CHAPTER 1

The Need for a Full View Integrated Approach

1.1 THE MOTIVATION

1.1.1 The Need for a New Paradigm

Technical analysis provides useful information about market dynamics, but one needs many years of experience and to be one of the best in the industry to do it right and do it with a degree of consistency. While much work has been done in accumulating significant amounts of knowledge in the field, important parts of the knowledge required for effective application of technical analysis are still not formalized and codified. This is reflected in the fact that most people do not get consistent results from technical analysis. For the majority of people who depend on technical analysis for making trading and investment decisions, the experience is often frustrating due to frequent failures and the lack of a meaningful way to conduct postmortem analysis about the reasons for the failures. The reason behind the uncertainty is simple, most technical analyses, consciously or unconsciously, use one fixed-time interval chart as their main focus. Although there are a few commendable efforts in employing multi-time-frame analysis, they are not widely followed, partly because further improvement is needed in exploiting the added power in order to justify the increased complexity.

In reality, the effective range of indicators calculated on one interval chart is very limited. The independently effective range, i.e., the range where movements are not driven by factors associated with other intervals, is even more limited. On average, analyses based on, say, a one-day interval chart are effective probably no more than 20 percent of the time. For the remaining 80 percent, analyses are purely operating

on chance; the direction of the market is not related to the indicator values of the selected interval chart, but rather driven by factors that would be reflected in the values of the indicators from charts of other time intervals.

Interval charts: an interval chart is a trace of stock market values made by using each time interval as one observation point, recording on the chart one or more values of open, high, low and close of each observation point. A one-day interval chart takes one or more of the values in a day as one observation point and displays all the observations for a given period on the chart; a one-week interval chart takes those values in a week as one observation point; and a two-week interval chart takes those values observed in two weeks and displays them on the chart.

The interval charts used in this book are candlestick interval charts, which display all the above four values for each observation point. See figure 2.1 for an example. The filled gray bars are falling bars with the close lower than the open. Rising bars with the close higher than the open are shown either as filled black bars (e.g. figure 2.1) or unfilled bars (e.g. figure 4.3).

Behind each interval chart are the series of the recorded values at each observation point. The two-terms interval charts and interval data series will be used interchangeably in the discussion.

While trend lines, channels and other graphic tools can be used to forecast a long-term trend, the weakness of such tools is that they are highly subjective and their effectiveness depends heavily on the user's experience and skills. Furthermore, they are strong in describing what has happened but have limited ability to predict what is going to happen. Trying to forecast the market based on such tools produces highly uncertain results, as the nature of such patterns is highly dependant on conditions in charts of higher order time intervals. At the pausing point of longer interval data series, when the market is on a temporary short-term countermovement in a lower order time interval, it most times would display notable pauses against the short-term trend before final resumption of the long-term trend. On the other hand, before completing the trend or reaching pausing points in longer interval data series, the market may move straightly in one direction after finishing shorter time interval countertrend/waves, or only pausing for a shortened period of time before resuming the movement in the original direction.

Even for experienced users and even after a multi-time framework is adopted, it remains an agonizing experience to decide whether a bear market has ended, or whether a rebound is only temporary. There has not been an indicator or an approach in technical analysis that can

provide answers to the above questions with a good degree of confidence and a sound logic to support it. The best that can be hoped is a statistical analysis that says that the indicator worked, say, 65 percent of the time in the past. Strictly following the indicators from a given interval chart such as the daily interval chart may result in repeated failures. For example, on a long declining trend, taking a long position on short-term pausing-ups, would suffer repeatedly from the ensuing further falls.

Even when an attempt is made to analyze a long-term trend by employing, say, a 40-day, 150-day or 200-day moving average, the result remains highly uncertain. First, using indicators calculated based on one-day charts to capture a long-term trend is at most an approximation. Therefore, there will almost always be a gap between the true value and the approximation. Second, the right choice of the parameters (i.e., is it a 40-day, 150-day or 200-day that should be used?) is closely related to the depth and the duration of the original trend in the opposite direction. Therefore, there is no fixed parameter that is right for all market conditions.

Presently, however, most users make their pick of a fixed parameter for the long-term trend and stick with it, whatever the specific market conditions. And such a pick does not have any analytical foundation. At most, a statistical analysis is made on the average success rate of different parameters in the past: the one that was most successful is then selected. The approach based on such statistical analyses can provide useful information, but has significant flaws when used as the base for taking market positions. There are two fundamental assumptions that serve as the foundation of technical analysis: that the past matters for the future and that historical patterns repeat themselves. Because of the first assumption, today is different from any time in the past as a result of having a different history. Therefore, for the second assumption to be applicable, the right condition must be specified for the repetition of the patterns. But the need for such a specification of the right condition is completely ignored in much of the existing technical analysis, statistical analysis in particular.

A fundamental fact of the stock market, or financial market in general, is that the market is volatile; a given trend is often accompanied by many small countermovements on the way. Many of the temporary countermovements appearing in the daily chart, however, will disappear in the monthly or the quarterly chart. This shows that the volatility associated with longer time intervals is characterized by larger countermovements. This observation, of course, is nothing new. It is commonly accepted that volatility is proportional to the square root of

the interval size. It should be pointed out that the assumptions made to obtain such a conclusion, and the use of unconditional volatility to characterize stock market dynamics are questionable and not supported by the analytical system presented in this book. However, the implication that a longer trend is associated with higher volatility is consistent with empirical observations.

It follows that the reversal of larger trends associated with a longer time interval requires countermovements of longer durations to confirm. This is required to make sure that the countermovements indeed signal the end of the original trend and the start of a new trend in the opposite direction, not just a result of volatility with the original trend still in force.

Consequently, as a necessary condition, the size of the original trend must be the same to justify the use of the same parameter value in determining whether the old trend has been reversed and a new countertrend has been established. Most technical analyses would have been more effective had attention been paid to this important conditionality. One laudable exception is the adaptive indicator approach, which tries to differentiate volatilities from trend reversals in various well thought out and sophisticated ways. It should be pointed out, however, that the concept of volatility used in the approach is not the right one. Instead of focusing on the potential magnitude of volatilities, attention is paid to the observed volatilities. As a result, the existing approaches to technical analysis cannot correctly identify the end of a trend and the start of a new trend with a high degree of consistency.

There is another area of technical analysis where improvement can be made to take advantage of the accumulated knowledge. Most times, indicators are employed in isolation. Efforts need to be made to systematically exploit the joint power of multiple indicators that reflect different aspects of the market.

1.1.2 The Answers from FVITA

The Full View Integrated Technical Analysis (FVITA) system introduced here takes advantage of the accumulated wisdom of existing technical analysis and addresses the aforementioned weaknesses successfully. The success is achieved by introducing a system of time intervals and focusing the analysis on different time intervals according to different market conditions. The design of the system is based on two fundamental facts about the stock market. First, as already mentioned above, the stock market is volatile. A deeper and longer trend takes a deeper

and longer countermovement to confirm its reversal and differentiate it from movement caused by volatility. Second, the stock market is fractal; the structure of the stock market, and financial market in general, is the same across different time intervals.

There are two different ways to construct our analysis so that it is consistent with the first fact about the stock market: to use a fixed time interval while adapting the parameters of the indicators used in the analysis according to each specific market condition, or to use the same indicator parameters and change the time interval being focused on according to the market conditions to be analyzed. The latter is unquestionably a better choice.

First, changing the parameter value is not desirable given that most of the indicators are not linear in nature in terms of time. Therefore, there is no easy and consistent way to relate the parameter values to different market conditions and get accurate and robust results. Second, given the second fact about the stock market, switching between different intervals can be easily carried out with the same set of analytical tools. To whatever degree of success an indicator's fixed parameter values can be used in one interval chart, it can be used to the other interval charts with the same degree of success. The patterns and rules governing the stock market work in the same way on charts of different interval sizes. Third, by switching time intervals while using the same indicator parameters, all the existing knowledge accumulated on technical analysis can be inherited whenever they are useful; the most effective indicators can be selected for the construction of an optimal analytical system.

Of course, all the limitations of the current technical analysis as it applies to each individual time interval will also be inherited. As it turns out, the most important limitation of the current technical analysis is its aforementioned inability to capture the forces associated with market dynamics of different duration. The key therefore is to find the boundaries of such limitations and construct a system of time intervals such that the end of the effectiveness of one interval chart is the beginning of the effectiveness of another interval chart. Equally important, objective criteria are needed to evaluate when such a boundary has been reached as the focus of the analysis will have to be shifted to a different interval chart accordingly. The good news is that FVITA indeed offers such a system of charts that are analytically manageable and at the same time perform excellently in offering continued effective coverage of market movements. Also developed are objective rules to decide which interval charts should be the focus of the analysis in different market conditions.

As a result, the analysis presented here will not only be more accurate and robust, but it will also be objective, consistent, and systematic, offering standardized and continuous coverage of the stock market movements.

Based on the system constructed here, we are able to answer, in novel ways, the critical questions of whether a bear market, or a declining trend, has ended and how we can judge if a rebound is only temporary.

Finally, note that it is possible for the driving forces associated with charts of different interval sizes to operate at the same time. While the central focus will be on one interval adapted to the specific market conditions, the system presented here allows the flexibility of paying attention to multiple intervals at the same time and taking into account the interactions between them when necessary.

1.2 THE NECESSITY OF FVITA

Analyzing a system of interval charts is apparently more complicated than focusing on just one fixed interval chart. But this complication is a reflection of the complexity of the stock market and is therefore necessary.

Take a careful look at the results of using a fixed-time interval for technical analysis, say the one-day interval chart. It may be observed that the trend indicators such as moving average or MACD of the selected time interval are fairly good in providing the right signal for long-term trend reversal when it happens. This observation, however, is misleading. The correct forecasting of a long-term trend by the daily interval chart is due to the fact that the change of a long-term trend always starts from the reversal of a short-term trend. Therefore, when the long-term trend does change, the short-term trend indicator will always provide the right signal.

However, when the long-term trend is still unfinished, and the market moves in the opposite direction on a short-term, temporary counter-movement, i.e., when the short-term and the long-term trend move in the opposite directions, the short-term interval chart will provide faulty signals. If the market rises temporarily with a long-term declining trend still incomplete, the fall will resume after a short period of pausing-up. In this case, the signal of a positive trend provided by the lower order interval chart will very quickly prove to be wrong if used to forecast the reversal of the long-term declining trend.

Suppose a daily chart is used to forecast a longer interval trend, say a trend driven by factors behind a monthly or quarterly interval chart,

and the user wishes to forecast the timing of the bottoming-up in a declining market. The right call will be made for sure when the final bottoming up occurs, because when the longer interval chart finishes its fall, the one-day chart will turn up first and signal the reversal of the negative trend. However, before the bottom is reached, when the longer interval downtrend has not been completed, there may be many temporary pause-ups where the one-day chart would send wrong signals of trend reversals.

In making any forecast, the forecaster needs to control two types of errors. A type I error is the error of making a forecast, but it does not materialize. A type II error is the error of missing to make a call when the event of interest occurs. Normally when different forecasting methods or systems are being evaluated, the main focus is on minimizing a type I error. For making forecasts in the stock market, it is obvious that controlling a type I error is the more important concern. When a type II error is committed, normally it means inaction and missed opportunities for profit. If a type I error is committed, however, it most likely will lead to wrong investment or trading decisions and result in losses. Using charts of short intervals to forecast a long-term trend has a high probability in making a type I error, calling a long-term trend reversal while the trend is still in force.

Is it a good strategy to address the above problem by following the short-interval rebound signal into the market and getting out when the signal turns negative? The answer is negative. Before the completion of a long-term trend, there may be many short-term pausing-ups. Such a strategy will accumulate a large amount of losses along the way before finally getting it right. When the market is close to a large pausing-up point, or close to the completion of the downside, in particular, volatility can be very high; the market may fall in waves rather than by a straight line on short-interval charts, with numerous short-term pausing-ups between falling waves. During these periods, the market may move in exactly the opposite direction to what is signaled by the short-term chart. As the short-term chart signals a positive trend, the stock market starts to fall. Shortly after the short-interval trend indicator turns negative, the market rebounds again. This can happen multiple times.

Furthermore, while short-interval trend signals will turn positive when the bottom of the long-term falling trend is reached, they may turn negative again temporarily and result in an early exit after the bottom-up in the long-term trend, with the possibility of missing out most of the profitable opportunities on the way up as a result of frequent, unnecessary exits.

If a short-interval trend indicator cannot be relied on to signal the reversal of long-term declining trends, can we use the chart of a long enough interval to make sure that most of the downturns are driven by a data series of shorter time intervals than the chosen interval? This will make sure that a trend reversal signal from the selected interval will cover most of the downtrend; the type I error will be drastically reduced. However, the approach is obviously not the right answer. First, if the interval chosen is too long, there may be significant countermovements within a continuing trend being ignored. Significant opportunities will be missed when the market moves in the opposite direction while the big trend is still not completed. For example, suppose a quarterly interval chart is used as the focus of analysis. On the course to complete a trend, there could be several months' countermovements on the way that will be missed, because the trend in the quarterly chart remains in force. This is despite the fact that the quarterly interval is still not large enough for correctly analyzing the decline associated with a cyclical economic downturn, such as the one accompanying the 2007 financial market crisis, or the market downturn after the internet bubble in 2000.

Second, if a position is held in the direction of the original trend, focusing only on the long time interval may lead to large and persistent losses that go beyond the investor's or trader's risk-bearing capacity. This is because signals from the long time interval will fail to detect many countertrend movements that are small relative to the selected time interval, but large relative to the risk preference of the position taker.

Furthermore, it takes more time for longer interval charts to send out signals than shorter interval charts. If a mistake is made, it will take more time to confirm the mistake, resulting in big losses. Taking the quarterly interval chart as an example, it may take several months before we can confirm a mistake is made. This is a risk most people would want to avoid. Additionally, it will also take a longer time to confirm a new trend for getting into the market. Obviously, if a few weeks are enough to confirm an uptrend, there is no reason to wait for a few months or a few quarters before action. In the latter case, the opportunity may no longer be available, or may have lost most of its value.

Finally, while a longer interval will reduce the risk of committing type I errors, it will increase the risk of committing type II errors, leading to missed calls when lower order interval trends are reversed.

Therefore, focusing on a single time interval, whatever its size, leaves us in the dark most times, resulting in missed opportunities as

well as unwanted risks. It is necessary to adopt a full view approach to technical analysis that focuses on whatever interval charts are the most appropriate for the given market conditions. Only when the interval chart is appropriately chosen in a systematic way, will it be possible to tailor the analysis to tightly match the specific market conditions and have a high degree of confidence in the judgment being made, and doing so in the timeliest way.

1.3 RANDOM WALK?

Any serious attempt at building a technical analysis system with a reasonable analytical foundation will have to confront the efficient market hypothesis, or its statistically testable form—the random walk theory. The latter states that future market prices cannot be forecast based on past and present market prices. Chapter 9 will offer more detailed discussion about the two and the difference between them. Whichever way the hypothesis is stated, the central message is the same for most of its adherents—if there were profitable opportunities presented by forecastable prices, it would have been taken.

While this does raise doubts about old, simple trading rules that are in the public domain, it would be a leap of faith to say that no rules, not even new, sophisticated rules in the private domain can be effective. There is no theoretical foundation for such an argument unless one is willing to assume a strong form of rationality that all market participants know everything possible about market valuation instantaneously. This strong form of rationality is clearly an untenable proposition under any reasonable interpretation of investor behavior associated with past market dynamics, especially during episodes of bubbles and panics. In fact, Eugene Fama, who developed the efficient market hypothesis in 1965, recognized that "There is nothing . . ., however, which suggests that superior fundamental or intrinsic value analysis is useless in a random walk-efficient market." What is said about fundamental analysis applies equally well to technical analysis.

The strength of the efficient market hypothesis thus rests not on strong logic but rather on the fact that most of the initial statistical analyses showed that the associated random walk theory stood well against alternative specifications. This initial success of the random walk theory, however, was more a reflection of the weakness of the alternative specification, rather than the strength of the random walk theory itself. The failure of the alternative specification is not a proof

of the validity of the random walk theory. In fact, in more recent years, there have been an increasing number of studies coming up with statistical evidence against the random walk theory. However, given how easy it is to run regressions with increasingly powerful computers and the difficulty to realize real trading gains from the demonstrated deviations, it is fair to state that the random walk theory remains hard to beat.

FVITA presented here, however, shows that the difficulty in beating the random walk theory is well anticipated given the alternative model specification used in the existing literature. In fact, the implication of FVITA is that the majority of the tests are misspecified with important missing variables. Based on patterns characterized by FVITA, the market dynamics are far more complicated than any trading rules that have been tested, suggesting a non-linear relationship between future prices and past prices with time varying parameters, likely of different signs under different market conditions of higher order time intervals. With higher order time interval conditions missing from the tests, the statistical analysis based on data collected from a single time interval suffers the same problem pointed out earlier about technical analysis. This explains why the random walk theory has been difficult to beat, and also points to the risk of spurious results in the cases when the alternative specification receives statistical support.

Clearly, the approach taken by FVITA will have to be tested and verified by other users after extensive tests by the author. Nonetheless, it is fair to say at this point that however the existing body of statistical and theoretical evidence is interpreted in relation to the efficient-market random walk theory, it does not provide a valid argument against technical analysis in general, and the system being presented here in particular. On the other hand, the robust regularities described in FVITA and presented here not only offer strong evidence against the random walk theory, but also raise serious questions about the validity of the empirical evidence in its favor.