PART ONE

The Set of Tools That Will Change Technical Analysis

CHAPTER 1

Effective Volume

An Open Window into the Market

When you are considering a stock to trade, you have to view yourself as a doctor treating a patient. You have three points of view to help you in your diagnosis:

1. The patient's general condition: age, gender, any preexisting conditions, regular exercise or not, smoking or heavy drinking, and so on.
2. The patient's symptoms: pain, fever, swelling, and the like.
3. The patient's internal examination: a blood test, a scan, an X-ray, and so on.

When analyzing a stock, you may think that the general condition is the fundamental analysis: earnings, profit growth, and so on. It may disappoint you to learn that these are only external measures of value. Value itself is useless if not compared to how it is priced. How value is priced is also virtually useless if you do not know what the expectation of shareholders is. Indeed, being a shareholder means possessing equity (value) for which the shareholder expects a return.

You will understand in Chapter 2 that the general condition of a stock is partly represented by its price trend. You will often see a price moving above and then below its price trend, indicating the evolving perception of value. Good trading requires you to catch this perception of value. I translate it into the measure of the expectation of active traders. You need to position your trades in harmony with this expectation: buy

when expectation is high, and sell when it is low. Chapter 2 explains this expectation concept and how to measure it. It is my first pillar for successful trading.

The second thing to look for when diagnosing a stock is its symptoms. Today's technical analysis is still performed at the level of the symptoms: Traders like to catch trends and their reversals, they will look for overbought and oversold situations, they will search for crowd movements, they will examine the demand/supply equilibrium, and so on. These traders are like doctors who look at a fever and know that after a few days the fever should dissipate. These traditional analysis tools are very useful if you master the art of interpreting them. Traders, like doctors, need a fair amount of experience to become truly skilled. Only then will they be able to see in the charts where a market or an individual stock is heading.

These traditional tools require skills, training, and thinking. The great majority of traders use these tools with end-of-day data and react in unison during the following trading session. The "doctors" will see similar symptoms and will prescribe similar treatments (though this is not always the case). I also use these traditional technical analysis tools, because it is critical to see what others see to know where the technical analysis will push the crowd of traders.

A doctor who has a doubt about a patient's diagnosis will order a blood sample to be analyzed; the doctor can then diagnose the disease and prescribe the necessary medicine.

Now, suppose that it were possible for a doctor to insert a tiny microscope inside the patient's body, and that this microscope had a wireless communication with the doctor's health monitoring station. The doctor could then monitor the fever not only after it appears (when the patient has already become sick), but *before* the fever appears, by monitoring any conditional change occurring at the microscopic level. The doctor could sort those changes and take into consideration only those that might cause a fever. Of course, this capability doesn't yet exist in medicine. Similarly, what is lacking in today's technical analysis is a way to detect micro changes that are strong enough to propagate over time into a full-blown sickness.

A very useful tool that I present in this book therefore allows traders to reach what might be called the cell level. Going down to the cell level does not necessarily mean analyzing each transaction, looking over the trading book size, or studying all the coming orders. You need to look at the microbes through your microscope, but remember that you are more interested in seeing their propagation than their mere existence. When Pasteur discovered microorganisms such as viruses and bacteria, it was not finding out they existed that revolutionized medicine but rather the interpretation

of *how* these organisms work. This interpretation led the way to vaccines that changed our everyday life.

I love the work of Russian Nobel Prize winner Dr. Ilya Prigogine and his theories of dissipative structures. I have to confess that it was when I was looking for a way to discover a new tool that I remembered my readings of Prigogine during my student days. Although these theories would not apply to understanding how the stock market works, I found the principles strikingly close to how I believe the stock market functions. The work of Dr. Prigogine states that the dissipation of matter or energy is usually linked to the ideas of efficiency loss and to the evolution toward a larger disorder. However, far from the equilibrium of a structure, the dissipation could be at the origin of new states of matter. In short, life was created by dissipation that brought a system far from the equilibrium and forced it into a new state of order. Prigogine states:

> *Far from the equilibrium, a state of operation can look like an organization because it results from the amplification of a microscopic deviation that at "the right timing" has privileged a reactive behavior as opposed to other reactive behaviors that were also possible. The individual behaviors can therefore in certain circumstances have a decisive role.*
>
> **—Translated by the author from *La nouvelle Alliance*, by Ilya Prigogine and Isabelle Stengers (Paris: Gallimard, 1979), page 237.**

As you may now understand it, the market may be moving en masse, and this pattern has been greatly amplified by the advent of the Internet and fast communications. However, I will show you that many market movements are started at a much lower level and that the broad price trend changes are often triggered by only a fraction of the volume exchanged.

Figure 1.1 shows the analogy between the stock market evolutions and the evolutions of an organism. An organism that is in a state of equilibrium first needs to be put out of equilibrium by an external trigger. This external trigger is strong enough to generate a micro change. If this trigger repeats itself for a period of time, it can propagate the change to the whole organism, which will then enter into a new state of equilibrium.

I am not saying that we have to forget traditional technical analysis, but rather that traditional technical analysis is less and less adapted to fast-moving markets where information and manipulations are the basis of the market movements.

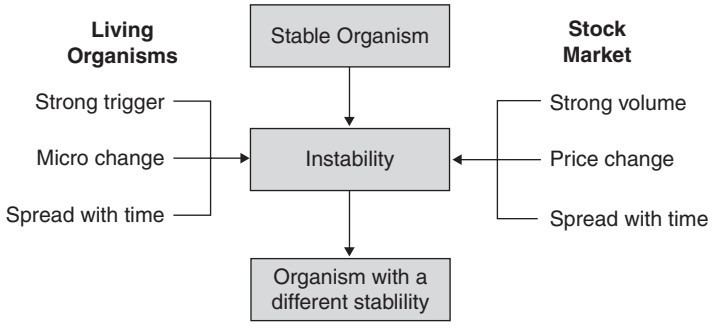

FIGURE 1.1 Change in market equilibrium. The price of a stock goes from one state of equilibrium to another. This change has triggered an abnormal increase in volume of transactions, one that is strong enough to trigger micro price changes whose spread will force a change in equilibrium.

TRADERS GET A SECRET NEW TOOL: A BRIEF INTRODUCTION TO THE TRADING MECHANISMS AND THE MARKET PLAYERS

Before explaining how things changed in 2001, I would like to point out three basic rules that govern the largest stock markets (NASDAQ, New York Stock Exchange, etc.):

1. The *price precedence rule* says that if you offer to sell a stock at the lowest price, your offer will be executed first. (If simultaneously John offers to sell his shares at $10, Jim at $10.01, and Martin at $9.99, Martin's order will be executed first.) This guarantees that buyers also get the best price for the stock they purchase. Buy orders that offer the highest buying prices are also executed first.
2. The *time precedence rule* says that buy or sell orders that have the same price are ranked in their order of submission: The first to arrive is executed first. (If John offers to sell his shares at $10, and five seconds later Martin also offers his shares at $10, John's order will be executed first, followed by Martin's.)
3. A lesser-known rule is called the *public order precedence rule*. This rule states that members of a public exchange cannot execute their own orders ahead of orders from the general public that are standing at the same price. This rule was created to increase investor confidence that members of the exchange will not use their superior information to their advantage by trading ahead of the public.

These three rules are applicable for orders only when they reach the market. However, before reaching the market, some orders go through a broker. The broker can just forward the order, or can take advantage of it and trade for himself ahead of the client's order. This is seldom the case, but dishonest brokers do exist, and the bad behavior of a few is finally pushing human beings out of the loop in favor of electronic order-routing systems.

As brokerage houses get a commission on each transaction, some have found out that it is more profitable to trade their clients' accounts often, despite the fact that eventually they bankrupt their own clients and lose them.

This reminds me of a friend who once told me that he had an e-mail exchange with a trading company in the United States; this company was ready to trade his account and, besides the traditional commissions on each transaction, take only 10 percent of his profits as commission. My friend thought that it was a good deal. Indeed, since he did not have to pay any management fee, he believed that this trading company would try to maximize its own profit, which was linked to my friend's profit. My friend even asked me if I wanted to invest with him. I had to refuse, because I do not let other people manage my money. After only a few months, the first $25,000 he tested in that account had been reduced to almost nothing. He told me at that time that he was not very happy, but that he was calling the trading company on a regular basis; apparently they were always willing to give him an explanation on why they lost his money. Still later, when I met my friend again, he explained to me that after losing his first $25,000, he really wanted to get his investment back. He decided to get "really tough" with the trading company and gave them one last chance—he put in another $12,500. I remember telling him at the time that if the manager of his account was truly looking for a 10 percent profit, he never would have let the account go bust and he would certainly never have accepted my friend's second investment. Why? The manager would have had to make a $25,000 profit to compensate for the first loss even before being paid one cent out of any profit from the additional $12,500. I advised my friend to take out whatever he could, because he was probably the victim of account churning, which is the term for when trading companies generate as many commissions as possible with useless trades. My friend did not follow my advice and thus learned an expensive lesson, losing his subsequent $12,500 investment.

How Decimalization Changed the Markets

Before 2001, prices were quoted in sixteenths of a dollar. Suppose you wanted to buy 1,000 shares of a stock whose bid price was $10.1875 and

whose ask price was $10.25. If there were liquidity at $10.25, you could either (1) get your shares at $10.25 (for a total amount of $10,250) or (2) place a bid at $10.1875 (for a total amount of $10,187.50) and wait for your bid to get filled, hoping that nobody would bid higher than you, buy all the available shares at the ask, and consequently push the price up. The spread cost—the difference between the ask (the best price offered by sellers) and the bid (the best price offered by buyers)—was rather high at $0.0625; for 1,000 shares, the difference between placing the order at the ask and placing it at the bid was $62.50. This high cost would have pushed buyers to place their orders at the bid and sellers to place their orders at the ask. Because of the time precedence rule that prioritizes the execution of orders, traders would place their orders early enough to be executed first. As a consequence, you could have market visibility and guess what large players wanted to do. Indeed, Table 1.1 shows the order size for the bid and the ask before decimalization.

Another consequence was that the price did not change much, since it took quite a large volume to move the price up or down by one tick (the smallest level of price change between the bid and the ask). Before decimalization, a tick was one-sixteenth of a dollar, or 6.25 cents.

We see in Table 1.2 a similarly sized order book after decimalization. It shows 20,000 shares on the bid, but distributed between $10.19 and $10.13. It also shows 22,000 shares on the ask, distributed between $10.20 and $10.25.

As a trader, suppose that you want to order shares at the bid. In Table 1.1, you are competing against 20,000 shares. If you wait longer, the bid could increase, and your chances to get shares at $10.1875 could diminish. Therefore, you will be inclined to rush your order in.

However, if you want to buy shares at the bid in Table 1.2, you are competing against only 500 shares. You now have less motivation to place your order at the bid, since competition is not showing up. You prefer to keep your hand closed like a good poker player. If you are lucky enough, someone will sell 600 shares at market price and the bid will be lowered one cent. This may allow you to get your shares at a cheaper price.

TABLE 1.1 Book of Orders (before Decimalization)

Buyers		Sellers	
Bid Volume	**Bid**	**Ask**	**Ask Volume**
20,000	$10.1875	$10.25	22,000

TABLE 1.2 Book of Orders (after Decimalization)

Buyers		Sellers	
Bid Volume	**Bid**	**Ask**	**Ask Volume**
500	$10.19	$10.20	10,000
3,000	$10.18	$10.21	3,000
5,500	$10.17	$10.22	7,000
1,000	$10.16	$10.23	300
5,000	$10.15	$10.24	700
4,000	$10.14	$10.25	1,000
1,000	$10.13		

The book of orders lists the prices at which buyers and sellers are ready to trade as well as what volume they want to trade. The spread is the difference between the best bid price (here, $10.19) and the best ask price (here, $10.20). In this example, the spread is $0.01. A buyer wanting to buy 100 shares may buy them at the bid for $10.19 per share and wait in line until the existing bid order of 500 shares is first executed, or may pay one cent more and have the order executed instantaneously at the ask for $10.20.

Furthermore, if you need to buy 12,000 shares in Table 1.2 and you place an order at the ask, the price will move up one tick to $10.21. This may be undesirable, especially since you would still like to buy another 100,000 shares at a good price. If you put large buy orders at the bid, you will show your hand to the market and attract other buyers.

The cheapest course of action would be to buy 9,500 shares at the ask, then sell 600 shares at the bid. The ask price would stay unchanged, but the bid price would fall one cent to $10.18. This would eventually cause sellers to lower the ask to $10.19, allowing you to buy your next set of shares at a lower price. It is a legitimate price manipulation that funds need to use in order to accumulate or distribute shares during sideways trading ranges. In Chapter 4, we will see if this manipulation is common practice.

In addition to this, program trading would automatically use these tactics to dispose of or purchase large blocks during sideways trading ranges, making sure that the price stays in the trading range until the strategic move is finalized.

In conclusion, we have seen that decimalization killed market visibility while favoring price manipulations. Fortunately, the Effective Volume tool that I present in Chapter 1 provides a way to see through tactical moves by large players. It allows all other traders to analyze the repetitive market tactics and show the underlying strategic decisions of large players.

The Effective Volume tool does not imply that these strategic decisions are correct and that you need to trade in the same direction.

However, knowing what large players are doing is key to helping your trading decisions, whether you are a retail player or a competing institutional player—especially if you have a correct measure of value. The Active Boundaries tool that I present in Chapter 2 will allow you to obtain a very accurate measure of value.

Since I began using the Effective Volume tool, one of my trading principles has been not to trade against large players. This is not to say that I always trade *with* the large players, but I am not fool enough to trade against them.

How Large Funds Adapted to Decimalization

A large fund has the dual advantage of size and power, but it also has limitations. Funds provide liquidity to the markets, and the system is designed to allow them some flexibility. The decimalization rule served them this flexibility on a silver platter. This rule was initially conceived as a way to attract private investors and lower the spread costs, but it was in fact an implicit authorization for large funds to manipulate markets. Indeed, before decimalization, if a fund wanted to lower the price of a stock, it had to sell at the bid enough shares to take out all the outstanding buy orders. Since the spread cost was high, all players entered their order in advance (first come, first served), and it was easy to see what large players wanted to do. Market manipulation at that time was quite costly. (For example, you had to sell perhaps 10,000 shares at a spread cost of $0.0625. This meant that if in fact you wanted to lower the price in order to buy a larger quantity at a lower price, you would have to purchase these 10,000 shares back $0.0625 higher. The manipulation would have cost you $625.)

Decimalization, though, lowered the spread cost, and therefore freed large players from disclosing their orders. This greatly reduced the size of the order book, allowing anybody with just a few hundred shares to increase or decrease the stock price. Typically, these days, if you have 1,000 shares, you can easily push the price down by one cent, at a cost of $1{,}000 \times \$0.01 = \$10$, which is 60 times less than before decimalization. I have no proof that markets are constantly manipulated. However, if a service suddenly costs 60 times less than it did the day before, you can be sure that this service will be used more often.

New Tools Are Necessary

Further on in this chapter I make detailed comparisons of the different tools that are used to study the price/volume relationship, but what I want to stress here is that a tool is an instrument that you are using to take a

measurement. That measurement gives you some clue about the underlying reality.

I like to compare trading a stock through technical analysis to the actions of an engineer who is in charge of a petroleum extraction rig. This engineer is responsible for digging a deep hole and eventually hitting a target. When drilling, the crew will encounter different types of ground texture; resistance and friction will increase. They will also encounter changing heat and pressure conditions. The engineer knows by experience that they will need more than one instrument to understand what is happening to the rig deep down in the hole. Similarly, traders need to use different tools when analyzing a stock.

The market is very complex. It is, of course, different from what it was 100 years ago, but it is also more complex than even 15 years ago. Just look at three key changes that have happened since then:

1. Communication speed has resulted in very quick price adjustments to news. Markets are becoming more efficient, but also crowded with many retail investors enjoying online communication.
2. Decimalization has changed the tactics of large players.
3. Hedge funds are bringing liquidity but also volatility (very large swings of price and volume).

A trader needs tools that can handle these changes. Such tools therefore need the following characteristics:

- The tools need to catch the strategic moves using an analysis of the accumulation/distribution tactics. Usually, institutional investors fragment one large order into many small orders that can then be sent undetected—this is called order fragmentation. Each small order will then be executed in one or more market transactions. Although data related to each transaction and each fragmented order is available, the tools need to "reconstruct" the fragmented orders, using minute data so that traders can have a better understanding of what institutional players are up to.
- The tools must be able to filter the noise out of the important signal. (We will see later in the chapter that only 25 percent of the total exchanged volume is responsible for 75 percent of the price changes. You'd better know the direction of the 25 percent and not move against the direction of these changes.)
- The tools must tell you if the moves of the large players are significant enough to induce a price change or to make or break a trend.
- The tools must allow you to make volatility adjustments between price and volume, which carry very different levels of volatility.

- The tools must show you what the position and expectation of other active traders are, because you will need to buy cheap—and a cheap price will be harder to find if everybody else expects the share price to decrease and is ready to sell. A cheap price is found when the last seller has finished selling and new buyers come in with a high expectation for the price to increase.

Finally, wouldn't it be nice if your computer scanned hundreds of stocks, applying all these new tools and giving you buy and sell signals?

VOLUME THAT MOVES THE MARKETS

When I started this work, I was almost completely convinced that large players were mainly responsible for stock price movements, because of the large size of their trades. Therefore, monitoring the movements of large players seemed to be the best way to monitor the whole market. My concern was to find out when institutional investors were moving in or out of stocks.

The analogy with Dr. Ilya Prigogine's work was telling me that I needed to do three things:

1. Measure the impact of volume changes to price changes at a level that was as close as possible to the transactional level.
2. Separate large from small volume.
3. See the evolution of such volume.

Therefore, I needed to be able to compare this evolution between fixed periods of time.

I was looking for a tool that could do these things. Because I am lazy, I tried to find an already existing tool, one that I could use right away.

I found two categories of tools: the "tick volume" tools and the "end of day" tools. As we will see later in this chapter, both types of tools have their own limitations and therefore neither could meet my needs.

Still wondering why nobody had found an answer to an obvious question ("What are large players doing?"), I started to develop my own tools.

In trying to answer that question, I realized that there are not that many different types of data to work with: on the time interval basis (1-minute, 5-minute, 10-minute), you can play with the open, high, low, and close of the price data, and add to it the volume data. On the transactional level, you have the order size, the execution time, the execution size, the price of execution, and some other minor information.

TABLE 1.3 One-Minute Data

		Open	High	Low	Close	Volume
9/25/06	14:27	$11.07	$11.07	$11.06	$11.06	5,889
9/25/06	14:26	$11.06	$11.06	$11.06	$11.06	200
9/25/06	14:25	$11.06	$11.07	$11.06	$11.06	28,335
9/25/06	14:24	$11.05	$11.06	$11.05	$11.06	18,131
9/25/06	14:23	$11.04	$11.06	$11.03	$11.05	33,188
9/25/06	14:22	$11.03	$11.04	$11.03	$11.04	3,298
9/25/06	14:21	$11.02	$11.04	$11.02	$11.04	29,658
9/25/06	14:20	$11.02	$11.02	$11.02	$11.02	17,825
9/25/06	14:19	$11.01	$11.02	$11.01	$11.02	11,351
9/25/06	14:18	$11.02	$11.02	$11.02	$11.02	40,889
9/25/06	14:17	$11.04	$11.04	$11.01	$11.02	14,015
9/25/06	14:16	$11.05	$11.06	$11.04	$11.04	13,802
9/25/06	14:15	$11.06	$11.06	$11.05	$11.06	32,536
9/25/06	14:14	$11.07	$11.08	$11.06	$11.06	16,399
9/25/06	14:13	$11.07	$11.08	$11.07	$11.07	20,041

Typical one-minute data format, including the minute opening price (open), the high of the minute (high), the low price of the minute (low), and the closing price of the minute (close). The last column represents the volume exchanged during that trading minute.

I started with the raw one-minute data such as that displayed in Table 1.3. Because the trading day is 6.5 hours long, there is a maximum of 390 trading minutes. Table 1.3 shows a typical data set, each line representing one minute. More recent data are shown at the top of the table. As shown in Table 1.3, each trading minute has an opening price, a high price, a low price, and a closing price. This means that during a trading minute, traders have been buying and selling shares. The price variations between the low and the high indicate that such activity existed. These price variations are usually done tick by tick. Conventionally, upticks and downticks are tiny price movements that move the price up or down by one tick (usually one cent). Within one trading time interval of one minute, there can be several upticks and downticks. From time to time, a volume spike takes the price up or down several ticks at a time.

I call *price inflections* the small price changes that occur between one trading minute and the next. Let's call the volume that is responsible for a price inflection the *Effective Volume*. We will see later how to calculate it. Please note that for me a price inflection of one tick has the same weight as a price inflection of two or more ticks, at least to measure the up and down buying and selling movements.

A price inflection indicates that the equilibrium between the bid and the ask was broken because of underlying market activity (traders pushing the price down instead of traders pushing the price up or vice versa). During one trading minute, the equilibrium can be broken on one side and then suddenly reverse to the other side. This usually happens when buyers and sellers trade similar volume sizes with a similar determination.

In the course of trading, suppose that an institution intends to place a large buy order. Either this large buy order will go as a block directly between institutions or that institution will have to buy from the market. Large orders placed at market usually push the price up. In order to go unnoticed, a large order has to be fractioned into tiny orders that will be brought to the market on a systematic basis. This must be done without triggering a new uptrend before the whole lot has been bought. This requires a careful tactical execution that involves a mix of order sizes and timing variations. Institutions either use special order-placing algorithms or obtain the assistance of a market maker.

How to Detect Such Movements

Only a fraction of the orders that reach the market are executed. Executed orders create transactions between a buyer and a seller. The buyer's and the seller's respective buy and sell orders are mutually filled. If you only study the transactions, it is very difficult to see the direction of these transactions. Because for each transaction there is a buyer and a seller, it is impossible to tell if sellers are stronger than buyers.

The direction of the trade is indicated by the small price change that occurs on the transaction: If the price increased on the transaction, the buyer was stronger (pushed the price up). Otherwise, the seller was stronger. Because institutions split up large orders into numerous small orders, studying the transaction size does not help in figuring out whether the transaction was generated by an institution. What we therefore need to do is study all the aggregated transactions within regular time intervals of one minute. The idea is to reconstruct the size of the original order by adding up all the transactions that occurred within one minute and to compare that number to the price variation.

Let's study this idea in one example: a large buyer. Let us suppose that an institution wants to buy 100,000 shares on the market of a stock that is trading 500,000 shares per day. The institution will probably have to use one of the following four tactics:

1. Place a large buy order at the bid.
2. Place regular small buy orders at the bid.

3. Place regular small buy orders at the ask.
4. Place a large buy order at the ask.

Let's study the consequences of such moves.

1. *Place a large buy order at the bid.* This is a passive strategy, since the institution has to wait for sellers to come to it. But, since regular buyers are still active, these players would need to bid the price up to get their shares. As a result, the institution will also have to raise its large bid, with the risk of starting a new uptrend. This method is ineffective for accumulating shares. It is easily detectable, since the large bid signals to the market that a large player is accumulating.
2. *Place regular small buy orders at the bid.* This is also a passive strategy, but the institution will not be easily detected. As we will see in Chapter 4, this strategy does not allow large players to take a significant position, and is therefore probably not often used.
3. *Place regular small buy orders at the ask.* This strategy is more active, because the institution is actively buying shares. This method requires that the institution have patience in its accumulation, to avoid price spikes that could trigger a new uptrend. However, because the buying is regular during a short period of time, the supply of shares will momentarily dry up and the price will momentarily increase. The institution needs to monitor these small price increases. If the small price increases trigger a change of key technical patterns, they could attract more buyers while the institution has not met its targeted number of shares. On small price increases, the institution must therefore either (1) wait for new sellers to come and push the price back down or (2) push the price back down by itself with a small sell order. Because of the statistical significance of the repetitive buying pattern, even distanced buy orders placed at the ask form a pattern using the Effective Volume, which I explain in the next section. The visible pattern is that large volume will be more often linked to price increases than to price decreases.
4. *Place a large buy order at the ask.* This very active strategy is used only when several institutions are competing to get shares, or when an institution wants to trigger a price increase by signaling to the market that it is buying shares. This is easily detectable through the monitoring of the price trend.

It should now be clear to the reader that what we need to analyze is not the situation at one point in time, but the regularity of the pattern during a set of consecutive, identical time intervals.

Traditional Way to Calculate Shares Accumulation

Larry Williams created a now widely used formula to calculate the accumulation/distribution (A/D) balance on daily charts. Figure 1.2 shows such a calculation. The principle is to weight the total volume exchanged during the day by the price gain/loss, divided by the price spread during that day.

- Share accumulation means buying.
- Share distribution means selling.

The simple idea behind this is to say that if shares are exchanged during the day and the closing price is higher than the opening price, for example, the total result is considered positive: Buyers are stronger than sellers. This means that on average, there is share accumulation during the day.

However, if the price spread during the day is very large compared to the gain, it means that traders have been fighting during the day. Therefore, the strength in accumulation of shares should be proportional to the extent of the fight.

In Figure 1.2:

- The gain = the outcome of the fight = \$10.4 − \$10.2 = \$0.2.
- The spread = the extent of the fight = \$10.5 − \$9.8 = \$0.7.

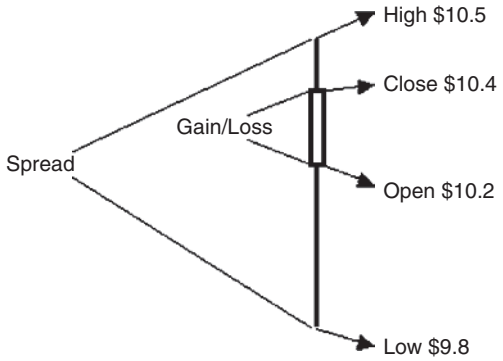

FIGURE 1.2 Larry Williams accumulation/distribution example #1.

$$\text{Accumulation} = \frac{\text{Gain}}{\text{Spread}} \times \text{Volume}$$

$$\frac{\$10.4 - \$10.2}{\$10.5 - \$9.8} \times 100{,}000\,\text{shares} = 28{,}571\,\text{shares}$$

- The number of shares shown by the accumulation calculation is therefore:

$$100{,}000 \times \frac{\$0.2}{\$0.7} = 28{,}571 \text{ shares}$$

However, if the opening price had been \$10.4 and the closing price \$10.2, there would have been a loss of −\$0.2, and we would have seen the same number of shares (28,571 shares), but on the distribution side.

We can note two potential problems with this formula:

The first problem is shown in Figure 1.3. Because the spread and the gain shown in Figure 1.3 are identical to the spread and the gain shown in Figure 1.2, the result of the accumulation/distribution calculation is identical: 28,571 shares in both cases.

However, some traders will tell you that the close of Figure 1.2 is stronger than the close of Figure 1.3, because the price in Figure 1.2 closed higher. Therefore, the share accumulation shown in Figure 1.2 is maybe more important than the share accumulation shown in Figure 1.3. This is why traders who calculate the accumulation/distribution of shares on the

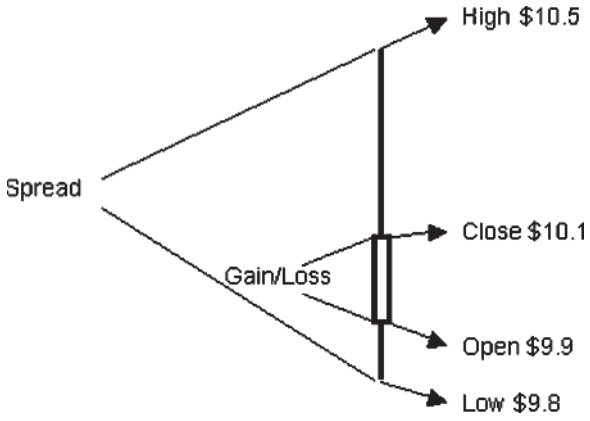

FIGURE 1.3 Larry Williams accumulation/distribution example #2.

$$\text{Accumulation} = \frac{\text{Gain}}{\text{Spread}} \times \text{Volume}$$

$$\frac{\$10.1 - \$9.9}{\$10.5 - \$9.8} \times 100{,}000 \text{ shares} = 28.571 \text{ shares}$$

Accumulation as defined by Larry Williams is independent of the relative position of the gain within the high-low range.

basis of price spread during a day will also look at where the close ended compared to the price spread. If the close ended near the high, they would conclude that the buying side had been stronger than the selling side.

The second potential problem is a lesser-known one: manipulation of the opening price sometimes exists. A strong opening price may attract buyers, while a strong closing price may attract sellers. A fund that wants to sell a large number of shares could therefore try to set a positive tone by forcing a strong opening.

In case of a different opening price, the Larry Williams accumulation/distribution formula yields quite a different result. Figure 1.4 shows that if the opening price had been \$10.5 instead of the open of \$10.2 shown in Figure 1.2, the Larry Williams formula would have resulted in a distribution of 14,286 shares instead of the accumulation of 28,571 shares calculated in Figure 1.2.

My message here is simply that in some cases, the opening price might be less valid as a parameter than the closing price. In general, methods that use end-of-day data could be more vulnerable to price manipulations, since they rely on fewer data points. The comments relative to Figures 1.2–1.4 have not been backed by any research data. The interested reader should refer to Larry Williams' book *Long-Term Secrets to Short-Term Trading*.

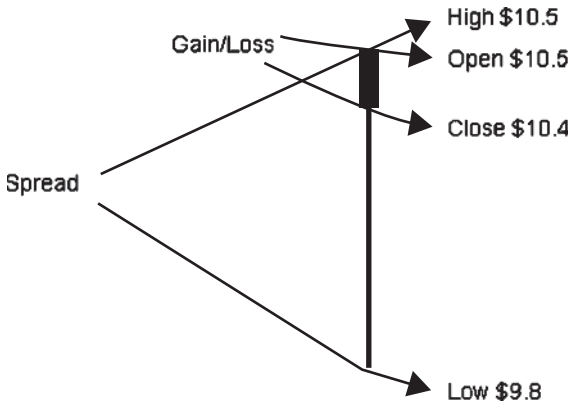

FIGURE 1.4 Larry Williams accumulation/distribution example #3. This method is very sensitive to opening price manipulations. In this case, an opening price at \$10.5 instead of \$10.2 results in a distribution of 14,286 shares instead of an accumulation of 28,571 shares.

$$\text{Distribution} = \frac{\text{Loss}}{\text{Spread}} \times \text{Volume}$$

$$\frac{\$10.2 - \$10.5}{\$10.5 - \$9.8} \times 100{,}000 \text{ shares} = -14.286 \text{ shares}$$

Do Not Trade Like My Grandmother

The classic technical tools that use the daily price changes and the daily volume are based on two assumptions regarding volume:

The first assumption is the price repartition of volume. These tools suppose that the volume is regularly distributed at every tick between the low and the high prices of the day.

Let us take the example of the company Tellabs on September 20, 2006. On that day, during trading hours, about 11 million shares changed hands. The Larry Williams accumulation formula gives:

Opening price: \$10.35

High price: \$10.41

Low price: \$10.05

Closing price: \$10.29

$$\text{Distribution} = \frac{\$10.29 - \$10.35}{\$10.41 - \$10.05} \times 11{,}000{,}000$$

$$\text{Distribution} = -1{,}833{,}333 \text{ shares}$$

Based on this example, this means that at every tick between \$10.05 and \$10.41, 297,000 shares were exchanged (see Figure 1.5a) (11,000,000 divided by the difference between \$10.05 and \$10.41 plus 1 tick, since the subtraction eliminates one of the two ticks at the extremities—the tick of

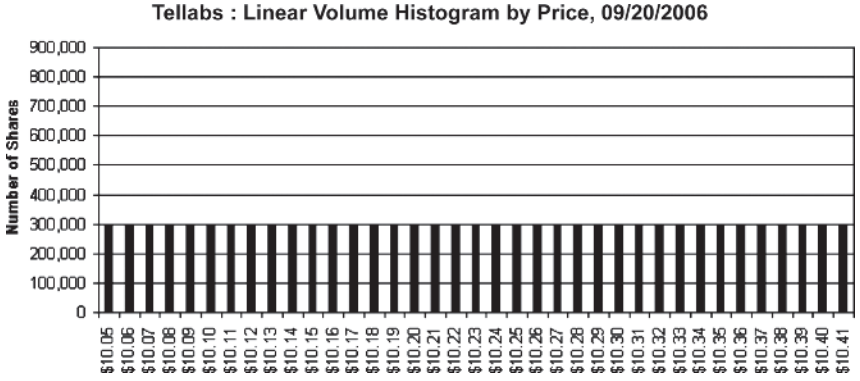

FIGURE 1.5a The linear volume repartition by price level. Linear volume repartition by price level is the first simplification implied by technical tools that use daily price variations and volume.

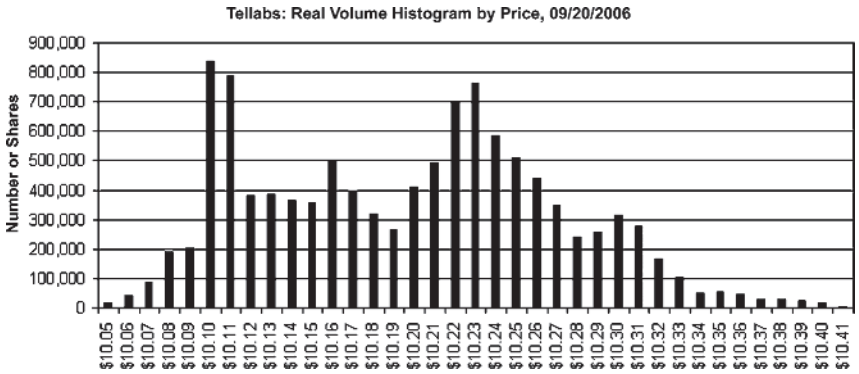

FIGURE 1.5b The real volume repartition by price level. The real volume repartition by price level is very different from the linear repartition.

the minute low price or the tick of the minute high price; between $10.05 and $10.41, there are therefore 37 ticks and not 36 as a normal subtraction would show).

In reality, the volume exchanged forms an irregular pattern, as shown in Figure 1.5b.

The second assumption is the time repartition of volume. The traditional tools suppose that the volume is regularly distributed every minute between the open and the close of the trading day. In our example, this means that at every minute between 9:30 A.M. and 4:00 P.M., 11,000,000 ÷ 390 = 28,205 shares have been exchanged (see Figure 1.6a). In reality, the daily buying and selling pattern clearly shows that volume came in spikes, and that a large proportion of the transactions occurred at the end of the trading day (see Figure 1.6b).

The two assumptions made by traditional tools that use end-of-day data to calculate the accumulation/distribution of shares are so drastic that as a trader, I have little confidence in using these tools, although some traders may find them reliable.

Indeed, one big characteristic of volume is that it comes in spikes. Typically, you would see many transactions of 100 shares and then suddenly a single transaction for 10,000 shares, or a set of transactions that would fill many small orders. In short, volume has a very high volatility on a minute-by-minute level.

On the day-by-day level, too, volume could jump 100 percent from one day to the next. This volatility is well known to traders whose mantra is "A price increase on a strong volume day is more valid than a price increase on a weak volume day." This is experience talking, similar to my

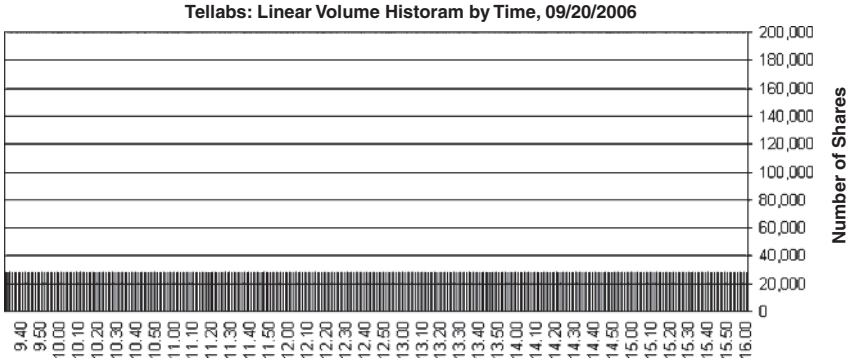

FIGURE 1.6a The linear volume repartition. The linear volume repartition by time level is the second simplification implied by traditional tools that use daily price variations and volume.

grandmother's advice when making jam: "If you close the pot when the jam is hot rather than when it's cold, the jam will keep longer." She was talking about what she knew from experience; she didn't have to be knowledgeable about the microbiological phenomenon.

Most of today's traders still act in the markets like my grandmother did in the kitchen. They understand little about the trading mechanism, and few really are aware of what their trading tools are calculating or what their limitations are.

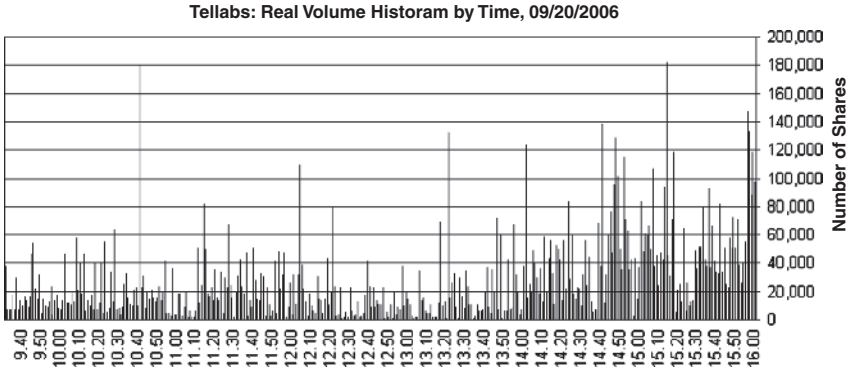

FIGURE 1.6b The real volume repartition by time level. The real volume repartition by time level is very different from the linear volume repartition.

Do not trade like my grandmother made jam. You need to understand what is going on in the market that you trade. There are two ways to gain knowledge:

1. Invest time to study how the market works. I advise you to participate in one of the seminars that Dr. Alexander Elder gives, or even one of his weeklong trading camps. Not only do these courses give you a working structure, but they also help you to feel how the market is moving. You will gain knowledge and confidence.
2. Use modern tools that will tell you what is happening.

EFFECTIVE VOLUME

To define the Effective Volume tool, I applied three modifications to Larry Williams' method. Let's look at Figure 1.7, where we see the evolution of the price during one trading minute. We can see that the price evolved among five ticks: \$10.00, \$10.01, \$10.02, \$10.03, and \$10.04. If we suppose that 5,000 shares were traded during that trading minute, Larry Williams' formula would tell us that the share accumulation is:

$$\text{Accumulation} = \frac{\$10.03 - \$10.01}{\$10.04 - \$10.00} \times 5{,}000 = 2{,}500\,\text{shares}$$

1. The first modification is to replace the open of the actual trading minute with the close of the previous trading minute. This modification looks at the volume that has a real impact on the price from one trading minute to the next. If the price increased, the Effective Volume will be positive. Otherwise it will be negative.

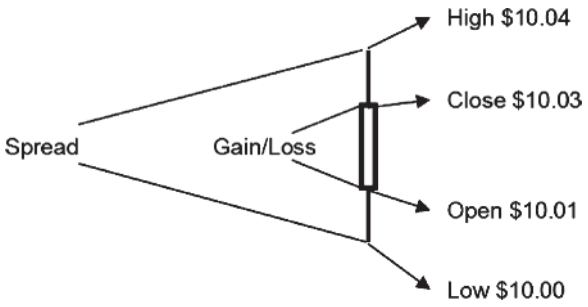

FIGURE 1.7 Larry Williams accumulation/distribution.

2. If the close from the previous minute is lower than the low of the actual minute, the second modification is to replace the low of the current minute with the close of the previous minute. Similarly, if the close from the previous minute is higher than the high of the actual minute, then the Effective Volume method requires replacing the high of the current minute with the close of the previous minute. In our example, if we suppose that the previous close was at \$9.99, we then would need to use that previous close in our calculation instead of the open of the minute (see Figure 1.8). This modification would give us the following number of shares being accumulated:

$$\text{Accumulation} = \frac{\$10.03 - \$9.99}{\$10.04 - \$9.99} \times 5{,}000 = 4{,}000\,\text{shares}$$

3. A last small adjustment still needs to be done: When applying the modified Larry Williams formula on small time intervals, it is necessary to add 0.01 to the top and to the bottom of the formula. The reason for this is that when shares are distributed between, for example, a low of \$9.99 and a high of \$10.04, it means that the shares traded at \$9.99, \$10.00, \$10.01, \$10.02, \$10.03, and \$10.04—six ticks instead of five (as would have been the case with the Larry Williams formula that simply subtracts \$9.99 from \$10.04, which would equal \$0.05 or only five ticks).

Applying the three small modifications to our example, the Effective Volume calculation gives the following results:

$$\text{Accumulation} = \frac{\$10.03 - \$9.99 + \$0.01}{\$10.04 - \$9.99 + \$0.01} \times 5{,}000 = 4{,}167\,\text{shares}$$

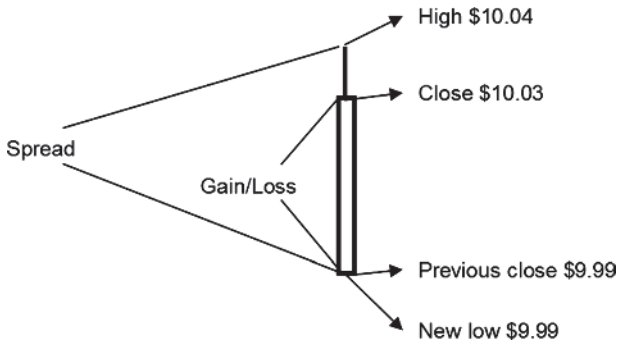

FIGURE 1.8 Modified Larry Williams accumulation/distribution.

Effective Volume Formula

The Effective Volume is calculated by using the following formula, which is a modified version of the Larry Williams accumulation/distribution (A/D) formula:

$$\frac{(\text{Close}_{i-1} - \text{Close}_i) + \text{PI}}{\text{High}_i - \text{Low}_i + \text{PI}} \times \text{Volume}_i$$

where Close_{i-1} = Closing price corresponding to time interval $(i-1)$: TI_{i-1}
Close_i = Closing price corresponding to time interval i: TI_i
High_i = Max (High_i, Close_{i-1})
Low_i = Min (Low_i, Close_{i-1})
PI = Price interval (usually US $0.01)

As you can see, the Larry Williams formula was changed in three ways:

1. I replaced the open of the time interval with the close of the previous time interval.
2. I adapted the high and the low of the current time interval to the value of the close of the previous time interval.
3. I added the PI number, usually 0.01, to use the exact number of ticks between Close_{i-1} – Close_i and between High_i – Low_i, and not just the mathematical difference between these values.

The last column of Table 1.4 shows the calculated values for Effective Volume using the preceding definition. A simpler definition of the Effective Volume, as presented in the Foreword written by Dr. Elder, consists of considering as "selling volume" the volume that pushed the price down from one minute to the next and as "buying volume" the volume that pushed the price up. Both definitions would produce similar results, because the main influential element of both definitions is to consider only the volume that is linked to a price change from one minute to the next, while the price variations within one trading minute carry a relatively small importance.

The rightmost column shows the Effective Volume figures calculated for every trading minute. It is their cumulative value that gives the Effective Volume flow shown in Figure 1.9.

What Is the Effective Volume Flow?

The Effective Volume flow is the total value of cumulated Effective Volume values from one minute to the next. It is interpreted similarly to any

TABLE 1.4 Effective Volume Example

		Open	High	Low	Close	Volume	Effective Volume
9/25/06	14:27	$11.07	$11.07	$11.06	$11.06	5,889	0
9/25/06	14:26	$11.06	$11.06	$11.06	$11.06	200	0
9/25/06	14:25	$11.06	$11.07	$11.06	$11.06	28,335	0
9/25/06	14:24	$11.05	$11.06	$11.05	$11.06	18,131	18,131
9/25/06	14:23	$11.04	$11.06	$11.03	$11.05	33,188	16,594
9/25/06	14:22	$11.03	$11.04	$11.03	$11.04	3,298	0
9/25/06	14:21	$11.02	$11.04	$11.02	$11.04	29,658	29,658
9/25/06	14:20	$11.02	$11.02	$11.02	$11.02	17,825	0
9/25/06	14:19	$11.01	$11.02	$11.01	$11.02	11,351	0
9/25/06	14:18	$11.02	$11.02	$11.02	$11.02	40,889	0
9/25/06	14:17	$11.04	$11.04	$11.01	$11.02	14,015	−10,511
9/25/06	14:16	$11.05	$11.06	$11.04	$11.04	13,802	−13,802
9/25/06	14:15	$11.06	$11.06	$11.05	$11.06	32,536	0
9/25/06	14:14	$11.07	$11.08	$11.06	$11.06	16,399	−10,933
9/25/06	14:13	$11.07	$11.08	$11.07	$11.07	20,041	0

other indicator that gives a general view of the accumulation or distribution of shares (see Figure 1.9). Its interpretation is straightforward: Effective Volume that is trending up means accumulation (buying); if it is trending down, that means distribution (selling). Effective Volume sometimes precedes price and sometimes follows price. We will study later how to interpret its movements compared to the price movements.

Why Does the Effective Volume Not Use the First Minute of Trading?

The Effective Volume method requires ignoring the first minute of a trading day, because the volume exchanged during the first minute of trading relates to overnight news and overnight orders. Traders who place their trades before the opening are usually not professional traders. Large players such as institutions do not react on news, but instead carefully plan their entries and exits. I therefore believe that since the main objective of Effective Volume is to monitor large players, it is better to avoid the first minute of trading.

Why Take the Close of the Previous Minute?

It is also important to take the close of the previous minute instead of the open of the actual minute. The reason is that if the open is different, it means that the last transaction that ended the previous trading minute

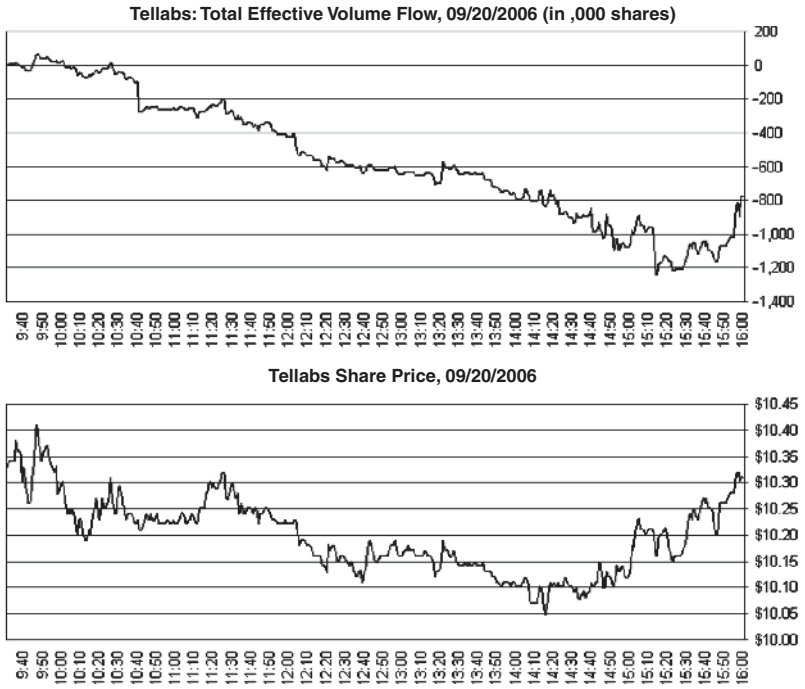

FIGURE 1.9 The Effective Volume flow and the price pattern. The Effective Volume flow shows the accumulation/distribution trend. It is computed by cumulating the Effective Volume calculated at every trading minute. We can see in this example that the Effective Volume trend is consistent with the price trend during the trading day of September 20, 2006.

exhausted either the bid or the ask, forcing the next transaction to open the next trading minute at a different price. This indicates the movement of the supply/demand balance. Indeed, if we start a new trading minute at a higher price, we know that the previous transaction took out the ask, and that the next transaction is a buying transaction that could not meet a seller at the previous ask, and therefore forced the ask up.

How Can We Monitor the Movements of Large Players?

In order to follow the tactical moves of large players, we need to separate the Effective Volume into two groups: the large players and the small players. A separation volume separates these groups. This means that for every trading minute we will examine the size of the Effective Volume that has been exchanged during that time interval. If the size of the exchanged

Effective Volume is higher than the separation volume, then we put this Effective Volume into the group of the Large Effective Volume. Otherwise, we put it into the group of the Small Effective Volume (I explain later in the chapter how to define the separation volume). Obviously, the total Effective Volume is the sum of the Large Effective Volume and the Small Effective Volume.

The Large Effective Volume separation is easier to understand with graphs. Figure 1.10 shows the price evolution during the last trading hour for the company Tellabs on September 20, 2006. Figure 1.11 shows the corresponding volume during the last trading hour.

The first step is to calculate the Effective Volume. Figure 1.12 shows the total volume from which only the volume that corresponds to price inflections was kept. Figure 1.13 shows the total Effective Volume. You can already visually notice that the Effective Volume represents only about half of the total volume exchanged.

The second step was to then separate the Large Effective Volume (Figure 1.14a) from the Small Effective Volume (Figure 1.14b). Now, look closely at these two figures. If you count the number of bars in Figure 1.14a, you will notice that there are only 17 bars. Figure 1.14b, by contrast, shows a total of 26 vertical bars, but these 26 bars are shorter than the bars in Figure 1.14a. The bars in Figure 1.14b represent the volume exchanged by small players, while the bars in Figure 1.14a represent the volume exchanged by large players.

Now, if you take a pair of scissors and cut out the vertical bars of Figure 1.14a, adding them end to end, you will create a very high vertical bar.

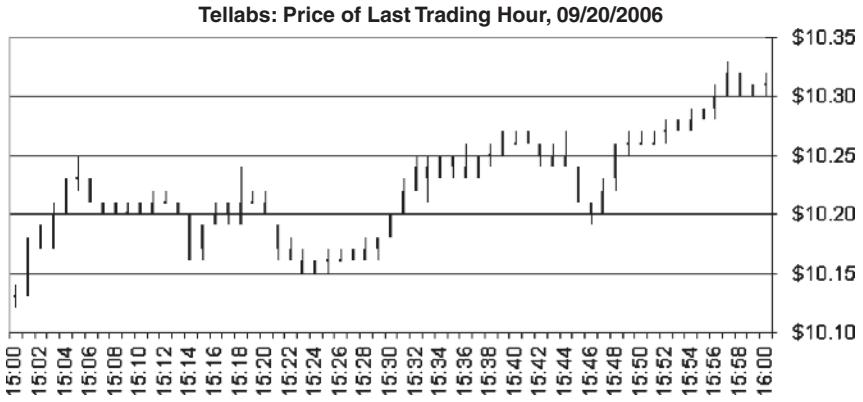

FIGURE 1.10 Tellabs closing price of last hour of trading on September 20, 2006. The chart shows an example of the minute-by-minute closing price bars for the last trading hour.

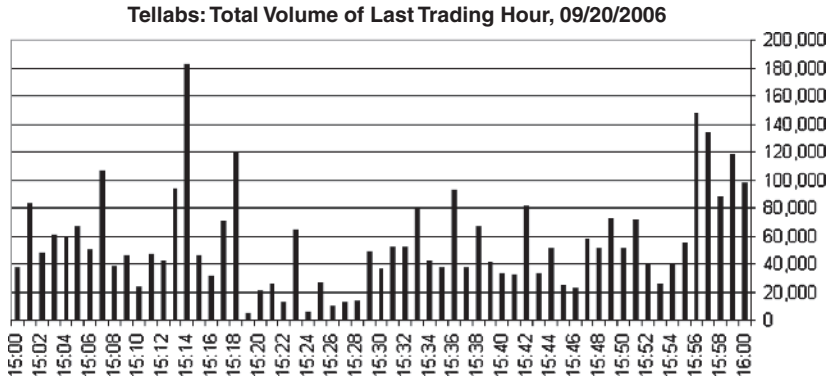

FIGURE 1.11 Tellabs total volume of last hour of trading. The chart shows an example of the minute-by-minute volume bars for the last trading hour for the company Tellabs on September 20, 2006.

The height of this vertical bar represents the sum of all the volume exchanged by large players during the last hour of trading, and that is responsible for a price inflection.

If you do the same with the small players, you will create a second vertical bar by adding up all the bars of Figure 1.14b. The height of this second vertical bar represents the sum of all the volume exchanged by small

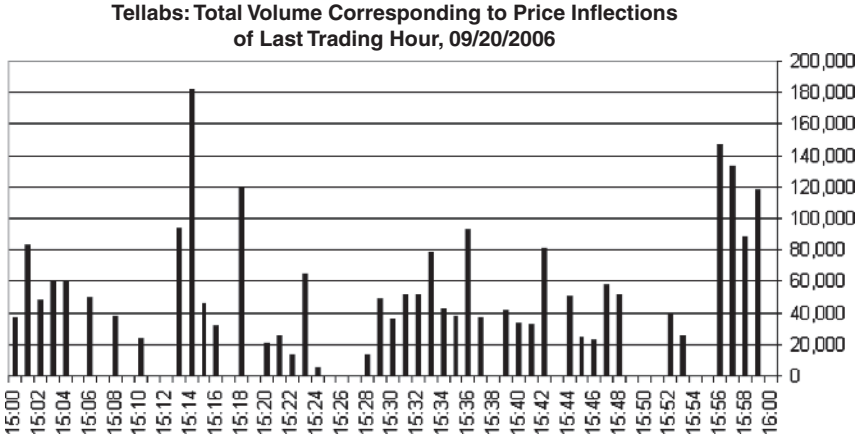

FIGURE 1.12 Total volume corresponding to price inflections. The first step is to consider only those trading minutes for which there was a price change between the previous minute and the actual minute.

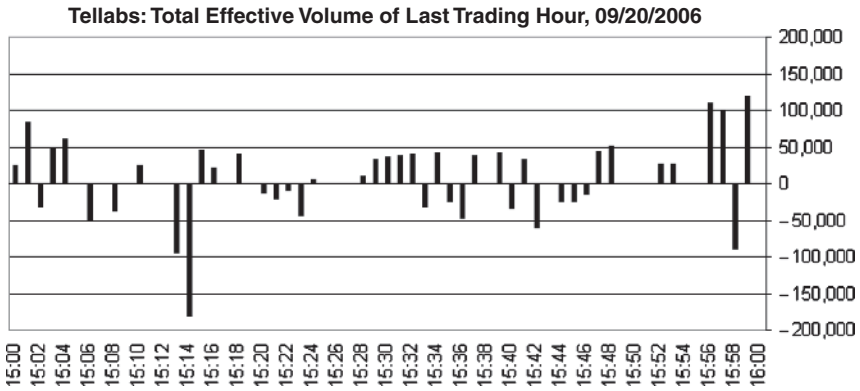

FIGURE 1.13 Total Effective Volume.

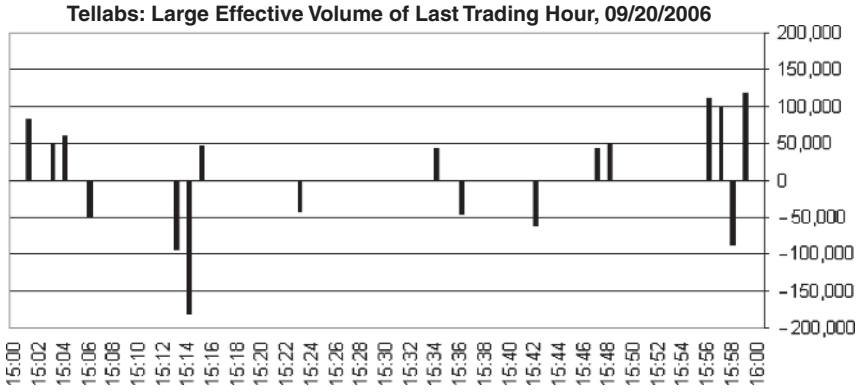

FIGURE 1.14a Large Effective Volume.

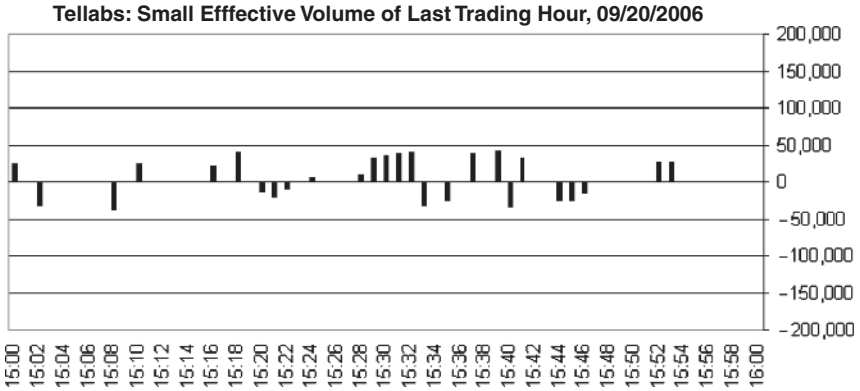

FIGURE 1.14b Small Effective Volume.

players. You will then notice that this second vertical bar has the same height as the first one.

The separation volume between small and large players during a fixed analysis period (one trading day, for example) is defined as the one-minute volume that divides all the players into two groups (large and small) in such a way that the volume of shares exchanged during that fixed period becomes equal (or as equal as possible) between the two groups.

Since the Effective Volume method builds two groups of players with the same number of shares, we can say that each group has the same purchasing or selling power as the other. The difference between the two groups is the determination or the overall trend that they are able to force on the price.

Let's have a look at Figures 1.15a and 1.15b. Which is easier to see: the trend of arrows in Figure 1.15a or in 1.15b? The difference between the two figures is that in Figure 1.15b I have erased all the smaller arrows. Without the noise generated by smaller arrows, the general trend is easier to grasp at a glance.

Playground Analogy

To better understand the Effective Volume concept and its analytical power, let's imagine schoolchildren aged six through 15 playing on a

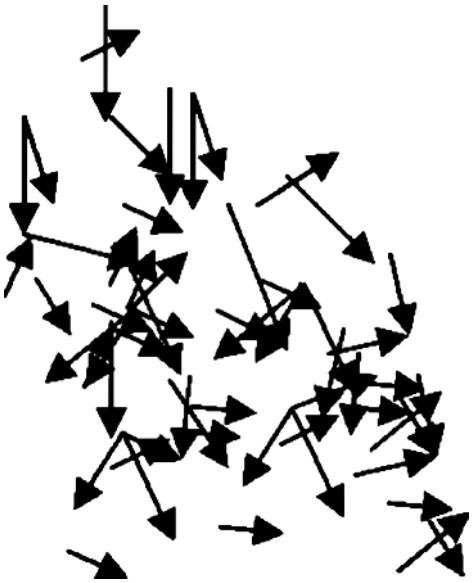

FIGURE 1.15a Large and small arrows. It is difficult to see the overall trend because of the noise generated by the smaller arrows.

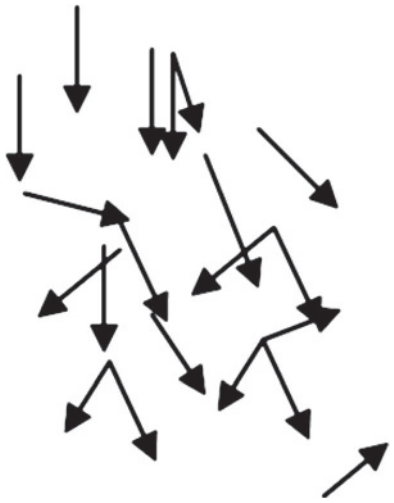

FIGURE 1.15b Large arrows only. The overall trend direction is clearer after the smaller arrows are eliminated.

playground in winter. These kids are instructed to throw snowballs at two Chinese gongs that are placed in the center of the playground. The first gong is called "Long" and the second is called "Short." The goal of the kids is to make as much noise as possible. The two gongs make distinct sounds, and the stronger the throw, the louder the sound.

Now, the goal of the teachers is to find out which gong produces the louder sound. To complicate the game, the school principal has two bags of magic powder that he throws every quarter of an hour on the playground. These two types of powder are called "positive earning surprise" and "negative earning surprise." When the "positive earning surprise" powder is thrown, the "Long" gong gets bigger and the "Short" gong gets smaller. The opposite happens when the "negative earning surprise" powder is thrown.

Obviously, the children aiming at the bigger gong will hit it more often. Therefore, it pays to study the size modification of the gong, and to study how many balls are hitting the gong. This is called the *standard technical analysis*.

Some professors prefer to study what the principal is doing, to see if he takes from one bag more often than the other, to see if he brought more of this or that powder, and so on. This is called *fundamental analysis*.

Obviously, if no child throws a snowball, no sound will be heard. Therefore, it is fair to say that the sounds originate from the children's activity, just as price moves are a consequence of buying and selling activity. On the playground, a six-year-old makes fewer snowballs, strikes with less power, and misses more often than a 15-year-old. It pays to look at the older kids'

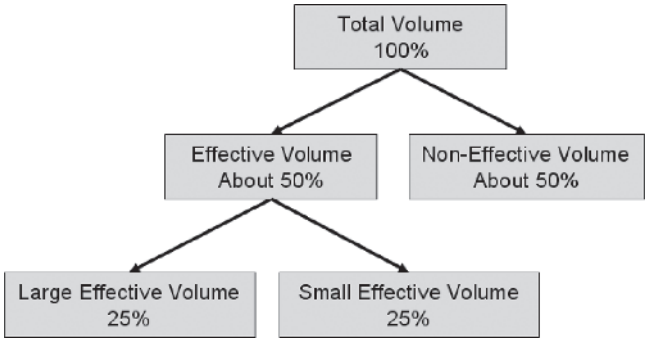

FIGURE 1.16 How volume is distributed.

behavior to guess the strength of the coming sound. Because we cannot watch all the children (there could be 2,000 or 20,000), what we end up doing is looking at all of the coming snowballs and listening to the collection of small and loud sounds made by each snowball. What we need is recording equipment that can both separate the coming balls by strength (size and velocity) and analyze only the sounds of the stronger snowballs.

My studies have shown that on a regular basis, half of the volume exchanged in one day has no impact on price movements (price inflections). These are the snowballs that miss the gong. The other half, which does have an impact on price changes, is called the Effective Volume. The Effective Volume represents the balls that hit the gong.

My studies have also revealed that if you separate the Effective Volume further in two groups of identical size in terms of total number of shares, the group with larger volume will be responsible for most of the price movements (see Figure 1.16). As a rule of thumb, I can say that 25 percent of the volume involved in stock trading is responsible for 75 percent of the price movements. I call this the Large Effective Volume, which is roughly 25 percent of the total volume. Knowing whether the players responsible for this 25 percent are buying or selling is critical for successful trading.

PRACTICAL EXAMPLES OF EFFECTIVE VOLUME CALCULATIONS

The Effective Volume method can be used in three instances:

1. A flat or sideways trading range will probably break in the direction of the Large Effective Volume flow (a trading range is formed when the price stays for some time at about the same value).

2. A price uptrend with a negative Large Effective Volume flow indicates that problems may lie ahead.
3. A price downtrend with a positive Large Effective Volume flow indicates that the downtrend might not be sustainable.

Follow the Large Players Accumulating in a Trading Range

The most effective way of using the Effective Volume tool is to look for accumulation by large players during a trading range. When I see such an accumulation taking place during a few consecutive days, I purchase shares. I then place a stop below that trading range and wait for the stock price to rise. If large players stop buying before the price rises, I review the situation.

Unfortunately, large players are not always right. They do not always act on privileged information or after running sophisticated analysis. However, if you have to buy a stock, you are certainly better off buying a stock that is experiencing strong accumulation by large players, especially if your traditional tools indicate that the time is right to buy.

Here is a good example with the company Federated Investors Inc. (FII). The weekly traditional analysis chart shows in Figure 1.17 that at point A the stock price is back to a one-year-old support level. Since it is hitting the line of support, the probability for a reversal is high. The Relative Strength Index (RSI) shows an oversold signal, indicating a possible cheap value compared to past prices.

The daily graph (Figure 1.18) shows that at point A we are in a trading range, but it is difficult to evaluate the best timing to purchase the stock: Is it better to buy at point A or at point B? Please note that during a trading range, both RSI and moving average convergence/divergence (MACD) are of little use.

The Effective Volume analysis clearly shows that during the trading range, one or more large players have been heavily accumulating (see Figure 1.19). You can see that the difference between the buying and the selling pressure by large players was greater than 1,000,000 shares during the last 20 trading days leading to point B, or 50,000 shares per day. Knowing that 800,000 shares on average are exchanged every day, the imbalance between buyers and sellers was 50,000/800,000 = 6.25%, which is by experience very important.

A good question would be: How do we know that we need to buy at point B instead of buying at point A?

The answer is: We do not know! There is no way to know when the large players will be satisfied with the accumulated shares, and when (if

FIGURE 1.17 Federated Investors weekly price graph.
Source: Chart courtesy of StockCharts.com.

ever) the price will move up (we may suppose that the price will move in the direction of the Effective Volume accumulation, which is often the case). My own rule of thumb is to buy during a trading range when the accumulation by large players is constantly above 5 percent of the daily volume for a minimum of three consecutive trading days.

Figure 1.20 shows an increase in price from point B, which was not triggered by any news. We may speculate that the large players decided that they had bought enough shares and that it was now time to push the price up, attracting new buyers. (Please note the dating convention used in the graphs: 07/10/06 means July 10, 2006. The same convention is used throughout the book.)

Another question that you may ask is "When do I need to sell?" This is a good question, but Effective Volume alone will not give a satisfactory answer. Indeed, finding a good selling point is much more difficult than finding a good entry.

You could sell for a few different reasons:

- Your target has been reached.
- Large players have stopped buying.

FIGURE 1.18 Federated Investors daily price graph.
Source: Chart courtesy of StockCharts.com.

- The price has not moved for some time.
- There has been bad news.
- The price has become expensive compared to the underlying value of the equity.

We will analyze the selling decision process in Chapters 5 and 6.

Follow the Insiders

Insiders have many reasons to sell, but only one reason to buy: to make a profit.

We are going to see how to try to catch insiders' moves. I do not consider company officers here, but rather indirect insiders, the ones who by chance got access to restricted information (although they are not restricted from buying and selling shares).

What characterizes the difference between an insider and a large player is the time span they use to buy or sell. A fund will need quite a

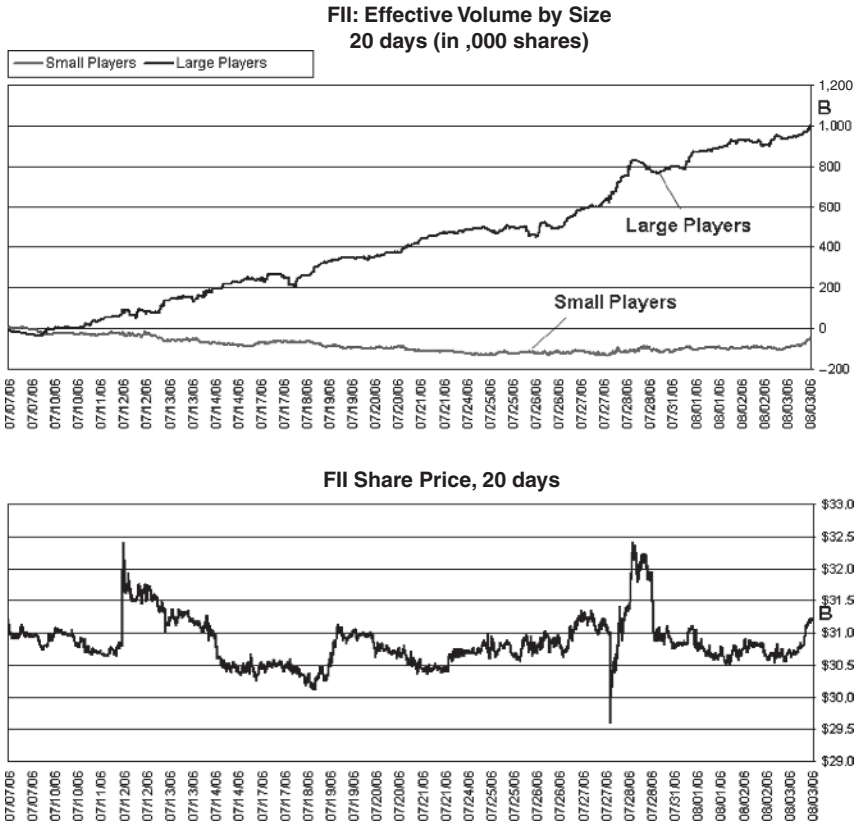

FIGURE 1.19 Federated Investors Effective Volume analysis.

long time to accumulate or distribute shares, while a typical insider may be satisfied with only a one-time purchase of a few thousand shares. Also, an insider plays like an option investor: The option will expire at some time. Similarly, the insider's advantage will expire at the publication of the news. The closer we are to the release date of the news, the smaller the insider's advantage is, because of the higher probability that other insiders will get the information and will move ahead of him.

There are several types of news:

- News that is linked to the day-to-day business: the discovery of oil for a petroleum company, a new patent for a high-tech company, an approval from the Food and Drug Administration for a pharmaceutical company, a very large contract, and the like.

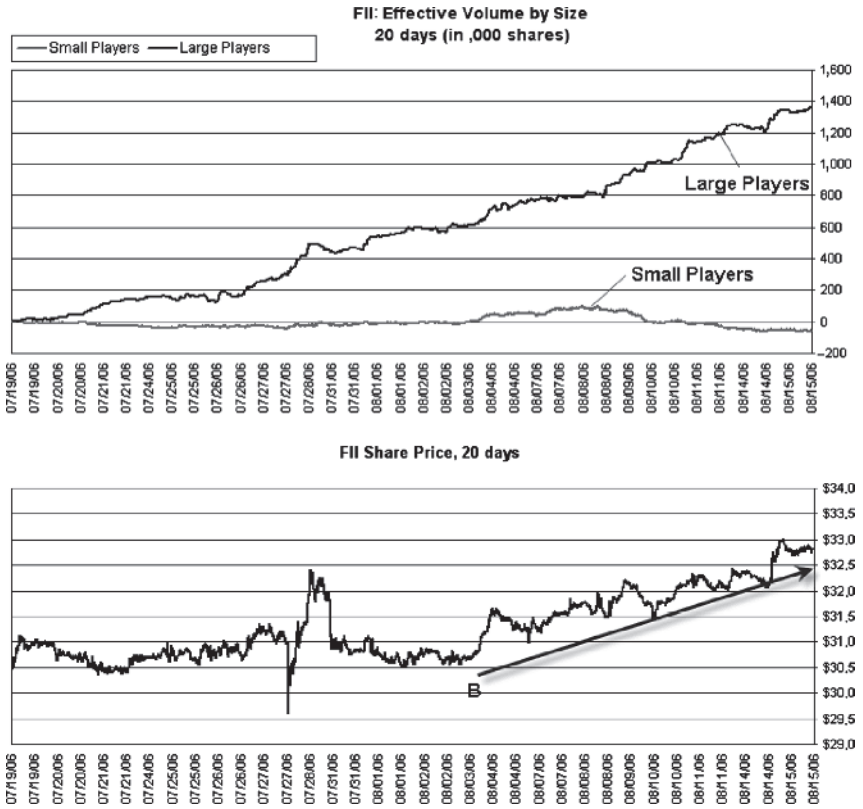

FIGURE 1.20 Federated Investors Effective Volume analysis.

- Exceptional news: a Securities and Exchange Commission (SEC) inquiry for any listed company, the purchase of another company, and so forth.
- The regular news: the good/bad quarterly earnings releases.

Day-to-Day Business Insider Let's have a look at an example of an insider move for PetroQuest Energy, Inc., a natural gas exploration company.

Looking at Figure 1.21, we can see two uptrends in Large Effective Volume: uptrend A and uptrend B. Uptrend A is normal; large players buy the stock, pushing the share price up. However, uptrend B is more difficult to explain, since the price is decreasing during the same period. Also, uptrend B in Large Effective Volume is stronger than uptrend A; during uptrend A, there was a net difference of 120,000 shares being bought. This difference

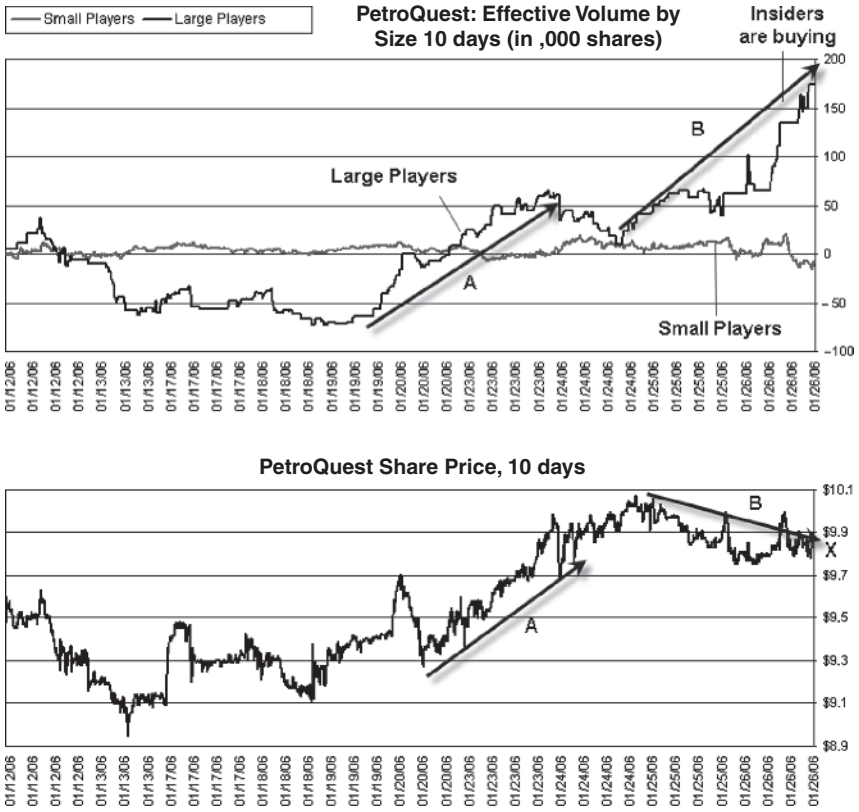

FIGURE 1.21 PetroQuest: Effective Volume analysis.

pushed the price up from $9.3 to $9.9, or 6.5 percent. How can we explain that during uptrend B the price declined by 3 percent while the net buying by large players was about 170,000 shares? The price should have proportionally increased by another 9 percent.

The B arrow of Figure 1.21 shows that some lucky investor bought 170,000 shares at an average price of $9.9, to see the price increase to over $12 in a matter of two days, as shown in Figure 1.22. This is a no-risk profit of more than $357,000. This is not a hedge fund or an institutional investor—just a standard information leak.

The PetroQuest 8-K filing on January 27, 2006, stated:

> *On January 27, 2006, PetroQuest Energy, Inc. (the 'Company') issued a press release announcing production and estimated proven reserves results for the year ended December 31, 2005. In*

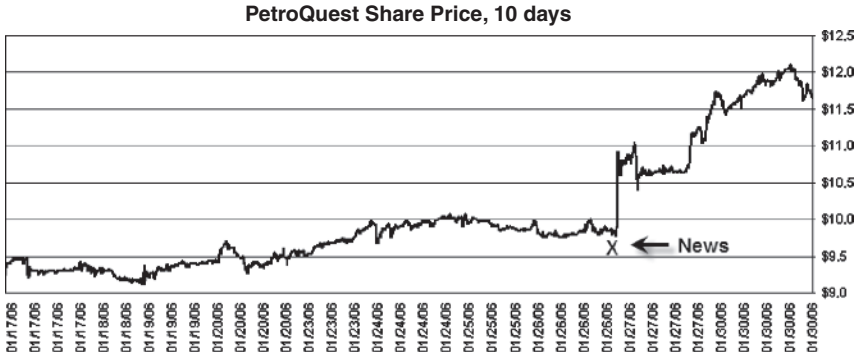

FIGURE 1.22 PetroQuest: price spike.

addition, the Company provided 2006 production guidance, an update of hedge transactions, and an overview of recent acquisition and drilling activities.

The main reason I developed the Effective Volume analysis was that I was fed up with being the last to know when some news was coming into the market.

When I returned home after a good working day, it often was too late to profit from good news or to avoid losses if the news had been bad. I lost money more often than necessary on bad news that was already known by a few. I also sold too quickly before good news hit the market.

Today, I still miss some big moves, but with the Effective Volume tool, I gain more of an insider view. Most important, I now have some time to *act* before the news hits the market rather than just *react* to the news.

Earnings Leaks Let's have a look at an earnings-related insider move for Ariba, Inc. (ARBA). Figure 1.23 shows normal behavior by large players who are pushing the price up during the A uptrend. By contrast, we can admire the share accumulation that took place during the B price downtrend, just before the earnings release that triggered the price jump shown in Figure 1.24.

Of course I cannot say with 100 percent certainty that this is an example of insider trading, but those 100,000 shares that were purchased between $7.5 and $8 (between January 19 and January 23) saw their value jump to $9.5 overnight—a gain of about $175,000. Another lucky investor!

A Mistaken Signal Signals before earnings can be dangerous, however, especially signals on the downside. Let's have a look at the company

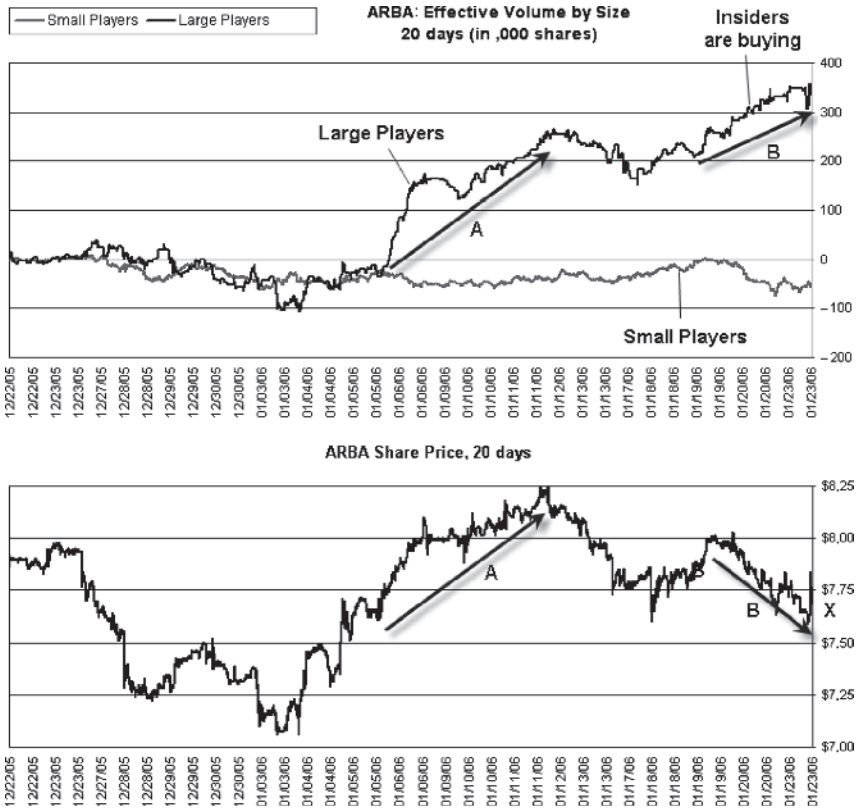

FIGURE 1.23 Ariba: Effective Volume analysis.

FIGURE 1.24 Ariba: price spike.

Cognizant Technology Solutions. Cognizant is an interesting case study. I lost money on it by following the large volumes. You can see from Figure 1.25 that large players had been selling before May 2, 2006, while the price during the last trading day seemed to hold fast. At that time, I was looking for a short play, and thought I had found one. (A short play means betting that the price of the stock will go down, by borrowing shares and selling them on the market. The profit is made by repurchasing the stock later on from the market at a lower price and pocketing the difference.) I placed my short order on May 2, just before the market closed. I have rarely lost money so quickly for not doing my homework (see Figure 1.26).

The reason for the misinterpretation was that we were very close to the day on which earnings would be announced. At such a time, some funds would prefer to be out of the stock instead of taking a possible hit because of a bad earnings report. Very few large funds would increase their risk just

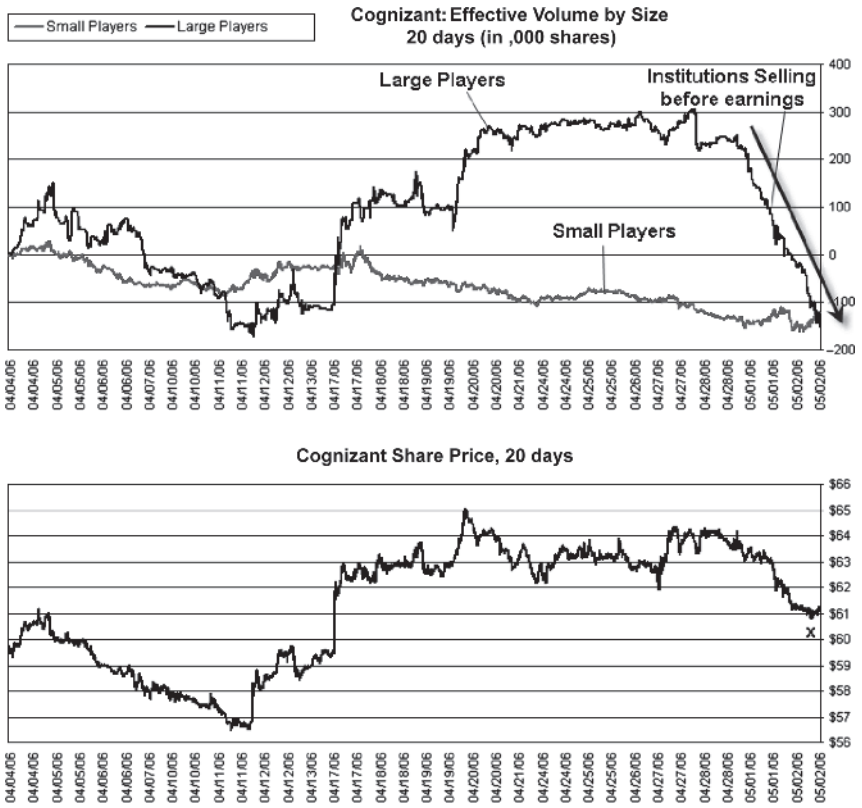

FIGURE 1.25 Cognizant: Effective Volume analysis.

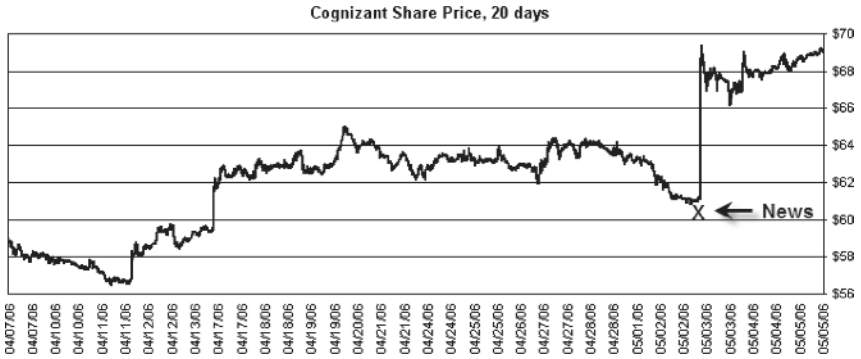

FIGURE 1.26 Cognizant: price spike.

one day before earnings are announced. In this case, the decrease of Large Effective Volume just prior to the earnings release had risk reduction as its motive, and I should not have interpreted it as selling due to superior information.

Had we seen large players increasing their positions just before the earnings release, it would have been a positive sign for the stock. Why? Because funds do not increase risk without reason, especially just before a major earnings release; therefore, we could have concluded that the funds had superior information indicating positive earnings.

Since that time, I have avoided placing shorts ahead of an earnings release.

Standard Technical Tools

This box explains a few standard technical tools, which are sometimes referred to in the later chapters of this book. The experienced trader may just want to skip to the next section.

All these are very well explained in *Trading for a Living* and *Come into My Trading Room*, both by Dr. Alexander Elder. If you do not know these indicators, I strongly advise you to study them. I will give some brief comments about these indicators.

Moving Averages: A moving average is a measure of the average price that people have been ready to pay for a stock during a period of time. It is the consensus value of the stock over a short-term or longer-term period (depending on whether you are averaging on 20, 50, or 200 days). The price may stay above or below the average for a considerable time, drawing an uptrend or a downtrend. If you are in an uptrend, it pays to buy when the price is back down to its value line. If you are in a downtrend, it pays

to sell when the price is back up to its value line. This means that trading against the price trend is very difficult, because you have to fight against the consensus opinion of the herd. Unless you are superhuman, it is frankly not a good idea to try to change the direction of a moving boat all by yourself. A moving average will give you an indication of value compared to past prices within a trend. (See *Come into My Trading Room*, by Dr. Alexander Elder.)

Relative Strength Index (RSI): J. Welles Wilder developed this momentum oscillator. This indicator compares the recent price gains to recent price losses and converts the result into a number between 0 and 100. A number below 30 indicates that the stock is oversold. Typical long downtrends can keep an RSI signal below 30 for many days. The buy signal comes when the RSI moves back up over the 30 line, indicating that the stock is probably changing its momentum to a new buying trend. Another buy signal is generated when the stock reaches a new bottom; a stronger RSI, however, indicates that the new push-down in price did not increase the average loss, and the RSI indicates a higher number for the gain/loss comparison. My experience shows that the RSI is widely followed. I suspect that since it is easy to program, many automatic trading methods use this signal to enter or exit stocks. At the start of a new trend, the RSI will give you an indication of value compared to past prices. (See *Trading for a Living*, by Dr. Alexander Elder.)

Moving Average Convergence/Divergence Histogram (MACDH): This momentum oscillator was developed by Gerald Appel. It compares a fast and a slow moving average in order to detect whether the price change is quicker or slower than before. It compares the acceleration (rate of change) of the fast and the slow moving averages. If the acceleration of the fast moving average is higher than the acceleration of the slow moving average, this indicates a positive momentum in the price. (See *Technical Analysis: Power Tools for Active Investors*, by Gerald Appel.)

Support/Resistance Lines: These lines are important. They indicate price congestions, or the price levels where many buy/sell decisions are taken. (See *Trading for a Living*, by Dr. Alexander Elder.)

TECHNICAL SECTION: HOW TO CALCULATE THE SEPARATION VOLUME

This section is for readers who want to know more about some of the technical details of the Effective Volume method.

Fixed Separation Method

There are many ways to separate Large from Small Effective Volume. You could, for example, pick a number and categorize every volume that is above this number as large volume. This separation method does not work well, though. Indeed, since volatility is one of the main characteristics of volume, if you fix the separation volume at a specific number, on some trading days you will end up having mainly Large Effective Volume, and on other trading days, mainly Small Effective Volume.

The reason for this is found in the behavior of large players. The buying by large players is usually executed during trading ranges, when nobody else is really paying attention. During that time, it is difficult to buy more shares than the supply side can support without raising the price. This means that large players will adapt their buying and selling order size to what the market can give or take from them. This situation changes every day. Therefore, on some days, a large player who wants to accumulate will buy more shares than on some other days. The consequence of this fact is that we need to recalculate our separation volume every day.

Average Separation Method

The most obvious way to separate Large from Small Effective Volume is to calculate the per-minute average Effective Volume exchanged for all the minutes of the day where a price inflection was found. The volume above that average is called Large Effective Volume and the volume below it is called Small Effective Volume. Such a separation is represented in Figure 1.27; I have used the Effective Volume of one trading day only (September 20, 2006) for the company Tellabs.

For Figure 1.27, the separation between the Large and Small Effective Volume is calculated as 25,951 shares, which is the average Effective Volume. As a reference, in Figure 1.27 there are 260 vertical bars. (Each bar represents a trading minute with valid Effective Volume, regardless of whether negative or positive. Please note that since I am interested only in the size of each bar, I turned positive all the negative Effective Volume in Figure 1.27.) The total number of Effective Volume shares was about 6,750,000 shares, compared to the total number of exchanged shares—about 11,000,000. We can see that the total Effective Volume represents only about 50 percent of the total number of shares traded.

If we plot the Large and Small Effective Volume flow using the average Effective Volume as separation volume, then we can see that the price pattern is following the large players' pattern (see Figure 1.28). In general, we may say that large players are the ones moving the price.

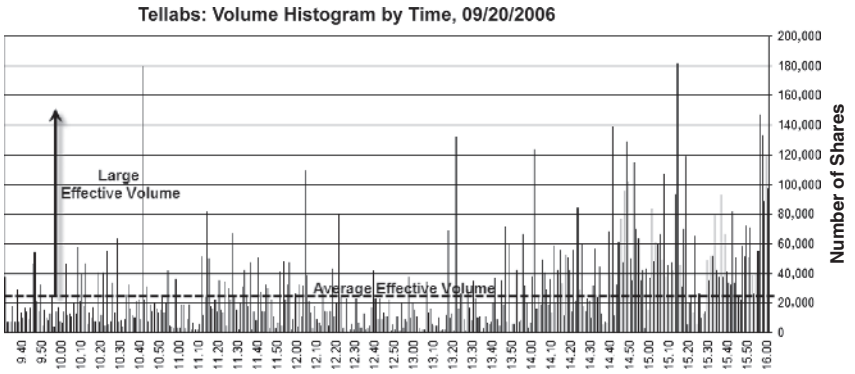

FIGURE 1.27 Tellabs one-day Effective Volume. On a sequential view of the vertical bars that correspond to the Effective Volume, it is difficult to see if the average Effective Volume is a good separation between the Large and the Small Effective Volume.

Figure 1.28 represents the Large and Small Effective Volume flow for September 20, 2006, using the average Effective Volume as separation volume.

Let's analyze this separation volume in more detail. If we come back to Figure 1.27 and sort the 260 vertical bars from the highest to the lowest, we obtain the very interesting results shown in Figure 1.29. What stands out immediately is that the total surface covered by the Large Effective Volume bars looks much bigger than the total surface covered by the Small Effective Volume bars.

An analogy will help us to understand the importance of that discovery. Suppose that the Department of Transportation wants to assess whether the new speed limit regulation is well respected on a particular road. One junior engineer places a very precise radar system on the side of the road. After one week of measurements, he notices that the radar registers an average speed of 14 mph, compared to the 40 mph limit. He concludes that the speed limit is well respected. However, looking at the data, we notice that among the vehicles that passed on that road, there were 90 bicycles and 10 cars. The bicycles' average speed was 10 mph, but the cars' average speed was 50 mph. Now we see that the problem lies within the data: The cars' speed is much higher than the bicycles' speed, and there are many more bicycles than cars.

It is quite similar to the stock market: We need to cope with volume volatility. The Internet is bringing more retail players to the market (more bicycles), and a growing number of funds are taking sizable positions (faster cars). In real life, it would make sense to put the cars on the highway and the bicycles on a cycling path. In the stock market, however,

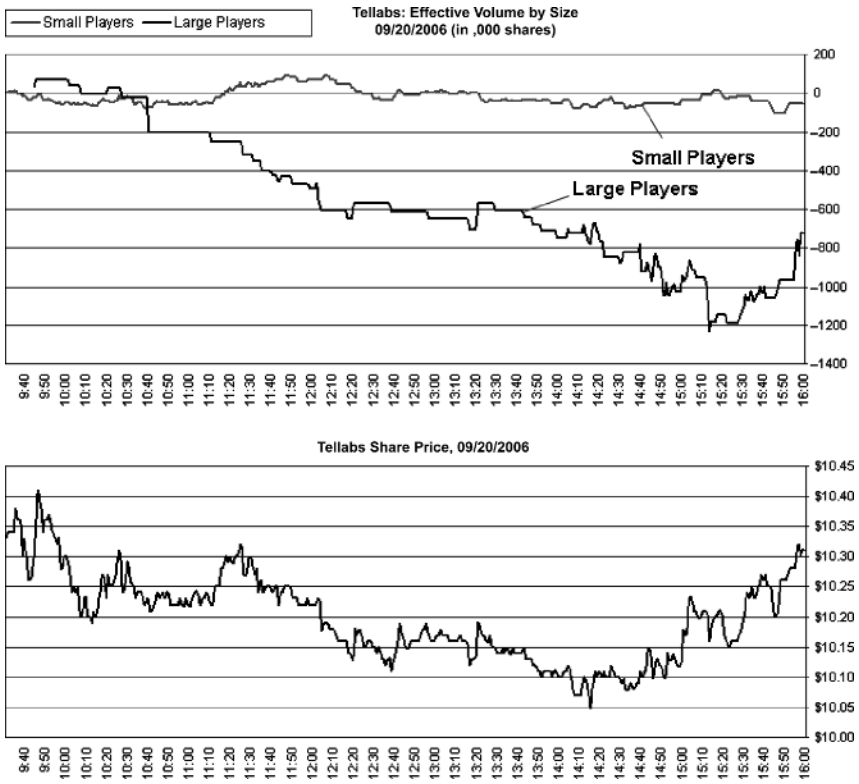

FIGURE 1.28 One-day Effective Volume separated by average size. The separation of Effective Volume into Large and Small Volume, when done using the average volume by vertical bars, produces a pattern where the Large Effective Volume is closely following the price pattern.

bicycles and cars compete for the same shares. This is where volatility was born. If you add to this volatility the fact that the recent decimalization killed market visibility, it is no wonder that the general public now believes that markets are manipulated. Later in the book I will provide more details on volatility (Chapter 3) and possible market manipulation (Chapter 4).

Equi-Power Separation Method

Remember that I define the Effective Volume as the volume responsible for a price change from one minute to the next. This means that it makes no difference whether the price increased by $0.01 or $0.02. In both cases, I consider the Effective Volume as buying volume. Therefore, every share that enters into the definition of Effective Volume has the same ability to

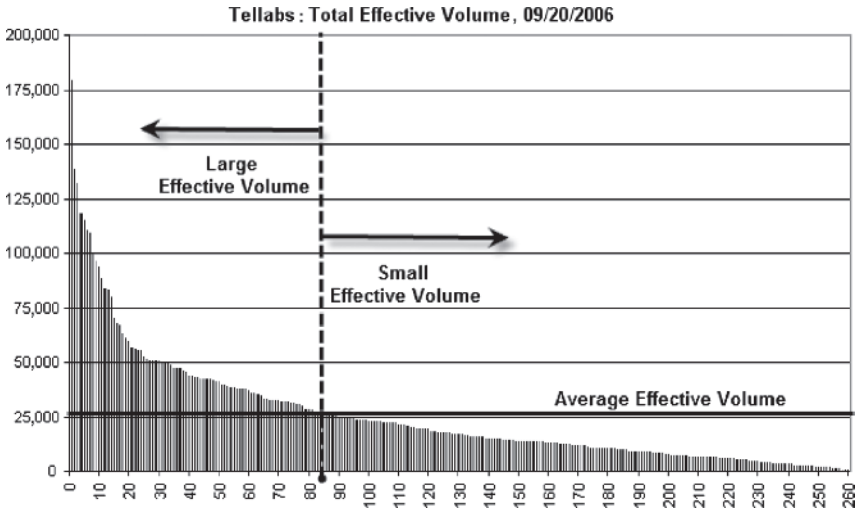

FIGURE 1.29 Repartition of Effective Volume by size. When rearranging all the bars of Figure 1.27 by size, we notice that the Effective Volume separation between the Large and the Small Effective Volume using the average separation method leaves too many shares within the pool of the Large Effective Volume. In this example, 70 percent of the shares belong to the large players group.

move the price up or down as any other share. If we separate all the Effective Volume shares into two groups that include the same number of shares, we have in theory two groups with the same intrinsic power to move the price.

In our example in Figure 1.29, we know that the total number of Effective Volume shares was 6,750,000 shares. Let's count the shares from the left of Figure 1.29 to the right until we reach 50 percent of 6,750,000 shares (i.e., 3,375,000). The calculation shows that we reach the 50 percent midpoint with a separation number of 42,500 shares. This means that all the Effective Volume sizes that are larger than 42,500 shares are labeled as large, and the rest are labeled as small. Figure 1.30 shows this new separation.

Please also notice in Figure 1.30 that I have labeled as Large Volume the volume corresponding to only 48 one-minute time intervals. This is out of the 260 one-minute time intervals that constitute the total number of time intervals for which we had price inflections. In other words, these 48 one-minute time intervals theoretically have the same power to move the market as the remaining 212 one-minute time intervals, because these 48 minutes include the same number of shares as the remaining 212 minutes.

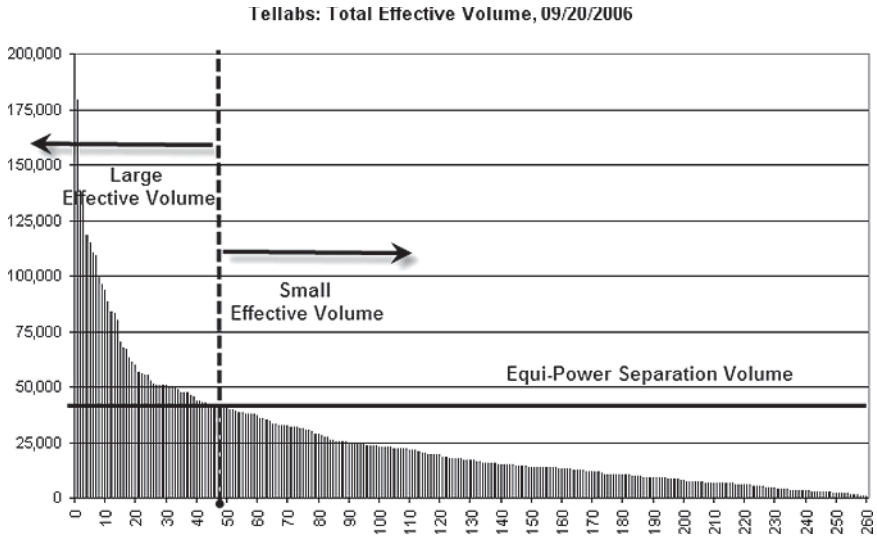

FIGURE 1.30 Equi-Power Effective Volume separation method. The Equi-Power Effective Volume separation method labels an equivalent number of shares as Large and Small Effective Volume. It allows for a more balanced separation where, in theory, each group of shares has the same power to move the price.

However, the difference between the two groups is that small players are scattered, and therefore they deliver their power in a very diffuse way; it will have only a limited influence on the price. In contrast, the volume corresponding to the large players will carry the colluding will of a few large holders, which will have much more influence on the price pattern. Large holders will have a general tendency to deliver their purchasing or selling power in a dedicated way that will determine the price direction.

If we now come back to Figure 1.28 and adapt it using our new definition of the separation volume, we can see in Figure 1.31 quite a different pattern of behavior. In Figure 1.28, which uses an average separation method, we see that large players have more influence than small players. This is normal, since the large players group includes 70 percent of the Effective Volume shares. However, in Figure 1.31, which uses the Equi-Power separation method (each group has 50 percent of the number of Effective Volume shares), we notice a much more balanced influence between large and small players.

The interpretation of the graph issued using the Equi-Power separation method is as follows: If both large and small players show a well-balanced pattern, it means that no institution was active during the period of analysis. (The large players group is therefore the group of large retail players,

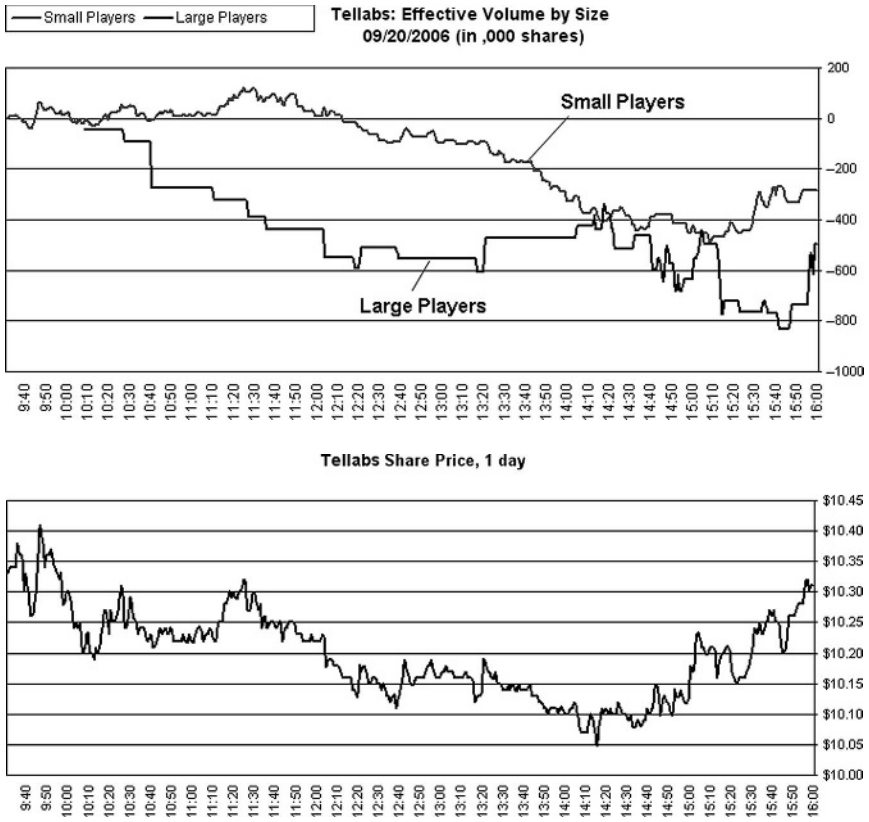

FIGURE 1.31 One-day Effective Volume separated by midpoint size. Compared to Figure 1.28, Figure 1.31 shows that the separation of Effective Volume into Large and Small Effective Volume using the Equi-Power method produces a more balanced pattern for the repartition of influence of each group on the price evolution.

while the small players group is the group of small retail players.) However, if the large players' pattern is very different from the small players' pattern, this shows how institutions have been moving.

IMPROVE YOUR TRADING: DECIDE ON THE BIG PICTURE

The stock market is getting quite complex, with many different players using a large variety of analytical tools and trading instruments. As a trader (retail or professional), you need to know what other traders are doing and when they are doing it.

The great majority of traders are momentum players or trend followers. This means that they are moving in and out of the market by following others' decisions. We may call it herd behavior. Herd analysis is a concept that is easy to understand and easy to model through price-based technical indicators (RSI, MACDH, trend indicators, etc.). However, indicators that are based only on price usually give you information after the fact.

Tools that are based on the price/volume relationship tend to catch the buy/sell decisions somewhat earlier, when these decisions are being spread to the herd. These tools are more powerful than tools based only on price, because they combine unrelated data (volume and price are believed to be unrelated) to strengthen the analysis. In the following section, I briefly study the tools that use a price/volume spread analysis, as well as the tick volume analysis tools. I find these tools useful, but fuzzy in the sense that you can't be sure whether the indicator tells what really happens in the market. These indicators may be generally correct; otherwise, why would they be used extensively?

The objective of the new tools that I present in this book (see Figure 1.32) is to study the decisions of other traders before these decisions are spread to the herd level. To move a herd of traders, two things must happen:

1. The herd needs to be ready to be moved. It is impossible to move a herd that is not in a position to move. You therefore need to study the position of the herd. This is the purpose of the Active Boundaries indicator presented in the next chapter.
2. You need trendsetters. These are a few key people who provoke change. You cannot see their move easily, except if you go down to the tactical level. This is what the Effective Volume method and its associated Effective Ratio and divergence analysis methods are for.

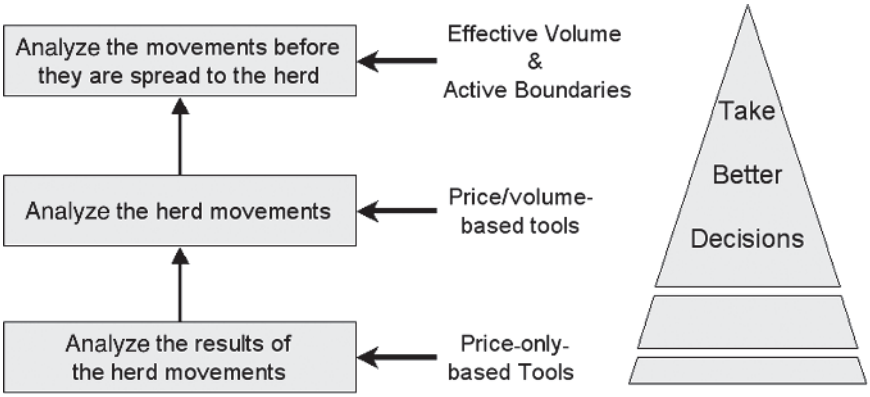

FIGURE 1.32 The evolution of the technical tools.

A COMPARISON WITH TRADITIONAL TOOLS

This section is very theoretical and reviews other well-known volume-based tools. You can skip it without compromising your understanding of the rest of the book.

Price-Based Indicators

When I started trading, I tried all the technical indicators that were available on the market, with different time frames and settings. I discovered that it was quite easy to find an indicator that would justify any possible trading decision. I also quickly found indicators that worked well for me: moving averages, RSI, MACDH, and support/resistance lines. These have been mentioned previously in this chapter.

Price/Volume-Based Indicators

The importance of a price/volume combination analysis has been understood for many years, so I will cite here only the work of a great pioneer of that analysis. Richard Wyckoff worked extensively on the price/volume relationship more than 80 years ago. A trader from the 1920s, Wyckoff wrote several books on the market, and eventually set up the Stock Market Institute in Phoenix, Arizona. At its core, Wyckoff's work is based on the analysis of trading ranges, determining when stocks are in basing, markdown, distribution, or markup phases. Incorporated into these phases are the ongoing shifts between "weak hands" (public ownership) and "composite operators," now commonly known as smart money.

There are several ways to use the combination of volume and price end-of-day data:

- Weight the volume to the price spread for the day.
- Weight the volume to the price change from the previous day.
- Compare the day price/volume relationship to the previous day's price/volume relationship.
- Use volume to weight other price-based indicators such as the RSI or the MACDH.

These different variations follow a similar purpose: *to determine the behavior of traders at the decisional level*. They are used to assess whether more traders decided to buy or to sell that day, and to give an indication for the next trading day. These tools help you to figure how the demand/supply balance is working out at the global level. The idea is that all the actions and all the opinions of traders are in the volume, while the price will indicate the direction of the movement.

What You Really Need to Know

I often read in the literature that this or that indicator measures the supply/demand equilibrium or the buy/sell equilibrium. Some will even use a still less precise term called bear/bull equilibrium. These terms are not helpful, because they are difficult to define and therefore to measure.

Let's look at a few general statements:

- When bulls are present or are getting stronger, the price should increase.
- When bears are getting stronger, the price should decrease.
- When bulls are getting weaker, the price should decrease.
- When bears are getting weaker, the price should increase.
- When the price trends up and if you recognize that the supply/demand equilibrium is moving in the direction of the bears, it means that the smart money is moving out.
- The key point is to find where the herd is moving by studying the strength of the buyers when the price reaches a top or the weakness of sellers when the price reaches a bottom.

I think that most of these statements are meaningless and thus useless. You can find them all over many trading books because they make things easy to understand, but the underlying concepts are so imprecise that the only way to explain them is by using a general market psychology type of explanation or supply/demand equilibrium.

Measuring the supply/demand equilibrium is an objective that is publicized by the majority of technical analysis books and tools. They would typically say that this or that divergence between the signal and the price indicates that bears or bulls are getting weak or strong.

The great majority of these authors transmit their trading experience in terms of patterns (price, price/volume, etc.). They will explain the pattern in terms of equilibrium or in terms of force or weakness. Very few come out with a mathematical formula to model this or that pattern or to catch the buyer/seller equilibrium. The reason is that formulas are imperfect; on many occasions they do not work well. Even general patterns are not sure bets (the head-and-shoulders pattern, the cup-and-handle pattern, etc.). Everybody agrees that markets are not perfect; this is the reason you need a risk-management policy such as stop loss.

The problem of unpredictability is not in the markets, but it is in how we interpret and measure the markets. As a trader, you need to better understand how the market works and have tools to better measure market movements. Then your trading will progress. You will gain confidence in

what you are doing and will place stops only when you are physically away from the markets.

Do not trade like a grandmother, who follows only the well-known patterns. Grandmothers are, of course, usually right, but you will greatly increase your confidence after you understand and can measure the forces that are behind the formation of patterns.

Let's revisit some more specific tools.

Force Index Force Index, which was invented by Dr. Alexander Elder, is best defined by taking Dr. Elder's own words in his book *Come into My Trading Room*:

> *Force Index helps identify turning points in any market by tying together three essential pieces of information—the direction of price movement, its extent, and volume. Price represents the consensus of value among market participants. Volume reflects their level of commitment, financial as well as emotional. Price reflects what people think, and volume what they feel. Force Index links mass opinion with mass emotion by asking three questions: Is the price going up or down? How big is the change? How much volume did it take to move the price?*
>
> *It is very useful to measure the force of a move because strong moves are more likely to continue than weak ones. Divergences between peaks and bottoms of prices of Force Index help nail important turning points. Spikes of Force Index identify zones of mass hysteria, where trends become exhausted. Here is the Force Index formula:*
>
> $$\textit{Force Index} = (\textit{Close today} - \textit{Close yesterday}) \times \textit{Volume today}$$

Then Dr. Elder continues with an explanation of how to use Force Index with price divergence:

> *Trend reversals do not have to come as a surprise; divergences between Force Index and price usually precede them. If the market is trying to rally, but the peaks in Force Index are becoming lower, it is a sign of weakness among the bulls. If a stock or a future is trying to decline, but the bottoms in Force Index are becoming more shallow, it is a sign of weakness among the bears.*

As I do not take anything for granted, I was wondering how correctly the multiplication of two different variables (price and volume) could lead to a meaningful result. Usually in physics, you would compare variables by

dividing them, in order to see the influence of a change in the first variable on a change in the second variable. For example, if you drive 100 miles for two hours, your speed would be the distance divided by the time, or 50 miles per hour. Then why can we not adjust the Force Index formula and call it the Weakness Index? (We know that the objective of both the Force Index and the Weakness Index is to measure the bulls/bears equilibrium.)

$$\text{Weakness Index} = \frac{\text{Volume today}}{\text{Close today} - \text{Close yesterday}}$$

Let's take an example. If on day one, the price change is +10 cents on a volume of 100,000 shares, which is twice the average volume, but on the following day, the price change is only +5 cents on a volume of 400,000 shares, what could we conclude?

The Force Index formula would conclude that the market is going to move higher, because the Force Index is increasing. In fact, the strength is doubling: more buyers came in, and as a consequence the price continued to move up.

$$\text{Day one Force Index} = +10\,\text{cents} \times 100{,}000 = 1{,}000{,}000$$

$$\text{Day two Force Index} = +5\,\text{cents} \times 400{,}000 = 2{,}000{,}000$$

The Weakness Index formula would conclude that the market is going to move lower, because the Weakness Index is increasing. In fact, it says that to move the price up by one cent on day two, we needed eight times more shares than on day one, indicating an increasing weakness. Between day one and day two, it looks like the supply of shares is increasing and that the market will soon reverse down. (This calculation is commonly known as the measure of price elasticity to volume.)

$$\text{Day one Weakness Index} = 100{,}000/10\,\text{cents} = 10{,}000\,\text{shares/cent}$$

$$\text{Day two Weakness Index} = 400{,}000/5\,\text{cents} = 80{,}000\,\text{shares/cent}$$

Both analyses are correct, because neither the Force Index nor the Weakness Index indicates if the price moved on the strength of demand or on the weakness of supply, which are very different. However, we saw before in this chapter that the buying/selling strengths are stronger than the strength of the demand/supply, because of the will difference. Therefore, I am inclined to say that the Force Index is a better indicator than the Weakness Index.

Another difficulty in interpreting the Force Index lies in the mere multiplication of price by volume. Indeed, because of its name, we may assume that the Force Index measures the buyers' strength in an increasing price trend and the sellers' strength in a decreasing price trend. However, it also includes the influence of the sellers' strength in an increasing price trend and the buyers' strength in a decreasing price trend. The problem is that since it multiplies price by volume, we have no certainty as to which element of the buy/sell balance is stronger. We may, however, suspect that it is the price direction that dictates the side to which the buy/sell balance will tilt.

Volume Weighted by the Price Spread Other methods try to measure the buy/sell balance during the day by weighting the volume with the balance between (Close price − Open price) and (High price − Open price). The idea is that this balance in prices is a good representation of the balance between buyers and sellers (volume balance). Unfortunately, this is a very incorrect assumption because of the large intraday volume volatility—we all know how strong the volume is at the beginning and at the end of the day.

Let's have a look at professional players at the close of the trading day. Since many technical tools follow the closing price, professional players will put a lot of energy (volume) into a close that will favor their positions. End-of-day indicators are therefore easily manipulated by large players, and may be giving an incorrect view on the buyers/sellers equilibrium.

Let's take one example that will show you the limitations of this type of indicator. Suppose that a share price moves down 50 cents on 400,000 shares that were exchanged during the trading day up until 30 minutes before the close. During the last 30 minutes of trading, however, a large fund appears and pushes the price up 70 cents on only 100,000 shares. The push is sudden and the supply of shares dries up, which results in a sudden price increase. It happens so quickly that sellers do not have time to offer new shares for sale, and as a result, the share price ends the day strongly at +20 cents.

All the end-of-day methods will consider that the price moved up 20 cents on volume of 500,000 shares, while in fact the price was mostly down during the day. A strong close would indeed normally attract buyers on the next trading day, which is probably a requirement for the large fund to sell its shares at a good price.

In this case, we see that a tactical move by a large fund, because it was taken at a key period of time (at the closing of the day), may induce other traders to make strategic decisions that will not be to their advantage. You now understand why there is a need for a tool that allows you to see tactical moves as well as the strategic ones.

I believe that these methods that combine price and volume work fine when used with end-of-day data, but that they lose efficacy when you shorten the analysis period to 1 hour, 30 minutes, 15 minutes, 5 minutes, and finally 1 minute. These methods were indeed developed before decimalization. Before decimalization, if you looked at intervals of one minute, you would hardly see any significant change in price. You would have to look at longer time intervals such as 10 or 15 minutes to try to analyze the volume/price relationship. Typically, you would use on the 10-minute analysis period one of the methods used for the end-of-day analysis, such as the on-balance volume method or the volume spread analysis method. I believe that a 10-minute analysis period is about the shortest time frame for which you can use these methods.

On very small time intervals of one minute, these methods do not work, because they have been designed to model accumulation/distribution and supply/demand at the decisional level of all the players, including large funds. The one-minute time range is more suited for analyzing tactical moves than decisional moves.

When a large fund is accumulating, this accumulation takes place during many days. Therefore, a repeating pattern of accumulation using these traditional methods on end-of-day data has a good chance of catching the strategic buying decisions of a large fund. This is especially true knowing that accumulation is better executed by active buying (placing buy orders at the market price) than by passive buying (placing limit buy orders, which wait for sellers to come in). Indeed, large limit orders are more visible to the market than market buy orders, and will invariably push other buyers to buy higher and sellers to retrieve their orders, waiting for better prices. As a position trader, you do not need to know more to make a successful trading decision.

However, if you go down very close to the transactional level, you will quickly notice that these traditional methods no longer work well. The main reason is that close to the transactions, you are facing tactical decisions and not strategic decisions. Tools that are used to model strategic decisions perform very poorly for tactical decisions. A typical tactical decision would be, for example, to send small or midsize buy orders on a regular basis, as long as the price stays within a given range, and then send a quick sell order to attract more sellers and bring the price back into the required range. You would continue this tactic until the supply of shares dries up.

Traditional tools are very poor at capturing such tactical behaviors, because they encounter two important mathematical issues:

1. On very small time intervals of one minute, the price spread is also very small. It is so tiny that interpretation becomes extremely hazardous.

Any type of volume can easily move the price up or down by one tick. At the level of the transaction, the market looks very erratic. Volume spikes would come on the bid or on the ask at what looks like stochastic, unpredictable moments.

2. At the level of the minute bar, price and volume exhibit a very different behavior: For example, you can imagine on the first bar that 5,000 shares have been traded, pushing the price up two cents. Then, on the following bar, imagine that 100,000 shares pushed the price down one cent, and then one minute bar later, that 200 shares pushed the price up again two cents. The problem that must be tackled is the incredible difference in volatility between price and volume. Price is fundamentally nonvolatile at the one-minute bar level, while volume is extremely volatile. Therefore, multiplying price by volume at the end-of-day level could still have some meaning, whereas multiplying price by volume at the level of the trading minute is mathematical nonsense.

However, even if you can solve these issues, there is still the danger of focusing on the tactical movements instead of trying to grab the strategic moves. What you then need to do is view these tactical moves in a daily or weekly flow and then compare the flow to past flows to understand the strategic moves.

It is like assembling a big puzzle with pieces coming from different bags. You first need to sort the pieces before assembling them to get the complete image.

Tick Volume Analysis It is now clear that going down to the transactional level gives us a better chance of catching tactical moves by large players. To use transactional data, a first tool was developed by Don Worden but later on extensively used and publicized by Laszlo Biriny. This tool, which Biriny called the "Money Flow Index," compares the amount of trading on small price upticks with the amount on small downticks, with the hypothesis that large-volume single trades are more important than small-volume trades.

This was true in the past, but less so today. According to research from the consulting firm Aite Group, at the end of 2006 the share of automated computer trading following predefined algorithms approached one-third of total U.S. equities trading volume; this number is expected to rise to 53 percent by the end of 2010.

These trades use algorithms that slice orders to intentionally hide the order size, drip releasing orders to the exchange, and as a consequence increase order fragmentation. Therefore, the hypothesis on which this Money Flow Index tool is based is quickly challenged by market reality.

A second set of tools counts orders executed at the ask as buying orders and orders executed at the bid as selling orders. The balance indicates the equilibrium between buyers and sellers. These tools are used in the same way that the end-of-day accumulation/distribution methods are used: They give a broad understanding of the market direction (decisional level).

When working with transaction data, however, the problem is that transactions occur randomly. Therefore, the only way to start measuring and comparing them is to link them to a specific time interval: You need to add transactions into cumulative minute data. You then arrive at the minute analysis and the Effective Volume method.

WHAT WE LEARNED REGARDING EFFECTIVE VOLUME

We started this chapter with a simple question: What are large players doing? We saw that the monitoring of the volume involved in small price changes from one trading minute to the next, which I defined as the Effective Volume, is a very good tool for detecting tactical moves by insiders, institutional investors, and other large players. Effective Volume often allows us to detect future price changes. The Effective Volume tool is excellent for detecting trendsetters, but we will see in the next chapter that in order to really monitor trends, the Effective Volume tool must be used in conjunction with the Active Boundaries tool.