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Standard & Poor's Diversified Trends Indicator

January 2007

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Methodology and Implementation

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The McGraw·Hill Companies

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Executive Summary

The Standard & Poor's Diversified Trends Indicator is a diversified composite of global commodity and financial futures that are highly liquid. The components are formed into sectors that are long or short (except energy) the underlying futures using a rules-based methodology. The indicator measures the extent (and duration), i.e. the extended volatility, of the trends of these sectors in aggregate.

Futures derive their returns differently from other financial assets. Unlike declining equities, where usually only short-sellers benefit, declining futures prices have as much benefit as rising futures prices: rising prices benefit producers; declining prices, consumers. As such, within the futures markets both buying and selling play an equally important economic role. Futures prices reflect not only current cash prices, but also expectations of future prices as well as general economic and fundamental factors. The S&P Diversified Trends Indicator methodology is investable, intending to reflect and capture the profit potential in price trends.

Speculators play an important role in the economics of futures markets. They provide liquidity and accept the risk of price fluctuations in return for a premium from hedgers who are unwilling to bear that risk.

This paper discusses the economic function of the futures market and how it relates to the rationale behind the S&P Diversified Trends Indicator. We describe how the indicator is constructed and what the methodology is designed to achieve. Weighting decisions, method for determining direction of position, rebalancing, and execution are explained. We consider the indicator's internal diversification and how the long exposure tends to capture inflation over long periods. We describe how exposure to the indicator tends to mitigate and even profit from commodity and financial price cyclicality. There is a discussion of long/short measures compared to long-only commodity indices and why the indicator tends to be profitable in a variety of market conditions. Finally, there is a brief discussion of two variations on the S&P Diversified Trends Indicator based on its sector subcomponents: the S&P Commodity Trends Indicator, and the S&P Financial Trends Indicator. ■

1. Introduction

Through a licensing agreement with Alpha Financial Technologies, LLC (AFT),[1] Standard & Poor's now offers the Standard & Poor's Diversified Trends Indicator.[2] AFT's CEO, Victor Sperandeo, is recognized as offering futures market trading expertise as a commodity trading advisor and has for some time implemented a number of successful strategies that are designed to profit from futures price trends. The S&P Diversified Trends Indicator is an evolution of these strategies in that it constitutes the intellectual property of AFT, but is constructed, calculated, and maintained by Standard & Poor's with participation from AFT.

The indicator follows a quantitative methodology to track prices of a diversified portfolio of 24 commodity and financial futures contracts. The contracts (also called components) are grouped into sectors and each sector is represented on either a "long" or "short" basis, depending on recent price trends of that sector. With the ability to go long or short sectors, the S&P Diversified Trends Indicator is designed to capture the economic benefit over long time periods derived from both rising and declining trends within a cross-section of futures markets.

The primary objective of the indicator is to measure in aggregate the component trends based on price movement and premium discount expansion and contraction of certain highly liquid futures. Limiting the volatility of the indicator was a guide in the determination of the methodology. The methodology is implemented in a rules-based, systematic manner. The indicator is not intended to be representative of a particular futures market or group of markets.

1.1 Description of the S&P Diversified Trends Indicator

The key characteristics of the S&P Diversified Trends Indicator include:

- 24 components (futures contracts), equally divided by weight, grouped into 14 sectors
  - Eight financial and six commodity sectors
  - By weight, equally divided between financial and commodities
- Long or short positions are determined by comparing the current sector price to a moving exponential average (i.e., most recent price weighted most heavily, etc.)
- Sectors are rebalanced monthly; components are rebalanced annually
- Performance has a positive correlation to its own standard deviation (i.e., performance tends to increase/decrease with increased/decreased volatility)
- Exposure offers potential to mitigate the negative effect of commodity and financial price cyclicality

[1] A limited liability company founded by Victor Sperandeo, with headquarters in Dallas, TX.

[2] An indicator is a rules-based model or strategy using judgment in its construction to target particular risk/return characteristics of an asset class or segment of a market. It does not intend to passively represent a market, but instead passively reflects a specific characteristic of that market.

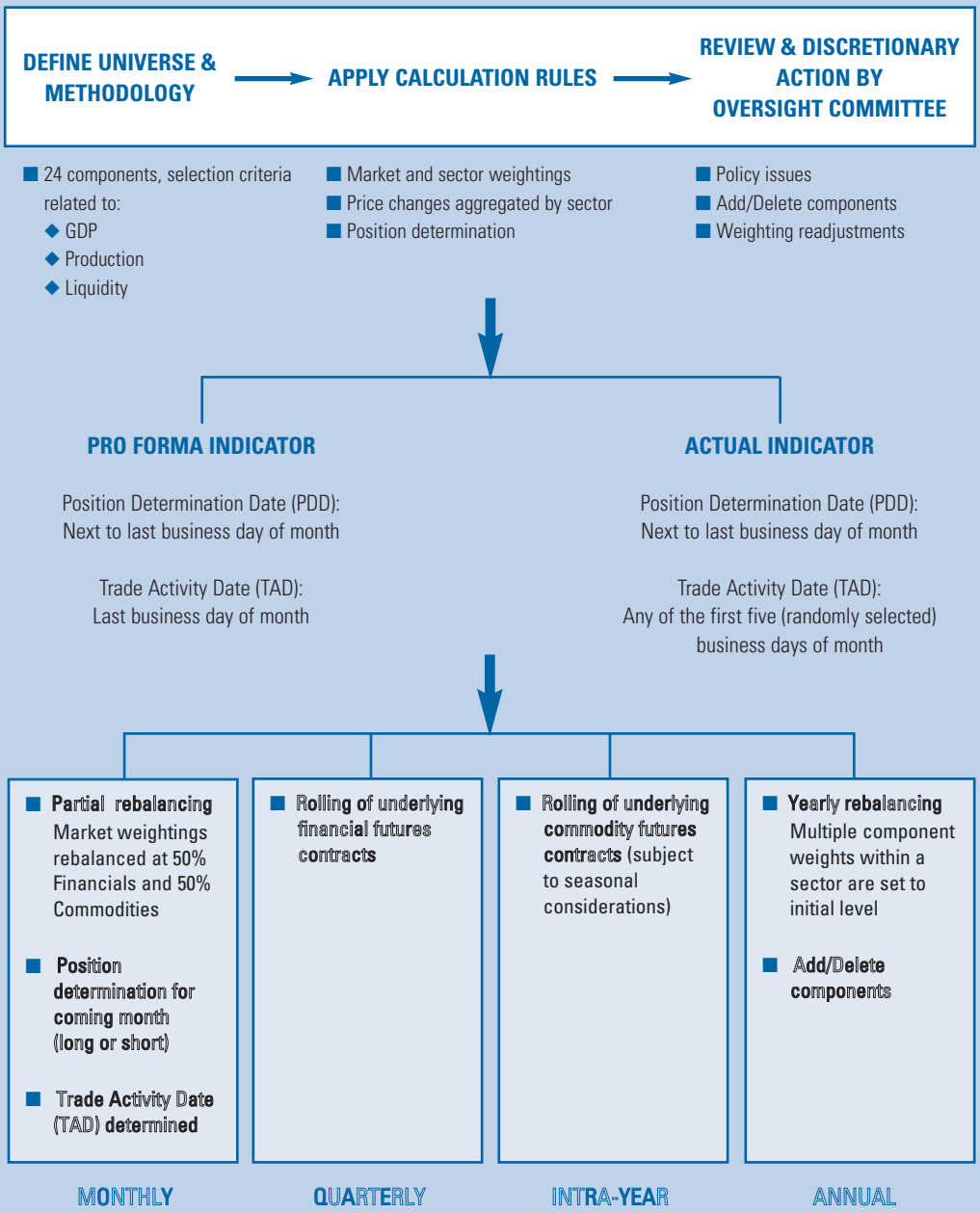
Exhibit 1 illustrates the sector weightings of the indicator, including a reference to the component weights. Note that in some cases there is only one component. See Appendix A for details of the component contracts.

EXHIBIT 1: S&P DIVERSIFIED TRENDS INDICATOR WEIGHTING SCHEME

MARKET	MARKET WEIGHT	SECTOR	SECTOR WEIGHT	COMPONENT	COMPONENT WEIGHT
Commodities	50.00%	Energy	18.75%	Heating Oil	3.00%
				Light Crude	8.50%
				Natural Gas	4.25%
				Unleaded Gasoline	3.00%
		Industrial Metals	5.00%	Copper	5.00%
		Precious Metals	5.25%	Gold	3.50%
				Silver	1.75%
		Livestock	5.00%	Lean Hogs	2.00%
				Live Cattle	3.00%
		Grains	11.50%	Corn	4.00%
				Soybeans	5.00%
				Wheat	2.50%
		Softs	4.50%	Cocoa	1.00%
				Coffee	1.50%
				Cotton	1.00%
				Sugar	1.00%
Financials	50.00%	Australian Dollar	2.00%	Australian Dollar	2.00%
		British Pound	5.00%	British Pound	5.00%
		Canadian Dollar	1.00%	Canadian Dollar	1.00%
		Euro	13.00%	Euro	13.00%
		Japanese Yen	12.00%	Japanese Yen	12.00%
		Swiss Franc	2.00%	Swiss Franc	2.00%
		U.S. Treasury Bonds	7.50%	U.S. Treasury Bonds	7.50%
		U.S. Treasury Notes	7.50%	U.S. Treasury Notes	7.50%

Exhibit 2 offers an overview of the construction and maintenance process of the S&P Diversified Trends Indicator and serves as an introduction to the description following. ■

EXHIBIT 2: PROCESS OVERVIEW



2. Methodology and Maintenance

The methodology of the S&P Diversified Trends Indicator is designed with a focus on capturing both up and down price trends, yet moderating volatility. Components of the indicator are chosen based on fundamental characteristics and liquidity (necessary for an investable model), as opposed to a means for achieving performance per se.

2.1 Selection Criteria

Of the factors considered in determining the S&P Diversified Trends Indicator components and weights, liquidity—the volume and notional size of futures contracts traded—is one of the most important. Liquidity is an indication both of the significance of a particular market and the ability to trade with minimal market impact. All the components of the indicator are consistently in the lists of top contracts traded in the U.S.

Investability is another important consideration. Other liquid contracts may exist, but exceptionally large contract values (i.e., $1,000,000 per contract for Eurodollar futures) would make the cost to replicate the indicator very inefficient. Contracts are limited to those traded on U.S. exchanges to minimize any impact from major differences in trading hours, avoid currency exchange calculations, and allow for similar closing times and holiday schedules.

2.1.1 Initial Weightings

For commodities, production is an indication of the significance of a given component to the world economy and of such component's significance within the futures markets themselves.[3] Since there is often no single recognized source for a commodity's production figures, estimates are used in selecting and making allocations.

Gross domestic product (GDP), is an indication of economic significance and is used in selecting and making allocations to financials.[4]

Markets are divided equally between tangible commodities and financials (excluding equities) in order to increase the internal non-correlation among the components. This is not done to reflect their relative notional values outstanding, but rather to produce a smoother, less volatile return.

Weightings of the financial sectors are based on, but not directly proportional, to GDP. Instead, the financials of the countries with a GDP of greater than $3 trillion are placed into tier 1 and countries with a GDP of less than $3 trillion are placed in tier 2. Tier 1 financials are meant to be close in weight, with slight relative tilts towards those from the larger economies. Thus, the U.S.-based financials have a higher importance than the euro currency. Tier 2 markets are weighted approximately proportionate to each other, but have some adjustments for liquidity, trading significance, and potential correlation to tier 1 markets. For example, the Canadian Dollar component receives a 1% weighting due to Canada's historical economic connection with the U.S. By not weighting the financials of the largest GDP countries so high, the tier weighting approach increases diversification.

[3] In the case of the Natural Gas component included in the Energy sector, North American rather than world production has been used as the relevant factor due to constraints linked to transporting natural gas internationally.

[4] The Swiss Franc is an exception: this currency is allocated a weighting slightly disproportionate (1%) to the Swiss GDP due to the Swiss franc's liquidity and Switzerland's political significance.

EXHIBIT 3: GROSS DOMESTIC PRODUCT, 2004

RELATED SECTOR WEIGHT	REGION	GDP (USD TRILLION)
15%	United States	$ 11.67
13%	European Monteary Union	$ 9.37
12%	Japan	$ 4.62
5%	United Kingdom	$ 2.14
1%	Canada	$ 0.98
2%	Australia	$ 0.63
2%	Switzerland	$ 0.36

Source: World Development Indicators Database, World Bank, March 2006

Commodity weights are based on generally known world production levels. A reasonability test is to compare weights with established commodity-specific indices, such as the Goldman Sachs Commodity Index (GSCI) and Dow Jones-AIG Commodity Index (DJ-AIG). As shown in Exhibit 4, when divided in half to match the fact that commodities are only half the weight of the S&P Diversified Trends Indicator, the production allocations compare fairly closely. The exception to this is the significantly higher Energy weighting in the GSCI due to strict adherence to production figures.

EXHIBIT 4: PRODUCTION ALLOCATION

	GOLDMAN SACHS COMMODITY INDEX	HALF WEIGHT	DOW JONES-AIG COMMODITY INDEX	HALF WEIGHT	S&P DIV. TRENDS INDICATOR
Energy	74.56%	37.38%	33.00%	16.50%	18.75%
Industrial Metals	8.49%	4.25%	18.09%	9.05%	5.00%
Precious Metals	2.20%	1.10%	8.22%	4.11%	5.25%
Livestock	4.20%	2.10%	10.45%	5.23%	5.00%
Grains	6.67%	3.34%	21.18%	10.59%	11.50%
Softs	3.88%	1.94%	9.06%	4.53%	4.50%
Weightings as of…		April 2006		January 2006	Any month end

Source: Respective index websites

2.2 Rebalancing

2.2.1 Monthly Rebalancing for Sector Weights

Sectors are rebalanced monthly to their fixed weights. The rebalance date is the second to the last business day of the month with an effective date randomly selected from any of the first five business days of the next month.

Rebalancing monthly helps to keep volatility low since otherwise an extended move in one group or sector would overweight the S&P Diversified Trends Indicator and potentially lead to significantly higher volatility of the indicator. Because the sectors are rebalanced, it follows that every month the aggregate markets are rebalanced to equal weighting (e.g., 50% commodities/50% financials). An exception to this (described more fully below) is when the Energy sector has a neutral position.

2.2.2 Variability of Component Weights

While sectors are always rebalanced monthly back to their fixed weights, the component weightings are allowed to vary. A hypothetical example is described below and shown in Exhibit 5:

In the Livestock sector, for the two months ending February 2000, the cumulative year-to-date return is 5.26% for the Lean Hogs component and -0.68% for the Live Cattle component. To determine the weight of each component within the Livestock sector for March 2000, we multiply one plus the component's year-to-date return by its initial weight and divide by one plus the sector's year-to-date return.

Thus, the weight for Lean Hogs in March is:
(1+5.26%) * 2.00% / (1 + 1.70%) = 2.07%

For Live Cattle, the March weight is:
(1 - 0.68%) * 3.00% / (1 + 1.70%) = 2.93%

The two components weights sum to 5.00%, which is the target Livestock sector weight.

EXHIBIT 5: EXAMPLE OF MULTIPLE COMPONENT WEIGHT CHANGES IN A SECTOR

	LEAN HOGS COMPONENT			LIVE CATTLE COMPONENT			LIVESTOCK SECTOR		
INITIAL WEIGHT			2.00%			3.00%			5.00%
	MONTHLY RETURN	YTD RETURN	MONTHLY WEIGHT	MONTHLY RETURN	YTD RETURN	MONTHLY WEIGHT	MONTHLY RETURN	YTD RETURN	MONTHLY WEIGHT
Jan-00	6.04%	6.04%	2.00%	0.29%	0.29%	3.00%	2.59%	2.59%	5.00%
Feb-00	-0.74%	5.26%	2.07%	-0.97%	-0.68%	2.93%	-0.87%	1.70%	5.00%
Mar-00	10.27%	16.07%	2.19%	0.07%	-0.61%	2.81%	4.29%	6.06%	5.00%

2.2.3 Annual Rebalancing for Component Weights

At the end of each year, each of the 24 components are rebalanced. It is expected that the component weights will not vary significantly from those shown in Exhibit 1. Although production and GDP figures change over time, in a relative sense as it affects component weights, that change is small.

Rebalancing components only annually allows a degree of microeconomic influence among the correlated sector components so that market actions can determine which components are relatively more important.

2.3 Position Determination

The rule for the indicator regarding long or short positions can be summarized as follows:

- **Long positions are** tracked when a component's current price input is equal to or greater than an exponential average of the past seven price inputs;
- **Short positions are** tracked when a component's current price input is less than an exponential average of the past seven price inputs;
- **Track a flat (zero weight)** position for the Energy sector when a short position is indicated; in this case, the 18.75% weight for Energy is distributed proportionately to the other 13 sectors.

Position is determined on the second to the last business day of the month (defined as the position determination date or PDD) when the monthly percentage change of a sector's price is compared to past monthly price changes exponentially weighted to give greatest weight to the most recent return and least weight to the return seven months prior. See Appendix B for details regarding the exponential average. The weighted sum of the percentage changes of all the sector prices equals the daily movement of the indicator.

After the market closes on the trade activity date (TAD), active S&P DTI contracts are replaced either because (a) a new long / short signal has been generated for a particular sector or component; or (b) to roll into a further dated contract as required by the roll schedule (see exhibit 8), or both. Therefore, new contracts become active as of the day following the TAD. The TAD is randomly selected and is one of the first five business days of each month. S&P acknowledges that limit closes which occur on the TAD in active S&P DTI contracts can restrict, and in some cases eliminate, the liquidity required for perfect replication of the S&P DTI.

2.3.1 Price Input

The price input for a particular contract is based on the cumulative percentage price change. For example, assume the March Euro contract goes from 100 to 102 in January and from 102 to 104 in February. At the end of February/beginning of March, the S&P Diversified Trends Indicator represents a selling of the March Euro contract and a buying of the June Euro contract which is trading at 110 and which then experiences a decline to 106 by month end. The price input for this hypothetical Euro contract would be as follows:

EXHIBIT 6: EXAMPLE OF PRICE INPUT CALCULATION

MONTH	PRICE PERCENTAGE CHANGE	CALCULATION OF PRICE INPUT	PRICE INPUT
January	2.00% = (102/100)-1		2.00%
February	1.96% = (104/102)-1	((1+2.00%)*(1+1.96%))-1	4.00%
March	-3.64% = (106/110)-1	((1+2.00%)*(1+1.96%)*(1-3.64%))-1	0.21%

2.3.2 Sectors versus Components

For those sectors with only one component (Industrial Metals and the eight financial sectors), the price input calculations to determine position are at the component level. For the Energy, Precious Metals, Livestock, and Grains sectors, the price inputs from the respective underlying components are aggregated to determine position for that sector as a whole. In this case, aggregating the components reduces minor and unnecessary minor fluctuations, i.e., whipsaws. An exception exists in the calculation of the Softs sector. Here, since there is no fundamental tie between each of its components (Coffee, Cocoa, Cotton, and Sugar), the position of each is determined separately. For example, Coffee could be long while Sugar is short.

[5] A "limit" is a contract's maximum price advance or decline from the previous day's settlement price permitted in one trading session, as determined by the relevant exchange.

2.3.3 Energy's Short Exemption – Risk of Ruin

Energy, due to the significant level of its continuous consumption, limited reserves, and oil cartel controls is subject to rapid price increases in the event of perceived or actual shortages. Because no other sector is subject to the same continuous demand with supply and concentration risk, the Energy sector is never positioned short in the S&P Diversified Trends Indicator methodology.

Exhibit 7 shows how the 18.75% weight of the Energy sector would be allocated to the other sectors if it were not positioned long.

EXHIBIT 7: S&P DIVERSIFIED TRENDS INDICATOR WEIGHTING SCHEME WITHOUT ENERGY

MARKET	MARKET WEIGHT	SECTOR	SECTOR WEIGHT	COMPONENT	COMPONENT WEIGHT
Commodities	38.50%	Energy	0.00%	Heating Oil	0.00%
				Light Crude	0.00%
				Natural Gas	0.00%
				Unleaded Gasoline	0.00%
		Industrial Metals	6.15%	Copper	6.15%
		Precious Metals	6.46%	Gold	4.31%
				Silver	2.15%
		Livestock	6.15%	Lean Hogs	2.46%
				Live Cattle	3.69%
		Grains	14.15%	Corn	4.92%
				Soybeans	6.15%
				Wheat	3.08%
		Softs	5.54%	Cocoa	1.23%
				Coffee	1.85%
				Cotton	1.23%
				Sugar	1.23%
Financials	61.50%	Australian Dollar	2.46%	Australian Dollar	2.46%
		British Pound	6.15%	British Pound	6.15%
		Canadian Dollar	1.23%	Canadian Dollar	1.23%
		Euro	16.00%	Euro	16.00%
		Japanese Yen	14.77%	Japanese Yen	14.77%
		Swiss Franc	2.46%	Swiss Franc	2.46%
		U.S. Treasury Bonds	9.23%	U.S. Treasury Bonds	9.23%
		U.S. Treasury Notes	9.23%	U.S. Treasury Notes	9.23%

Mathematically, original weights are divided by one minus 18.75%. Weights in Exhibit 7 do not sum to one due to rounding.

2.4 Contract Maintenance

The S&P Diversified Trends Indicator is an indicator of futures contract price trends, and futures contracts have limited durations. Consequently, in order for the indicator to be calculated on an ongoing basis, it must change (or roll) from tracking contracts that are approaching expiration to tracking new contracts. Currently, each contract has three to four roll periods each year and its own "roll pattern" based on historical liquidity. The following rules are observed in rolling the indicator futures contracts from an expiring contract to the next contract:

- The non-currency component contracts are rolled over from the current contract to the next contract beginning with the TAD for the month that is two months before the current contract matures.
- The currency contracts are rolled over from the current contract to the next maturing futures contract four times per year as of the TAD for the month prior to the contract's final maturity month.

See Exhibit 8 for a schedule of the active contracts used for price inputs of the indicator.

EXHIBIT 8: SCHEDULE OF CONTRACTS

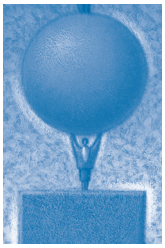
	ACTIVE CONTRACT FOR:											
CONTRACT NAME	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Heating Oil	H	M	M	M	U	U	U	Z	Z	Z	H	H
Crude Oil (Light)	H	M	M	M	U	U	U	Z	Z	Z	H	H
Natural Gas	H	M	M	M	U	U	U	Z	Z	Z	H	H
Unleaded Gas	H	M	M	M	U	U	U	Z	Z	Z	H	H
Copper	H	N	N	N	N	U	U	Z	Z	Z	H	H
Gold	M	M	M	M	V	V	V	V	Z	Z	G	G
Silver	H	N	N	N	N	U	U	Z	Z	Z	H	H
Lean Hogs	M	M	M	M	Q	Q	Z	Z	Z	Z	G	G
Live Cattle	M	M	M	M	Q	Q	Z	Z	Z	Z	G	G
Corn	H	N	N	N	N	U	U	Z	Z	Z	H	H
Soybeans	H	N	N	N	N	X	X	X	X	H	H	H
Wheat	H	N	N	N	N	U	U	Z	Z	Z	H	H
Cocoa	H	N	N	N	N	U	U	Z	Z	Z	H	H
Coffee	H	N	N	N	N	U	U	Z	Z	Z	H	H
Cotton	H	N	N	N	N	Z	Z	Z	Z	Z	H	H
Sugar	H	K	K	N	N	V	V	V	H	H	H	H
Australian Dollar	H	H	M	M	M	U	U	U	Z	Z	Z	H
British Pound	H	H	M	M	M	U	U	U	Z	Z	Z	H
Canadian Dollar	H	H	M	M	M	U	U	U	Z	Z	Z	H
Euro	H	H	M	M	M	U	U	U	Z	Z	Z	H
Japanese Yen	H	H	M	M	M	U	U	U	Z	Z	Z	H
Swiss Franc	H	H	M	M	M	U	U	U	Z	Z	Z	H
U.S. Treasury Bond	H	M	M	M	U	U	U	Z	Z	Z	H	H
U.S. Treasury Note	H	M	M	M	U	U	U	Z	Z	Z	H	H

LETTER	CONTRACT EXPIRATION
F	JAN
G	FEB
H	MAR
J	APR
K	MAY
M	JUN
N	JUL
Q	AUG
U	SEP
V	OCT
X	NOV
Z	DEC

The risk of aberrational liquidity or pricing around the maturity date of a commodity futures contract is greater than in the case of other futures contracts because (among other factors) a number of market participants take delivery of the underlying commodities. Spot markets in commodities occasionally have delivery problems, related to, for example, weather conditions disrupting transportation of cattle to a delivery point. Such a delay could cause the spot market to skyrocket, while later-dated futures contracts are little changed. The indicator avoids delivery issues by owning contracts that are outside of nearby delivery.

2.5 S&P Diversified Trends Indicator Oversight Committee

In order to provide for the smooth functioning of the S&P Diversified Trends Indicator, the S&P Diversified Trends Indicator Oversight Committee ("Oversight Committee") will make any decisions that cannot be systematized or that occur on an ad hoc basis. The Oversight Committee will implement established methodology or determine new policy if market conditions warrant change. For example, an exchange might substantially change the contract terms or even discontinue trading a component contract. In such cases, the Oversight Committee would determine any component or weighting changes. The Oversight Committee does not, however, use discretion to affect performance. Always, the goal is to maintain liquidity and low volatility in the indicator. ■



3. S&P Diversified Trends Indicator Performance

There are two kinds of returns for a futures-based index or indicator. The first is a simple combination of the weighted price percentage changes on a daily basis: this will be referred to as the S&P Diversified Trends Indicator Price Return (PR). The second return stream represents a simple, but realistic rate of return for an actual implementation of the indicator. Since futures contracts are bought on margin rather than with an actual cash investment, it is useful to have a return that uses a fully-collateralized margin account consisting of 90-day U.S. Treasury bills. This collateralized return will be known as the S&P Diversified Trends Indicator Total Return (TR). Compounding of the interest on the U.S. Treasury bill is on a quarterly basis.

3.1 S&P Diversified Trends Pro Forma Indicator Performance Analysis

For purposes of analysis, AFT constructed a pro forma version of the S&P Diversified Trends Indicator from January 1985 through December 2003. This methodology differs only slightly from the current methodology of the S&P Diversified Trends Indicator:

S&P Div. Trends Indicator	S&P Div. Trends Pro Forma Indicator
❖ Includes November Soybean contract	Includes September Soybean contract
❖ Includes December Cotton contract	Includes October Cotton contract
❖ TAD any of first five business days	TAD always last business day
❖ Quarterly compounding of T-bill interest for total return	Monthly compounding of T-bill interest for total return

Furthermore, minor changes were made to the component composition to accommodate market changes, specifically prior to January 2000 the Deutsche Mark futures contract was used instead of the Euro contract. Two contracts were not used until they demonstrated sufficient liquidity after their respective launch: before May 1991 Natural Gas was not included as a component and before February 1988 the Australian Dollar was not included.

The S&P Diversified Trends Pro Forma Indicator Price Return stream is based on data that were (for the period January 1, 1985 through May 31, 2001) attested to by a big four accounting firm that was engaged for a fee. Using the same AFT methodology for the period June 1, 2001 through December 31, 2003, the pro forma performance history for the price return series has been calculated by AFT and replicated by S&P using historical price data from Bloomberg. Since January 1, 2004, S&P has calculated the value of the S&P Diversified Indicator Price Return and Total Return series (the "live" series).

All references to the performance of the S&P Diversified Trends Indicator in this section refer to the combined pro forma and live series history of the S&P DTI PR and the S&P DTI TR.

A history of returns combining live results with a modified pro forma implementing the current (effective January 1, 2004) methodology of the S&P Diversified Trends Indicator is shown in Appendix D. Because the difference between the two methodologies is minor, the returns are similar: The annualized S&P Diversified Trends Pro Forma Indicator Price Return for the 21-year period over this period is 6.03 and 5.90 for the modified pro forma series. The correlation between the two series is 0.99.

Past performance during the pro forma period is based on backtested results that do not represent the results of concurrent calculation but are achieved instead through retroactive application of a methodology that was developed with the benefit of hindsight. The performance data disclosed in this document does not take into account taxes, brokerage commissions, advisory fees, or other fees, which would reduce the returns if they had been taken into account. Past performance is not necessarily indicative of future results and investing based on the S&P Diversified Trends Indicator may result in losses.

Exhibits 9 and 10 show the monthly and annual combined live and pro forma returns for both the price return and the total return series, respectively. See also see Appendix D.

EXHIBIT 9: MONTHLY AND ANNUAL RETURNS OF THE S&P DIVERSIFIED TRENDS INDICATOR, COMBINED PRO FORMA AND LIVE PRICE RETURN SERIES, JAN 1985-DEC 2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2006	0.01%	-1.81%	2.37%	2.99%	0.15%	-2.40%	1.72%	-0.02%	-1.81%	0.08%	0.70%	-0.42%	1.42%
2005	0.67%	-2.52%	2.09%	-3.50%	1.14%	2.47%	0.76%	1.88%	2.16%	-1.87%	2.38%	-0.91%	4.59%
2004	1.63%	3.57%	1.39%	-2.20%	0.36%	-0.17%	3.75%	-2.41%	5.53%	1.63%	0.27%	-1.15%	12.56%
2003	2.44%	1.83%	-2.35%	-0.58%	1.99%	-1.56%	-2.41%	-1.38%	-2.18%	3.21%	0.79%	3.86%	3.43%
2002	-0.16%	0.26%	-1.73%	0.20%	-0.37%	3.28%	-0.30%	2.57%	1.42%	-1.55%	0.49%	-2.50%	1.46%
2001	-2.12%	1.17%	2.04%	-0.25%	0.69%	-1.15%	-0.95%	-0.02%	0.84%	0.52%	-1.85%	0.62%	-0.55%
2000	1.37%	1.62%	-1.51%	1.39%	2.98%	1.84%	-1.97%	0.66%	0.05%	1.16%	2.50%	0.92%	11.45%
1999	-0.91%	2.58%	-1.10%	0.72%	-1.31%	1.96%	0.75%	1.54%	0.72%	-2.76%	2.52%	1.34%	6.05%
1998	0.05%	0.63%	1.42%	-0.04%	-0.22%	0.27%	1.88%	2.39%	-0.17%	-1.03%	-0.66%	0.39%	4.95%
1997	0.58%	-2.14%	1.61%	1.85%	-1.90%	0.51%	-0.49%	0.39%	1.44%	0.20%	-0.96%	0.60%	1.61%
1996	0.34%	-0.31%	2.66%	2.86%	0.07%	2.65%	-1.25%	0.21%	0.94%	2.55%	2.87%	1.13%	15.62%
1995	-0.49%	0.53%	2.42%	1.10%	-0.01%	-0.29%	-0.85%	0.40%	1.42%	0.60%	-0.21%	3.29%	8.09%
1994	-1.15%	-1.80%	1.09%	0.93%	1.37%	2.72%	1.14%	-1.56%	0.37%	1.33%	0.22%	-0.66%	3.97%
1993	0.23%	0.36%	0.30%	2.45%	0.23%	-1.83%	1.08%	-1.18%	1.53%	-1.31%	0.28%	-0.01%	2.09%
1992	-1.71%	-0.11%	0.43%	-0.12%	-0.26%	1.79%	3.34%	1.68%	0.48%	-2.16%	0.55%	-0.18%	3.67%
1991	1.05%	-1.09%	1.34%	-0.12%	0.25%	0.67%	-2.94%	0.88%	1.64%	0.85%	-0.76%	2.68%	4.43%
1990	0.84%	0.24%	1.34%	1.90%	-1.53%	1.87%	0.28%	4.58%	7.57%	-0.70%	-0.28%	-1.10%	15.68%
1989	0.45%	0.12%	4.30%	1.17%	2.57%	-0.11%	-0.94%	-2.81%	-0.01%	-0.92%	1.45%	2.80%	8.15%
1988	-2.41%	0.91%	-2.27%	1.43%	2.16%	-0.71%	-2.31%	0.48%	-0.60%	-0.95%	2.76%	0.15%	-1.51%
1987	0.83%	-0.98%	0.18%	3.53%	0.37%	1.03%	2.39%	-2.22%	-0.70%	-2.64%	2.84%	3.81%	8.51%
1986	0.00%	2.59%	1.68%	0.80%	-1.99%	-0.54%	1.96%	0.56%	-1.86%	-1.48%	0.41%	2.57%	4.65%
1985	0.33%	1.42%	-5.44%	-0.96%	2.45%	0.41%	3.32%	1.98%	2.35%	2.06%	2.54%	-0.75%	9.81%

EXHIBIT 10: MONTHLY AND ANNUAL RETURNS OF THE S&P DIVERSIFIED TRENDS INDICATOR, COMBINED PRO FORMA AND LIVE TOTAL RETURN SERIES, JAN 1985-DEC 2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
2006	0.35%	-1.46%	2.62%	3.21%	0.52%	-1.96%	2.03%	0.36%	-1.36%	0.46%	1.02%	-0.05%	5.74%
2005	0.86%	-2.34%	2.27%	-3.26%	1.39%	2.68%	1.00%	2.13%	2.37%	-1.55%	2.61%	-0.62%	7.55%
2004	1.71%	3.64%	1.47%	-2.12%	0.44%	-0.09%	3.85%	-2.29%	5.63%	1.77%	0.42%	-1.00%	13.92%
2003	2.54%	1.92%	-2.25%	-0.48%	2.08%	-1.46%	-2.33%	-1.30%	-2.01%	3.23%	0.87%	3.93%	4.53%
2002	-0.01%	0.40%	-1.59%	0.37%	-0.22%	3.40%	-0.15%	2.71%	1.56%	-1.41%	0.61%	-2.38%	3.17%
2001	-1.56%	1.57%	2.44%	0.13%	1.02%	-0.85%	-0.62%	0.28%	1.09%	0.74%	-1.67%	0.77%	3.30%
2000	1.85%	2.08%	-1.01%	1.86%	3.51%	2.28%	-1.46%	1.20%	0.58%	1.73%	3.02%	1.40%	18.30%
1999	-0.54%	2.93%	-0.66%	1.10%	-0.91%	2.34%	1.16%	1.96%	1.12%	-2.36%	2.99%	1.78%	11.29%
1998	0.49%	1.03%	1.88%	0.39%	0.18%	0.71%	2.32%	2.80%	0.22%	-0.67%	-0.28%	0.78%	10.24%
1997	1.04%	-1.73%	2.06%	2.31%	-1.45%	0.97%	-0.02%	0.83%	1.91%	0.67%	-0.55%	1.08%	7.24%
1996	0.82%	0.10%	3.04%	3.33%	0.51%	3.02%	-0.77%	0.67%	1.40%	3.00%	3.27%	1.56%	21.75%
1995	0.03%	1.00%	2.92%	1.57%	0.53%	0.19%	-0.36%	0.89%	1.85%	1.09%	0.26%	3.70%	14.47%
1994	-0.87%	-1.55%	1.39%	1.22%	1.73%	3.05%	1.49%	-1.15%	0.77%	1.75%	0.65%	-0.17%	8.51%
1993	0.49%	0.59%	0.58%	2.70%	0.46%	-1.54%	1.34%	-0.90%	1.78%	-1.06%	0.57%	0.27%	5.33%
1992	-1.37%	0.21%	0.80%	0.23%	0.05%	2.12%	3.66%	1.95%	0.74%	-1.93%	0.82%	0.11%	7.52%
1991	1.64%	-0.58%	1.82%	0.44%	0.75%	1.12%	-2.41%	1.38%	2.11%	1.32%	-0.35%	3.06%	10.65%
1990	1.58%	0.87%	2.00%	2.62%	-0.83%	2.50%	1.02%	5.23%	8.04%	-0.01%	0.35%	-0.45%	25.08%
1989	1.22%	0.81%	5.02%	1.91%	3.36%	0.62%	-0.20%	-2.07%	0.68%	-0.17%	2.13%	3.40%	17.83%
1988	-1.94%	1.43%	-1.73%	1.92%	2.70%	-0.16%	-1.75%	1.17%	0.05%	-0.29%	3.39%	0.82%	5.59%
1987	1.32%	-0.54%	0.67%	4.02%	0.80%	1.52%	2.90%	-1.69%	-0.16%	-2.08%	3.29%	4.26%	15.01%
1986	0.60%	3.11%	2.25%	1.33%	-1.48%	0.00%	2.48%	1.01%	-1.39%	-1.02%	0.83%	3.05%	11.17%
1985	0.99%	2.00%	-4.72%	-0.22%	3.10%	0.95%	3.96%	2.55%	2.90%	2.66%	3.09%	-0.14%	18.15%

It is noteworthy that the total return series did not have a negative annual return for the 21-year period, while the price return series had only two years with a negative return: 1988 with -1.51% and 2001 with -0.55%.

Exhibit 11 shows both price and total return performance and risk as measured by standard deviation for the S&P Diversified Trends Indicator compared with some key asset class benchmarks.

EXHIBIT 11: RETURN AND RISK FOR SELECTED EXPOSURES, 1985-2005

Annualized

RETURNS	S&P DTI	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	GSCI TR	SPCI TR
1-year	4.59%	7.55%	4.91%	2.43%	3.42%	25.55%	27.60%
3-year	6.79%	8.60%	14.39%	3.62%	2.85%	21.13%	18.90%
5-year	4.20%	6.42%	0.54%	5.87%	2.50%	9.83%	7.87%
10-year	6.00%	9.97%	9.07%	6.16%	2.52%	9.57%	7.45%
21-year	6.03%	11.30%	12.81%	8.52%	3.02%	10.80%	6.42%

RISK	S&P DTI	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	GSCI TR	SPCI TR
1-year	7.22%	7.17%	7.92%	3.14%	1.90%	25.39%	18.61%
3-year	7.73%	7.69%	9.17%	4.12%	1.42%	23.85%	16.49%
5-year	6.75%	6.70%	14.82%	4.01%	1.27%	22.09%	16.76%
10-year	5.95%	5.98%	15.58%	3.70%	1.01%	21.50%	15.71%
21-year	6.00%	6.03%	15.19%	4.41%	0.89%	18.30%	12.57%

SHARPE RATIO @ 5%	S&P DTI	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	GSCI TR	SPCI TR
1-year	-0.06	0.36	-0.01	-0.82	-0.83	0.81	1.21
3-year	0.23	0.47	1.02	-0.33	-1.52	0.68	0.84
5-year	-0.12	0.21	-0.30	0.22	-1.98	0.22	0.17
10-year	0.17	0.83	0.26	0.31	-2.45	0.21	0.16
21-year	0.17	1.04	0.51	0.80	-2.23	0.32	0.11

Return of the S&P DTI is directly related to the volatility of the underlying futures markets. Because inflation and futures volatility have been relatively low since 1985, the performance of both the price and total return pro forma indicators for the 21-year period is lower than stocks, albeit still positive. In relation to bonds, the price indicator has under-performed by 2.49 percentage points on an annualized basis, while the total return indicator out-performed by 2.78 percentage points annualized. However, both series have maintained a respectable spread over the Consumer Price Index (CPI) over all time periods analyzed.

Exhibit 12 shows the cumulative return of the indicators compared to equity and bond benchmarks, while Exhibit 13 shows the indicators compared to CPI and commodity benchmarks.

EXHIBIT 12: CUMULATIVE RETURN OF THE S&P DTI COMPARED TO EQUITY AND BOND BENCHMARKS, 1985-2005

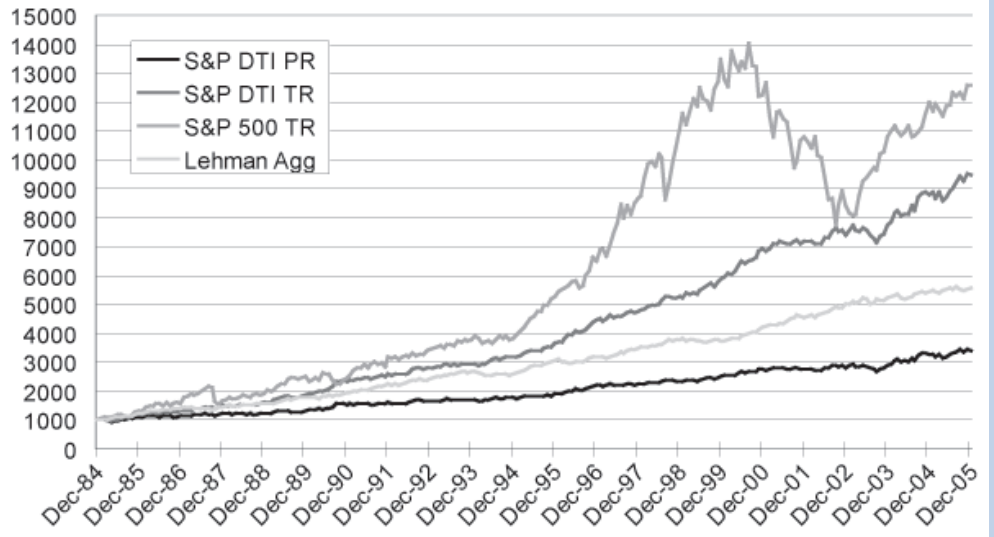


EXHIBIT 13: CUMULATIVE RETURN OF THE S&P DTI COMPARED TO CPI FOR ALL URBAN CONSUMERS (NOT SEASONALLY ADJUSTED) AND THE S&P COMMODITY INDEX, 1985-2005

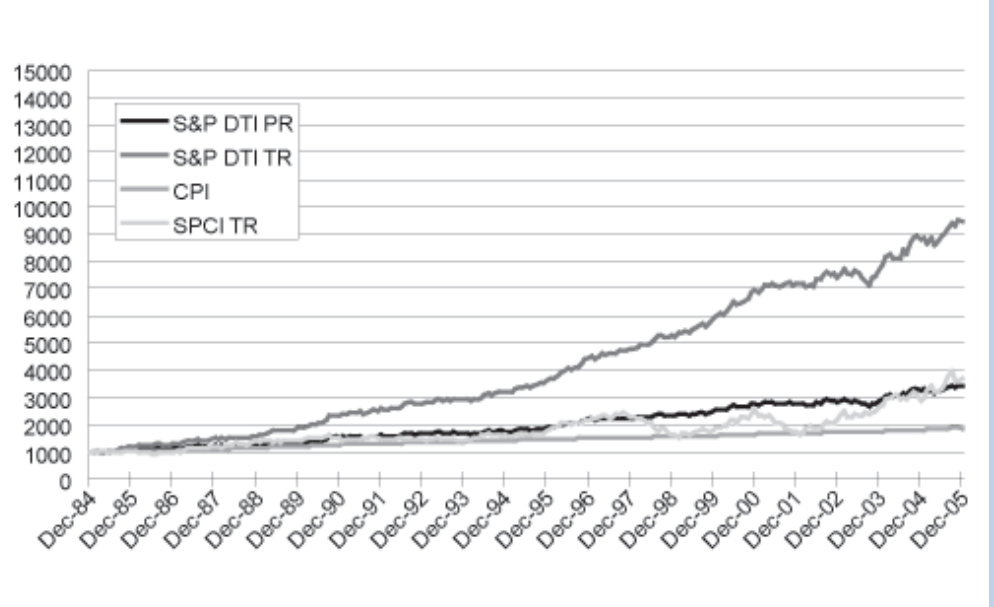


EXHIBIT 14: COMPARISON OF ROLLING PERFORMANCE, 1985-2005

		S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG.	SPCI TR
MONTHLY	Number of Periods	252	252	252	252	252
	Percent Profitable	63.5%	71.8%	64.3%	71.4%	58.3%
	Average Period Return	0.5%	0.9%	1.1%	0.7%	0.6%
	Best Period	7.6%	8.0%	13.5%	5.2%	13.1%
	Worst Period	-5.4%	-4.7%	-21.5%	-3.4%	-9.0%
1-Year	Number of Periods	241	241	241	241	241
	Percent Profitable	92.5%	97.1%	81.3%	95.0%	72.2%
	Average Period Return	6.1%	11.5%	13.8%	8.6%	7.4%
	Best Period	22.4%	32.2%	52.1%	28.7%	47.2%
	Worst Period	-7.5%	-6.5%	-26.6%	-3.7%	-31.9%
3-Year	Number of Periods	217	217	217	217	217
	Percent Profitable	100.0%	100.0%	85.7%	100.0%	82.9%
	Average Period Return	18.2%	38.0%	45.3%	27.2%	21.3%
	Best Period	33.7%	67.7%	134.3%	51.2%	90.1%
	Worst Period	1.1%	8.7%	-40.9%	11.3%	-19.9%
5-Year	Number of Periods	193	193	193	193	193
	Percent Profitable	100.0%	100.0%	82.9%	100.0%	90.7%
	Average Period Return	33.0%	72.9%	90.4%	49.6%	30.6%
	Best Period	49.2%	110.5%	251.1%	78.7%	91.6%
	Worst Period	12.9%	35.3%	-17.5%	33.0%	-25.4%

EXHIBIT 15: PROFIT/LOSS ANALYSIS, 1985-2005

S&P DIVERSIFIED TRENDS INDICATOR PRICE RETURN

DRAWDOWN ANALYSIS					CONSECUTIVE PROFITABLE PERIODS			
DRAWDOWN	LENGTH	RECOVERY	PEAK	VALLEY	RUN-UP	LENGTH	START DATE	END DATE
-8.09%	7	4	Feb-2003	Sep-2003	16.04%	7	May-1985	Nov-1985
-7.10%	5	6	May-1989	Oct-1989	15.32%	6	Oct-2003	Mar-2004
-6.35%	2	4	Feb-1985	Apr-1	14.98%	4	Jun-1990	Sept-1990

S&P DIVERSIFIED TRENDS INDICATOR TOTAL RETURN

DRAWDOWN ANALYSIS					CONSECUTIVE PROFITABLE PERIODS			
DRAWDOWN	LENGTH	RECOVERY	PEAK	VALLEY	RUN-UP	LENGTH	START DATE	END DATE
-7.57%	7	3	Feb-2003	Sep-2003	20.82%	7	May-1985	Nov-1985
-4.93%	2	3	Feb-1985	Apr-1985	20.16%	11	Aug-1995	Jun-1996
-3.89%	3	2	Jul-1987	Oct-1987	18.41%	8	Nov-1988	Jun-1989

The biggest drawdown (or worst string of monthly returns) of the price return indicator is -8.09%, which began after a peak in February 2003 and lasted to a valley in September 2003, subsequently taking four months to recover. For example, a $1000 investment linked to the price return pro forma indicator made at the beginning of February would have yielded for February 1.83% for a value of $1,018.34. By September 2003, that same investment has a value of $935.96 or 8.09% less than the peak of $1,018.34.

One of the primary benefits of the S&P Diversified Trends Indicator is the potential diversification that it can bring to a stock or bond portfolio. Below are correlation matrices to various exposures over varying periods of time based on monthly performance.

EXHIBIT 16: CORRELATION MATRICES BASED ON MONTHLY RETURNS, 1985-2005

1985-2005 *Number of observations = 252*

	S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR*
S&P DTI PR	1.00						
S&P DTI TR	0.99	1.00					
S&P 500 TR	-0.09	-0.08	1.00				
Lehman Agg	0.02	0.04	0.18	1.00			
CPI	0.01	0.04	-0.12	-0.09	1.00		
SPCI	0.24	0.22	-0.04	-0.08	0.05	1.00	
SPCI TR	0.25	0.25	-0.01	-0.07	0.10	0.95	1.00

1996-2005 *Number of observations = 120*

	S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR*
S&P DTI PR	1.00						
S&P DTI TR	1.00	1.00					
S&P 500 TR	-0.15	-0.15	1.00				
Lehman Agg	0.08	0.09	-0.07	1.00			
CPI	-0.01	-0.01	-0.10	-0.08	1.00		
SPCI	0.34	0.32	0.01	0.04	0.12	1.00	
SPCI TR	0.35	0.34	0.07	0.03	0.17	0.95	1.00

2001-2005 *Number of observations = 60*

	S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR*
S&P DTI PR	1.00						
S&P DTI TR	1.00	1.00					
S&P 500 TR	-0.09	-0.10	1.00				
Lehman Agg	0.14	0.15	-0.34	1.00			
CPI	-0.01	-0.01	-0.17	-0.13	1.00		
SPCI	0.39	0.38	0.06	-0.02	0.13	1.00	
SPCI TR	0.42	0.41	0.07	-0.03	0.19	0.96	1.00

2003-2005 *Number of observations = 36*

	S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR*
S&P DTI PR	1.00						
S&P DTI TR	1.00	1.00					
S&P 500 TR	0.09	0.09	1.00				
Lehman Agg	0.16	0.16	-0.03	1.00			
CPI	-0.06	-0.06	-0.43	-0.14	1.00		
SPCI	0.55	0.55	-0.04	0.08	0.20	1.00	
SPCI TR	0.60	0.60	-0.05	0.07	0.26	0.97	1.00

The low correlations of the indicators to these benchmarks over all the time periods analyzed indicate that a potentially more efficient portfolio can be created vis á vis stocks, bonds and commodities by incorporating the indicator.

Interestingly, the low monthly correlation to CPI could be due to a number of factors, including the lagged nature of the CPI value, the vast diversification of the 258-unit consumer product basket that constitutes the CPI, the ability of the S&P Diversified Trends Indicator to include short positions, and finally, the inability of producers to pass all input costs onto purchasers.

A correlation based on annual returns shows a much higher correlation to CPI, as shown in Exhibit 17.

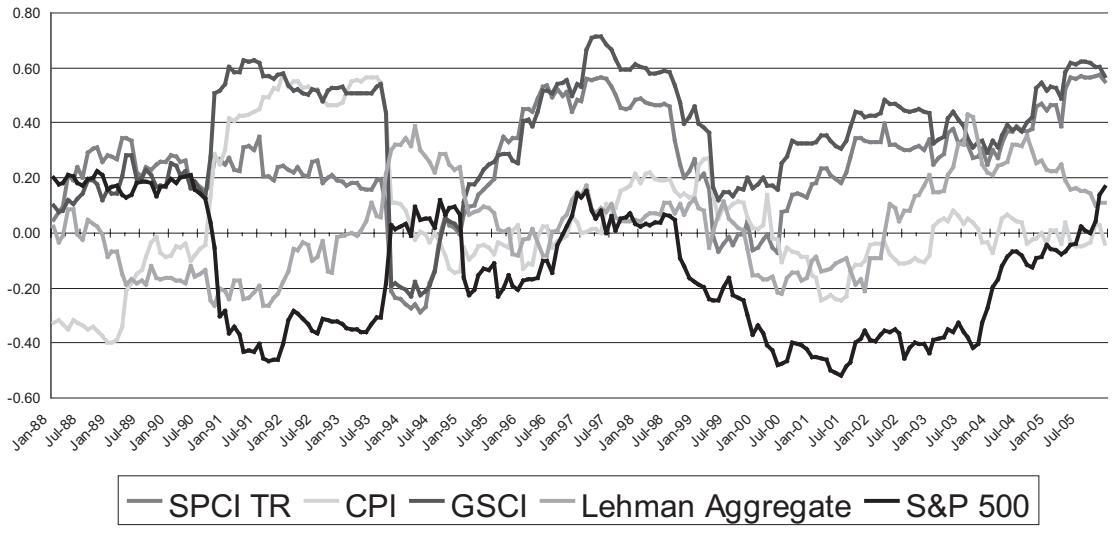
EXHIBIT 17: CORRELATION MATRIX BASED ON ANNUAL RETURNS, 1985-2005

1985-2005 *Number of observations = 21*

	S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR	GSCI TR
S&P DTI PR	1.00							
S&P DTI PR	1.00							
S&P DTI TR	0.93	1.00						
S&P 500 TR	0.07	0.18	1.00					
Lehman Agg	0.05	0.22	0.34	1.00				
CPI	0.53	0.63	-0.11	0.01	1.00			
SPCI	0.11	-0.03	-0.38	-0.31	0.22	1.00		
SPCI TR	0.27	0.18	-0.22	-0.24	0.34	0.91	1.00	
GSCI TR	0.48	0.45	-0.15	-0.14	0.57	0.71	0.81	1.00

Exhibit 18 shows that on a rolling basis, three-year correlations to the total return series seldom reach as high as .40 in either direction, with the exceptions of the GSCI and the SPCI.

EXHIBIT 18: ROLLING CORRELATIONS TO THE S&P DIVERSIFIED TRENDS PRO FORMA INDICATOR TOTAL RETURN, THREE-YEAR PERIODS ENDING 1988-2003



Analysis of the pro forma indicator's performance when stock or bond benchmarks have negative returns shows that it was frequently positive, indicating a potential to add value during those drawdown periods. Exhibits 19 and 20 show returns of the pro forma indicators for the 20 worst-performing months of stocks and bonds, respectively, since 1985. ■

EXHIBIT 19: PERFORMANCE OF VARIOUS EXPOSURES DURING 20 WORST-PERFORMING S&P 500 MONTHS, 1985-2005

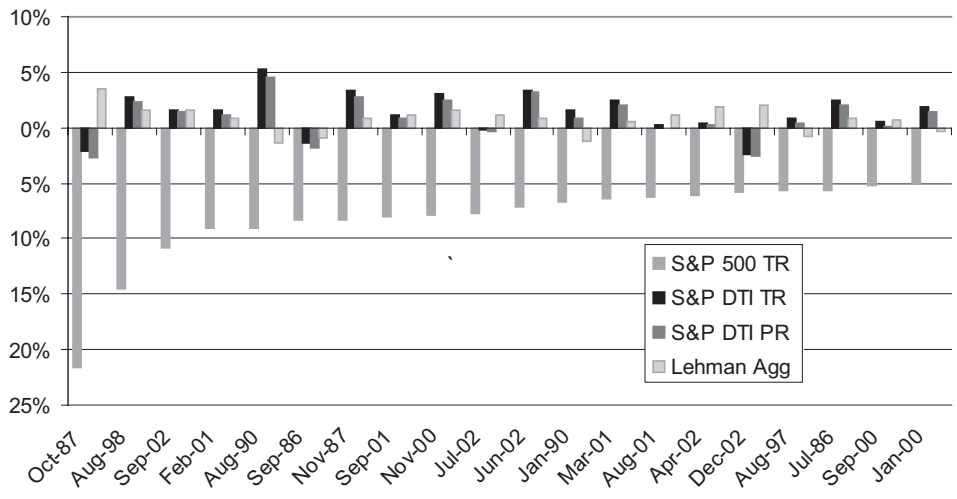
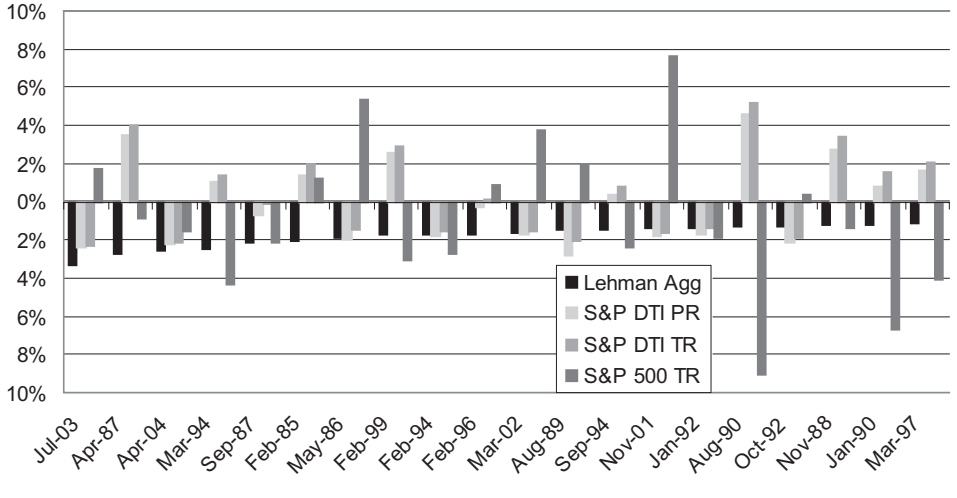
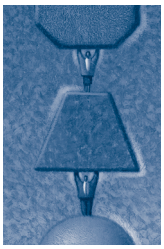


EXHIBIT 20: PERFORMANCE OF VARIOUS EXPOSURES DURING 20 WORST-PERFORMING LEHMAN US AGGREGATE INDEX 1985-2005





4. What the Quantitative Methodology is Designed To Do

4.1 The S&P Diversified Trends Indicator Measures Trends and Volatility

The S&P Diversified Trends Indicator is a Long/Short indicator methodology that measures price trends and volatility in the commodities and financial futures market. Because the indicator can represent either long or short positions, its return is more dependent on the trends in the futures markets rather than the direction. This is demonstrated by the fact that if Coffee appreciated 300% over one year (from $1.00 per bushel to $4.00), the indicator would reflect this increase and the Coffee component would be long. If Coffee then declined 75% over the next year (from $4.00 per bushel to $1.00 per bushel), the Coffee component would be short. Therefore, the higher volatility or greater extent of the price change trend would reflect a higher return in the indicator than if Coffee had moved from $1.00 to $1.25 to $1.00. To illustrate the relationship between volatility and the S&P Diversified Trends Indicator, Exhibit 21 shows the correlation between return and volatility of several indices, as well as the S&P Diversified Trends Indicator.

EXHIBIT 21: CORRELATION BETWEEN ANNUAL RETURN AND STANDARD DEVIATION FOR SELECTED BENCHMARKS, 1985-2005

S&P DTI PR	S&P DTI TR	S&P 500 TR	LEHMAN AGG	CPI	SPCI	SPCI TR	GSCI TR
0.44	0.36	-0.31	0.15	0.01	0.46	0.43	0.31

The S&P DTI, along with the GSCI and SPCI, has among the strongest volatility/return relationship, which is consistent with the nature of futures trading. In contrast, equity indices tend to react less well to volatility increases, often falling abruptly, creating a negative correlation.

4.2 Why Has The S&P Diversified Trends Indicator Been Profitable on a Pro Forma Basis?

The key reasons why the pro forma indicator has been profitable can be explained by its structure and by the fact that commodities derive their returns differently than financial assets. Some explanations for performance behavior of the pro forma indicator include:

4.2.1 High Internal Diversification

Since the 24 components are diverse and not affected by the same fundamentals, there is very little correlation among them. As one example, Cotton has practically speaking no relationship with Natural Gas, Live Cattle, Coffee, the Swiss Franc, etc. Within a portfolio, internal correlations are often higher among equities because equities are generally affected by the same macro economic variables (i.e., interest rates and GDP). As a result, equities generally provide less diversification benefit as a composite.

Appendix C shows that generally commodity and financial components have a negative correlation to each other that can help to mitigate risk.

4.2.2 Profit From Rising and Declining Price Trends

The ability of the indicator to represent either long or short positions allows it to capture profit since the components generally behave in a cyclical manner. However, constant, especially month-to-month, directional changes in the components or sectors may cause the indicator performance to decline.

4.2.3 Profit from Futures Markets' Risk Transfer Processes

The bulk of returns could come simply from buying uptrending commodities at a discount and selling downtrending commodities at a premium.[6] This "spread" characteristic is fundamental to the mechanics of futures markets (see discussion on backwardation and contango). The methodology profits from rising (long position) and falling prices (short position) and price fluctuations of futures markets present profit opportunities to investors who are willing to bear risks of price fluctuatations that the hedgers are not willing to bear. ■

[6] Victor Sperandeo: "The Fundamental Reason the S&P DTI has Consistent Positive Return", April 30, 2003

5. The Economic Function of the Futures Market

Futures contracts consist of agreements to buy or sell a controlled quantity and quality of an asset at a future date. The economic function of the futures market is to transfer the risk of price fluctuations between producers and consumers via a futures exchange. To facilitate this risk transfer, producers and consumers are generally willing to offer a discount or pay a premium to attract investors or speculators willing to accept this risk.

Because of supply/demand constraints and lead/lag times to production—commodity futures markets are far more cyclical than equities. This inherent difference suggests that an effective methodology can be long/short in nature since both long and short positions can be beneficial in the market place.

5.1 The Risk Transfer Phenomenon

The S&P Diversified Trends Indicator benefits from the risk transfer mechanism in the futures market. Futures contract prices are determined by a process similar to that of a discount wholesaler. A wholesaler buys merchandise from a producer with the expectation of reselling it at a profit to a future consumer. In this process, generally, the futures contract price is in backwardation (discounted) to commodities in uptrends and in contango (premium) with commodities in downtrends.

In futures markets, a long hedge is taken when a market participant wishes to purchase an asset in the future while locking in a price today. The long hedger will purchase a futures contract to protect against the possible price increase of the commodity to be purchased in the future. On the other hand, a short hedge involves a short position in futures markets and is used by a hedger who owns an asset and who expects to sell it in the future. A short hedge can also be used when an asset is not owned yet, but will be owned in the future. The short hedger will sell a futures contract to hedge against the possible decline in the price of the contract held.

Speculators voluntarily assume the risk that a hedger avoids. They buy and sell futures contracts in the hope of making a profit between the sale and purchase price of a futures contract. They buy a futures contract and hope to sell it later at a higher price. In this case, the speculator is long. Speculators are short when they sell a commodity in the future for a price above the price at which they can purchase the commodity future at a lower price before the expected time of delivery. To illustrate the economic function of the risk transfer process, suppose a farmer makes the business decision to plant the equivalent of 500,000 bushels of corn based on its current price after an extensive appreciation. Yet, because the farmer will not be able to sell the corn for several months, a great deal of risk exists on this investment because the price of corn could fall dramatically over that time. The futures markets allow the farmer to transfer this risk to a speculator by selling 100 corn futures contracts short and locking in the price today to be received in the future.

While the benefit to the farmer is obvious, the speculator benefits by being able to buy the farmer's corn at below market prices (this is generally referred to as "backwardation" or "discount") in exchange for accepting the risk of a decline in corn prices before the speculator can sell the farmer's corn. This discount serves the same role as the premium that an insurance company receives in exchange for accepting a risk. This same relationship of transferring risk to speculators exists with consumers who want to lock in today's prices.

5.2 Attracting Capital

An important aspect of the futures market, as with all markets, is the constant need by producers and consumers to attract investors willing to accept the risk and provide liquidity. In this respect, by providing liquidity, speculators play a role similar to that played by specialists on exchanges with a "specialist system." Correspondingly, on futures exchanges the specialist equivalent is called a "local" (i.e. a speculator) who provides liquidity, and, as a whole, receives a price advantage through the premiums and discounts of the futures traded. Generally, uptrending commodities trade at discounts and downtrending commodities trade at premiums. This reflects itself in a core return received by speculators risk in exchange for providing liquidity.

5.3 Futures Price in Backwardation (Discount)

Backwardation represents a price pattern in which a futures price is lower than a spot price. Normal backwardation occurs when the futures price is below the expected future spot price.

Let's assume that an oil producer wants to hedge future production. He can sell his current production at spot prices, but if he wants to hedge his future production and sell at a price that he thinks is high, he can only sell it to a speculator who thinks (hopes) that he can sell the oil for more over time. The speculator has to buy his product (oil) at a discount to the expected future market price to secure a reasonable opportunity to potentially make a profit. The speculator needs this business (statistical) edge to make a consistent return over time.

The oil producer who wants to hedge future production is willing to pay the equivalent of business insurance fees by selling oil at a discount to a speculator. At a higher spot price, producers have a greater desire to lock in these high prices for their future production while speculators demand a larger discount for their risk exposure since being long at higher prices incurs greater risk. If the futures contract is trading in congtango where the spot price is lower than the expected future price, the speculator would expect the price to rise by more than the premium to obtain a profit, a lower probability event.

Backwardation is not an issue in financials since bonds and notes do not trade at a discount or a premium.

5.4 Futures Price in Contango (Premium)

Contango occurs when the futures price is above the spot price. The difference is the risk premium contained in futures prices, which represents the compensation to speculators for their risk of selling short and hoping to buy it back later at a lower price, even if the current price is unchanged.

Contango futures markets are generally a characteristic of downtrending markets. In this case, the producers are unwilling to lock in their future production at prices they believe are too low while consumer-producers still need cost certainty for their own production.

Speculators, on the other hand, will be willing to trade if they can get a premium for the risk taken. As consumers they have a desire to lock in low prices, and are willing to pay a premium to speculators willing to sell future production.

An example of a contango market was corn in 1999. With corn near a contract low of 193 on November 26, 1999 and approaching government price supports, corn producers refused to sell future production at anything but a premium because prices were very low. Therefore, March 2000 corn was 205, May 212, July 219, etc.

However, Kellogg's wants to purchase corn for cornflakes because it needs product for its consumers. If farmers will not sell because they get paid the same price from the government

anyway, Kellogg's must buy from speculators who demand a risk premium to be short. Thus, downtrending commodities take on a premium at some point, but this premium does not necessarily predict an uptrend.

The general tendency of commodities to trade at discounts in uptrends, or premiums in downtrends, has exceptions. Precious metals, for example, always trade at premiums as they are "cost of carry" assets. This means that the holding of the metals always has an interest cost and if the futures traded at a discount (to fair value) a holder of the metal would sell it then buy the futures and thereby arbitrage the position, i.e., sell the asset and deposit the proceeds in a interest hearing instrument such as U.S. Treasury-bills.

Also, if the premium is greater than fair value, an arbitrageur would borrow the capital, buy gold, and sell the future. Thereby, the premium on precious metal futures approximates short-term interest rates, less insurance, transportation, and storage costs. ■

6. The S&P Diversified Trends Indicator and Inflation

6.1 Long Position Captures and Hedges Inflation Risk

Many investors consider futures markets as the ideal way to offset inflation risk in portfolios. The S&P Diversified Trends Indicator is long those futures contracts in markets with continuous rising prices and therefore tends to reflect the impact of those markets on the CPI over long periods. Through the long exposure, the S&P Diversified Trends Indicator is long the risk transfer discount associated with rising future expected prices. This is equivalent to owning rising expected prices, i.e. inflation. On the other hand, as inflation increases and causes yields to rise, prices of the financial contracts are more likely to fall and hence would be positioned as short in the indicator. As commodities rise and financials fall, the indicator reflects rising inflation.

Correlations between the S&P Diversified Trends Indicator and the CPI tend to be low in the short term. Partially, this may be due to the way that the CPI is calculated. It is data that is collected across 258 consumer products, collected monthly and published six weeks after month end. Additionally, the futures prices reflected in the S&P Diversified Trends Indicator, while directly impacting suppliers, are rarely passed fully onto their customers. Finally, the components of the indicator will not impact each and every one of the 258 consumer products found in the CPI and in some cases their impact may be in opposite directions, therefore potentially impacting short- and even medium-run correlations which will tend to be low in the short-term.

However, the S&P Diversified Trends Indicator is an effective measure for inflationary and deflationary trends. Unlike the CPI, where some of the actual consumer products trade on a regulated exchange, the S&P Diversified Trends Indicator takes advantage of the listed commodity futures to own futures contracts whose prices are rising (i.e. owning inflation) and to sell futures whose prices are falling (i.e. selling deflation or profiting from deflation). Over the long run, the fact that the underlying components reflect many of the CPI's components combined with the anticipated risk and return characteristics of the indicator, should allow the S&P Diversified Trends Indicator to be a relatively good, tradable proxy for inflation. Consequently, in very stable periods for the CPI, e.g., 1992-1994 and 2001-2003, the S&P Diversified Trends Indicator returns are also relatively low.

In summary, the S&P Diversified Trends Indicator's long portion could be a reflection of futures based inflation over long periods of time while the short position could be a better way to offset the impact of deflationary price trends on commodity measures and create a return which has historically been smooth and generally positive like the CPI.

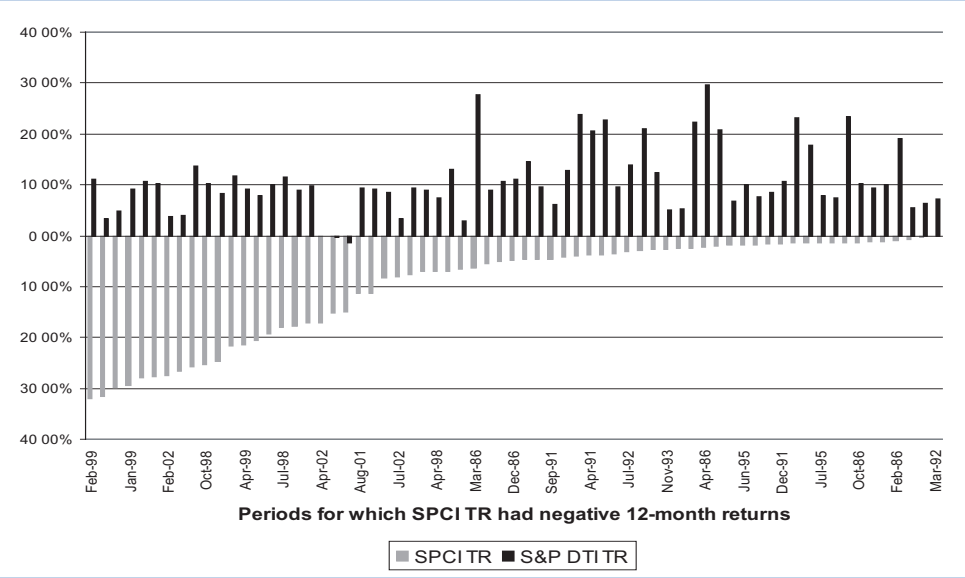
6.2 The Short Position Profits from Commodity and Financial Cyclicality

Since commodities and financials tend to behave in extended trends—falling as frequently as they rise—owning "long only" futures would result in extended and significant declines in value. The S&P Diversified Trends Indicator however, has tended to mitigate the "long only" risk by shorting futures contracts that are in declining price trends.

This inherent potential structural advantage is most dramatically illustrated by examining the S&P Diversified Trends Indicator's performance when commodities decline. When commodity-tracking measures decline in price—generally in deflationary environments—the indicator tends to appreciate. This is because long only commodity benchmarks usually measure the rise and fall of commodity prices only. The S&P Diversified Trends Indicator, on the other hand, does not have this structural handicap because it is able to short its components in downtrends, which reflect the producers' reason for hedging.

Exhibit 22 shows that for almost every 12-month period with a negative return of the SPCI, the pro forma indicator total return series had a positive return.

EXHIBIT 22: S&P DIVERSIFIED TRENDS INDICATOR TOTAL RETURN PERFORMANCE WHEN COMMODITY PRICES DROP



The indicator has the potential to profit from falling prices, whereas long only indices must follow price declines. It is deflationary or disinflationary scenarios that require the shorting of futures. The S&P Diversified Trends Indicator's tendency to gain—from the shorting of a downtrend—tends to smooth its performance. ■

Appendix A: Component Futures Contracts

The following are the futures contracts, exchanges, ticker symbols and date that the various markets currently included in the S&P Diversified Trends Indicator became available for use in indicator simulations. The "Start Month" column indicates the first month for which the returns of the market in question can reasonably be included in the indicator simulations. Typically a contract would not be eligible for inclusion until approximately one year after the contract first begins to trade. The delay is due, in part, to the need for the contract to have established sufficient liquidity.

FUTURES CONTRACT	EXCHANGE	SYMBOL	INCLUSION
Wheat	CBOT	W	January-85
Cotton	NYBOT	CT	January-85
Corn	CBOT	C	January-85
Copper	NYMEX	HG	January-85
Soybeans	CBOT	S	January-85
Cocoa	NYBOT	CC	January-85
Sugar	NYBOT	SB	January-85
Silver	NYMEX	SI	January-85
Live Cattle	CME	LC	January-85
Lean Hogs	CME	LH	January-85
Coffee	NYBOT	KC	January-85
British Pound	CME	BP	January-85
Swiss Franc	CME	SF	January-85
Gold	NYMEX	GC	January-85
Canadian Dollar	CME	CD	January-85
Japanese Yen	CME	JY	January-85
US Treasury Bond	CBOT	US	January-85
Heating Oil	NYMEX	HO	January-85
US 10 Year Treasury Note	CBOT	TY	January-85
Light Crude Oil	NYMEX	CL	January-85
Unleaded Gasoline	NYMEX	HU	January-86
Australian Dollar	CME	AD	February-88
Natural Gas	NYMEX	NG	May-91
Euro	CME	EC	January-00

CBOT: Chicago Board of Trade
CME: Chicago Mercantile Exchange
NYMEX: New York Mercantile Exchange
NYBOT: New York Board of Trade

Appendix B:
Exponential Average Multiplier Schedule

To create an exponential average for comparison, price inputs (percentage change from current and previous six PDDs) are weighted using a multiplier per the schedule below, using a base of 1.6 raised to (0,...,6) to establish weight s for each trailing month's input.

NUMBER OF MONTHS	MULTIPLIER	WEIGHT
7	1	2.32%
6	1.6	3.71%
5	2.56	5.94%
4	4.096	9.51%
3	6.5536	15.22%
2	10.48576	24.34%
1	16.777216	38.95%
Sum	43.072576	100.00%

The weight given to the price seven months prior is 2.32% (1/43.072576), and so on. Therefore, 78.5% of the indicator's moving average is weighted to the price movements of the last three months. This makes current price movements more important than those of the past, which is logical.

Appendix C: Correlation of Components

	HEATING OIL	LIGHT CRUDE	NATURAL GAS*	UNLEADED GAS	COPPER	GOLD	SILVER	LEAN HOGS	LIVE CATTLE	CORN	SOY-BEANS	WHEAT	COCOA	COFFEE	COTTON	SUGAR	AUD*	GPB	CAD	EUR	JPY	CHF	T-BOND	10-YR NOTE
Heating Oil	1.00																							
Light Crude	0.93	1.00																						
Natural Gas*	0.45	0.33	1.00																					
Unleaded Gas	0.90	0.91	0.38	1.00																				
Copper	0.09	0.03	0.00	0.08	1.00																			
Gold	0.21	0.20	0.15	0.14	0.19	1.00																		
Silver	0.07	0.09	0.02	0.04	0.17	0.62	1.00																	
Lean Hogs	0.08	0.08	0.05	0.04	0.00	0.10	0.07	1.00																
Live Cattle	0.01	-0.03	-0.05	-0.04	-0.02	-0.03	-0.01	0.39	1.00															
Corn	-0.10	-0.10	0.07	-0.04	0.06	-0.05	0.02	0.06	0.01	1.00														
Soybeans	-0.02	-0.06	0.07	-0.05	0.16	0.08	0.07	0.09	0.01	0.71	1.00													
Wheat	0.06	0.04	0.10	0.11	0.05	0.02	0.01	0.13	0.11	0.53	0.43	1.00												
Cocoa	0.08	0.12	-0.09	0.09	0.08	0.12	0.12	-0.02	-0.08	-0.03	-0.02	-0.07	1.00											
Coffee	-0.07	-0.05	-0.05	-0.04	0.09	0.01	0.04	0.00	-0.08	0.02	0.07	0.01	0.03	1.00										
Cotton	0.01	0.03	0.02	0.04	0.22	0.09	0.08	0.04	-0.07	0.16	0.24	0.09	0.10	-0.01	1.00									
Sugar	-0.07	-0.12	0.08	-0.11	0.10	0.00	-0.01	-0.08	0.06	0.12	0.09	0.07	0.05	-0.04	-0.06	1.00								
AUD*	0.19	0.14	0.19	0.14	0.40	0.31	0.20	0.08	0.09	0.11	0.19	0.18	0.04	0.03	0.19	0.08	1.00							
GPB	0.09	0.08	0.11	0.08	0.15	0.25	0.10	0.01	0.07	-0.10	-0.05	-0.04	0.15	-0.08	0.04	0.04	0.23	1.00						
CAD	0.17	0.13	0.19	0.13	0.23	0.24	0.18	0.09	0.04	-0.01	0.07	0.02	-0.03	-0.05	0.10	0.05	0.47	0.15	1.00					
EUR*	-0.01	-0.03	0.28	-0.02	0.08	0.32	0.15	-0.09	-0.07	0.05	0.06	0.15	0.12	0.02	0.12	0.03	0.51	0.71	0.32	1.00				
JPY	0.04	0.02	-0.01	0.02	0.08	0.24	0.09	0.00	0.06	-0.10	0.02	0.03	0.03	0.00	0.03	0.02	0.18	0.44	0.08	0.35	1.00			
CHF	0.05	0.04	0.17	0.00	0.05	0.31	0.08	-0.01	0.03	-0.12	-0.05	0.00	0.17	-0.06	0.00	0.09	0.14	0.71	0.09	0.95	0.58	1.00		
T-Bond	-0.10	-0.12	0.18	-0.12	-0.11	-0.04	-0.19	0.05	0.00	0.04	0.03	0.04	0.01	-0.08	-0.01	0.01	-0.04	0.14	0.10	0.29	0.09	0.16	1.00	
10-Yr Note	-0.10	-0.10	0.17	-0.11	-0.12	-0.02	-0.17	0.04	-0.02	0.00	0.00	0.04	0.05	-0.11	-0.02	-0.02	-0.06	0.16	0.10	0.35	0.14	0.23	0.96	1.00

Time period: 1985-2005, based on monthly data

* Correlation period started as of the date these respective contracts were incorporated into the pro forma indicator

Appendix D: Schedule of Hypothetical Performance

This modified pro forma series is based on the current methodology of the S&P Diversified Trends Indicator (effective January 1, 2004). See Section 3.1 for comparison and important disclaimers.

MONTHLY AND ANNUAL RETURNS OF THE S&P DIVERSIFIED TRENDS INDICATOR, COMBINED PRO FORMA AND LIVE PRICE RETURNS SERIES, 1985-2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL RETURN
2006	0.01%	-1.81%	2.37%	2.99%	0.15%	-2.40%	1.72%	-0.02%	-1.81%	0.08%	0.70%	-0.42%	1.42%
2005	0.67%	-2.52%	2.09%	-3.50%	1.14%	2.47%	0.76%	1.88%	2.16%	-1.87%	2.38%	-0.91%	4.59%
2004	1.63%	3.57%	1.39%	-2.20%	0.36%	-0.17%	3.75%	-2.41%	5.53%	1.63%	0.27%	-1.15%	12.56%
2003	2.44%	1.83%	-2.35%	-0.58%	1.99%	-1.60%	-2.23%	-1.39%	-2.16%	3.22%	0.79%	3.86%	3.60%
2002	-0.16%	0.26%	-1.73%	0.20%	-0.37%	3.25%	-0.40%	2.57%	1.42%	-1.55%	0.48%	-2.51%	1.33%
2001	-2.12%	1.17%	2.04%	-0.25%	0.69%	-1.12%	-0.97%	-0.02%	0.84%	0.52%	-1.84%	0.62%	-0.54%
2000	1.37%	1.62%	-1.51%	1.39%	2.98%	1.85%	-2.04%	0.81%	0.05%	1.16%	2.50%	0.91%	11.55%
1999	-0.91%	2.58%	-1.10%	0.72%	-1.31%	1.96%	0.80%	1.54%	0.72%	-2.76%	2.52%	1.34%	6.10%
1998	0.05%	0.63%	1.42%	-0.04%	-0.22%	0.25%	1.87%	2.39%	-0.17%	-1.03%	-0.66%	0.39%	4.92%
1997	0.58%	-2.14%	1.61%	1.85%	-1.90%	0.38%	-0.50%	0.40%	1.44%	0.20%	-0.95%	0.60%	1.48%
1996	0.34%	-0.31%	2.66%	2.86%	0.07%	2.66%	-1.23%	0.21%	0.94%	2.55%	2.87%	1.13%	15.65%
1995	-0.49%	0.53%	2.42%	1.10%	-0.01%	-0.31%	-0.84%	0.40%	1.42%	0.60%	-0.21%	3.29%	8.08%
1994	-1.15%	-1.80%	1.09%	0.93%	1.37%	2.72%	1.13%	-1.56%	0.38%	1.33%	0.22%	-0.66%	3.96%
1993	0.23%	0.36%	0.30%	2.45%	0.23%	-1.83%	1.07%	-1.18%	1.53%	-1.31%	0.28%	-0.01%	2.07%
1992	-1.71%	-0.11%	0.43%	-0.12%	-0.26%	1.78%	3.43%	1.68%	0.48%	-2.16%	0.55%	-0.19%	3.75%
1991	1.05%	-1.09%	1.34%	-0.12%	0.25%	0.68%	-2.99%	0.88%	1.64%	0.85%	-0.76%	2.68%	4.39%
1990	0.84%	0.24%	1.34%	1.90%	-1.53%	1.92%	0.28%	4.58%	7.57%	-0.70%	-0.28%	-1.10%	15.73%
1989	0.45%	0.12%	4.30%	1.17%	2.57%	-0.14%	-3.39%	-2.80%	-0.01%	-0.92%	1.45%	2.80%	5.44%
1988	-2.41%	0.91%	-2.27%	1.43%	2.16%	-0.87%	-2.18%	0.48%	-0.60%	-0.95%	2.76%	0.15%	-1.53%
1987	0.83%	-0.98%	0.18%	3.53%	0.37%	1.06%	2.34%	-2.22%	-0.70%	-2.64%	2.84%	3.81%	8.48%
1986	0.00%	2.59%	1.68%	0.80%	-1.99%	-0.53%	1.90%	0.56%	-1.86%	-1.48%	0.41%	2.57%	4.61%
1985	0.33%	1.42%	-5.44%	-0.96%	2.45%	0.41%	3.27%	1.98%	2.35%	2.06%	2.54%	-0.75%	9.77%

MONTHLY AND ANNUAL RETURNS OF THE S&P DIVERSIFIED TRENDS INDICATOR, COMBINED PRO FORMA AND LIVE TOTAL RETURNS SERIES, 1985-2006

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL RETURN
2006	0.35%	-1.46%	2.62%	3.21%	0.52%	-1.96%	2.03%	0.36%	-1.36%	0.46%	1.02%	-0.05%	5.74%
2005	0.86%	-2.34%	2.27%	-3.26%	1.39%	2.68%	1.00%	2.13%	2.37%	-1.55%	2.61%	-0.62%	7.55%
2004	1.71%	3.64%	1.47%	-2.12%	0.44%	-0.09%	3.85%	-2.29%	5.63%	1.77%	0.42%	-1.00%	13.92%
2003	2.54%	1.92%	-2.25%	-0.49%	2.08%	-1.50%	-2.15%	-1.31%	-2.07%	3.30%	0.86%	3.94%	4.68%
2002	-0.01%	0.39%	-1.60%	0.37%	-0.21%	3.38%	-0.24%	2.71%	1.55%	-1.42%	0.61%	-2.36%	3.06%
2001	-1.57%	1.63%	2.52%	0.13%	1.06%	-0.77%	-0.65%	0.29%	1.11%	0.74%	-1.64%	0.83%	3.64%
2000	1.84%	2.03%	-1.06%	1.86%	3.51%	2.30%	-1.53%	1.32%	0.53%	1.72%	3.00%	1.39%	18.15%
1999	-0.54%	2.92%	-0.68%	1.09%	-0.92%	2.32%	1.20%	1.96%	1.10%	-2.37%	2.96%	1.73%	11.15%
1998	0.49%	1.04%	1.87%	0.38%	0.19%	0.69%	2.30%	2.80%	0.23%	-0.68%	-0.28%	0.76%	10.18%
1997	1.03%	-1.73%	2.05%	2.30%	-1.45%	0.84%	-0.04%	0.83%	1.90%	0.66%	-0.53%	1.09%	7.06%
1996	0.81%	0.10%	3.04%	3.32%	0.50%	3.02%	-0.75%	0.65%	1.38%	2.99%	3.26%	1.55%	21.65%
1995	0.02%	0.98%	2.89%	1.56%	0.52%	0.18%	-0.35%	0.89%	1.86%	1.08%	0.24%	3.69%	14.34%
1994	-0.88%	-1.56%	1.35%	1.21%	1.69%	2.99%	1.47%	-1.17%	0.73%	1.75%	0.61%	-0.26%	8.13%
1993	0.49%	0.60%	0.59%	2.70%	0.46%	-1.56%	1.33%	-0.91%	1.78%	-1.07%	0.55%	0.24%	5.25%
1992	-1.37%	0.21%	0.79%	0.23%	0.08%	2.14%	3.74%	1.98%	0.77%	-1.93%	0.79%	0.05%	7.61%
1991	1.63%	-0.57%	1.84%	0.43%	0.76%	1.13%	-2.46%	1.37%	2.12%	1.31%	-0.33%	3.13%	10.74%
1990	1.57%	0.84%	1.97%	2.61%	-0.83%	2.54%	1.00%	5.24%	8.06%	-0.02%	0.35%	-0.45%	25.04%
1989	1.21%	0.78%	4.96%	1.90%	3.40%	0.60%	-2.67%	-2.04%	0.70%	-0.18%	2.13%	3.42%	14.88%
1988	-1.94%	1.41%	-1.75%	1.91%	2.67%	-0.39%	-1.62%	1.12%	-0.02%	-0.30%	3.38%	0.76%	5.18%
1987	1.31%	-0.54%	0.69%	4.02%	0.82%	1.54%	2.84%	-1.73%	-0.21%	-2.09%	3.40%	4.34%	15.09%
1986	0.59%	3.11%	2.24%	1.32%	-1.46%	0.02%	2.42%	1.03%	-1.32%	-1.03%	0.82%	3.03%	11.16%
1985	0.98%	1.99%	-4.78%	-0.23%	3.14%	1.02%	3.90%	2.52%	2.88%	2.65%	3.06%	-0.17%	17.99%

Appendix E: S&P Diversified Trends Indicator Calculation Algorithm

The daily values of the Standard & Poor's Diversified Trends Indicator (SPDTI) are:

$$SPDTI_t = \left(\frac{1 + WCh_t}{1 + WCh_{t\ 1}} \right) * SPDTI_{t\ 1}$$

where
t = Time period, where t = 0,1,2… and t = 0 is the first day in the quarter;
WCh_t = Weighted year-to-date percentage change up to date t for SPDTI;
WCh_{t-1} = Weighted year-to-date percentage change up to date t-1 for SPDTI.

Let i indicate the sector i in SPDTI.

$$WCh_t = \frac{\left(\sum_{i=1}^{14} DWPS_{it} \right)}{DCA_t}$$

where
$DWPS_{it}$ = Daily weighted percentage change of sector i at period t;
DCA_t = Daily change adjustment at time t:
If Energy sector is flat:
DCA_t = 1 - weight of energy sector;
Otherwise:
DCA_t = 1.

For sectors that only have one component:

$DWPS_{it} = SC_{it} * SW_i * ACP_t$

where
SC_{it} = Cumulative change of sector i on a roll-to-date basis;
SW_i = Weight of sector i (initial weights);
ACP_t = Active contract position of sector i where it takes on values 1 (long), 0 (flat for energy only), and -1 (short).

For sectors that have more than one component:

$DWPS_{it} = SC_{it} * SW_i * ACP_t$

where

$$SC_{it} = \frac{1 + SWC_{it}}{1 + SWC_{i,rolldate}} - 1$$

SWC_{it} = Sum of weighted percentage changes of components in the sector:

$$SWC_{it} = \frac{\sum_{c=1}^{C} w_c * ACCP_{ct}}{SW_{i,where,c \in i}}$$

where

w_c = Component (i.e. contract) weight;
SW_i = Weight of sector i (initial weights);
$ACCP_{ct}$ = Active component (contract) cumulative percentage change (on a year-to-date basis);
$ACCP_{ct} = ((1+ACCP_{ct}\text{-}1) * (1+ ACDPC_{ct})) -1$;
$ACDPC_{ct}$ = Active component contract daily percentage change;
$SWC_{i,rolldate}$ = Value of SWC_i at the last roll date = "Y" before t. The value from t+1 through the next roll date remains constant.

TABLE 1: HYPOTHETICAL ROLL DATE CALCULATION

		SECTOR I		
DATE	ROLLDATE	SWC	SWC(ROLLDATE)	SC
t-1		-3.79%	-0.69%	-3.11%
t	Y	-2.39%	-0.69%	-1.71%
t+1		-2.93%	-2.39%	-0.55%
t+2		-3.30%	-2.39%	-0.93%
t+3		-4.03%	-2.39%	-1.68%
t+4		-3.88%	-2.39%	-1.52%

We can see from Table 1 that SC_i depends on the roll date. The roll date at t = "Y" so $SWC_{i,rolldate}$ on date t+1 takes on value of SWC_i on t and carry forward until the next roll date = "Y". SC_i on t+3 = (1-0.0403)/(1-0.0239) - 1 = -1.68%.

Daily values of the Standard & Poor's Diversified Trends Indicator Total Return (SPDTI_TR) are:

$$SPDTI\_TR = \left[\frac{SPDTI_t - SPDTI_0}{SPDTI_0} + \sum_{t=1}^{t} SPDTI\_TR\_DI_t \right] * SPDTI_0 + SPDTI_0$$

where $SPDTI\_TR\_DI_t$ is the SPDTI total return daily interest rate, which is equal to (daily three-month U.S. Treasury bill rate at t = 0 divided by 360)*(date t - date t-1 and t=0 is the first day of the current quarter. Note that because there can be holidays or weekends, (date t - date t-1) does not necessarily equal to 1. For example, the SPDTI_TR daily interest rate jumps from 0.003% (1/3/2003) to 0.01% (1/6/2003) because three days have elapsed; on 1/6/2003, SPDTI_TR daily interest rate = 0.01% = (1.215%/360)*3.

Active Contract Position for Sector i:

For each of the 14 sectors, the monthly percentage change is calculated using the closing price on the second to the last business of each month, identified as the position determination date (PDD). Let τ denote the time period by month associated with the PDD. The active contract position of sector i at τ+1 is:

$ACP_{i\tau+1}$ = 1 If the Cumulative Monthly Sector Percentage Return up to τ >= Exponential Moving Average of the Cumulative Monthly Sector Percentage Return up to τ;
= -1 Otherwise;
= 0 If Energy.

The Exponential Moving Average of the Cumulative Monthly Sector Percentage Return up to τ ($CMSR_\tau$) is:

$$\frac{CMSR_{\tau\ 6} + 1.6CMSR_{\tau\ 5} + 1.6^2 CMSR_{\tau\ 4} + 1.6^3 CMSR_{\tau\ 3} + 1.6^4 CMSR_{\tau\ 2} + 1.6^5 CMSR_{\tau\ 1} + 1.6^6 CMSR_{\tau}}{43.07258}$$

where

$$\sum_{i=0}^{6} 1.6^i = 43.07258 \quad \text{and}$$

$CMSR_\tau$ = [(1 + $CMSR_{\tau-1}$)*(1 + Monthly Sector Returns at τ) - 1].

The S&P Diversified Trends Indicator Price Return and Total Return series can be found under the Bloomberg symbols SPDTP <Index> and SPDTT<Index>, respectively.

In addition to the S&P DTI Price Return and the S&P DTI Total Return, Standard & Poor's calculates and disseminates the S&P Diversified Trends Indicator Tracker Series. This indicator series is meant to be representative of an investment that replicates the returns of the S&P DTI Total Return and that assumes a charge of 1.25% annually in total fees. Like the other S&P DTI series, the S&P Diversified Trends Indicator Tracker Series is calculated on a daily basis and can be found under the Bloomberg symbol SPDTNV <Index>.

Daily values of the S&P Diversified Trends Indicator Tracker Series are:
$TS_t = TS_{t-1}$*[1+Gross Return - Daily Fee]

where Gross Return equals the daily return of the S&P DTI Total Return and the Daily Fee Equals (1.25% / number of days in a year).

Appendix F:
S&P DTI Sub-indicator: Commodities

I. The S&P Commodity Trends Indicator

The S&P Commodity Trends Indicator is an investable methodology that measures trends and volatility and seeks to benefit from trends (in either direction) in the commodity futures markets. Additionally, it measures the volatility of an aggregate of major commodity price movements. The S&P Commodity Trends Indicator is a composite of 16 commodity futures grouped into six sectors from around the world.

Generally, prices of these sectors and any underlying components are cyclical in nature. Each of the six sectors (with the exception of the Energy sector) will be positioned either long or short based on its price behavior relative to its moving average. This long/short aspect enables the S&P Commodity Trends Indicator to potentially capture profits in both up and down markets.

The S&P Commodity Trends Indicator can be used to capture inflation as many investors consider commodity futures markets useful to offset inflation risk in portfolios. In markets with rising prices, the S&P Commodity Trends Indicator is long in those futures contracts and therefore can reflect the impact of those markets on the Consumer Price Index (CPI) over extended periods. The S&P Commodity Trends Indicator also has the potential to profit from futures cyclicality. Since commodities tend to behave in extended trends, simple "long only" ownership of commodity futures could result in extended and significant drops in value. The S&P Commodity Trends Indicator mitigates the "long only" risk by shorting futures contracts that show falling price trends.

The S&P Commodity Trends Indicator Price Return and Total Return series can be found under Bloomberg symbols SPTICDP and SPTICDT, respectively. The daily values of the S&P Commodities Trends Indicator are calculated in a manner similar to that of the S&P Diversified Trends Indicator, which is described in Appendix E.

Standard & Poor's
55 Water Street
New York, NY 10041
USA

For more information about the S&P Diversified Trends Indicator, the S&P Commodity Trends Indicator or the S&P Financial Trends Indicator, please contact us at **index_services@standardandpoors.com**.