

Bloomberg Commodity Index (BCOM)

Extended Index Performance Methodology
1960-1990

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Introduction

This document details how the Bloomberg Commodity Index (“BCOM”) family was calculated from January 1960 to the index base date, January 1991. The extension of the performance history provides hypothetical returns from holding BCOM eligible commodities.

Table 1: BCOM Indices with Extended History

	SPOT	ER Ticker	TR Ticker	Inception Date
BCOM Index	BCOMSP	BCOM	BCOMTR	1/4/1960
BCOM Agriculture Index		BCOMAG	BCOMAGTR	1/4/1960
BCOM Soybean Oil Index		BCOMBO	BCOMBOTR	1/4/1960
BCOM Cocoa Index		BCOMCC	BCOMCCTR	1/4/1960
BCOM Corn Index		BCOMCN	BCOMCNTR	1/4/1960
BCOM Cotton Index		BCOMCT	BCOMCTTR	1/4/1960
BCOM Grains Index		BCOMGR	BCOMGRTR	1/4/1960
BCOM Softs Index		BCOMSO	BCOMSOTR	1/4/1960
BCOM Soybeans Index		BCOMSY	BCOMSYTR	1/4/1960
BCOM Wheat Index		BCOMWH	BCOMWHTR	1/4/1960
BCOM Ex-Agriculture & Livestock Index		BCOMXAL	BCOMXALT	1/4/1960
BCOM Sugar Index		BCOMSB	BCOMSBTR	1/13/1961
BCOM Live Cattle Index		BCOMLC	BCOMLCTR	1/14/1965
BCOM Coffee Index		BCOMKC	BCOMKCTR	1/12/1973
BCOM Gold Index		BCOMGC	BCOMGCTR	1/14/1975
BCOM Precious Metals Index		BCOMPR	BCOMPRTR	1/14/1975
BCOM Silver Index		BCOMSI	BCOMSITR	1/14/1975
BCOM WTI Crude Oil Index		BCOMCL	BCOMCLTR	1/13/1984
BCOM Energy Index		BCOMEN	BCOMENTR	1/13/1984
BCOM Heating Oil Index		BCOMHO	BCOMHOTR	1/14/1987
BCOM Lean Hogs Index		BCOMLH	BCOMLHTR	1/14/1987
BCOM Livestock Index		BCOMLI	BCOMLITR	1/14/1987
BCOM Unleaded Gasoline Index		BCOMRB	BCOMRBTR	1/14/1987
BCOM Copper Index		BCOMHG	BCOMHGTR	1/13/1989

Index Components and Rules for Inclusion

In order for the eligible commodities to be included in the hypothetical BCOM back history, the following guidelines and criteria were satisfied:

- 1) The commodity was included in BCOM and had a Commodity Index Percentage (“CIP”) from 1991 to 1998.
- 2) Historical commodity futures contract prices were available for one full trading year. As an example, the Live Cattle futures contract began trading in November 1964 and, therefore, the Live Cattle contract was included in BCOM during the January 1965 annual rebalance. There were no intra-year rebalances for the historical calculations.

Table 2: Historical Commodity Inclusion

Group	Commodity	Ticker	Contract Start Date	Inclusion
Grains	Soybean Oil	BO	7/1/1959	1960
Grains	Corn	C	7/1/1959	1960
Grains	Soybeans	S	7/1/1959	1960
Grains	Chicago Wheat	W	7/1/1959	1960
Softs	Cocoa	CC	9/30/1959	1960
Softs	Cotton	CT	7/1/1959	1960
Softs	Sugar	SB	1/3/1961	1961
Livestock	Live Cattle	LC	11/30/1964	1965
Softs	Coffee	KC	8/16/1972	1973
Precious Metals	Gold	GC	1/2/1975	1975
Precious Metals	Silver	SI	1/2/1975	1975
Energy	WTI Crude Oil	CL	3/30/1983	1984
Energy	Heating Oil	HO	7/1/1986	1987
Energy	Unleaded Gas	HU	4/25/1986	1987
Livestock	Lean Hogs	LH	4/1/1986	1987
Industrial Metals	COMEX Copper	HG	12/6/1988	1989

Commodity Index Percentages

The Commodity Index Percentages (“CIP”) are the target percentage weightings of each component in the index. From 1960 –1990, the annual CIPs were determined using the 1998 BCOM CIPs for each commodity. New target weights were based on the number of index eligible commodities for that given year. The new CIPs were applied at each BCOM annual rebalance. These historical CIPs are different from the BCOM methodology which states that the CIPs are derived by using 2/3 of the Liquidity and 1/3 Production data. Due to the limited amount of eligible commodities historically, the historical CIPs were calculated using the following formula:

$$BTW = \frac{ICTW}{\sum_x CTW}$$

BTW= BCOM Annual Target Weight

ICTW= Individual 1998 BCOM Annual Commodity Target Weight

CTW= 1998 BCOM Commodity Target Weight

X= Number of Commodities/Components

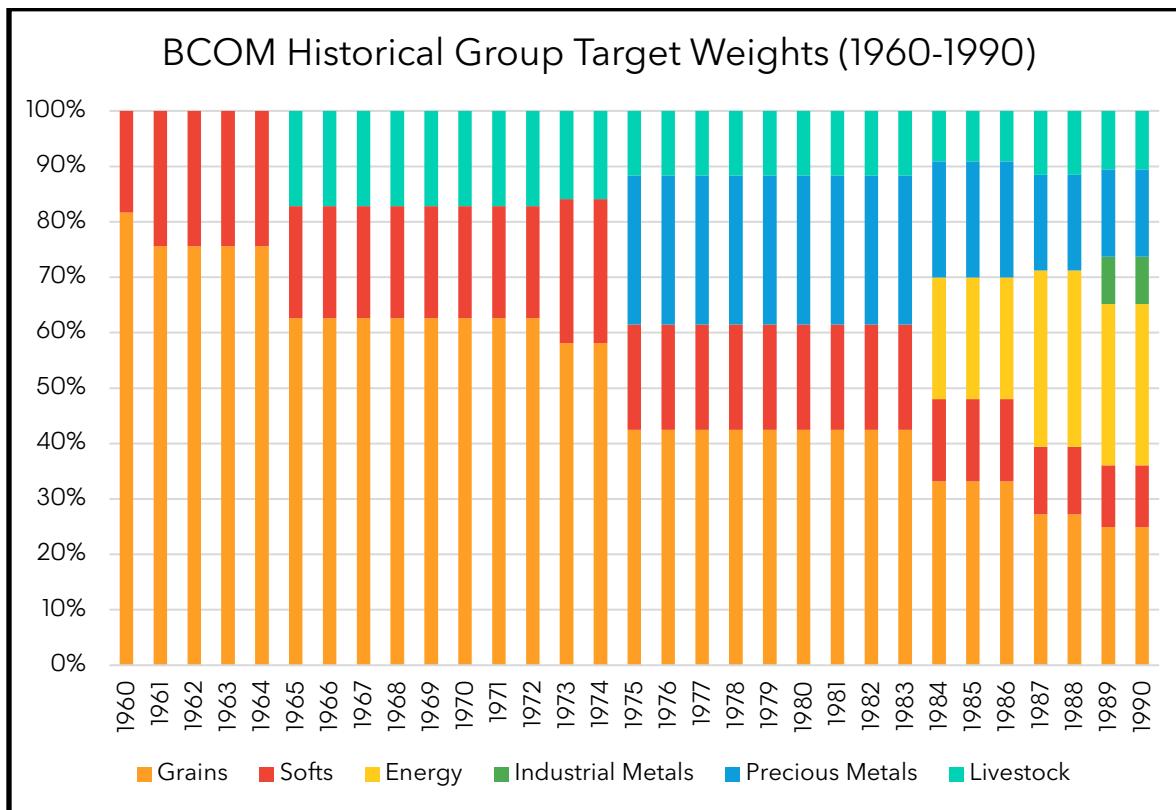
Using Table 3, the following demonstrates how the Soybean Oil CIP was calculated

$$(BO) 7.6239830\% = \frac{2.00000000\%}{26.2330060\%}$$

Table 3: 1960 BCOM Target Weights

Commodities	Tickers	1998 Target Weights	1960 Target Weights
Soybean Oil	BO	2.00%	7.62%
Corn	C	6.10%	23.25%
Cocoa	CC	2.00%	7.62%
Cotton	CT	2.81%	10.70%
Soybeans	S	9.08%	34.61%
Wheat	W	4.25%	16.19%
		26.23%	100.00%

Table 4: BCOM Historical Group Target Weights



Historic Contract Calendar

The extended index history follows the BCOM Methodology Contract Calendar, however, modifications were made when contracts were not historically available. The following table displays the contract calendar for commodities from 1960–1990 on the first business day of each month.

Table 5: BCOM Extended History Contract Table

Commodity	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	K	K	N	N	X	X	X	X	F	F
Sugar	SB	H	H	K	K	N	N	V	V	V	H	H	H
Cotton	CT	H	H	K	K	N	N	Z	Z	Z	Z	Z	H
Coffee	KC	H	H	K	K	N	N	U	U	Z	Z	Z	H
Live Cattle	LC	G	J	J	M	M	Q	Q	V	V	Z	Z	G
Lean Hogs	LH	G	J	J	M	M	N	Q	V	V	Z	Z	G
WTI Crude Oil	CL	H	H	K	K	N	N	U	U	X	X	F	F
Heating Oil	HO	H	H	K	K	N	N	U	U	X	X	F	F
Unleaded Gasoline	HU	H	H	K	K	N	N	U	U	X	X	F	F
COMEX Copper	HG	H	H	K	K	N	N	U	U	Z	Z	Z	H
Gold	GC	G	J	J	M	M	Q	Q	Z	Z	Z	Z	G
Silver	SI	H	H	K	K	N	N	U	U	Z	Z	Z	H
Cocoa	CC	H	H	K	K	N	N	U	U	Z	Z	Z	H

Tables 6–10 display the contact calendar for any year when modifications were necessary.

In Table 6, the Cotton roll scheduled was adjusted from January to April, as only the July and December contracts were historically available.

Table 6: BCOM 1960 Contract Table

1960	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	K	K	N	N	X	X	X	X	F	F
Cotton	CT	N	N	N	N	N	N	Z	Z	Z	Z	Z	H
Cocoa	CC	H	H	K	K	N	N	U	U	Z	Z	Z	H

In Table 7, two adjustments were made to the contract calendar in 1961. The Sugar roll schedule was adjusted from January – April, as only the July and October contracts were available. During the April roll period, Cocoa rolled into the September 1961 futures contract, rather than the July 1961 contract, due to lack of available prices.

Table 7: BCOM 1961 Contract Table

1961	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	K	K	N	N	X	X	X	X	F	F
Sugar	SB	N	N	N	N	N	N	V	V	V	H	H	H
Cotton	CT	H	H	K	K	N	N	Z	Z	Z	Z	Z	H
Cocoa	CC	H	H	K	K	U	U	U	U	Z	Z	Z	H

In Table 8, the Sugar roll schedule was adjusted for July through September due to prices of the December 1963 Sugar contract being unavailable. During the June 1963 roll period, Sugar rolled from the July 1963 futures contract directly to the March 1964 contract.

Table 8: BCOM 1963 Contract Table

1963	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	K	K	N	N	X	X	X	X	F	F
Sugar	SB	H	H	K	K	N	N	H	H	H	H	H	H
Cotton	CT	H	H	K	K	N	N	Z	Z	Z	Z	Z	H
Cocoa	CC	H	H	K	K	N	N	U	U	Z	Z	Z	H

In Table 9, the Soybean roll schedule was adjusted for the months of March and April due to the lack of pricing for the May 1963 Sugar contract. During the February 1970 roll period, Soybean rolled from the March 1970 futures contract directly to the July 1970 contract.

Table 9: BCOM 1970 Contract Table

1970	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	N	N	N	N	X	X	X	X	F	F
Sugar	SB	H	H	K	K	N	N	V	V	V	H	H	H
Cotton	CT	H	H	K	K	N	N	Z	Z	Z	Z	Z	H
Live Cattle	LC	G	J	J	M	M	Q	Q	V	V	Z	Z	G
Cocoa	CC	H	H	K	K	N	N	U	U	Z	Z	Z	H

In Table 10, the Coffee roll schedule was adjusted for the months of November due to unavailable prices for the December 1988 contract. As a result, the roll into the March 1989 contract occurred one month early.

Table 10: BCOM 1988 Contract Table

1988	Ticker	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chicago Wheat	W	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybean Oil	BO	H	H	K	K	N	N	Z	Z	Z	Z	F	F
Corn	C	H	H	K	K	N	N	U	U	Z	Z	Z	H
Soybeans	S	H	H	K	K	N	N	X	X	X	X	F	F
Sugar	SB	H	H	K	K	N	N	V	V	V	H	H	H
Cotton	CT	H	H	K	K	N	N	Z	Z	Z	Z	Z	H
Coffee	KC	H	H	K	K	N	N	U	U	Z	Z	H	H
Live Cattle	LC	G	J	J	M	M	Q	Q	V	V	Z	Z	G
Lean Hogs	LH	G	J	J	M	M	N	Q	V	V	Z	Z	G
WTI Crude Oil	CL	H	H	K	K	N	N	U	U	X	X	F	F
Heating Oil	HO	H	H	K	K	N	N	U	U	X	X	F	F
Unleaded Gasoline	HU	H	H	K	K	N	N	U	U	X	X	F	F
Gold	GC	G	J	J	M	M	Q	Q	Z	Z	Z	Z	G
Silver	SI	H	H	K	K	N	N	U	U	Z	Z	Z	H
Cocoa	CC	H	H	K	K	N	N	U	U	Z	Z	Z	H

Commodity Index Multipliers

The Commodity Index Multiplier (“CIM”) is a factor that is computed annually on the CIM Determination Date (4th business day in January) for each eligible commodity in an effort to implement the annual CIPs. The CIMs are rounded to eight decimal places and remain fixed for each commodity throughout the remainder of the calendar year.

The calculation of the BCOM CIMs adhere to Section 2.7 of the [BCOM Methodology](#). For 1960, the CIMs were calculated under the assumption that this was the initial CIM calculation, while the 1961–1990 CIMs follow the BCOM methodology. A ratio was created between the years of 1990 and 1991 to align the CIMs with the original 1991 CIMs. This ratio is multiplied by each CIM starting in 1990 and applied going backwards for each year until 1960. The ratio is calculated using the following formula:

$$CIM = XCIM * CR$$

Where;

CIM= BCOM CIM

XCIM= BCOM Extension CIM

CR= CIM Ratio

$$CR = \frac{CIM_y * FPD1_{i,y+1}}{CIM_{y+1} * FPD1_{i,y+1}}$$

Where;

$FPD1_{i,y+1}$ =Lead Futures Settlement Price in U.S. dollars for Index Commodity i, on upcoming year.

Calculation of Index History

The extended BCOM history is calculated in both excess return and total return for the headline indices. These indices are calculated per Section 3 of the [BCOM methodology](#). When the CIPs for each commodity in the index combined are greater than 50%, a BCOM index level was calculated. During each monthly roll period from 1960–1990, if a settlement price was unavailable, the constituent roll weight was held and standard rolling practices applied during the next business day. Commodity future limits were not monitored and accounted for during the BCOM history extension.

Following Section 3.2 of the BCOM methodology, the BCOM Total Return calculation combines the BCOM returns as well as the cash collateral invested in T-Bills. For this extended BCOM history, the following 3-month rates were applied.

Table 11: 3 Month Rates used for BCOM Extended History

	Ticker	Start Date	End Date
US Generic Government 3 Month Yield	USGG3M Index	1/4/1960	12/30/1960
US Treasury H15 Treasury Bill 3 Month Auction High Discount Rate	H15BDI3M Index	1/3/1961	12/27/1979
UST 13-Week Bill High Discount Rate	USB3MTA Index	12/28/1979	Present

Historical Index Returns

Table 12: Bloomberg Commodity Index Returns

	BCOMSP					BCOM					BCOMTR				
	1 YR	5 YR	10 YR	20 YR	30 YR	1 YR	5 YR	10 YR	20 YR	30 YR	1YR	5 YR	10 YR	20 YR	30 YR
1960	2.4%	-	-	-	-	0.5%	-	-	-	-	3.4%	-	-	-	-
1961	2.2%	-	-	-	-	-1.5%	-	-	-	-	0.9%	-	-	-	-
1962	6.5%	-	-	-	-	-1.5%	-	-	-	-	1.3%	-	-	-	-
1963	16.6%	-	-	-	-	20.9%	-	-	-	-	24.8%	-	-	-	-
1964	-9.2%	18.0%	-	-	-	-4.7%	12.2%	-	-	-	-1.2%	30.3%	-	-	-
1965	0.2%	15.4%	-	-	-	2.5%	14.5%	-	-	-	6.7%	34.5%	-	-	-
1966	1.6%	14.8%	-	-	-	-0.2%	16.0%	-	-	-	4.9%	39.8%	-	-	-
1967	3.5%	11.5%	-	-	-	-5.7%	11.1%	-	-	-	-1.4%	36.0%	-	-	-
1968	2.3%	-2.1%	-	-	-	-3.2%	-11.0%	-	-	-	2.3%	11.5%	-	-	-
1969	-0.4%	7.3%	26.6%	-	-	1.9%	-4.7%	6.9%	-	-	9.2%	23.2%	60.5%	-	-
1970	15.2%	23.3%	42.4%	-	-	16.0%	7.8%	23.3%	-	-	23.8%	43.0%	92.3%	-	-
1971	7.7%	30.7%	50.0%	-	-	9.1%	17.8%	36.7%	-	-	14.0%	55.5%	117.4%	-	-
1972	28.6%	62.4%	81.2%	-	-	30.7%	63.3%	81.4%	-	-	36.2%	114.9%	192.3%	-	-
1973	59.3%	153.0%	147.6%	-	-	112.6%	258.4%	219.1%	-	-	128.5%	379.9%	435.1%	-	-
1974	20.4%	205.8%	228.1%	-	-	33.1%	367.7%	345.6%	-	-	44.2%	534.1%	681.3%	-	-
1975	15.1%	125.6%	178.2%	-	-	-15.3%	241.8%	268.3%	-	-	-10.0%	360.6%	558.6%	-	-
1976	20.7%	152.8%	230.4%	-	-	15.1%	260.5%	324.7%	-	-	21.1%	389.0%	660.3%	-	-
1977	0.4%	97.5%	220.8%	-	-	2.1%	181.5%	359.6%	-	-	7.7%	286.6%	730.8%	-	-
1978	19.7%	48.4%	275.4%	-	-	18.8%	57.3%	463.7%	-	-	27.8%	116.3%	937.8%	-	-
1979	68.2%	107.3%	534.0%	702.9%	-	56.3%	84.7%	763.9%	823.1%	-	73.3%	159.8%	1547.5%	2545.0%	-
1980	14.6%	179.8%	531.1%	798.5%	-	1.2%	120.7%	654.3%	830.4%	-	13.9%	229.0%	1415.5%	2813.6%	-
1981	26.1%	71.4%	333.3%	550.2%	-	-34.5%	25.6%	352.9%	518.9%	-	-24.4%	105.6%	905.2%	2085.2%	-
1982	-1.7%	67.7%	231.2%	500.1%	-	-8.3%	12.8%	217.7%	476.4%	-	2.3%	95.2%	654.6%	2106.0%	-
1983	19.8%	67.8%	149.1%	516.6%	-	11.6%	6.1%	66.8%	432.2%	-	21.9%	86.2%	302.7%	2054.6%	-
1984	17.7%	-17.9%	70.2%	458.5%	-	-17.6%	-44.1%	3.3%	360.4%	-	-9.0%	-2.2%	154.0%	1884.8%	-
1985	0.8%	-27.8%	102.0%	462.0%	-	3.3%	-42.9%	25.9%	363.8%	-	11.5%	-4.3%	215.0%	1974.1%	-
1986	12.7%	-14.7%	46.2%	383.0%	-	-9.0%	-20.7%	-0.4%	322.9%	-	-3.3%	22.4%	151.6%	1812.9%	-
1987	8.8%	-5.6%	58.3%	407.7%	-	9.5%	-5.4%	6.8%	390.9%	-	16.2%	39.1%	171.5%	2155.2%	-
1988	10.9%	-12.6%	46.7%	450.6%	-	9.1%	-7.5%	-1.9%	452.8%	-	16.8%	33.2%	148.0%	2473.3%	-
1989	-0.3%	5.9%	-13.0%	451.4%	598.3%	7.9%	21.1%	-32.3%	485.3%	525.4%	17.3%	71.7%	67.8%	2665.1%	4339.3%
1990	5.6%	11.0%	-19.9%	405.8%	620.1%	10.3%	29.3%	-26.2%	456.5%	586.4%	19.1%	83.3%	75.5%	2559.7%	5013.6%
1991	14.4%	8.7%	-7.3%	301.8%	503.0%	-13.1%	23.4%	-2.2%	343.1%	505.6%	-8.2%	74.0%	113.0%	2040.9%	4554.3%
1992	1.0%	1.0%	-4.7%	215.8%	472.1%	0.1%	12.9%	6.8%	239.4%	515.8%	3.7%	55.3%	116.0%	1529.7%	4664.4%
1993	2.5%	-6.6%	-18.4%	103.2%	403.2%	-4.0%	-0.7%	-8.2%	53.2%	388.8%	-1.1%	31.6%	75.3%	605.7%	3676.1%
1994	16.5%	9.1%	15.6%	96.7%	545.5%	11.7%	2.8%	24.5%	28.7%	473.3%	16.6%	30.8%	124.6%	470.5%	4357.2%
1995	8.3%	11.8%	24.1%	150.7%	597.5%	8.9%	1.6%	31.3%	65.4%	509.1%	15.2%	26.5%	132.0%	630.7%	4712.1%
1996	3.8%	35.6%	47.5%	115.5%	612.2%	17.0%	36.8%	68.9%	68.1%	614.1%	23.2%	69.8%	195.4%	643.3%	5551.0%
1997	-9.8%	21.0%	22.2%	93.5%	520.7%	-8.2%	25.4%	41.5%	51.1%	594.7%	-3.4%	58.2%	145.6%	566.8%	5439.5%
1998	19.8%	-5.3%	-11.6%	29.7%	386.9%	-30.5%	-9.2%	-9.8%	-11.6%	398.4%	-27.0%	16.7%	53.5%	280.7%	3850.4%
1999	27.2%	3.4%	12.8%	-1.9%	522.2%	18.6%	-3.7%	-0.9%	-32.9%	479.8%	24.3%	24.4%	62.7%	173.1%	4399.9%
2000	21.2%	15.7%	29.4%	3.7%	554.5%	24.2%	9.9%	11.6%	-17.7%	521.0%	31.8%	42.3%	80.1%	216.1%	4690.8%
2001	18.2%	-8.8%	23.6%	14.7%	396.9%	-22.3%	-27.0%	-0.2%	-2.4%	342.2%	-19.5%	-7.0%	57.9%	236.4%	3281.2%
2002	33.3%	34.8%	63.1%	55.5%	415.1%	23.9%	-1.5%	23.5%	31.9%	319.0%	25.9%	21.2%	91.7%	314.1%	3024.9%
2003	19.0%	99.8%	89.2%	54.4%	284.6%	22.7%	73.9%	57.8%	44.9%	141.8%	23.9%	105.9%	140.2%	320.9%	1595.1%
2004	12.4%	76.5%	82.5%	111.0%	259.1%	7.6%	57.8%	52.0%	89.3%	95.6%	9.1%	80.7%	124.8%	404.9%	1182.6%
2005	30.2%	89.7%	119.6%	172.6%	450.6%	17.5%	49.3%	64.1%	115.5%	171.3%	21.4%	66.4%	136.8%	449.4%	1630.5%
2006	14.8%	166.5%	143.0%	258.4%	423.8%	-2.7%	87.0%	36.4%	130.4%	129.4%	2.1%	111.0%	96.3%	479.8%	1358.8%
2007	25.3%	150.6%	237.8%	312.9%	553.5%	11.1%	67.7%	65.2%	133.8%	149.7%	16.2%	94.8%	136.1%	480.0%	1474.4%
2008	28.9%	49.7%	199.2%	164.6%	288.0%	-36.6%	-13.3%	50.7%	35.9%	33.2%	-35.6%	1.1%	108.2%	219.7%	692.6%
2009	41.2%	88.1%	232.0%	274.6%	225.8%	18.7%	-4.4%	50.8%	49.4%	1.2%	18.9%	10.2%	99.1%	224.0%	443.9%
2010	26.4%	82.6%	246.4%	348.3%	259.3%	16.7%	-5.1%	41.7%	58.1%	16.7%	16.8%	6.1%	76.5%	217.8%	457.8%
2011	-8.1%	46.1%	289.3%	381.3%	346.4%	-13.4%	-15.5%	58.0%	57.7%	54.3%	-13.3%	-9.9%	90.0%	200.1%	539.2%
2012	3.7%	20.9%	202.9%	394.2%	371.1%	-1.1%	-24.8%	26.1%	55.7%	66.3%	-1.1%	-23.3%	49.3%	186.3%	518.4%
2013	-8.7%	55.4%	132.6%	340.2%	259.2%	-9.6%	7.3%	-7.0%	46.7%	34.7%	-9.5%	7.8%	9.0%	161.8%	358.9%
2014	17.0%	-8.7%	71.7%	213.4%	262.3%	-17.0%	-25.0%	-28.3%	8.9%	35.6%	-17.0%	-24.8%	-17.1%	86.4%	318.5%
2015	18.4%	-41.1%	7.6%	136.3%	193.3%	-24.7%	-51.6%	-54.1%	-24.7%	-1.1%	-24.7%	-51.5%	-48.5%	21.9%	182.7%
2016	23.1%	-21.0%	15.4%	180.4%	313.5%	11.4%	-37.8%	-47.4%	-28.3%	21.1%	11.8%	-37.4%	-43.7%	10.6%	226.7%
2017	7.6%	-18.1%	-1.0%	234.5%	308.9%	0.7%	-36.6%	-52.3%	-21.3%	11.4%	1.7%	-35.7%	-50.7%	16.4%	186.0%
2018	10.5%	-19.8%	24.6%	272.9%	229.8%	-13.0%	-39.0%	-34.6%	-1.4%	-11.1%	-11.2%	-36.9%	-32.0%	41.6%	117.4%
2019	10.4%	6.7%	-2.6%	223.5%	265.0%	5.4%	-22.5%	-41.9%	-12.3%	-13.2%	7.7%	-18.1%	-38.4%	22.6%	99.6%

Table 13: Bloomberg Agriculture Indices (Total Return)

	Agriculture					Grains					Softs				
	1Y	5Y	10Y	20Y	30Y	1Y	5Y	10Y	20Y	30Y	1Y	5Y	10Y	20Y	30Y
1960	3.4%	-	-	-	-	3.2%	-	-	-	-	-8.2%	-	-	-	-
1961	0.9%	-	-	-	-	1.8%	-	-	-	-	-7.9%	-	-	-	-
1962	1.3%	-	-	-	-	-1.0%	-	-	-	-	14.0%	-	-	-	-
1963	24.8%	-	-	-	-	16.2%	-	-	-	-	58.3%	-	-	-	-
1964	-1.2%	30.3%	-	-	-	3.2%	24.7%	-	-	-	-23.2%	17.1%	-	-	-
1965	2.2%	28.8%	-	-	-	9.0%	31.8%	-	-	-	-21.9%	-0.3%	-	-	-
1966	7.3%	37.1%	-	-	-	15.8%	49.9%	-	-	-	-16.4%	-9.4%	-	-	-
1967	-0.3%	35.0%	-	-	-	-12.8%	32.0%	-	-	-	35.6%	7.7%	-	-	-
1968	-3.2%	4.7%	-	-	-	-5.0%	7.9%	-	-	-	1.2%	-31.1%	-	-	-
1969	5.7%	12.0%	46.0%	-	-	7.3%	12.2%	39.9%	-	-	-5.0%	-14.8%	-0.2%	-	-
1970	27.2%	39.4%	79.5%	-	-	27.2%	30.9%	72.5%	-	-	11.2%	21.3%	20.9%	-	-
1971	8.0%	40.2%	92.2%	-	-	-0.1%	12.9%	69.3%	-	-	27.2%	84.4%	67.0%	-	-
1972	36.6%	92.0%	159.2%	-	-	43.0%	85.1%	144.5%	-	-	30.9%	77.9%	91.7%	-	-
1973	154.1%	403.9%	427.6%	-	-	173.8%	433.6%	475.9%	-	-	93.1%	239.3%	133.8%	-	-
1974	58.5%	655.8%	746.6%	-	-	26.7%	530.2%	607.2%	-	-	101.5%	619.9%	513.6%	-	-
1975	-12.8%	417.9%	621.7%	-	-	-24.9%	272.4%	387.4%	-	-	15.1%	645.3%	803.9%	-	-
1976	39.9%	570.9%	840.5%	-	-	20.0%	347.2%	405.0%	-	-	85.9%	989.4%	1909.1%	-	-
1977	-0.5%	388.9%	838.7%	-	-	-6.2%	193.3%	442.9%	-	-	8.4%	802.5%	1506.0%	-	-
1978	21.4%	133.6%	1077.0%	-	-	21.8%	30.4%	596.0%	-	-	14.7%	436.2%	1719.4%	-	-
1979	21.5%	79.0%	1253.0%	1874.7%	-	15.6%	19.0%	649.9%	949.3%	-	36.0%	262.0%	2505.8%	2501.2%	-
1980	16.4%	139.1%	1138.1%	2122.8%	-	16.1%	83.9%	584.9%	1081.2%	-	18.6%	273.0%	2680.3%	3262.5%	-
1981	-21.3%	34.5%	802.4%	1634.3%	-	-25.8%	13.8%	408.8%	761.5%	-	-9.5%	81.6%	1878.6%	3204.5%	-
1982	-12.6%	18.1%	477.3%	1396.3%	-	-13.4%	5.1%	208.3%	653.7%	-	-9.5%	51.6%	1268.3%	2523.3%	-
1983	35.1%	31.4%	207.0%	1519.7%	-	35.7%	17.1%	52.8%	779.8%	-	24.9%	65.2%	785.5%	1970.6%	-
1984	-9.3%	-1.9%	75.6%	1386.6%	-	-10.4%	-9.2%	8.0%	663.9%	-	-12.7%	6.0%	283.7%	2254.6%	-
1985	10.6%	-6.8%	122.8%	1507.7%	-	-0.1%	-21.9%	43.6%	600.1%	-	29.3%	15.6%	331.2%	3797.4%	-
1986	-5.7%	11.7%	50.2%	1312.4%	-	-4.7%	0.3%	14.1%	476.0%	-	-1.6%	25.7%	128.3%	4486.9%	-
1987	15.5%	47.6%	74.3%	1536.3%	-	16.3%	34.6%	41.5%	668.4%	-	11.4%	54.7%	134.5%	3666.9%	-
1988	26.5%	38.2%	81.7%	2038.1%	-	37.3%	36.3%	59.6%	1010.7%	-	8.8%	34.7%	122.6%	3949.1%	-
1989	-9.7%	37.6%	35.0%	1726.8%	2566.3%	-11.9%	34.0%	21.7%	812.3%	1176.6%	-4.0%	48.1%	57.0%	3990.5%	3983.2%
1990	-1.3%	22.9%	14.5%	1317.6%	2445.0%	-8.8%	22.3%	-4.5%	554.4%	1028.6%	9.9%	25.9%	45.5%	3944.9%	4791.9%

Table 14: Bloomberg Commodity Sector Indices (Total Return)

	Grains	Softs	Precious	Energy	Livestock
1960	3.2%	-8.2%	-	-	-
1961	1.8%	-7.9%	-	-	-
1962	-1.0%	14.0%	-	-	-
1963	16.2%	58.3%	-	-	-
1964	3.2%	-23.2%	-	-	-
1965	9.0%	-21.9%	-	-	-
1966	15.8%	-16.4%	-	-	-
1967	-12.8%	35.6%	-	-	-
1968	-5.0%	1.2%	-	-	-
1969	7.3%	-5.0%	-	-	-
1970	27.2%	11.2%	-	-	-
1971	-0.1%	27.2%	-	-	-
1972	43.0%	30.9%	-	-	-
1973	173.8%	93.1%	-	-	-
1974	26.7%	101.5%	-	-	-
1975	-24.9%	15.1%	-18.9%	-	-
1976	20.0%	85.9%	-1.2%	-	-
1977	-6.2%	8.4%	19.5%	-	-
1978	21.8%	14.7%	31.5%	-	-
1979	15.6%	36.0%	200.4%	-	-
1980	16.1%	18.6%	-6.4%	-	-
1981	-25.8%	-9.5%	-37.9%	-	-
1982	-13.4%	-9.5%	16.8%	-	-
1983	35.7%	24.9%	-15.8%	-	-
1984	-10.4%	-12.7%	-23.7%	-1.4%	-
1985	-0.1%	29.3%	2.9%	32.5%	-
1986	-4.7%	-1.6%	14.5%	-25.0%	-
1987	16.3%	11.4%	19.9%	5.2%	40.0%
1988	37.3%	8.8%	-14.2%	20.6%	23.7%
1989	-11.9%	-4.0%	-4.6%	76.4%	16.1%
1990	-8.8%	9.9%	-7.1%	48.5%	26.8%

Table 15: Bloomberg Single Commodity Indices (Total Return)

	Grains				Softs				Livestock		Precious		Energy		
	Soybean Oil	Corn	Soybean	Wheat	Cocoa	Cotton	Sugar	Coffee	Live Cattle	Lean Hogs	Gold	Silver	Crude Oil	Heating Oil	Unleaded Gas
1960	33.7%	-5.9%	6.7%	9.2%	-23.6%	3.4%	-	-	-	-	-	-	-	-	-
1961	18.1%	-12.1%	13.8%	-2.6%	-6.3%	-0.9%	-	-	-	-	-	-	-	-	-
1962	-24.7%	-7.1%	5.0%	-3.7%	-21.8%	0.8%	57.5%	-	-	-	-	-	-	-	-
1963	-6.1%	16.2%	16.5%	14.7%	12.3%	5.7%	182.2%	-	-	-	-	-	-	-	-
1964	26.5%	6.7%	5.3%	-9.5%	-25.3%	11.7%	-69.7%	-	-	-	-	-	-	-	-
1965	24.1%	3.4%	10.2%	14.5%	-12.9%	-3.0%	-48.6%	-	-	-	-	-	-	-	-
1966	6.7%	11.6%	25.6%	2.3%	8.9%	1.6%	-57.2%	-	-6.6%	-	-	-	-	-	-
1967	-15.0%	-20.4%	-2.9%	-21.8%	4.2%	51.6%	46.6%	-	-7.0%	-	-	-	-	-	-
1968	-1.6%	-5.2%	1.1%	-17.1%	49.3%	-18.8%	-22.3%	-	31.7%	-	-	-	-	-	-
1969	32.9%	7.9%	7.1%	6.3%	-8.0%	-12.3%	8.9%	-	26.9%	-	-	-	-	-	-
1970	91.7%	32.8%	24.1%	25.3%	-18.6%	-2.1%	62.0%	-	7.6%	-	-	-	-	-	-
1971	13.3%	-19.8%	9.0%	9.2%	-25.1%	26.6%	72.0%	-	44.7%	-	-	-	-	-	-
1972	-12.5%	16.7%	44.9%	81.7%	54.4%	30.8%	12.3%	-	32.6%	-	-	-	-	-	-
1973	245.9%	114.2%	178.8%	169.2%	145.4%	198.2%	58.7%	-	12.4%	-	-	-	-	-	-
1974	199.1%	43.1%	29.9%	-5.9%	91.2%	-49.6%	562.5%	-10.9%	-22.9%	-	-	-	-	-	-
1975	-40.7%	-12.0%	-33.2%	-26.1%	57.9%	56.2%	-64.7%	52.2%	44.0%	-	-	-	-	-	-
1976	30.9%	1.7%	52.5%	-24.2%	187.1%	26.7%	-47.0%	198.0%	-18.8%	-	-3.0%	2.8%	-	-	-
1977	14.1%	-19.5%	3.0%	-10.6%	52.7%	-24.2%	-1.4%	20.5%	15.5%	-	23.3%	9.5%	-	-	-
1978	46.7%	2.9%	29.8%	33.4%	59.7%	16.4%	-19.9%	12.7%	49.6%	-	34.3%	24.3%	-	-	-
1979	6.1%	21.7%	-3.1%	49.3%	-25.6%	16.7%	67.0%	72.5%	29.7%	-	132.8%	374.4%	-	-	-
1980	0.5%	26.4%	14.4%	5.9%	-27.1%	53.4%	88.4%	-35.1%	-2.4%	-	8.2%	-45.5%	-	-	-
1981	-27.3%	-29.0%	-23.5%	-26.1%	-7.1%	-21.4%	-56.5%	35.6%	-11.4%	-	-33.5%	-49.4%	-	-	-
1982	-17.7%	-12.9%	-8.4%	-24.3%	-26.7%	-3.2%	-56.2%	44.3%	43.8%	-	11.3%	31.6%	-	-	-
1983	77.6%	52.2%	41.0%	0.9%	68.6%	17.9%	-0.1%	24.9%	36.2%	-	-14.8%	-18.6%	-	-	-
1984	16.1%	-3.2%	-20.5%	2.3%	-10.6%	0.8%	-64.6%	28.3%	18.5%	-	-20.7%	-30.9%	-	-	-
1985	14.5%	1.3%	-6.0%	11.3%	21.9%	1.7%	10.4%	79.2%	-11.5%	-	7.2%	-7.7%	32.5%	-	-
1986	-31.9%	-24.1%	-1.8%	18.6%	-22.3%	96.9%	-10.9%	-43.1%	11.2%	-	23.5%	-8.0%	-25.0%	-	-
1987	28.2%	2.2%	25.4%	18.4%	-7.8%	27.3%	30.2%	-13.2%	47.3%	-	19.2%	21.9%	10.1%	-	-
1988	7.3%	42.5%	33.6%	37.3%	-17.5%	-1.2%	25.3%	25.9%	30.3%	12.0%	-15.7%	-10.4%	14.3%	18.3%	41.4%
1989	-21.3%	-7.6%	-19.3%	-3.0%	-32.2%	19.9%	33.2%	-41.0%	15.8%	17.3%	-0.3%	-15.3%	81.8%	69.8%	64.9%
1990	18.1%	0.3%	-5.4%	-31.6%	16.6%	34.1%	-20.4%	3.9%	25.2%	29.2%	-1.7%	-20.5%	49.2%	44.1%	47.3%

Table 16: Bloomberg Commodity Index Annual Roll Returns

	BCOM Spot Return	BCOM Total Return	Annual Roll Yield
1960	2.4%	0.5%	-2.0%
1961	2.2%	-1.5%	-3.7%
1962	6.5%	-1.5%	-8.0%
1963	16.6%	20.9%	4.3%
1964	-9.2%	-4.7%	4.4%
1965	0.2%	2.5%	2.3%
1966	1.6%	-0.2%	-1.8%
1967	3.5%	-5.7%	-9.1%
1968	2.3%	-3.2%	-5.4%
1969	-0.4%	1.9%	2.4%
1970	15.2%	16.0%	0.8%
1971	7.7%	9.1%	1.4%
1972	28.6%	30.7%	2.1%
1973	59.3%	112.6%	53.3%
1974	20.4%	33.1%	12.7%
1975	-15.1%	-15.3%	-0.2%
1976	20.7%	15.1%	-5.6%
1977	0.4%	2.1%	1.6%
1978	19.7%	18.8%	-0.9%
1979	68.2%	56.3%	-11.9%
1980	14.6%	1.2%	-13.4%
1981	-26.1%	-34.5%	-8.5%
1982	-1.7%	-8.3%	-6.6%
1983	19.8%	11.6%	-8.2%
1984	-17.7%	-17.6%	0.2%
1985	0.8%	3.3%	2.5%
1986	-12.7%	-9.0%	3.6%
1987	8.8%	9.5%	0.7%
1988	10.9%	9.1%	-1.9%
1989	-0.3%	7.9%	8.2%
1990	5.6%	10.3%	4.6%
1991	-14.4%	-13.1%	1.3%
1992	1.0%	0.1%	-0.9%
1993	2.5%	-4.0%	-6.6%
1994	16.5%	11.7%	-4.8%
1995	8.3%	8.9%	0.7%
1996	3.8%	17.0%	13.2%
1997	-9.8%	-8.2%	1.6%
1998	-19.8%	-30.5%	-10.8%
1999	27.2%	18.6%	-8.6%
2000	21.2%	24.2%	3.0%
2001	-18.2%	-22.3%	-4.1%
2002	33.3%	23.9%	-9.4%
2003	19.0%	22.7%	3.7%
2004	12.4%	7.6%	-4.7%
2005	30.2%	17.5%	-12.7%
2006	14.8%	-2.7%	-17.6%
2007	25.3%	11.1%	-14.2%
2008	-28.9%	-36.6%	-7.7%
2009	41.2%	18.7%	-22.5%
2010	26.4%	16.7%	-9.7%
2011	-8.1%	-13.4%	-5.2%
2012	3.7%	-1.1%	-4.9%
2013	-8.7%	-9.6%	-0.9%
2014	-17.0%	-17.0%	0.0%
2015	-18.4%	-24.7%	-6.3%
2016	23.1%	11.4%	-11.7%
2017	7.6%	0.7%	-6.8%
2018	-10.5%	-13.0%	-2.4%
2019	10.37%	5.44%	-4.93%

Table 17: Bloomberg Commodity Index Historical Roll Returns

Roll Returns	1960-2018	1960's	1970's	1980's	1990's	2000's	2010's
Positive	23	4	6	5	5	2	1
Negative	36	6	4	5	5	8	9

Table 18: Bloomberg Commodity Index Historical Cash Returns

	BCOM Excess Return	BCOM Total Return	Annual T-Bill Return
1960	0.5%	3.4%	3.0%
1961	-1.5%	0.9%	2.4%
1962	-1.5%	1.3%	2.8%
1963	20.9%	24.8%	3.9%
1964	-4.7%	-1.2%	3.5%
1965	2.5%	6.7%	4.2%
1966	-0.2%	4.9%	5.1%
1967	-5.7%	-1.4%	4.2%
1968	-3.2%	2.3%	5.5%
1969	1.9%	9.2%	7.2%
1970	16.0%	23.8%	7.9%
1971	9.1%	14.0%	5.0%
1972	30.7%	36.2%	5.5%
1973	112.6%	128.5%	15.9%
1974	33.1%	44.2%	11.2%
1975	-15.3%	-10.0%	5.2%
1976	15.1%	21.1%	6.0%
1977	2.1%	7.7%	5.6%
1978	18.8%	27.8%	9.0%
1979	56.3%	73.3%	17.0%
1980	1.2%	13.9%	12.7%
1981	-34.5%	-24.4%	10.1%
1982	-8.3%	2.3%	10.6%
1983	11.6%	21.9%	10.3%
1984	-17.6%	-9.0%	8.6%
1985	3.3%	11.5%	8.2%
1986	-9.0%	-3.3%	5.7%
1987	9.5%	16.2%	6.7%
1988	9.1%	16.8%	7.7%
1989	7.9%	17.3%	9.4%
1990	10.3%	19.1%	8.9%
1991	-13.1%	-8.2%	4.9%
1992	0.1%	3.7%	3.6%
1993	-4.0%	-1.1%	3.0%
1994	11.7%	16.6%	4.9%
1995	8.9%	15.2%	6.3%
1996	17.0%	23.2%	6.2%
1997	-8.2%	-3.4%	4.9%
1998	-30.5%	-27.0%	3.5%
1999	18.6%	24.3%	5.7%
2000	24.2%	31.8%	7.6%
2001	-22.3%	-19.5%	2.8%
2002	23.9%	25.9%	2.0%
2003	22.7%	23.9%	1.3%
2004	7.6%	9.1%	1.5%
2005	17.5%	21.4%	3.8%
2006	-2.7%	2.1%	4.8%
2007	11.1%	16.2%	5.1%
2008	-36.6%	-35.6%	1.0%
2009	18.7%	18.9%	0.2%
2010	16.7%	16.8%	0.2%
2011	-13.4%	-13.3%	0.1%
2012	-1.1%	-1.1%	0.1%
2013	-9.6%	-9.5%	0.1%
2014	-17.0%	-17.0%	0.0%
2015	-24.7%	-24.7%	0.0%
2016	11.4%	11.8%	0.4%
2017	0.7%	1.7%	1.0%
2018	-13.0%	-11.2%	1.7%
2019	5.44%	7.69%	2.25%

Table 19: Bloomberg Commodity Index Gross Returns

	BCOM Spot Return	BCOM Total Return	Gross Roll Yield
1960	2.4%	3.4%	1.0%
1961	2.2%	0.9%	-1.3%
1962	6.5%	1.3%	-5.2%
1963	16.6%	24.8%	8.2%
1964	-9.2%	-1.2%	8.0%
1965	0.2%	6.7%	6.5%
1966	1.6%	4.9%	3.2%
1967	3.5%	-1.4%	-4.9%
1968	2.3%	2.3%	0.0%
1969	-0.4%	9.2%	9.6%
1970	15.2%	23.8%	8.7%
1971	7.7%	14.0%	6.4%
1972	28.6%	36.2%	7.7%
1973	59.3%	128.5%	69.2%
1974	20.4%	44.2%	23.9%
1975	-15.1%	-10.0%	5.0%
1976	20.7%	21.1%	0.4%
1977	0.4%	7.7%	7.3%
1978	19.7%	27.8%	8.1%
1979	68.2%	73.3%	5.1%
1980	14.6%	13.9%	-0.7%
1981	-26.1%	-24.4%	1.7%
1982	-1.7%	2.3%	4.0%
1983	19.8%	21.9%	2.1%
1984	-17.7%	-9.0%	8.7%
1985	0.8%	11.5%	10.7%
1986	-12.7%	-3.3%	9.4%
1987	8.8%	16.2%	7.4%
1988	10.9%	16.8%	5.8%
1989	-0.3%	17.3%	17.6%
1990	5.6%	19.1%	13.5%
1991	-14.4%	-8.2%	6.2%
1992	1.0%	3.7%	2.7%
1993	2.5%	-1.1%	-3.6%
1994	16.5%	16.6%	0.1%
1995	8.3%	15.2%	7.0%
1996	3.8%	23.2%	19.4%
1997	-9.8%	-3.4%	6.4%
1998	-19.8%	-27.0%	-7.3%
1999	27.2%	24.3%	-2.9%
2000	21.2%	31.8%	10.7%
2001	-18.2%	-19.5%	-1.3%
2002	33.3%	25.9%	-7.4%
2003	19.0%	23.9%	5.0%
2004	12.4%	9.1%	-3.2%
2005	30.2%	21.4%	-8.9%
2006	14.8%	2.1%	-12.8%
2007	25.3%	16.2%	-9.1%
2008	-28.9%	-35.6%	-6.7%
2009	41.2%	18.9%	-22.3%
2010	26.4%	16.8%	-9.6%
2011	-8.1%	-13.3%	-5.2%
2012	3.7%	-1.1%	-4.8%
2013	-8.7%	-9.5%	-0.9%
2014	-17.0%	-17.0%	0.0%
2015	-18.4%	-24.7%	-6.3%
2016	23.1%	11.8%	-11.4%
2017	7.6%	1.7%	-5.9%
2018	-10.5%	-11.2%	-0.7%
2019	10.37%	7.69%	-2.68%

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