In This Issue

The Logistics Curve as a Superior Method for Modeling Price Behavior

Many analysts and chartists see the straight line as the baseline tool for formulating a trading system. They believe markets move in a linear fashion, so they look for a violation of the straight line trend as an indication of market reversal.

In truth, using the straight line as a model to describe long or short term market behavior is an exaggerated over-simplification. In hindsight, a straight line connecting two or more lows in a rising market can be set to identify the critical point when the trend changed direction. Similarly, another straight line through two or more highs in a declining period can be used as a reference to identify when the market reversed direction and began to rise. Drawing these lines in hindsight is simple. Identifying which lows and highs will turn out to be critical turning points in the future is another matter. When real money is invested based on your projections, an incorrect selection can produce market losses.

It is rare for any market to exhibit linear price movement behavior for more than a very few days. Whether evaluated in the short or the long term, a simple logistics curve could be used to model characteristic market behavior. The logistics curve uses a simple formula to incorporate feedback into an evaluation.

If we can assume the logistics curve can apply equally to price, then in the early stages of an up cycle, the curve suggests that markets accelerate rapidly as price catches up with a perceived limited supply. After reality and sanity prevail (the feedback), reduced demand caused by the higher price helps to decelerate the rate of price advance. The process then stalls as downward price movement adjusts for the over-compensated price correction. A mirror image repetition then takes prices lower as technology, lessening demand and market-substitution forces accelerate prices downward. Following the initial rapid drop, prices often decelerate to moderately lower levels until lower price again stimulates demand and the entire up-to-down cycle repeats.

The logistics curve equation (originally intended to address a permanently exhausted resource) actually addresses the supply of a resource through alternating periods

"Since supply and demand in the short term translate into price, it is our thesis that the logistics curve concept can monitor a similar relationship with price."

of abundance and scarcity. The notion of feedback occurs when the resource being supplied becomes rare or non-existent. When demand outstrips supply, the mathematical feedback is the absence of an inventory of the product. The logistics curve displays the form of the permanent or temporary supply function. A good example is the oil reserves of the Texas-Oklahoma-etc. oil fields which produced abundant oil supplies following original discovery. As reserves approach depletion, growth will slow and additional contributions to supply will begin to reach for the ultimate limit of zero. Since supply and demand in the short term translate into price, it is our thesis that the logistics curve concept can monitor a similar relationship with price.

How should one model a situation to take maximum account of the accelerating and decelerating forces that usually accompany every up or down price move? We can start with the straight line model then add a term which will factor in a decreasing rate of price advance.

The straight line model for price is of the form:

$$P(t) = P(0) + at \qquad \text{Eq. 1}$$

Where $P(t)$ is the forecasted price for future day t greater than 0, $P(0)$ is the actual price at the origin or beginning of a move, a is the slope of price appreciation per unit time, and t is time or the number of days since the origin price $P(0)$.

The straight line model above is used as a guide to determine if the anticipated pricing effects remain in place. A squared or equivalent term of time is necessary to factor in the curvature that will explain the accelerating and decelerating forces of the logistics curve.

By expanding our linear equation we have the exact form of the logistics curve as follows:

$$P(t) = P(0) + at - bt^2 \qquad \text{Eq. 2}$$

Where b is the coefficient of price deceleration per unit time.

To make this model work for you, "bt^2" must exceed "at" for t larger than some large T that would not be beyond the range of possibilities. In this way the characteristic function would not decrease.

In the supply logistics curve, equation 2 requires substituting supply, S, in place of price, P.

Equation 2 produces a characteristic function that looks like the following:
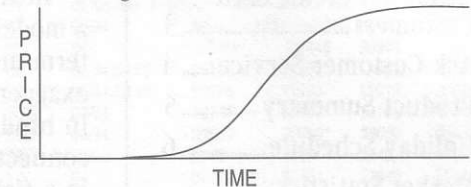
The above function shows the faster increasing price effects early in the price move. Then after the -bt squared term becomes more prominent with increasing t, the function shows a slow reduction in the forecasted price. This is very much like the density function of the normal probability distribution. The above curve has the form of the logistics curve. It is similar to the cumulative probability distribution function which is the integral of the normal density function (bell-shaped curve). The derivative of the logistics curve holds a form which is very much like the normal probability density function.

There are some important similarities between the supply logistics curve and the pricing application of the logistics curve. They are listed as follows:

1) Time. - Both systems depend upon units of time.

2) Form. - Both systems have the same mathematical form.

History On-Demand: An Update

We wish to thank all our customers for your patience in awaiting QuickTrieve® 4.05's History On-Demand. We are very sorry for the inconvenience the delays may have caused you. As a tangible token of our gratitude, we are making available an additional 50 months of free History On-Demand to current QuickTrieve 4.05 users. This data will be provided over and above the 100 free months we offered initially.

Please note that the restriction of retrieving all the data during a given month has been removed. You may order any remaining months of your 150 total free months at any time.

Remember that to be classified as "History on-demand," you must request that the data be downloaded when the order is transmitted.

At this time, our History On-Demand service supports stocks and normal commodity contracts. Computed commodity contracts such as cash, nearest futures and Perpetual Contract® Data, options and Initial Public Offerings (IPOs) are still unavailable. We hope to announce that IPOs and computed commodity series are available in the next CSI Technical Journal. In the meantime, you may order these types of data as assisted history orders through QuickTrieve. Normal rates apply.

We urge all of our customers to experience the convenience of retrieving history on-demand. With this new feature, virtually the entire CSI data base is at your fingertips any time of the day or night! ✦

Overseas Sprintnet Users:

Many local Sprintnet lines support retrieval at speeds up to 1200 baud only. If you are having trouble with higher baud rates, please try a slower speed. ✦

Attention Credit Card Customers:

We now accept the Discover Card for monthly payments on your CSI account. If you would like to change from another card on file to Discover, or begin making automatic payments on Discover, MasterCard, Visa or American Express, please contact our bookkeeping department. You'll need to have your credit card number and expiration date on hand when you call.

If you use a credit card for automatic payments of your CSI bills, please notify us of your new account number and/or expiration date whenever your current card expires. This will help us a great deal and avoid the possibility of account suspension due to unintentional nonpayment.

Thank you for your cooperation! ✦

The Logistics Curve...
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3) **Feedback.** - Both systems require a feedback function as follows: The logistics curve is limited by the exhaustion of the product. The price curve growth is limited when demand (supply) for the product is reduced (increased) from the effects of high (low) price.

Equation 1, of course, has the familiar characteristic function of the straight line:
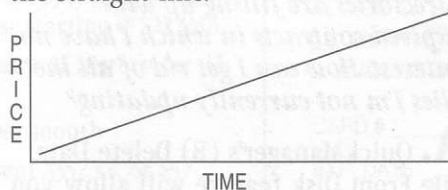
To make use of the price logistics model (equation 2), the next step would be to determine the values for the coefficients of a and b. This can

Ask Customer Service

Each month in this column our Customer Service Staff addresses a topic of interest to many subscribers. This month they'll present some common questions and answers about managing daily updates and data files.

Q. *When I first starting using CSI's update service, I retrieved a very large fixed portfolio. I have since switched to a smaller custom portfolio, but my printouts of daily updates still list all the contracts from the fixed portfolio. How can I be sure I'm not updating all those contracts?*

A. When you changed from a fixed portfolio to a custom one, you probably deleted the fixed portfolio number from your User Constants. Doing so would guarantee that you won't pick up that portfolio. If you haven't done this, you could retrieve the fixed portfolio by selecting (A)lternate port or (B)oth during the data retrieval session. If you opt for your (M)ain port only, you won't get a fixed portfolio, even if one is listed in User Constants. The one exception is in an unattended retrieval session, which will result in collection of any fixed portfolio listed in User Constants.

To verify what you're receiving, look closely at your daily data distribution printouts (data listings). You'll probably find a MISS status for those contracts that are not in your custom portfolio. MISS means that the file exists on your data drive, but it was not updated.

Q. *I am interested in just the active contracts of several commodities. I find that as time goes by, my data directories are filling up with expired contracts in which I have no interest. How can I get rid of all the files I'm not currently updating?*

A. QuickManager's (B) Delete Data File From Disk feature will allow you to select the files you wish to remove. We recommend using (H) Move/Split Data File to make an archive copy of your files on diskettes before deletion. That way, if

you later find you want to review the files, you can simply view them from the floppy disk or move them back onto your hard drive for analysis.

WARNING: NEVER use DOS commands to move or erase CSI-format files. It is critical that the Master File called QMASTER be updated during these procedures, which can only be done through QuickTrieve.

Q. *What if I want to remove an entire data directory?*

A. A simple way to remove a data directory from your listings is to edit your Master Path File with QuickManager's editor subsystem. Highlight the directory you no longer wish to use and press <F4> to delete. Be sure to press <F10> Save Changes before exiting the screen. This will make the data directory and all its files invisible to QuickTrieve, but they will still exist on your hard drive. Pressing <F8> will restore all CSI-compatible directories to your Master Path list.

Q. *I want to remove all the files in my data directory and start again. What's the fastest way to accomplish this?*

A. A fast, easy way to delete everything in a directory is to use QuickManager's A) Create Master File on Disk feature. This will wipe the slate clean for the selected directory and let you start over. Another alternative is to use B) Delete Data File from Disk, which allows you to selectively delete files individually or in groups. ◆

be done with a second degree least squares model fitted through a representative set of normalized points. The equation 2 function has the form of the standard logistics equation, but where the logistics equation models the supply of a commodity, we have attempted to model the price of a commodity. In our application we will assume that the forces of supply and demand will combine to limit further price advance (decline).

To determine a set of relative price weights that are representative of the commodity studied, simply extract all periods of rising (falling) price by replacing all members of each group of rising (falling) prices with the respective price divided by the initial price of each series. You would also have an average daily period duration, N, to which each sample set should be normalized. After averaging all like price index ratios for a typical normalized N-day period, the result would be your characteristic price function for the given commodity. This would explain expected price movement effects for the typical market advance or decline.

The resulting model would then be based upon the average relative price change day-by-day from the beginning to the end of a typical market move. Such a model should

We welcome your comments on this and other topics addressed in the CSI Technical Journal. Please send them to: CSI Journal, 200 W. Palmetto Park Rd., Boca Raton, FL 33432 - USA.

CSI Software Product Summary

Please check all that apply and complete the information box at right.
Mail or fax to CSI, 200 West Palmetto Park Road, Boca Raton, Florida 33432; Fax: (407) 392-1379

☐ **QuickTrieve®/QuickManager®** for PC - To retrieve, manage & edit data (includes 1994 Alerts Calendar); Unrestricted use $99. New daily user $59. QuickTrieve/QuickManager version 4.05 upgrade (for current QuickTrieve users only): $39

☐ **QuickPlot®/QuickStudy®** for PC - Charting & analysis software (requires QT/QM) $99

☐ **Trade Data Manager™** - Macintosh downloader & accounting program $59; upgrade $49 or *FREE* with $100 history order.

☐ **Trading System Performance Evaluator™** (TSPE) for PC - Computes your system's capital requirements $199

☐ **Trader's Money Manager™** for PC - Introductory price $499 (includes TSPE)

☐ **TraDe$k™** for PC - Traders' complete accounting system-(price varies with number of accounts) Starting @ $399/Unrestricted use $299/Daily data user or 12-month lease starting @ $22/Mo.

☐ **Seasonal Index Value Pack** for PC - Ten years of history for 33 popular commodities $444

☐ **Daily Updates** for PC - Starting at $10.80 per month

☐ **CSI Technical Journal** - Aug. 1990 to present $35/Yr. or $5/ Reprint

☐ **CSI Mailing List** - $200/1,000 names (CSI users omitted)

☐ **CSI Product Catalog** - *FREE*

NAME _____

DAY PHONE (____) _____

ADDRESS _____

_____

USER ID# _____

DISK PREFERENCE
☐ 5.25"/360K   ☐ 5.25"/1.2 MB (HIGH DENSITY)
☐ 3.5"/720K   ☐ 3.5"/1.44 MB (HIGH DENSITY)

METHOD OF PAYMENT (PREPAYMENT REQUIRED)
☐ CHECK   ☐ MASTERCARD/VISA   ☐ AMEX
AMOUNT ENCLOSED $ _____

CARD # _____

EXP. DATE _____

SIGNATURE _____

4/94

All prices subject to change without notice.

Spring *Holiday* Schedule

CSI will be closed for voice communication on Friday, April 1. The host computer will be operational for updates throughout the holiday weekend and Customer Service will be open as usual on Saturday, April 2. ✦

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be based on many years of history of a given market to obtain what would be the representative market advance (decline) equation.

Making profitable use of this new model:

Chart readers who decide when to buy or sell from the straight line model depend upon an accurate recognition of a significant trend line violation. The fitted logistic curve can produce similar insight for recognizing changes in market direction, without the subjective decision making. A model is your road map of what to expect, derived from years and years of past price behavior experience.

When used with other independent markets and related fundamentals, the curved function of price over time can be modeled to more realistically and profitably track your trading performance. We hope that those readers who are trading system developers will take our cue and produce more non-linear market tracking systems. We also hope that our readers who purchase trading systems can benefit from an increased availability of such systems, which could be excellent performers. ✦

Bob Pelletier

Market Statistics Update

ADDITIONS TO THE COMMODITY DATA BASE

Commodity:	German Long BUXL
CSI commodity #:	348 — Symbol: BXL
Exchange:	DTB (Deutsche Terminbourse)
Unit of measure:	Percent — Contract size: DM 250,000
Delivery months:	3,6,9,12
1st day on file:	940311 — CSI point value: DM 25.00
Conversion factor:	+2 — Newspaper/CSI price: 88.47:8847
Limit:	None — Max months forward: 9

Commodity:	90-Day FIBOR (Frankfurt Interbank Offer Rate)
CSI commodity #:	349 — Symbol: DFI
Exchange:	DTB (Deutsche Terminbourse)
Unit of measure:	DM/Basis point — Contract size: DM 1,000,000
Delivery months:	3,6,9,12
1st day on file:	940318 — CSI point value: DM 25.00
Conversion factor:	+2 — Newspaper/CSI price: 94.52:9452
Limit:	None — Max months forward: 16

DELETIONS FROM THE STOCK DATA BASE

4046	AFTQC	American Film Technologies Inc
8127	AXXX	Artel Communications Cp
2181	BRELC	Biorelease Cp
8231	BOONQ	Boonton Electronics Cp
7068	CCX	CCX Inc
8350	CFIXE	Chefmix Technologies Inc
8468	CSOF	Corporate Software Inc
8481	CRCCC	Craftmatic Industries Inc
2300	DVRFS	Dover Regional Financial Shares SBI
6113	FSEUX	Fidelity Select Portfolios/Elect. Util Port
8701	FFWV	First Fidelity Bancorp Inc (WV)
4150	FLBK	Florida Bank
2364	GHCI	Glacier Holdings Inc
4986	HCA	HCA-Hospital Cp of America Cl A
7145	HLN	Holnam Inc
7349	LQP	La Quinta Motor Inns LP
3343	LMG	Lawson Mardon Grp
4027	MEMXY	Memorex Telex NV ADR
9320	NAMC	North American Nat'l Cp
3466	PDA	Princeton Diagnostic Labs of America Inc
9507	QUME	Qume Cp
4545	RCII	Rehabclinics Inc
4606	SDOT	Seahawk Deep Ocean Technology Inc
9674	SPKR	Spinnaker Software Cp
9769	TERM	Terminal Data Cp
9906	WCLB	Warehouse Club Inc
3606	WEM	Western Energy Management Inc
9956	WOFG	Wolf Financial Group Inc
9960	WDST	Wordstar Int'l Inc

NAME, SYMBOL & EXCHANGE CHANGES

2109	ADYN	Aerodyne Products Cp -New name: Industrial Technologies; New symbol: INTI
8046	AKZOY	Akzo NV ADR - New name: Akzo Nobel NV ADR
4964	BUR	Burlington Industries Equity Inc - New name: Burlington Industries Inc
9254	CCRO	Clintrials Inc - New name: Clintrials Research Inc
8358	CDCRA	Children's Discovery Centers of America Inc CL A - New name: Children's Discovery Centers of America; New symbol: CDCR
8307	CDIC	Cardinal Distribution Inc - New name: Cardinal Health Inc
8322	CELS	Cellular Inc - New name: Commnet Cellular Inc
4098	COL	Columbia Healthcare Cp - New name: Columbia/ HCA Healthcare
7159	EGA	EQK Green Acres LP - New name: Green Acres Trust SBI
8698	FLAG	First Federal Savings Bank (LaGrange) - New name: Flag Financial.