

Capital Flow Software:

An Introduction to Market Profile and a User's Guide to Capital Flow Software

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Preface

In the past several decades, a fundamental change has taken place in the commodities markets.

The industry has expanded the application of the futures concept to more products and derivatives such as options and indexes, and consequently, the influx of capital into the marketplace has increased substantially. This continuing and sustained growth in the huge pools of available capital has produced profound changes in global markets -- specifically, we see great change in the way capital enters the market.

Not only has this influx of capital produced a change in an economic sense, but it has also produced change in a structural sense. Initially, these dollars flowed into the marketplace as a part of its structure, focusing activity in a specific location, which has a historic and familiar time frame. The market's day-by-day structure represented the activity of a specific group of people trading at a specific location. And historically the pool of capital centered at this location was the dominant factor in the market. Furthermore, the type of trading carried on in this central marketplace was one of price containment - a structure that led to price discovery.

Today, the global capital markets operate around the clock without reference to time and place. At any time of the day or night the marketplace can be inundated with a large influx of outside dollars willing to commit fully to any given situation. These huge shifts in capital have been occurring with increasing frequency over the last decade and a half; it is clear that the future holds a continuation of this development. The result of this change is that prices are increasingly less contained and that local liquidity has lost much of its short-term significance.

So the real change in the market is capital flow and it is timeless. Specifically, capital flow is a distribution, and a distribution is a series of prices in one direction which reflects an economic imbalance in the market. In other words, capital flow/distribution is money entering or exiting the market. In trading modern markets, a change is necessary, and it lies in the acceptance of the timelessness of distribution as it relates to market organization. If money flow is timeless, then our methods of data organization need to be rethought and revamped. The natural element of market change must be distribution and development rather than a day, segment of a day, or a composite of a 24-hour day.

All of the above information seems to call for drastic changes, when in fact, all that is needed is the recognition of reality. Modern data organization needs to reflect the purpose of the market and the changes in the market, within its existing working framework. Those who develop the vision to create and use new methods that can monitor the timeless flow of capital stand to reap rich rewards. Ideally, the natural changes that occur during the flow of capital should be isolated to best illustrate the natural change of the market itself.

The future belongs to those who have the vision to create new tools, new weapons in the battle against the old perceptions and the old ways of doing things. The new realities of capital flow require new analytic methods, new methods of capturing our vision, and new ways of making decisions.

Capital Flow Software is the door to the next century of trading. Now after the initial years of our research are complete we have at last the tools and the knowledge we need - in short, we have vastly enhanced the opportunities available in the financial markets of the coming decades.

Introduction

Capital Flow Software represents a new generation of decision-making support tools for traders in the global markets. In the closing years of the 20th century, the computer will dominate the financial markets to a degree that we can as yet only imagine. What will come to the fore is not just the tireless power of the machine to monitor, calculate, survey, and scan the markets for opportunities. Since the machines will be available to all, what will make the difference is the creative ability of the individual trader to add value to the trading opportunities that the computer identifies by itself. Capital Flow Software has been developed to fulfill these functions: first, to survey all global markets and identify high potential trading situations; and second, to support the individual trader with the best possible database and tools so that he or she can add value to the identified trade.

Capital Flow Software is the culmination of many years of market study, practical trading, and empirical observation. It is based on an original approach to the markets, to market data, and to market analysis. It has been developed by a trader (as opposed to analysts) and has as its focus the practical and immediate challenges that traders face on a daily basis.

To take full advantage of Capital Flow Software, it is necessary to understand the fundamental way in which all markets move and change, the basics of the Market Profile method of organizing market data, as well as the theory and practice underlying Capital Flow's unique database. The first portion of this manual covers these topics. The second portion of the manual covers the basic operations of Capital Flow Software, including discussions of how to operate the various analytic tools incorporated in the software, and their relative strengths. The third section of the manual covers the automated selection of trade opportunities through the Capital Flow Scanner, a sub-system of the software which operates in the background and which can monitor global markets on a 24-hour basis to alert traders to imminent opportunity. The Trader Control Screen is another development included in this manual; it permits the trader to monitor his thought process over many different markets on a single screen. In the final section of the manual we discuss a number of trading tactics and opportunities using Capital Flow Software.

Part 2: How Markets Work

Traders sometimes believe that to be successful they must acquire and carry with them a comprehensive understanding of how markets work under all conditions. However, this is not true; a general understanding of markets is all that is needed.

There are several widely-held theories of market behavior that are commonly encountered. Many academic theorists subscribe to the efficient markets theory, which holds that a market moves from efficiency to inefficiency and back again, always trying to achieve efficiency over time. This assumes that most if not all market participants have the same information at the same time and constantly act to bring prices into accord with their information about value. A similar view says that the market moves from equilibrium to non-equilibrium and back again, in an endless progression of swings back and forth as market participants attempt to correct states of disequilibrium.

Although our purpose here is not to establish the single definition of markets, it is important to see that both of the above definitions agree that the market has essentially two phases. In a similar fashion, our approach to the market also focuses on the fact that the market operates in two phases, or two modes - the vertical, and the horizontal. All market activity can be stated in terms of vertical movement (expressed in price), in terms of horizontal movement (expressed in natural time), or, most frequently, in a combination of vertical and horizontal movement. In a general sense, then, a market scenario that includes more vertical than horizontal movement can be termed dis-equilibrium, non-efficient, or non-price control; the opposite type - containing more horizontal than vertical movement - can be termed equilibrium, efficiency, or price-control. All of these terms refer to the relationship of price and natural time in the market. The market moves when, in the near term, more people want to buy than sell at a particular price, or vice-versa. In practice, the result is that the market moves vertically to bring about a new price range where the buy/ sell demand is more or less equal. This area of approximately equal demand tends to hold or contain prices, with the result that the market starts to move in a more or less horizontal fashion.

As a generality, then, we can say that the market has two phases (the vertical and the horizontal), and that practically speaking, market movement will almost always be a blend of the two. Although this general observation seems simple, it has an important consequence: in order to fully represent and understand the condition of the market, we need to have a two-dimensional database that will capture both the natural vertical and the natural horizontal movement, so that whatever studies we apply to the database will reflect the impact of each dimension on the other.

One of the problems with the most common conventional charting method, the open-high- low-close bar chart, is that it does not portray the second kind of market movement - the horizontal movement - very well. A conventional bar chart shows us an inflexible horizontal axis with no variance - each time slot marches forward the same distance without exception, regardless of the extent of market activity that occurs in that period. Thus a conventional bar chart is neutral in terms of horizontal analysis because the horizontal is always the same. Since we have seen that it

is necessary to capture the natural horizontal movement as well as the natural vertical movement, we must look to a new and different type of data management to truly represent market activity.

The answer to this dilemma lies in the Market Profile method of entering and organizing market data. The Market Profile graphic permits the natural expression of the market's horizontal movement, showing greater or lesser time spent at a single price graphically, as conditions at any given time warrant.

Data Entry

In contrast to conventional methods of charting, Market Profile is a method of data entry that creates a visual picture of the market and also, most importantly, allows the natural movement of the horizontal as well as the vertical to be captured and freely expressed. This unique and valuable method of data entry was developed by Mike Boyle, then a gifted programmer at the Chicago Board of Trade, who is now a Vice-President for Planning and Implementation of Information Systems at that exchange.

In Mike Boyle's Market Profile data entry system, half-hour vertical ranges are converted to sequential letters and these are placed according to price on the first vertical/horizontal axis. You pick the point at which you start. Letters for subsequent half-hour periods are placed next to these initial letters when the same price recurs, or above or below the range when the prices exceed the initial base range.

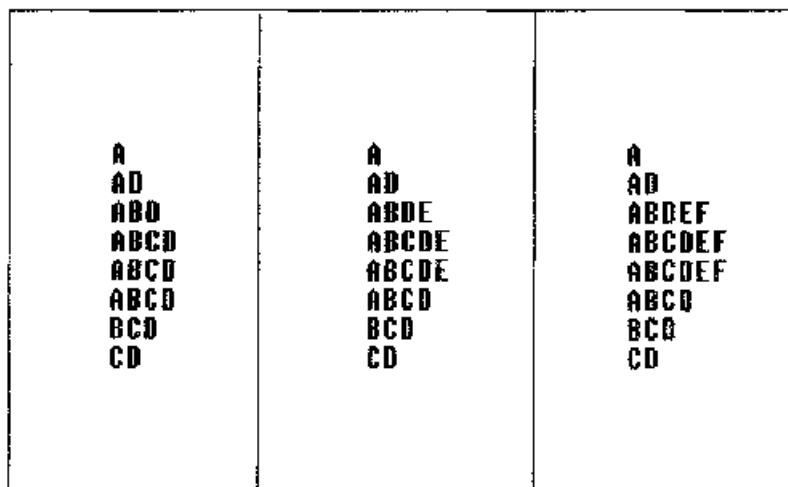
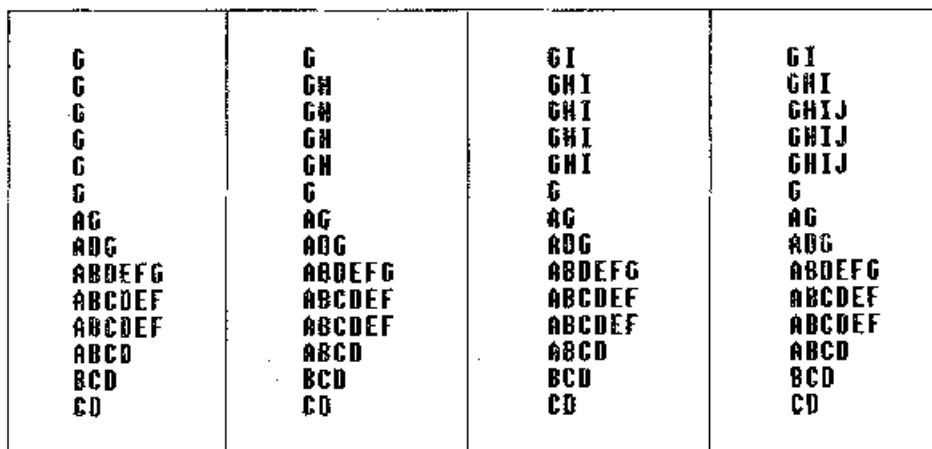


Figure 2

We see that when the market hits similar prices over time, the profile grows fatter as it produces horizontal movement; when the market spreads prices out in a larger range, the resulting profile is long and thin. Thus the "fatness" of the profile is a result of the market spending a lot of time

In Figures I through 3, watch as the accumulated data collapse into completed profiles. In this system, there is no fixed horizontal movement - horizontal movement can vary only from a given maximum, and is not always advanced horizontally by subsequent half-hour segments of time. Given a possible horizontal movement of ten half-hour segments, for example, the actual time the market "uses" to build the profile will be ten or less, in fact any number from one to ten.



By allowing the market to express itself along the horizontal dimension, the Market Profile database provides traders with a major new tool for understanding the condition of a market. This is why the Market Profile method of "collapsing" data is important. Now we can see when the market is moving horizontally, it is captured as such, and when it is moving vertically, it is not registering horizontally.

The horizontal movement of the market is of critical importance in that horizontal movement controls the database. When we can see or can measure that the market is not moving horizontally, we know that the market is moving vertically; the vertical is present by default. Thus the key to finding any degree of vertical movement is to find a lack of horizontal movement in some degree. Although the truth of this observation is readily apparent when the market manifests a major movement, the principle also holds for more subtle measurements that cannot be easily seen by the naked eye. This ability to detect incipient price movement is a major advantage of building the Capital Flow Database. As we will see in later chapters, the software has a number of tools that can measure small increments of relative change between the vertical and the horizontal. The way that we input data is critical because we would not be able to measure relative vertical and horizontal movement without the foundation we have built in this unique database.

The Bell-Shaped Curve

As the Market Profile accumulates data, the graphic starts to form a bell-shaped curve, with the largest number of data points clustered around one general price area and smaller numbers of data points proportionately above and below this mass. The bell curve is a statistical observation used to organize disparate pieces of information. The general properties of the bell curve state that virtually all data units will fall within three standard deviations of the mean.

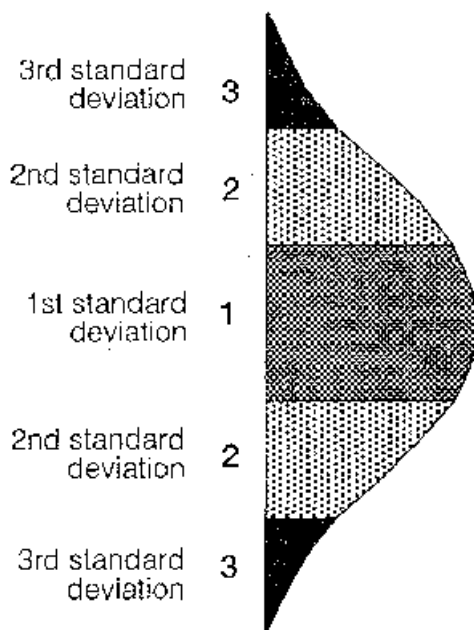


Figure 4

There are some important observations to be made here. The first is that in the market we have found only bell curves with the first distribution in the middle or at one end or another end of the curve. In fact, these two formations are the only possible arrangement of bell curves in the market. This produces a bi-polar, two-phase database, a key point to which we will return many times. The second observation is that the Market Profile bell curve develops in a characteristic fashion over time. This general characteristic means that the early development tends to be more vertical, and the later development tends to be more horizontal. In a sense, the bell curve is a living entity in that its development process has a natural life-span. In contrast to a data representation that only has a purely accounting function, the bell curve starts, grows, and becomes complete in recognizable steps in an organic and observable manner. As the profile grows, no matter where you start, it will be self-evident where you are. Eventually you will get in step with the market, because the process of building the bell curve is constantly repetitive, starting and building again and again, and if you do not immediately see where the market is in this process, it will quickly become apparent the profiles develop. The fact that the bell curves of Market Profile develop in this characteristic fashion gives important information to the trader -

the form of the profile being developed provides a natural time definition from beginning to end of a given market movement. We can observe when the curve is beginning, half done, three-quarters done, essentially complete, or over-developed, etc. On the face of it these observations provide valuable trading insights and also form the basis for more subtle measurements of market condition using studies applied to the database. Because development takes place in the horizontal dimension, capturing and defining this dimension allows the trader to take control of the market.

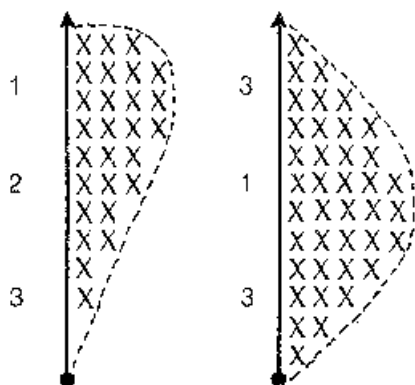


Figure 5

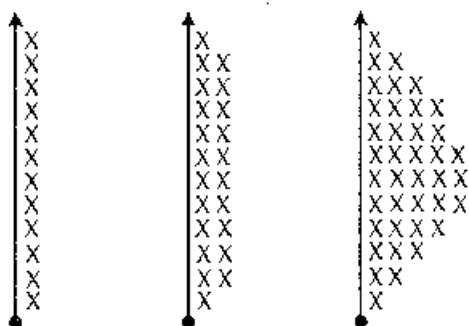
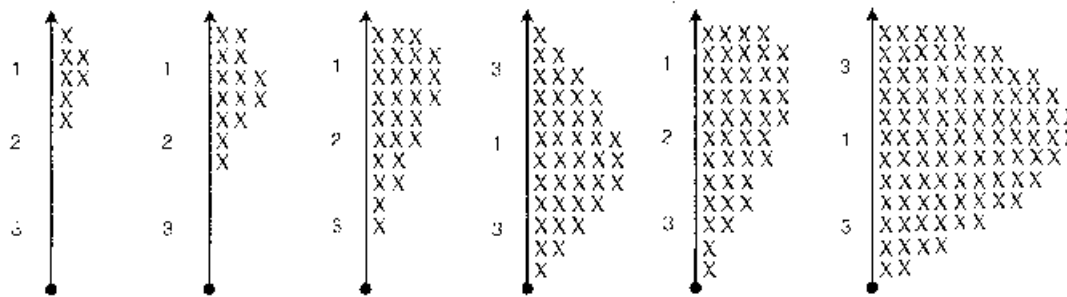


Figure 6

*Figure 7*

PART 3: Data Organizations

Two Phases of the Bell Curve

A distribution where the first standard deviation lies at the extreme is called a 3-2-1. When the first standard deviation is in the middle, we call it a 3-1-3. The second and the third standard deviation are always defined by the first standard deviation. We need to know where this first standard deviation is (i.e., is it in the middle or the extreme?), and how it is developing, and what its characteristics are. The first standard deviation is more horizontal than vertical in nature. Again, note that we are reducing our observations and decisions to a simple, two-phase, bi-polar, on-or-off, vertical-or-horizontal, yes-or-no, zero-or-one model of market activity. By building our database in such a way as to reflect this model we can make the most of our trading abilities and also make the most of the power of the computer

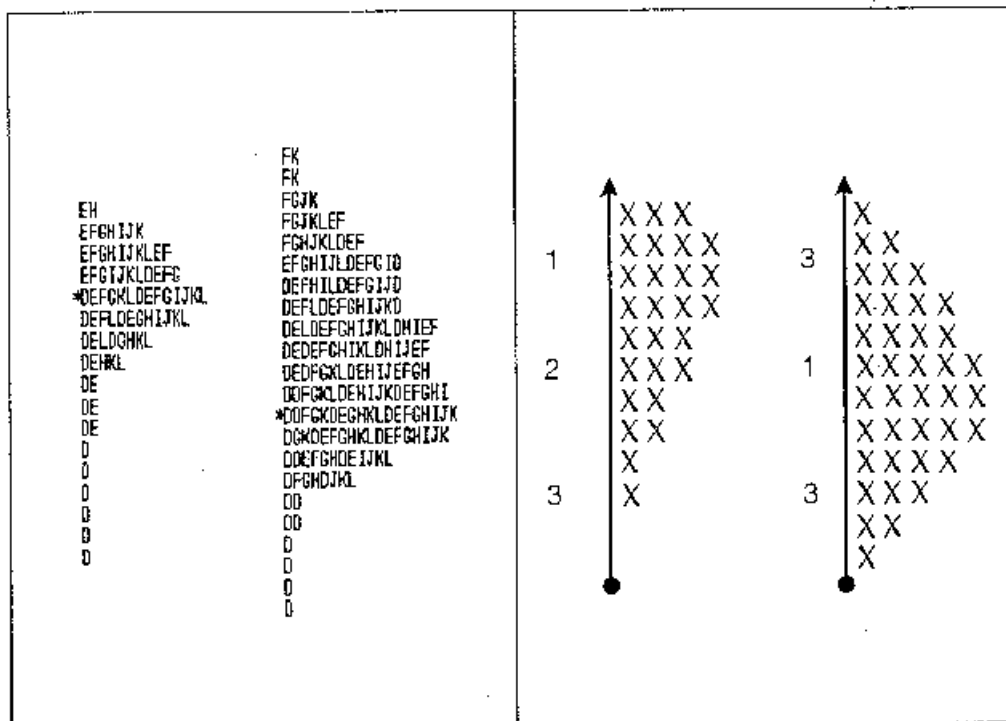


Figure 8. A & B

The Four Steps of Market Activity

In studying the way in which markets move and develop, one of the things that we have discovered is that there is a four-step process in our database, and that these four steps repeat themselves again and again, without end, forming and reforming in various time-frames as the market moves forward. By understanding this "blueprint" of market activity, we have a much higher chance of anticipating the next logical step in the market's development.

To see this "blueprint" most clearly, we will look at an idealized schematic first, and then look at examples from actual markets.

Step One

The first step is a strong vertical movement up or down - the market establishes a series of prices in one direction. This is a "non-price" control step (and the only step in which we find non-price control), and it represents the best (most profitable) trading opportunity for traders available in the market. The first step occurs because there is a market imbalance; a large shift of capital into or out of the market causes prices to shift rapidly. In terms of the bell curve, step one builds the vertical base of the distribution.

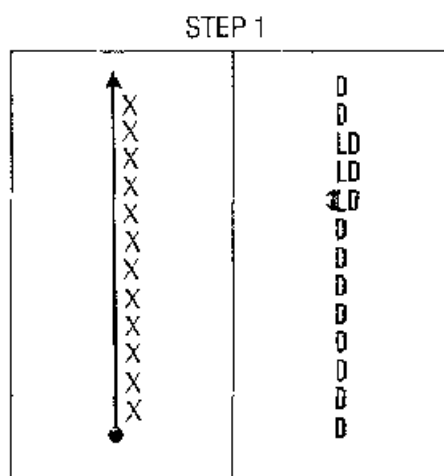


Figure 9, A & B

Step Two

The second step occurs when the market finds a price that stops the directional movement. After all, when the market is moving, something has to stop prices since they cannot rise indefinitely. Step two stops the market. In terms of the bell curve, step two is the beginning of the first standard deviation.

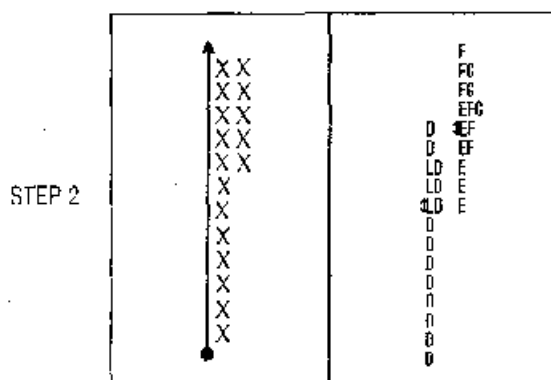


Figure 10, A & B

Step Three

The third step is when the market begins to move sideways, as the market begins to "develop." Prices move up and down in a smaller range around what will emerge to be the control price of this general area. Basically what happens in the third step is that the market develops the first standard deviation of prices. We could say that prices tend to "rotate" around this price as contracts change hands. In other words, the market moves horizontally when building the first standard deviation. The bulk of trading will take place in the middle; the market will also establish an unfair low price and unfair high price, at the two extremes, where relatively few trades will take place.

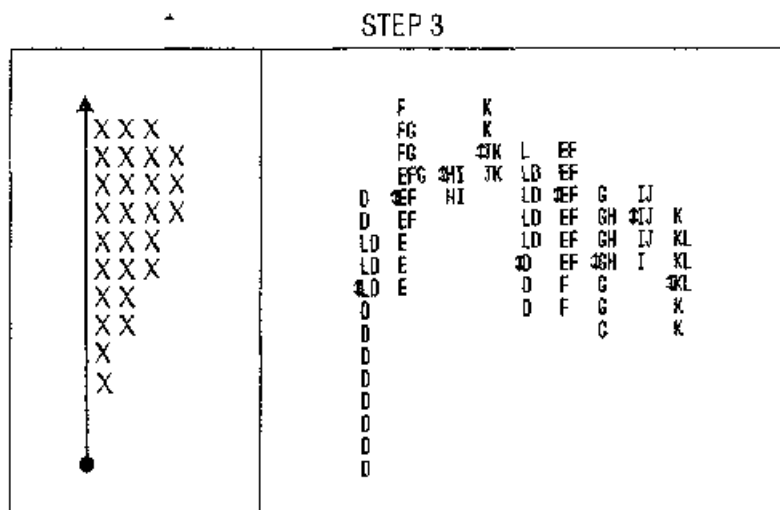


Figure 1 1, A & B

Step Four

In the fourth step, the market tries to move towards efficiency, and the first standard deviation of prices will migrate towards the middle of the entire range that began with step one. This "move to efficiency" can be thought of as the market's tendency to "fill out" the price range defined by step one. In other words, the market will retrace and develop the larger distribution until it resembles a bell-shaped curve. In this process, the most horizontal development (i.e., the fattest part of the curve, or the first standard deviation), will gradually shift downwards until it is located near the middle of the range. This process is known as the "floating first" (i.e., a floating first standard deviation), and is but another manifestation of the bi-polar nature of the market as it moves from equilibrium to disequilibrium and back again, or from efficiency to non-efficiency, as you prefer.

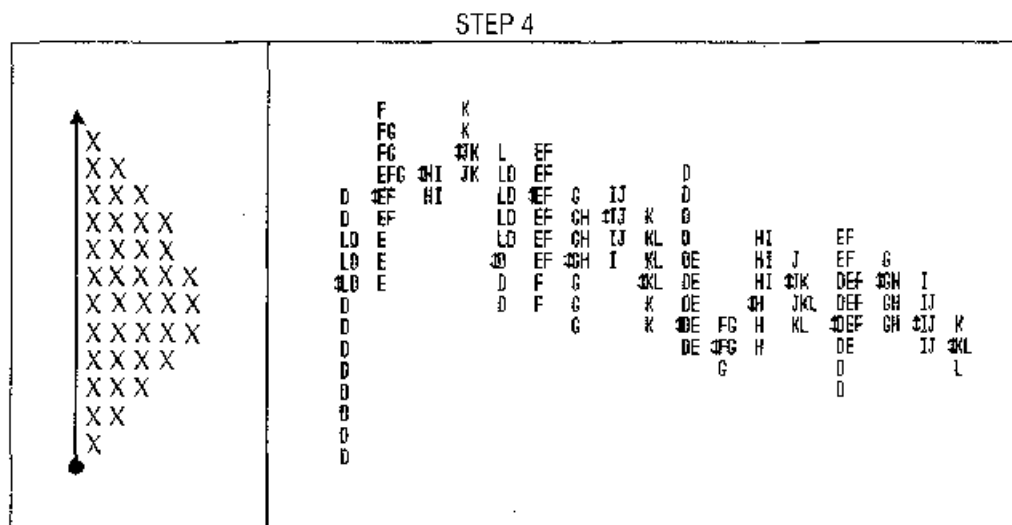


Figure 12, A & B

If you visualize these steps collapsed, they will approximate the forms shown in the accompanying schematic illustrations. The ability to visualize a "step" in collapsed form is an important skill to develop.

Because we know that the market repeats these steps endlessly again and again, and because we can often anticipate the next most likely move in this pattern, this four-step process defines a spectrum of opportunities for trading. In fact, there are eight possible trading opportunities in this spectrum, depending on where in the process that market is.

Obviously, it is during step one that the really big profits will be made. Logically, then, the time we need to be most alert is during the later portions of steps three and four, which will inevitably lead to a step one. These late term steps three and four are characterized by horizontal development in our database; they are often the best periods to monitor because it is out of these long periods of consolidation that the market proves to be most readable.

Price control versus Non-Price Control

We can see that some moves are more vertical and the rest are more horizontal in nature. Once again, these observations are consistent with our two-phase model of the market. We can also distinguish between these two phases of market activity by noting that vertical movement is "non-price-control" activity, that is, no price has yet emerged that has any control over the extent of the market's move. Step one is a "non-price control" phase of market activity. "Price control" activity, on the other hand, is market action where there is a price that "controls" the market by

keeping it in the same area. When the market rises above this "control price," there will be downward pressure on prices, and vice versa when prices drop below the "control price." Steps two, three, and four are price control steps; price control is that phase of the market when it is more horizontal than vertical. Non-price control, on the other hand, is that phase of the market when it is more vertical than horizontal.

"Minus Development"

The four-step blueprint of market activity is extremely important to the trader because it provides a background of normalcy in an arena which is fully defined - that is, a conceptual plan in which the outside limits of market activity are understood. In other words, we have an "ideal" or generalized plan of the market against which we can judge current activity, and further, there is no possible activity in the market which cannot be encompassed in one or another steps of this plan. Based on this information, in an ideal world the trader would always have a degree of control in the current situation because he would always know where the market was in the series of four steps. However, we don't live in an idealized world and there is one important fact that stands in the way - the four steps may or may not happen in sequence, due to the uncertain nature of the market. The market is almost always reacting not to one single capital flow event but to many different events, all occurring simultaneously as different players with different investment time-frames and different capitalizations take action. The consequence is that market can skip any or all of the three steps of development (i.e., steps two, three, or four, there is no start if there is no step one). The absence of an expected step is an important occurrence - this is a change from expected behavior and this change is the key to directional integrity.

In short, where the market does not trade is more important than where it does trade in terms of determining market direction.

We call this phenomenon "minus development" because an expected development of the market "blueprint" curve did not take place. If we think about it, minus development is a "skipped step." If we can find and exploit the characteristics of minus development in the market, we will be successful in our trading, because the various forms of minus development are the key to market direction.

"Minus development", or skipping steps, will appear more frequently in shorter market time frames. If you focus on longer patterns, the odds of your seeing all four market steps will become progressively greater. This means, of course, that you should be all the more alert when these longer time-frame patterns do not unfold normally.

Vertical movement creates "minus development" because it is a form of market movement that occurs when the market does not "develop" - that is, when it does not move sideways or horizontally. As traders, our basic task is to find "minus development." Instead of waiting for the next trade in a continuous stream of trades, we are looking for those areas where trading does not take place. In the larger sense, the lowest common denominator of minus development can be defined as any change in the vertical and horizontal relationship between comparative samples.

This principle holds for "skipped steps" as well.

In Figure 13 we see an example of 3-2-1 continuing into another 3-2-1, and not developing into a 3-1-3: At point B the market is completing step three. According to the four- step blueprint, we would expect the market to retrace and begin filling out the larger pattern of development. Instead, the market moves up vertically- it would hardly be accurate to describe this as step four behavior. In other words, the market appears to have skipped step four and moved directly to a new step one.

PART 4: The Common Characteristics of a Trading Opportunity

Trading opportunities come when the trader can identify market paths that lead to non- price control, i.e. to step one moves. The four-step "blue-print" of market activity gives us a background against which we can see trading either completing or deviating from the expected pattern. We know that one great advantage of the market profile data entry format is that it permits us to measure when the market is mostly horizontal or when it is mostly vertical, on a relative basis. This occurs when the market skips a horizontal slot, that is, when the number of slots used is less than the potential number of slots. When that occurs, then to that extent the market is moving vertically. In a similar fashion, we see that the four steps of the market blueprint, are not always completed in the same order each time. Instead of going progressively from step one through step four, the market may abort or skip any step at any time, due to its uncertain and unpredictable nature. (When the market skips a step, it does not mean that the market has abandoned this step; it will appear in a larger time frame.)

Minus Development

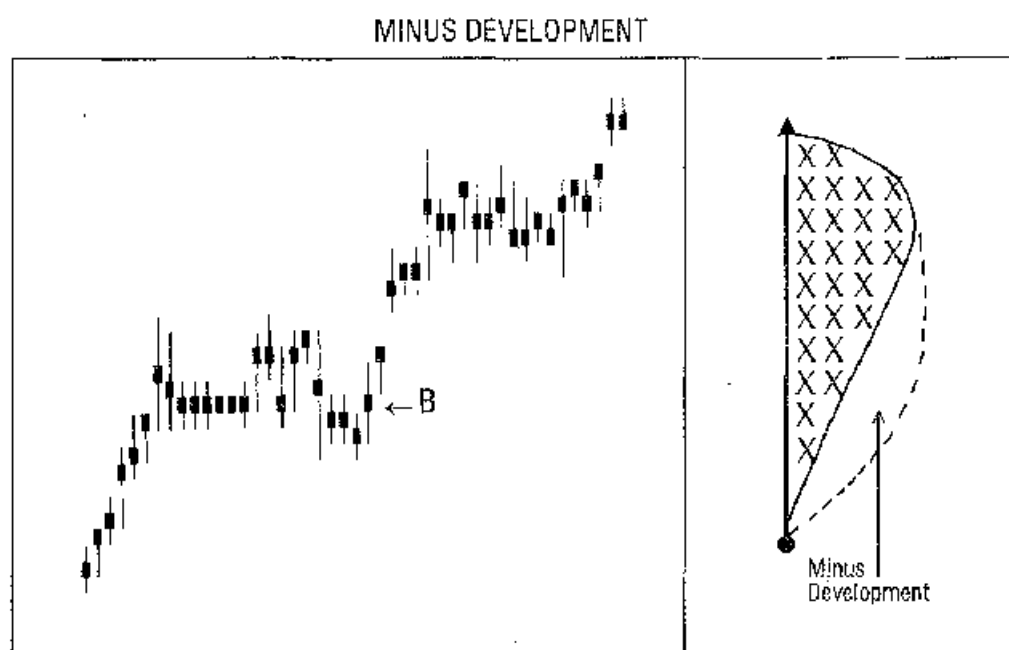


Figure 13, A & R

The Spectrum of Opportunity

There are a finite number of trading opportunities that can occur in our set-up. In fact, there are eight logical sequences of "skipped steps" that can occur. All possible market conditions, real or imagined, fall into one of these eight categories. We call this the "Spectrum of Opportunity." The eight spectrum trade categories are:

1. Step one changing immediately to another step one in the opposite direction.

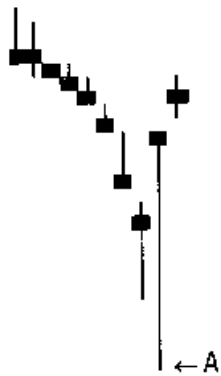


Figure 14

2. Step one moving to step two, then immediately reverting to a new step one.



Figure 15

**3. Step one followed by step two, then part of step three, moving back to a new step one.
(with little development of step three).**



Figure 16

Note: The letter "A" in Figures 14 through 21 indicates the start of a new step one.

4. Step one followed by step two, followed by a normal step three, moving on to a new step one.



Figure 17

5. Step one followed by step two and an overdeveloped step three, then reverting to a new step one.

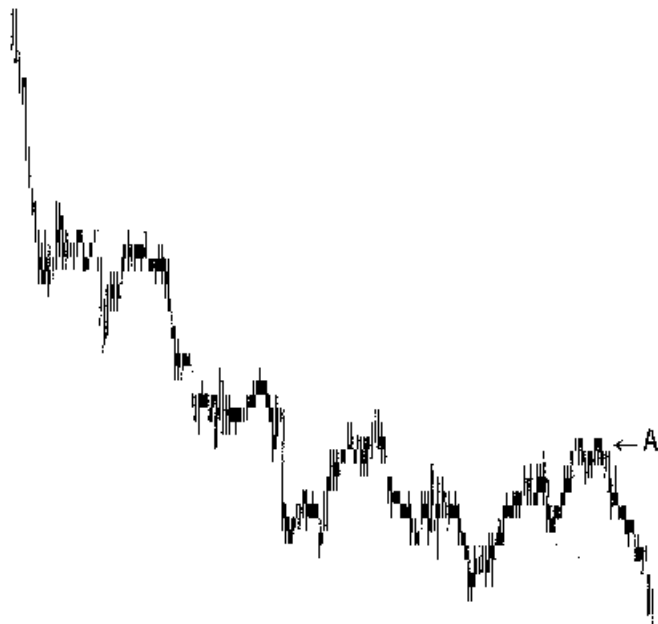


Figure 18

6. Step one followed by step two and step three and an aborted attempt at step four, then reverting to a new step one opposite I from the aborted step four.



Figure 19

7. Step one followed by step two, step three and step four, then followed by a new step one (normal development of the distribution).



Figure 20

8. Step one followed by step two, step three and an overdeveloped step four, then followed by a new step one.



Figure 21

In every case, the step that is aborted is a horizontal process; every aborted process is illustrated by a lack of horizontal movement. Control here, then, is horizontal. This is consistent with the principle of data entry followed by Market Profile. The missed activity is another version of "minus development" and it is the common characteristic of all trade opportunities.

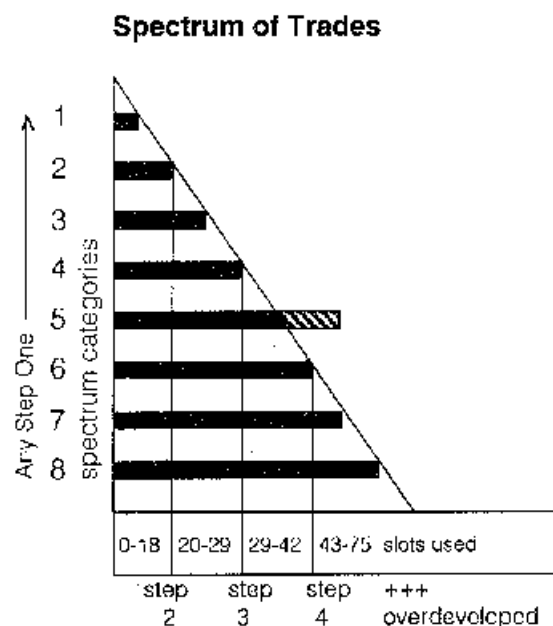


Figure 22

PART 5: Spectrum of Trades

Readability and Reliability

All market indicators are useful to traders only in so far as they are readable (i.e., they need to be easily recognizable), and reliable (i.e. they can be used to determine direction). A market indicator that is less readable contains more minus development; an indicator that is more readable contains less minus development. A step three development, for example, is more readable in its development. A skipped step two is only readable after the fact. When the market is most readable, we must be most patient in putting on the trade; impatience and rapid action is more appropriate in less readable situations.

Under most circumstances, the market will be either readable or reliable. Notice that spectrum categories three through eight have a background of development from which the foreground can develop into non-price control. Development provides readability from background to foreground, i.e. it gives you a standard against which to measure past developments and a framework in which to relate to potential new "non-price control". Spectrum one (step one to step one) doesn't give us any development to work with, but it gives us a high degree of reliability to a new direction because so much minus development has taken place.

This reinforces our concept that the reliability of market direction can be determined from the amount of minus development. Readability comes from the normal movement of the market in development of step one through step four. Reliability for direction of market activity comes

from what doesn't take place, i.e. minus development, and is why categories seven and eight are very readable as to what step we are in but hard to read as to the next potential market direction. It is hard to find the direction of the new movement until it happens, because we need to see minus development in the emerging market activity.

The existence of any degree of minus development provides us with a reliable indicator of market direction; reliability of market direction is a function of minus development. Extended horizontal movement can dissipate the effect of this minus development.

The Finite Background

This completes the discussion of our "finite background." By this we mean the complete conceptual structure encompassing all market activity. The finite background includes our database, the two-phase nature of the bell curve, the four steps of market development, and the eight possible spectrum trades. The finite background is the playing field of the market as it relates to our database. Once we can see and define the entire playing field, and not just parts of it, we can begin to identify patterns of data that will lead to a wide array of opportunities.

Capital Flow Data Organization

The Capital Flow database

Conventional Market Profile data entry breaks distributions into larger units of one to several days activity - or more. But our investigations have shown that great advantages will result if the database can be broken down into the smallest possible units of market activity that still retain the essential market characteristics of both horizontal and vertical activity.

As Capital Flow receives data from a market vendor, the automatic splitter applies an algorithm to the incoming TPO (Time Price Opportunity, or a trade at a single price in a given half-hour time period) and splits them into user-defined units. The splitter default is set such that no unit will have less than two lettered half-hour time periods in it and a new unit will be formed if it or any subsequent following unit exceeds the range that was initially set by the first two half-hour time periods or if the current range exceeds the range of the last unit of the accumulating data. The algorithm also sets a "control price" on the accumulated data unit at this departure point to complete its structure and also provide us with another element to analyze. This price is marked with a double arrow or with a heavy bar segment, depending on the display option used. The splitter also gives the user the option of creating his database using other parameters if he desires.

We do this to expand horizontal input as much as possible because, as stated earlier, it is the horizontal that gives the trader control. The key to this control is the software's ability to handle a

Half-hour bar charts become weekly bar charts only by a process of sampling, which of necessity drops out all data points except the weekly open, high, low, and close. The bar chart sampling process displays a rough approximation of what has occurred in the market, the Capital Flow Database can manage large amounts of horizontal data without losing any detail in the process. By incorporating more information from the horizontal dimension, we give the trader more control over the market.

Studies

Trading is a process of self-discovery; in Capital Flow Software the process of self-discovery is carried out through working with the studies. To help the trader bring objectivity to his or her market analysis, our software has a number of unique quantitative tools that can be brought into play. These tools, or studies, help remove the subjective element in analysis by quantifying the characteristics of price control and non-price control in comparative segments of the market.

When the quality of price control has been reduced to a set of numbers, we can take any two samples of market activity and compare them to see which one has more price control. This is important because price control is a relative quality. We are not simply looking for vertical movement; we are always looking for the relationship of vertical to horizontal movement in different segments of market activity.

Studies can be based on a long-term data sample or on a short-term data sample - the same database is used regardless of the amount of data selected to study. All of the studies in Capital Flow Software examine vertical/horizontal or horizontal/ horizontal relationships; they all seek to define change, because change is the objective manifestation of minus development. We define minus development as a change in the vertical/horizontal relationship, and that remains the basis for all trades. Thus the purpose of the studies is to bring objectivity to the trader's analysis so he can identify the background that is most appropriate for his trading strategy - that is, we want to identify the situation that sets up one of the eight spectrum trades in the finite background created by our database.

Studies should always be used collectively rather than individually; several studies used at once will give a much better picture of the market condition, particularly on the "cusp" of market activity, where changes can be subtle and slight. The goal of using these tools to study the market is always to identify one of the eight trading paths. Specifically, we want to identify the static area that precedes a new step one. If a trader can do this, he puts himself in control of the market-not the other way around. If we know where we are in the market, and we know what we are looking for, in terms of our personal preference as well as the market structure, then we have accomplished our goal.