PART I

Price Action

The most useful definition of price action for a trader is also the simplest: it is any change in price on any type of chart or time frame. The smallest unit of change is the tick, which has a different value for each market. Incidentally, a tick has two meanings. It is the smallest unit of change in price that a market can make, which for most stocks is a penny. It is also every trade that takes place during the day, so each entry on a time and sales table is a tick, even if it is at the same price as the prior trade. Every time the price changes, that change is an example of price action. There is no universally accepted definition of price action, and since you always need to try to be aware of even the seemingly least significant piece of information that the market is offering, you must have a very broad definition. You cannot dismiss anything, because very often something that initially appears minor leads to a great trade.

The definition alone does not tell you anything about placing a trade, because every bar is a potential signal both for a short and for a long trade. There are traders out there who will be looking to short the next tick because they believe that the market won't go one tick higher and others who will buy it believing that the market will likely not go one tick lower. They might be looking at the same chart and one trader sees a bullish pattern and the other thinks there is a bearish pattern that is stronger. They might be relying on fundamental data or any of a thousand other reasons for their opinions. One side will be right and the other will be wrong. If the buyers are wrong and the market goes one tick lower and then another and then another, they will begin to entertain the prospect that their belief is wrong. At some point, they will have to sell their positions at a loss, making them new sellers and

no longer buyers, and this will drive the market down further. Sellers will continue to enter the market either as new shorts or as longs forced to liquidate until some point when more buyers start coming in. These buyers will be a combination of new buyers, profit-taking shorts, and new shorts who now have a loss and will have to buy to cover their positions. The market will continue up until the process reverses once again.

For traders, the fundamental issue that confronts them repeatedly throughout the day is the decision about whether the market is trending or not trending. Even if they are looking at a single bar, they are deciding if the market is trending or not trending during that bar. Is that bar a trend bar, opening near one end and closing near the other, or is it a trading range bar with a small body and one or two large tails? If they are looking at a collection of bars, they are trying to decide if the market is trending or it is in a trading range. For example, if it is trending up, they will look to buy high or low, even on a breakout of the top of the move, whereas if it is in a trading range, they are only looking to buy at the bottom of the range and they want to sell instead of buy at the top of the range. If it is in any traditional pattern like a triangle or a head and shoulders top or bottom, it is in a trading range. Calling it one of those terms is not helpful because all that matters is whether the market is trending, and not whether they can spot some common pattern and give it a label. Their goal is to make money, and the single most important piece of information that they can discern is whether the market is trending. If it is trending, they assume that the trend will continue and they will look to enter in the direction of the trend (*with trend*). If it is not trending, they will look to enter in the opposite direction of the most recent move (*fade* or *countertrend*). A trend can be as short as a single bar (on a smaller time frame, there can be a strong trend contained within that bar) or, on a 5 minute chart, it can last a day or more. How do they make this decision? They do so by reading the price action on the chart in front of them.

It is important to understand that most of the time there is a 50 percent chance that the next tick will be up and a 50 percent chance that it will be down. In fact, during most of the trading day, you can expect that the market has a 50–50 chance of moving up X points before falling X points. The odds drift to maybe 60–40 at times during the day, and these brief times offer good trading opportunities. However, the market then quickly gets back to uncertainty and a 50–50 market where the bulls and bears are mostly in balance.

With so many traders trading and using countless approaches, the market is very efficient. For example, if you bought at the market at any point during the day without even looking at a chart, and placed a profit target 10 ticks higher and a one cancels the other (OCO) protective stop 10 ticks lower, you have a 50 percent chance of making a profit. If instead you sold originally and again used a 10-tick stop and profit target, you would still have a 50–50 chance of making 10 ticks on your short before losing 10 ticks on your protective stop. The odds are the same if

you picked 20 or 30 ticks or any value for X. There are obvious exceptions, like if you pick a very large value for X, but if your value for X is reasonable based on the recent price action, the rule is fairly accurate.

During the spike phase of a strong trend, the probability may be 70 percent or more that the trend will continue over the next few bars, but this happens only briefly and rarely more than once or twice a day. In general, as a strong breakout trend move is forming, if you choose a value for X that is less than the height of the current breakout, the probability is 60 percent or better that you will be able to exit with X ticks' profit before a protective stop X ticks away is hit. So if a bull breakout has gone four points (16 ticks) so far and is very strong and you pick a value of eight for X, then you probably have about a 60 percent chance of being able to exit with eight ticks' profit before an eight-tick protective stop is hit.

Because of the inherent high level of uncertainty, I often use words like *usually*, *likely*, and *probably* to describe what I think will follow in at least 60 percent of cases. This can be frustrating to readers, but if you are going to make a living as a trader, this is as good as it gets. Nothing is ever close to certain, and you are always operating in a gray fog. The best trades that you will ever see will always be described by uncertain words like these because they are the most accurate descriptions of the reality that traders face.

Everything is relative and everything can change to the exact opposite in an instant, even without any movement in price. It might be that you suddenly see a trend line seven ticks above the high of the current bar and instead of looking to short, you now are looking to buy for a test of the trend line. Trading through the rearview mirror is a sure way to lose money. You have to keep looking ahead, not worrying about the mistakes you just made. They have absolutely no bearing on the next tick, so you must ignore them and just keep reassessing the price action and not your profit and loss (P&L) on the day.

Each tick changes the price action of every time frame chart, from a tick chart or 1 minute chart through a monthly chart, and on all other types of charts, whether the chart is based on time, volume, the number of ticks, point and figure, or anything else. Obviously, a single tick move is usually meaningless on a monthly chart (unless, for example, it is a one-tick breakout of some chart point that immediately reverses), but it becomes increasingly more useful on smaller time frame charts. This is obviously true because if the average bar on a 1 minute Emini chart is three ticks tall, then a one-tick move is 33 percent of the size of the average bar, and that can represent a significant move.

The most useful aspect of price action is what happens after the market moves beyond (*breaks out* beyond) prior bars or trend lines on the chart. For example, if the market goes above a significant prior high and each subsequent bar forms a low that is above the prior bar's low and a high that is above the prior bar's high, then this price action indicates that the market will likely be higher on some subsequent

bar, even if it pulls back for a few bars in the near term. However, if the market breaks out to the upside and then the next bar is a small inside bar (its high is not higher than that of the large breakout bar) and then the following bar has a low that is below this small bar, the odds of a failed breakout and a reversal back down increase considerably.

Small patterns evolve into larger patterns that can lead to trades in the same or opposite direction. For example, it is common for the market to break out of a small flag to reach a scalper's profit and then pull back, and the pattern then evolves into a larger flag. This larger flag might also break out in the same direction, but it might instead break out in the opposite direction. Also, a pattern often can be seen to be several different things at the same time. For example, a small lower high might be the second lower high of a larger triangle, and a second right shoulder of an even larger head and shoulders top. The name that you apply is irrelevant since the direction of the subsequent move will be the same if you read the bars correctly. In trading ranges, it is common to see opposite patterns setting up at the same time, like a small bear flag and a larger bull flag. It does not matter which pattern you trade or what name you use to describe it. All that matters is your read of the price action, and if you read well, you will trade well. You will take the setup that makes the most sense, and if you are not fairly certain, you will wait until you are.

Over time, fundamentals control the price of a stock, and that price is set by institutional traders, who are by far the biggest volume players among the traders who are trading for the long term; high-frequency trading (HFT) firms trade larger volume but are intraday scalpers and probably do not significantly affect the direction on the daily charts. Price action is the movement that takes place along the way as institutions probe for value. The high of every bar on every time frame is at some resistance level; the low of every bar is at support; and the close is where it is and not one tick higher or lower, because computers put it there for a reason. The support and resistance may not be obvious, but since computers control everything and they use logic, everything has to make sense, even if it is often difficult to understand. Short-term computer algorithms and the news determine the path and speed, but the fundamentals determine the destination, and an increasing amount of the fundamental analysis is being done by computers as well. When the institutions feel that the price is too high, they will exit or short, and when they feel it is too low (a good value), they will buy. Although conspiracy theorists will never believe it, institutions do not have secret meetings to vote on what the price should be in an attempt to steal money from unsuspecting, well-intentioned individual traders. Their voting is essentially independent and secret and comes in the form of their buying and selling, but the results are displayed on price charts. They can never hide what they are doing. For example, if enough of them are buying, you will see the market going up, and you should look for ways to get long. In the short run, an institution can manipulate the price of a stock, especially if it is thinly

traded. However, institutions would make much less money doing that compared to what they could make in other forms of trading, and they don't want to waste their time on small profits. This makes the concern of manipulation of negligible importance, especially in stocks and markets where huge volume is traded, like the Eminis, major stocks, debt instruments, and currencies.

Each institution is operating independently of the others, and none knows what any other is doing. In fact, large institutions have many traders competing against one another; often they are on different sides of a trade without realizing it, and they don't care. Each trader is following his own system and is not interested in what some guy on the ninth floor is doing. Also, every move on the chart is a composite based on the total dollars traded; each trader is motivated by different factors, and there are traders trading on every time frame. Many traders are not even using charts and instead are trading off fundamentals. When I say that the market does something for a reason, it never does something for only one reason. Whatever reason I am giving is just one of the countless reasons behind the move, and I point to that one reason to give some insight into what some of the major traders are doing. For example, if the market gaps up a little on the open, falls quickly to the moving average, and then rallies for the rest of the day, I might say that the institutions wanted to buy lower and were on the sidelines until the market fell to an area of support and then they believed it was likely not to go lower. At that point, they bought heavily. In fact, that might be the logic used by some institutional traders, but others will have countless other reasons for buying at that price level and many of those reasons will have nothing to do with the chart in front of you.

When I look at a chart, I am constantly thinking about the bullish case and the bearish case with every tick, every bar, and every swing. During most of the day, the chance of making a certain number of ticks on a trade is just about the same as the chance of losing the same number. This is because the market is always searching for value and balance and spends most of the day with both bulls and bears feeling comfortable taking positions. Sometimes the odds might be 60–40 in favor of one direction, and in very strong trends the odds can briefly be 80–20 or even higher, but after most ticks during the day, the odds are about 50–50 and uncertainty, value, and balance prevail. Alan Greenspan said that as Fed chairman he was right about 70 percent of the time. This is very revealing because he had so much influence over whether he was right, yet he could only get his winning percentage up to 70. If you make money on 70 percent of your trades where you can never trade large enough volume to increase your chances of success, you are doing extremely well.

Whenever a pundit on television says with certainty that the market is going up and then castigates another panelist with an ad hominem attack, you know that the person is a fool. His arrogance indicates that he believes that his ability to predict is at least 90 percent, but if that were true, he would be so rich that he would not bother being on television. Because most scalps are only about 60 percent certain,

that other 40 percent possibility warrants a lot of respect. You should always have a plan in case the opposite happens, since it will happen often. Usually, it is better to get out, but sometimes it is better to reverse. It is always most important to be aware that the exact opposite of what you believe will happen in about 40 percent of your trades. It is worth noting that some traders are so good at reading charts and placing and managing trades that they can win as much as 90 percent of the time, but those traders are rare.

Television analysts always have impressive titles, make very convincing arguments, look impressive, sound professorial, and appear to be dedicating their lives to helping you. However, it is all a sham and you should never forget that it is just television. The purpose of television is to make money for the corporations that own the shows and the networks. The shareholders of those companies are not concerned at all about whether you make money from trade recommendations on the shows. The networks choose analysts based on ratings. They want people who will attract viewers so that they can sell advertising. They invariably choose charismatic people who look so sincere and concerned about your financial well-being that you feel compelled to watch and trust them. And they might be sincere, but that does not mean that they can help you. In fact, they can only hurt you by misleading you into believing that they can solve your financial problems and alleviate the stress that you are feeling as you try to care for your family. They are selling false hope and it is for their benefit, not yours. Remember, no one ever got rich from watching television.

Many television analysts make trade recommendations based on their fundamental analysis, and then describe the trade in technical terms. This is particularly true of forex traders. They will isolate an event, like an upcoming central bank meeting for some country, predict what the outcome will be, and recommend a trade based on that expected outcome. When they describe their trade, they will invariably make it clear that the trade is entirely technical and has nothing to do with the fundamentals. For example, if the EUR/USD is in a bull trend, they will invariably conclude that the meeting will make the Euro stronger against the dollar and recommend buying a pullback, placing a protective stop below the most recent swing low, and going for a profit target that is about twice as large as the stop. No one needs to know anything about that meeting to place that trade. They are simply recommending buying a pullback in a bull trend, and the trade has nothing to do with their analysis or the upcoming meeting. The people who actually influence the direction of the market because of their huge volume, like governments and banks, know far more about the upcoming meeting and the effect any announcement might have, and that is already reflected in the price. Also, these institutions are concerned about many variables that have nothing to do with the meeting. These television pundits are simply trying to impress listeners with their tremendous intellectual capacity to analyze the fundamentals. They want to see

themselves as especially bright and insightful. The reality is that they are enjoying pretending to be experts, but are talking nonsense. Their predictive ability based on the fundamentals is pure guesswork and has a 50 percent probability of being correct. Their technical analysis, however, is sound, and if the trade is successful, it is entirely due to their chart reading and in no way related to their fundamental analysis. Stock pundits also regularly make absurd interpretations of the fundamentals, like telling listeners to buy GS tomorrow, even though it has been in a bear trend for six months, because its CEO is strong and he will take action to make end the bear. Well, that CEO was there last week, last month, and six months ago, yet GS has been falling relentlessly! Why should it start to rally tomorrow or over the coming weeks? There is no fundamental reason at all, despite the professorial proclamation by the carnival barker on television whose job is to sell advertising, not to help you make money. Another pundit might recommend ADM or POT because Africa is developing quickly, and the improved quality of life of Africans will create demand for agricultural products. Well, it was growing quickly last month and six months ago, and nothing is different today. Whenever you hear a pundit make a recommendation based on what he proudly considers to be his profound insight, it is far better to assume that he is a fool and is on television only to entertain in order to earn advertising dollars for the network. Instead, simply look at the chart. If the market is going up, look to buy. If it is going down, look to sell. These television analysts always make it sound as if their single piece of fundamental information will control the direction of the market. Markets are far more complex and move for hundreds of reasons, most of which the television analyst has no way of knowing. The fundamentals are already reflected in the price action, and all you have to do is look at the chart to understand how the institutions, who are far smarter than the clown on television and who trade enough dollars to control the direction of the market, view the fundamentals. They analyze all of the data, not just one small piece, and they base their trades on thorough mathematical analysis, not some whimsical, simplistic sound bite. Follow them, not the pundit on television. They will clearly show you what they believe, and they cannot hide it. It is on the chart in front of you. Incidentally, fundamental analysis is basically a form of technical analysis because fundamental traders are making their decisions based on charts. However, their charts are of earnings growth, debt growth, revenue, profit margins, and many other factors. They study momentum, slope, and trend lines so they are really technicians but do not see themselves that way, and many don't trust the technical analysis of price alone.

Why does price move up one tick? It is because there is more volume being bid at the current price than being offered, and a number of those buyers are willing to pay even more than the current price, if necessary, to get their orders filled. This is sometimes described as the market having more buyers than sellers, or as the buyers being in control, or as buying pressure. Once all of those buy orders that can

possibly be filled are filled at the current price (the last price traded), the remaining buyers will have to decide whether they are willing to buy at one tick higher. If they are, they will continue to bid at the higher price. This higher price will make all market participants reevaluate their perspective on the market. If there continues to be more volume being bid than offered, price will continue to move up since there is an insufficient number of contracts being offered by sellers at the last price to fill the orders of the buyers. At some point, buyers will start offering some of their contracts as they take partial profits. Also, sellers will perceive the current price as a good value for a short and offer to sell more than buyers want to buy. Once there are more contracts being offered by sellers (either buyers who are looking to cover some or all of their long contracts or new sellers who are attempting to short), all of the buy orders will be filled at the current price but some sellers will be unable to find enough buyers. The bid will move down a tick. If there are sellers willing to sell at this lower price, this will become the new last price.

Because volume controls the direction of the market, beginning traders invariably wonder if market depth can give them an edge in their trading. If they are placing their trades on a price ladder, they can see the volume at every tick for several ticks above and below the current price. They think that since the information is there, there must be some way to use it to get an edge. They forget that the market is controlled by computer algorithms, and the programmers are also after every imaginable edge. When the game centers on quickly processing a lot of information in a fraction of a second in an attempt to make one or two ticks a thousand times a day with just a 55 percent success rate, an individual trader will lose every time. Traders have no way of knowing if what they see is real, or just a trap being set by one computer to trap other computers. There is a reason why you don't hear a lot of professional traders talking about incorporating market depth into their decision making. It is because it is not helpful. Even if traders could process it fast enough, the edge would be tiny compared to the edge that they can have from reading charts. They would be distracted and end up missing lots of other trades with a comparable risk, but a larger reward and winning percentage, and would therefore make less money. Only fight wars that you know you can win.

Since most markets are driven by institutional orders, it is reasonable to wonder whether the institutions are basing their entries on price action or their actions are causing the price action. The reality is that institutions are not all watching Apple (AAPL) or the SPDR S&P 500 exchange-traded fund (SPY) tick by tick and then starting a buy program when they see a two-legged pullback on a 1 minute chart. They have a huge number of orders to be filled during the day and are working to fill them at the best price. Price action is just one of many considerations, and some firms will rely on it more and others will rely on it less or not at all. Many firms have mathematical models and programs that determine when and how much to buy and sell, and all firms continue to receive new orders from clients all day long.

The price action that traders see during the day is the result of institutional activity and much less the cause of the activity. When a profitable setup unfolds, there will be a confluence of unknowable influences taking place during the trade that results in the trade being profitable or a loser. The setup is the actual first phase of a move that is already underway and a price action entry lets a trader just jump onto the wave early on. As more price action unfolds, more traders will enter in the direction of the move, generating momentum on the charts and causing additional traders to enter. Traders, including institutions, place their bids and offers for every imaginable reason and the reasons are largely irrelevant. However, sometimes a reason can be relevant, because it will allow smart price action traders to benefit from trapped traders. For example, if you know that protective stops are likely located at one tick below a bar and will result in losses to traders who just bought, then you should consider getting short on a stop at that same price because you will have a good chance to make a profit off the trapped traders as they are forced out.

Since institutional activity controls the move and their volume is so huge, and they place most of their trades with the intention of holding them for hours to months, most will not be looking to scalp and instead they will defend their original entries. If Vanguard or Fidelity has to buy stock for one of its mutual funds, its clients will want the fund to own stock at the end of the day. Clients do not buy mutual funds with the expectation that the funds will day trade and end up in all cash by the close. The funds have to own stock, which means they have to buy and hold, not buy and scalp. For example, after their initial buy, they will likely have much more to buy and will use any small pullback to add on. If there is none, they will continue to buy as the market rises.

Some beginning traders wonder who is buying as the market is going straight up and why anyone would buy at the market instead of waiting for a pullback. The answer is simple. It is institutions working to fill all of their orders at the best possible price, and they will buy in many pieces as the market continues up. Also, a lot of this trading is being done by institutional computer algorithms and it will end after the programs are complete. Other firms trade programs that buy constantly when the momentum is strong and stop only when the momentum slows. If a trade fails, it is far more likely the result of the trader misreading the price action than it is of an institution changing its mind or taking a couple of ticks' profit within minutes of initiating a program. The programs are statistically based, and for a trend to continue is statistically likely. The trend will continue until it reaches some technical point where the odds are that it has gone too far. It is not as if there is some single trend line or measured move target that all of the software writers will agree on. There are actually countless key technical points on the chart. The market turns when enough of them occur in the same area. One firm's programs will use some, and another firm will use others. If enough firms are betting on a reversal in the

same general area, the reversal will occur. At that point, the math favors a reversal; the institutions will take partial profits, and the quantitative analyst (quant) firms will take positions in the opposite direction. These algorithms will continue trading in the opposite direction until the market overshoots again, at which point the math favors a reversal and the quants will once again bet in the opposite direction.

If institutions are smart, profitable, and responsible for every tick, why would they ever buy the highest tick in a bull trend (or sell the lowest tick in a bear trend)? It is because that is what their algorithms have been doing profitably all of the way up, and some are designed to continue to do it until it is clear that the bull trend is no longer in effect. They lose on that final buy, but make enough on all of their earlier trades to offset that loss. Remember, all of their systems lose between 30 and 70 percent of the time, and this is one of those times. There are also HFT firms that will scalp for even a single tick right up to the high tick of a bull trend. The high is always at a resistance level, and many HFT firms will buy a tick or two below resistance to try to capture that final tick, if their systems show that this is a profitable strategy. Other institutions are buying as part of a hedge in another market (stocks, options, bonds, currencies, etc.) because they perceive that their risk/reward ratio is better by placing the hedge. The volume is not from small individual traders, because they are responsible for less than 5 percent of the volume at major turning points.

The only importance of realizing that institutions are responsible for price action is that it makes placing trades based on price action more reliable. Most institutions are not going to be day trading in and out, making the market reverse after every one of your entries. Your price action entry is just a piggyback trade on their activity, but, unlike them, you are scalping all or part of your trade.

Incidentally, if a scalper is using a stop that is larger than his profit target, he has to win on 70 percent or more of their trades to be profitable. Very few traders can consistently win 70 percent of the time, and therefore most traders should never use a stop that is larger than the profit target. However, when traders see a situation where the potential profit is at least as large as the risk and they are at least 60 percent confident about the setup, then they can consider taking the trade. Most traders should start out looking for swing trades where the profit is at least twice as large as the risk. The probability of success is usually only 40 to 50 percent, and there are only a few opportunities a day, but the chance of being profitable long-term is greater. There are times when a swing setup has a chance of success of 60 percent or more, but these are usually during strong breakouts. These are difficult for most traders to take because of the limited time to analyze the trade and the large bars and, therefore, larger risk, but the math is often the best that a trader will ever have.

There are some firms that day trade substantial volume. However, for their trades to be profitable the market has to move many ticks in their direction, and

price action traders will see the earliest parts of the move, allowing them to get in early and be confident that the odds of a successful scalp are high. Those firms cannot have the market go 15 ticks against them if they are trying to scalp four or eight ticks. Therefore, they will enter only when they feel that the risk of an adverse move is small. If you read their activity on the charts, you should likewise be confident in your trade, but always have a stop in the market in case your read is wrong or other institutions overwhelm the current move with trades in the opposite direction.

There is often a pullback that tests the entry bar's extreme to the tick. For example, if there is a long entry, the buyers will often place their protective sell stop at one tick below the low of that entry bar just after the bar closes. It is fairly common to see a pullback that comes down exactly to the low of that entry bar but not one tick lower. This means that the stops were not run, and that there must be institutional size volume protecting the stops. Since it is such an obvious price on the chart, they are doing this buying based on price action.

In the 5 minute Emini, there are certain price action events that change the perspective of smart traders. For example, if there is a two-legged pullback (an ABC) in a bull trend and the market then trades above the high of the prior bar, many buyers will be long at one tick above that prior bar's high (a high 2 long entry). If the market then trades below the low of the two-legged pullback, everyone will assume that the market will likely have at least one more leg down. If you are an institutional trader and you bought that high 2, you do not want it to fail and you will buy more all the way down to one tick above that key protective stop price. That institution is using price action to support its long.

HIGH-FREQUENCY TRADING

It is important to realize that a large and increasing part of the daily stock, futures, exchange-traded fund, currency, commodity, and options volume is being executed by high-frequency trading (HFT) firms that have algorithms designed by quantitative analysts called quants. Most of the programmers have master's degrees or PhDs in mathematics, quantitative analysis, engineering, programming, or physics, and the best ones make a $1 million a year for their efforts. Some algorithms hold positions for a fraction of a second, and others for an hour or two. Every imaginable strategy is used, including models based on complex financial analysis of huge volumes of data, to simple statistical aberrations. Every idea has to have sound logic, and back-testing has to confirm that it is effective. Some programmers tweak their programs during the day to give them an edge for the next few hours. Many programs operate in the world of nanoseconds (a billionth of a second), and every

advance in hardware and software that reduces the latency between receiving data and getting orders filled is employed. The fastest programming languages and operating systems are also used to reduce the latency. Since their edge is very small and hundreds of millions of dollars are at stake, HFT firms tend to be secretive, stealthy, and filled with smart people.

CBS's *60 Minutes* ran a story on HFT in October 2010 and reported that as much as 70 percent of the volume and over a billion shares of stock daily were being traded by HFT programs. This is somewhat misleading because the HFT firms are only part of the algorithm trading world. There are other programs that are designed for longer-term trading and are also part of that 70 percent. Both the instantaneous high-frequency trading software and the longer-term program trading software are created by quantitative analysts. These quants are mathematicians, and the ones who design the HFT programs care nothing about charts or fundamentals and are interested only in short-term market tendencies based on statistical analysis. Most of them don't even care about 5 minute charts, and their trading has nothing to do with whatever chart you are watching during the day.

In its report, *60 Minutes* interviewed the head of Tradeworx, a small HFT firm of mathematicians and quants that was trading 40 million shares a day on its basket of 4,500 stocks. That means that the firm is averaging 10,000 shares per day per stock. Since the traders are often making only a penny or a fraction of a penny per trade, they hold their positions for only a few seconds to a few minutes, and their position size is probably very small. Computers do all of the trading because the opportunities that they are trading exist for only a fraction of a second and humans are too slow to capture them. Because they are trading 4,500 companies, one of those companies is ranked 4,500th in terms of size and probably average daily volume. This means that some of the companies they are trading trade just a few hundred thousand shares or less a day. If they trade 10,000 shares in that company and 50 other HFT firms also trade 10,000 shares, that would be 5 million shares a day. Because this is more than the total volume traded in that company, it is likely that Tradeworx is often trading 1,000 shares or fewer per trade. The traders are obviously not trading 10,000 shares in every stock, but that is their average, based on the 40 million shares that they trade and Tradeworx's basket of 4,500 stocks. They are probably trading larger volume and more often in companies that have huge daily volume, but they would still have to be trading very small volume on many stocks. Many firms trade with the goal of scalping a penny or less on each trade, holding the trade for a few seconds to a few minutes.

Their programs are based solely on statistics. The edge in trading is always very small, but if it has a high mathematical certainty and you use it thousands of times a day, it theoretically will produce consistent profits. This is the same principle on which casinos make their money. On most games, their edge is only 3 percent or less, but they are more than 99 percent certain that the edge is real and not just

a coincidence. If a casino only has one customer, and he bets a billion dollars on a single bet, the casino has a 47 percent chance of going out of business on that bet. However, when thousands of gamblers place small bets every day, the odds are overwhelming that the casinos will consistently make money. The same is true for HFT firms.

One hypothetical strategy that this quant mentioned was buying $5 of every stock that fell 5 percent in the past week and shorting $10 of every stock that went up 10 percent in the past week on the basket of 4,500 stocks. The number of winners is only slightly greater than the number of losers, but when you trade a system with a slight edge often enough, you can generate a consistent profit, just like the casinos. He said that his firm sometimes loses two or three days in a row but has never had a losing month. One person interviewed mentioned that one firm reportedly made money every day for four consecutive years. You have to assume that they test every strategy that they can imagine, based on every piece of data available, including spreads, volumes, related markets, and the overall market, and if the testing shows that they have an edge, then they will trade it until it no longer continues to test well.

These firms get information about order flow a few milliseconds before everyone else and they spend tens of thousands of dollars a month to be as close to the exchange as possible to get their information as quickly as possible, and they also run the fastest computers available. Every extra millisecond that they can buy increases their edge. Their computers place and cancel thousands of order per second to get a sense of the impending market direction, and then they use this information to get in and out as early as possible. The technology is rapidly changing and since computerized trading controls most of the volume, it controls most of the price action, and this will likely always be the case. One important benefit to individual traders is that the huge volume makes liquidity high and allows traders to exit and enter with small spreads, reducing the cost of trading.

Dow Jones & Company now has a news service called Lexicon that transmits machine-readable financial news to its subscribers. Lexicon scans all of the Dow Jones stories about stocks and converts the information into a form that the algorithms can use to make decisions to buy and sell stocks in a fraction of a second. Other algorithms operate on a longer time frame and analyze stock performance and earnings statements, in addition to the news feeds, to make trading decisions. Some use differential evolution optimizing software to generate data that is used to generate other data. They can continue to refine the data until it reaches some level of mathematical certainty, and then the result is used to automatically buy or sell stocks. Some orders are so huge that they take time to place, and algorithmic trading software breaks the orders into small pieces to conceal the trading from traders who would try to capitalize on the incipient trend. Predatory trading algorithms try to unravel what the algorithm trading programs are trying to hide. Everyone is

looking for an edge, and more and more firms are using computers to find the edges and place the trades.

A trader cannot possibly analyze a report and all of its implications in time to place a trade on the 5 minute chart. Computers can process information and place orders far faster than an individual trader can, and this gives them a huge edge over individual traders just after a report is released. When a trader's opponent has a huge edge, he is at a big disadvantage, which means that he has no edge. Since his edge can never be large and he should trade only when it is there, he should avoid trading when it is not, especially when a competitor has a particularly large one. However, he can still make money from the report. Since so many firms now have computers that quickly analyze reports and then place trades based on that analysis, all a trader has to do is be able to read a chart to see what the consensus opinion is from all of that analysis. The computers will show you what the report means to the market, and all you have to do is trade in the same direction. Incidentally, computers have an additional edge at the end of the day. When traders have been trading for hours, they naturally become tired, slower, and resistant to taking trades. Computers never get tired and are as effective up to the final seconds of the day as they were at the open. If traders are not at their best, which is often the case in the final hour, they have less of an edge or no edge, and they should take a trade only if both they and the setup are strong.

If you think about it, an inherent problem that HFT firms face is that they can kill the goose that is laying those golden eggs. Their trading is statistically based, and although it is mostly tested over many years, they certainly pay attention to the way that the market has been behaving over the past few weeks. If enough firms make adjustments due to recent price action, there won't be enough volume to take the other side of their trades, and as a result they won't be able to trade the way their algorithms intend and they won't make as much money. They might even lose money. This imbalance results in a change in the price action. For example, if the recent daily range has shrunk to about a third of its long-term average, it cannot last that way for too long. Eventually everyone will figure out how to make money off of the small days, and they will likely all be doing the same thing. At some point, there won't be enough money left to take the opposite side of their trades, and either they won't get filled or they will have to accept worse entries. In either case, that will change the behavior of the market.

Many institutional traders who are working to fill large orders for institutional clients are angry with the high-frequency traders, but I suspect that a lot of it is jealousy. These institutional traders used to be at the top of the food chain and were responsible for all the significant moves in the market. Not anymore. They see the quants consistently making more money, and they are doing it in a way that totally disregards the fundamentals that traditional institutional traders think forms the bedrock of Wall Street. They hate these upstarts coming into their game,

disregarding their rules and everything they hold dear, having much better track records, commanding the most awe, and probably becoming more desirable places to work for the very best young, new traders. It is likely that some of their client money is getting diverted to HFT and other program trading firms, and this threatens some of their income. However, the goal is to make money; I am happy to have the added liquidity and I like all of the strong swings that are now common. I even like the tight trading ranges that these quants create, but they are more stressful to trade.

Liquidity means the immediate availability of shares at a fair price, and this means that high-frequency traders are actually helping institutional traders get a good price on their trades. This liquidity used to be provided by order offsetters (market makers), but their role has largely been taken over by HFT firms. Incidentally, just as there are complaints about HFT firms, there used to be complaints about unfair practices of market makers. One big complaint is that they fail to take the other side of trades when the market is crashing, which is the time when most traders desperately need someone to take the other side of a trade. There are other complaints about dark pools, flash trading, crossover networks, front-running, and just about every other aspect of computerized trading, but most of the unfair practices will likely be minimized by the federal government and should not cause a problem for individual traders in the long run.

The quants are providing liquidity to the market and reducing spreads for all traders, but their programs can sometimes contribute to big moves in a matter of minutes if enough of them are doing the same thing at the same time. These scalping programs probably do not have much influence on the swings during the day, which are more the result of institutional orders being filled for clients. Over the long run, fundamentals rule, but over the next few seconds to minutes, program trading often controls the market and it probably has nothing to do with the fundamentals of the market in question. The fundamentals determine the direction and the targets over the next several months, but mathematicians determine the path that the market will follow to that target. Since the algorithms are statistically based, they may in fact enhance support and resistance and trending because of market inertia. Markets tend to keep doing what they are doing, so the program writers will detect recurring behavior and write programs that capitalize on this. Since a trend is likely to continue, the programs will keep taking with-trend positions, and this might make the trend more reliable and have smaller pullbacks. Also, most breakout attempts of trading ranges fail, and they may even be more likely to fail with so much volume betting that they will.

Although markets have inertia, at some point the current price action becomes excessive. For example, if the daily SPY is in a bull channel and it has not touched the moving average for 45 days and it has only done that once in the past 10 years, the current behavior is extremely unusual. Anything that is extreme cannot last

long because eventually it will show up as an excess on every imaginable measure of excess, and excess is opportunity. The market is not good at determining how far is far enough, but it is very good at knowing when the market has reached an excess. Once enough firms have decided that there is an excess, they will see it as an edge and place bets on a regression toward the mean. They will bet that the market will go back to doing what it has always done. In the case of that SPY bull, the strong bears will short and add on higher as the number of days away from the moving average becomes even more extreme. Also, the strong bulls will see the unusual behavior and they will begin to take profits and not look to buy again until the market pulls back at least to the moving average. The market can reach extremes in any type of behavior, like the number of consecutive bear trend bars; the number of consecutive days where the range is half of the average or twice the average; the number of consecutive bars with lows, highs, or closes above those of the prior bar; and just about anything else that you can imagine. There are institutions out there that pay attention to any form of extreme behavior and they will fade it. Also, extreme behavior will eventually show up as extreme on every conceivable indicator, so traders basing their decisions on indicators will also begin to bet that the behavior will end. Yes, the extreme will eventually end, but unless you are very confident in your read, do not fade the trend, because the market can sustain its unusual behavior longer than you can sustain your account.

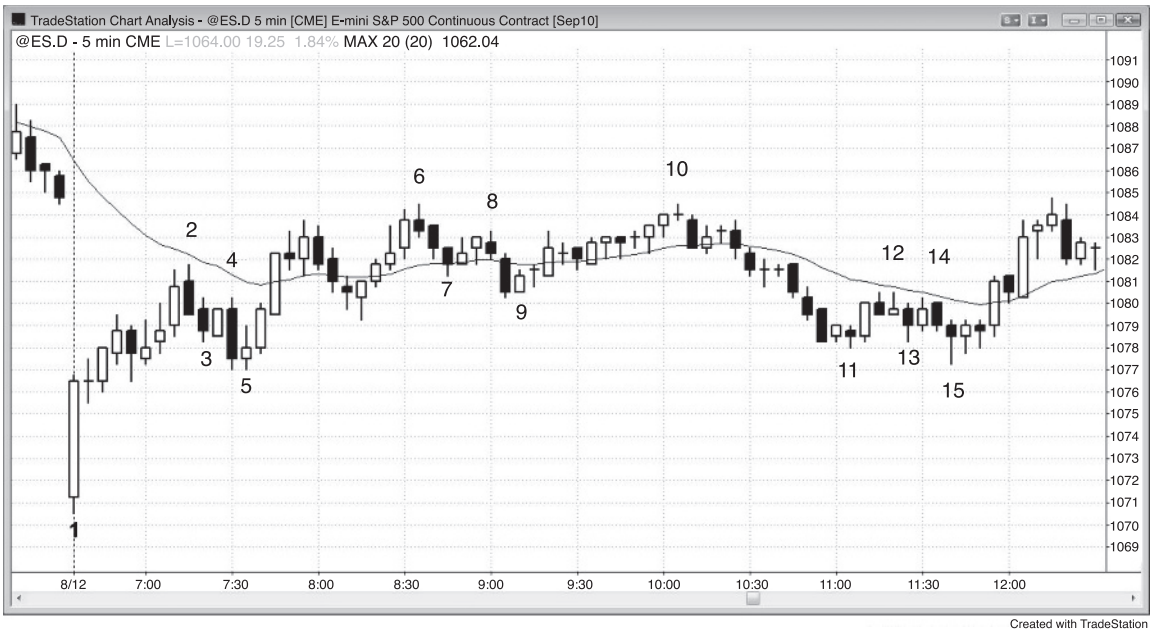

FIGURE PI.1 Two-Legged Pullbacks

Figure PI.1 and all of the charts in the book are available for download at www .wiley.com/go/tradingtrends, and you will be able to zoom in on the charts to see the details.

Two-legged corrections are reliable setups for trades in the direction of the trend. Bar counting is discussed in detail in a later section (in the second book), but since ABC patterns appear on just about every chart, they are worth discussing briefly here. As shown in Figure PI.1, bar 3 was the first leg down after the strong move up to bar 2. That made it the A leg of the ABC pullback. The little move up to the bar 4 high was the B leg, and the move down to the bar 5 low was the C leg. Since most pullbacks are not clear ABC patterns and instead often have just one leg and others have three or four, it is useful to have an alternative way to describe what is happening. Labeling a four-legged pullback as an ABCDE is too awkward to be useful. Instead, when there is a pullback in a bull leg, like to bar 3 in Figure PI.1, then the first bar that goes above the high of the prior bar is a high 1 long entry. Bar 4 is an example, as is the bar after bar 7. If the pullback continues down for a second leg, like it did to bar 5, then the first bar after bar 5 that goes above the high of the prior bar would be a high 2 entry. The bar after bar 5 is an example of a high 2 long entry, as is the bar after bar 9. Bars 5 and 9 were the high 2 buy setups or signal bars. If there was a third leg down in the bull flag, the entry would be a

high 3 buy entry, and if there was then a fourth leg down and the market turned up, the entry would be a high 4 long. When the market is in a bear leg, like it was in the move down from bar 10, the first leg up is the A leg of the ABC correction. Bar 12 or the bar before it was that A leg. The pullback from that small leg up was the B leg, which was bar 13. And then the second leg up was the C leg, which ended with the bar before bar 14. This was a sideways ABC, and it is common for the C leg to not surpass the A leg in an ABC pullback. Bar 13 was a low 1 short entry, as it was the first bar that traded below the low of the prior bar in a bear flag. Bar 15 was a low 2 short entry bar.

The big legs are essentially unstoppable, but the small price action is fine-tuned by some institutional traders who are watching every tick or have programs designed to take trades based on small price movements. For example, some Emini traders will try to scalp out with a one-point profit, or four ticks. If they just entered a buy, the market will usually have to move six ticks above the high of the signal bar. They probably entered on a buy stop at one tick above the high of the signal bar, and their profit-taking limit order is four ticks above their entry price. It usually will not get filled unless the market trades one tick higher than their limit order, which is six ticks above the signal bar's high. Sometimes when the market just keeps hitting five ticks but not six (a potential five-tick failure), there will suddenly be a trade of 250 Emini contracts and the price does not tick down. In general, anything over 100 contracts should be considered institutional in today's Emini market. Even if it is just a large individual trader, he likely has the insight of an institution, and as he is trading institutional volume, he is indistinguishable from an institution. Since the price is still hanging at five ticks, almost certainly that 250-lot order was an institutional buy. This is because if institutions were selling in a market filled with nervous longs, the market would fall quickly. When the institutions start buying when the market is up five ticks, they expect it to go more than just one tick higher and usually within a minute or so the price will surge through six ticks and swing up for at least many more. The institutions were buying at the high, which means that they think the market will go higher and they will likely buy more as it goes up. Also, since four-tick scalps work so often, it is likely that there is institutional scalping that exerts a great influence over most scalps during the day.

Traders pay close attention to the seconds before key time frames close, especially 3, 5, 15, and 60 minute bars. This is also true on key volumes for volume bar charts. For example, if many traders follow the 10,000 shares per bar chart for the 10-Year U.S. Treasury Note Futures contract, then when the bar is about to close (it closes on the first trade of any size that results in at least 10,000 shares traded since the start of the bar, so the bar is rarely exactly 10,000 shares), there may be a flurry of activity to influence the final appearance of the bar. One side might want to demonstrate a willingness to make the bar appear more bullish or bearish. In simplest terms, a strong bull trend bar means that the bulls owned the bar. It is

very common in strong trends for a reversal bar to totally reverse its appearance in the final few seconds before a 5 minute bar closes. For example, in a strong bear, there might be a long setting up with a very strong bull reversal bar. Then, with five seconds remaining before the bar closes, the price plummets and the bar closes on its low, trapping lots of front-running longs who expected a bull trend reversal bar. When trading countertrend against a strong trend, it is imperative to wait for the signal bar to close before placing your order, and then only enter on a stop at one tick beyond the bar in the direction of your trade (if you are buying, buy at one tick above the high of the prior bar on a stop).

What is the best way to learn how to read price action? It is to print out charts and then look for every profitable trade. If you are a scalper looking for 50 cents in AAPL or two dollars in GOOG on the 5 minute chart, then find every move during the day where that amount of profit was possible. After several weeks, you will begin to see a few patterns that would allow you to make those trades while risking about the same amount. If the risk is the same as the reward, you have to win much more than 60 percent of the time to make the trade worthwhile. However, lots of patterns have a 70 percent or better success rate, and many trades allow you to move your stop up from below the signal bar extreme to below the entry bar extreme while waiting for your profit target to be reached, reducing your risk. Also, you should be trying to enter trades that have a good chance of running well past your profit target and you should therefore only take partial profits. In fact, initially you should focus on only those entries. Move your stop to breakeven and then let the remainder run. You will likely have at least a couple of trades each week that run to four or more times your initial target before setting up a reverse entry pattern.

Fibonacci retracements and extensions are a part of price action, but since most are just approximations and most fail, they only occasionally are helpful in trading. For example, the first pullback in a new trend often retraces about 62 percent of the first leg but not often enough to place a limit order to enter there. That limit order would have you entering in the opposite direction of the market. For example, if the market is falling and you are trying to buy what you hope will become a higher low, the risk/reward ratio is not high enough and the stress is too great to be doing that routinely; however, there are exceptions when it is a sensible strategy. If a Fibonacci number is good, it will be associated with a chart pattern that is reliable and tradable on its own, independent of the Fibonacci measurement or any indicators.

Elliott Wave Theory is also a type of price action analysis, but for most traders it is not tradable. The waves are usually not clear until many, many bars after the ideal entry point, and with so many opposite interpretations at every instant, it requires far too much thought and there is too much uncertainty for most active day traders.

CHAPTER 1

The Spectrum of Price Action: Extreme Trends to Extreme Trading Ranges

Whenever anyone looks at a chart, she will see areas where the market is moving diagonally and other areas where the market is moving sideways and not covering many points. The market can exhibit a spectrum of price behavior from an extreme trend where almost every tick is higher or lower than the last to an extreme trading range where every one- or two-tick up move is followed by a one- or two-tick down move and vice versa. Only rarely will the market exist in either of these extreme states, and when it does, it does so only briefly, but the market often trends for a protracted time with only small pullbacks and it often moves up and down in a narrow range for hours. Trends create a sense of certainty and urgency, and trading ranges leave traders feeling confused about where the market will go next. All trends contain smaller trading ranges, and all trading ranges contain smaller trends. Also, most trends are just parts of trading ranges on higher time frame (HTF) charts, and most trading ranges are parts of trends on HTF charts. Even the stock market crashes of 1987 and 2009 were just pullbacks to the monthly bull trend line. The following chapters are largely arranged along the spectrum from the strongest trends to the tightest trading ranges, and then deal with pullbacks, which are transitions from trends to trading ranges, and breakouts, which are transitions from trading ranges to trends.

An important point to remember is that the market constantly exhibits inertia and tends to continue to do what is has just been doing. If it is in a trend, most attempts to reverse it will fail. If it is in a trading range, most attempts to break out into a trend will fail.

FIGURE 1.1 Extreme Trading Range and Trends

Figure 1.1 has two extreme trends and one extreme trading range. This day began with a strong bear trend down to bar 1, then entered an unusually tight trading range until it broke out to the upside by one tick at bar 2, and then reversed to a downside breakout into an exceptionally strong trend down to bar 3.

Two-legged moves are common, but unfortunately the traditional nomenclature is confusing. When one occurs as a pullback in a trend, it is often called an ABC move. When the two legs are the first two legs of a trend, Elliott Wave technicians instead refer to the legs as waves 1 and 3, with the pullback between them as wave 2. Some traders who are looking for a measured move will look for a reversal back up after the second leg reaches about the same size as the first leg. These technicians often call the pattern an AB = CD move. The first leg down begins with point A and ends with point B (bar 1 in Figure 1.1, which is also A in the ABC move), and the second leg begins with point C (bar 2 in Figure 1.1, which is also B in the ABC move) and ends with point D (bar 3 in Figure 1.1, which is also C in the ABC move).

Some corrections go for a third or even a fourth leg, so I prefer a different labeling system to account for this and discuss it later in the books. In its simplest form, it counts the legs of a pullback. For example, if there is a down leg in a bull trend or in a trading range and a bar then goes above the high of the prior bar, this

breakout is a high 1. If the market then has a second leg down and then a bar goes above the high of a prior bar, the breakout bar is a high 2. A third occurrence is a high 3, and a fourth is a high 4. In a bear leg or in a trading range, if the market reverses back down after one leg, the entry is a low 1. If it reverses back down after two legs up, the entry is a low 2 entry and the bar before it is a low 2 setup or signal.

Since measured moves are an important part of trading and the AB = CD terminology is inconsistent with the more commonly used ABC labeling, the AB = CD terminology should not be used. Also, I prefer to count legs and therefore prefer numbers, so I will refer to each move as a leg, such as leg 1 or the first push, and then leg 2, and so forth. After the chapter on bar counting in the second book, I will also use the high/low 1, 2, 3, 4 labeling because it is useful for traders.

Deeper Discussion of This Chart

The day broke out above yesterday's high on the open and the breakout failed, leading to a "trend from the open" bear trend day. This was also a trend resumption bear trend day. Whenever there is a strong trend on the open and then a tight trading range for several hours, the chances for a trend resumption day are good. There is often a false breakout between approximately 11:00 a.m. and noon PST, trapping traders into the wrong direction, and that failed breakout is a great setup for a swing trade into the close.