2

Liquidity Data Bank™ / Market Profile™ Analysis

The Liquidity Data Bank™ (LDB), illustrated in Chapter 1 (Figure 1-4) is one of the "nonstandard" types of data. Currently released only by the Chicago Board of Trade and the Chicago Mercantile Exchange, the end-of-day reports are typically ready at 7:30 P.M. (second CBOT reconciliation), 11 P.M. (third, and essentially last, CBOT reconciliation) and 6:30 A.M. (CME Liquidity Report). An hourly, within-the-day LDB report from the CBOT is covered in Chapter 3.

LDB reports contain unique information on trading volume at-price that is not available from any other source. These data allow the trader to evaluate the different types of floor activity (member, commercial, off-floor member, and public), to track volume and volume changes (by price), and to locate the volume value area (central 70 percent of trading). A part of each LDB record is the Market Profile, showing day market structure with the profile distribution. As a whole, the LDB contains both detailed volume data and an overall picture of the day's TPO distribution, tying the parts into the structure of the day.

Unlike the LDB volume information, which comes from the clearing, the Market Profile can be readily built during the trading day. Its use is mainly in determining the emerging market structure, e.g., whether the market is balanced, with a bell-shaped distribution of TPOs, or is moving. A great deal of the profile analysis in CBOT (1984), Dalton, Jones, and Dalton (1990), Jones (1988), Steidlmayer and Buyer (1986), and Steidlmayer and Koy (1986) use information from the developing profile to infer the day's market condition and value. Reading the profile as it is building throughout the day has proved extremely difficult for the off-floor trader. The reason is, in part, that without a longer-term understanding of the market, which is to say, the current condition of the market, there is a great deal of ambiguity in a profile. If the market is in a trading range (bracketing), the same price movement can fit either of

two types: (1) it can be normal rotation, as expected in a balanced market (called *trade facilitation* because price is moving to "facilitate," or accommodate, all participants); or it can be a breakout of the bracket that signals a change in market condition (from bracketing to trending). The trader can know the market's condition. This is the subject of Chapter 3.

Reference Points

The LDB and Market Profile are rich sources of current information. Put another way, the two of them produce many reference points of use in market understanding and trading decisions. A few useful reference points are elaborated below. Many of the reference points given are useful only in balanced markets where slight nuances can be significant. An extensive discussion can be found in Dalton, Jones, and Dalton (1990).

Total Volume

The LDB lists cleared volume for each side of the transaction; a round turn counts as two. Cleared volume counts actual trades, since both sides (buy and sell) are matched. Some key reference points are changes in total volume, volume relative to its average, direction of volume change, and value area. Trader interest in the market is shown by volume traded; and relative interest is shown by day-to-day comparisons of volume at price. Dispersion of volume compares the volume above the high volume point to that below, which shows relative pressure for the day. The peak volume point for one day is often an important reference point for the next and can show either support or resistance. Volume by quadrants (quarters of the price range) identifies heavier trading locations.

Volume by Trader Type

Volume is listed by price by trader type (Cti1 = Floor, Cti2 = Commercial, Cti3 = Off-floor members, Cti4 = Public). Reference points include commercial activity inside and outside the value area, public activity inside and outside the value area, and floor activity for the day relative to commercial and public norms.

Market Profile TPOs

The point of control (peak TPO count) locates the high point of value for the day. Structure of the day comes from the distribution, bell-shaped or other. The TPO value area is used for comparison to the volume value area. TPO counts above and below the control price measure differential trading pressure. The Trade Facilitation Factor, TFF, is the ratio of total TPOs to the number of price divisions traded.

LDB Reports for Balanced and Trend Days

A Balanced Day

An LDB report for a balanced market day is given as Figure 2-1. The day type, according to profile theory, would be "normal variation," one in which the early base (TPOs Z, $, A) is extended, but the day retains a bell-shaped distribution.

An LDB report has three parts:

1. Volume Summary for Either CBOT or CME
   Against each price traded the report shows the volume at that price (each side of the trade is counted)
   %VOL, the percentage that volume is of the day's total
   %Cti1, the percentage of that volume traded by floor members (locals)
   %Cti2, the percentage of that volume traded by commercials
   %Cti3, the percentage of that volume traded by off-floor members
   %Cti4, the percentage of that volume traded by public and others
   brackets, the half-hour periods (TPOs) when that price traded

2. TPO Analysis calculated by CISCO for Either CBOT or CME.
   TPOs are used to estimate the value area, to find the upper and lower activity counts, and to calculate the CISCO Trade Facilitation Factor (ratio of total TPOs to ticks, or steps). These data provide a quick measure of buying/selling pressure and whether the market is facilitating trade. CISCO has published research on the validity of TPO value areas, finding that they are a very good substitute for volume-based ones. For non-CBOT/CME profiles, TPO analysis is all we have. Of course, during the day, TPO analysis is very useful for all markets.

3. Futures Summary
   Futures summary data is released only by the CBOT. It shows the trading at the open, close, high, and low and within the four price quadrants. These data help in the evaluation of the market's response at those various price levels, and of which market participants are active at each point.

Figure 2-1. LDB report for March 1993 T-bonds, January 22, 1993

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT

VOLUME/FUTURES SUMMARY REPORT FOR 01 22 93

COMMODITY -- T-BOND (CBOT) DAY MAR 93

Volume Summary

Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets
10612	354	0.1	52.3	0.0	0.6	47.2	$
10611	5972	1.3	55.3	7.0	0.5	37.2	$
10610	13132	2.9	50.2	17.4	5.5	27.0	$
10609	8804	1.9	64.1	13.0	2.6	20.3	$
10608	11955	2.6	58.8	6.0	2.5	32.7	$KL
10607	28341	6.2	55.9	12.0	1.9	30.3	$KL
10606	33905	7.5	58.6	10.9	3.4	27.2	$KL
10605	20108	4.4	53.9	6.8	3.2	36.1	Z$HKL
10604	37461	8.2	58.0	9.8	2.0	30.2	Z$GHJKLM
10603	60418	13.3	56.8	10.4	2.9	29.9	Z$AGHIJKLM
10602	40480	8.9	58.5	10.5	4.3	26.8	Z$AGHIJK
10601	31181	6.9	60.1	14.2	4.1	21.6	$ABDGHIJK
10600	41844	9.2	55.4	11.0	4.3	29.3	$ABCDGIJK
10531	28197	6.2	58.3	11.2	2.0	28.5	ABCDFGIJ
10530	24306	5.3	62.0	9.1	2.2	26.7	ABCDEFG
10529	24767	5.4	57.9	13.8	2.7	25.7	BCDEFG
10528	24391	5.4	56.1	14.6	1.8	27.6	BCEF
10527	11665	2.6	53.5	21.5	1.2	23.9	BCE
10526	7145	1.6	52.1	19.9	0.1	27.8	BE
10525	24	0.0	50.0	0.0	0.0	50.0	B
70% 10607	321935	70.8	57.4	10.8	3.2	28.7	Z$ABCDFGHIJKLM
V-A 10531							

		%CTI1	%CTI2	%CTI3	%CTI4
Volume for T-BOND (CBOT) DAY MAR 93	454450	57.3	11.5	2.9	28.2
Volume for all T-BOND (CBOT) DAY	456855	57.3	11.5	2.9	28.3

TPO Analysis

CENTER 10603

VALUE AREA FROM TPOS
UPPER 10604
LOWER 10529

TPOS UPPER 22
TPOS LOWER 56

```
TPO TOTAL       93
TICKS (STEPS)   20
TF FACTOR      4.7

Futures Summary

OPEN  10604    97879  21.5  57.3  10.1   2.6  30.0 Z$AGHIJKLM
      10603

HIGH  10612      354   0.1  52.3   0.0   0.6  47.2 $

 LOW  10525       24   0.0  50.0   0.0   0.0  50.0 B

CLOSE 10604    97879  21.5  57.3  10.1   2.6  30.0 Z$AGHIJKLM
      10603

Quadrants

QD 1  10612    40217   8.8  56.6  11.3   3.2  28.9 $KL
      10608

QD 2  10607   180233  39.7  56.9  10.2   2.7  30.2 Z$AGHIJKLM
      10603

QD 3  10602   166008  36.5  58.5  11.2   3.5  26.7 Z$ABCDEFGHIJK
      10530

QD 4  10529    67992  15.0  55.9  16.0   1.8  26.3 BCDEFG
      10525
```

An Analysis of the LDB Report for January 22

The Volume Summary shows a value area of 10607 to 10531, well centered within the price range; the volume is balanced. Floor activity (Cti1) is relatively uniform throughout the entire day. Commercials (Cti2) averaged 11.5 percent of the volume, about normal. They became unusually active when prices dropped below the initial base, 21.5 percent at 10527 and 19.9 percent of the volume at 10526. As the market dipped below value, commercials stepped in, with heavy buying, stopping the downward thrust, forcing price back up. Early in the day, heavy commercial volume at 10610 and 10609 was probably selling activity, since the

market opened at 10604/10603, then about 7:40 quickly ran up to 10612 and right back down within a few minutes. At the very bottom price of the day, the public (Cti4), no doubt, sold and the floor (Cti1) fed them. Trading at 10525 occurred only around 8:40 A.M., a quick dip and a fast rejection, based on the commercial action at 10526 and 10527. So, for the day, the commercials capped the market at 10610 (resistance) and 10526 (support). For the coming day, the public trader can have some confidence in a near-term support level around 10526/10527, with resistance around 10610. Breaching either price is an alert to a change of value.

According to the TPO Analysis, the center of control, the price with maximum TPOs, is at 10603. The value area of 10604–10529, calculated from the TPOs, compares to 10607–10531 calculated from the volume, so the TPO value area is slightly lower. TPO value areas tend to be close approximations to volume value areas ("Determining . . ." 1987) and are useful during the day before LDBs are available and in markets that have no LDB report at all. The TPO count above and below the center of control is 22 and 56 from profile theory, indicating a net upward pressure. The TF (trade facilitation) Factor (total TPOs/ticks) measures how well the market is facilitating trade; is it accommodating all market participants? Values of TF above about 6 in T-bonds indicate many participants standing aside (narrow trading range). (Perfect trade facilitation would be 1.0 (only one TPO per price in a strongly trending market), the poorest would be 15 for the bonds (all TPOs on the same price line).

The first part of the Futures Summary lists the trading at the open, high, low, and close prices. Open and close prices may be traded at other times of day, as is clear from the Volume Summary. For a balanced day like this one, there is a great deal of activity in the middle, which just happens to contain both the open and close. Note that the open and close are not marked on the LDB volume summary.

The second part of the Futures Summary breaks the day's display into price quadrants and examines the trading within each price range. On a balanced day, one expects most trading to be in the center two quadrants, with little at the two extremes. In quadrant 4, the bottom, commercials show unusually heavy trading, which we already understand from the Volume Summary; the commercials were capping, locating support at 10527/10526.

A Trend Day

For the next trading day, Monday, January 25, the LDB shows quite a different situation. The market was quiet during B period (8:30 to 9:00 A.M.) and most of C period, after the opening periods (Z, $, A) at 10621 to 10612.

Figure 2-2. LDB report for March 1993 T-bonds, January 25, 1993

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT

VOLUME/FUTURES SUMMARY REPORT FOR 01 25 93

COMMODITY -- T-BOND (CBOT) DAY MAR 93

Volume Summary

Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets
10709	665	0.1	58.6	28.7	0.0	12.6	L
10708	16218	2.9	47.2	6.5	2.7	43.6	LM
10707	16184	2.9	56.0	10.1	2.7	31.2	LM
10706	12224	2.2	55.4	8.6	2.9	33.1	KL
10705	23217	4.2	57.6	6.2	2.2	34.1	KL
10704	13933	2.5	46.3	4.5	1.7	47.5	HJKL
10703	18353	3.3	54.7	8.8	2.7	33.7	HJKL
10702	19316	3.5	52.8	14.4	4.6	28.2	HIJKL
10701	30167	5.4	50.6	13.6	3.2	32.6	HIJK
10700	35717	6.4	52.4	11.1	1.9	34.7	HIJK
10631	16612	3.0	51.8	8.4	5.0	34.8	HIJ
10630	18387	3.3	53.7	7.5	1.4	37.4	GHJ
10629	9190	1.6	55.8	13.0	2.2	29.1	FGHJ
10628	16850	3.0	55.6	12.1	3.0	29.2	FGHJ
10627	21570	3.9	56.8	13.1	3.5	26.6	FG
10626	5389	1.0	47.8	13.5	1.2	37.5	FG
10625	7963	1.4	56.8	6.1	1.5	35.6	DEF
10624	30872	5.5	57.1	10.7	3.2	29.0	DEF
10623	27665	4.9	57.9	10.5	1.6	30.0	CDEF
10622	24386	4.4	50.0	16.7	4.2	29.1	CDEF
10621	26605	4.8	53.2	10.7	2.7	33.4	$CDF
10620	15425	2.8	53.2	10.0	3.2	33.6	$BCDF
10619	28824	5.2	56.2	9.4	3.1	31.4	$BC
10618	28385	5.1	54.9	15.7	3.3	26.1	$ABC
10617	28749	5.1	60.2	9.7	4.4	25.7	$ABC
10616	18165	3.2	53.1	14.7	3.3	28.8	Z$AB
10615	20593	3.7	58.7	14.4	2.5	24.4	Z$AB
10614	14035	2.5	57.9	14.4	1.3	26.4	Z$
10613	13397	2.4	56.4	9.0	4.1	30.4	Z$
10612	76	0.0	67.1	0.0	0.0	32.9	Z
70% 10708	406243	72.7	53.7	10.6	2.8	32.9	$BCDEFGHIJKLM
V-A 10620							

		%CTI1	%CTI2	%CTI3	%CTI4
Volume for T-BOND (CBOT) DAY MAR 93	559132	54.5	11.1	2.9	31.4
Volume for all T-BOND (CBOT) DAY	563363	54.5	11.1	2.9	31.5

TPO Analysis

CENTER 10702

VALUE AREA FROM TPOS
UPPER 10706
LOWER 10620

TPOS UPPER 16
TPOS LOWER 72

TPO TOTAL 95
TICKS (STEPS) 30
TF FACTOR 3.2

Futures Summary

OPEN	10613 10614	27432	4.9	57.2	11.8	2.7	28.4	Z$
HIGH	10709	665	0.1	58.6	28.7	0.0	12.6	L
LOW	10612	76	0.0	67.1	0.0	0.0	32.9	Z
CLOSE	10707 10708	32402	5.8	51.6	8.3	2.7	37.4	LM

Quadrants

QD 1	10709 10701	150277	26.9	52.7	9.7	2.9	34.8	HIJKLM
QD 2	10700 10626	123715	22.1	53.8	10.9	2.7	32.6	FGHIJK
QD 3	10625 10619	161740	28.9	55.0	11.0	2.9	31.1	$BCDEF
QD 4	10618 10612	123400	22.1	57.0	13.1	3.3	26.6	Z$ABC

Around 9:20 an upward move past 10621 began, trading between 10625 and 10620 until nearly the end of F period (about 10:55). From there it went on up, to close at 10707–10708.

Several items are of interest: volume is very heavy; at no point during the move is commercial (Cti2) trading at such a level that there is any threat of stopping the rise; and the public (Cti4) is strong throughout. If one were in the market as a day trader, the profile of periods Z through F could have indicated balance. The opening was a gap up from Friday, however, and the market would have to be considered trending, contradicting any definition of balance. On a day with such a strong undercurrent, one would either go with the flow or be guided by the hourly LDBs, covered in Chapter 3.

At the close of January 25, the trader is faced with a difficult market to analyze. There is no balance. Close is near the high, so there has been no time to confirm that price is at value; if price had been rejected at the top and traded lower with heavy volume, the inference would be that value had caught price. Trading in the upper quadrant is heavy and the profile shows a market structure with multiple distributions. As we will see in Chapter 4, this breakout can be described by a run-pause scenario: we have experienced the breakout, and now we expect the pause.

Cti Volume Analysis: General

On a daily basis, most volume analysis turns on the value area. Nuances in volume by the four classes of floor member can also be illuminating, however. One can measure and archive a particular class's activity over a period of time, gaining a base from which to draw conclusions. Markets change in an evolutionary, long-term way and also in a repetitive, cyclic manner. For short time frames, we have developed three methods of analyzing the volume behavior of the four member types. Based on the value-area concept, these are volume per price tick, volume inside/outside the value area, and the quadrant measure. We find that commercial traders often identify value by selling near the top and buying near the bottom. At other times, the public may show the inception of a trend by leading a breakout. Then, if value has changed, the commercials will probably join them. Unusually low floor-trader volume can indicate a level of indecision in the market. The possibilities are virtually endless simply because of the depth of the information available. The following section applies the three methods to the volume of commercial trader action.

More than a single Cti measure is needed because the distributions are often not regular and symmetrical about the middle price. Skewed dis-

tributions can be such that in some cases there is no trading above (or below) the value area. When that happens, the value area (high 70 percent of the trading) will not be centered and measures of volume above and below the value area will be distorted. In discussing the three methods, reference will be made to column headings in Table 2-1.

Volume per Price Tick (VOL/PRICE TIC)

The average volume per price tick within the value area is computed and arbitrarily set equal to 100 and placed in the column labeled V-VA. Then the average volume per price tick above the value area is computed. That is divided by the average volume per price tick within the value area and posted as a percentage in column (V-AB). The same is done with the volume below the value area for column V-BL. Normally, the volume above and below will be much smaller and their percentages will be much less than 100. When either gets relatively large something unusual is happening.

Value Area

Total volumes above and below the value area are used for this calculation. The starting point is the average percentage of volume in the value area, labeled %VA. Then the percentages of volume the value area are found above (%ABV) and below (%BLO) the value area. The total of %VA + %ABV + %BLO add up to the %Cti for the class being calculated at each price.

Quadrant

The quadrant measure is the least sensitive, finding the fraction of the total Cti volume in the upper and lower quarters of the day's price range. This measure is important when the value area abuts the top or bottom price. When that happens, it is impossible to tell what the Cti volume above or below would have been had trading continued beyond the close.

Commercial Traders Volume Analysis: An Example

To "read" the commercial, you first need to know his or her average behavior. Then departures from the norm indicate how the commercial feels about the market. If price is falling and one day there is substantial commercial activity below the value area, it is a good bet that price has moved below value and the commercials are buying. If a market is rallying and there is unusually heavy commercial activity throughout the upper part of the range, price has probably not reached value. When price

has passed value, expect the commercials to be selling at just a few prices (the capping phenomena).

One of the best ways to understand the commercial message is to note the time of day the unusual commercial activity occurred. Commercial activity near the top (bottom) price early in the day indicates resistance (support). Heavy commercial volume at the end of the day sends an unclear signal. It could be capping or it could mean the commercials have altered their perception of value and are going with the move. In that case, it is wise to await the next day's trading before coming to a conclusion.

The net result of "commercial watching" is risk limitation. If the smartest traders are selling, should you be buying?

We use data tables that cover the last 10 days. The general idea is to detect the unusual; so the 10-day average of the commercial behavior becomes the base. As noted above, commercial activity at the top of the day's range early in the day sets a resistance point, activity at the bottom denotes buying, the setting of support. Unusually heavy commercial activity on the close requires additional information from the next day to show whether it was buying or selling.

Analysis of the commercial (Cti2) behavior for soybean oil for the 10-day period May 11 through May 25, 1992, is in Table 2-1. Details of the calculations for each of the three methods are below.

VOL/PRICE TIC

Experience has shown that volumes over 70 percent of the value-area volume per tic tend to be significant. We look for cases where V-AB and V-BL are over 70. On May 20, V-AB = 30 and V-BL = 45. So both are less than half the value-area trading. On May 22, V-AB is 89, so the Cti2 trading on the high side of the price range is significant. The commercials could have been buying or selling the highs around 2064. But the action was early in the day, so we believe that the commercials were selling the highs. Next, we will look at the Value Area analysis to see if there is confirmation.

VALUE AREA

Experience here is that values of %ABV and %BLO in excess of 50 percent of their 10-day averages are significant. On May 22, the amount of Cti2 trading was 3.4 percent of the total (column %TOT), This was divided among the region above (%ABV = 1.1), the value-area region (%VA = 2.0), and the region below (%BLO = 0.3), (1.1 + 2.0 + 0.3 = 3.4). Now we look to the 10-day averages (10-day average %ABV = 1.4) and find that the 1.1

percent traded is 2.2 times the average of 0.5 (220 percent), The %BLO is 0.3, which is 43 percent of the 10-day average of 0.7. So the Value Area method also showed unusual activity at the top and none at the bottom.

QUADRANT

As with the Value Area method, quadrant values over 50 percent above their 10-day averages are deemed significant. For May 22, 31.4 percent of the total Cti2 volume traded that day wound up in the upper quadrant, with 9.0 percent in the lower. Comparing these values to the averages shows that the upper quadrant had unusual activity: 31.4 divided by 20.7 shows activity over 1.5 times normal (150 percent). The quadrant measure, then, does confirm the other two; it too suggests commercial selling activity early in the day.

Examination of the 10-day period suggests that the upper commercial activity is "capping" the market at successively lower levels–2125 on May 13, 2143 on May 14, 2111 on May 19, 2076 on May 21, and 2064 on May 22–as the market slowly trended down. Likewise, the support level dropped too, but much less (2082 on May 13 to 2050 on May 21). The trader would probably not want to short this market, since the lower commercial level seems rather firm around 2075 to 2050. A price below the support, say 2025, however, could portend a resumption of the trend.

Table 2-1. Commercial activity analysis for July 1992 soybean oil, May 11 through 22, 1992

CTI2 STUDY FOR: Soybean Oil 07 92

					VOL/PRICE TIC				VALUE AREA			QUADRANT	
DATE	HIGH	LOW	CLOSE	CTI	V-AB	V-VA	V-BL	%TOT	%ABV	%VA	%BLO	%QD1	%QD4
05 22 92	2064	2052	2054	2	89	100	47	3.4	1.1	2.0	0.3	31.4	9.0
05 21 92	2076	2050	2051	2	26	100	7	3.8	0.9	2.9	0.0	12.9	37.7
05 20 92	2104	2075	2093	2	30	100	45	3.7	0.7	2.7	0.3	4.8	51.3
05 19 92	2111	2077	2086	2	0	100	11	4.7	0.0	4.5	0.3	47.7	0.9
05 18 92	2134	2098	2128	2	40	100	50	2.3	0.2	1.4	0.7	17.9	22.8
05 15 92	2143	2105	2106	2	0	100	85	7.5	0.0	5.2	2.3	21.2	18.8
05 14 92	2143	2093	2119	2	24	100	0	7.2	1.4	5.7	0.0	5.1	38.9
05 13 92	2125	2082	2112	2	0	100	92	9.2	0.0	6.4	2.7	47.5	22.4
05 12 92	2084	2058	2081	2	29	100	11	4.6	0.6	3.8	0.2	10.2	3.6
05 11 92	2065	2031	2054	2	3	100	14	3.6	0.1	3.0	0.5	8.2	2.1
		AVERAGE		2	24	100	36	5.0	0.5	3.8	0.7	20.7	20.8

Table 2-1. Commercial analysis of soybean oil, July 1992, May 11 - 22.

Table 2-2. Commercial activity review for July 1992 soybean oil, May 11 through 22, 1992

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Commercial Activity Review (10 days max.).  Significant action is:
 VOL/PRICE TIC:  Values of 70 or more.
 VALUE AREA:  Fifty percent greater than the average.
 QUADRANT:    Fifty percent greater than the average.

05 22 Upper Comml Action:  2064 VOL/PRICE   VALUE AREA  QUADRANT
05 21 Upper Comml Action:  2076             VALUE AREA
      Lower Comml Action:  2050                         QUADRANT
05 20 Lower Comml Action:  2075                         QUADRANT
05 19 Upper Comml Action:  2111                         QUADRANT
05 15 Lower Comml Action:  2105 VOL/PRICE   VALUE AREA
05 14 Upper Comml Action:  2143             VALUE AREA
      Lower Comml Action:  2093                         QUADRANT
05 13 Upper Comml Action:  2125                         QUADRANT
      Lower Comml Action:  2082 VOL/PRICE   VALUE AREA
```

On the up side, the resistance is in the 2100 region. Since the commercials have "capped" in this region, only a substantial breakout could change the market condition.

An easy reference table (Table 2-2) lists the commercial activity prices and volumes and interprets the Cti2 activity using the three rules posted.

Commercial Floor Traders Identify Value: General

Value of a commodity is its most important attribute, one that all trading methods seek to identify. The fundamentalist is clearest about it: isolate all the economic factors, weight them, combine them, and presto: Value. Technical analysts use price (and sometimes volume and open interest) to develop trading models–implicitly equating some type of smoothed price change to value change. Nevertheless, the link between price and value in most models is tenuous because value is so very difficult to tie down. Then, too, value is often a moving target. In bracketing, trading-range markets, value is the peak region of "price over time." That is, value is the region that wins the trading popularity contest, the price region with the most trading over the time period of the bracket. Identifying this "fair" price (region) can be accomplished in a bracketing market with the Overlay Demand Curve™ (see Chapter 4), discussed in ("Locating Value . . ." 1989) and in a book on the same subject (Jones 1991). Trading of commercial members on the floor of the Chicago Board of Trade and the

Chicago Mercantile Exchange provide a sometimes daily update of current value.

Commercial members use the futures markets principally for business purposes rather than for speculation. They represent grain merchants, livestock hedgers, banks, oil companies, S&Ls, and so forth. A commercial's charge is to do daily business at value; in other words, within value area (where 70 percent of the trading in the futures markets occurs that day; see Steidlmayer and Buyer 1986). Because of the nature of their business, commercial traders know more about the location of (big v) Value and changes in Value than others in the market. By Value (capital v) we mean the longer-term, multi-day Value found by the Overlay Demand Curve™; by value (little v) we mean "today's" value, as in value area.

A consequence of their deeper knowledge of the market is that commercials tend to keep bracketing, trading-range markets in balance. Commercial traders confirm Value through direct market intervention, i.e., responsively selling highs or buying lows. By these actions they tend to set and reset the support and resistance levels sought and used by other traders. Interpreting the commercial trading activity continually locates and updates value for the trader.

When Value is changing, the commercials are initially seen going with the trend, i.e., buying the high of the day in an uptrend or selling the low in a downtrend, and, later on, setting increasingly higher support levels in an uptrend or increasingly lower resistances in downtrends. As a trend comes to an end, commercial capping at both extremes (support and resistance) comes back into play.

A "Quiet" Day

The LDB™ is the only source of day-to-day commercial trading activity. Although the LDB has been publicly available since 1985, it is fair to say that many traders are not familiar with an LDB display. We will begin with a quiet day in the Chicago Board of Trade soybean market, a day with low commercial trading activity outside the value area.

There are many days when the commercials are "minding their own business," trading primarily in the value area. On such days, trading outside is relatively small. We use such days as a base to set the standard for nonintervention. It is tempting to call the nonintervention days normal behavior, but "normal behavior" implies "most frequent." In the month of July, 15 of the 21 trading days showed some unusually high commercial trading activity outside the value area. The following month

showed more. Clearly, the commercials' "normal" behavior includes market intervention. Figure 2-3 shows such a quiet trading day with no unusual commercial activity outside the value area.

The columns as before, are Price, Volume (both sides of the trade), %Vol (percentage of the day's volume at that price), %Cti1 (floor member activity as a percentage of the %Vol figure), %Cti2 (commercial member activity as a percentage of %Vol), %Cti3 (off-floor member activity as a percentage of %Vol), %Cti4 (public and all other activity as a percentage of %Vol), and lastly, Brackets (half-hourly identifiers: D is 9:30 to 10 A.M., E is 10 to 10:30, etc.).

The value area in the %Cti2 column is denoted by "v" (and annotated by "v-a" on the right), while above and below are "a" and "b" respectively. The value area is calculated by the exchange, as listed in the lines entitled 70%, V-A. For this day, %Cti2 is 3.0 percent of the total volume, of which 0.2 is above (volume from 5896 to 5886), 0.3 (volume from 5864 to 5850) is below, and 2.5 is in the value area (0.2 + 2.5 + 0.3 = 3.0). (A high-appearing %Cti2 value at 5856 is explained by the low volume; 18.2 percent of 330 is only 60 of the 51288 trades made by the commercials, a negligible amount.) Trading outside the value area is small compared to that inside. This is a typical quiet day, one in which the commercials show little interest outside the value area.

Commercial Resistance at a Price Far from the Close

Taking on the role of speculator, commercial traders use their knowledge of Value to enter balanced markets at extremes. Their intervention (capping) at a price far from the day's close often drives the market rapidly back to Value. This was the situation on July 8, in the November 1992 soybeans (Figure 2-4), where commercial market activity near the highs rapidly drove price back down to Value.

Column headings and markings are the same as in Figure 2-3. The %Cti2 trading shows very heavy commercial activity at 5900, 5896, and 5890, all above the value area. With the help of the tick volume display in Figure 2-5, we can imagine a scenario like this: Well-camouflaged commercial selling in J period (12:30 to 1:00 P.M.) ran the market down to 5890. Then the low-volume probe back up to 5900 failed when the buyers looked around and no one was with them. In the rush for the exit, price was pushed all the way down to 5874, closing well within the value area.

Heavy trading appeared in J period (12:30 to 1:00 P.M.), around 5900 and also at 5896, 5894, and 5892. A probe in the closing period got back up to 5900 before collapsing to close at 5874.

Figure 2-3. LDB report for November 1992 soybeans, July 7, 1992

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT

VOLUME/FUTURES SUMMARY REPORT FOR 07 07 92

COMMODITY -- SOYBEANS (CBOT) NOV 92

Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets	
5896	590	0.3	59.3	4.2a	8.5	28.0	G	
5894	3410	2.0	44.0	2.3a	5.6	48.1	FG	
5892	3350	2.0	67.0	1.0a	1.8	30.1	FG	
5890	7690	4.5	60.6	0.5a	2.3	36.5	EFGH	
5886	11210	6.6	61.2	1.4a	10.7	26.8	EFGHJK	
5884	18190	10.6	60.6	1.7v	11.6	26.1	EFGHIJK	<== v-a
5882	7740	4.5	70.0	2.2v	11.3	16.5	EFGHIJK	!
5880	19160	11.2	49.2	4.1v	10.8	35.9	EFGHIJK	!
5876	10130	5.9	61.4	3.5v	8.6	26.5	EFGHIJK	! <== Close
5874	13500	7.9	54.1	4.5v	13.9	27.6	DEFGHIJK	!
5872	6900	4.0	69.6	5.4v	8.0	17.0	DEFGIK	!
5870	26985	15.8	54.9	4.4v	6.3	34.3	DIK	!
5866	3595	2.1	56.5	1.1v	7.8	34.6	DIK	<== v-a
5864	15895	9.3	61.1	2.3b	9.4	27.2	D	
5862	6210	3.6	72.5	3.6b	3.9	20.0	D	
5860	9355	5.5	69.7	1.6b	7.2	21.4	D	
5856	330	0.2	53.0	18.2b	1.5	27.3	D	
5854	4150	2.4	31.9	1.8b	17.5	48.8	D	
5850	2570	1.5	33.9	0.2b	9.9	56.0	D	
70% 5884	122095	71.4	57.9	3.5	9.7	28.9	DEFGHIJK	
V-A 5864								

		%CTI1	%CTI2	%CTI3	%CTI4
Volume for SOYBEANS (CBOT) NOV 92	170960	58.3	3.0	9.0	29.7
Volume for all SOYBEANS (CBOT)	243960	56.8	3.1	7.6	32.5

The commercials have spoken clearly. Price is limited on the upside by the resistance level associated with the cap (5900 here). We can see from the symmetry of the distribution in the Brackets column, i.e., the bell-shaped curve, that the market is balanced for the day.

Figure 2-4. LDB report for November 1992 soybeans, July 8, 1992

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT

VOLUME/FUTURES SUMMARY REPORT FOR 07 08 92

COMMODITY -- SOYBEANS (CBOT) NOV 92

Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets	
5904	380	0.2	55.3	0.0a	5.3	39.5	J	
5902	930	0.6	33.3	0.0a	0.0	66.7	J	
5900	4995	3.0	60.1	11.6a	1.1	27.2	JK	
5896	6160	3.7	54.4	4.1a	8.1	33.4	IJK	
5894	8325	5.0	66.4	1.6a	7.2	24.7	EIJK	
5892	6200	3.7	61.9	0.7a	7.5	29.9	EIJK	
5890	8530	5.1	55.3	4.3a	5.2	35.2	EIJK	
5886	5580	3.3	66.5	1.2v	8.2	24.1	EFHIK	<== v-a
5884	16940	10.2	59.4	2.4v	11.5	26.7	EFHIK	¦
5882	6290	3.8	69.4	3.6v	6.5	20.5	EFGHIK	¦
5880	8930	5.4	53.3	5.1v	8.3	33.3	DEFGHIK	¦
5876	9640	5.8	71.4	1.5v	7.7	19.5	DEFGHK	¦
5874	14060	8.4	58.1	3.5v	11.3	27.1	DEFGHK	¦<== Close
5872	7500	4.5	64.0	2.6v	16.1	17.3	DEFGHK	¦
5870	12290	7.4	57.2	5.6v	7.0	30.1	DEFGHK	¦
5866	9200	5.5	62.5	3.1v	10.7	23.7	DFG	¦
5864	10120	6.1	51.5	0.3v	10.5	37.6	DFG	¦
5862	5695	3.4	68.7	0.4v	9.2	21.6	D	¦
5860	15570	9.3	67.4	1.2v	5.1	26.3	D	<== v-a
5856	3190	1.9	54.2	6.4b	8.2	31.2	D	
5854	5100	3.1	23.3	2.2b	3.5	71.0	D	
5850	1250	0.7	29.6	0.0b	5.2	65.2	D	
70%	5886	121815	73.0	61.7	2.6	9.3	26.4	DEFGHIK
V-A	5860							

			%CTI1	%CTI2	%CTI3	%CTI4
Volume for SOYBEANS (CBOT)	NOV 92	166875	59.6	2.9	8.3	29.2
Volume for all SOYBEANS (CBOT)		234645	58.4	3.8	6.7	31.1

Figure 2-5. Tick volume for November 1992 soybeans, July 8, 1992

```
SX     SOYBEANS (CBOT)          NOV 92   8-JUL-92                    15:31:18
    5904    J 2
    5902    J 4
    5900    JK 12 1          <== J period (down) activity
    5896    IJK 6 22 5                  ¦
    5894    EIJK 1 7 24 11              ¦
    5892    EIJK 5 6 15 14              ¦
    5890    EIJK 14 9 4 13              ¦
    5886    EFHIK 23 1 3 9 13
    5884    EFHIK 30 4 6 8 13
    5882    EFGHIK 18 7 1 8 6 4
    5880    DEFGHIK 3 7 13 5 14 3 4
    5876    DEFGHK 12 5 26 7 14 0
    5874    DEFGHK 26 3 31 7 8 3  <== Close
    5872    DEFGHK 25 2 15 11 2 1
    5870    DEFGHK 12 1 3 20 1 1
    5866    DFG 12 4 22
    5864    DFG 26 1 9
    5862    D 38
    5860    D 37
    5856    D 18
    5854    D 10
```

The Soybean Cap—Did It Work?

It is always a matter of interest to the trader just how effective the capping is (Table 2-3). In our studies we have found commercial capping to be dynamic, to be tested and reaffirmed over and over. Of course, a cap should be expected to remain until market conditions change. This one was long-lived, having been the last resistance identified before the market turned down. So this cap held at least until the present writing (on 8/28, the close was 5432). Later on, a T-bonds study will demonstrate multiple capping over just a few days.

Table 2-3. Daily summary prices in November soybeans following the commercial capping on July 8

	Open	High	Low	Close	Volume	
7/08/92	5850	5904	5850	5874	94265	<== Cap at 5900
7/09	5874	5896	5810	5814	130935	
7/10	5840	5874	5832	5850	83260	
7/13	5750	5830	5750	5820	125545	
7/14	5810	5830	5770	5772	92125	
7/15	5740	5780	5740	5756	84215	
7/16	5750	5760	5684	5692	116610	
7/17	5710	5740	5652	5656	111780	
7/31	5614	5636	5510	5520	132300	

Figure 2-6. LDB report for December 1992 T-bonds, June 11, 1992

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT
VOLUME/FUTURES SUMMARY REPORT FOR 06 11 92

COMMODITY -- T-BOND (CBOT) DAY SEP 92

Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets	
9914	7448	1.8	43.9	16.4a	0.6	39.1	ACDE	
9913	42945	10.4	59.1	14.2v	3.4	23.3	ABCDEF	<== v-a
9912	66635	16.2	54.8	14.8v	4.7	25.7	ABCDEFGH	¦
9911	32498	7.9	54.2	9.8v	6.1	30.0	ABCDEFGHI	¦
9910	24456	5.9	54.9	18.3v	2.5	24.3	$AFGHIJLM	¦
9909	35977	8.7	58.2	14.9v	1.9	24.9	$AHIJKLM	¦<==
9908	38984	9.5	57.4	16.4v	1.9	24.3	$AHIJKL	¦ Close
9907	47301	11.5	58.7	19.2v	3.1	19.0	$AKL	¦
9906	26932	6.5	53.3	17.8v	2.5	26.3	$AKL	<== v-a
9905	12556	3.0	56.6	19.4b	0.6	23.4	$K	
9904	12001	2.9	54.6	16.7b	1.6	27.0	$	
9903	2987	0.7	54.1	25.7b	1.6	18.5	$	
9902	3426	0.8	46.5	17.8b	0.5	35.2	$	
9901	1578	0.4	56.1	0.5b	3.5	39.9	$	
9900	6798	1.7	48.6	19.0b	1.2	31.2	Z$	
9831	18070	4.4	58.1	13.1b	2.8	26.0	Z$	
9830	20034	4.9	50.3	15.9b	0.7	33.1	Z$	
9829	4116	1.0	52.5	13.5b	0.6	33.5	Z$	
9828	3290	0.8	49.4	0.9b	0.0	49.7	$	
9827	1940	0.5	50.8	21.1b	0.9	27.2	$	
9826	1590	0.4	54.3	15.7b	0.6	29.3	$	
9825	276	0.1	46.0	4.0b	0.0	50.0	$	
70% V-A 9913 9906		315728	76.7	56.5	15.6	3.4	24.5	$ABCDEFGHIJKLM

		%CTI1	%CTI2	%CTI3	%CTI4
Volume for T-BOND (CBOT) DAY SEP 92	411838	55.6	15.6	2.9	25.8
Volume for all T-BOND (CBOT) DAY	420817	55.7	15.3	3.0	26.0

As an aside, the exchange official volume reported for 7/08, 188530 (94265 x 2 for both sides), is considerably higher than the 166875 of the LDB. LDB is the volume after all matching is done, the cleared volume. When one sees the difference between the two, it becomes clear that decisions based on fine detailed calculations on the exchange official volume are asking more from the data than can reasonably be expected.

Table 2-4. Daily summary prices during a period of commercial (support) capping in the September T-bonds

	Open	High	Low	Close	Volume	
6/05/92	9905	9931	9903	9923	299688	<== Cap at 9906
6/08	9921	9924	9915	9924	64626	
6/09	9921	9929	9908	9910	129738	<== Cap at 9910
6/10	9909	9910	9900	9904	156695	
6/11	9831	9914	9825	9909	193879	<== Cap at 9827
6/12	9909	10003	9909	9920	219501	<== Cap at 9909

The capping on June 5, 9, and 12 were found in the same way as for Figure 2-6.

Commercial Support at a Price Far from the Close

In the T-bonds of June 11 (Figure 2-6), the commercials are capping the lows, creating commercial member activity in the T-bonds below Value (support). This cap will be seen to be one of a number of reaffirmations of a well-identified support level.

Column headings and markings are again the same as in Figure 2-3. Converting to volume and calculating the percentages as before, we find that, of the 15.6 percent of the total volume traded as %Cti2, the volume below the value area is 3.4 percent, inside is 12.0 percent, and above is 0.2 percent. Average values for the percentage above and below are 2.0 and inside is 12.0. So the 3.4 value below is 70 percent higher than usual for the volume below the value area (3.4 = 1.7 x 2.0). Visually, we see heavy commercial activity from 9826 up to 9905, all the way up to the value area. This day is one of a series in which the commercials have set or reaffirmed support prices.

Table 2-4 shows that the commercials capped every time an opportunity was presented. On June 11, when the market traded down to 9825 shortly after the open, the commercials immediately jumped in, starting at 9826, and remained unusually active all the way on up until prices stabilized in A period (8 to 8:30 A.M.). Understanding commercial capping requires a "workout" period. If there is unusual commercial activity near the close it could be capping or it could be the commercials going with a change in value. Other evidence is required: the next day's trading, public volume in that region (available from the hourly LDB reports, see Chapter 3), breakout from a bracket (discussed in Chapter 4), etc. An interesting point is that the commercials in soybeans are

Figure 2-7. LDB report for September 1992 T-bonds, July 22, 1992

CHICAGO BOARD OF TRADE LIQUIDITY DATA BANK* REPORT
VOLUME/FUTURES SUMMARY REPORT FOR 07 22 92
T-BOND (CBOT) DAY SEP 92

Volume Summary

	Price	Volume	%Vol	%Cti1	%Cti2	%Cti3	%Cti4	Brackets
	10302	1560	0.4	53.5	6.5	0.5	39.5	L
	10301	20768	5.1	54.6	14.3	1.9	29.2	LM
	10300	15685	3.9	52.0	13.2	1.3	33.5	LM
	10231	13379	3.3	56.2	5.7	1.9	36.2	L
	10230	15302	3.8	49.8	19.4	0.8	30.1	JKL
	10229	14488	3.6	52.0	18.6	1.8	27.7	IJKL
	10228	43323	10.7	56.1	16.4	1.7	25.8	IJK
	10227	23908	5.9	53.9	15.6	2.2	28.2	IJK < Breakout
	10226	2072	0.5	50.2	26.4	0.9	22.5	IJ
	10225	3134	0.8	39.4	14.2	1.9	44.5	I
	10224	1599	0.4	37.3	19.2	0.6	42.9	I
	10223	7818	1.9	38.2	13.2	1.0	47.7	EFGI
	10222	34595	8.6	54.3	14.5	2.5	28.8	DEFGHI
	10221	49848	12.4	59.1	16.2	2.0	22.7	DEFGHI
	10220	32251	8.0	54.4	20.1	3.0	22.5	DEFGHI
	10219	7628	1.9	56.8	18.1	1.7	23.3	DEFH
	10218	1796	0.4	59.9	12.8	1.4	25.9	D
	10217	6560	1.6	57.1	14.8	1.6	26.4	ZCD
	10216	27490	6.8	50.5	17.2	1.7	30.7	ZCD
	10215	6606	1.6	56.7	11.2	0.5	31.6	ZCD
	10214	6752	1.7	67.6	14.3	2.8	15.3	Z$ACD
	10213	20640	5.1	60.9	14.7	2.8	21.6	Z$AC
	10212	22803	5.7	61.9	11.1	4.8	22.2	Z$ABC
	10211	19770	4.9	60.5	12.1	4.0	23.4	$ABC
	10210	3580	0.9	49.9	6.1	1.6	42.4	$AB
70%	10228	322173	79.9	56.1	15.5	2.4	26.0	Z$ABCDEFGHIJK
V-A	10210							

			%CTI1	%CTI2	%CTI3	%CTI4
Volume for T-BOND (CBOT) DAY	SEP 92	403355	55.4	15.2	2.2	27.1
Volume for all T-BOND (CBOT) DAY		404565	55.4	15.2	2.2	27.1

responsible for about 4 percent of the volume, while in the T-bonds they control up to 16 percent of the trading. In the two markets their effect is the same. They identify support and resistance levels and, implicitly, value.

Commercial Trend Following

When a market's condition changes from bracketing to trending, the public traders are usually leading the breakout. Sometimes the commercials participate in the break, sometimes not. If the commercials do not join the trend, it is often because value has not changed and they are waiting to trade responsively and push the market back into a trading range. Commercials going with a breakout generally means that value has changed. The problem in using just LDB reports is that often one cannot recognize a breakout from one day's data. Later, in Chapters 5 and 6, a study of a period of trending in T-bonds is shown to start on July 22, 1992. The upside breakout price is 10227. Figure 2-7 is the LDB report for that day.

In Figure 2-7 the market is seen to be bound to trading in the range 10223 to 10210 from the open into I period (12:00 to 12:30 P.M.). During this time the commercial (Cti2) activity is about normal, even though there are two distributions (a "trend" day in Market Profile parlance). Later on, at higher prices, the commercial activity continues high. In balanced markets, commercial activity falls outside the value area. Since the longer-term breakout occurred at 10227, it is clear that the commercials are actively buying into the trend. Of course, the public is very active all the way up from 10223.

Conclusion

The LDB is the only source of volume at price. Identification of the class of trader who did the trading shows the internal dynamics of the market. Generally, trends are supported by the public (Cti4), which is reflected in the Cti4 volumes. This point will be made even clearer when one looks at the hourly updates in the next chapter.

The most productive class to study at first is the commercials. They are followed (almost slavishly) on the floor and they clearly have much to tell. The off-floor trader who understands the commercials can have a continual reading of value. The commercials' responsive trading provides a continually updated measure of local support or resistance. As value changes, as in a trend, the commercials are often to be seen leading the market to the new stability level. When markets break out of a balanced situation, continuous commercial activity outside the value area, as prices are moving, is strong evidence for the start of a trend.

Balanced markets that support responsive trading and the trends that result from breakouts are fairly short-term phenomena. Markets change over the longer term also. Today's "normal" volume divisions between

the classes of trader may well change. Commercials, in particular, can gradually become more or less active. Markets' characteristics, their responses to stimuli, undergo long-term "secular" change. Such longer-term behavior may be very important, as when total volume declines or grows; or when the floor trader (Cti1) volume drops relative to that of the other classes.

We have illustrated mostly shorter-term, immediate market activity. This information sets the stage for understanding the hourly LDBs of the next chapter and is used heavily in Chapter 5 on trade selection and in Chapter 6 on trader management. The longer-term information may prove useful for quite long (months or even years) analyses. One thing is sure: these fundamental data on market demand (volume) will support many more types of studies.

The Market Profile part of the LDB is much more qualitative, relying as it does on half-hourly time frames. But the qualitative element is the Market Profile's strength. It shows the structure of the market for the day. In Chapter 4, accumulations of profiles into Overlay Demand Curves will give both the structure of the overall market (the distribution) and its condition (bracketing or trending). The Overlay, in combination with the commercial data from the LDB, leads directly to Value in a form that provides the trader with clear market understanding.