

TRADING TECHNIQUES

Market Profile Basics

Every off-floor trader would like to get a feel for how things really are on the exchange floor. Mastering Market Profile may help you get it.

by Jayanthi Gopalakrishnan



Worried that you'll never be able to compete with the floor traders? After all, they're right there in the middle of the action. They're privy to information that off-floor traders see late or maybe never. Once you start using Market Profile, however, you may find yourself with more information than the floor trader. No longer will floor traders, decked out

in their colored jackets, frantically gesturing and scrambling to make themselves heard and seen by other traders, seem chaotic, intimidating, or bizarre. Instead, with the use of Market Profile, you will see the order in the markets.

J. Peter Steidlmaier developed Market Profile in the 1980s in conjunction with the Chicago Board of Trade. Traders who use it say that they get an in-depth understanding of the market, contributing to improved trading. Many factors can be monitored from Market Profile.

Market Profile is not an indicator in the typical sense. It does not provide buy/sell recommendations but acts more like a decision-support tool. It organizes the data so that you can understand who is in control of the market, what is perceived as fair value, and the direction of the price move. It is possible to extract enough information from Market Profile for you to position your trades more advantageously.

Market Profile is useful for the pit trader as well as the off-floor trader. The indicator can help the off-floor trader get a better sense of the market; prior to the introduction of Market Profile, only floor traders had access to this information. Although all references here refer to using futures contracts, Market Profile can be used just as effectively for other tradables. Software vendors such as Cqg and WindoTrader provide Market Profile displays for equities.

IN THEORY

The concept of Market Profile stems from the idea that markets have a form of organization determined by time, price, and volume. Each day, the market will develop a range for the day and a *value area*, which represents an equilibrium point where there are an equal number of buyers and sellers. In this area, prices never stay stagnant. They are constantly diverging, and Market Profile records this activity for traders to interpret.

Market Profile is based on the normal distribution curve, wherein approximately 70% of the values fall within one

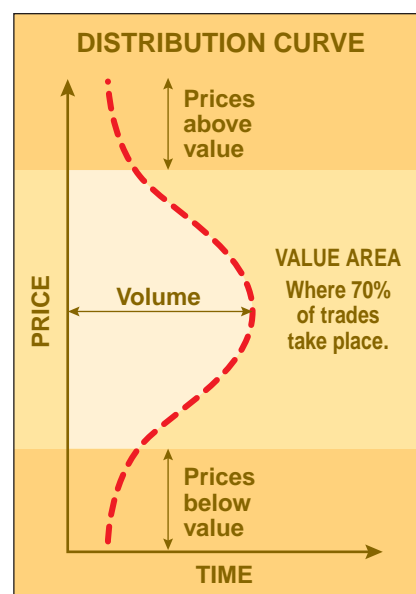


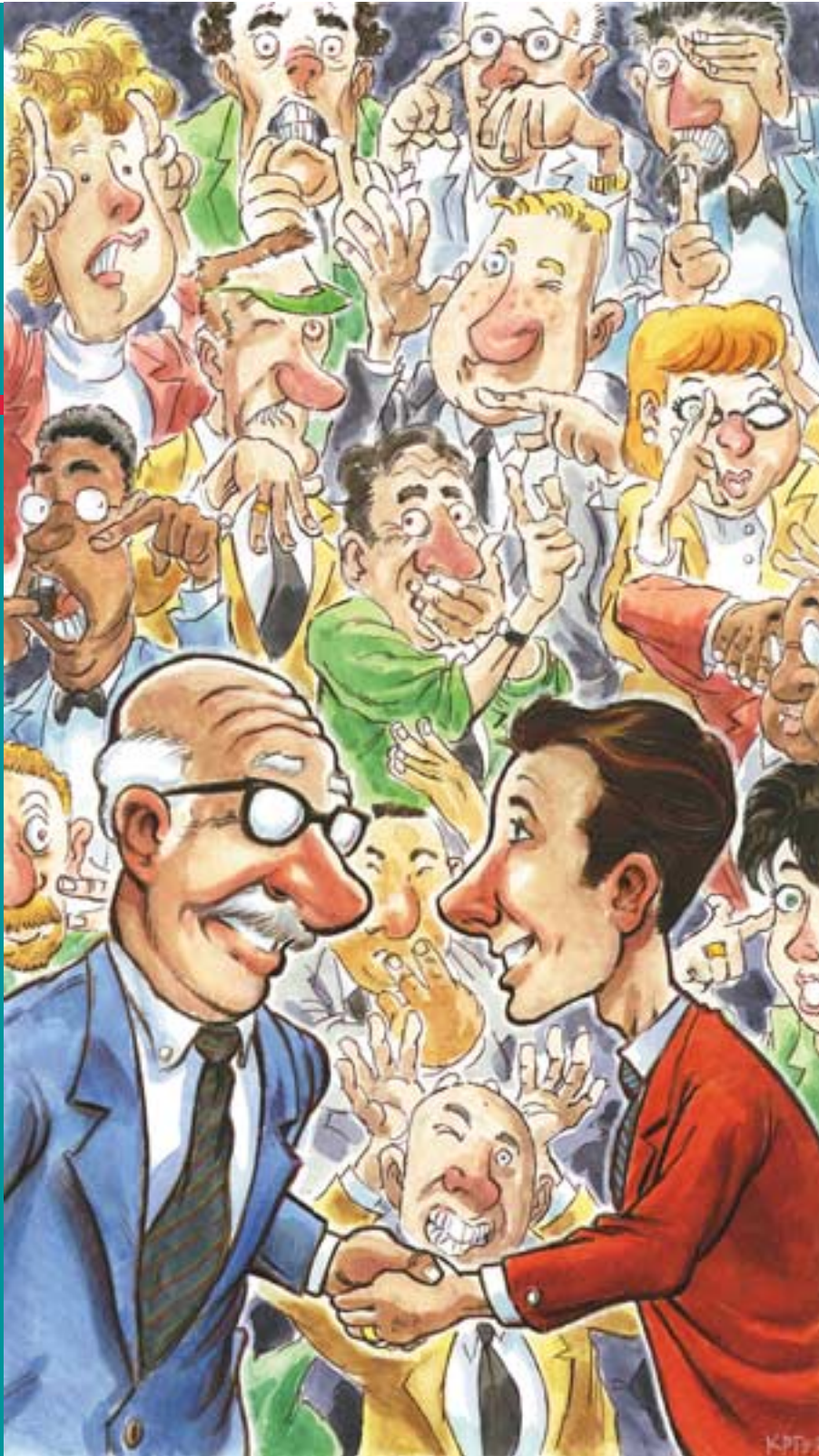
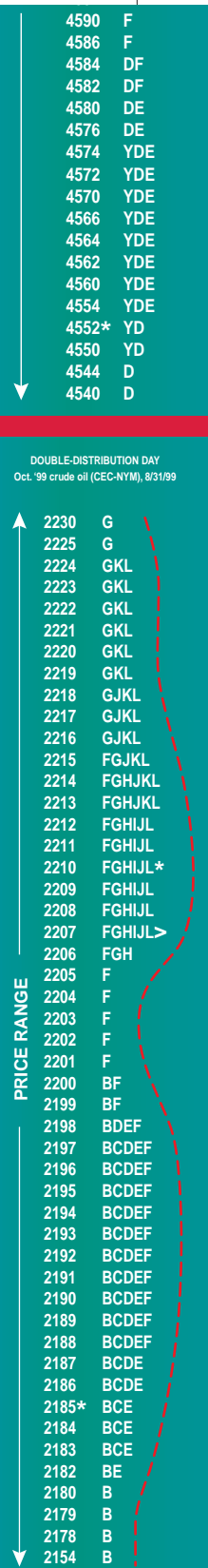
FIGURE 1: MARKET PROFILE STRUCTURE. The structure of Market Profile follows that of a normal distribution curve of price occurrences.

standard deviation of the average. If you rotate the normal distribution curve so that price is along the vertical axis and time on the horizontal axis (as shown in Figure 1), you have the structure of Market Profile.

A normal distribution curve assumes that the number of occurrences follow a bell-shaped curve. Anyone who has traded in the markets, however, knows that prices never follow a definite pattern; in fact, you rarely see a normal distribution. What you *do* see are skewed distribution of prices, which makes it possible to see the price at which most of the trades actually took place. This provides significant clues about the direction of prices and is the groundwork for understanding Market Profile. In theory, this helps the trader identify where prices are in relation to values.

Monitoring price distribution over time gives insight into what levels are considered fair and unfair. You may take advantage of this information and identify good trading opportunities.

Volume is the key to understanding Market Profile. If prices move away from the value area but volume starts to dry



up, it is likely that prices will move back to the value area. Such a movement indicates that sellers are not happy that prices are below value and buyers are not happy that prices are above value. Trading activity may increase only when prices return to the value area.

If, on the other hand, prices diverge from the value area with increasing trading activity, that indicates market participants are reevaluating their idea of value. By observing market activity through Market Profile, you can get a grasp of who is in control of the market and determine which way the market is likely to move.

WATCHING IT DEVELOP

The development of Market Profile can be seen during the course of the trading day in Figure 2. Market Profile is made up of *time price opportunities* (Tpos), which are represented by letters. Each letter represents one half-hour of the trading day (but beware that the letters used to represent time periods are not consistent across vendors). In the example in Figure 2, the periods are represented with letters A to J, with A being the first half-hour.

The first hour of trading sets the general pattern for the day and is your first opportunity to view market activity. This period is important for determining what the floor traders are doing; those traders are trying to find a price at which both the buyer and seller agree to make a trade. There are two broad categories of market participants: the *day-timeframe trader* and the *other-timeframe trader*. The floor trader is referred to as the day-

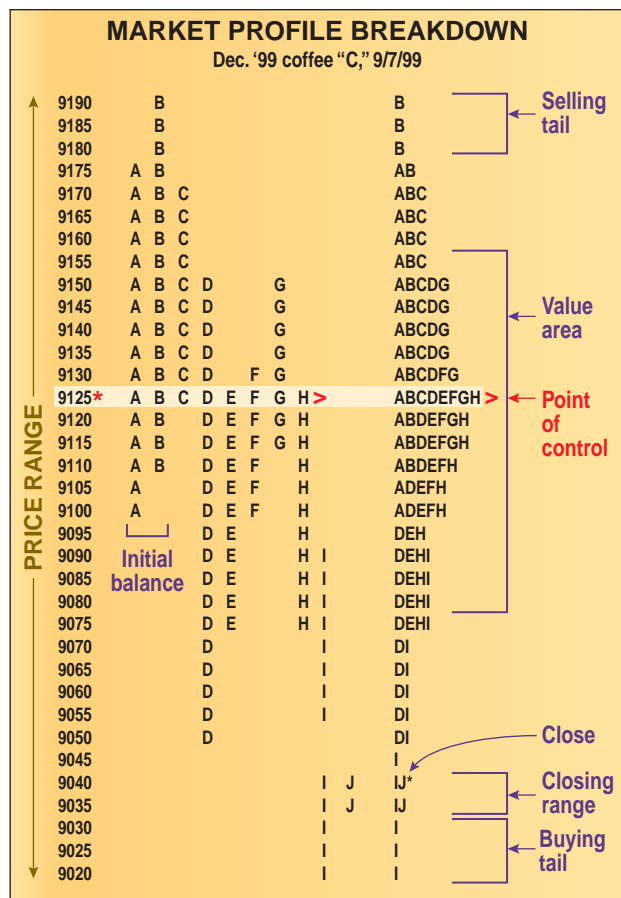


FIGURE 2: MARKET PROFILE BREAKDOWN. Market Profile is made up of time price opportunities (TPOs), which are represented by letters. Each letter represents one half-hour of the trading day and is placed at each price level occurring during that time.

timeframe trader and all others as other-timeframe. The latter trader type provides market direction by moving prices to new levels, whereas the former is interested in trading large volumes on few ticks. They provide liquidity to the markets.

The *initial balance* is the price range of market activity during the first hour (the first two time periods). In Figure 2, this is represented by A and B. On September 7, 1999, the initial balance for the December 1999 coffee contracts was established in the first two half-hour periods between \$91.00 and \$91.90. A wide initial balance suggests that prices will stay within the range, whereas a narrow one suggests that prices may extend beyond it. The ability to differentiate between the two will only be possible after some experience. If the price range falls outside the range set by the initial balance, there is the suspicion that the other-timeframe trader has entered the market and tried to move prices away from the area of balance.

During D period, the other-timeframe seller entered the market and drove prices lower. However, during the subsequent periods, buyers entered the market and drove prices higher. In H, the seller entered again and held control till the close, as can be seen by the activity during I and J periods.

The height of the entire profile — that is, the high to the low — is known as the *range*. In this example, the range is \$90.20 to \$91.90, which is wider than the initial balance.

On occasion, prices go above or below the initial balance. This is known as a *range extension*. In this example, the range extends below the initial balance, indicating a seller range extension.

The price range where 70% of the trading activity takes place, one standard deviation from the mean, is the *value area*. In this example, it is the area between \$90.80 and \$91.55. Calculation of this area is covered in more detail in the sidebar, "Value area calculation." This is where the bell curve comes in. The value area reflects the acceptance level of a certain price range or balance area. Any attempt to move prices away could provide important clues to direction.

The *point of control* is the longest line of Tpos closest to the center of the range. In Figure 2, \$91.25 represents the point of control. This is where most of the trading activity took place and is considered to be a fair value for the trading day.

J period is the *closing range* and designates the day's close. Here, it is \$90.40. The closing price is important because you need it as a reference point for the following day's opening activity.

When you have a series of single letters on either extreme, it is known as a *single-print buying/selling tail*. The presence of such a tail indicates a strong reaction by the other-timeframe traders. In this case, both single-print buying and selling tails are present. Since both are very short — only three letters — the response from the other-timeframe traders was very strong. The buying tail represented by the three I periods shows that the other-timeframe buyer responded quickly to lower prices. Conversely, the three Bs at the top of the profile indicates that the other-timeframe sellers responded quickly when the prices were above value.

RECOGNIZING DIFFERENT DAYS

Now that you know how a profile develops, it's time to examine the different types of days you might encounter. There are several types of profiles, and you should be able to recognize the shapes associated with the different types of

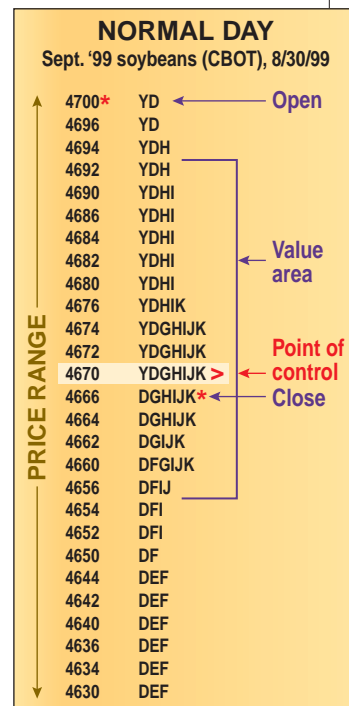


FIGURE 3: PROFILE OF A NORMAL DAY. A wide initial balance and a relatively balanced market characterize a normal day. The TPOs are represented by DEFGHIJK. The Y period represents trading prior to the open.

VALUE AREA CALCULATION

Value area can be calculated using either volume or time price opportunity (TPO) count. Here's the calculation using the TPO count:

- 1 Count the total number of TPOs, including single prints.
- 2 Calculate 70% of this number.
- 3 Identify the point of control (the longest line of TPOs closest to the center of the range) and note its TPO count.
- 4 Add the TPOs of the two prices above and below the point of control. The TPOs of the two with the greater number should be added to the TPOs of the point of control.
- 5 Continue this process till the total number of TPOs counted reaches 70% of the total number of TPOs.

The same methodology can be used to calculate the value area using volume. See sidebar Figure 1 for the application of the calculation.

Total TPOs = 131

70% of 131 = 91.7

TPOs of the point of control = 11

TPO count: $11 + 20 + 18 + 16 + 14 + 9 + 6 = 94$

Value area = \$21.48 to \$21.59

—J.G.

VALUE AREA CALCULATION

Oct. '99 crude oil, 8/24/99

| | | |
|-------|-------------|----|
| 2165 | C | |
| 2164 | CE | |
| 2163 | CE | |
| 2162 | BCDE | |
| 2161 | BCDE | |
| 2160 | BCDE | |
| 2159 | BCDE | |
| 2158 | BCDEJ | 9 |
| 2157 | BCDEFJK | |
| 2156 | BCDEFGIJK | 16 |
| 2155 | BCDEFGHIJKL | 11 |
| 2154 | BCDFGHIJKL | |
| 2153* | BCDFGHIJKL | 20 |
| 2152 | BCFGHIJKL | |
| 2151 | BCFGHIJKL | 18 |
| 2150 | BCFGHIKL* | |
| 2149 | BCFIKL | 14 |
| 2148 | BCFIKL | 6 |
| 2147 | BIL | |
| 2146 | BIL | |
| 2145 | BIL | |
| 2144 | BI | |
| 2143 | BI | |
| 2142 | BI | |
| 2141 | BI | |
| 2140 | BI | |
| 2130 | I | |

SIDEBAR FIGURE 1: VALUE AREA CALCULATION. The value area is calculated using the TPO counts at price levels above and below that level with the most TPOs.

NORMAL VARIATION OF A NORMAL DAY

Sept. '99 soybeans (CBOT), 8/27/99

| | |
|-------|----------|
| 4682 | G |
| 4680 | GK |
| 4674 | GK* |
| 4670 | GK |
| 4664 | EGHIJK |
| 4662 | EGHIJK |
| 4660 | EGHIJK |
| 4656 | EGHIJK |
| 4654 | EFGHIJK> |
| 4652 | EFGIJK |
| 4650 | EFGIJK |
| 4646 | EFIJK |
| 4644 | EFIJK |
| 4642 | DEFIJ |
| 4640 | DEFIJ |
| 4636 | DEJ |
| 4634 | DEJ |
| 4632 | D |
| 4630 | D |
| 4626 | D |
| 4624* | D |
| 4620 | D |
| 4616 | D |
| 4614 | YD |
| 4612 | Y |
| 4602 | Y |

FIGURE 4: NORMAL VARIATION OF A NORMAL DAY. The profile indicates activity during the early trading hours followed by a range extension. This implies that the other-timeframe trader entered the market after watching it for a while. D represents the first half-hour period. The Y period represents trading prior to the open.

days. To do so, however, will require practice. Once you do, you can get a feel for the market.

It is equally important to determine whether the buyer or seller is in control in the early trading hours. Some off-floor traders prefer to wait till the third time period before making any trades, because during this period, you may see the development of a value area and extension of prices beyond the initial balance, both providing clues as to what type of day is developing. If the development is not clear at this point, it is a good idea to stand on the sidelines and wait.

The *normal day* is characterized by a wide initial balance, which indicates that the other-timeframe trader entered the market early. This is usually due to the release of major news that suggests either bullish or bearish signals. During the remainder of the trading day, the other-timeframe buyers and sellers trade back and forth and the market remains relatively balanced. Figure 3 shows an example of a normal day. As mentioned previously, it is rare to find a normal distribution in Market Profile, and hence a "normal" day is not particularly normal.

A more common occurrence is the "normal" variation of a

TREND DAY

Sept. '99 soybeans (CBOT), 8/23/99

| | |
|-------|-------|
| 4664 | K |
| 4662 | K |
| 4660 | K |
| 4656 | JK* |
| 4654 | JK |
| 4652 | JK |
| 4650 | JK |
| 4646 | J |
| 4644 | J |
| 4640 | J |
| 4636 | J |
| 4634 | J |
| 4630 | J |
| 4626 | J |
| 4624 | IJ |
| 4622 | I |
| 4620 | FI |
| 4614 | FHI |
| 4612 | FGHI |
| 4610 | FGHI |
| 4606 | FGHI |
| 4604 | FGHI> |
| 4602 | FGHI |
| 4600 | FGHI |
| 4596 | FI |
| 4594 | FI |
| 4590 | F |
| 4586 | F |
| 4584 | DF |
| 4582 | DF |
| 4580 | DE |
| 4576 | DE |
| 4574 | YDE |
| 4572 | YDE |
| 4570 | YDE |
| 4566 | YDE |
| 4564 | YDE |
| 4562 | YDE |
| 4560 | YDE |
| 4554 | YDE |
| 4552* | YD |
| 4550 | YD |
| 4544 | D |
| 4540 | D |

FIGURE 5: STANDARD TREND DAY. Prices are constantly moving up and there is no interest in moving them in the opposite direction.

DOUBLE-DISTRIBUTION DAY

Oct. '99 crude oil (CEC-NYM), 8/31/99

| | |
|-------|---------|
| 2230 | G |
| 2225 | G |
| 2224 | GKL |
| 2223 | GKL |
| 2222 | GKL |
| 2221 | GKL |
| 2220 | GKL |
| 2219 | GKL |
| 2218 | GJKL |
| 2217 | GJKL |
| 2216 | GJKL |
| 2215 | FGJKL |
| 2214 | FGHJKL |
| 2213 | FGHJKL |
| 2212 | FGHIJL |
| 2211 | FGHIJL |
| 2210 | FGHIJL* |
| 2209 | FGHIJL |
| 2208 | FGHIJL |
| 2207 | FGHIJL> |
| 2206 | FGH |
| 2205 | F |
| 2204 | F |
| 2203 | F |
| 2202 | F |
| 2201 | F |
| 2200 | BF |
| 2199 | BF |
| 2198 | BDEF |
| 2197 | BCDEF |
| 2196 | BCDEF |
| 2195 | BCDEF |
| 2194 | BCDEF |
| 2193 | BCDEF |
| 2192 | BCDEF |
| 2191 | BCDEF |
| 2190 | BCDEF |
| 2189 | BCDEF |
| 2188 | BCDEF |
| 2187 | BCDE |
| 2186 | BCDE |
| 2185* | BCE |
| 2184 | BCE |
| 2183 | BCE |
| 2182 | BE |
| 2180 | B |
| 2179 | B |
| 2178 | B |
| 2154 | B |

FIGURE 6: DOUBLE-DISTRIBUTION DAY. Here, two distributions are identified, indicating that the other-timeframe trader found prices to be at an unfair value and aggressively moved prices higher to another value area.

normal day, which is also identified by activity during the

early hours of trading. What makes this different from a normal day is that the other-timeframe trader enters the market after standing on the sidelines for a while. Note in Figure 4 how, during the fourth time period (represented by G), the range is extended beyond the initial balance. This indicates that the other-timeframe has found an opportune price level and entered the market aggressively. During the remainder of the day, trading activity occurs between the other-timeframe and day-timeframe traders. A new balance area will usually be formed.

Another type is the *trend day*. There are two types: standard and double-distribution trend days. Trend days are especially

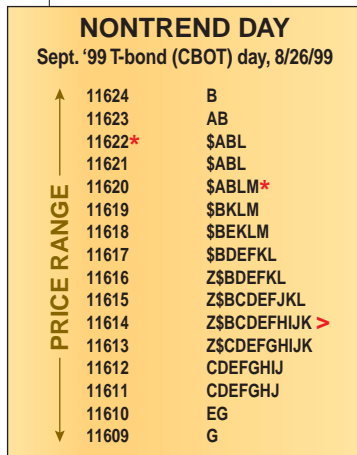


FIGURE 7: NONTREND DAY. A narrow trading range with a wide profile identifies this profile. It is likely that traders are waiting for a news event or economic release, or it may be a day prior to a holiday. Here, the TPO symbols are Z\$ABCDEFHIJKLM.

entered the market. The other-timeframe buyers enter the market aggressively during F because they believe prices are below value. This results in the prices extending to another level. Trading between buyers and sellers occurs at this stage, and a new balance level is established.

If you detect the formation of the double-distribution day early, you can take advantage of some great trading opportunities. It is important to watch the Tpos here between the two distributions. They are usually single prints, but if you notice them changing to double prints later during the trading day, it is an indication that price levels are not being sustained at the second distribution; they are, in fact, moving back to the first distribution.

There are days when there will be no enthusiasm that you can observe in the market. You will be able to identify this by a very narrow trading range with a wide profile (Figure 7); no evidence of a range extension is apparent. This is known as a *nontrend day*. What may be happening here is that traders are waiting for either a news event or an economic release, or it could just be a day prior to a holiday. Usually, a nontrend day is followed by a change in trend. In Figure 8, you can see that the profile of the September 1999 Treasury bond contracts, which traded on August 26, 1999, was followed by a downward trend.

There is another type of day known as the *neutral day*. In this case, as the name suggests, there is not much difference in the perception of value between buyers and sellers. You can see that both buyers and sellers are active by the range extensions on either side of the initial balance. Figure 9 represents such a day. The close is in the middle of the range, indicating that there is a balance between the buyer and seller. If, however, the close was near either extreme, it may mean that the buyer (if it closed toward the top) or seller (if it closed toward the bottom) is in control.

useful in indicating price direction. Figure 5 gives an example of a standard trend day; price is consistently rising and there is no interest in moving it in the opposite direction. The profile is usually narrow, with no time period containing more than five Tpos. The other-timeframe participant is in control.

A double-distribution day is displayed in Figure 6. You can clearly see the two different distributions that occurred during the trading day. The initial balance is represented by the B and C Tpos and is relatively narrow, which means that the other-timeframe participant has not

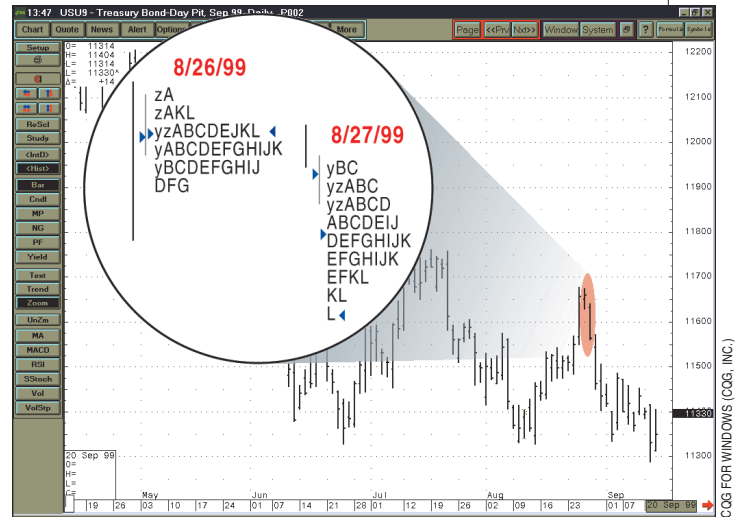


FIGURE 8: IMPLICATIONS OF A NONTREND DAY. A nontrend day is usually followed by a change in trend. From the bar chart, you can see that the nontrend day that occurred on August 26 was followed by a downtrend. Figure 7 also displays the profile for September 1999 Treasury bond contracts traded on August 26. Since they are from different sources, however, the TPO letters and price increments do not coincide.

USE IT

After you gain some experience in analyzing Market Profile, you should be able to recognize the different types of days and predict the direction of the price. After you understand how to recognize the different days, you will need to put it all in perspective to see what Market Profile reveals and how traders can benefit from it.

Market Profile is different from a tick chart. It combines price, volume, and time and organizes those factors into a form that you will be able to recognize. A tick chart gives you an idea of the relationship between price and volume at a specific time. By observing Market Profile, you will be able to visually determine the price levels at which the markets are in equilibrium. You will also understand who is in control at any given time and recognize when that control shifts. This gives you an edge in making good trading decisions, alerting you to the possibility of a shift in the perception of value.

The auctioning process in the markets is similar to that of any business: supply and demand. In the futures pits, when

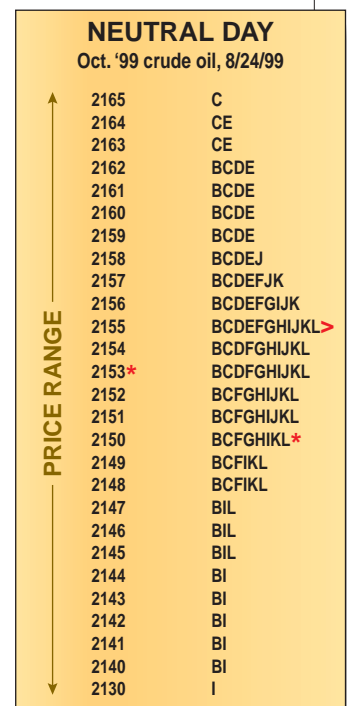


FIGURE 9: NEUTRAL DAY. Here, both buyers and sellers are active and they are in agreement on the value of the contracts. Since the close is in the middle of the profile, it indicates that there is balance between the buyers and sellers.

other-timeframe buyers and sellers conduct a transaction, the process goes through a middleman or the day-timeframe trader. If there is an imbalance between supply and demand, it is the floor trader who must bear the brunt. For example, if there are more other-timeframe sellers than buyers, the floor trader will be faced with a situation where there is an increased supply but not enough demand to dispose of the contracts. In order to restore the equilibrium between the buyers and sellers, prices will have to be reduced to the point where they will attract buying activity.



BUYING AND SELLING

Traders react differently to prices at different times, so it is important to recognize the type of activity that is taking place. There are two broad categories of buying and selling activities known as *initiative* and *responsive*. Differentiating between the two is

important, and the structure of Market Profile will provide clues to the type of activity taking place.

To determine which activity is taking place, you must compare the current day's profile to that of the previous day (Figure 10). If traders take the initiative to move prices higher or lower than the previous day's value area, the action indicates that the activity is initiative. If, on the other hand, selling activity is dominant when prices are higher than the previous day's value area, or buying activity prominent when prices are lower, you can conclude that responsive activity is taking place.

Comparing the current day's profile to those of previous days enables the market participant to recognize the changes from one day to the next and observe changes in market participation and attempted divergence of price from value. Such an approach will provide clues about whether the market action is occurring in a trending or bracketing (trading range) market and reveal whether movement is likely to be met with acceptance or rejection.

You can spot a trend by looking at the movement of the value area. If it moves in one clear direction, either up or down, you know that the market is in a trend. A bracketed market is one in which prices move back and forth between two price levels that act as support and resistance.

When the value area steadily moves in one direction, this means that the movement in price is being accepted. If, however, the value area is overlapping the previous value area, you can conclude that the trend is slowing down and starting to find balance. In a bracketed market, both the other-

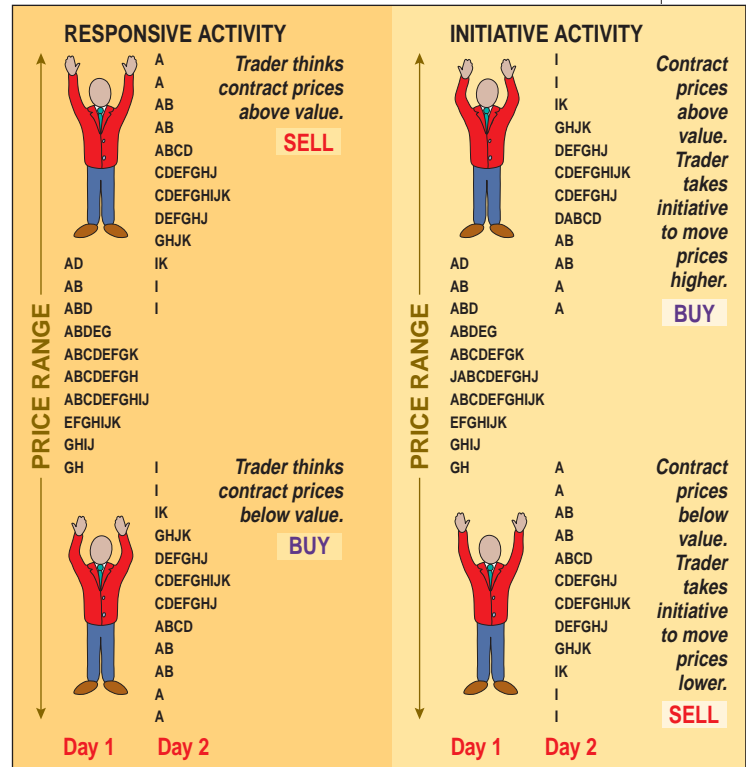


FIGURE 10: RESPONSIVE VS. INITIATIVE ACTIVITY. Increased selling activity when prices are above the previous day's value area, or buying activity when prices are below indicates that responsive activity is prevalent. Conversely, if increased buying activity is dominant when prices are above the previous day's value area, or selling activity prominent when prices are below, it indicates that initiative activity is prevalent.

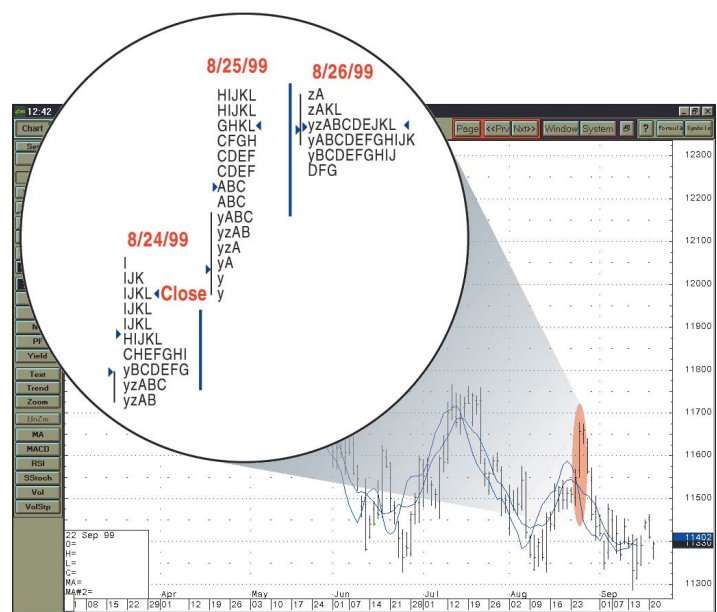


FIGURE 11: MARKET PROFILE WITH MOVING AVERAGES. Using Market Profile in conjunction with traditional indicators such as moving averages can supply additional confirmation. Here, moving averages alert a sell signal earlier than Market Profile, providing clues of a change in price direction.

timeframe buyers and sellers are responsive. When prices reach the top of a bracket, the seller enters and pushes them down. Conversely, when price reaches the bottom of the bracket, the buyer responds by driving them up.

To determine whether a market is bracketing or trending, I find it useful to combine Market Profile with moving averages. Figure 11 shows a bar chart of the September 1999 Treasury bond contracts with an overlay of the five- and 10-day moving averages and Market Profile of August 24 to 26, 1999.

Market Profile reveals several factors that provide you with an idea of the trading activity taking place in the markets.

The moving average crossover methodology does a good job of indicating the trend direction and revealing good trading points. Combining it with Market Profile reveals some interesting points. The crossover of the moving averages that took place on August 24 in September T-bonds indicated a sell signal. However, with Market Profile, we can observe that the sell signal came too early; the profile does not indicate that the sellers are in control. In fact, it shows the opposite.

Since the close was above the value area, the profile of August 24 suggests that prices were likely to rise, which is precisely what happened. It is necessary to determine whether the prices will continue moving up. The profile of August 25 has a higher value area and a wider range than that of the previous day. It also shows no signs of decreased initiative activity. These factors indicate that the prices will probably keep going up.

On the profile of the following day (August 26), you can see the following:

- 1 Prices did not have much of a range and seemed to be that of a nontrend day. As mentioned previously, a nontrend day is usually followed by a change in trend.
- 2 Prices did not go above the high of the previous day.
- 3 The value area developed within that of the previous day.
- 4 Moving averages indicate an even sharper downturn.

The bar chart on Figure 11 shows that prices decreased sharply after August 26, 1999, suggesting that they hit a resistance level.

CONCLUSION

Market Profile reveals several factors that provide you with an idea of the trading activity taking place in the markets. Monitoring the market action will enable you to determine the type of day that is developing, whether a price trend has started, what the value area is, the type of activity (initiative or responsive) taking place, whether the activity is continuing or changing from the previous day, and whether the market is trending or bracketing. Combining Market Profile with indicators such as moving averages can help you create a successful trading strategy. Next time, I'll show you more ways to apply it.

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