05. One goes with this ratio the DDM long and the TNA short. This strategy gives at the end the by far highest win of 466759\$. It gets – besides the first 2 months – never under the water. But the performance goes up and down considerable. It cashes in the last 2 months. In bad

times the base IWM performs worse than the base DIA. Additionally the Triple is eaten up by the high volatility. But note that the base IWM climbs in the considered time span from 68.47 to 72.65 or by 5.9%. The Triple TNA does not win 15%. In contrary it loses -13.1%. This is the money-trap.

The DIA increases from 107.52 to 115.92 or 7.5%. The DDM from 46.74 to 54.77 or 15.8%. Besides the crazy SLV DIA is the only pair I have considered where the Ultra delivers also in the long run the multiplication factor. The exponential growth and the volatility-erosion effect are in balance. The impressive final win is not only the result of a lucky trend. It's in first case the combination of the multiplication factor -3 versus -1 between the Ultra and the Triple and the higher volatility of the Russell-2000. In the plain Blue-Label version it's only the volatility which differed. The lower multiplication factor of 1.22 is in favor of the plain Blue-Label. In case of a strong trend the exponential growth effect is for the special-edition higher.

The Blue-Label Special Edition is not without its risk. But the combination looks very hot.

Conclusion:

The Johnny Walker strategy works best in sideways markets with little trend and high volatility. It seems to be a very reasonable strategy and is according to [3] widely played by funds. The choice of the Label is a matter of risk-taste.

References:

- [1] Avellanda M, Zhang St.: Path-dependence of Leveraged ETF returns.
 [2] Cheng M, Madhavan A.: The Dynamics of Leveraged and Inverse Exchange-Traded Funds.

Result Tables:

Trade Date	IWM IWM-Qty	UWM IWM-Prc	1,99 IWM-Val	UWM-Qty	UWM-Prc	UWM-Val	Pos-Value	Win	Percent
17.03.2010	29209	68,47	1999940	-29648	33,89	1004771	995170	0	0
16.04.2010	29209	71,46	2087275	-29648	37,03	1097865	989410	-5760	-0,579
17.05.2010	29209	69,69	2035575	-29648	34,81	1032047	1003528	8359	0,84
16.06.2010	29209	66,68	1947656	-29648	31,44	-932133	1015523	20353	2,045
16.07.2010	29209	61,07	1783794	-29648	26,33	-780632	1003162	7992	0,803
16.08.2010	29209	61,56	1798106	-29648	26,53	-786561	1011545	16375	1,645
15.09.2010	29209	65,36	1909100	-29648	29,74	-881732	1027369	32199	3,236
14.10.2010	29209	70,53	2060111	-29648	34,73	1029675	1030436	35266	3,544
12.11.2010	29209	72,03	2103924	-29648	36,04	1068514	1035410	40241	4,044
14.12.2010	29209	77,31	2258148	-29648	41,44	1228613	1029535	34365	3,453
13.01.2011	29209	79,94	2334967	-29648	44,59	1322004	1012963	17794	1,788
14.02.2011	29209	82,49	2409450	-29648	47,29	-	1007396	12227	1,229

						1402054				
16.03.2011	29209	78,25	2285604	-29648	42,42	1257668	1027936	32767	3,293	
14.04.2011	29209	82,63	2413540	-29648	47,38	1404722	1008817	13648	1,371	
16.05.2011	29209	82,29	2403609	-29648	46,83	1388416	1015193	20023	2,012	
15.06.2011	29209	78,03	2279178	-29648	41,92	1242844	1036334	41165	4,136	
15.07.2011	29209	82,81	2418797	-29648	47,32	1402943	1015854	20684	2,078	
15.08.2011	29209	71,76	2096038	-29648	34,55	1024338	1071699	76530	7,69	
31.08.2011	29209	72,65	2122034	-29648	34,95	1036198	1085836	90667	9,111	

Table 1: IWM v. UWM

Trade	IYR	URE	1,944						
Date	IYR-Qty	IYR-Prc	IYR-Val	URE-Qty	URE-Prc	URE-Val	Pos-Value	Win	Percent
17.03.2010	41623	48,05	1999985	-24704	41,65	1028922	971064	0	0
16.04.2010	41623	50,29	2093221	-24704	41,3	1020275	1072945	101882	10,492
17.05.2010	41623	51,37	2138174	-24704	42,59	1052143	1086030	114967	11,839
16.06.2010	41623	51,9	2160234	-24704	42,75	1056096	1104138	133074	13,704
16.07.2010	41623	47,95	1995823	-24704	36,54	-902684	1093139	122075	12,571
16.08.2010	41623	50,48	2101129	-24704	40,23	-993842	1107287	136224	14,028
15.09.2010	41623	54,13	2253053	-24704	46,11	1139101	1113952	142888	14,715
14.10.2010	41623	55,08	2292595	-24704	48,36	1194685	1097909	126846	13,063
12.11.2010	41623	54,96	2287600	-24704	47,94	1184310	1103290	132227	13,617
14.12.2010	41623	54,25	2258048	-24704	46,64	1152195	1105853	134790	13,881
13.01.2011	41623	56,02	2331720	-24704	50,57	1249281	1082439	111376	11,469
14.02.2011	41623	59,35	2470325	-24704	56,68	1400223	1070102	99039	10,199
16.03.2011	41623	57,3	2384998	-24704	52,72	1302395	1082603	111539	11,486
14.04.2011	41623	58,99	2455341	-24704	56,53	1396517	1058824	87760	9,038
16.05.2011	41623	60,95	2536922	-24704	60,34	1490639	1046282	75219	7,746
15.06.2011	41623	58,53	2436194	-24704	55,38	-	1068087	97023	9,991

						1368108				
						-				
15.07.2011	41623	61,19	2546911	-24704	61,43	1517567	1029345	58281	6,002	
						-				
15.08.2011	41623	56,64	2357527	-24704	51,3	1267315	1090212	119148	12,27	
						-				
31.08.2011	41623	57,22	2381668	-24704	52,02	1285102	1096566	125502	12,924	

Table-2: IYR v. Ultra URE

Trade	SLV	AGQ	2						
Date	SLV- Qty	SLV- Prc	SLV-Val	AGQ- Qty	AGQ- Prc	AGQ- Val	Pos- Value	Win	Percent
17.03.2010	117096	17,08	2000000	-17302	57,79	-999883	1000117	0	0
16.04.2010	117096	17,41	2038641	-17302	59,39	1027566	1011076	10958	1,096
17.05.2010	117096	18,53	2169789	-17302	65,91	1140375	1029414	29297	2,929
16.06.2010	117096	18,08	2117096	-17302	62,05	1073589	1043507	43389	4,338
16.07.2010	117096	17,49	2048009	-17302	57,35	-992270	1055739	55622	5,562
16.08.2010	117096	18	2107728	-17302	60,33	1043830	1063898	63781	6,377
15.09.2010	117096	20,17	2361826	-17302	74,9	1295920	1065907	65789	6,578
14.10.2010	117096	24,03	2813817	-17302	105	1816710	997107	-3010	-0,301
12.11.2010	117096	25,52	2988290	-17302	116,32	2012569	975721	-24396	-2,439
14.12.2010	117096	28,81	3373536	-17302	145,41	2515884	857652	-142465	-14,245
13.01.2011	117096	28	3278688	-17302	136,02	2353418	925270	-74847	-7,484
14.02.2011	117096	29,96	3508196	-17302	153,41	2654300	853896	-146221	-14,62
16.03.2011	117096	33,37	3907494	-17302	185,75	3213847	693647	-306470	-30,643
14.04.2011	117096	41,07	4809133	-17302	278,64	4821029	-11897	1012014	-101,19
16.05.2011	117096	32,85	3846604	-17302	158,7	2745827	1100776	100659	10,065
15.06.2011	117096	34,88	4084308	-17302	176,07	3046363	1037945	37828	3,782
15.07.2011	117096	38,24	4477751	-17302	207,78	3595010	882741	-117376	-11,736
15.08.2011	117096	38,67	4528102	-17302	208,25	3603142	924961	-75156	-7,515
31.08.2011	117096	40,45	4736533	-17302	224,79	3889317	847217	-152900	-15,288

Table-3: SLV v. Ultra AGQ

Trade	IWM	TNA	2,958						
Date	IWM- Qty	IWM- Prc	IWM-Val	TNA- Qty	TNA- Prc	TNA-Val	Pos- Value	Win	Percent
17.03.2010	29209	68,47	1999940	-12074	55,99	-676023	1323917	0	0
16.04.2010	29209	71,46	2087275	-12074	63,54	-767182	1320093	-3824	-0,289
17.05.2010	29209	69,69	2035575	-12074	56,93	-687373	1348202	24285	1,834
16.06.2010	29209	66,68	1947656	-12074	47,93	-578707	1368949	45032	3,401
16.07.2010	29209	61,07	1783794	-12074	36,25	-437683	1346111	22194	1,676
16.08.2010	29209	61,56	1798106	-12074	36,34	-438769	1359337	35420	2,675
15.09.2010	29209	65,36	1909100	-12074	42,82	-517009	1392092	68175	5,149
14.10.2010	29209	70,53	2060111	-12074	53,49	-645838	1414273	90356	6,825
12.11.2010	29209	72,03	2103924	-12074	56,4	-680974	1422951	99034	7,48
14.12.2010	29209	77,31	2258148	-12074	69,26	-836245	1421903	97986	7,401
13.01.2011	29209	79,94	2334967	-12074	76,94	-928974	1405994	82077	6,2
						-			
14.02.2011	29209	82,49	2409450	-12074	83,88	1012767	1396683	72766	5,496
16.03.2011	29209	78,25	2285604	-12074	70,56	-851941	1433663	109746	8,289
						-			
14.04.2011	29209	82,63	2413540	-12074	83,36	1006489	1407051	83134	6,279
16.05.2011	29209	82,29	2403609	-12074	81,57	-984876	1418732	94815	7,162
15.06.2011	29209	78,03	2279178	-12074	68,66	-829001	1450177	126260	9,537
15.07.2011	29209	82,81	2418797	-12074	82,02	-990309	1428488	104571	7,899
15.08.2011	29209	71,76	2096038	-12074	48,84	-589694	1506344	182427	13,779
31.08.2011	29209	72,65	2122034	-12074	48,91	-590539	1531495	207578	15,679

Table-4: IWM v. Triple TNA

Trade	EEM	EDC	2,914						
Date	EEM- Qty	EEM- Prc	EEM- Val	EDC- Qty	EDC- Prc	EDC- Val	Pos- Value	Win	Percent
17.03.2010	47562	42,05	1999982	-20741	33,09	-686320	1313662	0	0
16.04.2010	47562	42,46	2019483	-20741	33,71	-699231	1320252	6589	0,502
17.05.2010	47562	39,25	1866809	-20741	25,38	-526407	1340402	26740	2,035
16.06.2010	47562	39,94	1899626	-20741	25,75	-534081	1365546	51883	3,95
16.07.2010	47562	38,65	1838271	-20741	23,14	-479947	1358325	44662	3,4
16.08.2010	47562	41,06	1952896	-20741	27,28	-565814	1387081	73419	5,589
15.09.2010	47562	43,31	2059910	-20741	31,52	-653756	1406154	92491	7,041
14.10.2010	47562	46,78	2224950	-20741	39,37	-816573	1408377	94715	7,21
12.11.2010	47562	46,41	2207352	-20741	37,89	-785876	1421476	107814	8,207
14.12.2010	47562	46,96	2233512	-20741	38,57	-799980	1433531	119869	9,125
13.01.2011	47562	47,79	2272988	-20741	41,41	-858885	1414103	100441	7,646
14.02.2011	47562	45,4	2159315	-20741	35,27	-731535	1427780	114117	8,687
16.03.2011	47562	44,6	2121265	-20741	32,84	-681134	1440131	126468	9,627
14.04.2011	47562	49,07	2333867	-20741	42,14	-874026	1459842	146179	11,128
16.05.2011	47562	46,85	2228280	-20741	36,28	-752483	1475796	162134	12,342
15.06.2011	47562	46,08	2191657	-20741	34,07	-706646	1485011	171349	13,044
15.07.2011	47562	46,66	2219243	-20741	35,63	-739002	1480241	166579	12,68
15.08.2011	47562	42,23	2008543	-20741	24,53	-508777	1499767	186104	14,167
31.08.2011	47562	42,75	2033276	-20741	24,88	-516036	1517239	203577	15,497

Table-5: EEM v. Triple EDC

Trade Date	IWM IWM- Qty	TWM IWM- Prc	-1,994 IWM-Val	TWM- Qty	TWM- Prc	TWM- Val	Pos- Value	Win	Percent
17.03.2010	-29209	68,47	1999940	-12309	81,48	1002937	3002878	0	0
16.04.2010	-29209	71,46	2087275	-12309	73,8	-908404	2995679	7198	0,36
17.05.2010	-29209	69,69	2035575	-12309	75	-923175	2958750	44127	2,206
16.06.2010	-29209	66,68	1947656	-12309	78,6	-967487	2915144	87734	4,387
16.07.2010	-29209	61,07	1783794	-12309	90,8	1117657	2901451	101427	5,071
16.08.2010	-29209	61,56	1798106	-12309	87,44	1076299	2874405	128473	6,424
15.09.2010	-29209	65,36	1909100	-12309	75,84	-933515	2842615	160263	8,013
14.10.2010	-29209	70,53	2060111	-12309	63,8	-785314	2845425	157453	7,873
12.11.2010	-29209	72,03	2103924	-12309	60,6	-745925	2849850	153028	7,651
14.12.2010	-29209	77,31	2258148	-12309	52,04	-640560	2898708	104169	5,208
13.01.2011	-29209	79,94	2334967	-12309	48	-590832	2925799	77078	3,854
14.02.2011	-29209	82,49	2409450	-12309	44,56	-548489	2957939	44938	2,247
16.03.2011	-29209	78,25	2285604	-12309	48,76	-600187	2885791	117086	5,854
14.04.2011	-29209	82,63	2413540	-12309	43,2	-531749	2945288	57589	2,879
16.05.2011	-29209	82,29	2403609	-12309	43,15	-531133	2934742	68136	3,407
15.06.2011	-29209	78,03	2279178	-12309	47,25	-581600	2860779	142099	7,105
15.07.2011	-29209	82,81	2418797	-12309	41,32	-508608	2927405	75472	3,774
15.08.2011	-29209	71,76	2096038	-12309	50,81	-625420	2721458	281419	14,071
31.08.2011	-29209	72,65	2122034	-12309	48,1	-592063	2714097	288781	14,439

Table-6: IWM v. Inverse-Ultra TWM.

Trade Date	EEM EEM- Qty	EDZ EEM- Prc	-2,955 EEM- Val	EDZ- Qty	EDZ- Prc	EDZ- Val	Pos- Value	Win	Percent
17.03.2010	-47562	42,05	1999982	-15394	43,97	-676874	2676856	0	0
16.04.2010	-47562	42,46	2019483	-15394	41,8	-643469	2662952	13905	0,695
17.05.2010	-47562	39,25	1866809	-15394	48,85	-751997	2618805	58051	2,903
16.06.2010	-47562	39,94	1899626	-15394	42,26	-650550	2550177	126680	6,334
16.07.2010	-47562	38,65	1838271	-15394	44,26	-681338	2519610	157247	7,862
16.08.2010	-47562	41,06	1952896	-15394	35,98	-553876	2506772	170084	8,504
15.09.2010	-47562	43,31	2059910	-15394	29,83	-459203	2519113	157743	7,887
14.10.2010	-47562	46,78	2224950	-15394	23,36	-359604	2584554	92302	4,615
12.11.2010	-47562	46,41	2207352	-15394	23,37	-359758	2567110	109746	5,487
14.12.2010	-47562	46,96	2233512	-15394	21,88	-336821	2570332	106524	5,326
13.01.2011	-47562	47,79	2272988	-15394	19,98	-307572	2580560	96296	4,815
14.02.2011	-47562	45,4	2159315	-15394	22,79	-350829	2510144	166712	8,336
16.03.2011	-47562	44,6	2121265	-15394	23,38	-359912	2481177	195679	9,784
14.04.2011	-47562	49,07	2333867	-15394	17,33	-266778	2600645	76211	3,811
16.05.2011	-47562	46,85	2228280	-15394	19,43	-299105	2527385	149471	7,474
15.06.2011	-47562	46,08	2191657	-15394	19,91	-306495	2498152	178705	8,935
15.07.2011	-47562	46,66	2219243	-15394	18,24	-280787	2500029	176827	8,841
15.08.2011	-47562	42,23	2008543	-15394	21,63	-332972	2341515	335341	16,767
31.08.2011	-47562	42,75	2033276	-15394	20,12	-309727	2343003	333853	16,693

Table-7: EEM v. Inverse-Triple EDZ

Trade Date	DDM DDM- Qty	UWM DDM- Prc	1,288 DDM- Val	UWM- Qty	UWM- Prc	UWM- Val	Pos- Value	Win	Percent
17.03.2010	42789	46,74	1999958	-45817	33,89	1552738	447220	0	0
16.04.2010	42789	49,17	2103935	-45817	37,03	1696604	407332	-39888	-8,919
17.05.2010	42789	45,75	1957597	-45817	34,81	1594890	362707	-84513	-18,897
16.06.2010	42789	43,8	1874158	-45817	31,44	1440486	433672	-13548	-3,029
16.07.2010	42789	41,09	1758200	-45817	26,33	1206362	551838	104619	23,393
16.08.2010	42789	42,78	1830513	-45817	26,53	1215525	614988	167769	37,514
15.09.2010	42789	45,25	1936202	-45817	29,74	1362598	573605	126385	28,26
14.10.2010	42789	49,75	2128753	-45817	34,73	1591224	537528	90309	20,193
12.11.2010	42789	50,69	2168974	-45817	36,04	1651245	517730	70510	15,766
14.12.2010	42789	53,54	2290923	-45817	41,44	1898656	392267	-54953	-12,288
13.01.2011	42789	55,94	2393617	-45817	44,59	2042980	350637	-96583	-21,596
14.02.2011	42789	61,31	2623394	-45817	47,29	2166686	456708	9488	2,122
16.03.2011	42789	55,05	2355534	-45817	42,42	1943557	411977	-35242	-7,88
14.04.2011	42789	61,58	2634947	-45817	47,38	2170809	464137	16917	3,783
16.05.2011	42789	64,38	2754756	-45817	46,83	2145610	609146	161926	36,207
15.06.2011	42789	58,02	2482618	-45817	41,92	1920649	561969	114749	25,658
15.07.2011	42789	63,86	2732506	-45817	47,32	2168060	564445	117225	26,212
15.08.2011	42789	53,54	2290923	-45817	34,55	1582977	707946	260726	58,299
31.08.2011	42789	54,77	2343554	-45817	34,95	1601304	742249	295030	65,97

Table-7: Ultra-DDM v. Ultra-UWM

Trade	DDM	TNA	2,053				Pos-		
Date	DDM- Qty	DDM- Prc	DDM- Val	TNA- Qty	TNA- Prc	TNA-Val	Value	Win	Percent
17.03.2010	42789	46,74	1999958	-17396	55,99	-974002	1025956	0	0
16.04.2010	42789	49,17	2103935	-17396	63,54	1105342	998593	-27363	-2,667
17.05.2010	42789	45,75	1957597	-17396	56,93	-990354	967242	-58713	-5,723
16.06.2010	42789	43,8	1874158	-17396	47,93	-833790	1040368	14412	1,405
16.07.2010	42789	41,09	1758200	-17396	36,25	-630605	1127595	101639	9,907
16.08.2010	42789	42,78	1830513	-17396	36,34	-632171	1198343	172387	16,803
15.09.2010	42789	45,25	1936202	-17396	42,82	-744897	1191306	165350	16,117
14.10.2010	42789	49,75	2128753	-17396	53,49	-930512	1198241	172285	16,793
12.11.2010	42789	50,69	2168974	-17396	56,4	-981134	1187840	161884	15,779
14.12.2010	42789	53,54	2290923	-17396	69,26	1204847	1086076	60120	5,86
13.01.2011	42789	55,94	2393617	-17396	76,94	1338448	1055168	29213	2,847
14.02.2011	42789	61,31	2623394	-17396	83,88	1459176	1164217	138261	13,476
16.03.2011	42789	55,05	2355534	-17396	70,56	1227462	1128073	102117	9,953
14.04.2011	42789	61,58	2634947	-17396	83,36	1450131	1184816	158860	15,484
16.05.2011	42789	64,38	2754756	-17396	81,57	1418992	1335764	309808	30,197
15.06.2011	42789	58,02	2482618	-17396	68,66	1194409	1288208	262253	25,562
15.07.2011	42789	63,86	2732506	-17396	82,02	1426820	1305686	279730	27,265
15.08.2011	42789	53,54	2290923	-17396	48,84	-849621	1441302	415347	40,484
31.08.2011	42789	54,77	2343554	-17396	48,91	-850838	1492715	466759	45,495

Table-8: Ultra-DDM v. Triple-TNA