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Auction Market Theory

Donald L. Jones**CISCO Futures 2002 ©****Part 1. Auction Market Theory****Part 2. Reward, Risk and Trading Models****Part 3. Standards: Potential and Opportunity****References****Appendix 1. Comparison of CAPM and AMT****Appendix 2. Technical Analysis Example****Appendix 3. Review of the Normal Distribution****Appendix 4. Fundamental and Technical Analysis****Appendix 5. Day Trading with Market Profile: Rules****Acknowledgements**

The field of Auction Markets was developed quite recently in the history of financial economics. J. Peter Steidlmaier laid the groundwork, changing the focus from price to value. We have borrowed freely from his works. Jim Dalton, one of the first to recognize the value of Steidlmaier's ideas, contributed heavily with Mind Over Markets (co-authored by Eric Jones and Rob Dalton). Eric Jones edited The Profile Report, an important source of research on Market Profile in the early days. Professor Tom Drinka, at Western Illinois University, was also responsible for research and for bringing Auction Market techniques into the classroom. My thanks go to Tom for reviewing this work as well as an earlier book, Value Based Power Trading.

Closer to home, Christopher Young, in my organization, developed a computer analysis of "day type", for types of Market Profiles. Day types are 'normal', 'trend', 'non-trend', etc. The idea was to catalog a time series of day types and chart the normal growth patterns of markets. When the data refused to fit a pattern I realized that markets are not day-to-day serially

correlated. Inter-day volatility masks the trend even in relatively strong trends. Lack of serial correlation implies that one could not blindly use yesterday's data to trade today. A longer timeframe is needed to find the 'market condition', i.e. whether it is balancing, trending or in transition. That was the breakthrough that led to Auction Market Theory.

Donald L. Jones Aurora, Colorado March 12, 2002

Auction Market Theory

Auction Market Theory develops and clarifies the structure of short timeframe non-equilibrium auction markets. The primary variable is value, the region of price accepted by the market. Based on market structure, the theory generates trading strategy. A side result of the theory is the capability of calculating reward to risk ratios for individual markets. In turn, opportunity is categorized and standards in the nature of indexes are set for the trading function.

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Auction Markets

Most of the world's markets are auction based, e.g. futures, options, debt and equities, derivatives, etc. The **Auction market dynamic** is created by the participants. Daily price range is determined through negotiation between the traders. As price is negotiated, some prices are accepted by the marketplace and create heavy volume. Rejected prices, the highs and lows, and sometimes opens and closes, are seldom traded and generate little volume. By trading many times throughout a day, accepted prices identify value.

Despite the ubiquity of auction markets, there is no general auction market theory. Capital Market Theory (CAPM) (ref. 1 and Appendix 1) is a special case for long term, **equilibrium** markets. CAPM is at base an **investment** theory. It assumes a logical investor with a particular level of risk tolerance. A portfolio approach provides diversification. What is not provided is guidance for the trading upon entering, changing and exiting the portfolio. The **trading** part of the investment process is ignored.

Observation and experience shows that the trading part of portfolio management can be critical to overall performance. For convenience, assume a one-hundred percent rollover of a portfolio and a trading **gain** of two percent of the average value on the net rollover. With an average portfolio gain of eight percent, trading gain represents a twenty-five percent enhancement of return. A two percent trading range is not unusual in the S&P 500 index, while the nasdaq index range is much larger. CAPM makes the point that index funds are superior because of the low rollover and hence low costs. But even index funds have some rollover that might be traded rather than just rolled. Every trade has a risk, expenses and offers an opportunity. There are good and bad times to buy and sell. The trading function can conceivably be a profit center instead of merely a cost. Trading risk is not treated in the risk tolerance measure that initially sets the portfolio. Identifying and managing the trading timeframe is the substance of Auction Market Theory (AMT). Futures approach the ideal in auction markets. Auction market analysis developed on a futures exchange. Most explanations in the text will use futures because of convenience.

J. P. Steidlmayer (ref. 2), a member of the Chicago Board of Trade, first described and interpreted the day structure of auction markets. An extension of the day market concept was added by Jones (ref. 4) to cover **market condition**, the environment in which day trading takes place.

Sharpe, in the foreword to the reprinted reference 1, makes the point that CAPM uses little empirical material (mercifully, he says, because of the short half-life of empirical studies). Most of science starts empirically; collecting and sorting data to derive basic principles. AMT is based on empirical studies, in part because the underlying mathematical description would be a non-linear, non-homogenous differential equation with non-constant coefficients, and basically insoluble. Many fields of science suffer the same defect, but airplanes fly even though their wings are not infinitely long. Likewise, auction markets can be understood phenomenologically through empirical evidence. An assumption is that the probability of making better trading decisions improves with market understanding. This is a general principle running through most human endeavors. Successful decisions in most arenas come from data coupled with a good understanding of the business at hand. Thus, auction market theory is normative in effect, providing information for decision making.

Very Long Timeframe/Very Short Timeframe Auctions

An equity market can be idealized as a long timeframe, equilibrium market, as in Capital Market

Theory. Such an equilibrium market is an **investment** medium. At the same time, equities trade every day in the short timeframe non-equilibrium limit. Other markets such as commodity futures spend virtually their entire lives in a non-equilibrium situation. Non-equilibrium markets can thus be characterized as **trading** media. Auction markets as a whole are a continuum, stretching from the shortest, non-equilibrium limit to the long timeframe equilibrium limit. However, the non-equilibrium short timeframe limit theory developed here will be termed Auction Market Theory (AMT) as contrasted with the long limit CAPM.

Auction Market Theory (AMT); 3 Parts, a Brief Review

Part 1. Development of AMT: The Theory

The primary aim of Auction Market Theory is to identify the characteristics of short timeframe non-equilibrium auction markets and to present a coherent description of their behavior. Achieving this goal will place market analysis on a quasi-quantitative basis, removing the mystique and misinformation surrounding market activity. An allied aim is to develop a procedure to utilize current market knowledge as a guide to future (trading) action. The approach is empirical. Observables are identified, cataloged and interpreted to provide a structurally sound market description that applies to real world situations. AMT analyses will identify the salient elements of a market; including value, market condition, risk, volatility and other items in a market's structure. These market elements will, in turn, be used to generate a strategy for trading.

AMT (theory) develops the principles governing short timeframe market phenomena. Often, prediction of future events qualifies a theory. Financial markets are replete with market predictors and market predictions. It is an axiom of Auction Market Theory that future prices are not predictable. **Current** market condition is found from AMT principles. Market condition is the state of the market, e.g. local equilibrium or balance, local trend or transitions between the two. The state or condition is time dependent in that one timeframe may be in one state (say a market is balanced in a twelve day view, while trending by a four day measure). AMT analysis shows that **changes** to the current condition can be the basis for market decisions. A strategy developed subject to the event of change from one market condition to another is non-predictive (normative). While predictions of future price are not made, logical conclusions from market behavior are. Incidentally, CAPM operates much the same way, picking portfolio candidates on the basis of past behavior.

Part 2. Calculation of Reward and Risk

The aim of trading is the **reward**, the gain from a trade. Reward (plus or minus) results from the trading process. Auction Market Theory does not specify trading procedures; rather trading strategies. It will be shown that maximum potential reward in a day trade depends only on the entry point. In certain situations (e.g. balanced markets) entry points are readily identifiable. Reward maxima for a trading event can then be found.

Reward alone, while significant, is better understood in terms of it's relation to the risk involved. The **rarely known** reward-to-risk ratio is important to appropriate money and risk management. A risk estimate can be found from a simplified standard trading model that uses entry prices and risk from an AMT analysis process. The maximum time frame of a trade is from trade entry to market close. The maximum possible reward is the largest price excursion from entry to close. This is defined as the **Potential** of the trade. Potential for a trade in such a case, is defined by one variable, the entry point. Potential in day trading plays somewhat the same role as the index in CAPM, i.e. as a marker for success. In AMT, Potential measures opportunity. These points will be developed in Part 2 below.

Part 3. Standards: Potential and Opportunity

Standards are desirable but **rare** as a basis for evaluating models and markets. If an **investor's** stock portfolio value declines while the market index is declining more, the investment is described in positive terms (it beat the market). In non-equilibrium trading there are no indexes. A loss is absolute, a gain is absolute. But, losses can carry different connotations. A loss in a market offering little opportunity is quite different from a loss in one with much opportunity. Potential is the arbiter, it sets the standard. If one trades a market that consistently offers low Potential, one should change markets. If one does poorly in markets that consistently offer substantial opportunity, one must examine one's trading methodology. Part 3, below, will use auction market principles 'best trading' risk and reward to risk ratios to catalog markets.

CAPM is Not a Guide for AMT

Although the focus of AMT is on short timeframe **trading** markets, the long-term (CAPM) is important psychologically. The public tends to think of short timeframe **trading** in terms of the more familiar longer term **investing**. The two are quite different. Speculation, betting on risks and opportunities, in the day timeframe has a totally different risk and reward structure from investing. The long term upward trend of equities rewards a buy and hold strategy. The same strategy in speculation is fatal. A trader/investor who is not aware of the difference is doomed. A comparison of CAPM and AMT is in Appendix 1.

Auction Market Structure: Beginnings of AMT

Short timeframe auction markets, although not an equilibrium system, do spend time in quasi-equilibrium, balanced trading. As a non-equilibrium system, AMT is difficult to describe in a closed mathematical formulation. Much of the analysis of near term markets is necessarily empirical. A benefit is that AMT, in practice, is not obscured by mathematical formalism. The average trader can readily understand and follow the principles. That is not true of CAPM with its efficient frontier.

AMT is applicable to **trading strategy** in a wide variety of instruments; **securities, options, interest rates, futures contracts and other double ended markets**. Regardless of the market, the timeframe for a given trade is specific to that trade. It ranges from seconds to minutes to many days, determined by the market itself, in its relationship to value and value change. A certain percentage of losses are **inevitable** in a trading environment. Leverage may exist, as in futures or margin trading in equities or more generally in hedge funds. Consequently, unlike a long term investor, a trader should risk much less than 100% of an account's capital on each trade. Performance is measured by appreciation alone, but it can be gauged against an ideal, the **Potential**.

Beginnings of Auction Market Analysis: Steidlmayer Original Decisions

J.P. Steidlmayer started as a floor trader at the Chicago Board of Trade in 1963. Over time he developed the concepts from which evolved the Market Profile volume charts and an auction market description as well (ref. 2). The seven market concepts below are a brief overview of his work.

- 1) All the publications he searched attempted to **predict** the market. They failed. He surmised that **prediction of the future should not be a goal**.
- 2) Graham and Dodd's book Security Analysis showed that **value could be found** in the present tense. He projected this result to his trading.
- 3) He posited a **basic unit of market activity**, now known as the **TPO** (price and time location of trading activity). TPO's are measured in half-hour segments of the trading day. Steidlmayer selected the half-hour time frame because that seemed to be the time it took for new information to get represented into price change.
- 4) He found that grouping a day's set of basic units forms a bell shaped distribution of price - volume over a day, which he named a **Market Profile (tm)**. The bell shape called to mind the

'normal distribution' so widely applied elsewhere to bring "order out of chaos".

5) Price-over-time measures value. He saw that relative value at a price is equal to the sum of the basic units (TPO's) at that price.

6) Traders/investors seek a fair price. Markets auction 'too high' and 'too low' in the search for fair prices. **Markets accept fair prices** with enhanced volume and reject unfair prices by way of low volume. The price range is reached by **negotiation** among the traders.

7) His experience showed that there are **two sorts of market**, '(balanced) day trading' where value is static and the market moves around a static fair price; and 'longer term' where value is moving (sometimes called 'trend days').

Market Observables: Exchanges

Organized financial auction markets have been present in the United States since 1792. As markets expanded, rules were implemented and the exchange structure, with memberships (seats), took form. Exchanges formed the arena for the growth of the well-defined auction markets that exist today. Steidlmyer's pioneering work occurred within the exchange structure. In developing Auction Market Theory, a somewhat different path is taken from the Steidlmyer work. Here the market observables, self evident facts clear to all, forms the starting point. Nevertheless, reference 2 forms the base for much of the development that follows.

Significant Market Observables

1) Possibly the first rules in 1792 set the **meeting place, time and trading hours**. These rules are, in the case of electronic markets, now being stretched to include non-floor, non-exchange hours. Futures exchanges set margins based on volatility (risk).

2) Auction prices are arrived at by **negotiation**.

3) Some prices are **accepted** by the market and show considerable trading activity during the market day.

4) Other prices, often the highs and lows, are quickly **rejected**, trading little.

5) A market may be **accumulating (balancing)** or **distributing (moving)**. That is, markets spend time in balance and sometimes trend.

6) Some participants seek quick gains, e.g. **day traders**, while others trade a **longer term** strategies (position/swing traders).

7) Some days **many traders are active** in a market, other days **few trade**. Some days a market will have high volume, some days not.

8) Some markets usually have **wide daily trading ranges**, others are noted for consistently **small ranges**.

9) The **heaviest trading** often occurs in the opening and closing periods.

10) Markets display **little day to day serial correlation**.

11) Markets **cycle** from balance to trend and back to balance.

12) An auction timeframe can be long or short (e.g. the market has been in balance for 15 days, or the market broke out of balance and has been trending for 3 hours).

13) Members on the floor have different functions (**scalpers, commercials, specialists, trading for the public, etc.**).

14) Electronic platform markets **clear, or complete trades faster than the floor**.

Information Derived from the Observables

Market observables deal primarily with prices and trading (volume). Auction Market Theory owes it's utility to **value**. In this section, the first steps are taken to convert the one-dimensional price to the two-dimensional value description of auction markets. An illustration of price analysis versus value analysis is in Appendix 2.

First, the observables are fleshed out.

1) Trading hours.

Electronic markets tend to show much the same structure as the floor because arbitrage exists and they often take their cues from the floor. As electronic trading matures, those markets will likely lose a large part of their dependence on the exchange floor.

Exchanges, or clearing authorities for some electronic exchanges, interact with the public principally in setting margins. Margin is 'earnest money' guaranteeing the broker that losses are covered. A trader's interest in margins in part is the amount of money that must be deposited in order to trade. Far more important is how the exchanges set margins. With a lot of experience backing them up, the exchange margin is set to mirror the risk. Trading models inevitably have a risk function of some sort. However, anytime exchange margin is changed, there is a change in the risk being taken. Since exchange margins are not necessarily what a broker charges, (brokers often charge more), keeping track of exchange margins takes some effort.

Each trade has a buyer and a seller. In figure IDO 1, price auctioned as high as 6054 until no one would bid higher. Likewise, price auctioned down to 6036, where no one would take less. There were many buyers and sellers at the middle prices. Each completed trade was **negotiated** between a buyer and a seller.

TRADING BEGINS 0720 (CST) CLOSES 1400 CHICAGO TIME

[illegible]

6037	6	x
6036	12	x

Figure IDO 1. Swiss franc volume by price. Oct. 26, 2001. Minimal trading occurs at the top and bottom prices. The three top and three bottom prices have only 3 percent of the day's volume. The middle six (6043 - 6048) have 70 percent of the trading. The disproportionate volumes at 6045 and 6047 are at least partly artifacts of the way orders are placed (e.g. five is a popular trading point, diminishing the six next to it). Volume data is from the Chicago Mercantile Exchange Liquidity Data, with volume in 'sides' (two sides equals one round turn).

With no idea of when the trading at a particular price took place one would be hard pressed to tell from figure IDO 1 just when a price may have traded. That is not much of a problem in a congesting market like this one, since there are many opportunities at all the prices in the value area (central 70 percent of trading, 6043 - 6048). Recasting the price - volume plot into a Market Profile and a half-hour bar chart adds a substantial level of information as in figures IDO 4 and IDO 5. The half-hour bars are identified by letters; y, z, A, B,..., where each letter signifies a time span. The y's are for the period 07:00 to 07:30, z is for 07:30 to 08:00, A is for 08:00 to 08:30 and so on. The letters are called TPO's or time-price-opportunities. Collapsing the bars to the price axis creates the Market Profile. TPO counts are commonly used in place of actual volume since they embody both price and time.

3) Accepted Prices

Referring to figure IDO 1 again, the price range 6039 to 6050 is heavily traded. A trader entering the day wishing to sell or buy at 6044 would have many opportunities to do so. A wide range of prices were approved for trading by the participants. These constitute the accepted prices for this day. The graphic is of an accumulating market, one which is cohesive, compact and in which there is good agreement on the location of acceptable price (value). An accumulating market has a single price - volume distribution roughly in the shape of a bell curve.

4) Rejected Prices

Prices not accepted by the market generate very light volume. Such prices rarely trade and the trader who wants to do business there has little opportunity to do so. The trader who wished to buy at 6035 had no opportunity at all. In figure IDO 1 the upper three prices and the lower three prices are one-third of the day's trading range but only 3 percent of the volume.

5) Accumulation and Distribution

The accumulating market of figure IDO 1 has given way to a distributing, or moving market the next day. Figure IDO 2 appears to be in two parts; the range from 6106 to 6122 and the range 6122 to 6143. The close on 10/26 at 6048 is far below today's close of 6134. That 86 point difference is \$1075 per contract. Without outside evidence we would guess that price continued upward throughout the day, but one cannot be sure without further investigation. The **Market Profile** in figure IDO 6 will solve the problem.

CONTRACT: DEC 01 S FRANC (CME-IMM) TRADING DATE: 10 29 01

TRADING BEGINS 0720 (CST) CLOSE 1400 CHICAGO TIME

PRICE	VOLUME	Volume Plot x = 20
6143	86	xxxx
6142	50	xxx
6141	228	xxxxxxxxxxxx
6140	194	xxxxxxxxxx
6139	308	xxxxxxxxxxxxxxxx
6138	842	xx
6137	548	xx
6136	1022	xx
6135	384	xx
6134	334	xx
6133	496	xx

Figure IDO 2. Swiss franc volume by price. October 29 is the next trading day after October 26 of figure IDO 1. The trading range is twice as large and the orderliness of IDO 1. has disappeared. Volume today is 12,844 compared to the much lower 2,574 of yesterday. This market has moved over \$1,000 in one day (close to close).

Day traders, by definition, are out of the market by the close. They have no long term effect on the market, since they are holding positions only a fractional part of the day and not at all overnight. Markets do move, and sometimes rather violently. Exchange members, as a group, tend to be flat or hedged at the close. Longer term demand, the sort that moves markets, comes from those who hold positions past the close. These are the position traders in the futures, options and debt markets; and the institutions and public in equities. Day traders are the opportunists who jump on a move and hold a short time. Position traders have the patience to hold longer term, creating demand.

Perception of opportunity drives the day and short term position trader. The trading day in figure IDO 1 was quiet and few traders acted on what little opportunity existed. The overnight, off-exchange market, which is substantial in currencies, had a 50 point (\$625) move. This alerted the exchange timeframe traders. In the first hour of the next trading day price jumped some more and there were over 4000 contracts traded, 160 percent of the previous day total. Opportunity appeared and was eagerly taken.

It was pointed out in item 1) that markets with floor trading develop a backlog prior to open. The necessity of day oriented trading exiting prior to close develops a backlog there, also. Since both open and close have associated ranges, demand is artificially changed at these particular times. With the rise of electronic markets, artificial demand from exchange openings and closings will disappear.

9) Trading Ranges

Short timeframe traders gain by quickly recognizing an opportunity, seizing it and just as quickly exiting. Return is a function of the speed and range of the day's internal movements. So is risk. A quantitative measure of risk in the day timeframe evaluates average swing size. Some swings are more risky to trade than others. At the other extreme, some markets are so un- risky that their opportunity is unacceptably small to the day trader. One of the capabilities of Auction Market Theory is to explore and quantize this aspect of auction markets.

10) Serial Correlation and Forecasting

There is little day-to-day serial correlation in auction markets (see e.g. Speculation, Hedging ..., Labys & Granger, 1970; or reference 4, p19). This makes today's trading a poor predictor for tomorrow. Consequently, it would be a questionable aim of a market theory to propose forecasting market behavior. AMT trading is based on **understanding the current market situation** and having a strategy for change; not predicting "tomorrow's" price.

11) Members Functions

So far market knowledge is equated to an understanding of value based data displays. A market is also comprised of people, the public and the members and/or professional traders. Four classes of futures members inhabit the floor. Non-members must interact with them. It is to the public's advantage to understand member's motivation. Class 1 are the Locals or scalpers, the other side of virtually every transaction. They work for themselves, provide liquidity and are most comfortable with balanced markets. Class 2 are the commercials who's job is to trade and hedge for their companies. These are the businessmen of the floor. Their company will be a large commercial firm, e.g. Morgan Stanley. Since commercials know both the cash and futures markets, they are the best informed traders on the floor. They too work best in balanced markets. In addition to their "business" they may speculate when prices are out of line (capping is discussed later). Commercials typically do five to fifteen percent of the volume. Class 3 are members clearing for other, off-floor, members. This class accounts for around five to ten percent of the volume. Lastly, Class 4 clears for us, the public. We, the public, are typically twenty to thirty percent of the day's trading volume. Chicago Board of Trade and Chicago Mercantile Exchange release the Liquidity Data Bank reports with volume-price-member type statistics.

CBOT VOLUME REPORT

TRADING DATE: 03 22 01

CONTRACT: JUN 01 T-BOND (CBOT) DAY

TRADING BEGINS 0720 (CST);CLOSES 1400;TPO SYMBOLS ARE Z\$ABCDEFGHIJKL
FIRST PERIOD IS 10 MINS;SUBSEQUENT PERIODS ARE ALL 30 MINS

PRICE	VOLUME	%VOL	%CTI1	%CTI2	%CTI3	%CTI4	BRACKETS(*)
10708	2036	0.6	45.6	14.7	4.5	35.2	F
10707	5694	1.8	59.0	8.7	12.2	20.1	F
10706	5934	1.9	60.5	3.8	6.8	28.9	FIK
10705	8342	2.6	57.6	2.9	5.9	33.6	FIKL
10704	13868	4.3	56.4	3.6	11.5	28.5	EFIKL
10703	14320	4.5	54.0	5.8	5.5	34.7	EFIJKL
10702	12186	3.8	61.5	12.3	6.2	20.0	EFGHIJKL
10701	20582	6.4	56.9	9.7	7.9	25.5	EFGHIJKL
10700	15382	4.8	57.2	8.5	6.7	27.6	DEFGHIJKL
10631	23526	7.4	50.5	6.5	6.7	36.3	CDEFGHJKL
10630	32526	10.2	56.7	7.5	6.0	29.8	CDEFGHJL
10629	19146	6.0	57.2	4.3	9.6	28.9	CDEGHJLM
10628	24108	7.5	56.3	6.6	7.9	29.1	BCDEGHLM

10627	14762	4.6	54.5	5.7	10.9	28.9	BCDEGHLM
10626	13938	4.4	55.1	9.2	5.5	30.3	BCDEGH
10625	12528	3.9	59.8	3.9	13.3	23.0	BCEGH
10624	8466	2.6	61.7	2.8	7.4	28.0	BCE
10623	19036	5.9	61.1	5.1	5.7	28.2	BCE
10622	5384	1.7	57.5	4.5	4.4	33.6	BE
10621	2104	0.7	57.7	6.7	5.9	29.7	BE
10620	582	0.2	78.7	0.0	0.9	20.3	BE
10619	1210	0.4	60.6	0.0	2.4	36.9	ZAB
10618	6980	2.2	53.8	1.5	3.5	41.2	Z\$AB
10617	8616	2.7	59.9	7.3	8.1	24.8	Z\$AB
10616	8616	2.7	55.9	2.1	7.8	34.2	Z\$A
10615	5056	1.6	54.0	5.7	9.0	31.2	\$A
10614	8106	2.5	61.5	3.5	9.9	25.1	\$A
10613	5006	1.6	63.2	2.2	7.2	27.4	\$A
10612	1900	0.6	58.6	3.9	7.6	29.8	\$
10611	4	0.0	50.0	0.0	0.0	50.0	\$

	%CTI1	%CTI2	%CTI3	%CTI4
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VOLUME FOR JUN 01 T-BOND (CBOT) DAY	319944	57.0	6.1	7.6	29.3
VOLUME FOR ALL T-BOND (CBOT) DAY	320350	57.0	6.1	7.6	29.3

70% VOLUME SUMMARY

PRICE	VOLUME	%VOL	%CTI1	%CTI2	%CTI3	%CTI4	BRACKETS
10704	225338	70.4	56.3	6.8	7.9	29.0	BCDEFGHIJKLM
10624							

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Figure IDO 3. Liquidity Data Bank for T-bonds, March 22, 2001.
 Column headings: Price, Volume (in half contracts), %Volume for each price, %CTI1 is volume percentage for the local members, %CTI2 is volume percentage for the commercial members, %CTI3 is volume percentage for the off-floor members and %CTI4 is members acting for the public.
 On the far right, BRACKETS refers to the Market Profile.

Below the volume table, totals show the average percentages of volume for each of the four member classes. 70% Volume Summary is the value area. T-bonds are quoted in 32nds. The price 10708 stands for 107 and 8 32nds. The next price tick above 10631 is 10700. A move from 10600 to 10700 is \$1000 for the one unit jump. A move from 10621 to 10622 is one price tick, worth \$31.25. Liquidity Data Bank reports are a more comprehensive version of Market Profiles. The value area is defined by trading volume as opposed to using the TPO's as in IDO 5.

12) Electronic Trading Platforms

Electronic platforms are developed primarily to cut trading costs. A side effect is that trades clear faster and more accurately. Member - public interactions are minimized. In some cases simultaneous trading occurs on the floor and on the electronic market. At this time, many traders are placing orders electronically through their computers but the trades are still routed to a trading desk and pass through the standard floor procedures. While how a trade is accomplished is of little moment theoretically; practically there can be a big difference in costs.

As electronic trading grows, the influence of floor members will diminish. The current effects of exchange trading hours will no doubt diminish as well. These changes will little affect the fundamental characteristics of auction markets. Most likely, a trader familiar with auction market basics will have minimal trouble incorporating such changes. For instance, if opens and closes disappear entirely, a new timeframe to replace the exchange day will become apparent, probably defined by trading volume. Currently, the 24 hour electronic markets show consistent times of higher volume tied into the market being traded.

13) Markets Cycle

Markets continually move from **balance** to **testing the balance**, to **trend**, to **testing for end of trend** and

back to balance. The time spent in any one phase may be long or short. There is no valid method of predicting **when** the phase may change. Further, any phase may be arbitrarily short. The change from balance to trend can occur in minutes or may take days of testing the balance. Figure IDO 1 was a balance day, the next day that balance has cycled into a trend phase. The progression is known: a market in balance today will surely break out in the future.

Structure of a Trading Day, the Market Profile (tm)

Figure IDO 1 illustrates the price - volume structure of one quiet day in a balanced market. Missing is information on the time of day any particular volume occurred. By slicing a day into sub timeframes and posting the segments in order, a picture of time behavior emerges. Figure IDO 4 shows the trading of figure IDO 1 in half-hour bars. Contract volume is now "time" volume.

MARKET PROFILE* REPORT FOR 10 26 01 AND SEGMENTED AUCTION														
COMMODITY -- S FRANC (CME-IMM) DEC 01														
Price	Brackets				Segmented Auction									
6054														F
6052														F J
6051														C F J
6050														C F G J K L
6049														C D F G H J K L
6048				A										C D F G H J K L
6047			z	A										C D E F G H J K >L
6046		y	z	A										C D E F G H J K L
6045		>y	z	A										C D E F G >H >I > >
6044		y	>z	A										C D E F G H I
6043		y	z	>A	>B	>C	>D	>E	>F	>G				I
6042			z	A	B	C	D	E	F	G				
6041			z	A	B	C	D	E	F					
6040			z	A	B	C	D	E						
6039				A	B									
6038				A	B									
6037				A	B									
6036					B									

Figure IDO 4. Swiss franc price by time. Oct. 26, 2001. Time is denoted by vertical bars: y is 0700 - 0730, z is 0730 - 0800, A is 0800 - 0830 and so on until L, 1330 to 1400. These letter groups are just 1/2 hour bars. The display is called a "Segmented Auction" since the day is segmented into half-hour time periods.

The time source of the quasi-bell shape of figure IDO 1 is now apparent. The lower part was built in early day trading, the upper, later. End of day trading was near the highs.

Combining figures IDO 1 and IDO 4 displays both volume and time. Many markets do not report volume along with the price ticks. In fact, some markets never report volume at price, just end of day totals for all prices. A surrogate for volume (demand) is **price over time**. Each of the letters in figure IDO 4 denotes trading at that price within that time frame. The auction market assumption is that frequency of trading at a price measures relative demand. e.g. at 6050, trading first occurred in the C timeframe, then recurred in F, G, J, K, L timeframes a total of six periods throughout the day. At 6054 there was trading only in F time period. The assumption is that there is more demand at 6050 with six events than at 6054 with one event, i.e. 6050 won the popularity contest. Figure IDO 1 shows that indeed there was much more volume at 6050 than at 6054.

Events (the A, B, C's) are called TPOs, short for Time-Price-Opportunity (or That-Price-Occurred). One who wanted to trade at 6050 had at least six chances, six different half hour periods where trading occurred at 6050, while someone wanting to trade at 6054 only had the F time frame to do it in. Opportunity at 6050 is approximately one-sixth the opportunity at 6054. A more precise measurement of relative opportunity could be obtained by using 15 minute bars, or even shorter.

Practically, TPOs greatly simplify defining market structure within the trading day. Collapsing the TPOs from the half hour bar into the price - volume distribution of figure IDO 5 completes the development of the Market Profile.

MARKET PROFILE* REPORT FOR 10 26 01 AND SEGMENTED AUCTION													
COMMODITY -- S FRANC (CME-IMM) DEC 01													
Price Market Profile							Segmented Auction						
6054 F							F						
6052 FJ							F				J		
6051 CFJ						C	F				J		
6050 CFGJKL						C	F	G			J	K	L
6049 CDFGHJKL						C	D	F	G	H	J	K	L
6048 ACDFGHJKL			A			C	D	F	G	H	J	K	L
6047 zACDEFGHJKL		z	A			C	D	E	F	G	H	J	K >L
6046 yzACDEFGHL	y	z	A			C	D	E	F	G	H		L
6045 yzACDEFGHI	>y	z	A			C	D	E	F	G	>H	>I	>
6044 yzACDEFGHI	y	>z	A			C	D	E	F	G	H	I	
6043 yzABCDEFGI	y	z	>A	>B	>C	>D	>E	>F	>G		I		
6042 zABCDEF		z	A	B	C	D	E	F	G				
6041 zABCDEF		z	A	B	C	D	E	F					
6040 zABCDE		z	A	B	C	D	E						
6039 AB			A	B									
6038 AB			A	B									
6037 AB			A	B									
6036 B				B									

Figure IDO 5. Swiss franc **Market Profile**. Oct. 26, 2001.

The price - time distribution

is quasi-bell shaped. TPO volume peaks in the middle prices

(6050 to 6040) and then tails off toward the upper and lower limits. There is very little support for trading at the highs and lows of the day.

The highs and lows are **rejected**. Prices in the middle are **accepted**.

A Market Profile tends to even out the volume trading spikes such as those at 6047 and 6045 in figure IDO 1. The same is seen to be true in figure IDO 6, the profile of the data in figure IDO 2.

Price-over-time, in line with general usage, is designated **value**. Value maps out a wide area in the mid region of a balanced market. It is inappropriate to say for figure IDO 5 that **value** for

the day is 6045. Rather, one would state that the market finds value in the 6050 - 6040 **area**. It **is** appropriate to say "the market rejects prices in the neighborhood of 6054 and 6036".

Balance days consistently display the quasi-bell shaped curve. That shows a general agreement on value. Note that the distribution is not ideally normal--this is experimental data (e.g. there is not enough data to apply econometric analyses).

Trend days often show small bell shaped price - volume distributions (ref. 4, pg 78 -84), albeit in a manner modified to accept the change in value.

MARKET PROFILE* REPORT FOR 10 29 01
AND SEGMENTED AUCTION

COMMODITY -- S FRANC (CME-IMM) DEC 01

Price Brackets	Segmented Auction															
6143 K															K	
6142 KL															K	L
6141 KL															K	L
6140 HKL									H						K	L
6139 EHKL					E				H						K	L
6138 BEHKL		B			E				H						K	L
6137 BDEHKL		B		D	E				H						K	L
6136 BDEHKL		B		D	E				H						K	L
6135 BDEHJKL		B		D	E				H		J				K	L
6134 BDEHIJKL		B		D	E				H	I	J				K	L
6133 BDEHIJKL		B		D	E				H	I	J				K	L
6132 BDEHIJK		B		D	E				H	I	J				K	
6131 BCDEHIK		B	C	D	E				H	I					K	
6130 BCDEFHIK		B	C	D	E	F			H	I					K	
6129 BCDEFGHK		B	C	D	E	F	G	>H	>	>					>K	>
6128 BCDEFG		B	C	D	E	F	G									
6127 BCDEFG		B	C	>D	>E	>F	>G									
6126 BCFG		B	C			F	G									
6125 BCFG		B	C			F	G									
6124 B		B														
6123 B		B														
6122 B		B														
6121 B		B														
6120 B		B														
6119 zB			z	B												
6118 zA			z	A												
6117 yzA		y	z	A	>	>										
6116 yzA		y	z	A												
6115 yzA		y	z	A												
6114 yzA		>y	z	A												
6113 yzA		y	>z	>A												
6112 yzA		y	z	A												
6111 yzA		y	z	A												
6110 yzA		y	z	A												
6109 zA			z	A												
6108 zA			z	A												
6107 zA			z	A												

6106 z

z | |

Figure IDO 6. Market profile for SF on October 29, 2001. A trend day. The volume profile, figure IDO 2, shows the same general structure, but market profile shows timing within the movement. Overnight trading in the inter-bank market moved price upward as noted (from about 6050 to the 6114 region). For the first three periods the market accepted 6114 as the new balance. But this was merely a **pause**, not end-of-trend. The next jump in B period (8:30 - 9:00) found a new balance around 6133.

Structures like the two distributions in IDO 6 illustrate the **inefficiency** of markets. An overnight price rise of about 50 points obviously came on an increase in demand. The exchange market opened around 6114 and traded there for about an hour. However, the latent demand in the market became slowly recognized, driving price to the 6135 region, which became the balance for the day. Can this scenario be proved? No, it is not possible know the opinions and thought processes of all traders. However, this "slowly catching on" behavior is quite prevalent in value shifts. Another example of inefficiency we will discuss is the "short covering rally" in which the demand is latent on the opening, price is driven up strongly, the shorts are often covered in about an hour, and then price slowly recovers over several hours as the true demand becomes apparent to the traders. A profile of this action represents a capital P. This behavior has been named the "P" distribution, as in Peter (Steidlmayer). The P distributions show a time lag of about two hours, the time it takes the market to digest the real demand.

Market Profile Recap

Within a trading day, the natural interplay of trading forces generates a price - volume curve similar to the well known bell shape of the normal distribution. The volume per price around the middle prices far outweighs the volume per price farther away. The middle seventy percent of the volume is designated **Value** by analogy with the +/- one standard deviation of the normal curve (see figure 2). Prices at either end of the 70 percent value region define the **Value Area**. Prices outside the Value Area are increasingly less significant the further they are from the value region, with the day's highs and lows having the least volume and being least significant (ref. 5).

Longer Term Considerations, the Overlay Demand Curve (tm)

Any auction market may be, at a particular time, (1) in balance (temporary equilibrium), (2) in a trend or (3) in transition between equilibrium and trend. The trend phase breakout from a balance can often be identified in a short time, depending on the speed with which it develops. If there is a quick breakout, the change to trend is fast, e.g. overnight (the Swiss franc on 10/29, figures IDO 1 and IDO 2). An equilibrium or balanced **market condition** becomes recognizable only after it is well underway, e.g. several days after the end of a trend (see ref. 4, pg 77 for run - pause behavior in trends).

Market Profile, Multiple Days: Overlay Demand Curve

Market Profile pictures the 'day' structure of a market. It's time frame is the length of the trading day and the information it contains reflects the participant's feelings **for that time frame**. Reference points for the profile (value area, point of control, etc.) are 'local' and have an equally short term validity (of the order of a day). Carry over into the next day depends on the rate of change of the participants change in attitude. Each day is relatively independent of the former day; the coupling from day to day is normally very weak (ref. 4, pg 19). But a trader seeks information to act on and previous market activity **inevitably** has some effect. That carry-over effect is measured by consolidating several days of Market Profile, into what is

called the 'Overlay Demand Curve'.

FIVE DAYS OF MARKET PROFILES
MARKET PROFILE* REPORT FOR 03 16 01 - 03 22 01

COMMODITY -- T-BOND (CBOT) DAY JUN 01

Day ID ==>	5	6	7	8	9
Price 03 16 01	03 19 01	03 20 01	03 21 01	03 22 01	
10708					F
10707					F
10706					FIK
10705					FIKL
10704					EFIKL
10703					EFIJKL
10702					EFGHIJKL
10701					EFGHIJKL
10700					DEFGHIJKL
10631					CDEFGHJKL
10630					CDEFGHJL
10629 A					CDEGHJL
10628 AB					BCDEGHL
10627 AB					BCDEGHL
10626 ABCD				Y	BCDEGH
10625 ABCD				Y	BCEGH
10624 ABCD				YZ	BCE
10623 ABCDE				YZ	BCE
10622 ABCDE				YZ	BE
10621 ABCDE				YZ	BE
10620 zABCDE				YZ	BE
10619 zABCDE				YZ	yAB
10618 zABCDEL				zB	yzAB
10617 zABCEFL				zABCGHJ	yzAB
10616 zBCEFL				ABCGHJ	yzA
10615 zBCFL				ABCGHIJK	z
10614 zBCFGIL	y			ABCFGHIJK	z
10613 yzBFGHIL	yz	L		ABCFGHIJK	z
10612 yzFGHIJL	yzA	L		ABCEFGGHIJK	z
10611 yzFGHIJL	yzABG	L		BCEFHKL	z
10610 yzFGHIJL	yzABCG	L		BCDEFHKL	
10609 yzFGHJKL	yzABCDG	L		BCDEFKL	
10608 yzFGHJKL	yzABCDEFGHI	KL		CDEFL	
10607 yzGHJKL	ABCDEFGHJIJ	KL		CDEFL	
10606 yGJKL	BCDEFHJIJ	KL		CFL	
10605 JK	CEHIJK	KL			
10604	JK	yBJKL			
10603	KL	yzABCDEJK			
10602	KL	yzABCDEJK			
10601	KL	yzABCDEJK			
10600	L	zACDEJK			
10531	L	zEFJK			
10530	L	zEFGIJK			
10529		EFGHIJ			
10527		FGHI			
10526		I			

Figure IDO 7. Five sequential days of Market Profiles. Mar. 16 - 22, 2001.

To illustrate: The five days of figure IDO 7 appear to be trending down for three days and then trending up. There is, of course, noise and volatility included in the data. Further, each day may have it's own rumors, power plays, reports and the like. We are left with an unknown variation from day to day, even if the (real) value does not change. Each of the days appears to have a relatively well developed bell shaped curve of value. However the center of value, the maximum TPOs (POC) varies from day to day:

	POC (Point of Control)
3/16	10611
3/19	10608
3/20	10602
3/21	10612
3/22	10631

The scatter in POC averages out to 10611. The first four days average is 10608. The latest day, 3/22, seems to be out of line, a little stronger than the average deviation. We leave the question of day 5 for the moment and return to figure IDO 7. Our eye may well have fooled us. At least in the first four days our perception of trend was based on an average deviation of only about 3 points in the POC. The volatility (half-hour ranges) is easily 8 points.

The Overlay Demand Curve and Market Condition

Experience shows that successful trading with the Market Profile alone is difficult to attain. Missing is the **context** for analysis, the longer term structure of the market.

One trades differently in a trend than in a balance. But trend, balance or transition phases are often not one-day phenomena. It usually takes **several** days for a recognizable balance to develop. The same is true for the transition from a trend to a balance. Time is a factor, due to noise, volatility and changing market situations. Extending to a longer timeframe can be accomplished by collecting and assembling a series of day timeframe Market Profiles.

Since there is little day-to-day serial correlation between profiles, merely stepping from one profile to the next is too confusing, as noted in the discussion following figure IDO 7. Rather, the set of profiles must be integrated, collected in such a way that their salient characteristics are preserved with much of the noise and some of the volatility excised.

Summing several days of profiles cancels out the noise (rumors, news, etc.) that is a part of each day. The resulting **Overlay Demand Curve(tm)** turns out to contain a deeper level of information. This is similar to a tornado that, while comprised of many individual wind cells, is totally unlike any of them. **Overlays (tm)**, in the same way are more than the sum of their Market Profiles. The Overlay converts data from the day timeframe to the longer term required for understanding the over-all market behavior. An Overlay answers the question **what is the market doing** with a time specific response (e.g. the market has been in balance for the last four days, while trending up over the last 17 days). The response "balance last four days, within an overall 17 day trend" quantifies the **market's condition**. An Overlay provides, among other things, market condition, distribution limits for balanced markets, trading entry prices and provisional stop loss points. **Market condition is the starting point and foundation for all subsequent trading decisions.**

Overlays can be set at any length. A convenient grouping for futures is found to be four

periods: five, 10, 15 and 20 days. The Overlay of the five days of Market Profile of figure IDO 7 is in figure IDO 8. We define a distribution (bell) to be limited by three TPO's as an estimate of the distribution cut-off at \pm two standard deviations, the approximate 95 percent confidence level of a normal distribution. Thus, the upper limit is 10706 and the lower limit is 10528. There is a single distribution, so the market is in balance, on a 5 day basis. Insofar as the normal distribution analogy holds, a price outside the upper or lower limit is likely to be the start of a different distribution. Put another way, a breakout from an Overlay limit is an alert for a change in value. Or, a breakout from balance is an alert of a potential change of market condition from non-directional to directional (trending).

TPO VOLUME OVERLAY AND PRICE ROTATION PROFILE

JUN 01 T-BOND (CBOT) DAY

03 16 01 TO 03 22 01

PRICE	DYS	L/F	ROT	PROFILE *	TPOS	TPO	VOL	OVERLAY *
10708	1	9	9		1	X		
10707	1	9	9		1	X		
10706	1	9	9		3	XXX	<==	Upper Dist. Limit
10705	1	9	9		4	XXXX		
10704	1	9	9		5	XXXXX		
10703	1	9	9		6	XXXXXX		
10702	1	9	9		7	XXXXXXX		
10701	1	9	9		8	XXXXXXXX		
10700	1	9	9		9	XXXXXXXXX		
10631	1	9	9		10	XXXXXXXXXX		
10630	1	9	9		11	XXXXXXXXXX		
10629	2	59	59		10	XXXXXXXXXX		
10628	2	59	59		8	XXXXXXXXX	<==	Close
10627	2	59	59		7	XXXXXXX		
10626	3	59	589		9	XXXXXXXXX		
10625	3	59	589		10	XXXXXXXXXX		
10624	3	59	589		10	XXXXXXXXXX		
10623	3	59	589		9	XXXXXXXXXX		
10622	3	59	589		9	XXXXXXXXXX		
10621	3	59	589		9	XXXXXXXXXX		
10620	3	59	589		11	XXXXXXXXXX		
10619	3	59	589		11	XXXXXXXXXX		
10618	3	59	589		12	XXXXXXXXXX		
10617	3	59	589		15	XXXXXXXXXXXXXXX		
10616	3	59	589		15	XXXXXXXXXXXXXXX		
10615	3	59	589		16	XXXXXXXXXXXXXXX		
10614	4	59	5689		19	XXXXXXXXXXXXXXXXXX		
10613	5	59	56789		22	XXXXXXXXXXXXXXXXXXXX		
10612	5	59	56789		22	XXXXXXXXXXXXXXXXXXXX		
10611	5	59	56789		24	XXXXXXXXXXXXXXXXXXXX		
10610	4	5	5678		25	XXXXXXXXXXXXXXXXXXXX		
10609	4	5	5678		22	XXXXXXXXXXXXXXXXXXXX		
10608	4	5	5678		24	XXXXXXXXXXXXXXXXXXXX		
10607	4	5	5678		21	XXXXXXXXXXXXXXXXXXXX		
10606	4	5	5678		20	XXXXXXXXXXXXXXXXXXXX		
10605	3	5	567		10	XXXXXXXXXX		
10604	2		67		7	XXXXXXX		
10603	2		67		11	XXXXXXXXXX		
10602	2		67		12	XXXXXXXXXX		
10601	2		67		11	XXXXXXXXXX		
10600	2		67		10	XXXXXXXXXX		
10531	2		67		7	XXXXXXX		
10530	2		67		7	XXXXXXX		
10529	1		7		5	XXXXX		
10528	1		7		5	XXXXX	<==	Lower Dist. Limit
10527	1		7		1	X		

Figure IDO 8. Five Day Overlay Demand Curve of June 2001 T-bonds 3/16 - 3/22.

The label L/F gives the range of the earliest day (5) and the most recent day (9). The Rotation Profile (ROT PROFILE) is the range for each of the five days presented in Market Profile form. It allows the relative dates of trading to be resolved. In this case, the 9's show the latest day's trading to be near the top of the 5 day distribution.

Earlier it was noted that one effect of disequilibrium is that Auction Market Theory has an **empirical** base. That point is demonstrated in the following discussion of the Overlay of figure IDO 8. It will be seen that the tenets of AMT leads one directly to the analysis. Unraveling the details inside a particular market situation draws on both **market knowledge** and **experience**. There are many possible Overlay timeframes, for all different markets. The shortest one would use would have at least the most recent **market condition** in its entirety. This one covers five days of the U.S. T-bonds. The market may be in one of four conditions (balance, transition to trend, trend and transition to balance). Figure IDO 8 shows a balance (10706 - 10528). Further, trader activity and interest in the market may be of various kinds. Yet, the Overlay and Market Profile structures are **universal**, bringing the market forces together in a single display. The analyst's task is to read the market from AMT principles and set the strategy for the next day. The basics will all be there, but the reasons for the behavior will often come from experience and market understanding.

Observables are the raw data of Auction Market Theory. They range from prices and their behavior to constructs such as Market Profile and Overlay Demand Curves. The constructs bring value into the picture. With value in hand, theory development can proceed.

Auction Market Theory Development. The Elements.

Now that the observables and their consequences have been considered, it is time to collect and sort out the descriptors of auction markets. General information brings auction markets into focus; what they are, how they are constituted. This information is the framework for understanding the details of the theory.

Elements of Auction Markets

General

Since financial auction markets are of diverse sorts, some of these general elements are prone to change. The viewpoint here is of exchange based trading. Movement to off-exchange trading will certainly alter the effects of exchanges and members. However, nothing in the foreseeable future will change the fundamental way auction markets behave, the way prices are negotiated and the way demand affects value.

- 1) Future price levels are not predictable.
- 2) Markets display little day to day serial correlation.
- 3) Auction market: marketplace in which price is arrived at by negotiation.
- 4) Double-sided auction markets see activity by both buyers and sellers.
- 5) Auction markets are not generally equilibrium systems.
- 6) An auction market's structure is continuously evolving, being revalued.
- 7) An auction market is in one of two conditions: balancing or not balancing.
- 8) Demand fluctuates over the day timeframe.
- 9) Demand change drives price change.
- 10) Markets generate price data: ticks, open, high, low, close
- 11) Price ranges are developed by negotiation.
- 12) Some prices are accepted, some are rejected.
- 13) Market volume varies day to day.
- 14) Market range varies day to day.
- 15) Markets accumulate (balance) and distribute (trend).
- 16) Markets cycle (phases are: balance, test, trend, test, balance, etc.)

- 17) A market phase can exist for a short time (minutes) or long (days).
- 18) Market hours control aspects of trading: openings, closes, initial balance.
- 19) Heavier trading is seen on exchange opens and closes.
- 20) Auction markets are traded for short term appreciation.
- 21) Traders seek value.
- 22) Accepted prices define value.
- 23) Value is price over time. $P \times T = V \times \text{constant}$
- 24) Value based (price-time) data: Market Profile, Overlay Demand Curve.
- 25) Short timeframe trader holding period is from minutes to hours.
- 26) Longer timeframe trader holding period is days.
- 27) Longer timeframe traders move markets by accumulating positions.
- 28) Public day traders and public long timeframe traders seek trends.
- 29) Long term trending markets are controlled by long timeframe traders.
- 30) Four types of exchange members (floor, commercials, off-floor, public).
- 31) Most members seek balanced markets.
- 32) Most members are short-time frame traders.
- 33) Electronic platforms clear faster

Market Profile (MP)

Market profiles graphically display generally understood market characteristics (price - volume). A market day displays price change from demand, rumors, aborted moves and trading strategies. Market Profile displays the **structure** of the day.

- 1) Price - volume structure: a day's trading is quasi-bell shaped.
- 2) Accepted and rejected prices are displayed. Usually they are highs and lows.
- 3) The TPO is the minimum time for information to be decoded by the market.
- 4) TPOs developed because of market inefficiency in mirroring demand.
- 5) The Value Area is easily identified by it's bell shaped bulge.
- 6) The most heavily traded price is near the middle of the distribution (POC).
- 7) Volatility is measured by the average range of the half-hourly bars.
- 8) Market Profile displays market congestion.
- 9) Balancing markets are congesting.
- 10) Pausing trends are congesting.
- 11) Market Profile displays Initial Balance (first hour).
- 12) Demand change is often delineated in 'double (running)' Market Profile.

The Overlay Demand Curve identifies the phase, the market condition. The Overlay is a multi-day construct. Market profile is a day structure. It's interpretation requires a larger framework, the phase of the market. A balanced profile in a balanced market phase would be interpreted differently than the same profile within a trending market.

Overlay Demand Curve (ODC)

- 1) ODC collects day markets into longer term structures.
- 2) Demand Curve structure of ODC shows market condition, its phase.
- 3) ODC development shows continuation or change in phase.
- 4) Breakout from balance is an alert for trend.
- 5) ODC shows time evolution of a market with varying length Overlays.
- 6) Balanced markets define the distribution limits and risk.
- 7) ODC is Quasi-bell shaped, locates value region and shows price rotation.
- 8) In trending markets, ODC shows trend components including pauses.
- 9) The ODC distribution delineates expected and unexpected market behavior.
- 10) Expected/unexpected behavior leads to "if this, then that" analysis.
- 11) ODC may contain internal trends.

12) ODC balance may be skewed, indicating non-balance influences.

The Structure is Complete

Auction markets can be analyzed and understood with the **elements** posted above. These elements are the base of Auction Market Theory. Since the theory is empirical it is not falsifiable, i.e. it's validity rests upon it's utility. But markets change and new definitions may be required or old ones altered. Certainly there will be change in the exchange structure if electronic trading dominates. Or, the TPO, which is defined on a 30 minute basis, may move to another timeframe as new methods of information dissimulation develop. Such change will **not alter** the fundamental ways auction markets work.

The elements of the theory are both **descriptive and numeric**. Facts of auction market behavior are useful for qualitative decisions, e.g. increasing volume alerts the trader to other possible changes. Numeric elements are the stuff of **hard** trading decisions. Numerics are, e.g. the Market Profile value area prices, the rejected highs and lows; the Overlay Demand Curve limits and risks and the price of the pause in a trend. The numerics can lead to trading rules, e.g. buy if market price exceeds the upper limit.

Volatility

Volatility is a natural part of all auction markets. In CAPM it is the risk, arrived at statistically. AMT is slightly different. Volatility is related to the trading range; small in quiescent periods, larger in more active markets. It changes from day to day. Fluctuation grows with volume in the day timeframe. Daily trading range does give a gross estimate of market fluctuation.

A better working estimate of volatility describes activity within the day. Market Profiles are based on half-hour periods. Half-hour timeframes break down the day into manageable parts. More importantly, a half-hour appears to be the minimum average time for changes in demand to be reflected in the value (see Steidlmayer Observations, 3).

We define the (AMT) volatility as the average range of the half-hour time periods of a Market Profile. In figures IDO 9 and IDO 10, these are:

	y	z	A	B	C	D	E	F	G	H	I	J	K	L	Average
March 21	8	8	6	10	12	4	6	9	6	8	5	6	7	6	7.4
March 22	4	8	7	12	9	7	17	11	10	9	7	7	8	11	9.1

The average of the half-hour bars approximates the risk of a trade stop-out from either the long or short side. It is the 'noise' risk. If one sets a risk (stop-loss) smaller than the noise, then the probability is high that simple market fluctuation will cause trade exit. The volatility, then, becomes the minimum risk one should take on a trade.

Practically, volatility has another important use. It is a sensitive measure of market congestion. Balanced markets (congestion) have low volatility. Trending markets have larger volatilities. March 21 is clearly congesting, as observed in figure IDO 9. March 22 (figure IDO 10) is a combination trend (periods y through F) and congestion (periods G through L). The 90 day average volatility for T-bonds (as of March 13, 2002) is 8.3. Minimum is 3.9 and maximum is 15.5. Assuming about the same range in 2001, both March 21 and 22 are near the average. Large volatility increases rarely precede the start of a trend, although sometimes the general market tenor, as measured by volatility, rises prior to directional movement. Volatility is more of a coincident indicator, which helps to uncover trend end. In the table below, volatility offers a tip-off to market intentions.

UU MAR 02

DATE	OPEN	HIGH	LOW	CLOSE	BAL	VTY	ULIM	LLIM
1/28/ 2	113250	113880	112610	113550	YES	303	113900	111800

1/29/	2	113600	113825	109750	110050	NO	546		
1/30/	2	110050	111575	108075	111550	NO	775		
1/31/	2	111550	113000	111300	113050	NO	405		
2/ 1/	2	112875	113225	111850	112350	YES	350	113600	108700
2/ 4/	2	112325	112400	109100	109525	YES	471	113000	108700
2/ 5/	2	109550	110150	108225	108900	NO	614		
2/ 6/	2	108925	109450	107700	108375	NO	600		
2/ 7/	2	108625	109500	107625	107700	NO	578		
2/ 8/	2	107625	109675	107550	109650	YES	483	110300	107750
2/11/	2	109700	111275	109425	111025	NO	308		
2/12/	2	111050	111325	110250	110750	NO	337		
2/13/	2	110725	112150	110525	111875	NO	383		
2/14/	2	111900	112550	111175	111675	NO	367		
2/15/	2	111650	111800	110300	110475	YES	387	112400	109850

Table IDO-T1. S&P emini March 2002. Market demand interpretation aided by the volatility. BAL is 5 day balance as discussed in the Overlay Demand Curve section. ULIM and LLIM are the Overlay balance limits. VTY is the half-hour bar average volatility for the day.

Start with the Balance as of close Jan 28.

Jan 29, breakout on down side alerts for start of trend.

Close of Jan 29: Price lower, volatility at 546 is up 80 percent.

Interpretation: volatility implies demand is still present.

Close of Jan 30: Trend bottomed out at 108075. Closed higher.

Interpretation: short timeframe trend is over. Higher volatility is not directional and is disregarded.

Start with the Balance as of close Feb 4.

Feb 5, breakout on down side, volatility up 30 percent, price lower.

Interpretation: short timeframe trend is probably still in place.

Feb 6, price moves down slightly, volatility is only 27 percent above entry.

Interpretation: demand or trader interest is not growing.

Feb 7, price continues down, volatility is down to 22 percent above entry.

Interpretation: demand continues to decay.

Feb 8, local bottom reached at 107550, close is higher, market in balance.

Interpretation: trend is over.

Start with the Balance as of close Feb 8.

Feb 11, breakout on the upside, close at breakout price, volatility lower.

Interpretation: breakout not supported by demand increase.

Volatility is another valid way to check markets for congestion. As reference point for market condition, volatility adds to the visual measures discussed in figures IDO 6, 9, 10 and 12.

Volatility calculations are tied to the timeframe. If a different timeframe is selected (say 15 minute bars) the volatility will be unique to that timeframe. However, the only valid volatility is the one associated with the appropriate timeframe, the timeframe that best reflects the time delays inherent in the market. That timeframe is thirty minutes in the data in this report.

An Application: Day Trading T-bonds on March 23

Auction Market Strategy for March 23, Market Condition from Overlays: At the end of a trading day we are faced with the decision of how to trade tomorrow. A swing/position trader will first attend to the trades that are still on. A day trader will presumably have no current trades. For this example we assume no positions left over at the close of March 22.

Our general approach is to collect the information available on value and market condition. These data will include the latest day's behavior and at least the market of the day prior. Then we factor in what we know from the theory of markets. Lastly, we set our strategy for the next day. Both day and swing traders start their analyses at the same place--with the market condition.

Market Condition at the close of March 22 from figure IDO 8 is:

MC1) Market in 5 day balance, with limits 10706 and 10528, close 10628

MC2) Balance is skewed toward the top

MC3) Latest day trading (L/F = 9) concentrated at upper prices

From the previous 5 day Overlay of March 21 in figure IDO 13:

MC4) Market in 5 day balance, limits 10626 and 10527, close 10611

MC5) Balance is symmetrical

MC6) Latest day trading (L/F = 9) mostly above the midpoint

Conclusions from Market Condition (MC) behavior

MC7) On March 22 the balance broke out on the upside but did not hold

MC8) Price ran up to 10708 (14 ticks = \$437), then pulled back to close at 10628, a sign of weakness

MC9) At end of day, market is back in balance (is this a failed breakout?)

Market Condition Preliminary trading decisions (TD) for March 23

TD1) Swing trader will go long above 10706 or short below 10528

TD2) Risk will be around \$325, the one standard deviation level.

Recall that the market condition provides the framework within which value based trading decisions are made.

Auction Market Value Analysis (MV) for March 23 At the end of trading on March 21 the value area is 10617 to 10609. Market Profile for the day is unremarkably congesting (figure IDO 9).

MV1) Value Area 3/21: 10617 to 10609, 8 points (\$250)

LENGTH OF FIRST PERIOD = 10 MINS

MARKET PROFILE* REPORT FOR 03 21 01
AND SEGMENTED AUCTION

COMMODITY -- T-BOND (CBOT) DAY JUN 01

Price	Brackets	Segmented Auction															
10626	y	y															
10625	y	y															
10624	yz	y z															
10623	yz	>y z															
10622	yz	y>z															
10621	yz	y z															
10620	yz	y z															
10619	yz	y z>															
10618	zB	z		B													
10617	zABCGHJ	z	A>B>C>					G	H			J					
10616	ABCGHJ		A B C>					G	H			J					
10615	ABCGHIJK		A B C>					G	H	I		J	K				
10614	ABCFGHIJK		A B C>				F	G	H	I		J	K				
10613	ABCFGHIJK		A B C>				F	G	H	I		J	K				
10612	ABCEFGHIJK		A B C>	E>F>G>H>I>J>K>													
10611	BCEFGHIKL		B C>	E F>				H	I			K	L				
10610	BCDEFHKL		B C>	D E F>				H				K	L				
10609	BCDEFKL		B C>	D E F>								K	L				
10608	CDEFL		C>	D E F>									L				
10607	CDEFL		C>	D E F>									L				
10606	CFL		C>	F>									L				

TPO Analysis

CENTER 10612

VALUE AREA FROM TPOS

UPPER 10617

LOWER 10609

Figure IDO 9. Market Profile for T-bonds, March 21, 2001.

After the seven point drop in the first two periods, the market is in congestion the rest of the day.

The latest trading day, March 22, has value area of 10705 to 10625. It shows congestion, trend and then large congestion.

- MV2) Initial trading is slightly above and inside previous value
- MV3) Trend: breakout from the congestion at 10620 with a run to 10628
- MV4) Congestion for the rest of the day, a sign of trend termination
- MV5) Close of 10628 is well down into the congestion region

- Conclusions from Market Value behavior
- MV6) Value is higher on the day, but got there early (B period)
 - MV7) Market showed congestion early, during first hour or so
 - MV8) Market spent last 5 hours in congestion
 - MV9) Except for the quick run in B period this is a congesting market
 - MV10) Value at 10705 - 10625 provide support/resistance for tomorrow
 - MV11) Price nearing 10705 (upper limit = 10706) is a warning of impending breakout
 - MV12) Price below 10625 is a sign of weakness

Trading Strategy (TS) for March 23, Basis both Condition and Value: Note that all the information used is market developed. Also remember that market condition can change overnight as happened in the Swiss franc example. The trader reads the market and determines a strategy based on current conditions. Any substantial change will be obvious, requiring an upgraded analysis.

- TS1) The market is in balance. Price above 10706 is an upside breakout
Price below 10528 is a downside breakout
- TS2) Risk on breakout for the swing trader is around \$330
- TS3) Risk on breakout for the day trader is around \$160
- TS4) Early congestion followed by massive later congestion on 3/22
is indicative of a market confused about underlying demand
- TS5) A breakout tomorrow is unlikely because of the congestion picture
in the last few market hours of 3/22.
- TS6) This is a low priority market for the breakout swing trader
- TS7) If tomorrow open is still in the upper area of the Overlay, day
traders are looking to short any turndown. If prices reach
near the bottom of the Overlay, we will seek to buy bottoms.
- TS8) If the upper limit (10706) is exceeded, day traders change to looking
to buy into upturns.
- TS9) Upper Limit (10706) and upper value area (10705) are nearly
coincident. Price there is strongly bullish.
- TS10) Day traders turn bearish below 10625, seeking to short downturns.

Trading strategies TS1 through TS10 come from a direct reading of the auction market variables. Another seasoned trader may use the same data in a somewhat different way, differentiated by experience. The starting point is the same: trading on 3/22 began with an upside thrust, a breakout, and then traded down while congesting. The previous day, 3/21, ended in a much more symmetrical balance and that day's Market Profile was likewise quite normal for trading in a balance.

So 3/22 is a colossally failed breakout. Why? How soon in the day's development could a market savvy trader catch on? Congestion tells the tale. We are looking for that transition from trend to balance. We can recognize congestion graphically as in figure IDO 10. But if we know more about markets, we have a chance to do some intelligent guessing.

LENGTH OF FIRST PERIOD = 10 MINS

MARKET PROFILE* REPORT FOR 03 22 01
AND SEGMENTED AUCTION

COMMODITY -- T-BOND (CBOT) DAY JUN 01

Price	Brackets	Segmented Auction
10708	F	F
10707	F	F

10706	FIK							F		I		K	
10705	FIKL							F		I		K	L
10704	EFIKL					E	F			I		K	L
10703	EFIJKL					E	F			I	J	K	L
10702	EFGHIJKL					E	F	G	H	I	J	K	L
10701	EFGHIJKL					E	F	G	H	I	J	K	L
10700	DEFGHIJKL				D	E	F	G	H	I	J	K	L
10631	CDEFGHJKL			C	D	E	F	G	H		J	>K	>L
10630	CDEFGHJL			C	D	E	F	G	H		>J		L
10629	CDEGHJL			C	D	E		G	H		J		L
10628	BCDEGHL			B	C	D	E		G	H			L
10627	BCDEGHL			B	C	D	E		G	H			L
10626	BCDEGH			B	C	D	>E	>	>G	>H	>		
10625	BCEGH			B	C		E		G	H			
10624	BCE			B	C		E						
10623	BCE			B	C		E						
10622	BE			B			E						
10621	BE			B			E						
10620	BE			B			E						
10619	yAB	y		A	B								
10618	yzAB	>y	z	A	>B	>							
10617	yzAB	y	z	A	B								
10616	yzA	y	>z	>A									
10615	zA		z	A									
10614	zA			z	A								
10613	zA			z	A								
10612	z			z									
10611	z			z									

TPO Analysis

CENTER 10631

VALUE AREA FROM TPOS

 UPPER 10705
 LOWER 10625

Figure IDO 10. Market Profile for T-bonds, March 22, 2001.

After moving out of the y-z-A congestion the market struggled to a top in F period. From C period through the rest of the day the market is congesting.

Short Covering Rally

A common phenomena in markets is the 'short covering rally'. Conceptually, imagine that many of the local members on the floor end the day short, rather than their more usual flat. After a sleepless night, they come to work eager to exit. As professionals, they know better than to exit all at once. Each one is looking for an exit that hurts the least. Some trade immediately and some wait.

The net is that the market sees demand over the period in which the members are buying in their shorts. This period is typically an hour or two. During the time the members are net buying, public interest is aroused. The public carries the price on up until they realize demand has evaporated. But this takes time. The market is not efficient. The TPO shape of a short covering rally is that of a capital P. Price runs up, stopping past the point where the excess demand is gone. Then there is a period of backing and filling, forming the loop of the P. Look at figure SC 10 again. Do you see the P?

Now we understand the overloading toward the upper prices in the Overlay for March 22 (figure IDO 8). The upside breakout was likely driven by a short covering rally. It was merely an accident that the rally occurred near the breakout of the Overlay. Now we have evidence for the failure of the trend. No wonder the Market Profile for March 22 did not fit in with the prior four days.

Additional Market Analysis from Short Covering Data

TS11) The odds are that the Overlay tomorrow will pull back, i.e. 10708 is a local high.

TS11) Unless new upside demand enters the market, the odds are that the

Overlay tomorrow will pull back, i.e. 10708 is a local high.

TS12) Understanding the probable cause of the rise on March 22 does not substantially change our strategy for March 23. Corroboration adds confidence in the original analysis.

Buy/Sell Confirmation of the Original Premise for Short Covering

We cannot look into the minds of the floor traders. But sometimes we can see what they have done. The Chicago Board of Trade releases an end-of-day Buy/Sell report. These data list the four classes of member's volume at each price and also how much of the activity is buying and how much is selling.

The Buy/Sell Report for March 21 is in figure IDO 11. For the Locals, CTI1, it lists the buying, selling and net for each price, and totals at the bottom. Floor traders indeed ended the day selling more than they bought by over 1000 contracts (2108 sides = 1054 equivalent contracts). Yes, on the 22nd, Locals probably came to work with latent demand and an itch to get out.

Updated on March 21, 2001 at 20:56 for US 01M Traded on March 21, 2001
Net Buy and Sell/Bracket Information

Price	Volume	CTI1b	CTI1s	CTI1n	CTI2n	CTI3n	CTI4n	Half-hour Brackets Z\$ABCDEFGHIJKLM
10626	2010	53	644	-591	-35	-206	832	Z
10625	1796	516	264	252	20	98	-370	Z
10624	864	259	294	-35	5	-48	78	Z\$
10623	5834	1663	1575	88	26	278	-392	Z\$
10622	3914	1086	1143	-57	280	57	-280	Z\$
10621	4696	1776	1215	561	-70	-97	-394	Z\$
10620	6726	1974	2307	-333	66	-20	287	Z\$
10619	5198	1690	1439	251	-207	-41	-3	Z\$
10618	4188	1503	1333	170	4	-45	-129	\$B
10617	7388	2113	2736	-623	-263	322	564	\$ABCGHJ
10616	12732	3572	4117	-545	357	-166	354	ABCGHIJ
10615	24336	6729	7848	-1119	458	-155	816	ABCGHIJK
10614	22922	7033	7287	-254	345	-596	505	ABCFGHIJK
10613	23874	6659	6593	66	-404	-95	433	ABCFGHIJK
10612	13172	3902	3748	154	200	-426	72	ABCEFGHIJK
10611	15886	4586	4862	-276	-14	-62	352	BCEFGHIKLM
10610	16566	4226	5195	-969	16	-232	1185	BCDEFHKLM
10609	12748	3718	3643	75	-491	174	242	BCDEFKL
10608	16040	4379	5010	-631	163	-211	679	CDEFKL
10607	12728	4177	2897	1280	-339	355	-1296	CDEFKL
10606	1246	519	91	428	0	0	-428	CVL
Grand Total	214864	62133	64241	-2108	117	-1116	3107	

Figure IDO 11. Buy/Sell statistics for T-bonds (day), March 21, 2001. CTI1, floor traders buy (b), sell (s) and net (n) volumes at each price culminates in a net sell of 2108 sides (side = 1/2 contract). The other three classes of traders (CTI2 = Commercials, CTI3 = Off Floor Members and CTI4 = Members Trading for the Public) show the net only. Market Profile symbols are Z = 07:20 to 07:30, \$ = 07:30 to 08:00, A = 08:00 to 08:30. B = 08:30 to 09:00 and so on.

Additional Market Analysis from Buy/Sell Data

TS13) At the end of March 21 the Locals were net short 1054 contracts.

Analysis for March 22 would suggest a potential net demand from the floor traders.

Commercial Capping

Paragraph 11) mentioned commercial capping; the process where the commercial members (CTI2) sell heavily

at the top (or buy heavily at a bottom) to push price back to balance. March 22 T-bonds moved up on demand that was exhausted at the top. Did the commercials aid the price drop? In figure IDO 3 the CTI2 average volume for the day is 6.1 percent of the total. Going down the %CTI2 column we see the first two values of 14.7 and 8.7. Both are substantially larger than the 6.1. The path of price in F period (10:30 to 11:00) is down from 10708 to 10630. Indeed, it appears the commercials capped and drove price well back to the middle.

Additional Market Analysis from Commercial Capping Data

TS14) Commercial selling at the top indicates the public does not have enough buying power to keep the upward trend in place. Again, commercial data confirms analyses TS4, TS5, TS6 and TS11.

Volatility Information

In the volatility discussion above, the breakout day has a volatility of 9.1. Since the long term average is in the 8's, 9.1 is just above the average, and hence does not imply trend. In this instance, volatility merely confirms the other conclusions. Another market situation may well find volatility much more important in helping unravel the market's message.

Conclusion

Auction Market Theory shows the structure and patterns of auction markets. It provides the tools to convert price to value and value change (Market Profile) and to market condition and risk (Overlay Demand Curve). The theory deconstructs a market from it's current condition. To look inside, so to speak. In addition to value, condition and risk, one can know which prices are accepted, which rejected. It is often possible know what the members are doing. Yes, markets can be understood. One has the salient facts and these facts lead to conclusions. We call these conclusions 'strategy'. Understanding ones markets imbues us with a confidence unfamiliar to most traders. When you know, and know that you know, confidence replaces fear.

A big advantage of understanding the market and setting up a strategy based on that understanding is that if a strategy turns out to be wrong it is very quickly apparent. The swing trader will know when a breakout fails. A swing trader will also have a strong clue when a trend falls into congestion--in hours, not days. Day traders, too, will usually know when market conditions change, say from balance to trend, and so can react accordingly.

The generality of the theory makes it a starting point for much new market research. One area, just being explored, is the measurement of reward to risk ratios. An early finding is that the Dow Jones Index has a reward to risk ratio about twice that of the SP Index. Another area is categorizing markets by trading opportunity. Now that the initial development is in place, and with a theory to lean on, there is a vast arena of practical market applications waiting to be discovered.

Unfinished Business

But wait, a lot of analysis went into developing a strategy for trading on March 23. How did it work out? The trading strategy TS1 - TS14 indicated a small liklihood of any further upward activity. No new demand entered. The market of March 23 confirmed the analysis. It is a classically 'dead' market. The events of March 22 took the wind out of the trader's sails. The day market on March 23 opened at 10610 and stayed within 10 ticks of that price all day long (figure IDO 12).

LENGTH OF FIRST PERIOD = 10 MINS

MARKET PROFILE* REPORT FOR 03 23 01
AND SEGMENTED AUCTION

COMMODITY -- T-BOND (CBOT) DAY JUN 01

Price Brackets	Segmented Auction												
10615 H													H
10614 BCH				B	C								H
10613 BCFGH				B	C			F	G		H		
10612 BCFGH				B	C			F	G	H			
10611 yzABCDEFGHI	Y	z	A	B	C	D		F	G	H	I		
10610 yzABCDEFGHI	>Y	z	A	B	C	D	E	F	>G	>	>I		

10609	yzABCDEFI	y	> z	> A	> B	> C	D	E	F			I			
10608	yzABCDEFIJK	y	z	A	B	C	> D	> E	> F			I	> J	> K	>
10607	zBCDEFIJK		z		B	C	D	E	F			I	J	K	
10606	zBCDEJKL		z		B	C	D	E				J	K	L	
10605	BCDEJKL				B	C	D	E				J	K	L	
10604	BCDEJL				B	C	D	E				J		L	
10603	BDEL				B		D	E						L	
10602	DEL						D	E						L	
10601	D						D								

TPO Analysis

CENTER 10608

VALUE AREA FROM TPOS

UPPER 10611

LOWER 10605

IDO 12. Market Profile for T-bonds, March 23, 2001.

The market congested all day.

Recalling some of our analyses:

TS4) Early congestion followed by massive later congestion on 3/22

is indicative of a market confused about underlying demand

TS5) A breakout tomorrow is unlikely because of the congestion picture

in the last few hours of 3/22.

TS6) This is a low priority market for the breakout swing trader

TS11) Unless new upside demand enters the market, the odds are that the

Overlay tomorrow will pull back, i.e. 10708 is a local high.

TS12) Understanding the probable cause of the rise on March 22 does

not substantially change our strategy for March 23. Corroboration

adds confidence in the original analysis.

The Market Profile of March 23, in figure IDO 12, fits neatly into the Overlay of March 21. The breakout on March 22 is shown to be a transient, not due to any permanent change in demand or value. Thus, the trader can totally discard the action of March 22. Trading action of March 22 did not alter the value picture of the market. Trading analysis for Monday, March 26 can be based on figure IDO 13, the Overlay of March 21!

TPO VOLUME OVERLAY AND PRICE ROTATION PROFILE

JUN 01 T-BOND (CBOT) DAY

03 15 01 TO 03 21 01

PRICE	DYS	L/F	ROT	PROFILE *	TPOS	TPO VOL OVERLAY *
10629	1		6		1	X
10628	1		6		1	X
10627	1		6		1	X
10626	2	9	69		4	XXXXX
10625	2	9	69		5	XXXXXX
10624	2	9	69		6	XXXXXXX
10623	2	9	69		6	XXXXXXX
10622	2	9	69		6	XXXXXXX
10621	2	9	69		6	XXXXXXX
10620	2	9	69		9	XXXXXXXXXX
10619	2	9	69		9	XXXXXXXXXX
10618	2	9	69		10	XXXXXXXXXXX
10617	3	59	569		13	XXXXXXXXXXXXXX
10616	3	59	569		13	XXXXXXXXXXXXXX
10615	3	59	569		15	XXXXXXXXXXXXXXXXXX
10614	4	59	5679		18	XXXXXXXXXXXXXXXXXXXX
10613	5	59	56789		23	XXXXXXXXXXXXXXXXXXXXXXXXXX
10612	5	59	56789		25	XXXXXXXXXXXXXXXXXXXXXXXXXX
10611	5	59	56789		27	XXXXXXXXXXXXXXXXXXXXXXXXXX
10610	5	59	56789		30	XXXXXXXXXXXXXXXXXXXXXXXXXX
10609	5	59	56789		25	XXXXXXXXXXXXXXXXXXXXXXXXXX

10608	5	59	56789	27	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
10607	5	59	56789	24	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
10606	5	59	56789	23	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
10605	4	5	5678	15	XXXXXXXXXXXXXXXXXXXX
10604	3	5	578	12	XXXXXXXXXXXX
10603	3	5	578	18	XXXXXXXXXXXXXXXXXXXX
10602	3	5	578	19	XXXXXXXXXXXXXXXXXXXX
10601	3	5	578	19	XXXXXXXXXXXXXXXXXXXX
10600	3	5	578	18	XXXXXXXXXXXXXXXXXXXX
10531	3	5	578	13	XXXXXXXXXXXX
10530	3	5	578	13	XXXXXXXXXXXX
10529	2	5	58	11	XXXXXXXXXXXX
10528	2	5	58	11	XXXXXXXXXXXX
10527	2	5	58	4	XXXX
10526	1	5	5	2	XX
10525	1	5	5	2	XX
10524	1	5	5	1	X

Figure IDO 13. Five Day Overlay Demand Curve for June 2001 T-bonds
3/15 - 3/21.

Part 2. Reward and Trading Models

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Rewards

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Market Condition

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Transition to Balance

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Conclusion

Rewards

Gains and losses are the natural result of trading. One's **reward** is the cumulation, the sum of the trading results less the fixed costs of the endeavor. While the fixed costs are amenable to some control, by far the larger part of one's reward lies with the trading gains. This apparent fact leads most traders to concentrate on developing trading models, the second part of this section. But just jumping to model development is putting the cart before the horse. Missed in most trading research is the need to quantify what one might **expect** as a reward. Putting 'Reward' into perspective means putting one's expectations into some quantifiable form.

Any individual trade can be a winner or a loser. Experience of successful traders places the expected win ratio at 30 to 50 percent. If, in practice, one wins 50 percent of the time there is a 50 percent chance of one loser in a row, a 25 percent chance of two losers in a row and

one-tenth of one percent chance of ten losers in a row (one in a thousand). Any month with 125 trades (about six per day) will likely have a string of seven losses somewhere in the period. **If one trades regularly, a long string of losses at some point is a virtual certainty.**

When a string of losses hits, the ordinary trader begins to have doubts. Not only is the overall reward in danger but one's methodology comes into question. The entire enterprise starts to crumble.

What is the solution to the natural behavior of the laws of chance in the trading enterprise? **Reward preservation** has several facets. These are:

1. Trading should follow a **well defined** and researched model as discussed in the Trading Models section below.
2. Any market traded should be understood from the **probability of return** standpoint. Some markets offer substantial opportunity and some offer little. Opportunity is quantized as **Potential**, the maximum possible gain offered after trade entry. Risk is another factor. One desires to maximize the Potential/risk ratio. Potential and risk/reward are treated in Part 3, Standards.
3. **Diversification.** All markets traverse periods of high activity and low activity. A once high opportunity market can become one of low opportunity. Or a high opportunity market may become overheated, with the accompanying risk generating a low reward to risk ratio. Clearly, one should be aware of the opportunity/reward/risk factors of all the markets in one's trading universe. Diversification studies of spreading one's trading risk among several markets all show the benefit of such practice.

Trading Models

Trading is a **disequilibrium** market activity. Price appreciation opportunities are found only where value is changing. The most potentially profitable situations are the ones where value change is quasi-monotonic, a trend moving in a fairly straight line. Capturing appreciation requires recognition of the inception of a trend and a realization of when the trend is over. Normally, the recognition and monitoring process is incorporated into a set of trading rules, a **model**. Specification of a completely defined model removes all flexibility from the trader. On the other hand, specifying no model at all makes it difficult to proceed with a research study (and orderly trading!). Successful traders seem to follow an 'expert-systems' process where there are some rules, with the additional overrides of market knowledge as needed.

We are guided here by the 'expert' concept; defining some parameters and rules, while leaving substantial room for decision to the trader. The aim is to have as a base, a bare bones model that is simple, and yet fundamentally sound. A "plain vanilla" model, while easy to understand, still provides the unequivocal entry point needed to measure a trade's Potential.

Trading is highly personalized. Some traders have a **feel** for the market. Others seek an

organized **model** to guide their trading. These latter are in the vast majority. They can be identified as "non technical" traders since they will not, or can not develop their own models. Help is offered by the industry. A recent issue of Stocks and Commodities Magazine (July 2001) listed over 400 companies that sell trading products and data. Very few of the 400 (possibly only one) apply Auction Market Analysis. If the trader is to follow Auction Market techniques in trading, a model must be found that is driven by **value change**, not price change. Ideally, such a model can be utilized by both the non-technical and more advanced traders. Anyone who understands the rudiments of Auction Market Analysis could trade the basic model, while the more advanced traders could build on the basic model in developing their own personal methodology.

Initial Conditions

Profiting from the appreciation potential offered by changing markets requires a model that is active if value is **changing** and that gets out or stays out when value is constant and stable. The most reliable and lowest risk alert point is found when a market in balance breaks out. This is the only instance in which a change in the quasi-normal distribution can be pinpointed. Markets in which value is changing are often 'trending'. But 'trend' is a market condition that requires a time frame and 'size' in it's definition. That is, a market may be trending over the last three days, while on a longer timeframe (say 20 days) that same market is in balance. Or a market can be in a trend that is so small that the volatility hides it. The ideal trend trading model needs to be able to identify market condition, to recognize a trend start and to determine when the trend is over.

A valid model will most likely be time frame dependent. i.e. one sort of model for day trading, somewhat different rules for swing (multi-day) trading and yet another for the long timeframe (CAPM). The primary initial condition is that the market be in balance. The market selected should be one that has a recent history of offering opportunity.

Market Condition

The trending phase of the market is just one of four conditions (balance, test, trend, test, balance, etc.). The form, the procession is fixed, although a particular phase, such as transition to trend, may be very, very short to the point of non-existence. The time spent in each condition varies according to the market situation (a balance may be 3 days, 7 days or three months).

Balance

Balance is distinguished as a single price - volume distribution of the Overlay Demand Curve (Fig. 4) with the latest close inside the balance. Balance is a quasi-equilibrium state. End prices (limits) are known, i.e. alerts for end of balance or breakout from the single distribution. Value is known. Although a trend is often hard to discover, balance is easily recognizable. Risk is defined as a portion of the distribution analogous to one standard deviation (practically, a common approximation is one-eighth of the range of the balance).

Transition to Trend

A transition from balance moves the market into a dis-equilibrium market condition, one with multiple distributions. A **successful** transition results in the start of a trend, i.e. a change in value. A **failed** transition, i.e. a **false breakout**, results in trade nullification.

Trend

Trending is just price change reflecting changing demand. A trend is a quasi-orderly dis-equilibrium market condition. The path of a trend is generally not smooth, exhibiting runs and pauses. The trend's final pause marks the beginning of the transition back to balance; consolidation back into a single distribution.

Transition to Balance

This transition is from a dis-equilibrium market condition back into (short term) quasi-

equilibrium. Although the transition itself may be fast (it usually is not), several days must pass before the balance is apparent. As a balanced condition emerges, the first day or two of the new balance are hard to recognize because of volatility. After a few days, the Overlay process integrates out much of the volatility and the single distribution becomes apparent.

Trends are easier to recognize when viewed within the context of the four conditions, i.e. trend closely follows balance. Balance is easiest to define, since it is the phase where value is not changing. As balance evolves into transition, a measurable event, called **breakout**, occurs. Breakout is merely where price moves past the balance limit. This phase can more properly be called 'alert for trend', since it is a test of demand. If the breakout fails and no trend develops, market condition normally reverts back to balance. Theoretically, one might view the situation as the market breaking out and rapidly passing through transition to trend, trend and transition to balance. Or the failed breakout can be seen as simply that, an erroneous breakout that was not supported by a change in value. Either way, the net result is the same, a failed trade.

Trading Models

An assumption is that a valid trading model will be in **tune** with the market. That is, parameters developed will come from current market conditions (i.e. value), not from some predetermined measure (e.g. a ten day moving average). There are a multitude of trading models in the literature and offered by vendors. Traders want them. Most are based on 'technical analysis'. Some commercial models may be productive, but the evidence for success is scanty. A fundamental problem with 'technical models' is that they are based on fixed formulas and use price as the primary input variable.

Formula models suffer from the absence of 'expert' input. Many traders have data bases. If a formula is known, there is no limit of traders that can apply it. Traders will gravitate to the model and the **zero sum** characteristics of trading will work to minimize the gains. Adding costs makes the process **negative-sum**, and hence most will lose. Statistics on futures and equities day trading show that up to 90 percent of day traders lose.

Avoiding the pitfalls of formula trading is no mean task. In a zero-sum environment the returns are 50 percent to winners and 50 percent to losers. Costs ensure that less than half of the wager will be paid to winners. This statistic is inevitable in short term trading. To be profitable one has to somehow be in the winning group--either winning a high percentage of trades or by making one's winning trades significantly larger than ones losers, or both. Appreciation accrues only when value is changing. A competent model will be highly attuned to changing value, not necessarily changing price (see figure IDO 7 and figure IDO 8 and discussion). It is apparent that in the competition for trading return the edge goes to the trader who understands markets.

Model Evaluation

The ideal for any model evaluation is to compare it to a standard. Long term growth of the economy is reflected in market indexes. Over the longer term of ten years or so, it is possible for up to 100 percent of investors to win. Market indexes grow. CAPM portfolio returns can be measured against an index. No index exists for AMT. In the same time frame, one trader may do well while another may lose. There is no underlying index because there is no agreement on how to catalog returns in the **trading** environment. In the period of a day, a floor trader might make twenty trades, averaging 2 ticks gain per trade. A (public) day trader might make three trades, averaging 10 ticks per trade. Another day trader might make only one trade for 15 ticks. Who did better? It is hard to tell. The three are not really comparable since they took different risks.

Yet, the trading arena can be **good** (offer large opportunity for gain) or **bad** (low opportunity).

How does one know good opportunity from bad? The key is in the Potential, as developed more fully in Part 3 on Standards. In a balance, as IDO 8, one knows the range (10706 to 10528) and the Octant risk of 5 ticks. Risk derives from volatility. Further, risk and potential reward are proportional (in general). A five point risk translates to \$156. Trading for a potential \$156 reward is reasonable. If the market volatility were low and risk is 2 ticks, the potential reward is \$62. Considering costs of some \$30 and the possibility of loss as well, the average trader would decline the trade. If the trader used a particular model over a period of time, there would be a track record. With experience with the model, one could know which market conditions are **good**. But the problem remains; how would one rank this particular model against other models? Standards are needed.

One Necessary Parameter

An absolute evaluation of any day trading model can be made by defining a **single** prior condition. That condition is the **entry price**. Assume that all models enter at the same price and a trade is not allowed to extend past the exchange close. Then during the trade there is one best point to exit. The only problem is locating the entry.

Finding Trade Entry

Specifying trade entry can be accomplished many ways. We will explore and choose a tested Auction Market methodology using the balanced Overlays. As before, we specify a breakout from the balance to be an **alert** for trend start. In this case that breakout price becomes the entry. No trading rules are defined for the initial risk, the management of the trade throughout the day or for the exit. A trader will make all the management decisions. Obviously, different traders will make different decisions within the rules. The **standard** for this trade is simply the point of highest open trade equity during the period from entry to close. This standard is called the **Potential**. To paraphrase, once trade entry is attained the Potential becomes fixed, but appreciation from trading is not.

A Standard Model for Auction Markets

Requirements of a 'standard' model are 1) information on the balanced markets within a set of all markets in the defined arena (futures, securities, etc.), and the posted breakout price (s) from the balance. Possibly many models meet these requirements. We will discuss one that has been published, one that has been used by many traders as a starting point in learning Auction Market Analysis. This is the **Basic Model** in the **Trader Control Package (TCP)** of CISCO Futures (ref. 6). Requirement 1) is met by a list of balanced markets for the day: two such sources are the **Bracket Screen** and the **Advice Engine Report**, both CISCO products. Both lists are essentially just compilations of Overlay parameters.

The Basic Model

The Basic model is included in the CISCO training course. A training tool, Basic Model comes in several varieties; for day trading, swing trading and for responsive trading of balanced markets (non-breakouts). Rules for the most elementary form of the breakout day trading Basic Model are:

- (1) limit trading to balanced markets only
- (2) go long on a breakout of 1 tick above the Upper Limit
- (3) go short on a breakout of 1 tick below the Lower Limit
- (4) use a trailing stop of one Octant
- (5) if not stopped out during the day, exit on the exchange close.

Only item (4) violates the freedom of action post entry discussed in **Model Evaluation**. A stop-loss risk limit in the courses is a pedagogical tool for teaching risk control. For the purposes of this discussion, item (4) is not necessary. Practically, item (4) is useful as a starting point in many research studies, since the risk is tied to the value range.

Conclusion

Part 2 presents a simple model with rules that are easy to implement. With the unambiguous entry provided, Potential can be found for a wide variety of markets. The next section on 'Standards of Comparison', will turn to the development of trading efficiency measurement using the Potential found with the Basic Model.

Part 3. Standards of Comparison

Contents

Standards

Trade Identification. Advice Engine Report

Experimental Standard

Potential

Models

Locating 'Best Trading Risk'

Figure IDO 14. Advice Engine Report June 13, 2001

Figure IDO 15. Select Table June 1 to June 15, 2001

Reward to Risk Ratio

Figure IDO 16. SP Reward/Risk Study November 6, 2000 to June 26, 2001

Standards

Non-equilibrium day-trading for appreciation is much less organized than long term investing where returns can be compared to average market movements (indexes). Day trading seeks out short term opportunities. There is no over-all order in the short term, no index for comparison. An absolute test, the test of ruin, does exist. But what of the trader who is successful at least part of the time? How is that success rated? Could that trader have done better? If so, how much better? There are two aspects to the rating question for traders. First, **how well does the trader locate opportunity?** Second, **once opportunity is found, how well is it handled?** Both questions can be answered within the context of Auction Market Theory (AMT). Question one has a solution in the **Advice Engine Report** discussed in this section, that is, Advice Engine locates trading opportunities. The answer to question two hinges on the **Potential**. Potential permits comparisons: how well did Basic Model do compared to the Potential? How well did a trader's model compare? Now the researcher can have an **absolute** to measure models and performance against.

Trade Identification. Advice Engine Report

Short term breakout trading success comes from finding trends. Locating a trend in progress and trading it is a high risk process. Trends are of uncertain length and vary in intensity. Their price - volume distribution is changing and thus is hard to catalog. Risk is uncertain, but the increased volatility accompanying a trend insures high risk. Lower risk trading opportunities are better found in the pre-breakout market. For futures, one source of trading candidates is found in the Advice Engine Report. Essentially the same approach can be used in equities and other auction markets.

A balanced market contains the **distribution value based market parameters** that identifies breakout prices prior to breakout. Risk is lower because 1) market condition is in equilibrium so the distribution is stable and 2) volatility is low. A breakout is a high probability, low risk precursor of the start of a trend. When a trend does not develop from a breakout, the loss is limited to the low risk of the balanced quasi-equilibrium distribution, not the high risk of

a trending, thoroughly non-equilibrium distribution. When a trend does develop, the trade offers the advantage of early entry. The trade is then well positioned to take advantage of the appreciation offered by the market.

Experimental Standard

Measuring the effectiveness of a trading procedure or model is more complicated. The market situation in which the model operates is not in equilibrium. This makes finding a closed mathematical solution of the optimum unlikely. The trading function is different for each trader and is fundamentally unknowable in general. Yet, an experimental **standard** can be developed. The primary condition is only that a trade be initiated at the breakout point defined by AMT. Other subsidiary conditions relating to time can be applied for special cases, but for the basic standard for day trading, we specify that all trades not otherwise closed out will be terminated at the close of exchange trading for the day. Conditions, then, are two: enter on the AMT breakout, exit no later than the close for the day. No information is needed on the explicit model followed by the trader.

Potential

A trade can be either profitable or unprofitable. The best possible result comes when the trade is not stopped out but exits on a close that is the highest post entry price (if a long trade) or the lowest post entry price (if a short trade). Normally, the best open-trade price occurs not at the close, but at some intermediate time after initiating the trade. The best open-trade price is the **Potential** of that trade. Potential is always positive or zero, while the actual trade may win or lose.

Potential measures a trade's maximum possible return. **Potential** plays a role akin to the index in CAPM. It is a quantity against which the trade's performance can be measured. Unlike the index - portfolio comparison, the trade return - Potential ratio cannot be greater than 1. That is, the return on a trade cannot exceed the potential. Further, a portfolio may decrease in value, but still be considered successful if it beats the index. The return - Potential comparison is absolute. Potential never 'loses', it can not go below zero (before costs). But the trade can lose. A losing collection of trades (portfolio) is just a loser. There are no mitigating circumstances of the sort in CAPM.

The absolute nature of **Potential** makes it the 'ideal' measure, within the limitations of the initial condition of the model (entry price). Turning things around, the **Potential** is a measure of the effectiveness of the selection process. **Potential** also qualifies the trading model. Markets are qualified by their potential too, some offering a lot, some a little. Over time, some high potential markets abate, some low ones improve. Potential measures the performance of a model, evaluates a market's tradeability and provides a check on selection processes such as Advice Engine.

Models

The section on **Reward and Trading Models** explains the **Basic Model** and its source for entry prices, the Advice Engine. Here, we are concerned with **ratings**. The Return/Potential ratio of a model is a consequence of the trading process. AMT is a guide to appreciation through trading. There are an unlimited number of possible trading models. AMT is a guide for **value based** models. The Basic Model of AMT is experimentally proven. It is simple and can be understood by non-technical traders. The data base used by the Basic Model is just that set of Overlay Demand Curves developed daily from the Market Profile. These data have been in use by public traders for many years (ref. 4). However, the Basic Model is merely a convenience. Any other model would do as well for tests, so long as it meets the initial condition of entry on breakout (or other defined price).

Locating 'Best Trading Risk'

Assume that one is using the **Basic Model** under the conditions of entry and risk earlier specified. Trading in the non-equilibrium arena is a short timeframe, highly risky venture. Initial risk is the 'Octant' (1/8 of the price range of the Overlay Demand Curve). Breakouts from an Overlay mark the transition from quasi-equilibrium to disequilibrium. The disequilibrium phase is the source of appreciation and is accompanied by considerable risk. The best risk may be the 'Octant' or it may be some other value entirely. An important measure for the trader is the reward to risk ratio (R/R). Of course, trading return alone is important, but the R/R is more basic to account viability. A poor R/R increases the risk of ruin because one is risking relatively more for the same return.

Auction Market Theory based procedures are used to develop the Advice Engine Report daily.

Advice Engine Report (tm) Trading With Low Risk

Advice Engine (tm) Opportunities: At close of JUN 13 01

Advice Engine (tm) surveys the entire futures market for potential trades.
Each future is analyzed within 5, 10, 15 and 20 day time frames.
Entry prices and risk levels are posted for each future, each period.
Suggested Risk is a safety net, identifying losing trades very quickly.

Traders can use the Advice Engine (tm) in many ways.
Breakout entries and risk stops can be traded directly.
Shorter time frames can be used as "alerts" for longer time frames.
Counter-trend (responsive) trades can be keyed off "failed trend" trades.
Breakout price and risk can confirm/modify other trading models.

	Mo	Yr	ND	Long	StopL	Short	StopS	Risk \$	Risk Pts	VaU	POC	VaL
CC	7	01	5	5900	5873	5690	5717	99	27	5830	5790	5770
CC	7	01	10	6000	5962	5700	5738	141	38	5830	5790	5770
CC	7	01	15	6040	5997	5700	5743	160	43	5830	5790	5770
CC	9	01	5	6190	6165	5990	6015	94	25	6130	6080	6075
CC	9	01	10	6290	6252	5990	6028	141	38	6130	6080	6075
CC	9	01	15	6325	6284	6000	6041	153	41	6130	6080	6075
CO	7	01	5	947	941	903	909	55	6	935	928	927
CO	7	01	10	968	960	904	912	80	8	935	928	927
CO	7	01	15	974	967	924	931	63	7	935	928	927
CO	9	01	5	942	937	906	911	45	5	939	934	931
CO	9	01	10	966	958	906	914	75	8	939	934	931
DJ	9	01	5	110850	110637	109150	109363	213	213	110650	110300	110090
DJ	9	01	10	112350	111950	109150	109550	400	400	110650	110300	110090
DJ	9	01	15	111800	111481	109250	109569	319	319	110650	110300	110090
EC	6	01	5	85500	85368	84450	84582	164	132	85430	85260	85120
EC	6	01	10	86050	85850	84450	84650	250	200	85430	85260	85120
EC	9	01	5	85400	85275	84400	84525	157	125	85300	85130	85020
EC	9	01	10	85400	85262	84300	84438	172	138	85300	85130	85020
ED	6	01	5	9611	9610	9604	9605	22	1	9612	9611	9610
ED	6	01	10	9611	9609	9597	9599	44	2	9612	9611	9610
QL	7	01	5	9080	9035	8720	8765	189	45	8850	8830	8770
QL	7	01	10	9500	9400	8700	8800	420	100	8850	8830	8770
QL	8	01	5	8870	8833	8580	8617	153	37	8730	8695	8675
QL	8	01	10	9070	8998	8500	8572	300	72	8730	8695	8675

S	7	01	5	4750	4730	4590	4610	100	16	4744	4732	4724
S	7	01	10	4750	4716	4490	4522	163	26	4744	4732	4724
S	8	01	5	4700	4680	4540	4560	100	16	4690	4684	4672
S	8	01	10	4700	4665	4434	4467	166	27	4690	4684	4672
S	11	01	5	4580	4560	4424	4444	97	16	4570	4562	4544
S	11	01	10	4580	4550	4340	4370	150	24	4570	4562	4544
SF	6	01	5	5622	5615	5566	5573	88	7	5595	5583	5576
SF	6	01	10	5640	5629	5558	5569	129	11	5595	5583	5576
SF	9	01	5	5616	5610	5574	5580	66	6	5603	5592	5586
SF	9	01	10	5616	5610	5574	5580	66	6	5603	5592	5586
SM	7	01	5	1730	1723	1676	1683	68	7	1727	1723	1720
SM	7	01	10	1730	1723	1676	1683	68	7	1727	1723	1720
SM	8	01	5	1686	1679	1633	1640	67	7	1684	1681	1676
SM	8	01	10	1686	1675	1604	1615	103	11	1684	1681	1676
SM	8	01	15	1684	1670	1574	1588	138	14	1684	1681	1676
SM	8	01	20	1684	1667	1552	1569	165	17	1684	1681	1676
SM	9	01	5	1634	1627	1578	1585	70	7	1635	1631	1625
SM	9	01	10	1634	1628	1588	1594	58	6	1635	1631	1625
SP	9	01	5	128700	128200	124700	125200	1250	500	126910	126360	125910
SP	9	01	10	129200	128637	124700	125263	1407	563	126910	126360	125910
SU	7	01	5	873	870	849	852	34	3	865	862	861
SU	7	01	10	875	870	840	845	49	5	865	862	861
SU	7	01	15	878	873	844	849	48	5	865	862	861
SU	10	01	5	859	855	833	837	37	4	852	849	848
SU	10	01	10	860	855	822	827	54	5	852	849	848
SU	10	01	15	860	855	824	829	51	5	852	849	848
SU	10	01	20	894	885	824	833	98	9	852	849	848
TX	6	01	5	11980	11968	11890	11902	57	12	11918	11910	11895
TX	6	01	10	11980	11966	11870	11884	69	14	11918	11910	11895
TX	9	01	5	12010	11998	11920	11932	57	12	11945	11937	11927
TX	9	01	10	12010	11996	11905	11919	66	14	11945	11937	11927
U2	6	01	5	10204	10131	10028	10101	157	5	10200	10126	10121
U2	6	01	10	10204	10131	10028	10101	157	5	10200	10126	10121
U2	9	01	5	10115	10110	10007	10012	157	5	10110	10106	10031
U2	9	01	10	10114	10109	10008	10013	149	5	10110	10106	10031
UU	9	01	5	128700	128200	124700	125200	250	500	126875	126650	125875
UU	9	01	10	129300	128725	124700	125275	288	575	126875	126650	125875
Todays Select Trades 010613												
SP	9	01	10	129200	128637	124700	125263	1407	563	126910	126360	125910
DJ	9	01	10	112350	111950	109150	109550	400	400	110650	110300	110090
QL	7	01	10	9500	9400	8700	8800	420	100	8850	8830	8770
QL	8	01	10	9070	8998	8500	8572	300	72	8730	8695	8675
EC	6	01	10	86050	85850	84450	84650	250	200	85430	85260	85120

Legend: Mo and Yr are the delivery, ND is the days in the Overlays,
 Long signifies Buy at or above the listed price, StopL is
 the stop-loss price.
 Short means Sell at or below the listed price; StopS is its
 stop-loss. Risk \$ is the stop-loss in dollars; Risk Pts is
 in trading points. VaU, POC and VaL are the Market Profile
 Value Area and Point of Control. Todays Select Trades are
 chosen from the best reward to risk ratios.

Figure IDO 14. Advice Engine Report (Part 1) at close June 13, 2001 for trading June 14. Items in the Todays Select Trades 010613 are selected from the entire list on the basis of an proprietary algorithm. Select items appear in the Select Table in Figure IDO 15 below. Advice Engine Report is a product of CISCO Futures.

The **Advice Engine Report** is a menu for the day trader. It locates potential trades. Select Trades Table is a subset of the Report. It is a compilation of those trades deemed to offer the best opportunities based on a proprietary algorithm. This table, updated daily, is carried live on the CISCO web page (Ref. 9). A Select Table entry that trades (breaks out) lists the Potential. The items that traded provide a data base for additional research. Initially, the table can help answer the first **standards** question, "is Auction Market Theory an efficient trade locator"? Peruse the Select Trades Table. Remember **Potential** is tabulated in trading fractions. Since there are no absolute standards, the reader must judge if the AMT methodology is worthwhile.

Conversion Table \$ multiplier

CC	Coffee	3.75
CL	Crude Oil	10.00
DJ	Dow Index	1.00
EC	Euro	1.25
HO	Heating Oil	4.20
JY	Yen	12.50
ND	Nasdaq Index	1.00
NK	Nikkei Index	0.50
NY	Cotton	5.00
QL	Unleaded Gas	4.20
SP	S&P Index	2.50
U2	T-Bonds	31.25

The Select Trades Table is a compilation of the Select Trades from the Advice Engine Report. Added is the **Potential** information on those that broke out the following day. Figure IDO 15. is a representative sample of the Select Trades Table, built daily from the Advice Engine Report.

Select Trades: Close of 010611 Tde dte = 010612

	Mo	Yr	ND	Long	StopL	Short	StopS	Risk \$	RiskPt	Potential
QL	7	01	10	9640	9527	8740	8853	473	113	294S
QL	8	01	10	9120	9042	8500	8578	326	78	
SP	6	01	10	128300	127875	124900	125325	1063	425	3375S
SP	9	01	10	129200	128787	125900	126313	1032	413	3450S

Select Trades: Close of 010612 Tde dte = 010613

	Mo	Yr	ND	Long	StopL	Short	StopS	Risk \$	RiskPt	Potential
QL	7	01	10	9560	9457	8740	8843	431	103	126S
QL	8	01	10	9080	9007	8500	8573	305	73	
SP	6	01	10	128300	127862	124800	125238	1094	438	1625S
SP	9	01	10	129200	128775	125800	126225	1063	425	1800S

Select Trades: Close of 010613 Tde dte = 010614

	Mo	Yr	ND	Long	StopL	Short	StopS	Risk \$	RiskPt	Potential
DJ	9	01	10	112350	111950	109150	109550	400	400	2050S
EC	6	01	10	86050	85850	84450	84650	250	200	350L
QL	7	01	10	9500	9400	8700	8800	420	100	504S
QL	8	01	10	9070	8998	8500	8572	300	72	
SP	9	01	10	129200	128637	124700	125263	1407	563	6250S

Select Trades: Close of 010614 Tde dte = 010615

	Mo	Yr	ND	Long	StopL	Short	StopS	Risk \$	RiskPt	Potential
QL	7	01	10	9100	9043	8650	8707	237	57	126S
QL	8	01	10	9070	8998	8500	8572	300	72	

Figure IDO 15. Select Table for several days of June 2001. Selections that traded have Potential listed in trading fractions (QL Jul 01 on June 15 Potential is 126, or \$529).

Reward to Risk Ratio

Any of the trade possibilities in the report can be used for R/R studies. Select Trades data are archived and are a convenient source of data. Risk for a trading instrument varies on a daily basis. That is a measurable. Reward is a function of trading technique, trading decisions and the underlying market. While one's gains are critical, their wide variability from trade to trade make them difficult to evaluate. A composite measure like the reward to risk ratio (R/R) is much more stable. Other factors excluded, one seeks to maximize the reward to risk ratio in order to optimumly utilize the trading account funding. This can be done on the basis of Octant risk to Potential or Octant risk to return from the Basic Model. In the following we illustrate the process by measuring R/R on basis of return.

Figure IDO 15 is a short portion of the **Select Table**. The entire table is on the CISCO website (ref. 6). An example of a study on the SP Index is in Figure IDO 16. The trading model is the Basic Model using the Overlay limits for entry. Risk equals the Octant on entry, trailing as the price moves with the trade, but not regressing when price moves counter to the trade.

Returns vary in their response to changing the risk. Typically, an increase in risk cuts down on the number of losses while increasing the size of losses. The Dow Jones Index return is fairly stable with increasing risk. The S&P Index is not. A table of this variation using the 23 breakout trades from November 2000 through June 2001 shows a consistent decrease of R/R with increasing risk. In the worst case listed, a risk of 1.8 times an Octant, one risks \$3230 (1292 x 2.5) to gain \$550 (220 x 2.5). The best case at only 20 percent of an Octant, one only risks \$358 to gain \$1085. While these variations are startling, the real value of these calculations lies in the the change over time. A look at the one Octant risks in Figure IDO 16 shows a decided easing over the eight months of data. The risk is lessening and a trader would know to choose lower risks, rather than higher in the current market atmosphere.

S&P Reward to Risk Ratio: November 6, 2000 to June 26, 2001

% of One Octant	Av Gain	Av Risk	R/R	Wins	Losses
20	434	143	3.03	11	12
40	317	287	1.10	13	10
50	361	359	1.01	14	9
60	300	430	0.70	14	9
80	305	574	0.53	14	9
*100	309	718	0.43	15	8
120	317	861	0.37	17	6
140	241	1005	0.24	16	7
150	322	1076	0.30	17	6
160	288	1148	0.25	17	6
180	220	1292	0.17	16	7

The table below, Figure IDO 16, is a trade-by-trade listing of the data used in the 100 percent Octant line above. Two additional tables for fifty percent and 150 percent are in Figures IDO 17 and IDO 13.


```

% of Basic Model Octant Stop 100
SP 0012 001106 R=1150 IN= 144420( 945) OUT= 143750 GAIN= -670 SUM= -670
SP 0012 001108 R= 400 IN= 141400(1502) OUT= 141350 GAIN= 50 SUM= -620
SP 0012 001122 R= 913 IN= 133670( 624) OUT= 134583 GAIN= -913 SUM= -1533
SP 0012 001130 R= 925 IN= 132600(1551) OUT= 130625 GAIN= 1975 SUM= 442
SP 0012 001205 R= 800 IN= 136700(1014) OUT= 137400 GAIN= 700 SUM= 1142
SP 0103 001213 R= 600 IN= 140930(2303) OUT= 140350 GAIN= -580 SUM= 562
SP 0103 010119 R= 925 IN= 136540(1936) OUT= 136255 GAIN= -285 SUM= 277
SP 0103 010123 R= 925 IN= 136550(1309) OUT= 136600 GAIN= 50 SUM= 327
SP 0103 010130 R= 988 IN= 137630(1236) OUT= 138250 GAIN= 620 SUM= 947
SP 0103 010202 R= 750 IN= 138420(1830) OUT= 137750 GAIN= -670 SUM= 277
SP 0103 010208 R= 525 IN= 134150(1316) OUT= 134675 GAIN= -525 SUM= -248
SP 0103 010214 R= 800 IN= 131900( 844) OUT= 131650 GAIN= 250 SUM= 2
SP 0103 010216 R= 900 IN= 131160( 802) OUT= 130550 GAIN= 610 SUM= 612
SP 0103 010220 R=1000 IN= 130250(1629) OUT= 128550 GAIN= 1700 SUM= 2312
SP 0106 010403 R= 900 IN= 111850(1326) OUT= 111210 GAIN= 640 SUM= 2952
SP 0106 010427 R= 538 IN= 125750(1446) OUT= 125900 GAIN= 150 SUM= 3102
SP 0106 010501 R= 588 IN= 126200(1310) OUT= 126872 GAIN= 672 SUM= 3774
SP 0106 010511 R= 400 IN= 124460(1407) OUT= 124780 GAIN= -320 SUM= 3454
SP 0106 010516 R= 413 IN= 124200( 646) OUT= 124613 GAIN= -413 SUM= 3041
SP 0109 010612 R= 413 IN= 125860( 722) OUT= 124933 GAIN= 927 SUM= 3968
SP 0109 010613 R= 425 IN= 125770(1317) OUT= 125325 GAIN= 445 SUM= 4413
SP 0109 010614 R= 563 IN= 124650( 808) OUT= 122500 GAIN= 2150 SUM= 6563
SP 0109 010626 R= 675 IN= 121580( 556) OUT= 121025 GAIN= 555 SUM= 7118
Number Trades= 23 GAIN= 7118 AVG= 309 AVG-RISK= 718 RW/RSK= 0.43
WINS-TRADES 11494/ 15 LOSS-TRADES -4376/ 8

```

Figure IDO 16. All SP Select Table trades from November 2000 through June 2001 (23 in all). Risk is the Octant posted in the Advice Engine Report.

The case in Figure IDO 16 uses an unaltered Octant stop.

Average reward is 309 (\$772) and average risk is 718 (\$1795). R/R is 0.43

The next drawdown table runs through the same calculation, reducing the risk by one-half.

```

% of Basic Model Octant Stop 50
SP 0012 001106 R= 575 IN= 144420( 945) OUT= 144325 GAIN= -95 SUM= -95
SP 0012 001108 R= 200 IN= 141400(1502) OUT= 141350 GAIN= 50 SUM= -45
SP 0012 001122 R= 457 IN= 133670( 624) OUT= 134127 GAIN= -457 SUM= -502
SP 0012 001130 R= 463 IN= 132600(1551) OUT= 133063 GAIN= -463 SUM= -965
SP 0012 001205 R= 400 IN= 136700(1014) OUT= 137800 GAIN= 1100 SUM= 135
SP 0103 001213 R= 300 IN= 140930(2303) OUT= 140650 GAIN= -280 SUM= -145
SP 0103 010119 R= 463 IN= 136540(1936) OUT= 136717 GAIN= 177 SUM= 32
SP 0103 010123 R= 463 IN= 136550(1309) OUT= 136837 GAIN= 287 SUM= 319
SP 0103 010130 R= 494 IN= 137630(1236) OUT= 138250 GAIN= 620 SUM= 939
SP 0103 010202 R= 375 IN= 138420(1830) OUT= 138125 GAIN= -295 SUM= 644
SP 0103 010208 R= 263 IN= 134150(1316) OUT= 134413 GAIN= -263 SUM= 381
SP 0103 010214 R= 400 IN= 131900( 844) OUT= 131250 GAIN= 650 SUM= 1031
SP 0103 010216 R= 450 IN= 131160( 802) OUT= 130100 GAIN= 1060 SUM= 2091
SP 0103 010220 R= 500 IN= 130250(1629) OUT= 130750 GAIN= -500 SUM= 1591
SP 0106 010403 R= 450 IN= 111850(1326) OUT= 110760 GAIN= 1090 SUM= 2681
SP 0106 010427 R= 269 IN= 125750(1446) OUT= 125900 GAIN= 150 SUM= 2831
SP 0106 010501 R= 294 IN= 126200(1310) OUT= 127166 GAIN= 966 SUM= 3797
SP 0106 010511 R= 200 IN= 124460(1407) OUT= 124580 GAIN= -120 SUM= 3677
SP 0106 010516 R= 207 IN= 124200( 646) OUT= 124407 GAIN= -207 SUM= 3470
SP 0109 010612 R= 207 IN= 125860( 722) OUT= 124727 GAIN= 1133 SUM= 4603
SP 0109 010613 R= 213 IN= 125770(1317) OUT= 125113 GAIN= 657 SUM= 5260
SP 0109 010614 R= 282 IN= 124650( 808) OUT= 122482 GAIN= 2168 SUM= 7428
SP 0109 010626 R= 338 IN= 121580( 556) OUT= 120688 GAIN= 892 SUM= 8320
Number Trades= 23 GAIN= 8320 AVG= 361 AVG-RISK= 359 RW/RSK= 1.01
WINS-TRADES 11000/ 14 LOSS-TRADES -2680/ 9

```

Figure IDO 17. All SP Select Table trades from November 2000 through June 2001 (23 in all). Risk is the Octant x 0.5 as posted in the Advice Engine Report.

The run in Figure IDO 17 uses one-half the standard Octant stop.

Average reward is 361 (\$902) and average risk is 359 (\$898). R/R is 1.01
Cutting down the risk by half improves the R/R by a factor of 2 over the
normal one Octant risk.

Now compare a bigger risk, 1.5 Octants.

% of Basic Model	Octant	Stop	150								
SP 0012	001106	R=1725	IN= 144420(945)	OUT= 144650	GAIN=	230	SUM=	230			
SP 0012	001108	R= 600	IN= 141400(1502)	OUT= 141350	GAIN=	50	SUM=	280			
SP 0012	001122	R=1369	IN= 133670(624)	OUT= 132300	GAIN=	1370	SUM=	1650			
SP 0012	001130	R=1387	IN= 132600(1551)	OUT= 131087	GAIN=	1513	SUM=	3163			
SP 0012	001205	R=1200	IN= 136700(1014)	OUT= 137300	GAIN=	600	SUM=	3763			
SP 0103	001213	R= 900	IN= 140930(2303)	OUT= 140050	GAIN=	-880	SUM=	2883			
SP 0103	010119	R=1387	IN= 136540(1936)	OUT= 135793	GAIN=	-747	SUM=	2136			
SP 0103	010123	R=1387	IN= 136550(1309)	OUT= 136600	GAIN=	50	SUM=	2186			
SP 0103	010130	R=1482	IN= 137630(1236)	OUT= 138250	GAIN=	620	SUM=	2806			
SP 0103	010202	R=1125	IN= 138420(1830)	OUT= 137375	GAIN=	-1045	SUM=	1761			
SP 0103	010208	R= 787	IN= 134150(1316)	OUT= 133500	GAIN=	650	SUM=	2411			
SP 0103	010214	R=1200	IN= 131900(844)	OUT= 132050	GAIN=	-150	SUM=	2261			
SP 0103	010216	R=1350	IN= 131160(802)	OUT= 130600	GAIN=	560	SUM=	2821			
SP 0103	010220	R=1500	IN= 130250(1629)	OUT= 128550	GAIN=	1700	SUM=	4521			
SP 0106	010403	R=1350	IN= 111850(1326)	OUT= 111660	GAIN=	190	SUM=	4711			
SP 0106	010427	R= 807	IN= 125750(1446)	OUT= 125900	GAIN=	150	SUM=	4861			
SP 0106	010501	R= 882	IN= 126200(1310)	OUT= 126578	GAIN=	378	SUM=	5239			
SP 0106	010511	R= 600	IN= 124460(1407)	OUT= 124980	GAIN=	-520	SUM=	4719			
SP 0106	010516	R= 619	IN= 124200(646)	OUT= 124819	GAIN=	-619	SUM=	4100			
SP 0109	010612	R= 619	IN= 125860(722)	OUT= 125139	GAIN=	721	SUM=	4821			
SP 0109	010613	R= 637	IN= 125770(1317)	OUT= 125537	GAIN=	233	SUM=	5054			
SP 0109	010614	R= 844	IN= 124650(808)	OUT= 122500	GAIN=	2150	SUM=	7204			
SP 0109	010626	R=1012	IN= 121580(556)	OUT= 121362	GAIN=	218	SUM=	7422			
Number Trades=		23	GAIN= 7422	AVG= 322	AVG-RISK= 1076	RW/RSK= 0.30					
WINS-TRADES		11383/	17	LOSS-TRADES	-3961/	6					

Figure IDO 13. All SP Select Table trades from November 2000 through June 2001 (23 in all). Risk is the Octant x 1.5 as posted in the Advice Engine Report.

The run in Figure IDO 13 uses one and one-half the standard Octant stop. Average reward is 322 (\$805) and average risk is 1076 (\$2690). R/R is 0.30 Increasing the risk by half decreases the R/R by a factor of 50 percent over the normal one Octant risk.

The higher risk cut down the number of losses (6 out of 23) compared to the one Octant case (8 out of 23). This is expected. One can set the risk so high that all the trades are held at the close. At that stop level, the phrase 'protective stop' has no meaning.

Application: A Short Covering Rally

Auction Market Theory provides the **framework** within which to analyze **specific** market situations. In Part 1, "Application of Day Trading T-bonds on March 23" we opened the book on the T-bond market at the close of 3/22. Examination of the recent five Market Profiles indicated the latest day in figure IDO 7 did not fit in too well with the earlier ones. The Overlay Demand Curve showed balance, but with an exceptionally large amount of trading near the top. The question for the trader is "how do I treat tomorrow's market", i.e. the market of 3/23.

To **better define** the situation as of the close of 3/22, we back up to the Overlay of the previous day, 3/21. The 3/21 Market (figure IDO 13, day 9 in the L/F column) opened higher than the day before, day 8, and then traded down. It had a well developed bell shape. It tells us that any ideas of strength early in the day dissipated within the day. Likewise the five day Overlay was well balanced, with nothing unusual. We have the limits for that Overlay--a sort of support/resistance for a **balanced** market, at 10626 and 10527.

What happened on 3/22?

The high is 10708, low is 10611. There was an **upside breakout** from the previous day Overlay (10627) late in period A. We will not comment on trading within the day, our stated goal is to learn enough about the market to determine what to do on 3/23.

Now we understand the tilt, the overloading of value toward the upper part of figure IDO 8. There had been an **upside breakout** on 3/22 at 10627, with price reaching 10708 and closing at 10628. The heavy trading in the 10703 to 10626 area filled in the Overlay, maintaining a single distribution, but with an extended upper limit (10626 to 10706). This action confirms our suspicions about the Market Profile of 3/22 not fitting in with the previous four days. In fact, this day was a breakout first (a trend alert) and then **congestion** near the top of the Overlay.

Short Covering

Given the previous and current Overlays and the Market Profile of 3/22, a knowledgeable market analyst would suspect that 3/22 might be a **short covering rally**. Such a rally occurs when a significant number of short term (day) traders end the previous day (3/21) short. These shorts must be **bought in** the next day. Buying in looks like a normal increase in demand and price moves up to accomodate the demand. However, once the shorts are covered the demand evaporates. **It takes the market some time to recognize the change.** In profile format, a short covering rally looks like the letter P. Price runs up from the bottom of the P and then congests, forming the rounded upper part. Price then begins to ease as the other traders recognize the lowered demand. Day structure for 3/21 is in figure IDO 7, where the 'P' configuration is quite apparent. Short covering rallies and long liquidations ('b' configuration) are a regular occurrence. The time delays in developing the fat part of the P's and b's doubtless come from inefficiencies in the information process. After a while, maybe two hours, the players are all back on the same page.

Trading Strategy for Tomorrow Based on Auction Market Theory

At the end of Part 1, a trading strategy for 3/23 was developed from strictly the 'numerics', from Auction Market principles. It was noted that there are descriptive elements in market understanding as well. Experience helps! The analyst who looked at the evidence in Part 1 would have come to the same conclusion as a second analyst who had experience with short covering rallies. The second analyst would have a deeper understanding of the structure of the Overlay and Market Profile of 3/22. That is illustrated in the following.

- 1) For tomorrow, 3/23, the trader would look for continuation of the value change observed on 3/22. The upper limit (resistance) at 10706 is a marker for continuation. If the move of 3/22 is in fact over, it is unlikely that the price range of close 10628 to the 10706 limit will be traded. **If 10706 is exceeded, the trend alert from 3/22 is confirmed and the short covering rally is just one piece of a larger value rise. If 10706 is not breeched, the balance is confirmed and one would trade accordingly.**
- 2) If in fact the trading of 3/22 was a breakout occasioned by a short covering rally, the value change observed was not solidly based on new demand. That would mean the strength shown on 3/22 would not be expected to continue. As in 1), price movement beyond the upper limit (10706) would be highly unlikely.
- 3) Since we strongly suspect a short covering rally breakout on 3/22, just as in the analysis in Part 1, we would view the balance of 3/21 as a better representation of the market than that of 3/22. Consequently, for trading purposes we would use limits of 10626 - 10527 rather than the ones left from the false breakout (10706 - 10528).

It was noted in the Theory Development paragraph that while predictions of the future were

not made, knowledge of the current market situation permitted an "if this, then that" approach. In the discussion above we use current knowledge to guide us in our ideas about tomorrow's behavior. We believe that the 3/22 strength was a really short covering rally. The net activity on the day is a 'failed breakout', regardless of the reasons. So we would not expect another breakout on 3/23. However, there exists a balanced distribution with an upper limit at 10706 (or 10626!). Price above that tomorrow would be breakout and hence an alert that a trend may be starting. But there is a short side, too. Price below 10528 (or 10527!) would be an alert for a down trend. The auction market trader is set to follow the market, not a preconceived prediction.

References

Ref 1: Portfolio Theory and Capital Markets, McGraw Hill, 1970

Ref 2: Markets and Market Logic, Porcupine, 1986

Ref 3: Steidlmyer on Markets, Wiley, 1989

Trading activity time frame pg. 70

Ref 4: Value Based Power Trading, Probus, 1993

Predictions pg. 18

Ref 5: Mind Over Markets, Probus, 1993

Ref 6: CISCO HomeStudy Long Course, <http://cisco-futures.com>

Ref 7: Japanese Candlestick Charting, Prentice-Hall, 1991

Ref 8: Decision Table and Advice Engine: <http://www.cisco-futures.com>

Ref 9: Select Table in Advice Engine: <http://www.cisco-futures.com>

Appendix 1. AMT and CAPM Contrasted

A general Auction Market Theory would include AMT in the day time frame, CAPM in the year time frame and an as yet unspecified intermediate time frame theory joining the two. Such a theory would cover all financial auction markets. Insofar as CAPM is concerned, AMT fills a missing element, **disequilibrium**. All portfolios and changes specified by CAPM are constructed in the near timeframe. That is, at some point one must buy and/or sell the individual instruments in a portfolio. AMT can augment CAPM in the near term decision of timing a portfolio change. Hedge funds ideally use both CAPM and AMT principles. The point is that AMT adds near term information. It is just this near term information that the **trader** uses for trading.

CAPM is a tool for investment professionals, but some of it's aura has filtered down to the public. Investment firms have spread the word of their sophisticated market analytical tools and sell mutual funds on that basis. CAPM concepts are of little value to the day trader. AMT is designed for day trading. It is of incidental use to investors. The two are related as noted, but have more differences than similarities.

Capital Market Theory vs Auction Market Theory

Possibly the largest difficulty **investors** entering the day trading arena face is assuming that day trading is similar to investing. This is emphatically not the case. The day trader has the potential to generate far larger returns than available in investing. But the risk is much, much larger and the environment, the rules of engagement, is far different.

Arena

CAPM: Portfolio analysis/selection (equities and debt)

AMT: Any auction market

Scope

CAPM: Overall portfolio performance in the long term

AMT: Individual instrument performance in the short term

Time Frame

CAPM: Annual or quarterly

AMT: Near term (holding period measured in fractions of days)

Goal

CAPM: Annual return, modified by risk taken

AMT: Near term appreciation in value

Investment Risk Level

CAPM: Full; entire account invested

AMT: Partial; as little as 5% of account risked per trade

Intrinsic Leverage

CAPM: None when equities purchased

AMT: Factor of 10 to 20 in futures

Market Restrictions

CAPM: Equilibrium

AMT: Local equilibrium - disequilibrium cycle

Primary Variables

CAPM: Annual return, portfolio risk

AMT: Intrinsic value and changes in value

Risk Measure

CAPM: Standard deviation of annual return

AMT: Estimated standard deviation of local equilibrium price

Quantities Studied

CAPM: Groupings of instruments, portfolios

AMT: Individual instruments

Optimization

CAPM: Efficient portfolios

AMT: Maximum R/R (return to risk ratio)

Market Prediction

CAPM: Yes, expected return calculated from history

AMT: No, market condition change governs trading behavior

Methodology Directly Accessible to Investor/Trader**CAPM:** No**AMT:** Yes**Appendix 2: Technical Analysis (TA). An Example**

While there is no theory competing with AMT for market analysis, a great deal of effort continues to go into **Technical Analysis (TA)**. TA is price based market research focussed on 'indicators'. There are hundreds of books on TA techniques and well over 100,000 traders have databases and TA analysis programs. How does TA differ from AMT? The difference is simple but profound. TA uses **price based analysis** (all prices treated equally), AMT is **based on value** (all prices are **not** equally valued). If TA were an effective methodology for the trader, it would be easy to say that TA and AMT were just two different ways of looking at the market. However, most traders do use TA and it is estimated that over 90 percent of futures traders lose (recent surveys of equities day traders appear to show the same result). Consequently, the newer methodology, AMT based, may offer traders an advantage. At the least, AMT has a sound theoretical foundation, whereas TA does not. With AMT, one can look inside the market to divine what is happening and why, with TA, one cannot.

The difference between TA and AMT can be illustrated easily. A popular TA model is **Japanese Candlesticks**, Ref 7. In the example below we first show a Market Profile and compare it to a Japanese Candlestick for the same day.

TRADING DATE: 30 DEC 99 CONTRACT: MAR 00 SOYBEANS (CBOT) (S H)
 TRADING BEGINS 0930 (CST); CLOSES 1315; TPO SYMBOLS ARE DEFGHIJK

```

4710 I
4706 I
4704 HI
4702 HI    <= Value Area Upper
4700 FGHI
4696 FGHI
4694 FGHI
4692 FGHI
4690 DFGHI
4686 DEFHI close
4684 DEFI
4682 DEF
4680 DEF    <= Value Area Lower
4676 DE
4674 DE
4672 DE
4670 DE
4666 D
4664 D
4662 D
4660 D
4654 D    open
4652 D
4650 D

```

Figure IDO 14. Price ranged from 471:0 to 465:0. Value Area is 470:2 to 468:0. Center of the day's distribution is 468:6. Relative volume is in the letters, the TPO's. There was five times the volume at 468:6 as at 471:0 or 465:0.

A brief analysis of the market from the profile:

- 1) The open was quickly rejected by the market
- 2) The Low was immediately rejected by the market
- 3) Price traded most of the day within the value area 4702 - 4680
- 4) The high at 4710 was immediately rejected by the market

It is clear that the market **accepted** (as value) prices in the 4702 to 4680 range and did not highly value prices outside that range. Normally, one would combine this and earlier Market Profiles into an Overlay, getting market condition. From that point, one would analyze the market and obtain trading information as in the trading strategy example above. For now, it is enough to simply read the market from the profile and compare that information with the candlestick.

In the Japanese Candlesticks technical method, the basic element is a cylinder with open and close as limits; with the high and low spiking above and below the open/close base. The candlestick form for the Market Profile above looks like:

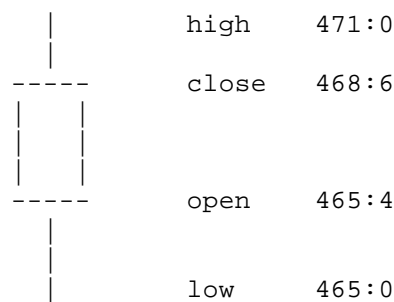


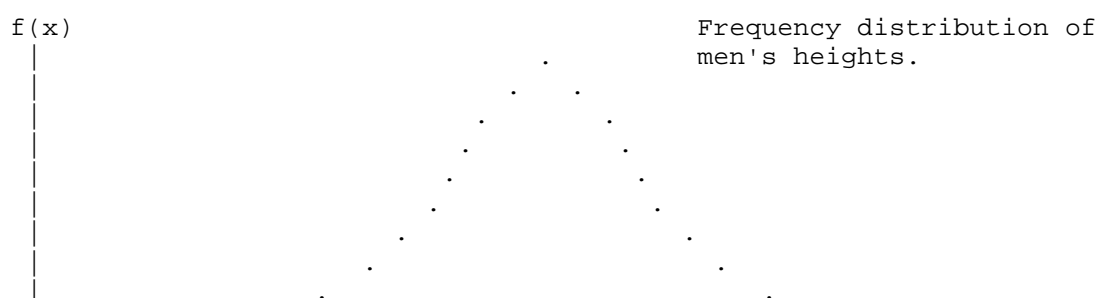
Figure ID0 15. Candlestick representation of Fig. 6.

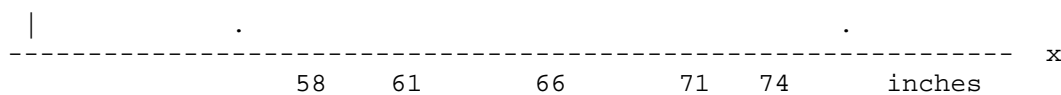
The prices most utilized by Candlesticks, the high and low, are just the ones **least valued** (traded the least) by the market. Likewise, the open, in this case, was also quickly rejected, but was used by Candlesticks to form a base.

As with the Market Profile, Candlesticks would combine this day with others to develop trading decisions. Value is important, as we have shown. Consequently, Candlesticks is using poor, non-representative data in their construction. **Every day's** high and low are those prices **least valued** by the market. Trading decisions taken on the basis of poor data are unlikely to prove to be good predictions of the market's future path or even provide a reasonable picture of the current market situation.

Appendix 3: Review of the Normal Distribution

The normal distribution (ND) is possibly the most used and useful statistical description concerned with human affairs. The form of the ND is a simple bell shaped curve of the frequency of occurrence of the variable, e.g. men's heights.





The most men, the average, were 5 ft, 6 inches tall (66 inches). One standard deviation on either side of the average, where the slope of the curve had a bend (inflection point), the men from 61 to 71 inches were grouped. This was about 68 percent of the total. Much further out, +/- two standard deviations, 56 to 79 inches, about 95 percent of the sample were included. Statisticians often use the 95 percentile range to define the distribution. Any occurrence outside that area would be suspected of not belonging to the distribution. That is, men below 56 or above 79 inches would be considered abnormal and not representative of the group. Included would be all men 4 ft 7 or less and men 6 ft 8 in or more. (These numbers are illustrative and not from an actual experiment.)

Mathematically, the distribution function $f(x)$ is written:

$$f(x) = 1/(S * \text{SQRT}(2*PI) * E^{\text{pwr}(-1/2)((x - M)/S)^{\text{pwr}(2)}})$$

where:

S = Standard Deviation

SQRT = Square Root

PI = constant (2.71...)

E = constant (3.14....)

pwr = raised to the power

x = the variable value on the base (e.g. 61 or 71 at 1 S)

M = Mean or average of the distribution (66 here)

The formula for the normal distribution is found in most statistics books. It is not the formula that interests us in Auction Market Theory, anyway. We care about the groupings, the concept that measuring the central 70 percent of trading in a balanced market gives us a handle on value (for that day). Further, that an approximation to the +/- two standard deviation points are the upper and lower limits of the Overlay Demand Curve.

Appendix 4. Fundamental and Technical Analysis

Short time frame trading has long endured the fundamental versus technical controversy. Fundamentalists seek to predict the 'proper' value of an instrument from basic economics. Their tools are reports of economic variables that are believed to affect the value of the instrument. Interest rates, production and consumption rates, unemployment reports, etc. are factored into their calculations. Typically, thirty or more variables can be easily accessed. Once value is determined, buying or selling is indicated, determined by current market pricing.

Technicians use charts, formulae for moving averages, oscillators, relative strength and so forth to develop 'indicators'. A technician's implicit assumption is "the market speaks through price". Fundamentalist's problems are 1) maybe the most important variable is not known and hence not included, 2) even if all significant variables are known the weightings may be incorrect and 3) assuming the correctness of the analysis, still the psychology of the market may keep prices away from the calculated values. Technicians suffer from 1) the ability to calculate hundreds of indicators and the problem of which to follow (the paralysis of analysis) and 2) reliance on the wrong data for the job (see the appendix on Technical Analysis). Most traders cannot perform the fundamentalist's tasks adequately. Most traders can perform technical analysis by purchasing sets of programs and data bases.

AMT is neither Fundamental nor Technical according to the descriptions above. Like the technicians, AMT uses market generated data. Like the fundamentalists, AMT calculates value. However, the data used by AMT differs from that of the technicians. The value calculated by AMT has little to do with "what the value should be" of the fundamentalists. AMT value is "what the market says it is". The similarities between AMT and technicians/fundamentalists are minor, the differences profound.

AMT requires that each instrument in the market (futures, equities, etc.) be monitored **separately**. There is no general index that characterizes overall auction markets, since the driving forces for the individuals are, in the short term, **unique** to themselves. Within a market one may find trading opportunities anywhere and at any time. The U.S. futures markets average 75 trading candidates daily. About 40 percent of that 75 trade. Selecting **viable** trades hinges in part on the trader's **risk capital**, appetite for risk and judgement. Risk in trading deals with the potential for ruin, quite unlike risk in equities. There are straightforward formulae that specify the proper trading risk, given one's trading history (win/loss ratio and winning gains/losses ratio).

Auction Market Theory permits development of other controls that can significantly affect the trader's **bottom line**. A most important measure is the theoretical **reward to risk ratio (R/R)**. A requirement is for a standardized trading model (of the sort discussed in Part 2 on trading models) to sample the rewards and risks for historical trades on a given instrument. Based on trading statistics (actual or theoretical) the average reward to risk ratio, R/R, identifies the **current profit potential** of a trading instrument. A study of trading data shows variations of up to a **factor of ten** in R/R. Thus, the R/R factor plays a strong role in selecting the best risk. Maximizing R/R is a concept similar to the 'Efficient Portfolio' of CAPM. In each case, one seeks to select the optimum situation for the job; thus minimizing risk and maximizing return. An example of the effectiveness of the R/R ratio is found in Part 3.

Appendix 5. Day Trading With Market Profile and Market Condition

Trading strategy is based on **value change**. The Value Area of the Market Profile locates 'day' value. Overlays identify the longer term value limits. A day trader seeks to capture the very short term appreciation or depreciation as the market reacts to perceived changes in value. The 'day' and 'Overlay' values define the starting point for a trading strategy.

Some day traders seek to trade many times per day. There is rarely enough new opportunity to justify such a high level of trading. Markets assimilate new information slowly, as evidenced by the utility of the Market Profile, a half-hour based measure of value. Trading opportunities within a day may be several for very active markets and only one or two or none for quieter times. For example, in figure 3, the first profile, March 16, opened low and moved up for about an hour (10610 to 10629; 19 points or \$593 potential). Then B period (8:30 to 9 AM) dropped 16 points, followed by a C period rise of 13 points. A long fall began toward the end of D period (10626) ending in G period (11 to 11:30) at 10606. The rest of the day was quiet, with the market not developing any sizeable value changes. This day saw four trading opportunities that were large enough to potentially generate profits. The next day, March 19 had no appreciable day trading opportunities. Listing the trading opportunities for March 16:

OP 1. UP 10610 to 10629 Period y, z, A
OP 2. DN 10629 to 10613 Period B

OP 3. UP 10613 to 10626 Period C
 OP 4. DN 10626 to 10606 Period D, E, F, G

The Value Diagram for a Balanced Market

An example will illustrate the principles. The market of March 15 ended in a five day balance with limits 10615 and 10507; the profile Value Area is 10607 to 10527. A Value Diagram of the market situation at the beginning of the trading day of March 16 is:

Overlay	Market Profile	Region
10615		1. Up Trend
	10607 ==> Resistance	2. Overlay balance
	10527 ==> Support	3. Profile rotation
10507		4. Overlay balance
		5. Down trend

There are five different regions on this value diagram. Region 1, above the Overlay upper limit, is up trend territory. Region 2, between the Overlay upper limit and the upper Value Area price is part of the balance but above the previous day's 'resistance'. Inside the Value Area is the profile rotational area. Then Region 4 is Overlay balance and Region 5 is down trend. The entire balance range (10615 to 10507) is rotational for the five day period. The Market Profile Value Area is specific to the most recent day. Pinpointing the Region either guides a trading decision or confirms an action already taken.

While the strategy is to trade in the direction of value change, an example of entry rules in a balanced market is given for illustration only (a trader will have his own rules for entry and exit). 1) Price moving above 10615 is a breakout and the trader buys bottoms. 2) Price moving below 10507 is a breakout and the trader sells tops. 3) Price moving down through 10615 is sold. 4) Price moving up through 10507 is bought. 5) A long position moving up through 10607 is a confirmation. 6) A short position moving down through 10527 is a confirmation. 7) Price confined between 10607 and 10527 is a no trade.

If the market is not balanced, but in an up trend the trader buys bottoms.
 If the market is not balanced, but in a down trend the trader sells tops.

For unbalanced markets not in a trend, the Market Profile Value Area replaces the balanced market limits in the analysis.

Following these rules for the market of March 16:

The market opened at 10610, below the upper limit, went as low as 10606 and then price moved up through 10615 and would have been bought (1). That move ended at 10629 at about 08:20 AM.

Price then regressed to 10613 about 08:55. It would have been sold (3) as it passed through 10615.

Again the breakout at 10615 (09:00) was bought (1). This triggers a reversal from short to long (1). This move ends at 09:25 and the market congested for about an hour.

The next move, down, began at 09:50 at 10626 and carried through to 10606 at 11:15. It would have been sold as it passed through 10615 (3).

In outline, these several runs are:

10610	==>	10629	Long at 10616	breakout
10629	==>	10613	Short at 10614	back into balance
10613	==>	10626	Reverse to Long at 10616	breakout
10626	==>	10606	Short at 10614	back into balance

Each of the suggested entries is driven by an alteration in market condition. The exit is chosen by the trader on the basis of congestion, a trailing stop or whatever the trader desires. The strategy, however, is firmly anchored in value. Knowledge of the day's initial value structure provides the strategy, the guidance to make consistent trading decisions on the basis of value change and it's direction.