COMMODITY FUNDS

Fall 2002

Commodity funds are Private Partnerships that invest in commodity and financial contracts.

<u>Characteristics:</u>

(1). Private Partnerships means not registered for the general public but available only to "knowledgeable investors."

(2). Commodity and financial futures can be bought or sold. They are in zero net supply. Thus, for every investor who owns a contract, there must be a seller. As a first approximation the expected return is zero.

(3). Normally an investor "sell" the shares to the fund at N.A.V. Sometimes the issuing brokerage firm finds a new buyer.

(4). The only information available to the public comes if the commodity fund chooses to report.

(5). They normally have dissolve rules where if they decline in size or N.A.V. declines to some level, they dissolve.

Data Problems

One of the major problems with investors considering Private Partnerships is a data problem with the class as a whole. What is their performance is a difficult question.

Causes:

(1). There are no mandatory reporting rules that funds have to report to some agency.

(2). Good funds choose to report.

(3). The services that collect this information and report it to major newspapers and magazines are sloppy and way overstate performance.

Example

The major source for commodity fund data is MAR.

Problems:

(1). Funds that have a bad month or two do not choose to report. Thus, the data does not include any information on failing funds in their last months of existence.

(2). Funds restate. Example:

Month	N.A.V.	Date Report
Jan	1000	Jan
Feb	1100	Feb
Feb	900	March
March	990	March

Services do not go back and restate returns. They will report a 10% return in January and February.

(3). Funds do not report some months. These bad months do not get into data.

(4). Bias in index construction:

Fund	N.A.V.S.				
	J	F	M	A	M
A	100	200	100	200	100
B	200	100	200	100	200

	Returns			
A	+100	-50	+100	-50
B	-50	+100	-50	+100

Average monthly return: 25%.

COMMODITY TABLES

Table I The Returns and Risks of Commodity Funds, 1980–1988

Year	Monthly Standard Deviation[a]	Annual Return (per cent) All[b]	Annual Return (per cent) Beginning Year
1980	12.6[c]	5.8980	2.0748
1981	10.0	0.5452	4.0716
1982	10.1	0.4944	−0.0864
1983	11.7	−16.1568	−15.0768
1984	10.6	7.0620	7.6656
1985	8.7	10.5096	10.8840
1986	10.4	−17.3916	−17.1588
1987	8.7	27.8676	28.3200
1988	10.4	0.4962	0.5568
	10.4	2.2565	2.3612

[a] The standard deviation for non-log returns is almost identical.
[b] Simple average annual return was 4.4 per cent.
[c] This number excludes the firm with the highest standard deviation. This firm existed for only a few months in 1980. Including this firm would result in a value of 24.3 for 1980.

TABLE 1 Return and Risk Data for Commodity Funds

Year	No. of Funds	Average Monthly Return		Average SD
		For Monthly Holding Period	For Annual Holding Period	
1	12	.0182	.0027	.1577
2	16	.0219	.0090	.1211
3	34	.0149	.0112	.0824
4	49	−.0191	−.0267	.1167
5	70	−.0020	−.0054	.0793
6	85	.0097	.0048	.0943
Average	...	.0073	−.0007	.1130*

* Not simply an average of the six yearly numbers. Rather, it is an average arrived at using the technique discussed in the text.

Table II Returns and Risks of Comparable Assets, 1980–1988

	Yearly Return (per cent)	*Standard Deviation of Monthly Return*
Common Stocks	14.88	4.91
Long-Term Corporate Bonds	11.80	3.84
Long-Term Government Bonds	11.40	4.17
Shearson Lehman Bond Index	11.40	2.38
Treasury Bills	8.64	0.25

Sources: Common stock and long-term corporate and government bond returns from R. Ibbotson, *Stocks, Bonds, Bills, and Inflation 1989 Yearbook* (Chicago: Ibbotson Associates, 1989). Shearson Lehman Bond Index data supplied by Shearson American Express.

Table III Year-by-Year Performance of Commodity Funds

Starting Year	Percentage Return in Year								Lifetime Return (per cent per year)
	1	2	3	4	5	6	7	8	
1980	9.45	8.72	−7.43	−6.32	−3.34	−1.19	−5.50	16.24	1.47
1981	−1.74	−7.90	−12.34	7.14	10.40	−9.67	21.16		−1.86
1982	−25.32	−23.74	9.10	23.02	16.18	15.28			−7.17
1983	−6.20	3.67	11.76	−18.38	18.01				−0.54
1984	2.26	19.60	−12.30	8.92					2.73
1985	8.24	−24.66	25.12						−0.08
1986	1.31	21.52							6.31
1987	−0.18								−0.26

Table IV Dissolution Experience

	New Entrants[b]	*Total Dissolved*	*Per Cent Dissolved*	*Number of Funds Dissolved in Their Year*								
				1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Before 1980[a]	13	6	46									
1980	12	4	33⅓					1		1	1	1
1981	22	11	50				3	3	2		3	
1982	16	4	25		2	1	1					
1983	18	6	33⅓		1		2	1	2			
1984	12	3	25			1	2					
1985	14	2	14		2							
1986	16	2	13		1	1						
1987	21	2	10	1	1							
1988	14	0	0									
	158	40	25	1	7	3	8	5	4	1	4	1

[a] We do not show the year of existence in which these funds dissolved because they were started in very different years and the data we have simply tell us they existed as of June 1979.

[b] Funds are classified as new funds by the year for which we have the first return data. Thus a fund that started in December would have its first return in January and be classified as a new entrant in January.

Table V Probability of Dissolution

i^{th} Year of Existence	Number of Firms at Beginning	Number Dissolved in Year	Probability of Dissolving in Year i	Probability of Dissolving in or Before Year i*
1	145	1	0.7%	0.7%
2	130	7	5.4	6.0
3	104	3	2.9	8.7
4	87	8	9.2	17.1
5	67	5	7.5	23.3
6	53	4	7.5	29.1
7	37	1	2.7	31.0
8	24	4	16.7	42.5
9	9	1	11.1	48.8

The probability of dissolving in a before year i is not simply the cumulative distribution of the previous column but is adjusted for the probability that a fund may already have dissolved before it reached year i.

TABLE 3 Correlation Coefficients

Year	Stocks	Bonds	Treasury Bills	Consumer Price Index	Commodity Futures Index	Commodity Cash Index	Average Fund
1	.183	−.021	−.127	.180	.267	.236	.504
2	−.044	−.050	−.065	−.194	−.260	−.114	.541
3	−.003	.228	−.165	−.024	−.402	−.073	.705
4	.050	−.067	−.218	.067	.435	.365	.743
5	−.186	−.203	.194	−.024	.091	.119	.503
6	−.214	.114	.009	−.092	−.543	−.538	.676
Overall average*	−.121	−.003	.010	.009	−.021	−.018	.617
Simple average	−.036	.007	−.062	−.015	−.069	−.001	.612

* The overall average is not an average of the six yearly numbers but rather an average across funds of the correlation of each fund with the respective index for the entire time period over which we have data for the fund.

TABLE 4 Break-even Rates of Return

Scenario	% Stock	Excess Return $(\bar{R}_p - R_F)$*	SD (σ)*	Correlation with Portfolio p (cp)†‡	Break-even Rate of Return $(\bar{R}_c)$‡
6 year	100	.0046	.0399	−.121	.0069
25 year	100	.0023	.0414	−.121	.0077
6 year	63	.0033	.0309	−.099	.0073
25 year§	63	.0012	.0289	−.110	.0080

* Entries from table 2.

† The covariance of a commodity fund with a portfolio is the sum of the proportion in each asset in the portfolio times the correlation of the commodity fund with the asset times the product of the standard deviation of commodity funds times the standard deviation of the asset. For example, the covariance for the third entry is .63(−.121)(.1130)(.0399) + .37(−.003)(.1130)(.0293).

‡ Assumes standard deviation of commodity funds of .1130 (see table 1).

§ Assumes a correlation of .10 between stocks and bonds, which is the average correlation between corporate and government bonds and the stock index, as shown in Ibbotson (1985).

Table VI Cross-Sectional Skewness of Commodity Fund Returns

Year	*Skewness*
1980	−1.0470
1981	−0.4564
1982	−1.0988
1983	−1.2860
1984	−0.3882
1985	−0.5407
1986	−0.4160
1987	0.3231
1988	2.5071

Table VII Predictability of Return from Partners' Experience

	Annual Percentage Return to Funds Managed by Partners with Prior Experience in		
	4+ Funds	*1–3 Funds*	*0 Funds*
1983	−10.04	12.51	−1.96
1984	−1.5	10.19	−7.93
1985	–	4.51	−8.35

Table VIII Predictability of Return from Partners' Past Performance in Public Funds

	Annual Percentage Return to Funds Managed by Partners with	
	Above-Average Prior Performance	*Below-Average Prior Performance*
1983	10.14	−7.67
1984	10.83	0.78
1984	7.57	6.38

TABLE 6 Values of Sharpe at $t + 1$ from Ranking by Sharpe Ratio in t

	Period 2		Period 3		Period 4		Period 5		Period 6		Avg.	Avg.
	Sharpe Ratio	Rank	Sharpe Ratio	Rank	Sharpe Ratio	Rank	Sharpe Ratio	Rank	Sharpe Ratio	Rank	Ratio	Rank
Top 3	.3279	1	.1031	1	−.1834	2	−.0933	2	.3392	1	.0987	1.4
Bottom 3	.2898	2	−.1966	2	−.1032	1	.1262	1	.0770	2	.0386	1.6
Top ⅓*	.3279	1	.0569	1	−.2427	1	−.1903	2	.0622	1	.0028	1.2
Middle ⅓	−.1154	3	−.0567	2	−.4090	3	−.2308	3	−.0488	2	−.1495	2.6
Bottom ⅓	.2898	2	−.1685	3	−.2691	2	−.1115	1	−.1613	3	−.0841	2.2

*In forming the three groups, if the total number of firms was not divisible by 3, the extra one or two firms were placed in the middle group.

TABLE 7 **Value of Return at $t + 1$ for Ranking of Return at t**

	Period 2		Period 3		Period 4		Period 5		Period 6		Avg.	Avg.
	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
Top 3	.0167	1	.0170	1	−.0229	1	−.0109	2	−.0044	2	−.0009	1.4
Bottom 3	.0149	2	−.0054	2	−.0285	2	.0249	1	.0136	1	.0039	1.6
Top ⅓*	.0167	1	.0127	1	−.0162	1	−.0009	2	.0152	1	.0059	1.2
Middle ⅓	.0050	3	.0118	2	−.0351	3	.0035	1	.0003	3	−.0029	2.4
Bottom ⅓	.0149	2	.0045	3	−.0275	2	−.0127	3	.0018	2	−.0038	2.4

*In forming the three groups, if the total number of firms was not divisible by 3, the extra one or two firms were placed in the middle group.

TABLE 8 **Value of Standard Deviation at $t + 1$ for Ranking of Standard Deviation at t**

	Period 2		Period 3		Period 4		Period 5		Period 6		Avg.	Avg.
	SD	Rank	SD	Rank	SD	Rank	SD	Rank	SD	Rank	SD	Rank
Top 3	.2300	1	.1131	1	.1795	2	.1599	1	.0364	2	.1438	1.4
Bottom 3	.0637	2	.0639	2	.1955	1	.0346	2	.0639	1	.0843	1.6
Top ⅓*	.2300	1	.0934	1	.1244	1	.1077	1	.1326	1	.1376	1.0
Middle ⅓	.1183	2	.0749	2	.1074	3	.0880	2	.0915	2	.0960	2.2
Bottom ⅓	.0637	3	.0648	3	.1127	2	.0525	3	.0678	3	.0723	2.8

*In forming the three groups, if the total number of firms was not divisible by 3, the extra one or two firms were placed in the middle group.

TABLE 1 **Comparison between Historic Returns Reported in Prospectuses and Returns after Funds Went Public**

	N	Average Monthly Returns	Average Monthly Returns as % of Return in Prospectus	No. of Funds with Returns above Own Prospectus	No. of Funds with Returns above the Average of All Prospectuses
Prospectus	77	5.59			
Public commodity funds:					
First year public*	73	.23	4.1	2	1
First 2 years public†	51	.36	6.4	2	1
First 3 years public	36	.30	5.4	0	0
First 4 years public	25	.54	9.7	0	0

*Four funds were excluded because of missing data in early months.

†Only 51 of the 77 firms in our sample had return data available 2 years after going public. The numbers decrease as we go down the table because funds that went public toward the end of our sample period do not have a long history of performance after going public.

TABLE 2 **Relative Prospectus Performance Compared with Relative Actual Fund Performance**

Public Returns = a + b Prospectus Returns

Year Went Public and No. of Years of Performance*	Intercept a	Slope b	R^2	Returns (Upper Half Minus Lower Half†
1983:				
1	−1.29	−.16	.16	−.55
1982:				
1	−1.79	.13	.05	+.59
2	−.65	.10	.02	+.44
1981:				
1	−.92	.15	.09	−.44
2	−.38	−.00	.00	−.47
3	.42	−.08	.10	−1.17
1980:				
1	−.20	.22	.09	1.94
2	−.64	.21	.15	1.57
3	−.58	.11	.08	.46
4	.02	.06	.02	.10
1979:				
1	4.72	−.71	.84	−2.61
2	3.12	−.42	.38	−1.92
3	1.24	−.05	.07	−.73
4	.33	.07	.06	−.70

*Year is from July to June. Thus, 1979 is for funds that went public from July 1979 to June 1980.

†This column shows the difference in returns actually earned once public. The number is the return on the funds that had the highest returns reported in the prospectus minus the funds which had the lowest returns.