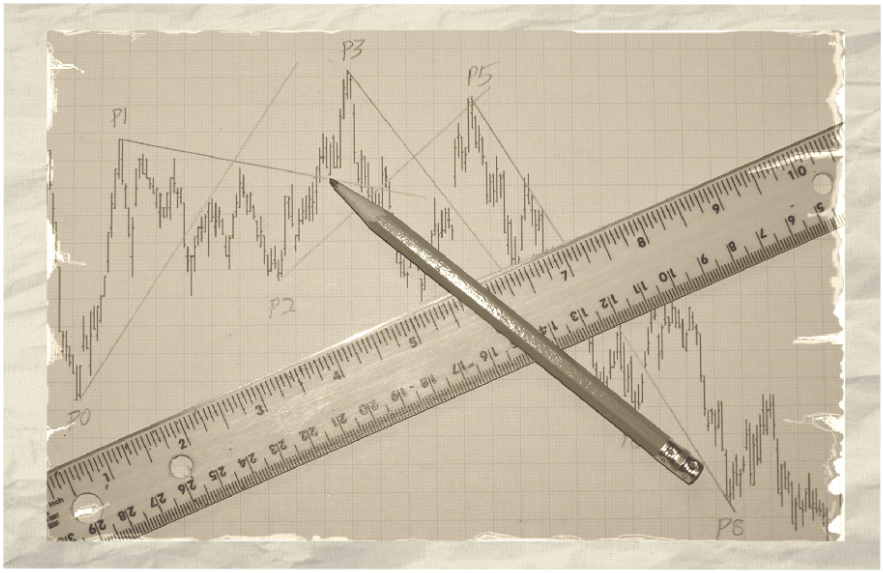
Using Median Lines As A Trading Tool

An Empirical Study
Grain Markets 1990-2005



By Greg Fisher

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Using Median Lines As A Trading Tool:
An Empirical Study – Grain Markets 1990 - 2005

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Abstract

BACKGROUND:
The Median Line method is a trendline technical analysis tool used by chartists to gage market movement. The Median Line method was developed by Dr. Alan H. Andrews to determine potential market direction by drawing a single line on the chart of any market security. Dr. Andrews study of the method determined price action returned to the Median Line 80% of the time. Obviously, having the ability to gage market price movement and being 80% accurate would be of interest to a number of people.

OBJECTIVE:
To determine the effectiveness of the Median Line method and if the 80% accuracy holds true.

RESEARCH QUESTION:
Can the Median Line technical analysis tool accurately predict market price action in the grain markets, and does the 80% accuracy hold true?

FORMAT:
History and explanation - The paper will explain the origins and historical use of the Median Line and action/reaction methods and developments of the methods since. The paper will describe the method in detail with chart examples.

Empirical study - An empirical study of the Median Line will be conducted. The grain markets (CBOT wheat, KCBOT wheat, CBOT corn, and CBOT soybeans) from 1990-2005 will be charted and the Median Line method will be applied. The "new crop" contract for each grain for each year will be studied (July – CBOT wheat, KCBOT wheat, December – CBOT corn, November – CBOT soybeans). The number of the times market price movement acts according to the Median Line rules will be determined. The probability that price acts according to the Median Line method rules will be determined.

Summary – The results of the empirical study will be summarized and the research question will be answered.

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PART I
Introduction

Technical analysis of the exchange-traded markets is a method applied by investors to predict future price movement based on past price history.

Technical traders rely on indicators including statistical indicators, price patterns, and trendline analysis. Today's computers have made a variety of indicators accessible to traders, including indicators that are based on price action and on time series. Stochastics, Bollinger Bands, Relative Strength Index, and Moving Average Convergence Divergence are a few of the commonly used indicators. The indicators are designed to give the trader an idea of where prices could be headed and when a trend will end or begin based on price history. Today, many traders watch live data streamed to their computer and evaluate market action as it unfolds.

Traders in the "pre-computer" era hand charted many commodities or securities often receiving charts in the mail only once a week. Traders would update the charts by filling in the price bars and using simple techniques such as trendlines to get a feel for the market.

A trendline can be defined as:

> "A trendline is an indication of levels of support and resistance in the market place. Price ranges and extremes in price action are smoothed in a way by using trendlines. In a fashion, trendlines help us to determine acceptable valuation levels during a certain time period. Longer term trendlines can indicate the various support or resistance levels of price that is mutually agreed through free market operations. As time and conditions change, so do the perceptions and evaluations of value, which leads to penetration of previously held valuation beliefs. Penetration of a long term trendline is an indication of changing supply and demand and could point to a trend reversal."[1]

With today's technological advances, are the trendline techniques of the old days outdated and no longer useful? Have the markets advanced beyond the ability to use trendline analysis to gage market movement?

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PART II
History of the Median Line

Dr. Alan H. Andrews

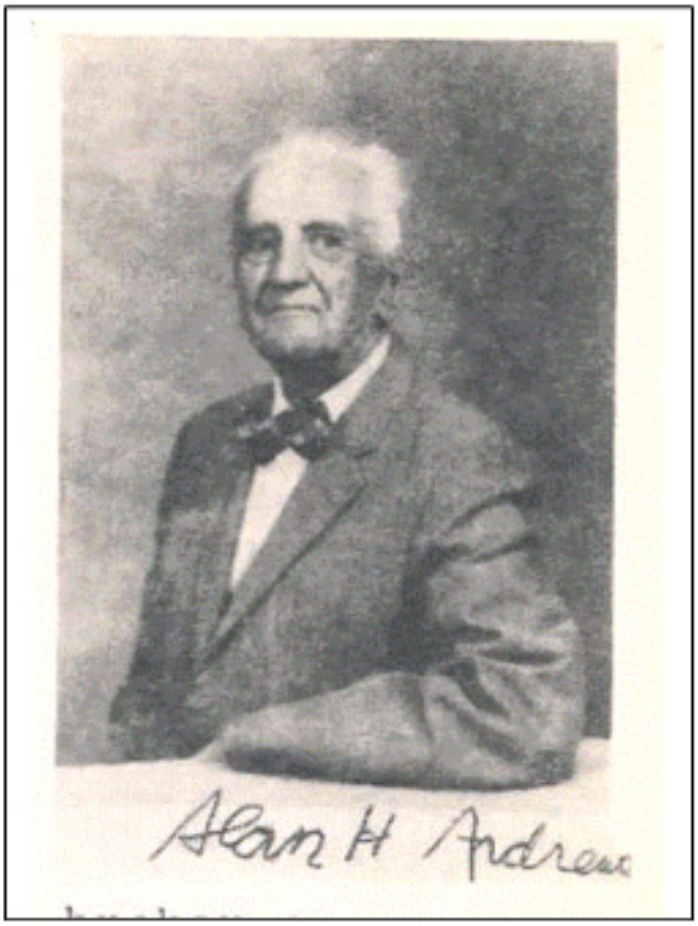


Figure 1. Alan H. Andrews.[9]

One particular trendline tool was created by Dr. Alan H. Andrews. Andrews method called the Median Line, sometimes called "Andrews' pitchfork", was created to indicate lines of support or resistance where price trends tend to stall out or reverse. In essence, the Median Line is a method of channel identification in a trending market.[2]

Andrews grew up in a family well aware of the markets and trading. Andrews father owned a brokerage firm, trading for clients as well as his own accounts. The firm handled accounts for the Kennedy family during the Great Depression and reportedly made them a large amount of money during this period. Andrews graduated from MIT with a degree in engineering. After the young Andrews graduated, his father challenged him to make one million dollars in one year. Andrews did not accomplish the task in one year; however, he did accomplish the task in just over two years trading commodity

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futures.[5] Andrews later became a civil engineering lecturer at the University of Miami in Florida. After he retired, Andrews devoted his professional time to managing his own investments and teaching others.[3]

Andrews created a course for his students entitled the "Action-Reaction Course". The course was 60 pages in length and used what is best described as a case study approach. He described his method as the "Median Line Method". The Andrews course sold for $1,500 in the 1960's and 1970's.[3]

Andrews believed the markets exhibited an order that could be identified.

> "Of the two kinds of change in the Universe, flowing change and random change, we are indebted to Newton's invention of Calculus that enables us to find out in advance the conditions that flowing change will produce in the future. His discovery of the natural law that Action and Reaction are equal and opposite in the field of physics also has been applied in the Course to the random changes of price movements in free markets. This application of the Action-Reaction law enables you to learn in advance where the probable reversals of price trends will come in the future."[6]

> "When we speak of any scientific law, we mean a statement that a relationship has been observed among certain given conditions. We mean, "if these conditions now, then those conditions follow, and can be expressed mathematically". We have "order" through which we can know the outcome from these conditions. We can therefore take advantage of this knowledge, and thereby progress and profit."[6]

> "So Newton was one of the great discoverers of this "orderliness" that underlies all of the Creator's work, even if we are often slow in discovering it. Newton's Laws therefore as stated above, have benefited the users in both flowing and random changes."[6]

Andrews attended many trading seminars during his career where he made many contacts and lasting friendships. Andrews work was significantly influenced by two individuals he met at the trading seminars; Roger Babson and George Marechal.[5]

Andrews credited Roger Babson with the idea of applying Newton's Third Law of Motion to economics.

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Roger Ward Babson

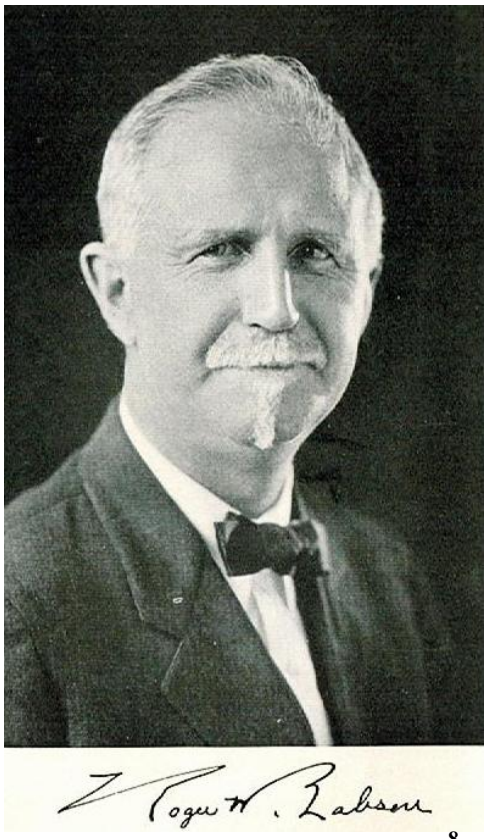


Figure 2. Roger Ward Babson.[8]

Roger Ward Babson accomplished many successes in his lifetime to say the least. Babson could be described as entrepreneur, educator, author, and philanthropist. Babson founded three colleges, authored 47 books, and ran for the United States Presidency in 1940.[12]

Babson received training as an engineer at MIT from 1895-1898. In 1904, Babson founded Babson's Statistical Organization, later called Business Statistics Organization and then Babson's Reports. Today the organization exists as Babson-United Investment Reports. In 1907, Babson expanded his investment practice to include counseling on choosing and timing investments.[12]

Babson was disturbed by a sudden stock market crash in March of 1907 and set out to prevent future occurrences. Babson cites two books that influenced him to pursue the creation of the Babsonchart, a composite chart of commodities and securities as an economic indicator. *Benner's Prophesies of Future Ups and Downs in Prices*, published in 1884 contains a quote Babson was particularly fond of: [7]

> "There is a time in the price of certain products and commodities,
> Which, if taken by men at the advance, leads on to fortune;
> But if taken at the decline, leads to bankruptcy and ruin." [7]

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Babson also drew his ideas from, *How Money Is Made in Security Investments*, by Henry Hall. Babson explains the influence of the two books on the creation of the Babsonchart.

> "I took the above books, with other material, to Professor George F. Swain, …the head of the civil engineering course at the Massachusetts Institute of Technology. We both concluded that there was something in the idea which these books portrayed. I set my people to work compiling what became the first Babsonchart." [7]

The method they created considered areas of price action on charts rather than the highs and lows of price action common to forecasting. The method assumed after a depression area equal to a preceding area of prosperity, another area of prosperity would develop. The method involved drawing a line through the cycle making the area below the line equal to the preceding area above the line. The "Normal Line" separated areas of prosperity above the line from areas of depression below the line. Babson believed investors could closely forecast the length of a depression based on the normal line method. Babson attributed the method to Newton's law of action and reaction.[7]

> "It was Professor Swain who first drew a "normal line" through these zigzag charts which we had made and through the composite chart which included them all…Professor Swain also suggested that Newton's Law of Action and Reaction may apply to economics as it does to physics, chemistry, astronomy, and other fields." [7]

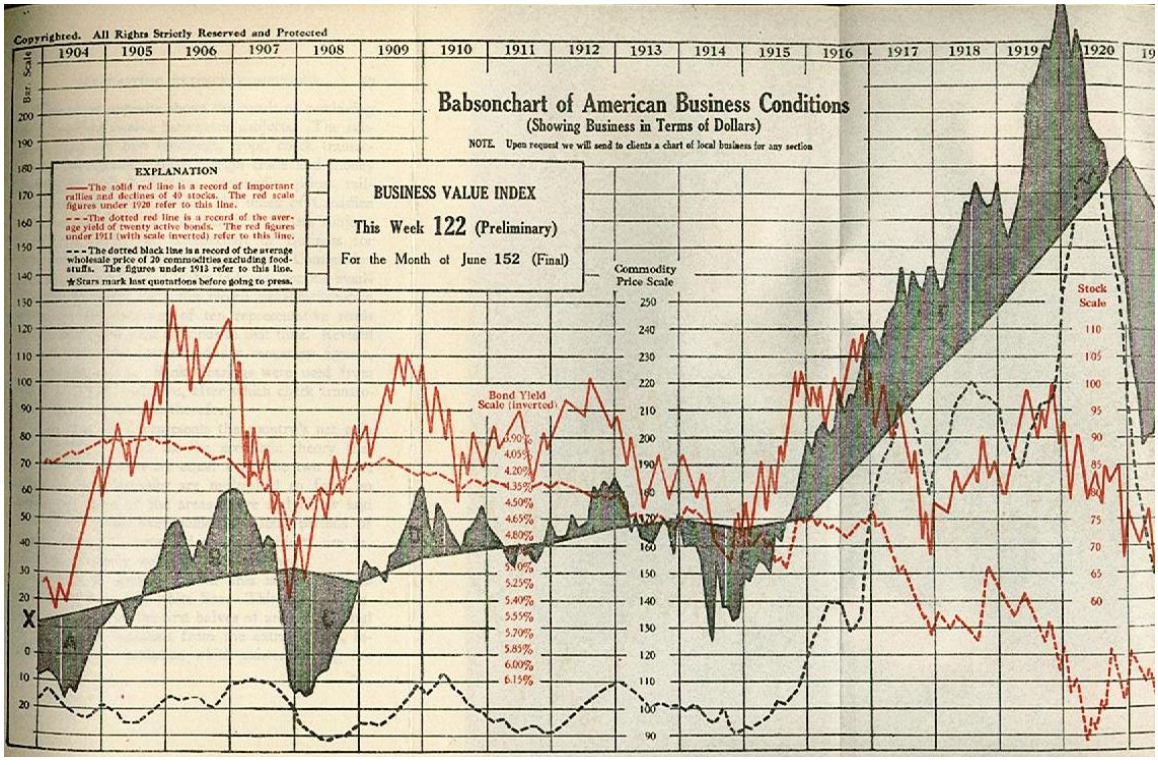


Figure 3. Babsonchart of American Business Conditions – October 2, 1923.[13]

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Using these methods, Babson earned the distinction of forecasting the 1929 stock market crash in an article published in New York Magazine.[3]

Andrews wrote of Babson:

> "This rule was first applied to price trend changes by the late Roger Babson. He adapted it to price movements from Sir Isaac Newton's scientific law that states "Action and reaction are equal and opposite". He stated that his fortune of over $50,000,000 was due to this principle. In gratitude to Newton, he established the Gravity Research Foundation now located at New Boston, N.H., and went to England where he was able to buy Newton's former home. He then transported the study where Newton made his discoveries to the Babson Business Institutes, and you may visit and sit in this beautifully paneled room at Wellesley Hills in Babson Park. The writer, your director was presented with some apples and said to be the descendents of the apple tree that Newton is said to have been sitting under when the fall of an apple started his train of thought leading to the important laws that he developed, relative to gravitation."[6]

Although the methods of Babson and Andrews were based on the same theory of action and reaction, Babson's method measured the area price moved above or below a line drawn though the center of previous price swings where Andrews' methods were based on price movement unrelated to area. Babson's methods were used as long-term economic indicators for economic analysis. Andrews' methods were based more on short-term to intermediate-term trading.[10]

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George Marechal

George Marechal is famous for a market prediction he made in the early 1930s. Marechal copyrighted a fifteen-year forecast for the Dow Jones Industrial Average. The top of the chart is Marechal's forecast in December of 1933, and the bottom of the chart is the actual performance of the Dow Jones Industrials from 1934 through 1948.

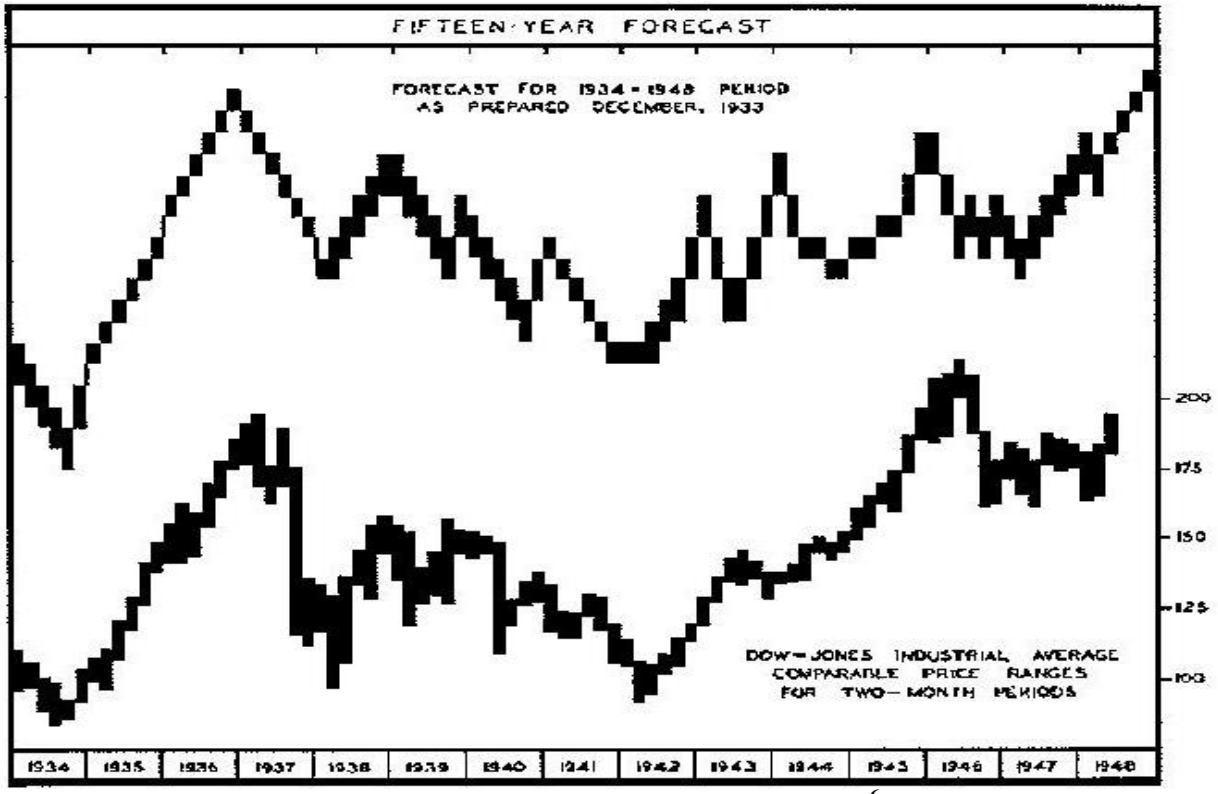


Figure 4. George Marechal's forecast prepared December 1933.[6]

Andrews wrote of Marechal:

> "Marechal, by mathematical methods of his own, was the first to demonstrate that there is order underlying the so-called random changes in price fluctuations. No professor at any university, no government economists, have ever been able to produce a similar chart showing, as Marechal's famous chart, copyrighted in advance, what the Dow Jones Industrial stock averages would do 15 years ahead. As one of many other samples of this mathematical orderliness regulating the flow of stock prices, the writer received from this remarkable man, now approaching 90, several months before President Nixon's election, an accurate prognostication of what the D.J. Industrial Average would do the day after Nixon's election."[6]

Although it is clear Marechal had a significant influence on Andrews, it is unknown if Marechal played a large part of the creation of the Median Line Method. The copyrighted chart is the only publicly available document of Marechal's work. [5]

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PART III
The Median Line Technique

The Median Line – A Definition

The creation of the Andrews Median Line is quite simple, but first a definition of the terms involved is in order.

1. Median Line (ML) - The middle line of the construct
2. Median Line Parallel (MLH) - The outer line(s) of the construct.
3. Pivot (P) - The extreme price on a price chart where a change of direction takes place.

The method of drawing the Andrews Median Line is very simple. First, three consecutive pivots on a price chart must be selected. The pivot sequence is a high, low, high or a low, high, low configuration. The pivots are to be labeled in sequence P1, P2, P3. A line is then drawn connecting pivots P2 and P3. The midpoint of line P2-P3 is then found. A line is then drawn from P1 through the midpoint between P2 and P3 and extended. This is the Median Line, and it is a ray that originates at P1 and bisects the distance between P2 and P3. A second line is drawn parallel to the Median Line beginning at pivot P2. A third line is drawn parallel to the Median Line beginning at pivot P3. The Median Line construct is complete.

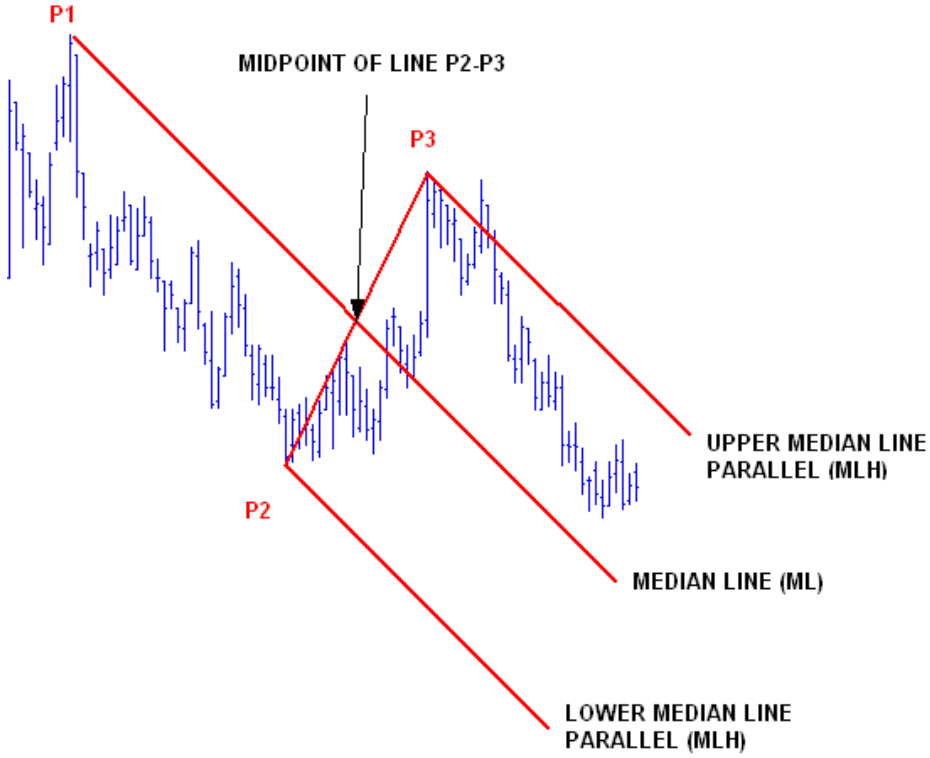


Figure 5. Andrews Median Line construction.

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Defining Pivots

The first difficulty imposed by the method is which pivots to choose.

> "During on of his seminars, Dr. Andrews related that the first thing he looked for when he picked up a price chart was the number of prominent reversal points that were present in the prevailing trend of the time frame he was studying. He called those reversal points "significant pivots" and gave each one a number beginning with P0, followed by P1, P2, P3, and so on."[11]

The identification of pivots is subjective, so for the purposes of this study, a more exact definition is necessary. A pivot for this study will be defined as:

A reverse in price direction that reverses the previous trend by violating the previous trendline.

Andrews' Trendlines

The Andrews definition of a trendline will be used:

> "For an uptrend within the period of consideration, draw a line from the lowest low, up and to the highest minor low point preceding the highest high. The line must not pass through prices in between the two low points. Extend the line."[11]

> "For a downtrend within the period of consideration, draw a line from the highest high point to the lowest minor high point preceding the lowest low so that it does not pass through prices in between the two high points. Extend the line."[11]

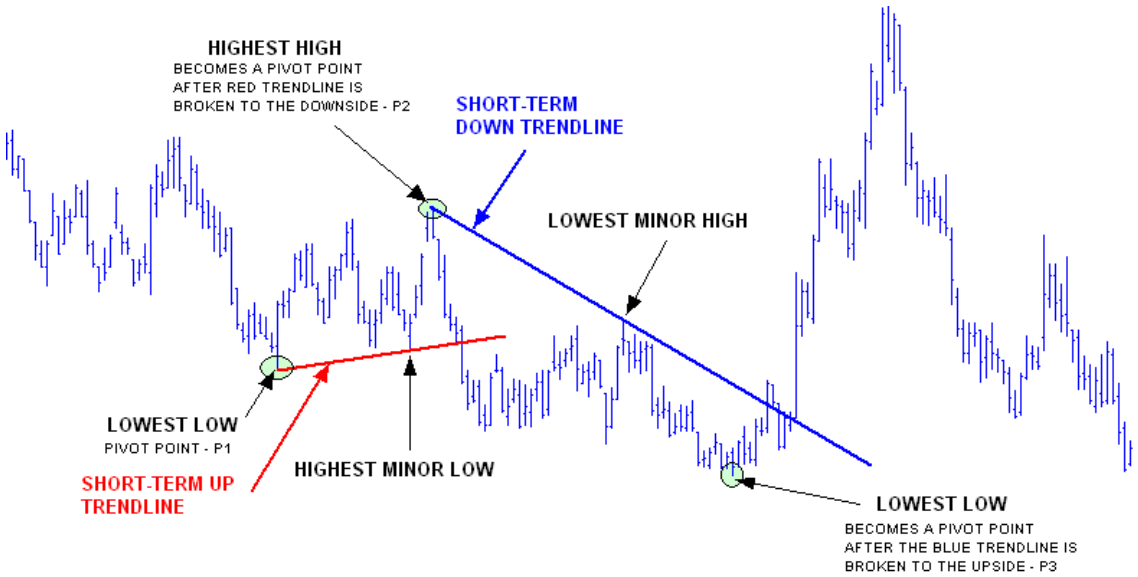


Figure 6. Andrews' trendlines.

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The time frame of the trend under study must also be defined. Monthly, weekly, daily, hourly, and even 15-minute price charts are available. For the purposes of the study, daily charts for finding trends and defining pivots will be used:

Daily charts will be used to identify price trends using Andrews trendline method.

Identification of Price Pivots

To summarize, a pivot will be chosen by identifying:

A reverse in price direction that reverses the previous trend by violating the previous trendline.

Where,

Daily charts will be used to identify price trends using Andrews trendline method.

Median Line as a Price Magnet

The best way to describe the expected outcome of the Median Line is by Andrews himself, as well as those who studied his work and applied the method.

> "What everyone wants to know is where the latest trend is headed, and where the next pivot (P) will be from which the reverse trend will start. The probability of the next P being at the latest ML seems to be about 80%, and even without any additional rules that enable you to be constantly either long or short, the profit potential of this simple rule is tremendous for you."[6]

> "Dr. Andrews found that his Median Line served as a magnet, drawing prices toward it. He also discovered that once prices reached a Median Line, more often than not they would reverse direction. By drawing a Median Line after a new pivot had formed, he was able to see at a glance where prices would likely reach...approximately 80% of the time. More often than not, in other words."[11]

> "Andrews always held that the Median Line is based on the law of physics. He believed that principles from physics could be applied to financial markets… These principles are that natural cycles return to their centers, and for every action there is a reaction… When a swing in the financial markets returns to the Median Line, it also completes one cycle. Andrews believed that the price returns to the Median Line about 80% of the time."[10]

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Andrews original course states five observations concerning the Median Line (ML).

"There is a high probability that:

1. prices will reach the latest ML
2. prices will either reverse on meeting the ML or gap through it
3. when prices pass through the ML, they will pull back to it
4. when prices reverse before reaching the ML, leaving a "space", they will move more in the opposite direction than when prices were rising toward the ML
5. prices reverse at any ML or extension of a prior ML" [6]

Median Line Parallels

Andrews found the Median Line Parallels (MLH) often acted as support and resistance. Although the Median Line Parallels did not act as magnets as the Median Line, they often suggested areas where price would stop and consolidate or reverse. Andrews found if price rises to touch a Median Line then reverses after touching it, price is likely to find support at the lower Median Line Parallel. Conversely, if price falls to touch a Median Line and then reverses after touching it, price likely will find resistance at the upper Median Line Parallel. Andrews found that, if price reaches a Median Line and gaps (skips over) or zooms through the Median Line with a large price move, price will likely find resistance or support at the leading Median Line Parallel.

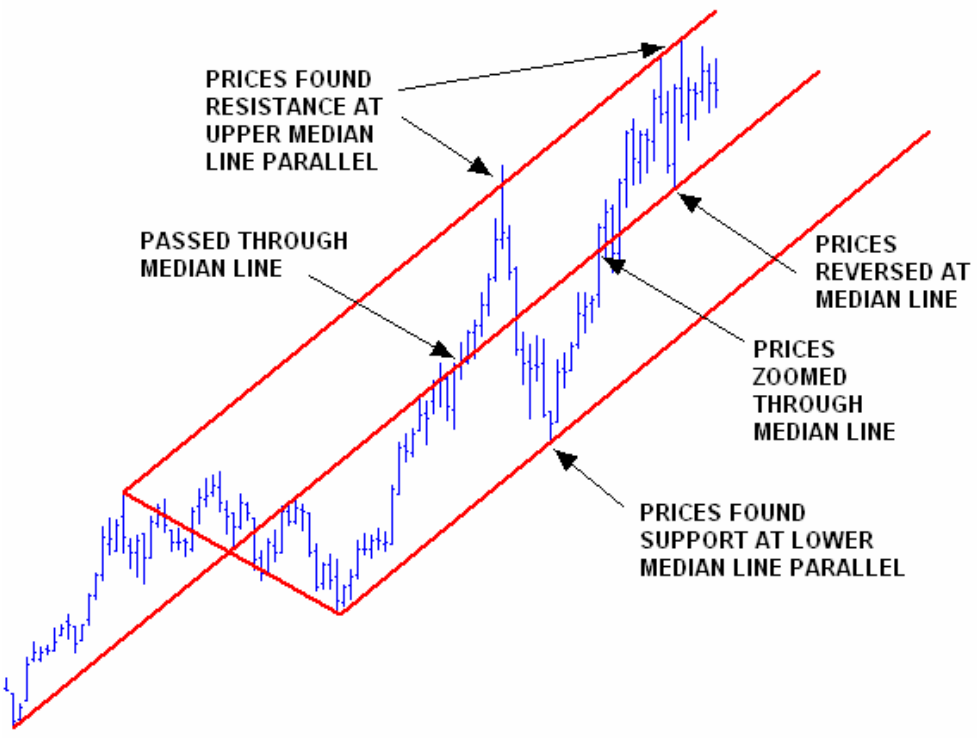


Figure 7. Price interaction with Median Line and Median Line Parallels.

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Mini-Median Line

Andrews used the Mini-Median Line when prices reached an area of support or resistance where a pivot was likely to occur. For example, the method could be applied when prices were near the Median Line or Median Line Parallel. The Mini-Median Line is drawn the same as a regular pitchfork except the closing prices are used as the pivots rather than the alternate high and low extremes. The Mini-Median Line is used on small prices swings.

> "The "Mini-Median Line" (MML) was Dr. Andrews favorite and most often used market pricing tool. He used the Mini-Median Line pitchfork to signal buy and sell opportunities as the price action of a stock or commodity unfolded from day to day. He said it not only generates timely signals for short-term trading, it's also an indispensable tool for use whenever a reversal is anticipated." [11]

> "Dr. Andrews said that as a rule of thumb, 2 to 4 days are usually the maximum between pivots 2 and 3, and P1 can be from 1 to several days back from P2." [11]



Figure 8. Mini-Median Line construct.

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Reverse Median Line

Andrews used the Reverse Median Line to spot buy or sell price levels that often indicated continuance of the current trend or price reversals. The Reverse Median Line construct is drawn like the regular Median Line construct by choosing three alternative pivots, but instead of using P1 as the beginning pivot, P3 is used. The mid-point between P2 and P1 is then located. A line is then drawn from P3 through the mid-point of P2 and P3. The parallel lines are then drawn. Because the pitchfork will be extending to the left rather than the right, the pitchfork lines need to be extended to the right.

> "…rather than using his normal pivot counting approach for this technique, i.e.: labeling the beginning pivot of the trend he was studying as P0, he labeled the beginning pivot as P1." [11]

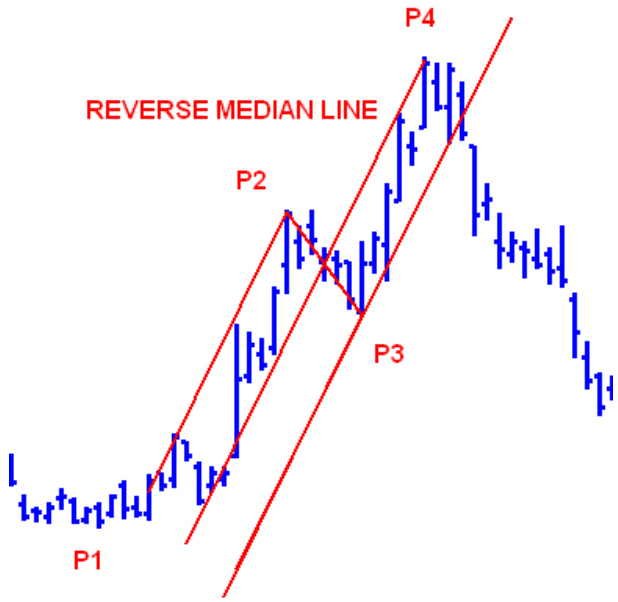


Figure 9. Reverse Median Line construct.

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Schiff Median Lines

Andrews used a technique developed by one of his students, Jerome Schiff, a New York floor trader. The name would more accurately be described as the "modified" Schiff Median Line because Andrews taught a modified version of the original line created by Schiff.[5] The Schiff Median Line can be used when price heads toward the Median Line, but before reaching the Median Line, begin to drift sideways, moving away from the Median Line. The Schiff Median Line can also be used when the regular Median Line is unusually steep. The procedure for drawing a Schiff Median Line is the same as a regular Median Line except the starting point is drawn at the midpoint between P1 and P2 rather than from P1.

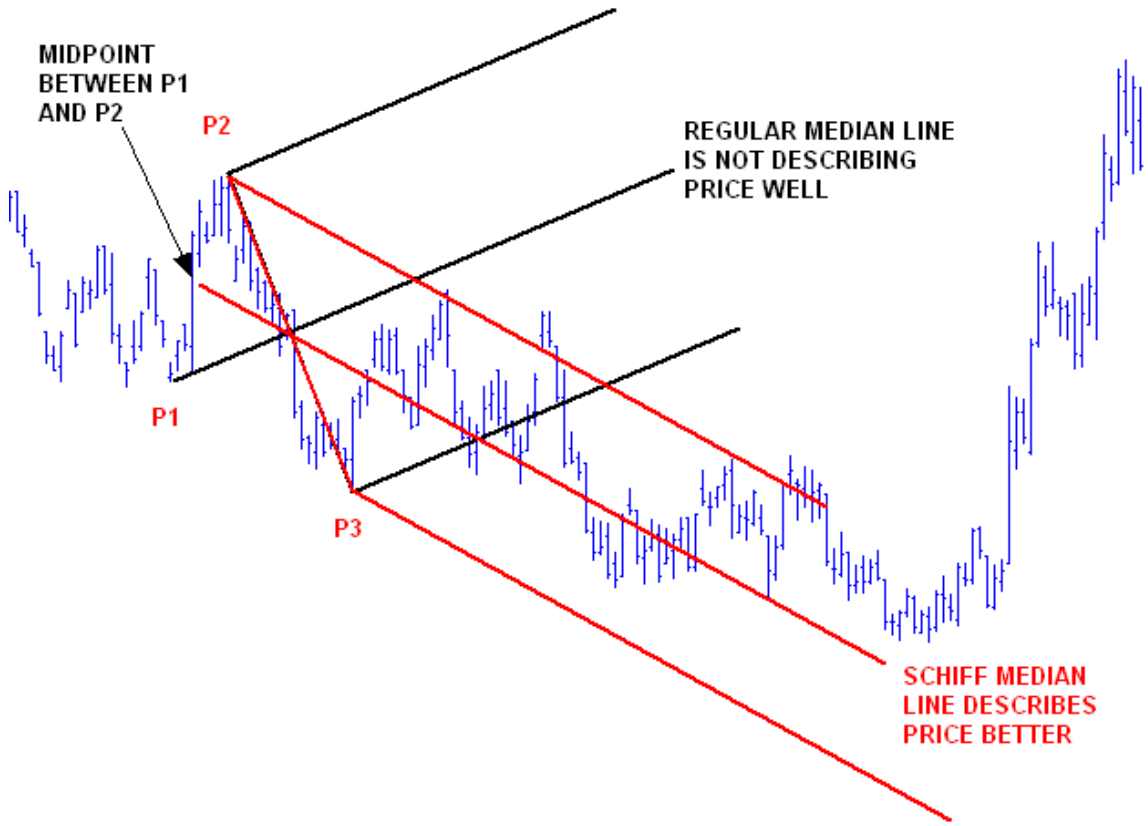


Figure 10. Schiff Median Line.

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PART IV
Price Failures

Andrews estimated price returns to the Median Line approximately 80% of the time and stays within the Median Line Parallels during price trends. He also realized this would not always be the case, so he created methods for trading when price do not act as expected. He called these situations "price failures".

> "When prices fail to reach the ML as shown by a space between the P of reversal and the ML, the probability is that this price reversal will go further than it did on its approach toward the ML." [6]

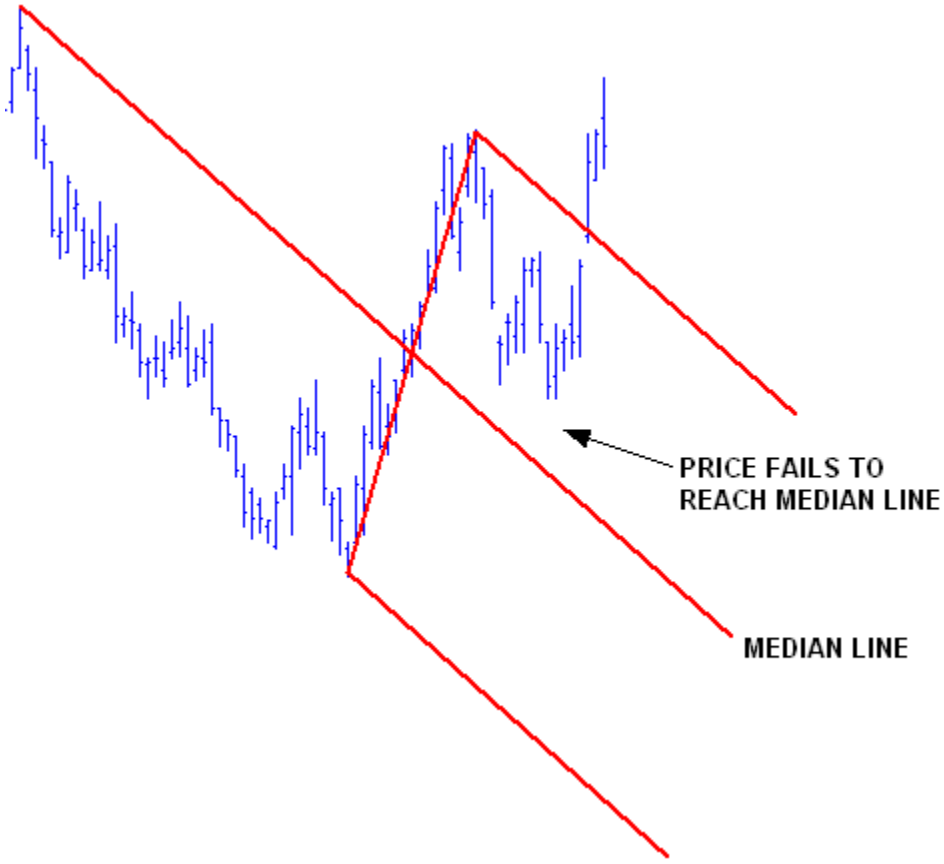


Figure 11. Price failure.

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Sliding Parallels

Andrews developed the Sliding Parallel as a reversal indicator if price fails to reach the most recent Median Line, and proceeded beyond the Median Line Parallel. If a Median Line Parallel is penetrated, a short line is drawn congruent to the Median Line Parallel from the price extreme of the price bar where the Median Line Parallel is penetrated. If a future price penetrates the Sliding Parallel, a buy or sell order is generated.

> "Frequently, after crossing a lower Median Line Parallel, prices continue to rise along the Median Line Parallel before the further drop that was signaled by passing through. So here you can use a Sliding Parallel through the bottom of the range of the most recent day as a sell signal if prices drop through that Sliding Parallel." [6]

> "Dr. Andrews considered 2-3 days were usually the maximum for using a Sliding Parallel, but noted that an extended Sliding Parallel could be valid for a longer period if prices didn't penetrate the Sliding Parallel, but rather continued to trade along the pitchfork line…Also he said false signals could often be avoided if a trader requires that all, or the greatest portion of a price bar goes beyond a pitchfork parallel line before drawing a Sliding Parallel line." [11]

Although it is unclear that Andrews used inside Sliding Parallels, other traders since have found a use for them.

> "Sliding Parallels are also parallel to the Median Line and can be drawn "inside" the Median Line [that is, between the upper and lower MLH] or "outside" the Median Line [meaning above or below the MLH]. They are used as support and resistance." [5]

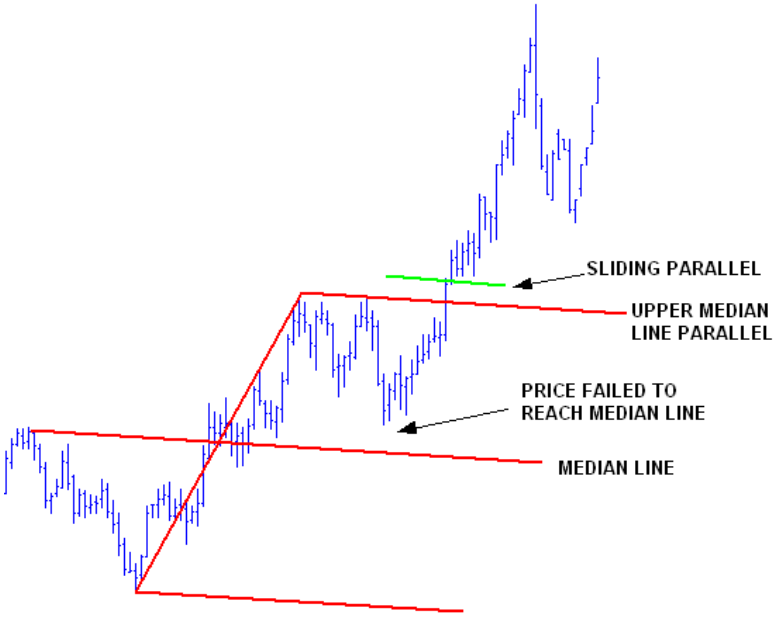


Figure 12. Sliding Parallel.

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Warning Lines

In cases where price penetrates a Sliding Parallel, Andrews used "Warning Lines", which essentially copy the leading Median Line Parallel along the P2-P3 ray. Andrews considered the Warning Lines as indications of likely support or resistance for price moves that extend beyond the Sliding Parallel.

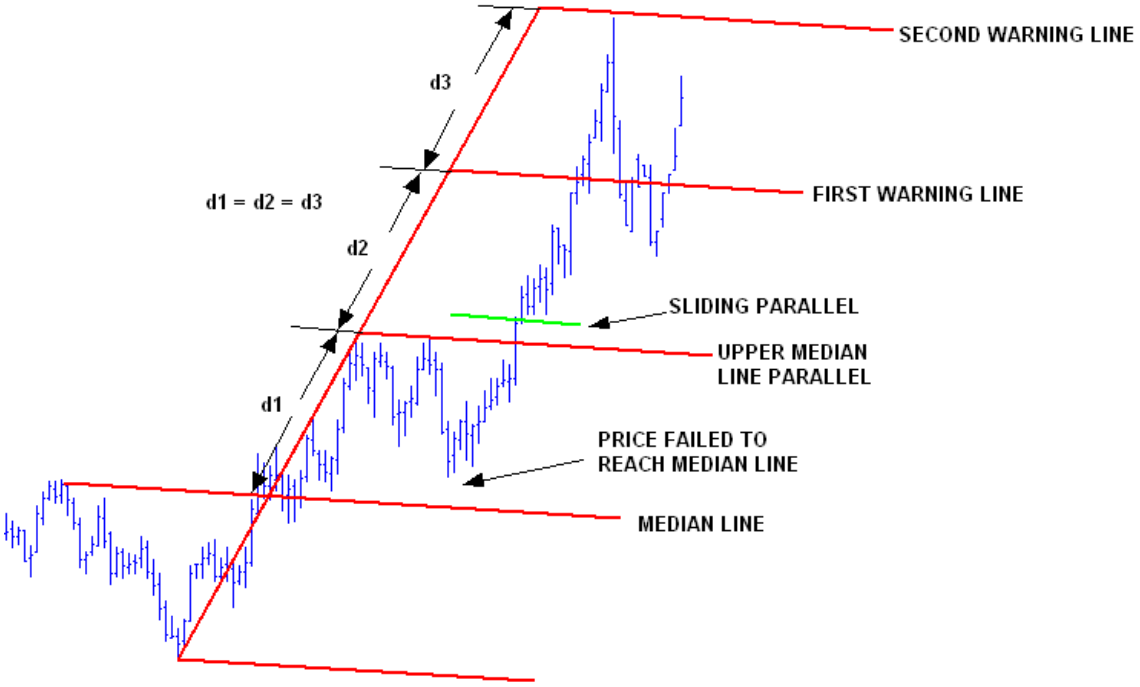


Figure 13. Warning Lines.

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Hagopian's Rule

Andrews included another rule observed by one of his course members and so named the rule after him. Hagopian's Rule is another price failure that Andrews used to enter orders.

> "When prices reverse trend before reaching a line at which probability indicates such a reverse could start, proper action may be taken in buying or selling, as soon as prices cross the trendline they were moving along before reversing. A large countermove is indicated and confirms the first action as above, when prices cross the first trend line sloping away from the original line." [6]

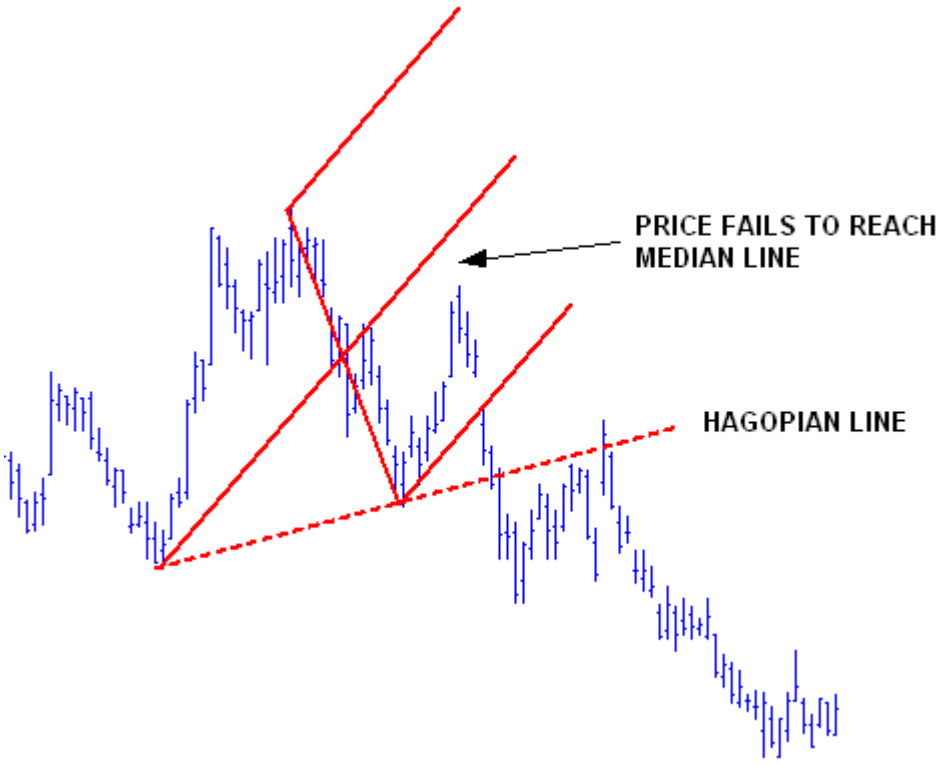


Figure 14. Hagopian line.

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PART V
The Study

The study will involve the observance of price movement related to the high probability trading rules of the Median Line:

1) Prices reach the latest Median Line
2) Upon meeting the Median Line, prices will reverse, gap/zoom through or consolidate.
3) Upon gapping or zooming through the Median Line, price will revisit the Median Line before continuing
4) After a Median Line reverse/gap/zoom prices will reach the Median Line Parallel
5) Upon meeting the Median Line Parallel, prices will reverse, gap/zoom through or consolidate.

If price fails to act as expected the following ideas apply:

1) If price fails to meet the Median Line, price will move further in the other direction than it did on the approach to the Median Line
2) Prices will reach the first Warning Line

The process of determining the success of the method is described below as well as illustrated in Figure 15:

1. After a pivot forms, a Median Line will be drawn.
2. Prices will reach the Median Line or not and the result will be recorded.
3. In the case of price reaching the Median Line:
    i. If prices reach the Median Line they will reverse, gap/zoom through, or consolidate around the Median Line - the result will be recorded.
    ii. If prices gap/zoom through the Median Line and revisit the Median Line before continuing on in the direction previous, the result will be recorded.
    iii. If after prices reverse/gap/zoom the Median Line, price reaches the corresponding Median Line Parallel, the result will be recorded.
    iv. If prices reach the Median Line Parallel, they will reverse, gap/zoom through, or consolidate around the Median Line Parallel the result will be recorded. If price reverses, price returns to the Median Line, the result will be recorded. If a gap/zoom, price revisits the Median Line and price reaches the first Warning Line, the result will be recorded. If price consolidates, price continues on in the original direction it traveled before meeting the Median Line Parallel.
4. In the case of price failing to reach the Median Line:
    i. Measurements will be taken to determine if prices reversed and moved further in the opposite direction as it did on approach to the Median Line and results recorded.
    ii. If price reaches the first Warning Line, the result will be recorded.

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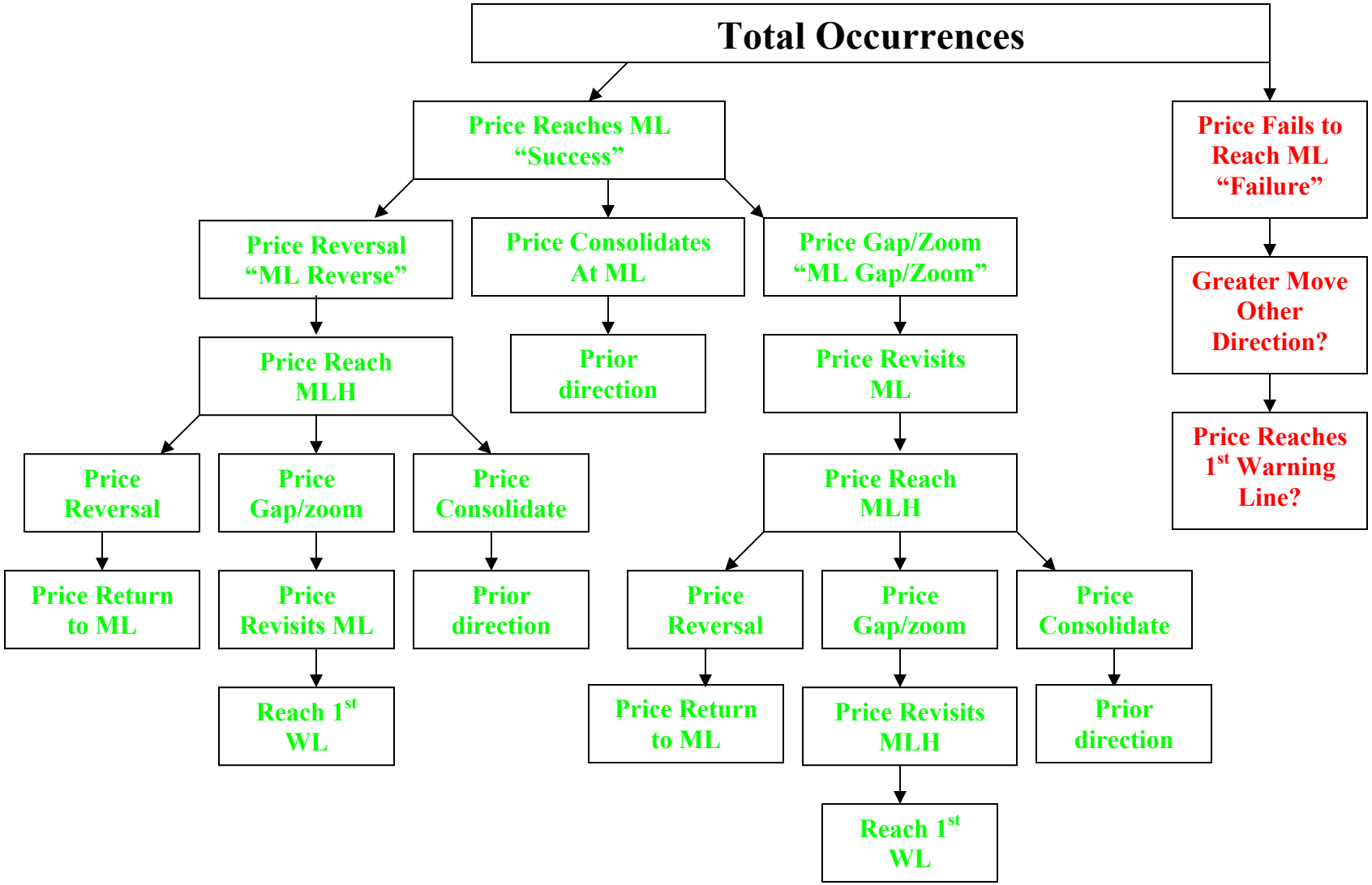


Figure 15. Flowchart of Possibilities.

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	Occurances	%						
Total								
		Occurances	%					
	ML success			of total				
		Reverse			of successes			
			Reach MLH			of reverse		
				Reverse			of reverse, reach MLH	
					Return to ML			of reverse, reach MLH, reverse
				Gap/Zoom			of reverse, reach MLH	
					Revisit MLH			of reverse, reach MLH, gap/zoom
					Reach 1st WL			of reverse, reach MLH, gap/zoom
				Consolidate			of reverse, reach MLH	
					Original dir.			of reverse, reach MLH, gap/zoom
		Consolidate			of successes			
			Original dir.			of consolidate		
		Gap/Zoom			of successes			
			Revisit ML			of Gap/Zoom	of reverse, reach MLH	
			Reach MLH			of Gap/Zoom		of gap/zoom, reach MLH, reverse
				Reverse			of reverse, reach MLH	
					Return to ML			of gap/zoom, reach MLH, gap/zoom
				Gap/Zoom				of gap/zoom, reach MLH, gap/zoom
					Revisit MLH		of reverse, reach MLH	
					Reach 1st WL			of reverse, reach MLH, gap/zoom
				Consolidate				
					Original dir.			
		Occurances	%					
	ML failure			of total				
		Greater move			of failures			
		Reach 1st WL			of failures			

Table 1. Results sheet.

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PART VI
Results

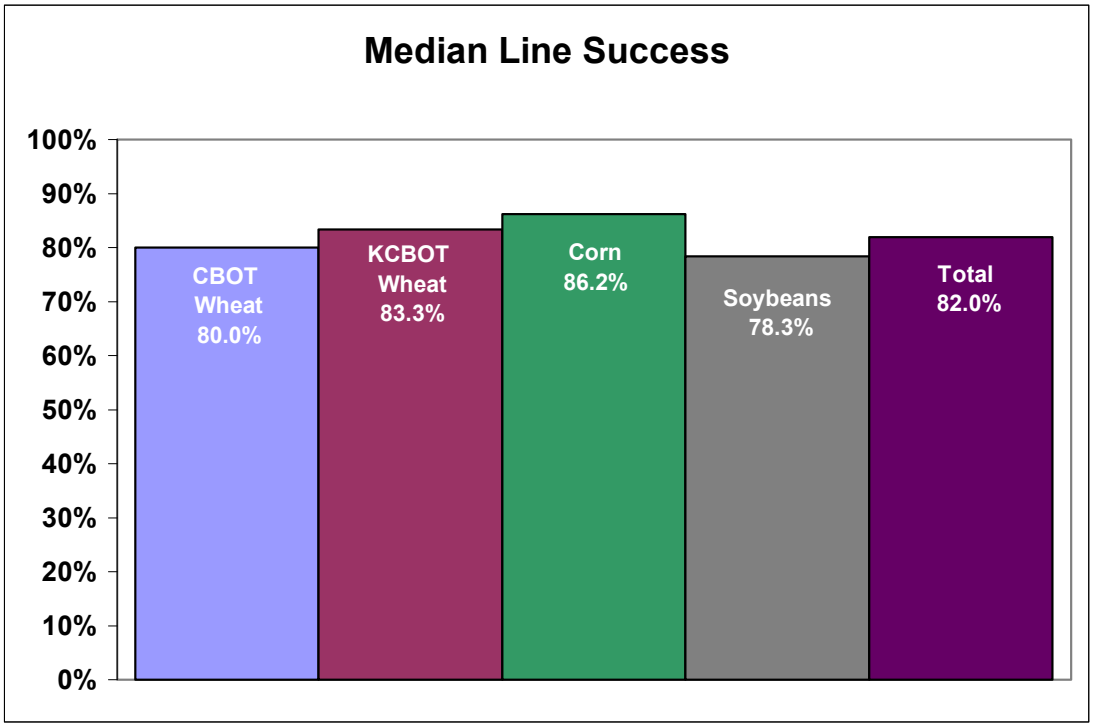


Figure 16. Median Line Success.

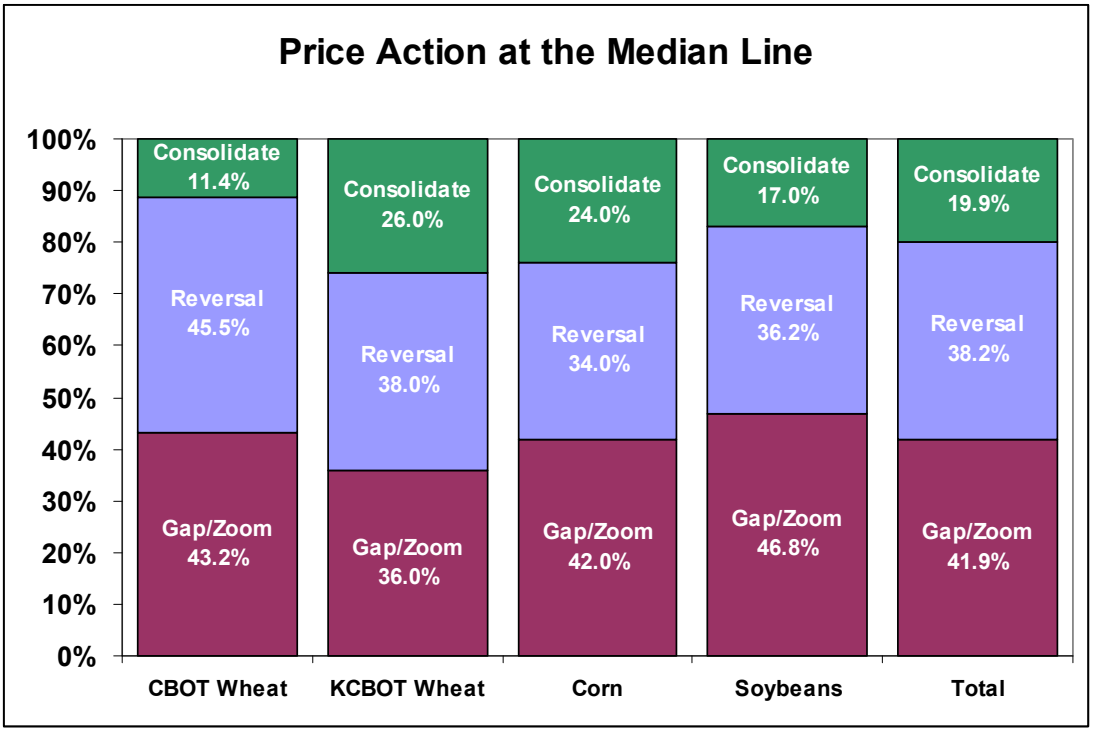


Figure 17. Price Action at the Median Line.

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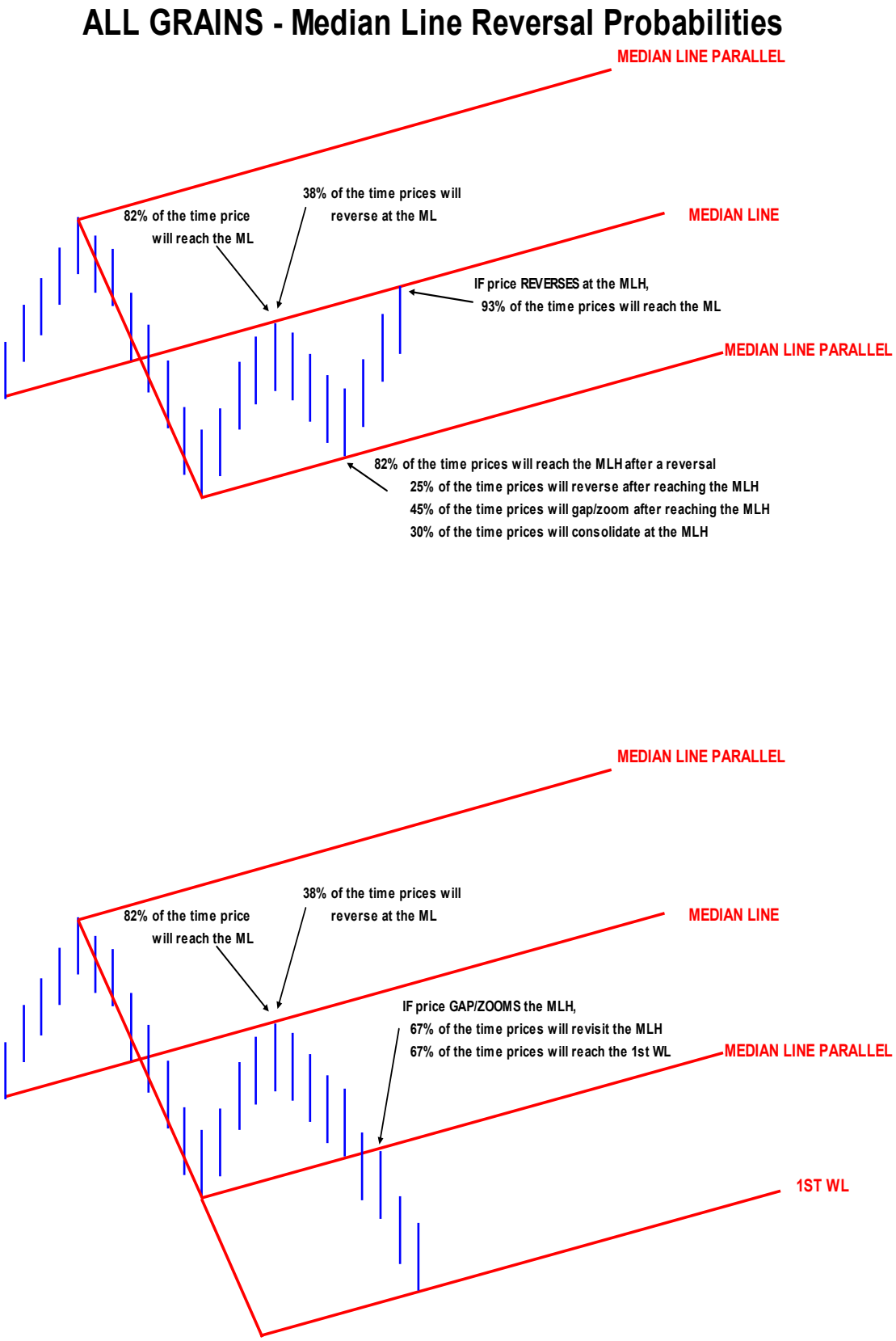


Figure 18. Median Line "Reverse" Probabilities of all Grains.

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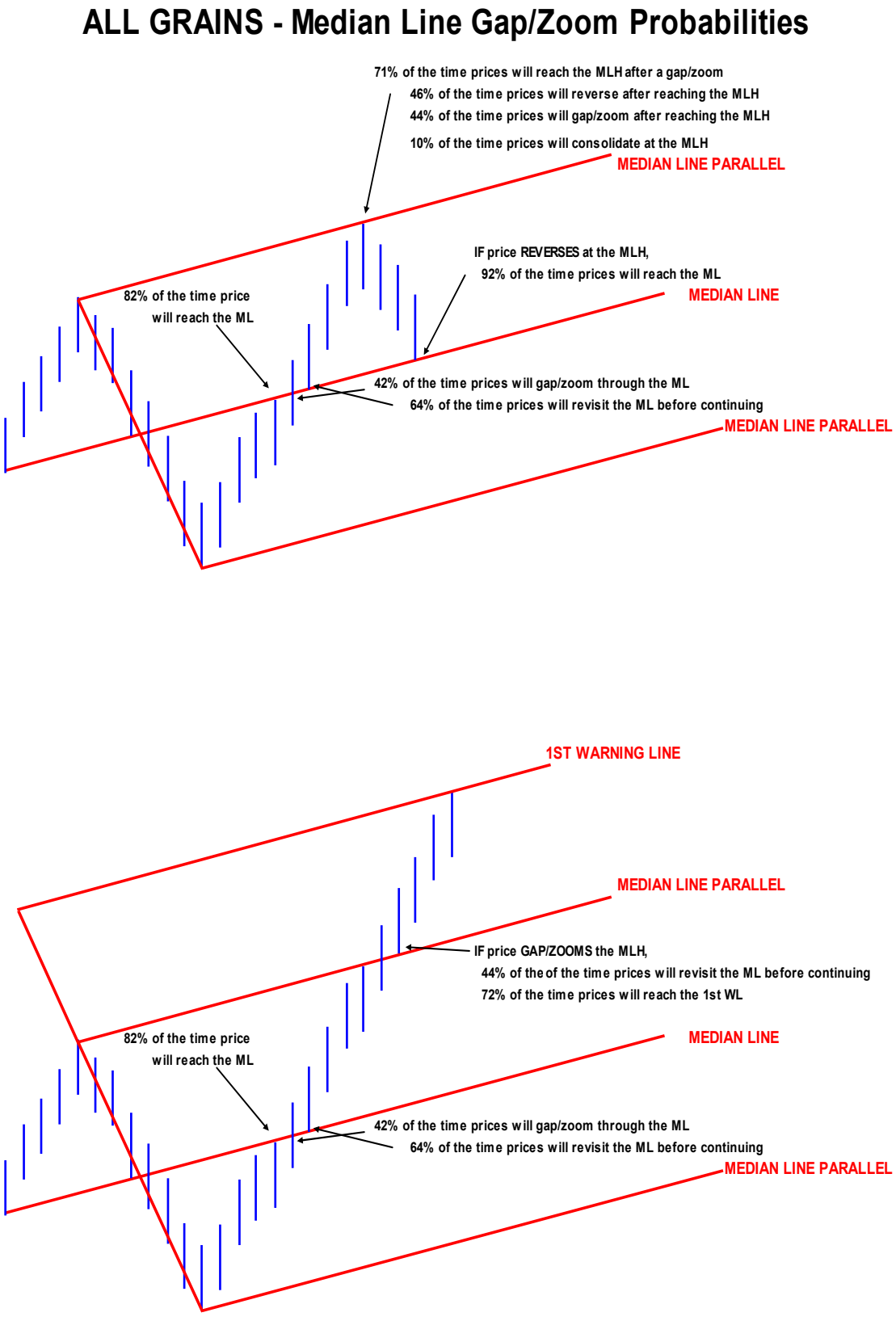


Figure 19. Median Line "Gap/Zoom" Probabilities of all Grains.

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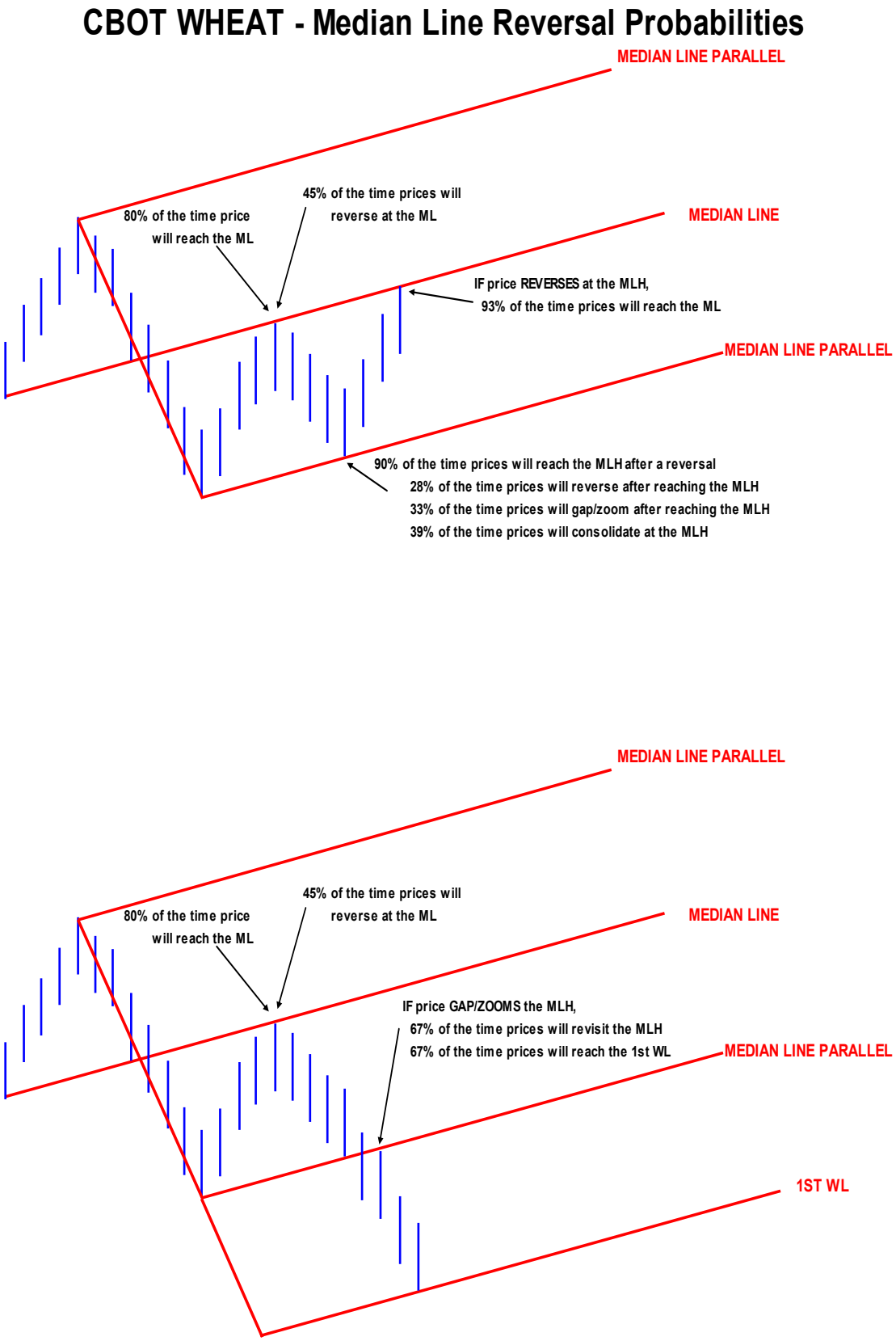


Figure 20. Median Line "Reversal" Probabilities of CBOT Wheat.

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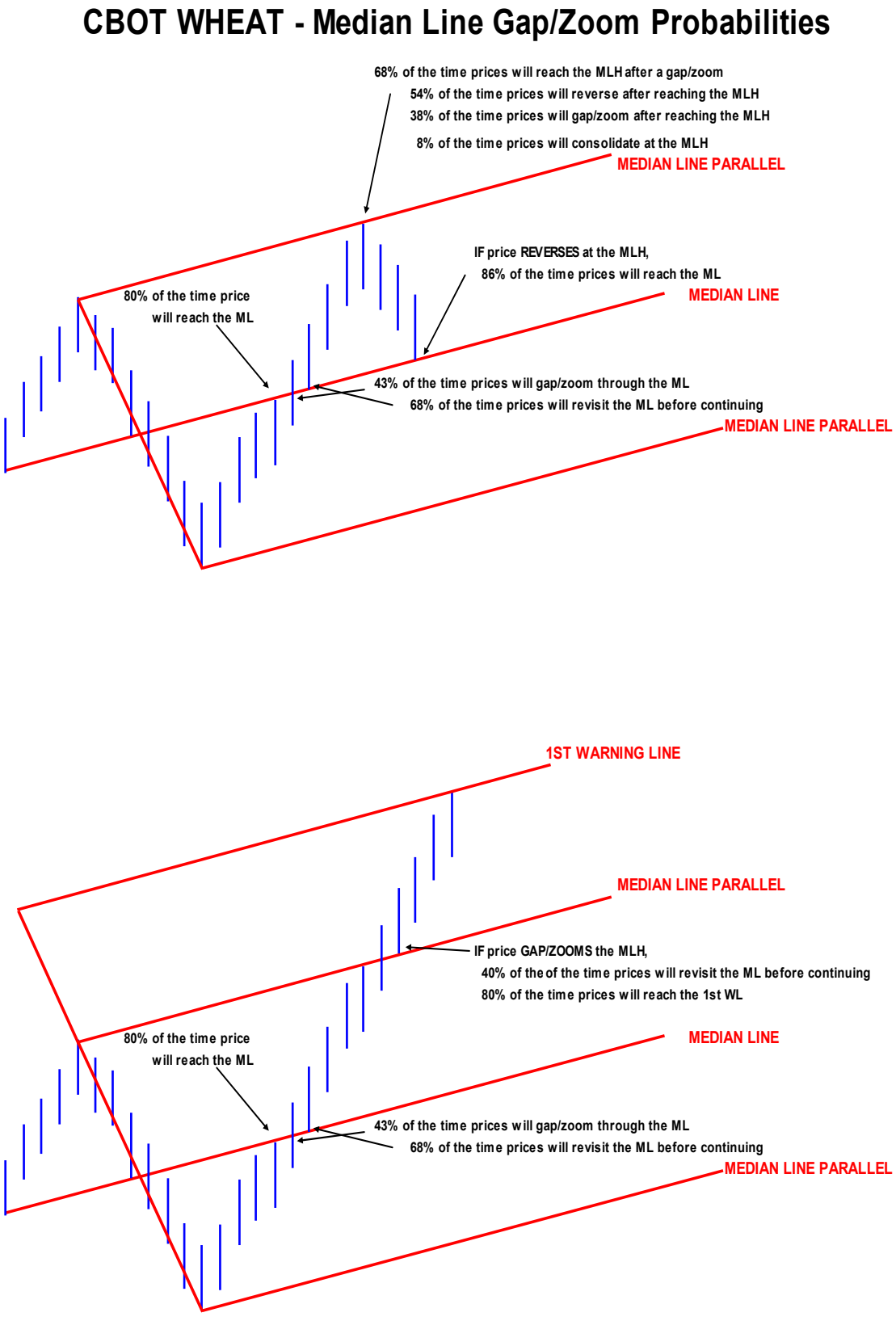


Figure 21. Median Line "Gap/Zoom" Probabilities of CBOT Wheat.

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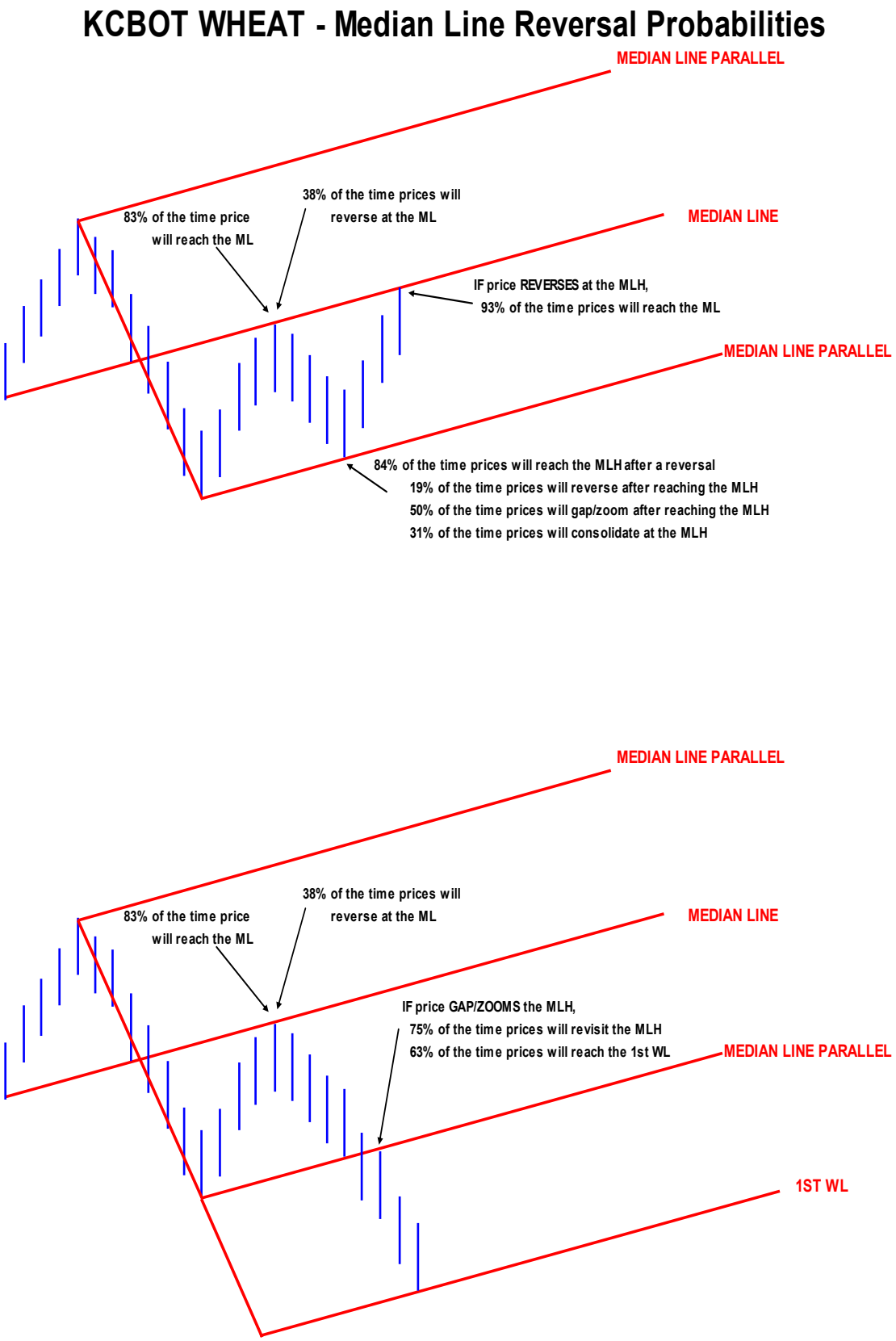


Figure 22. Median Line "Reversal" Probabilities of KCBOT Wheat.

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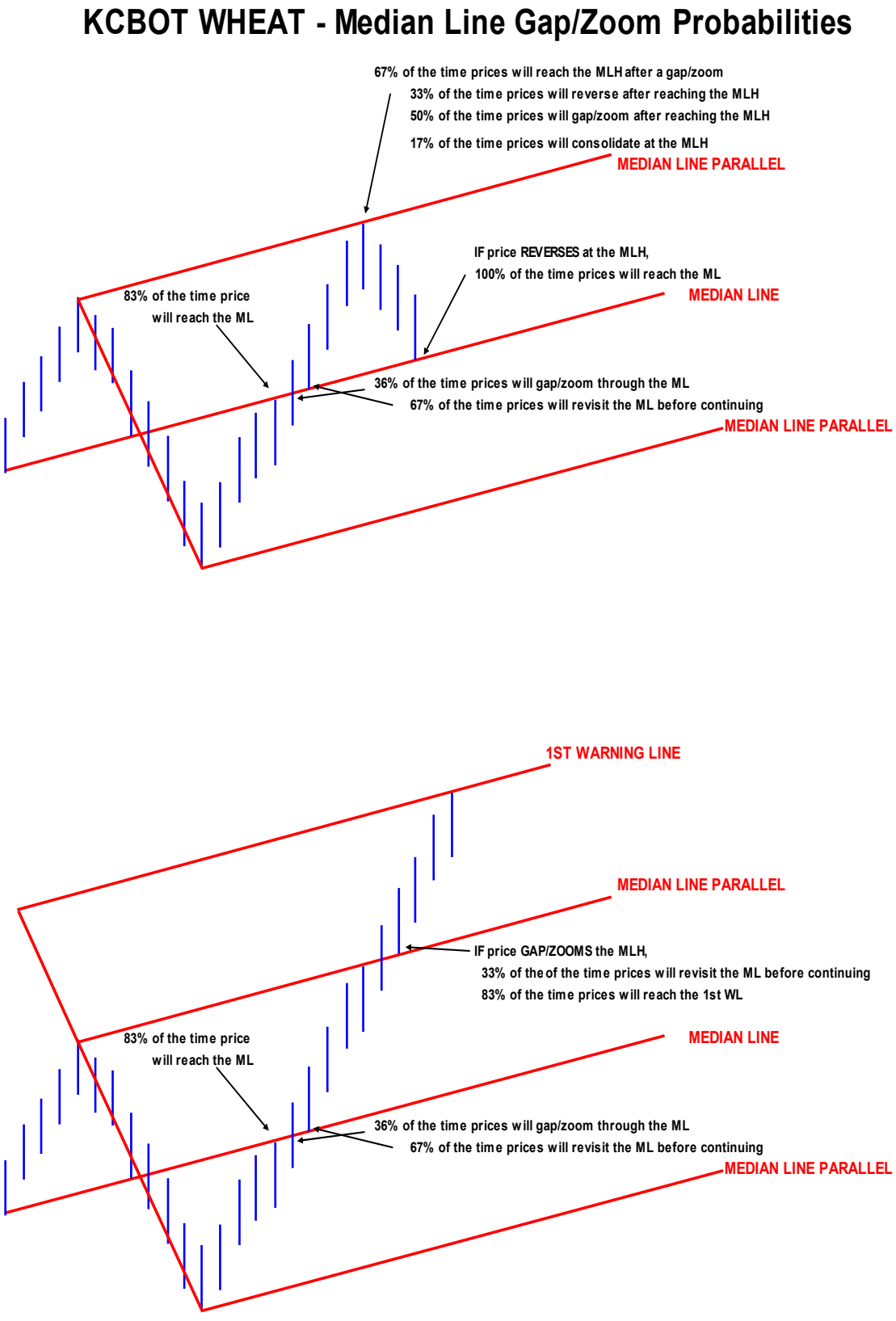


Figure 23. Median Line "Gap/Zoom" Probabilities of KCBOT Wheat.

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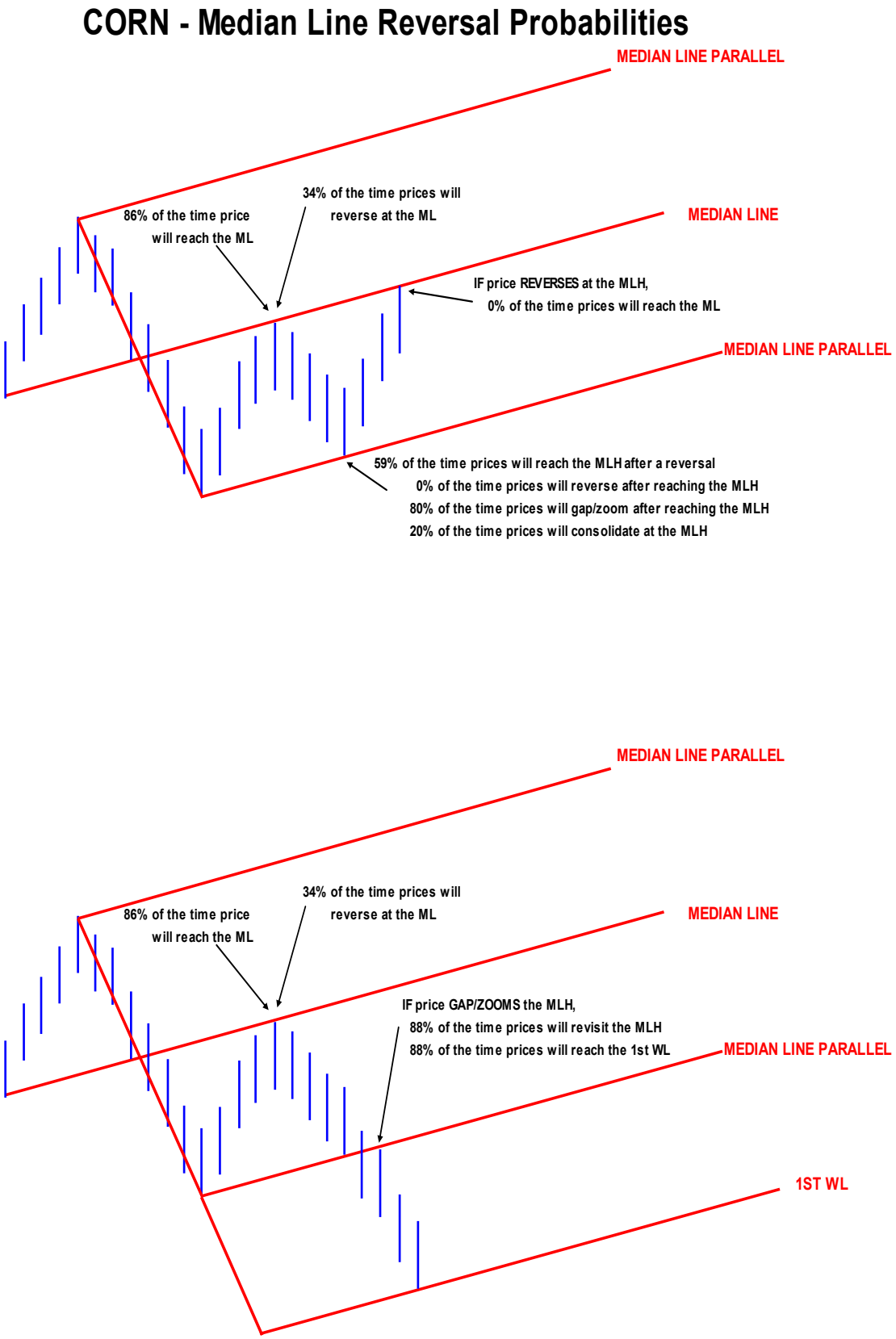


Figure 24. Median Line "Reversal" Probabilities of CBOT Corn.

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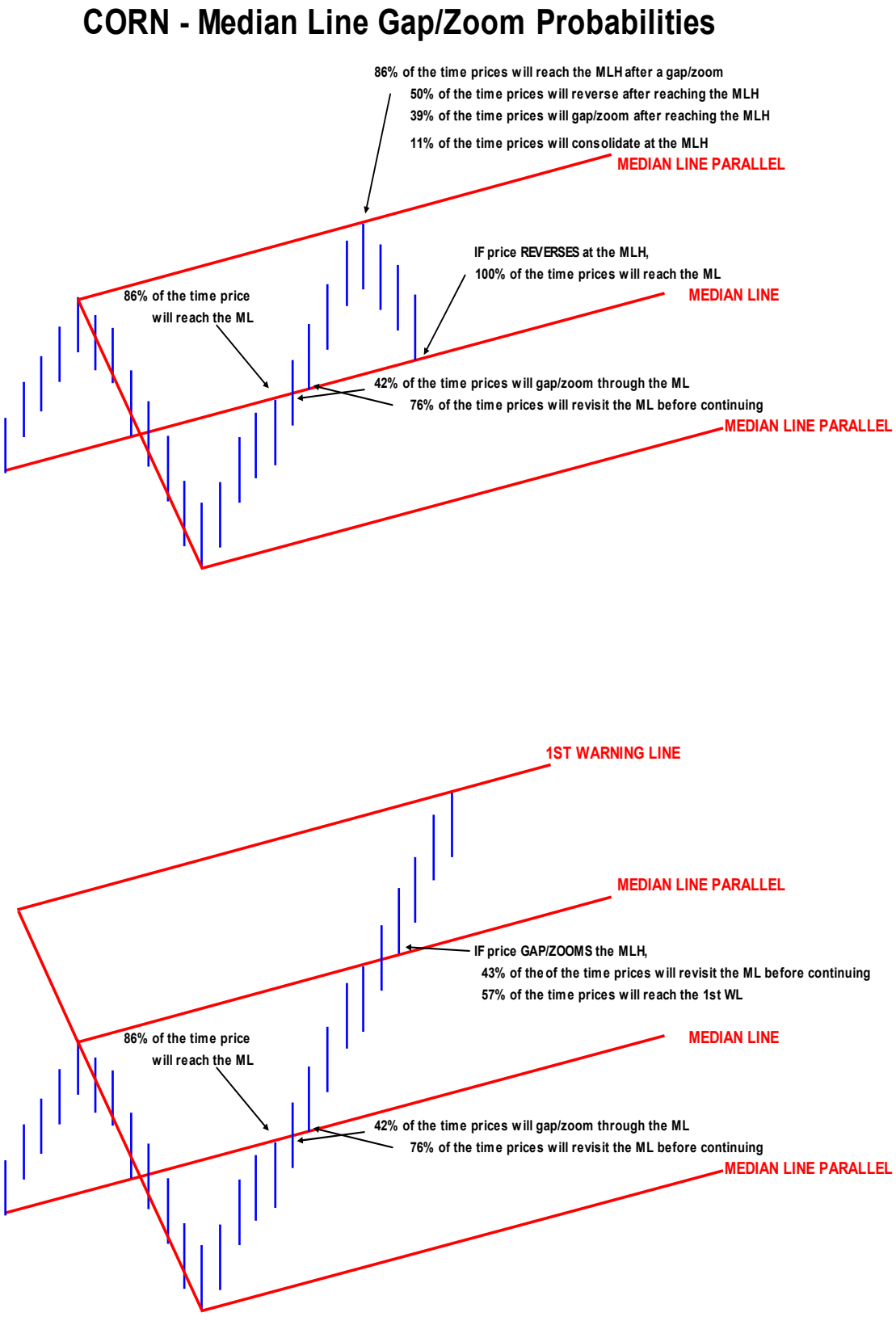


Figure 25. Median Line "Gap/Zoom" Probabilities of CBOT Corn.

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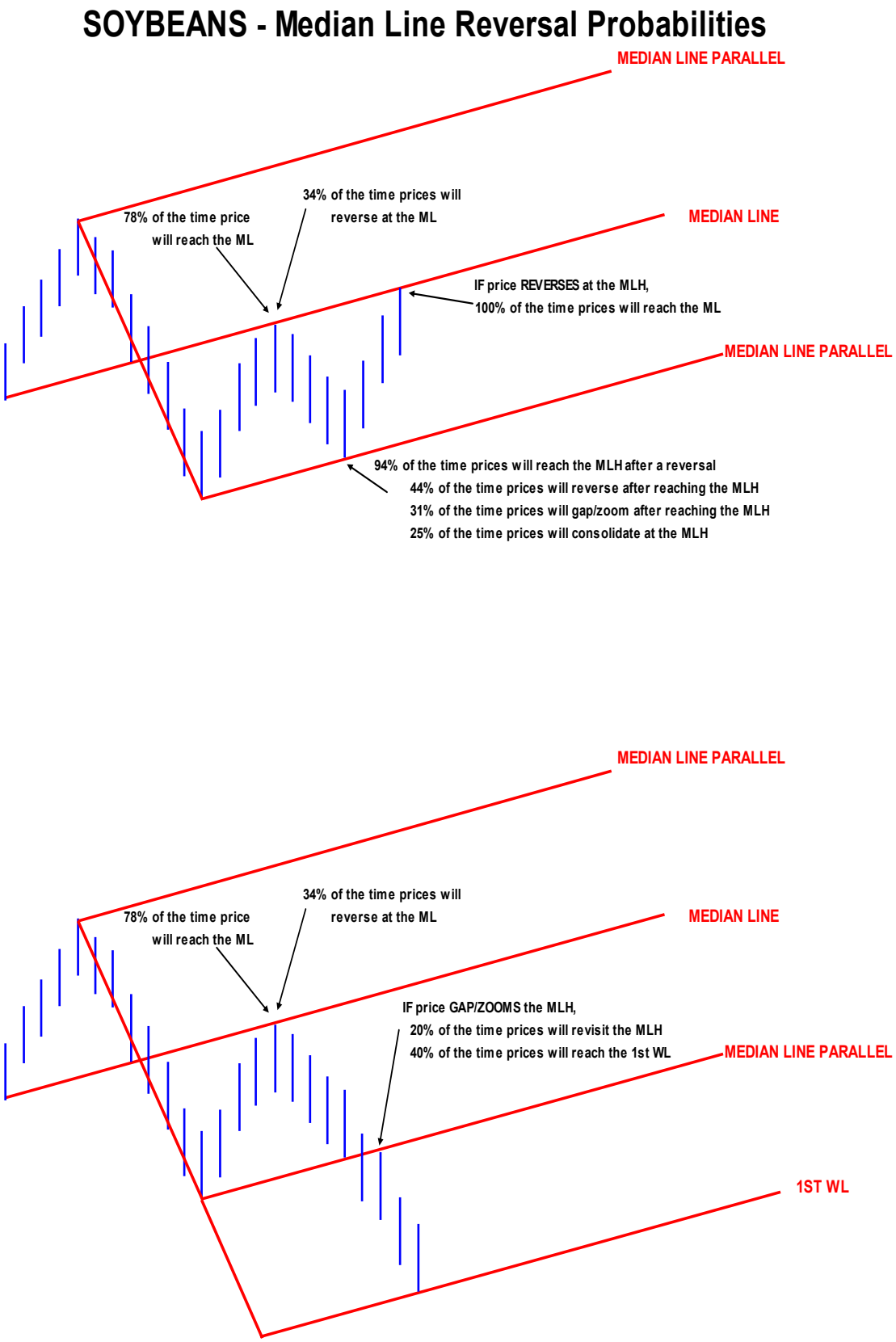


Figure 26. Median Line "Reversal" Probabilities of CBOT Soybeans.

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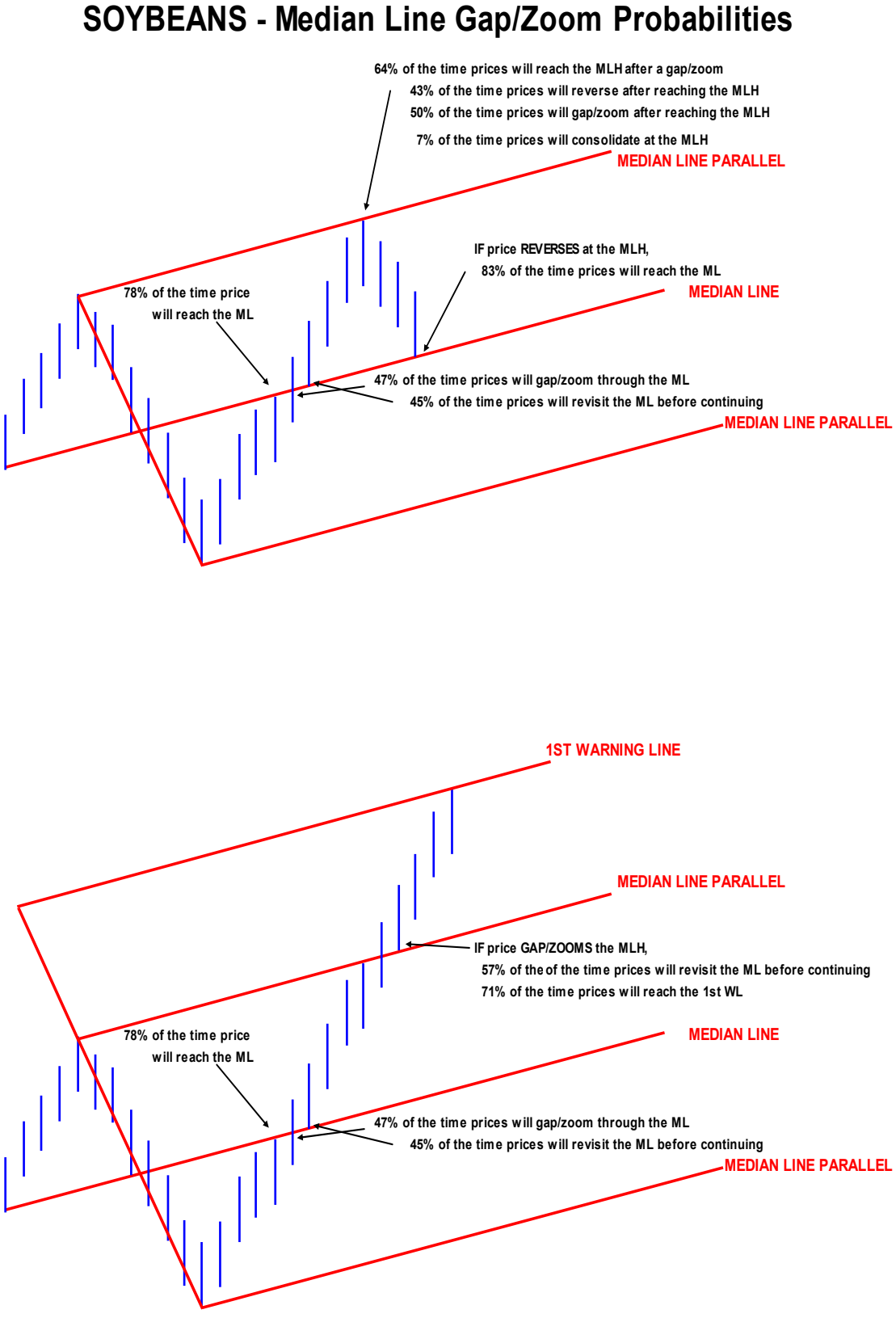


Figure 27. Median Line "Gap/Zoom" Probabilities of CBOT Soybeans.

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PART VII
Summary

Median Line Success

The results show price reaches the Median Line approximately 80% of the time. The average of Median Line successes for all four grains over the time period studied was 82%. Soybeans were the only part of the group that recorded a price return to the Median Line less than 80% at 78%. The assumption of price reaching the Median Line 80% of the time held true for the other three grains.

Price Action at the Median Line

The results show price most often will gap/zoom when reaching the Median Line. For all grains, price gap/zoomed the Median line approximately 42% of the time followed by a price reversal 38% of the time and price consolidation at the Median Line 20% of the time. The largest percentage of price reversals occurred in CBOT Wheat with 46% of the occurrences resulting in a price reversal. The largest percentage of gap/zooms of the Median Line occurred in soybeans with 47% of the occurrences resulting in a gap/zoom. The largest percentage of price consolidation occurred in KCBOT Wheat at 26% of the time. Price tends to consolidate the least in CBOT wheat at 11% of the time.

Price Action at the Median Line Parallels

The results show that the Median Line Parallels do act as important areas of concern. For all grains, after a Median Line reversal, price will reach the Median Line Parallel 82% of the time. For all grains, after a Median Line gap/zoom, price will reach the Median Line Parallel 71% of the time.

Highest Probability Patterns

For all grains, the highest probability pattern follows the configuration: Median Line reversal, and a reversal at the Median Line parallel. Price will return to the Median Line 93% of the time after following this pattern. Another high probability pattern exists when price gap/zooms the Median Line and then reverses at the Median Line Parallel. Price will return to the Median Line 92% of the time after following this pattern. Intuitively, this means price is cycling within the Median Line set exactly as the theory describes. Therefore, the highest probability pattern should exist in these patterns.

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Median Line Revisits

For all grains, the results show that if price gap/zooms the Median Line, price revisits the Median Line 64% of the time before continuing in the direction previous. If price initially reverses at the Median Line and proceeds to the Median Line Parallel where price gap/zooms the Median Line Parallel, price will revisit the Median Line Parallel before proceeding 67% of the time. If price initially gap/zooms the Median Line and proceeds to the Median Line Parallel where price gap/zooms the Median Line Parallel, price will revisit the Median Line Parallel before proceeding 44% of the time.

Median Line Failures

In the instance of price failing to reach the Median Line, price will move further in the opposite direction 55% of the time. Price will reach the first Warning Line after a price failure approximately 60% of the time.

Median Line Method Limitations

The choice of pivots to draw the Median Line set is subjective. The simple trend line method used on the study is simple and straight-forward, but is somewhat subjective. The study is historical and had the benefit of having all price data known when the Median Line sets were drawn. Real-time trading can make selection of pivots difficult. When exactly can one determine when a pivot has formed? The study assumes all pivots were chosen correctly as it is based on known price data.

Conclusions

The Median Line method appears to be a valid method of determining potential price action. Price returned to the Median Line 80% of the time as the method suggests. The most impressive outcome is the probabilities related to price cycling within the Median Line set. If the Median Line set describes price well, and price bounces off the Median Line and Median Line Parallels, high probability patterns appear. Although limitations exist with the method, the probabilities recorded demonstrate the usefulness of the method in determining potential price action. However, the study did not consider actual trade management including entries and exists. Actually trading the method is another endeavor in itself. The study does however suggest the Median Line method can give a trader an idea of the probability of price following a certain pattern given the proper conditions. It appears intuition and experience play a major role in the success of applying the method. It is unlikely an individual can pick up the basics of the method and immediately have success in trading. It appears, as with anything, practice and study are the keys to successfully applying the Median Line method to trading.

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PART VIII
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Notes:

a) Special acknowledgement to Gordon DeRoos, Al Unger and Mike Davis for their input.
b) All charts prepared with Gecko's Track N Trade Pro Version 4.0.

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PART IX
Appendix

RESULTS – DATA

All Grains 1990-2005
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Chicago Board of Trade Wheat 1990-2005
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Kansas City Board of Trade Wheat 1990-2005
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Chicago Board of Trade Corn 1990-2005
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Chicago Board of Trade Soybeans 1990-2005
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PRICE CHARTS

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Chicago Board of Trade Corn 1990-2005
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Chicago Board of Trade Soybeans 1990-2005
Pages 70-77

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All grain results (CBOT Wheat, KCBOT Wheat, Corn, Soybeans) 1990-2005

	Occurances	%					
Total	233	100.0%					
		Occurances	%				
	ML success	191	82.0%	of total			
		Reverse	73	38.2%	of successes		
			Reach MLH	60	82.2%	of reverse	
				Reverse	15	25.0%	of reverse, reach MLH
					Return to ML	14	93.3%	of reverse, reach MLH, reverse
				Gap/Zoom	27	45.0%	of reverse, reach MLH
					Revisit MLH	18	66.7%	of reverse, reach MLH, gap/zoom
					Reach 1st WL	18	66.7%	of reverse, reach MLH, gap/zoom
				Consolidate	18	30.0%	of reverse, reach MLH
					Original dir.	15	83.3%	of reverse, reach MLH, gap/zoom
		Gap/Zoom	80	41.9%	of successes		
			Revisit ML	51	63.8%	of Gap/Zoom	
			Reach MLH	57	71.3%	of Gap/Zoom	
				Reverse	26	45.6%	of reverse, reach MLH
					Return to ML	24	92.3%	of gap/zoom, reach MLH, reverse
				Gap/Zoom	25	43.9%	of reverse, reach MLH
					Revisit MLH	11	44.0%	of gap/zoom, reach MLH, gap/zoom
					Reach 1st WL	18	72.0%	of gap/zoom, reach MLH, gap/zoom
				Consolidate	6	10.5%	of reverse, reach MLH
					Original dir.	3	50.0%	of reverse, reach MLH, gap/zoom
		Consolidate	38	19.9%	of successes		
			Original dir.	21	55.3%	of consolidate	
		Occurances	%				
	ML failure	42	18.0%	of total			
		Greater move	23	54.8%	of failures		
		Reach 1st WL	25	59.5%	of failures		

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CBOT WHEAT 1990-2005

	Occurances	%						
Total	55	100.0%						
		Occurances	%					
	ML success	44	80.0%	of total				
		Reverse	20	45.5%	of successes			
			Reach MLH	18	90.0%	of reverse		
				Reverse	5	27.8%	of reverse, reach MLH	
					Return to ML	4	80.0%	of reverse, reach MLH, reverse
				Gap/Zoom	6	33.3%	of reverse, reach MLH	
					Revisit MLH	4	66.7%	of reverse, reach MLH, gap/zoom
					Reach 1st WL	4	66.7%	of reverse, reach MLH, gap/zoom
				Consolidate	7	38.9%	of reverse, reach MLH	
					Original dir.	7	100.0%	of reverse, reach MLH, gap/zoom
		Gap/Zoom	19	43.2%	of successes			
			Revisit ML	13	68.4%	of Gap/Zoom		
			Reach MLH	13	68.4%	of Gap/Zoom		
				Reverse	7	53.8%	of reverse, reach MLH	
					Return to ML	6	85.7%	of gap/zoom, reach MLH, reverse
				Gap/Zoom	5	38.5%	of reverse, reach MLH	
					Revisit MLH	2	40.0%	of gap/zoom, reach MLH, gap/zoom
					Reach 1st WL	4	80.0%	of gap/zoom, reach MLH, gap/zoom
				Consolidate	1	7.7%	of reverse, reach MLH	
					Original dir.	1	100.0%	of reverse, reach MLH, gap/zoom
		Consolidate	5	11.4%	of successes			
			Original dir.	4	80.0%	of consolidate		
		Occurances	%					
	ML failure	11	20.0%	of total				
		Greater move	6	54.5%	of failures			
		Reach 1st WL	6	54.5%	of failures			

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KCBOT WHEAT 1990-2005

	Occurances	%					
Total	60	100.0%					
		Occurances	%				
	ML success	50	83.3%	of total			
		Reverse	19	38.0%	of successes		
			Reach MLH	16	84.2%	of reverse	
				Reverse	3	18.8%	of reverse, reach MLH
					Return to ML	3	100.0%
				Gap/Zoom	8	50.0%	of reverse, reach MLH
					Revisit MLH	6	75.0%
					Reach 1st WL	5	62.5%
				Consolidate	5	31.3%	of reverse, reach MLH
					Original dir.	3	60.0%
		Gap/Zoom	18	36.0%	of successes		
			Revisit ML	12	66.7%	of Gap/Zoom	
			Reach MLH	12	66.7%	of Gap/Zoom	
				Reverse	4	33.3%	of reverse, reach MLH
					Return to ML	4	100.0%
				Gap/Zoom	6	50.0%	of reverse, reach MLH
					Revisit MLH	2	33.3%
					Reach 1st WL	5	83.3%
				Consolidate	2	16.7%	of reverse, reach MLH
					Original dir.	1	50.0%
		Consolidate	13	26.0%	of successes		
			Original dir.	4	30.8%	of consolidate	
		Occurances	%				
	ML failure	10	16.7%	of total			
		Greater move	7	70.0%	of failures		
		Reach 1st WL	8	80.0%	of failures		

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CBOT CORN 1990-2005

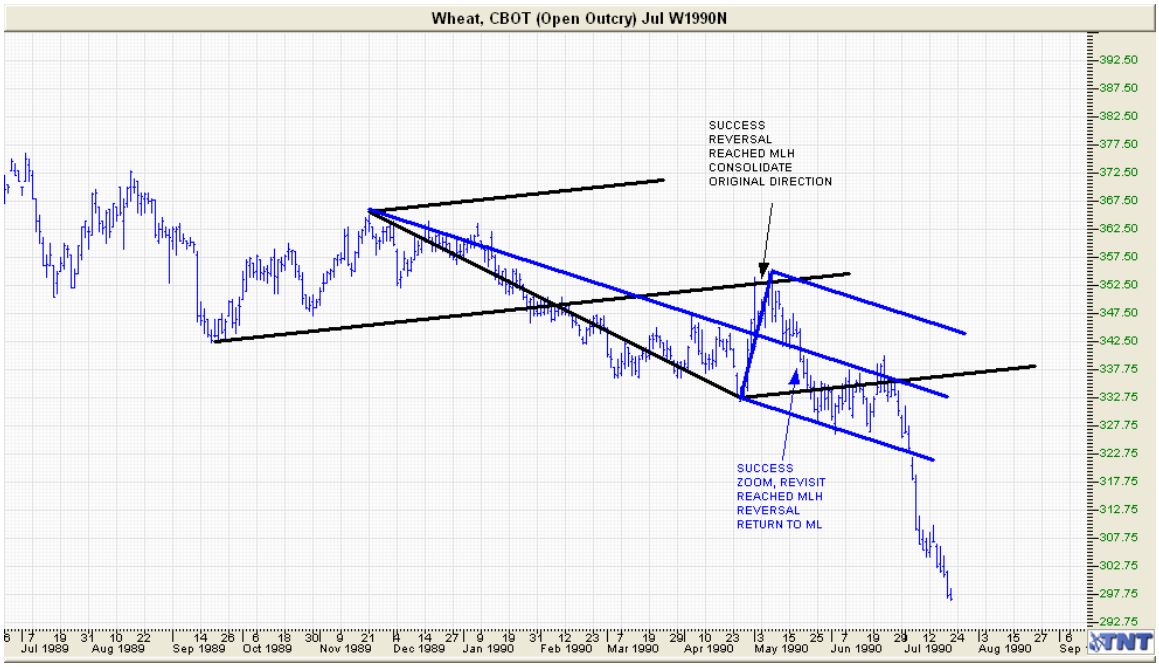
	Occurances	%						
Total	58	100.0%						
		Occurances	%					
	ML success	50	86.2%	of total				
		Reverse	17	34.0%	of successes			
			Reach MLH	10	58.8%	of reverse		
				Reverse	0	0.0%	of reverse, reach MLH	
					Return to ML	0	#DIV/0!	of reverse, reach MLH, reverse
				Gap/Zoom	8	80.0%	of reverse, reach MLH	
					Revisit MLH	7	87.5%	of reverse, reach MLH, gap/zoom
					Reach 1st WL	7	87.5%	of reverse, reach MLH, gap/zoom
				Consolidate	2	20.0%	of reverse, reach MLH	
					Original dir.	1	50.0%	of reverse, reach MLH, gap/zoom
		Gap/Zoom	21	42.0%	of successes			
			Revisit ML	16	76.2%	of Gap/Zoom		
			Reach MLH	18	85.7%	of Gap/Zoom		
				Reverse	9	50.0%	of reverse, reach MLH	
					Return to ML	9	100.0%	of gap/zoom, reach MLH, reverse
				Gap/Zoom	7	38.9%	of reverse, reach MLH	
					Revisit MLH	3	42.9%	of gap/zoom, reach MLH, gap/zoom
					Reach 1st WL	4	57.1%	of gap/zoom, reach MLH, gap/zoom
				Consolidate	2	11.1%	of reverse, reach MLH	
					Original dir.	0	0.0%	of reverse, reach MLH, gap/zoom
		Consolidate	12	24.0%	of successes			
			Original dir.	9	75.0%	of consolidate		
		Occurances	%					
	ML failure	8	13.8%	of total				
		Greater move	5	62.5%	of failures			
		Reach 1st WL	5	62.5%	of failures			

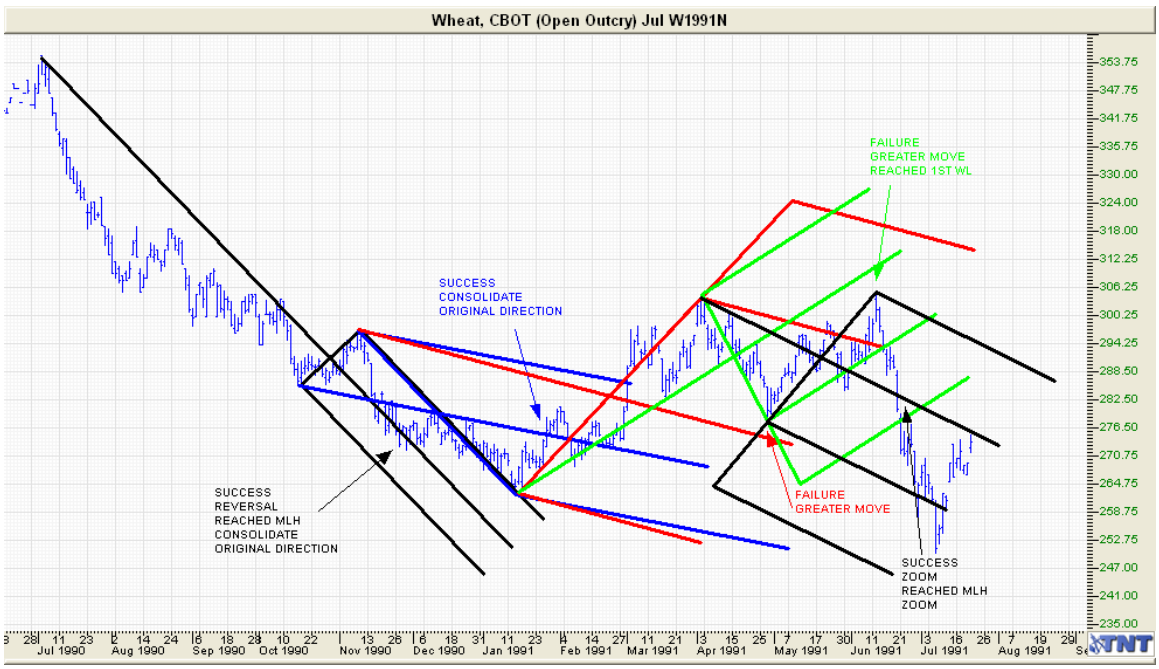
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CBOT SOYBEANS 1990-2005

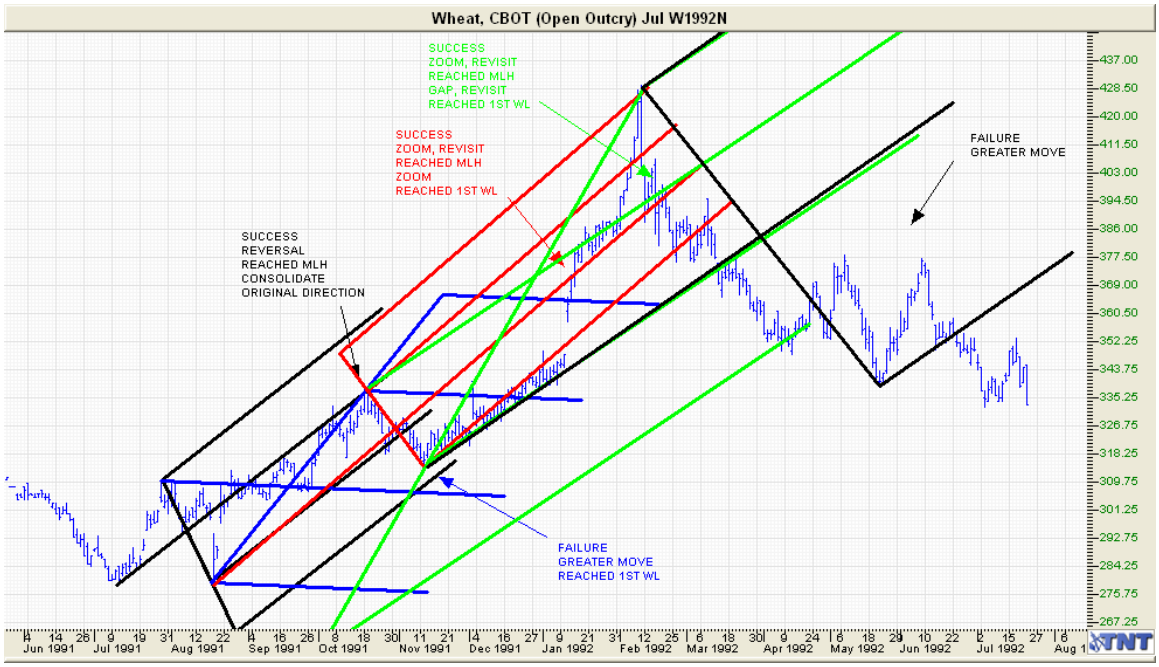
	Occurances	%						
Total	60	100.0%						
		Occurances	%					
	ML success	47	78.3%	of total				
		Reverse	17	36.2%	of successes			
			Reach MLH	16	94.1%	of reverse		
				Reverse	7	43.8%	of reverse, reach MLH	
					Return to ML	7	100.0%	of reverse, reach MLH, reverse
				Gap/Zoom	5	31.3%	of reverse, reach MLH	
					Revisit MLH	1	20.0%	of reverse, reach MLH, gap/zoom
					Reach 1st WL	2	40.0%	of reverse, reach MLH, gap/zoom
				Consolidate	4	25.0%	of reverse, reach MLH	
					Original dir.	4	100.0%	of reverse, reach MLH, gap/zoom
		Gap/Zoom	22	46.8%	of successes			
			Revisit ML	10	45.5%	of Gap/Zoom		
			Reach MLH	14	63.6%	of Gap/Zoom		
				Reverse	6	42.9%	of reverse, reach MLH	
					Return to ML	5	83.3%	of gap/zoom, reach MLH, reverse
				Gap/Zoom	7	50.0%	of reverse, reach MLH	
					Revisit MLH	4	57.1%	of gap/zoom, reach MLH, gap/zoom
					Reach 1st WL	5	71.4%	of gap/zoom, reach MLH, gap/zoom
				Consolidate	1	7.1%	of reverse, reach MLH	
					Original dir.	1	100.0%	of reverse, reach MLH, gap/zoom
		Consolidate	8	17.0%	of successes			
			Original dir.	4	50.0%	of consolidate		
		Occurances	%					
	ML failure	13	21.7%	of total				
		Greater move	5	38.5%	of failures			
		Reach 1st WL	6	46.2%	of failures			

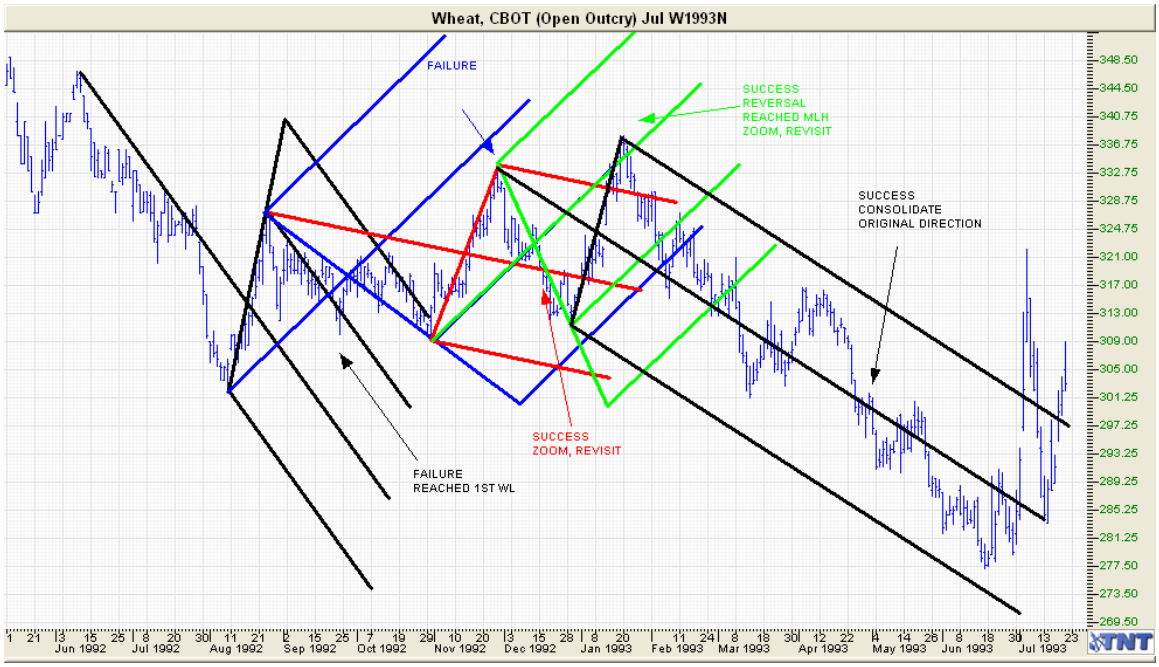
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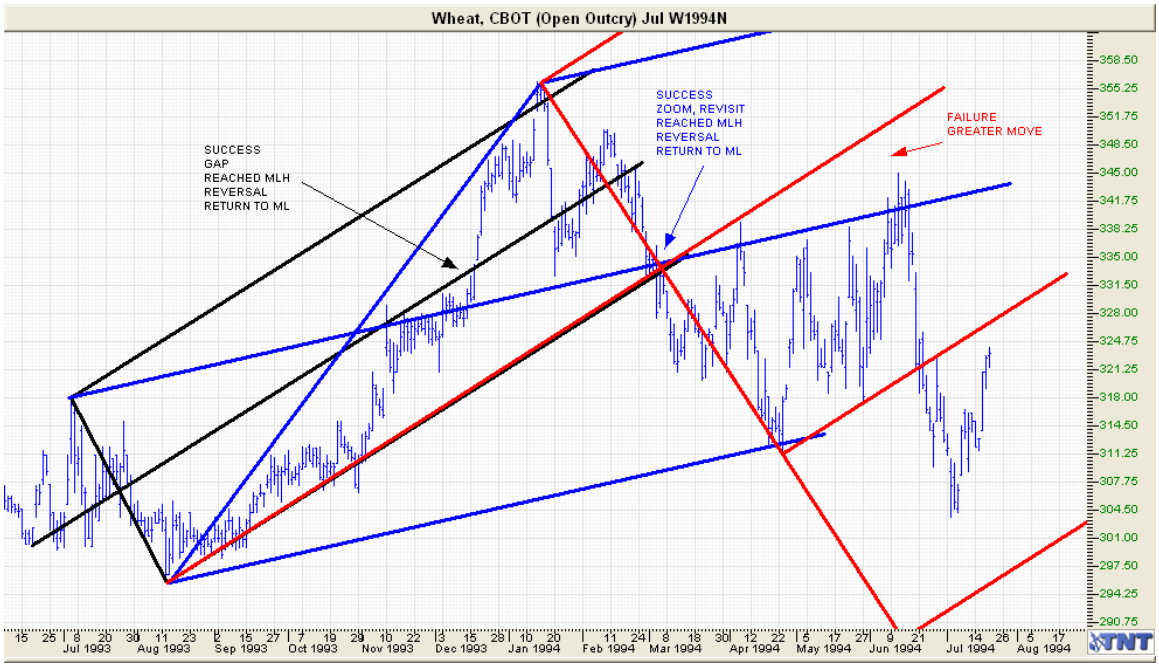


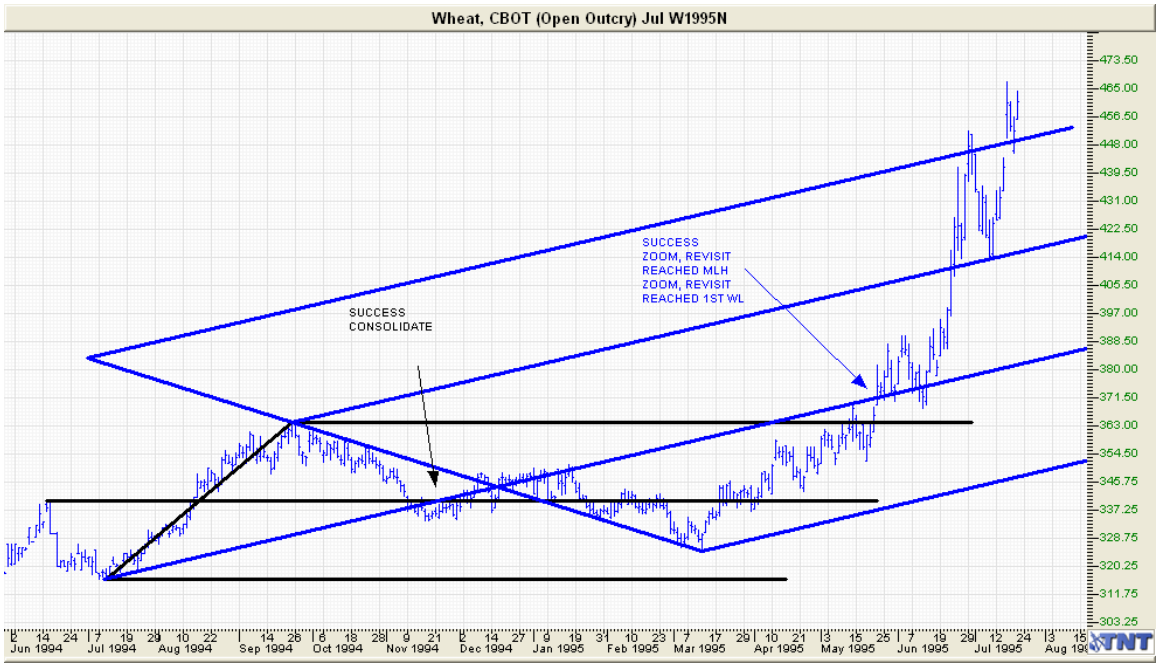
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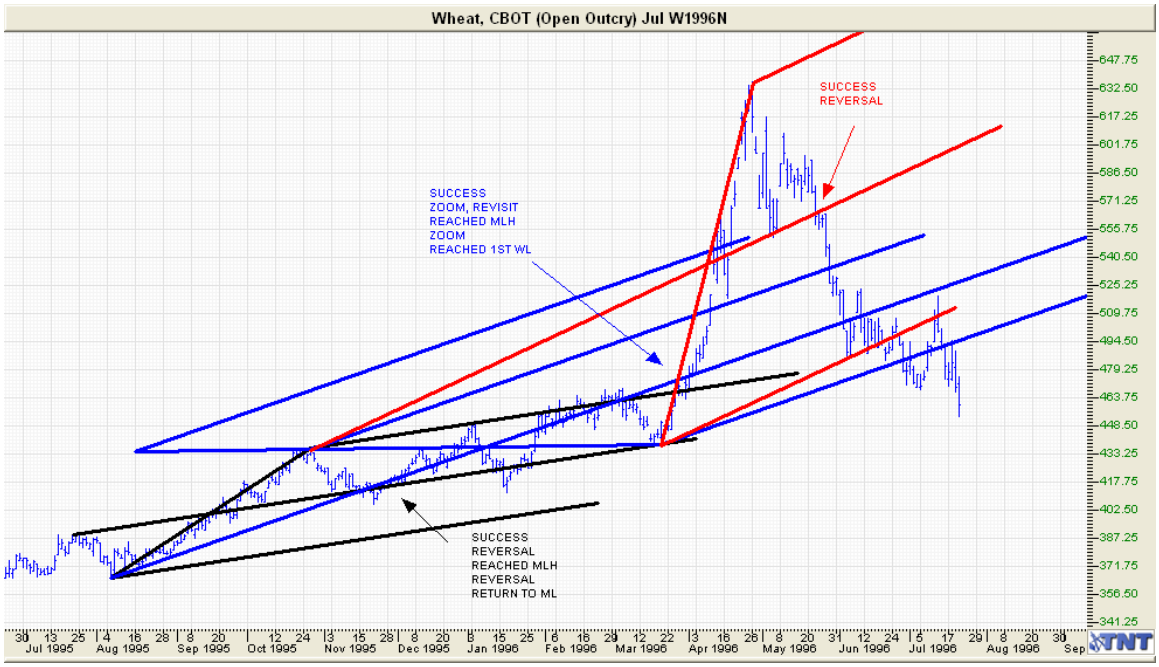


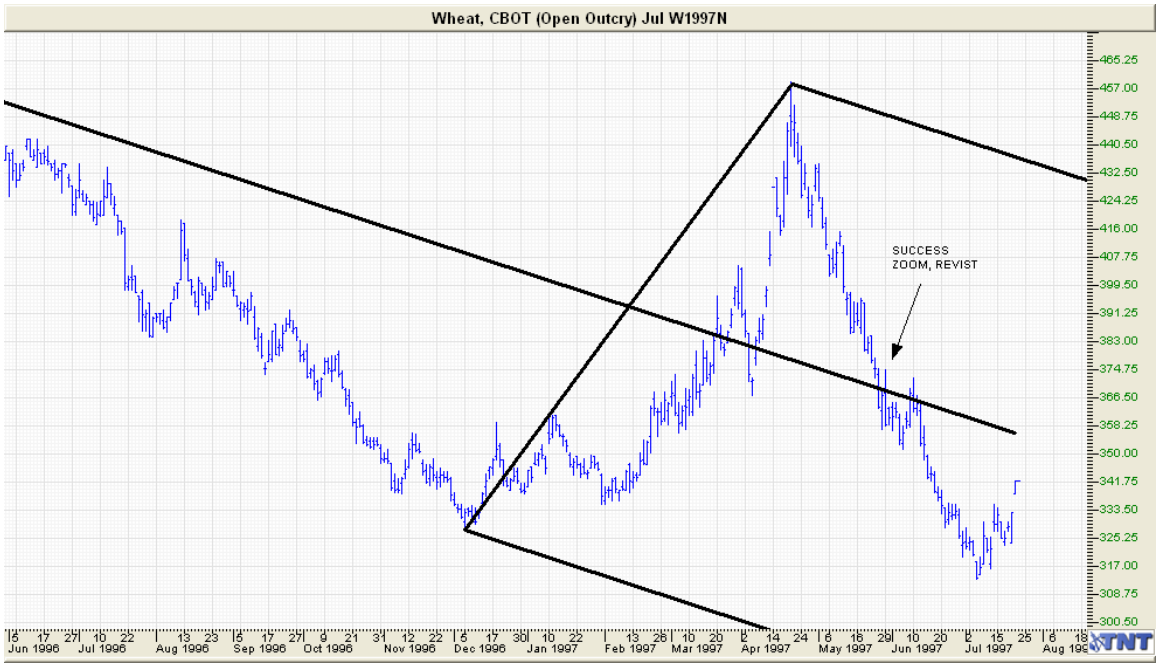
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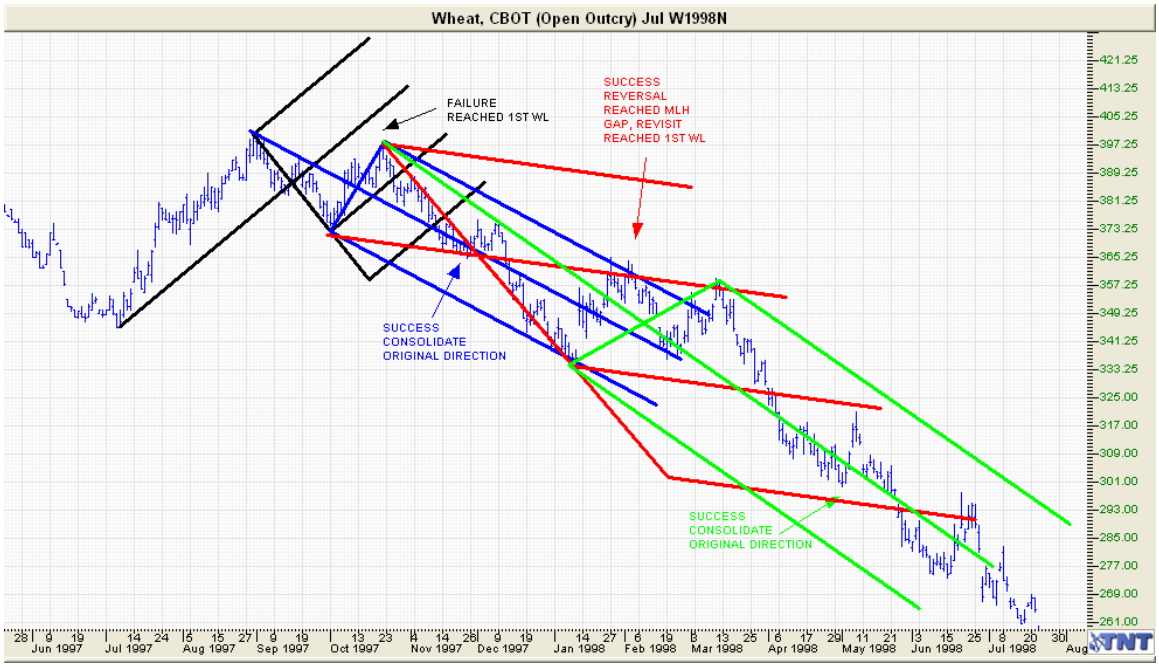


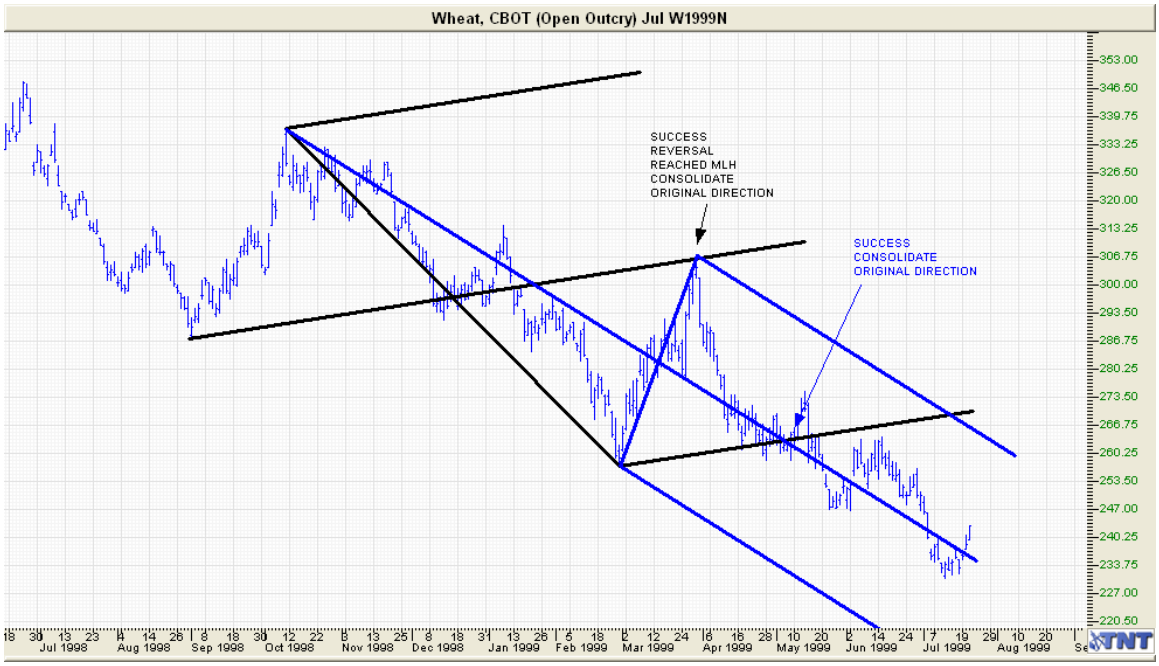
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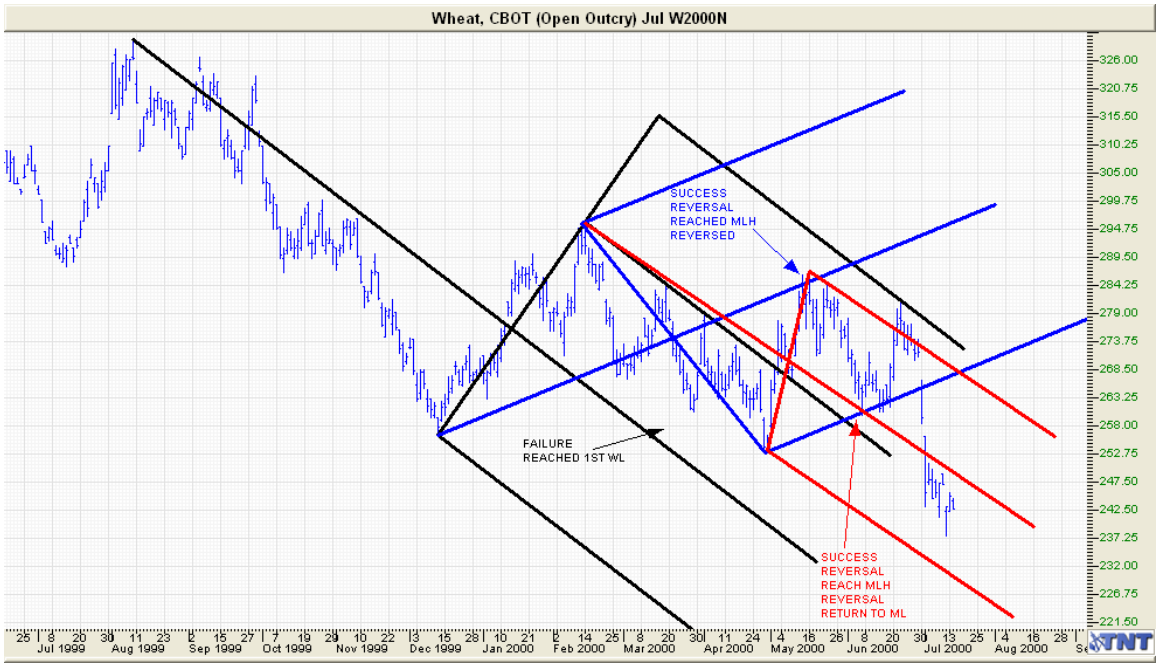


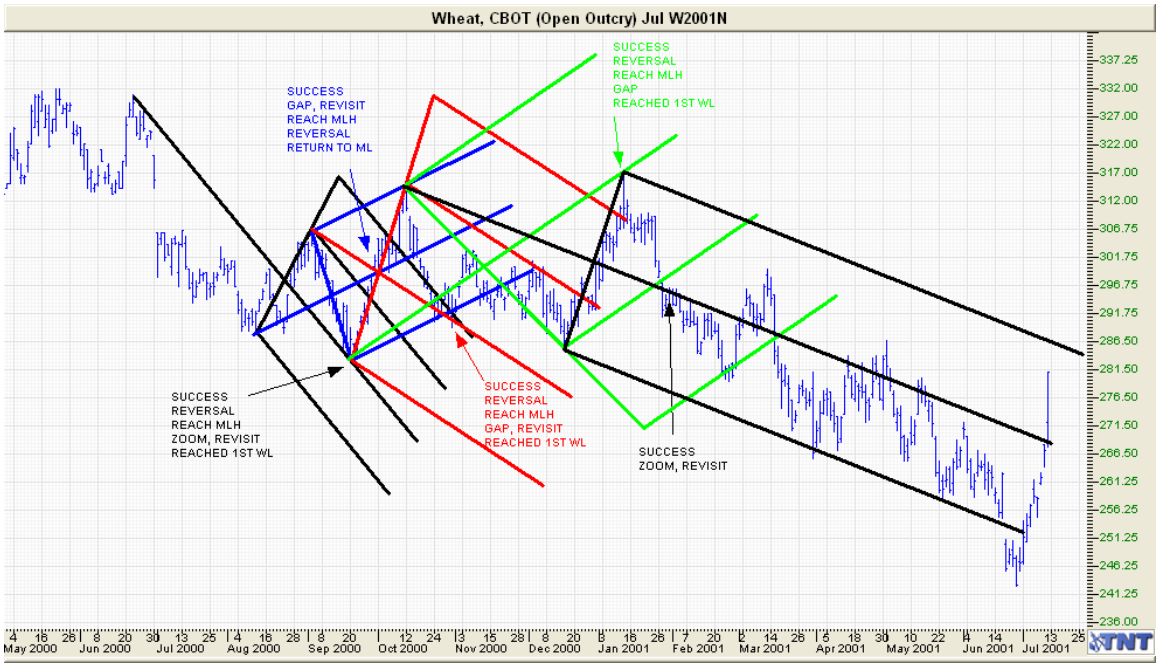
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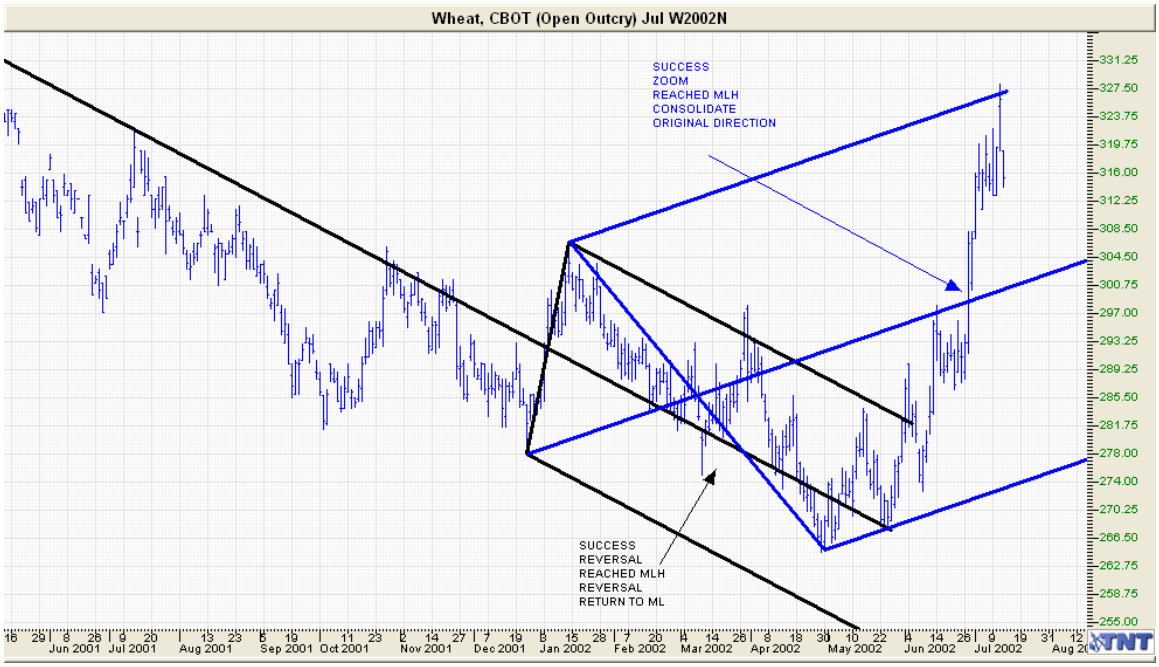


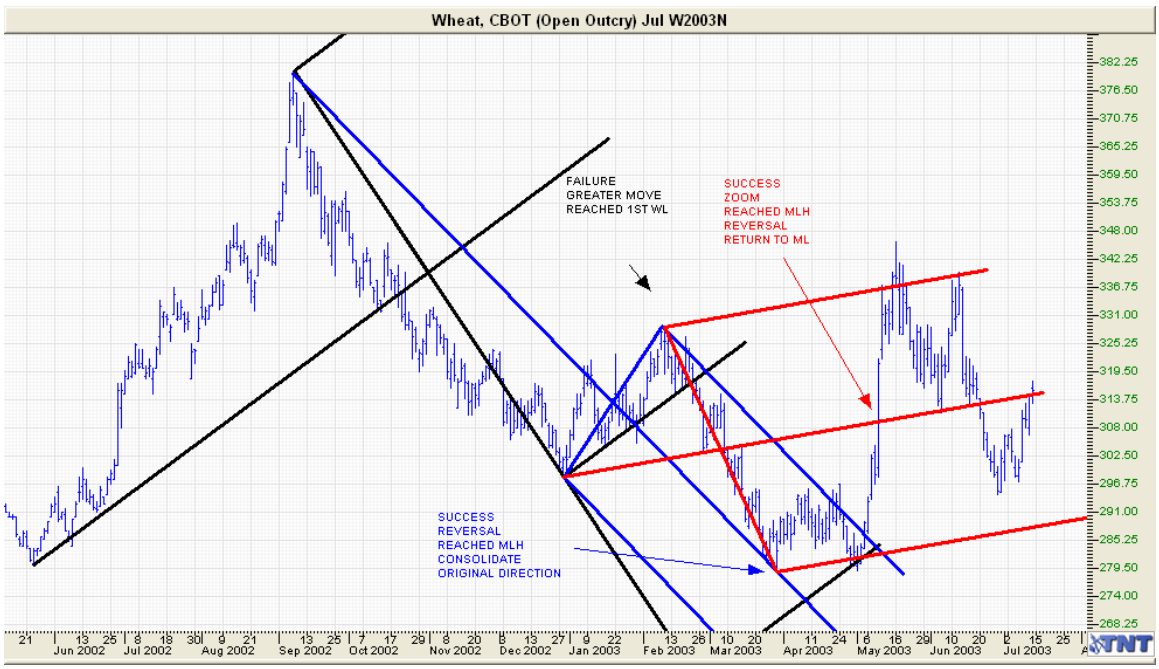
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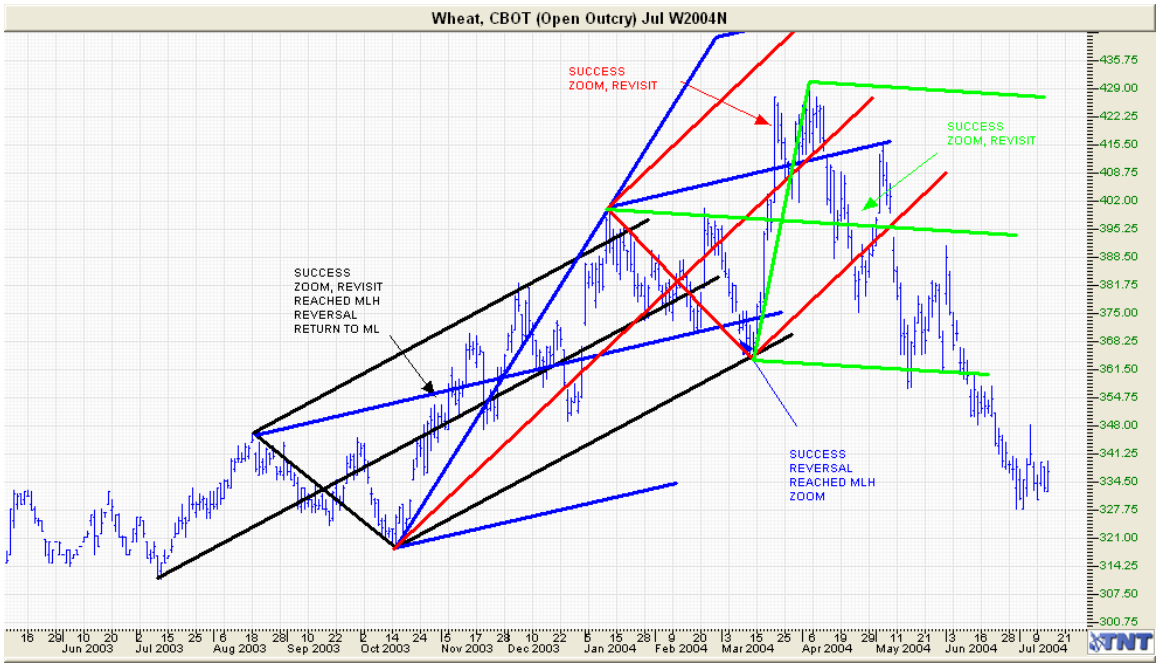


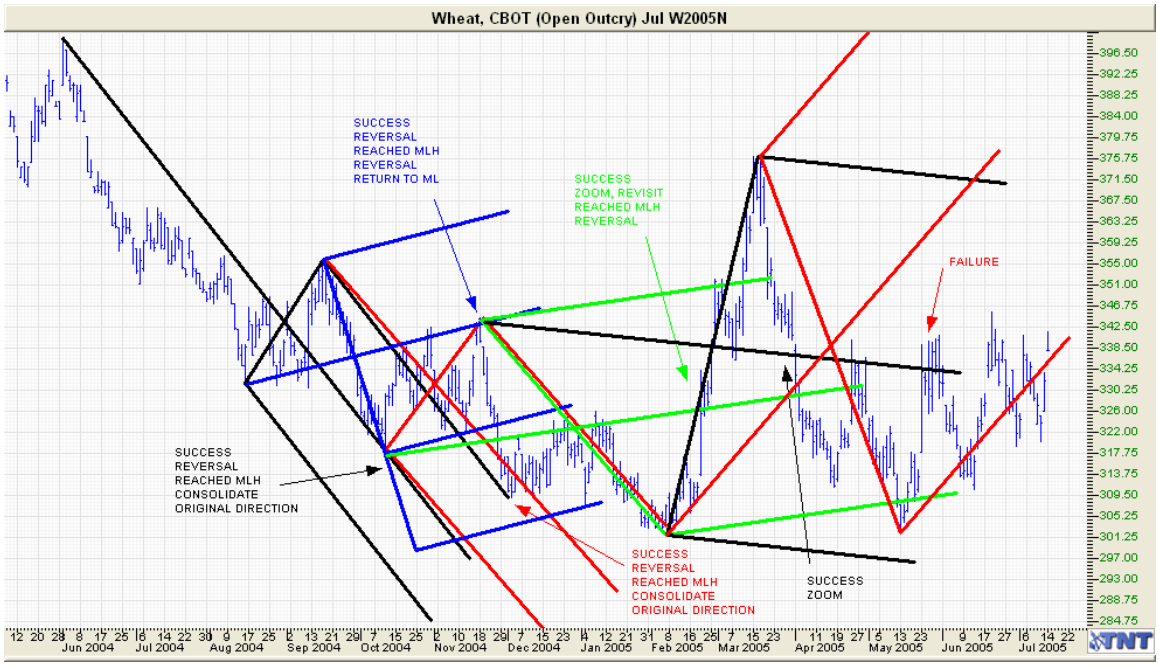
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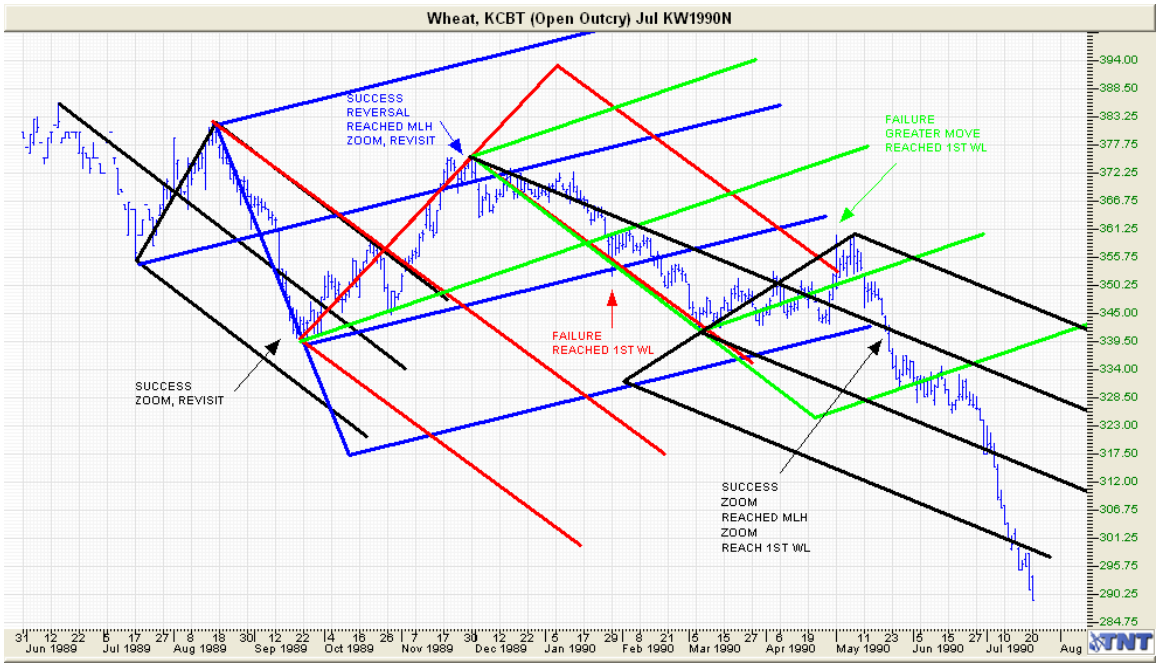


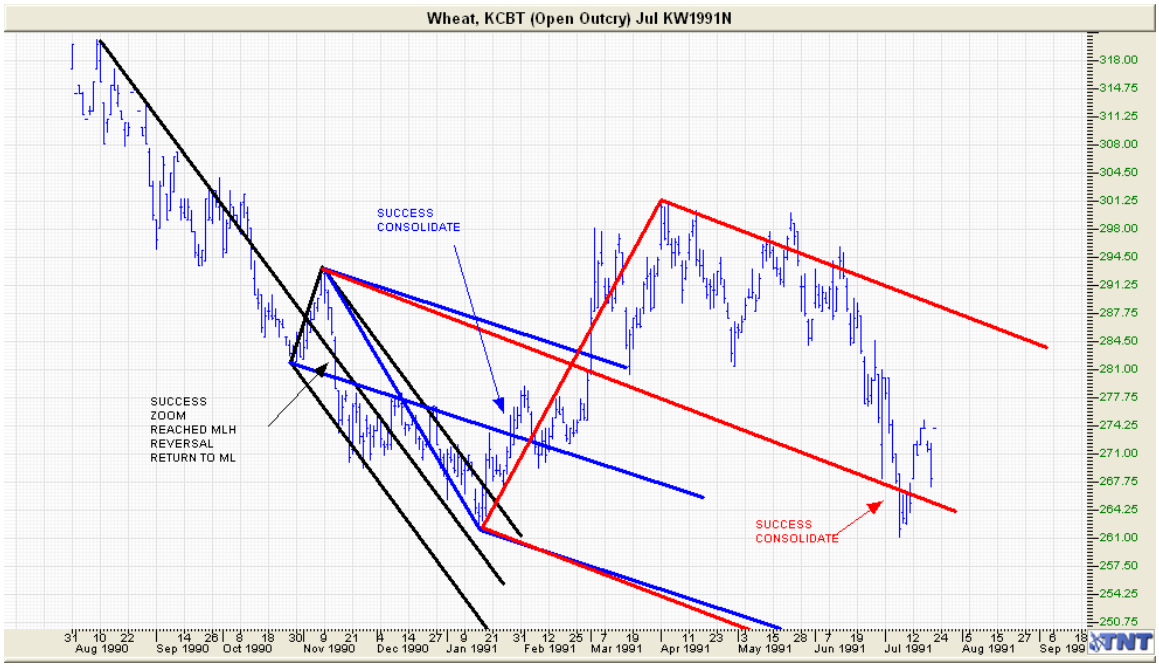
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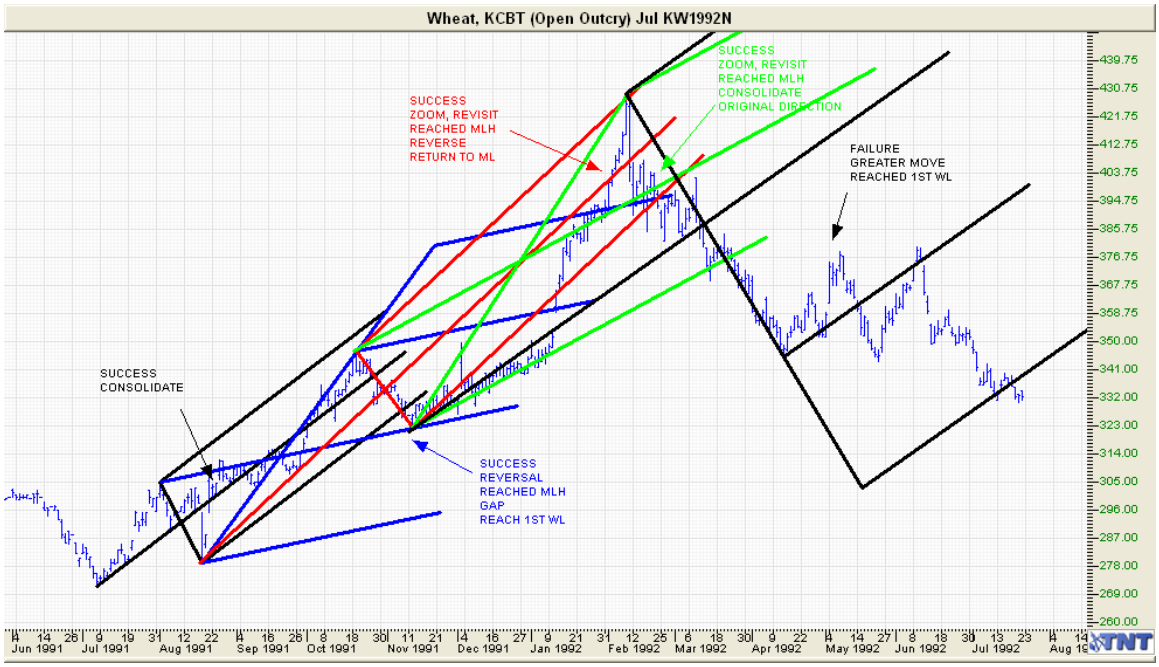


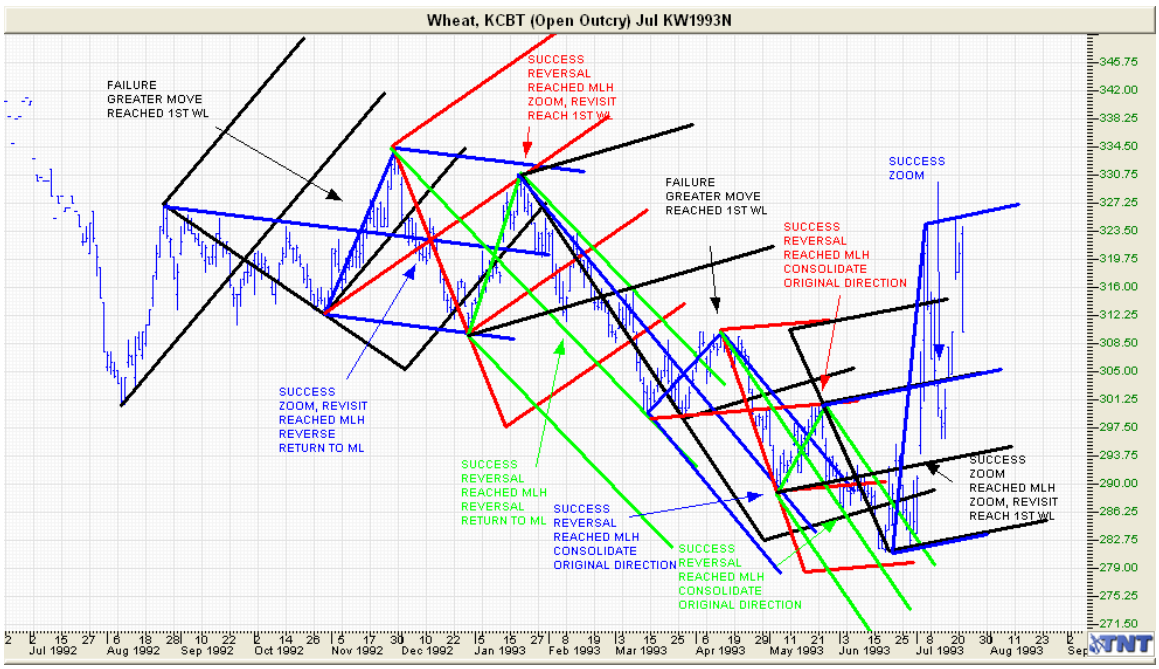
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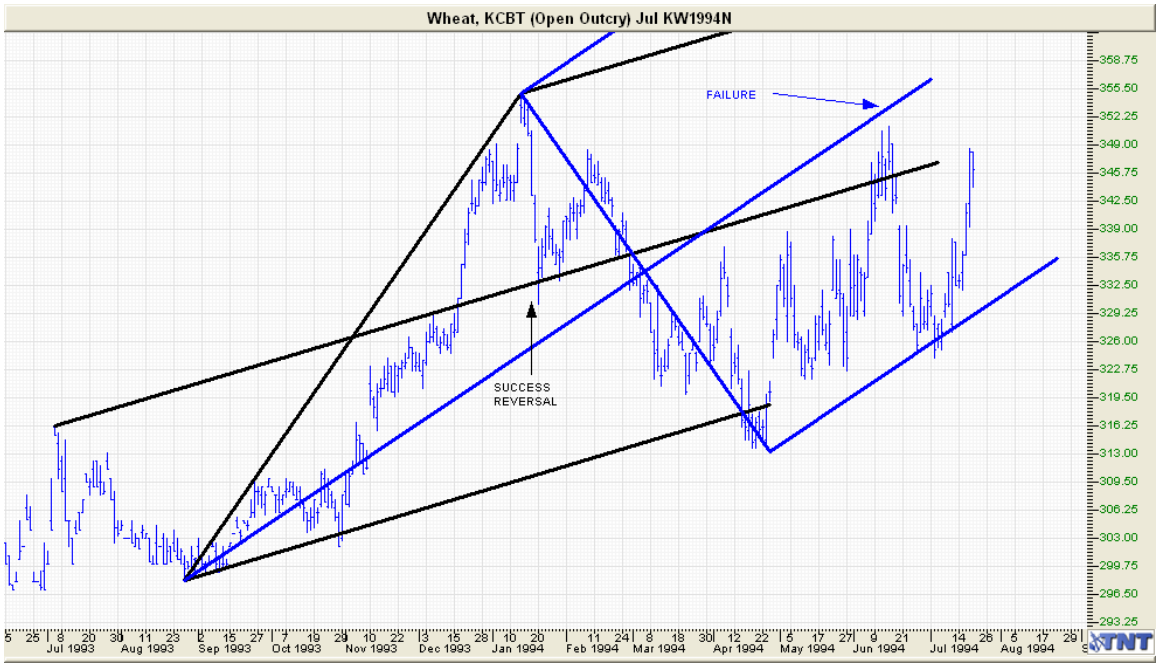


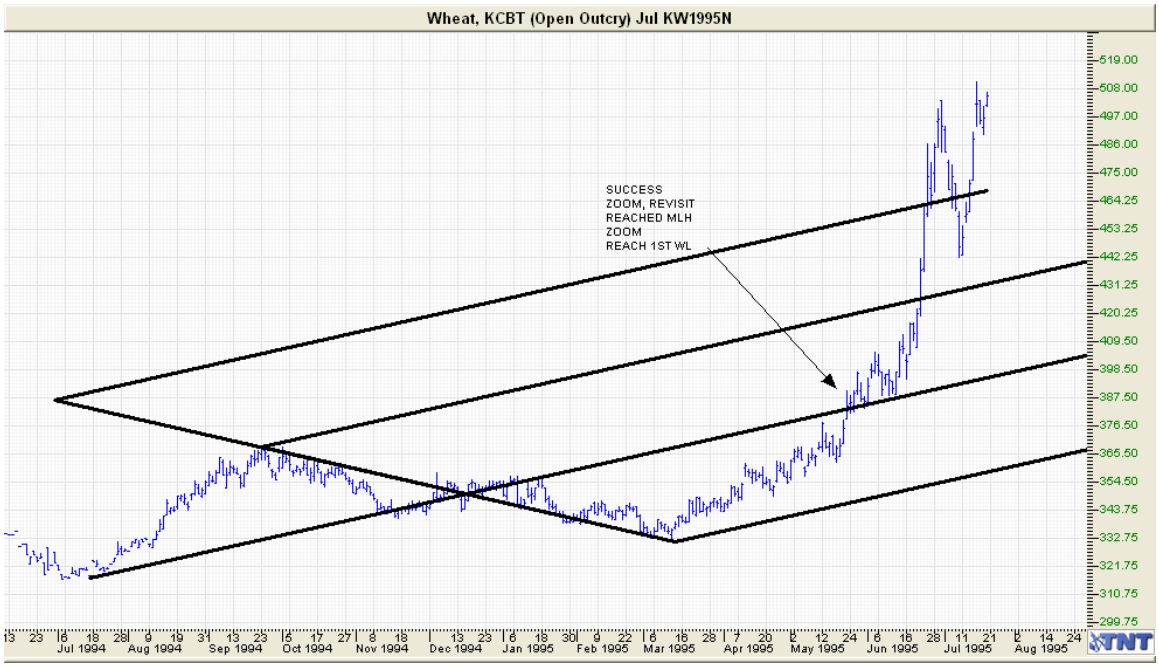
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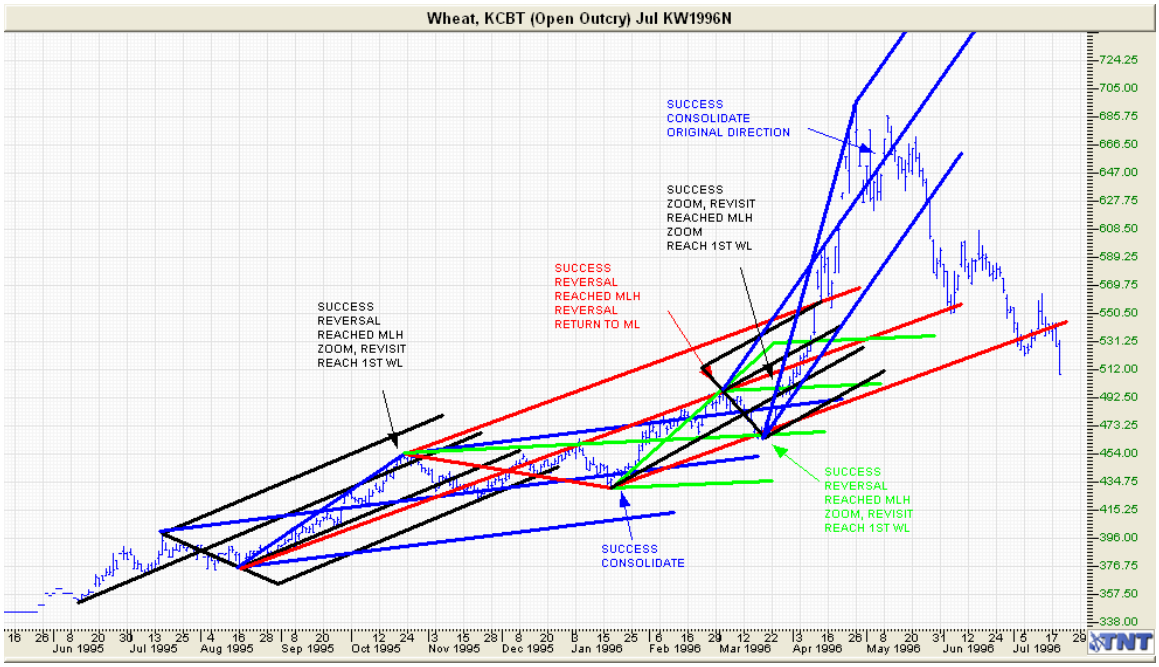


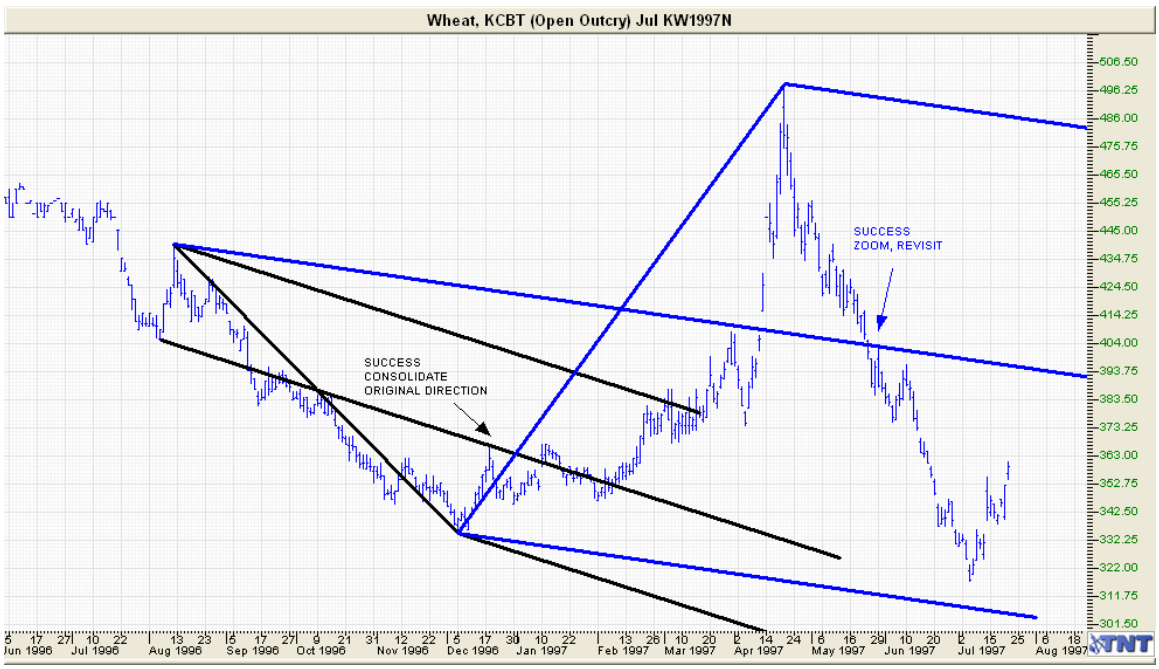
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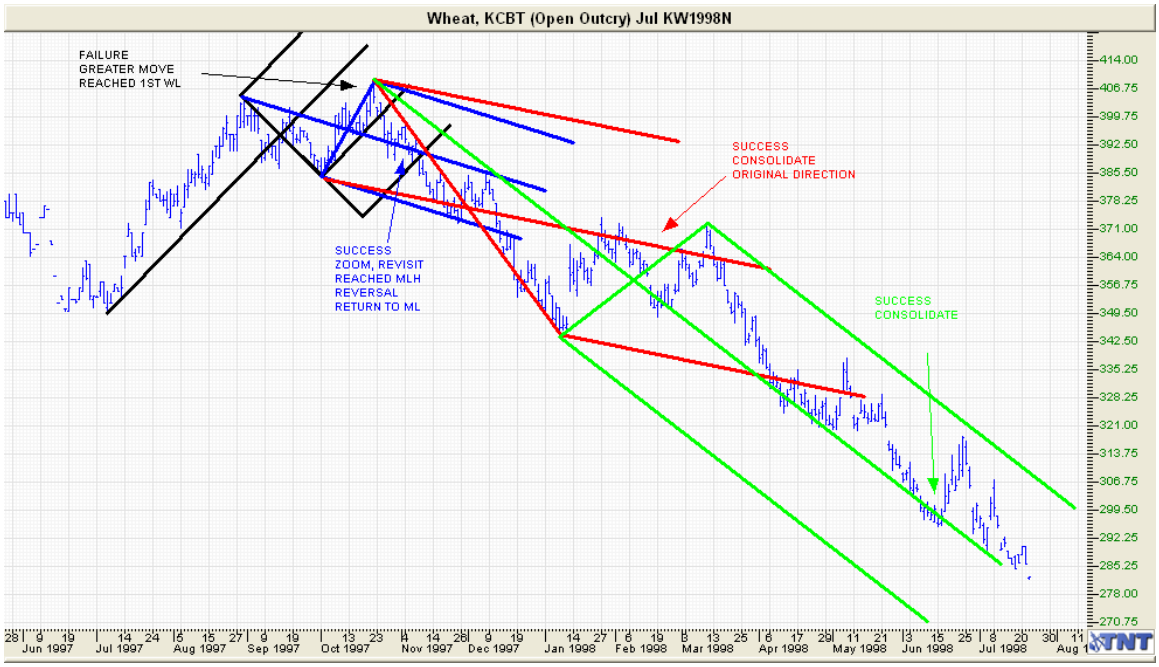


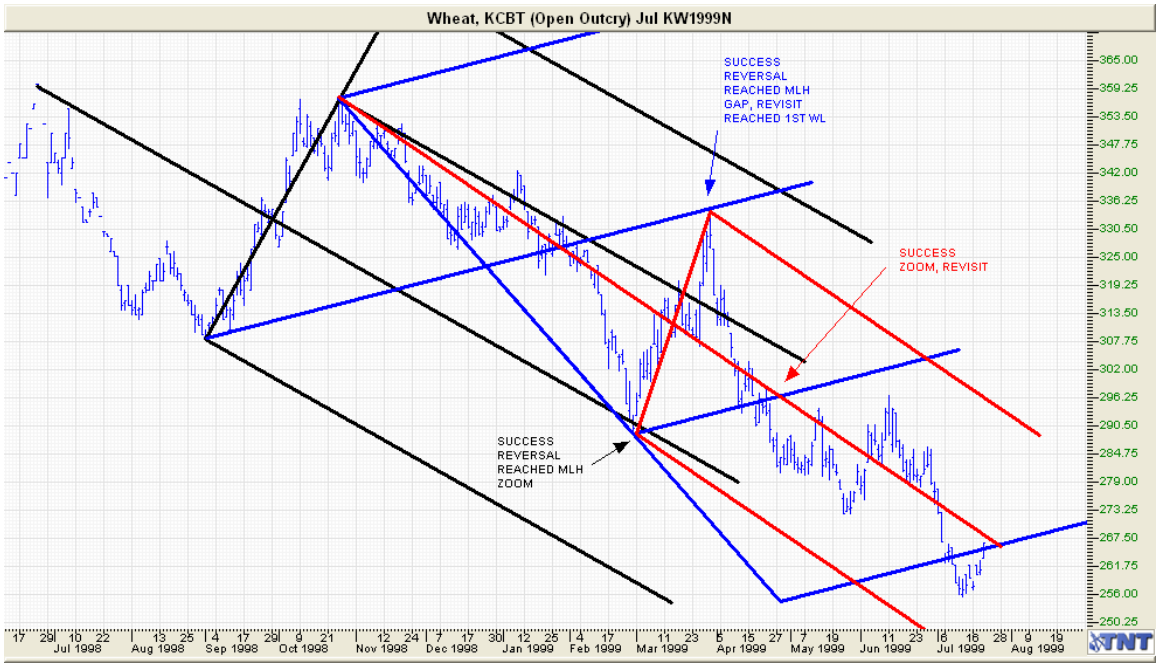
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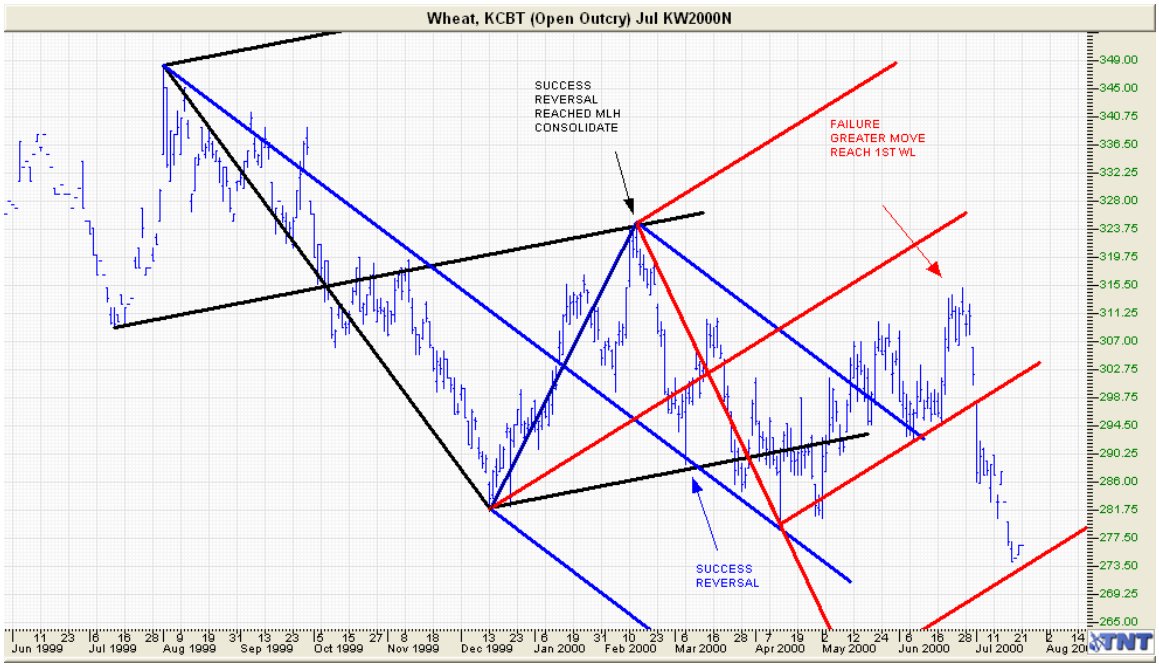


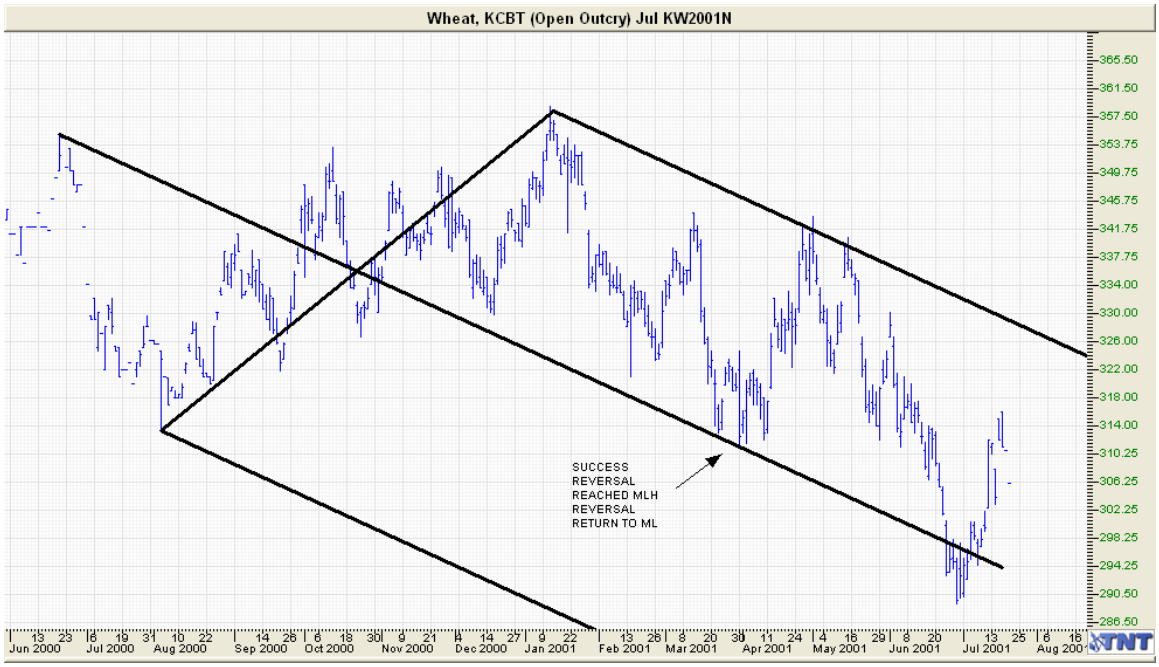
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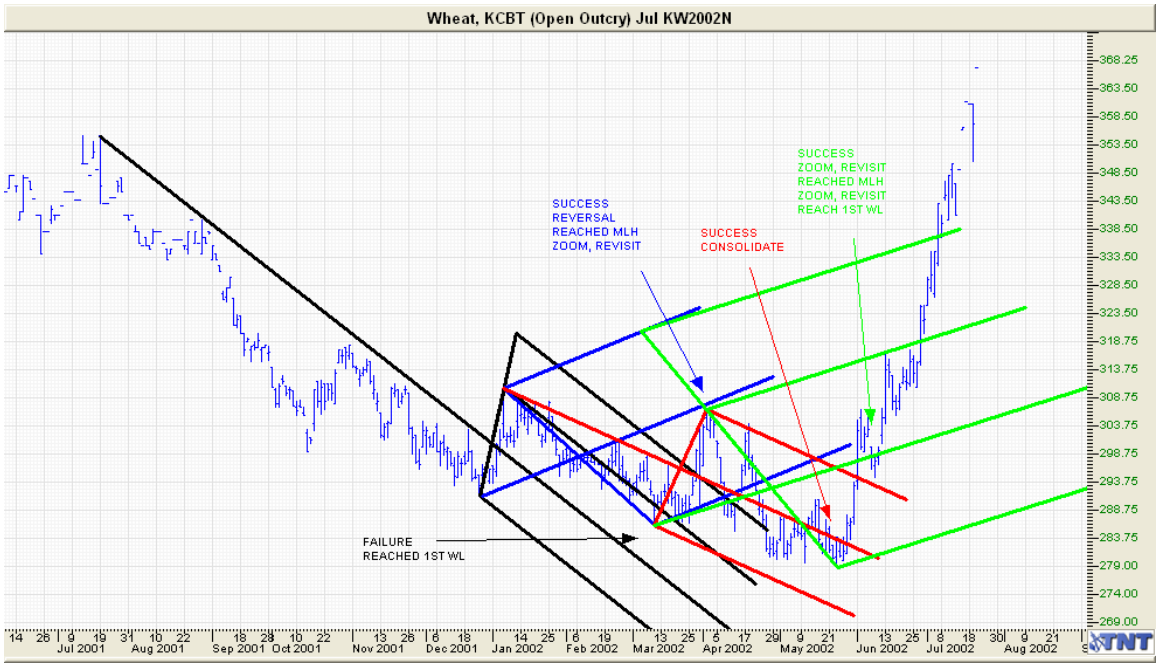


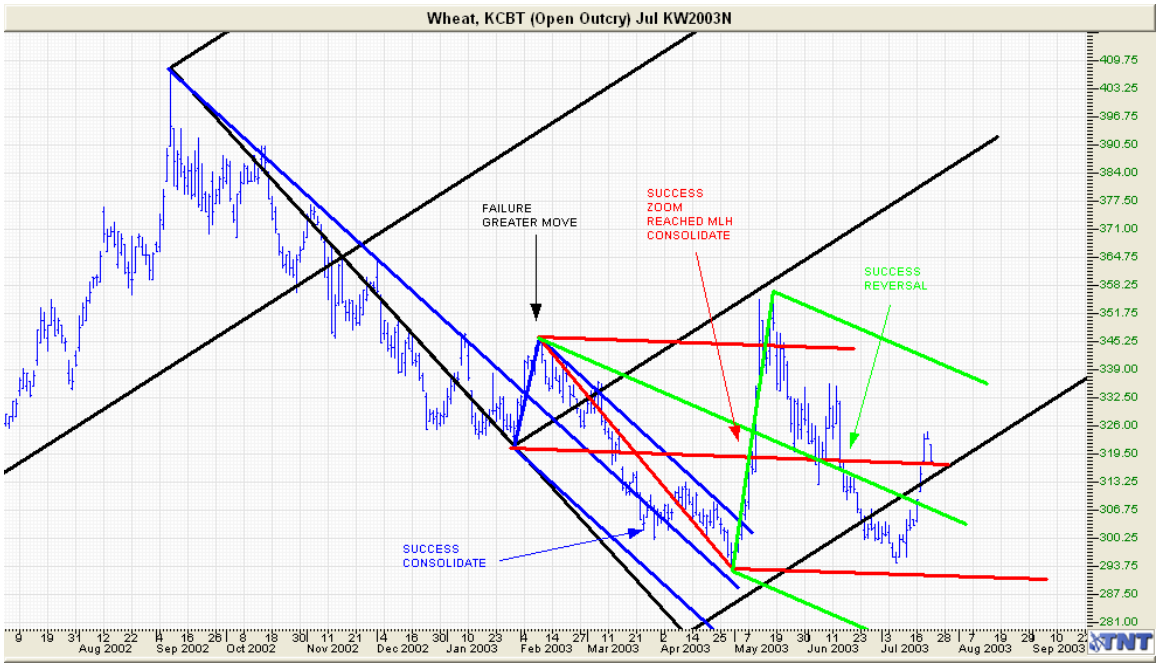
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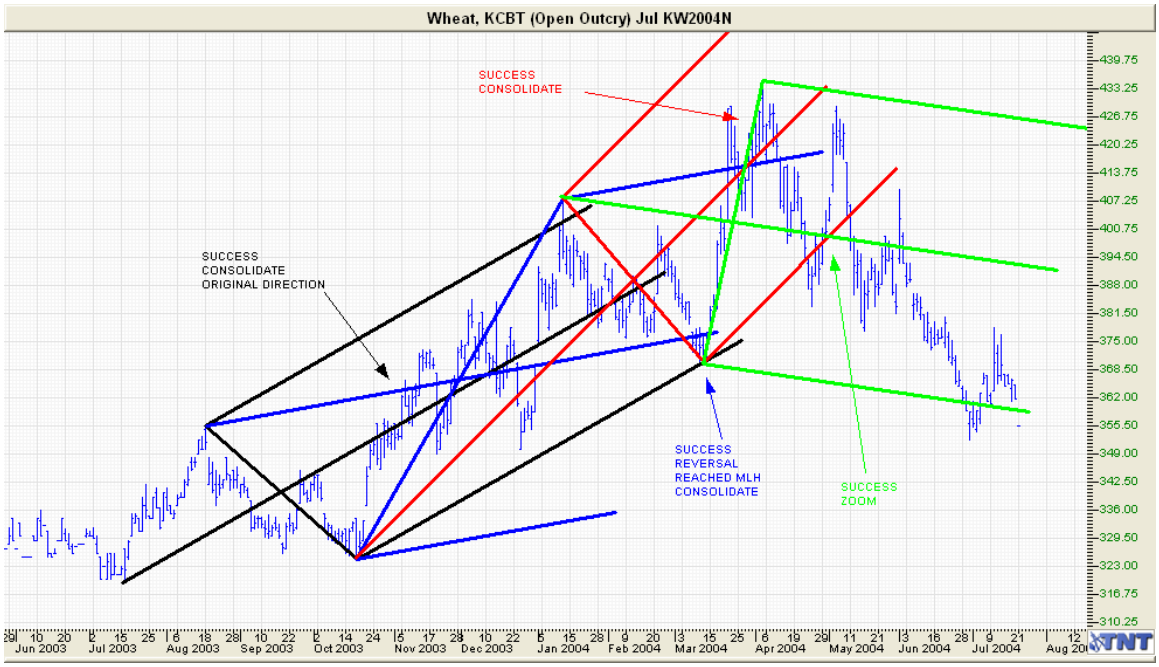


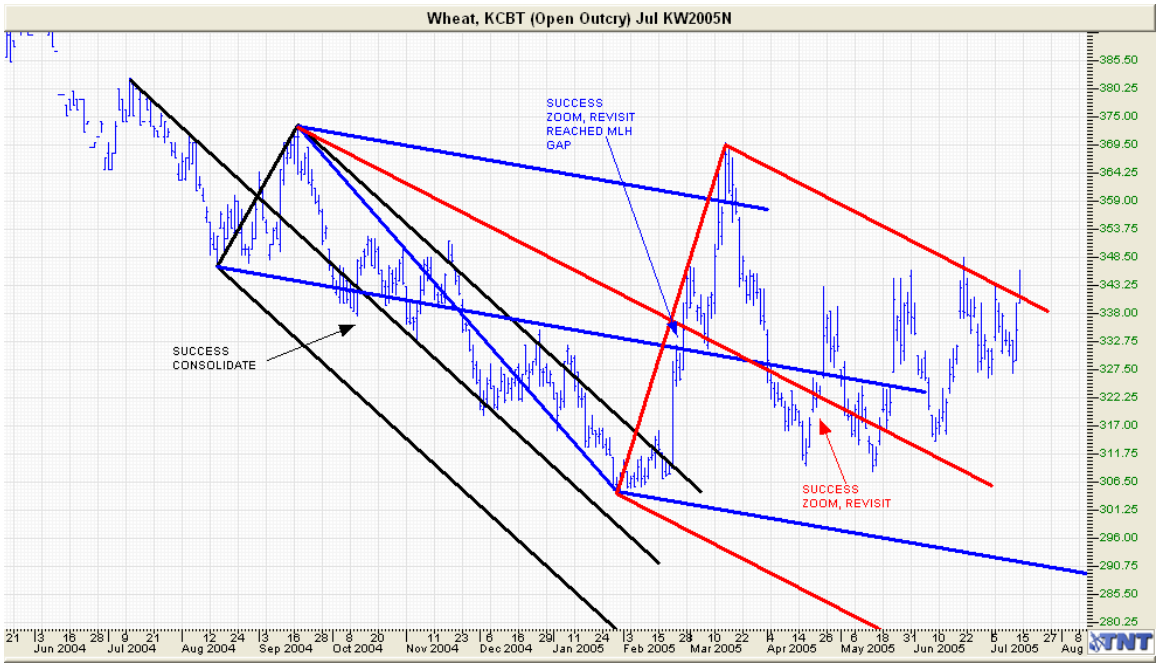
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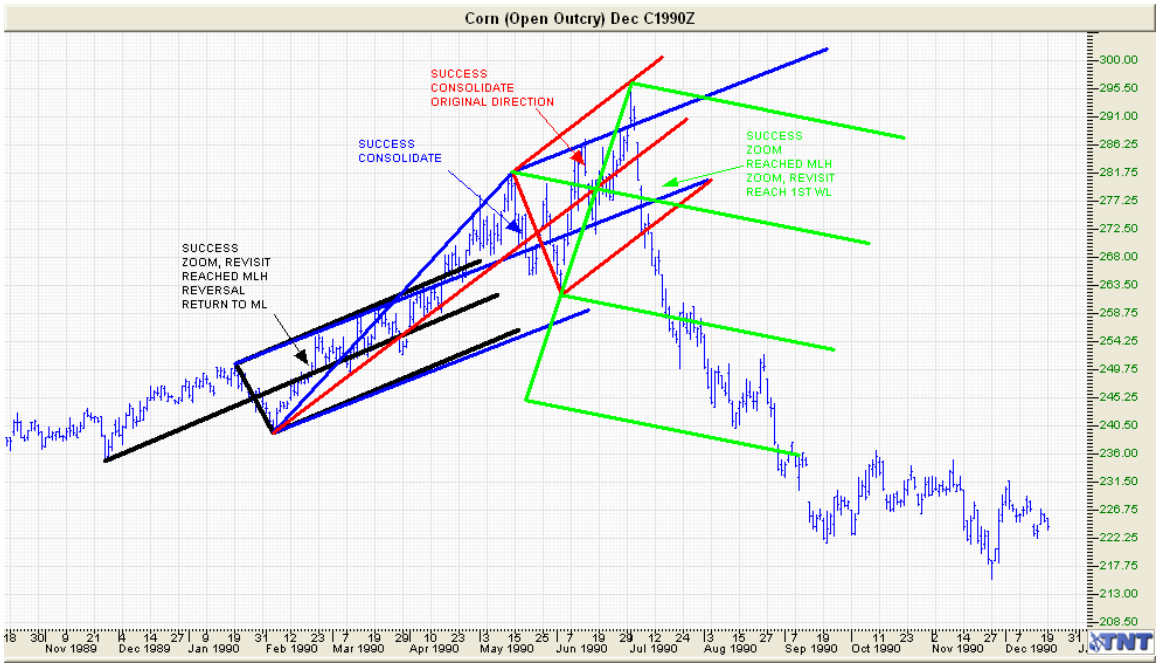


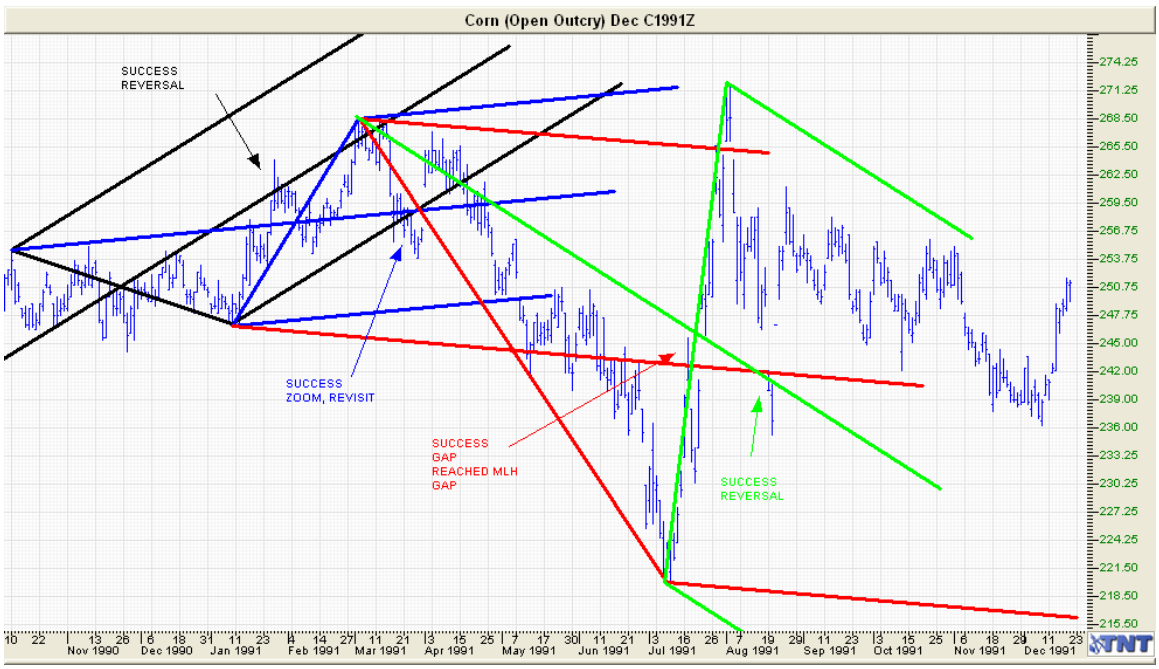
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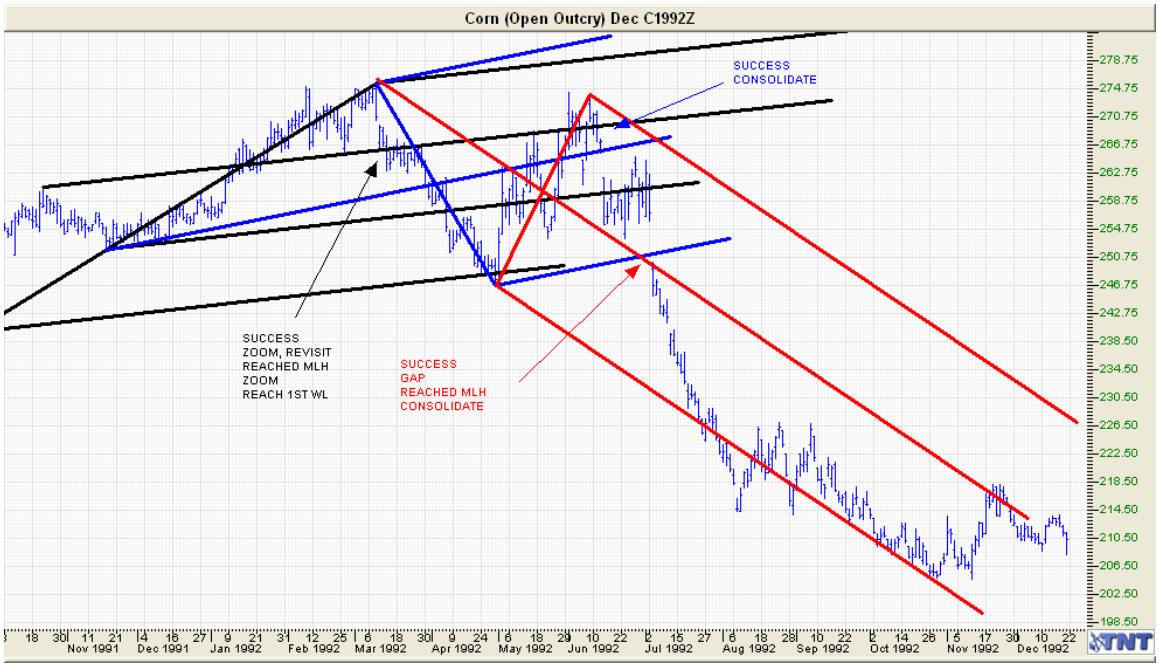


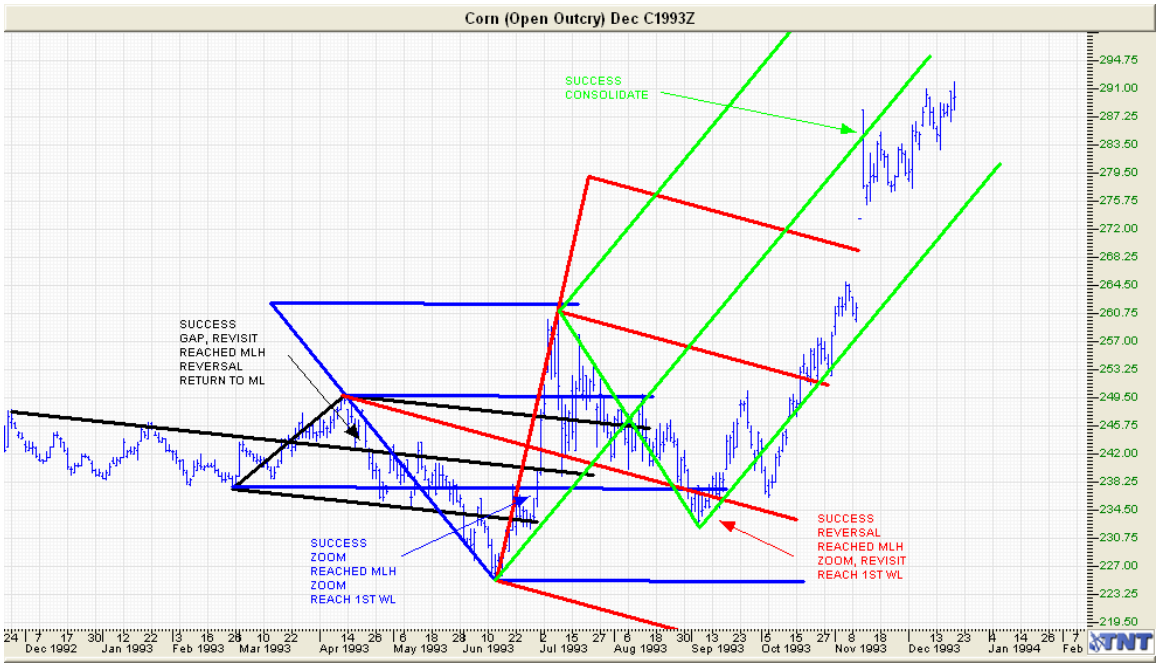
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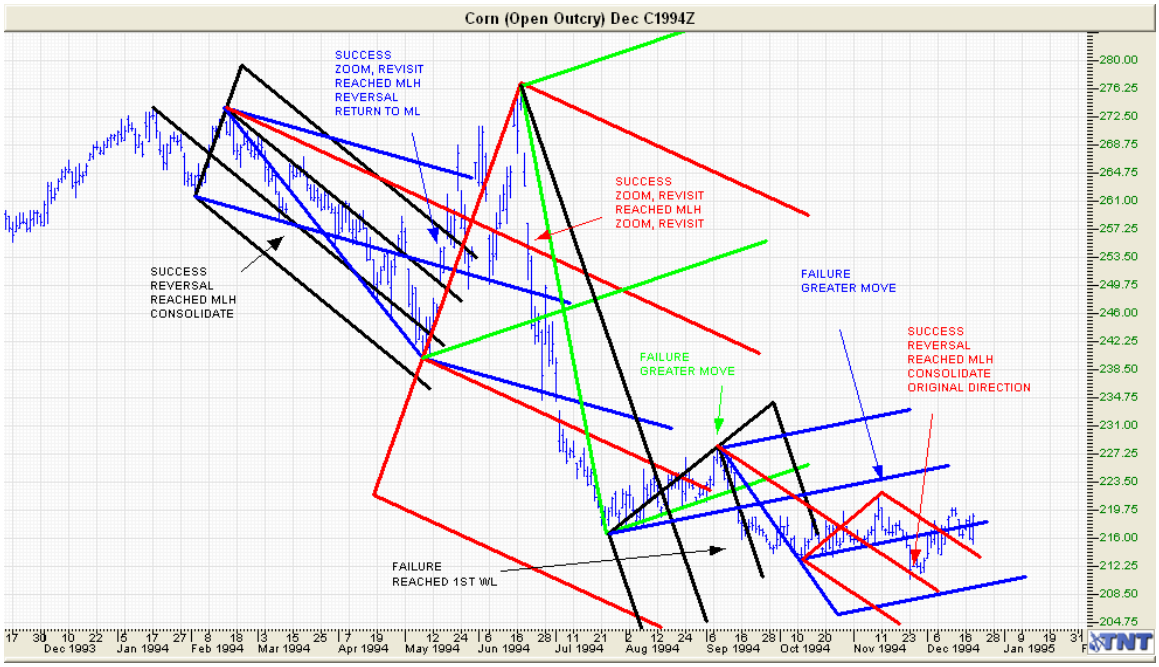


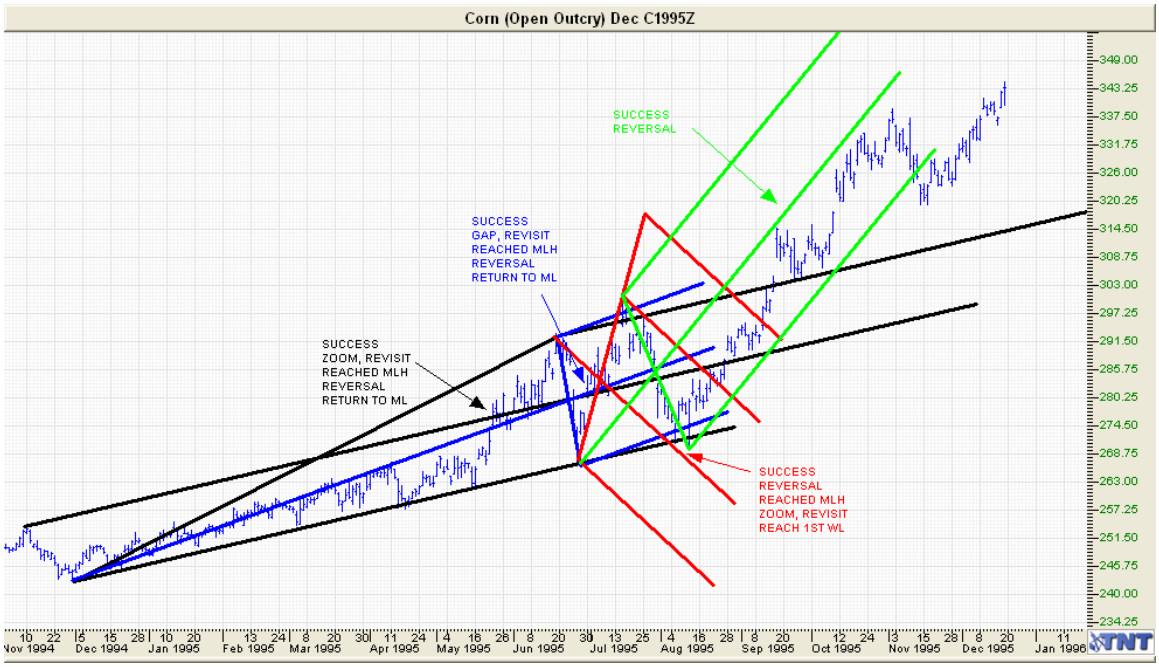
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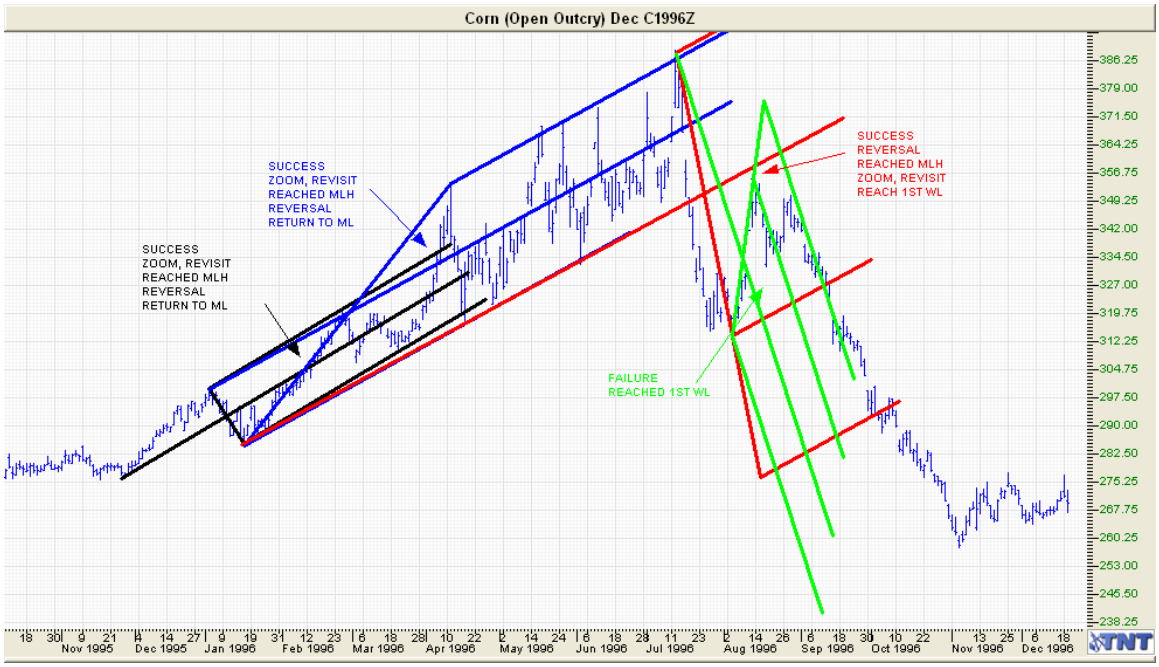


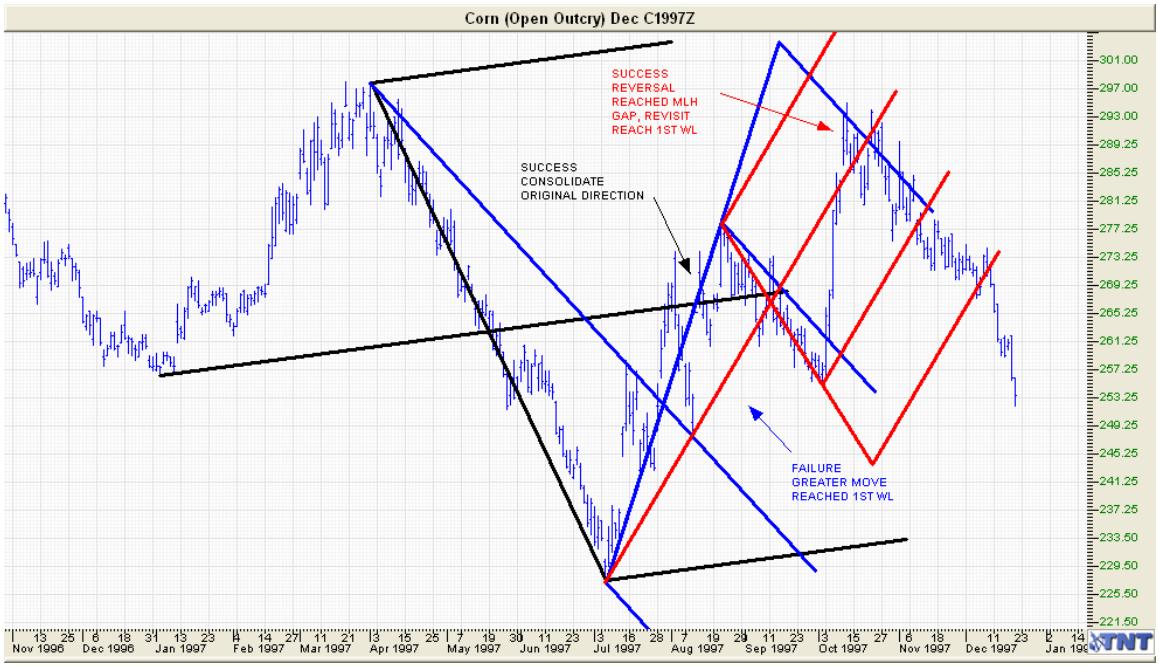
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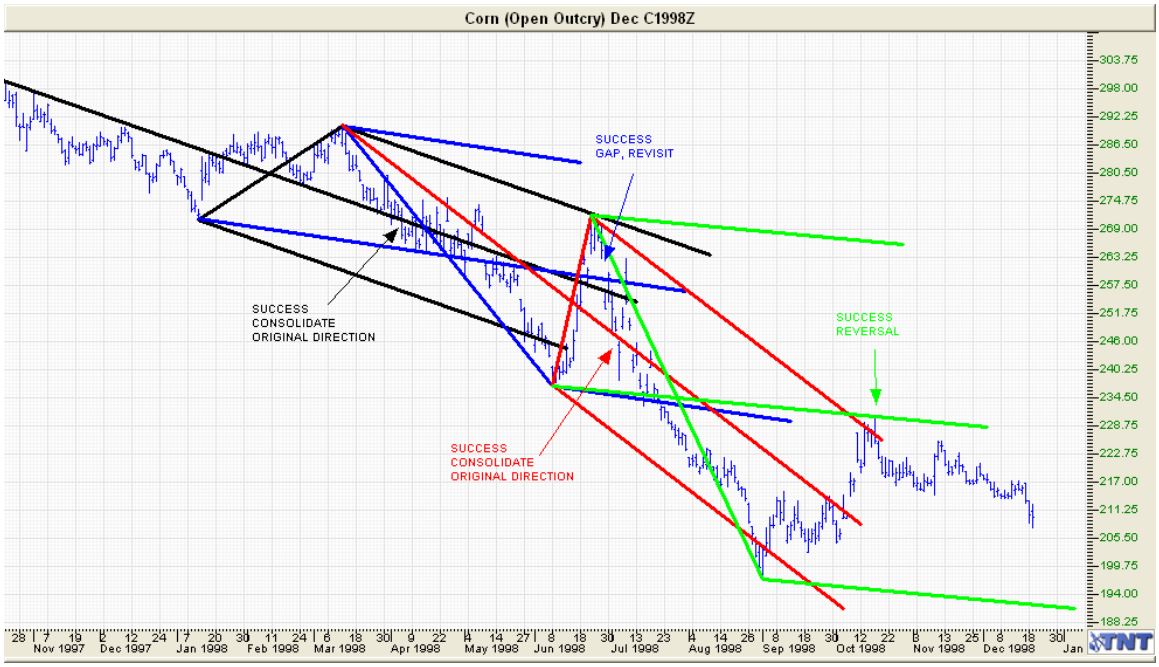


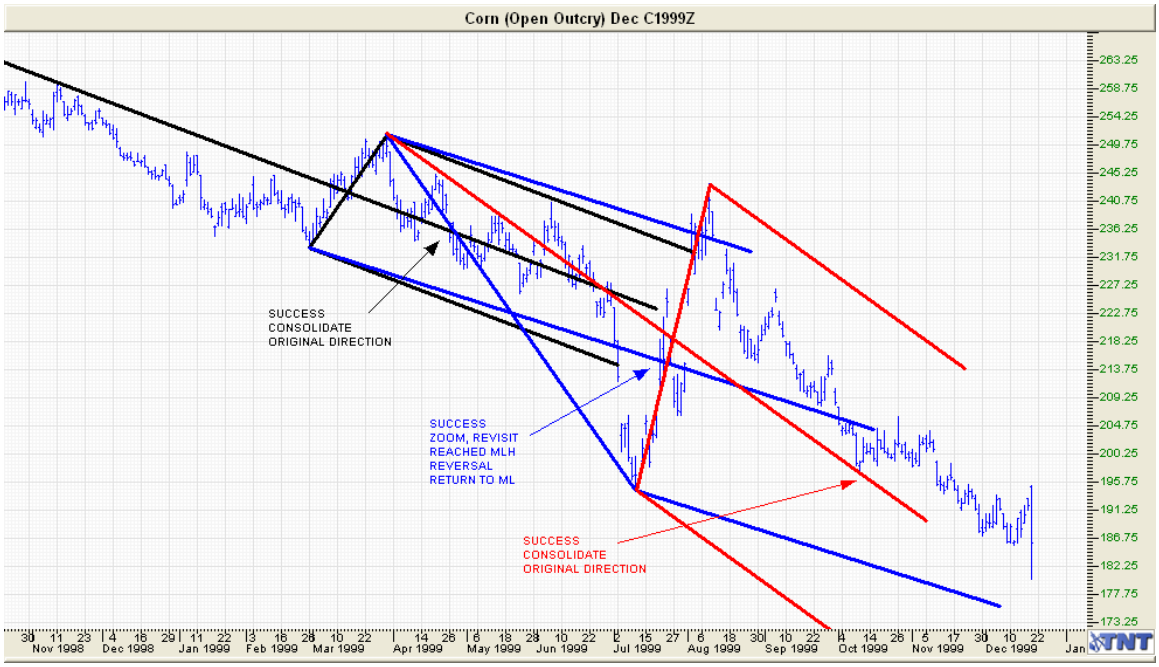
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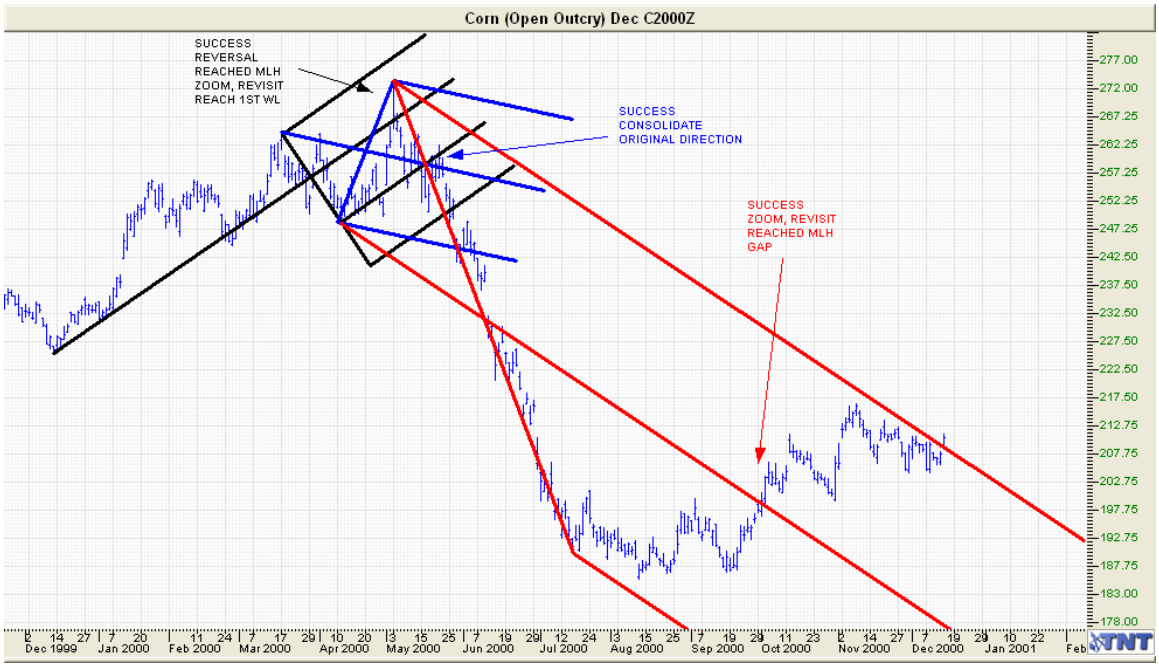


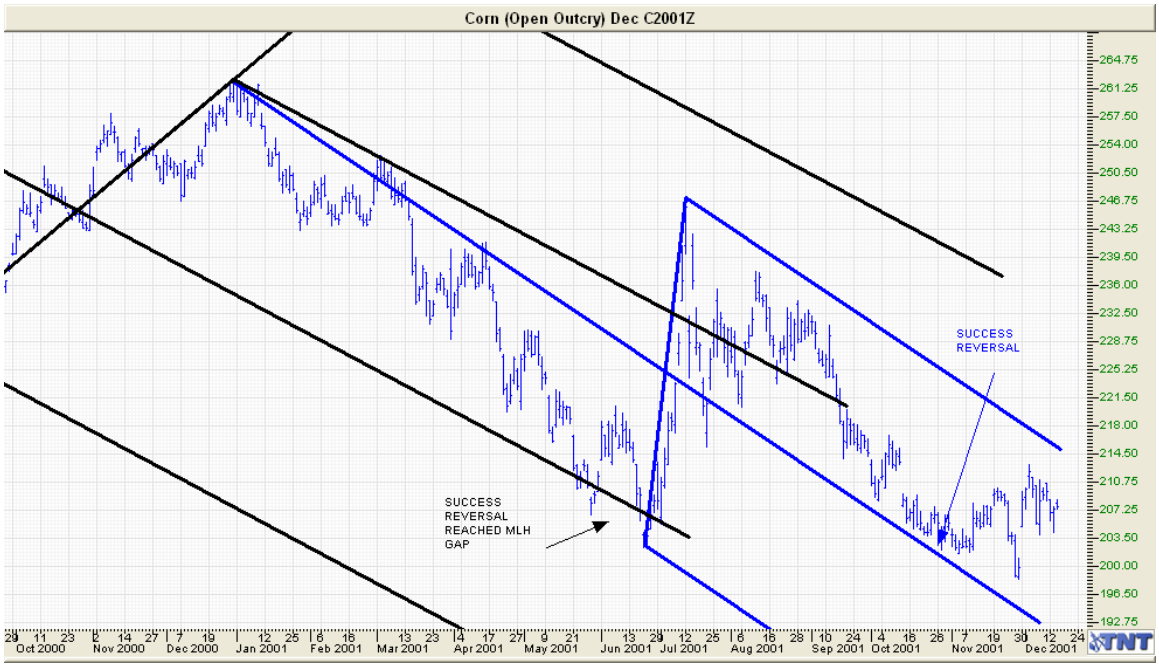
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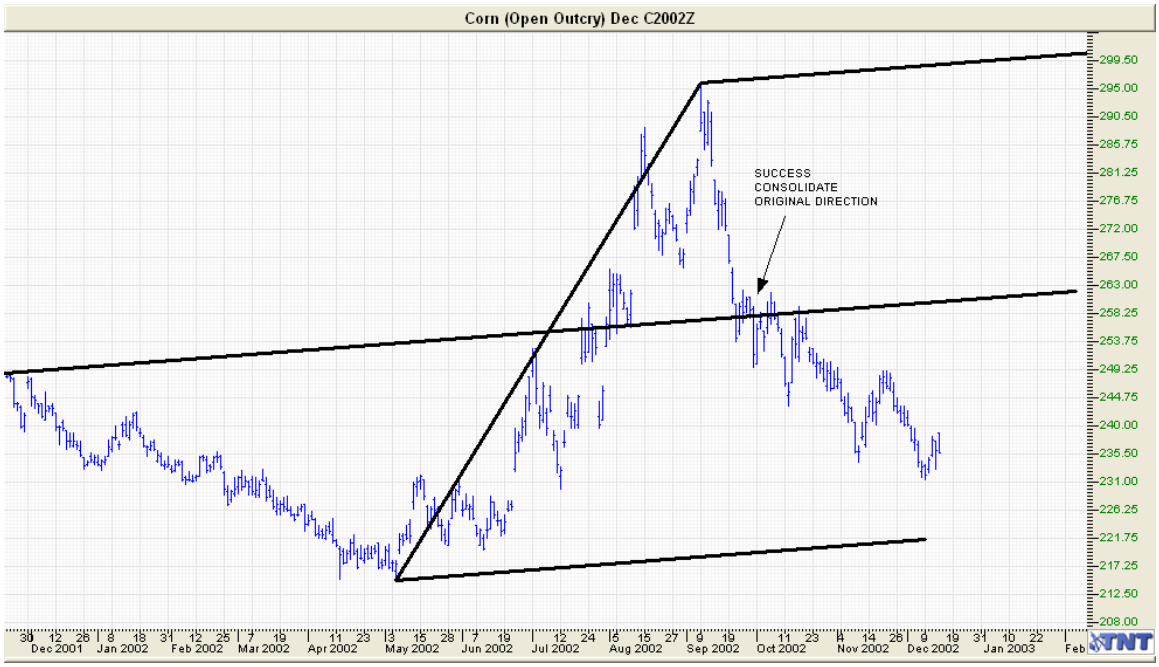


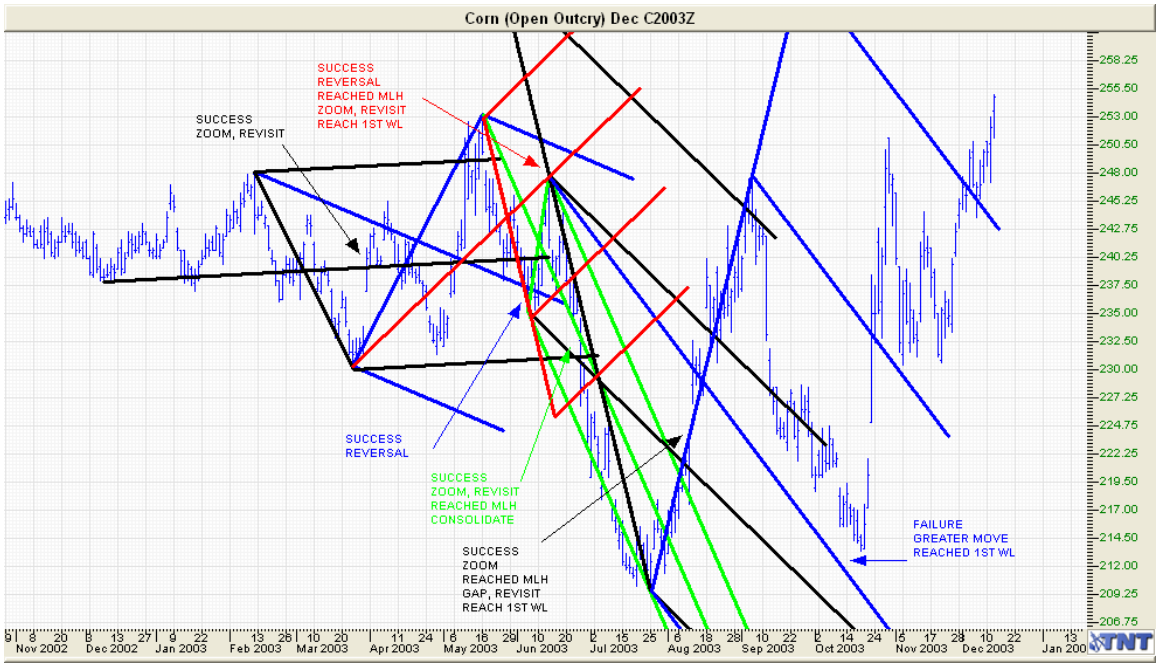
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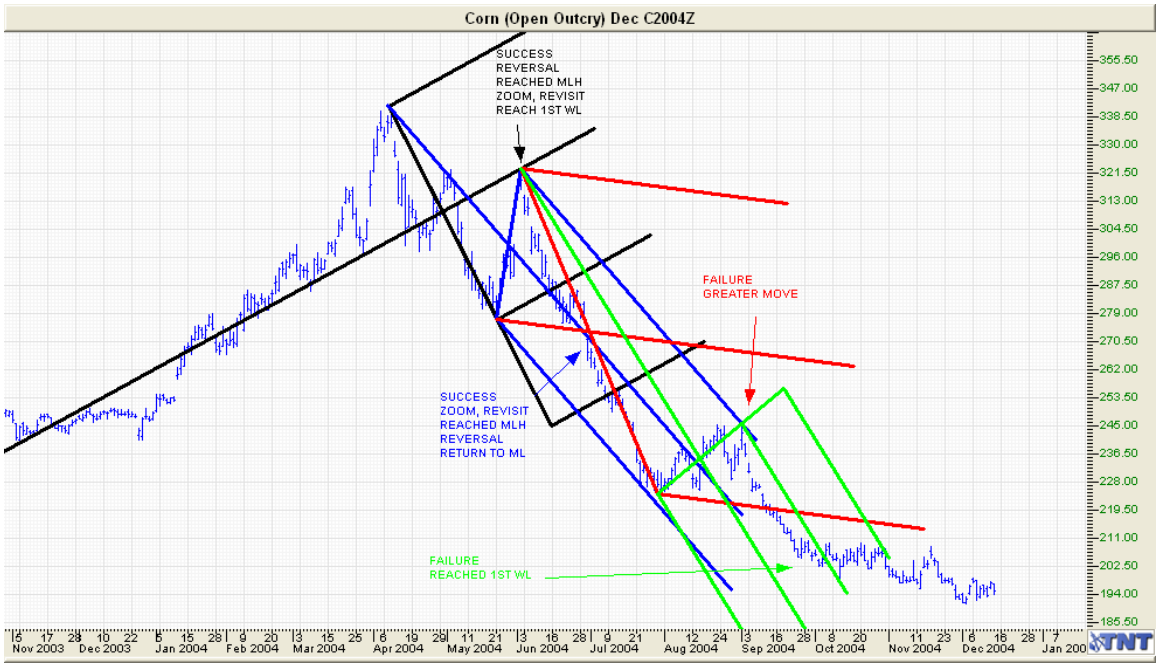


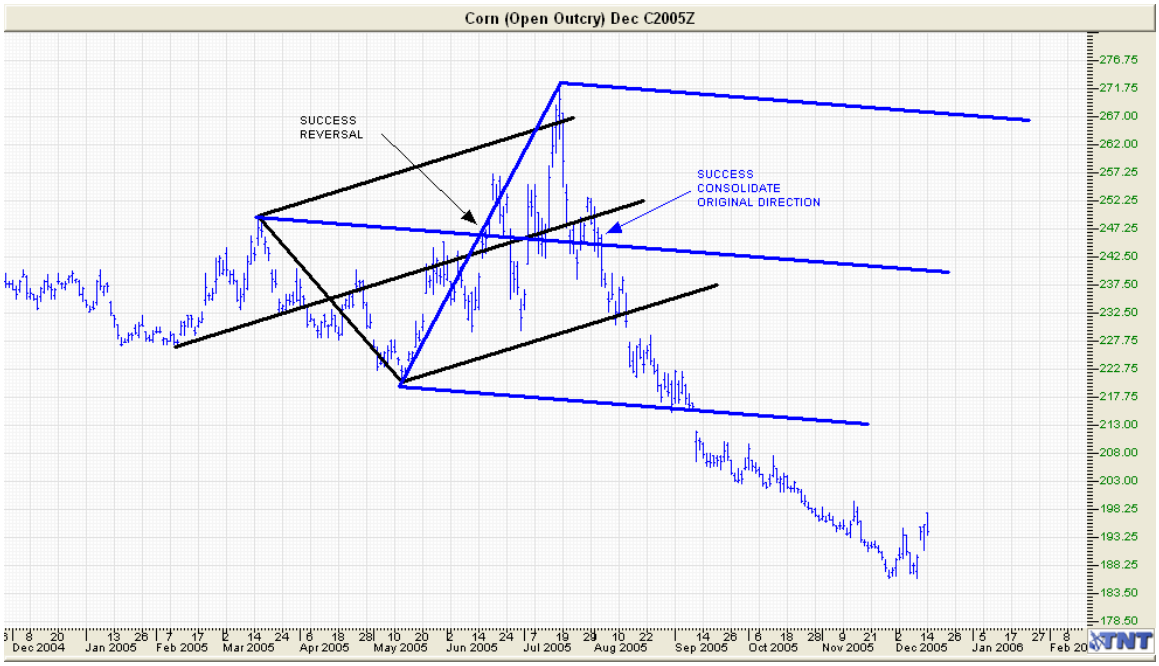
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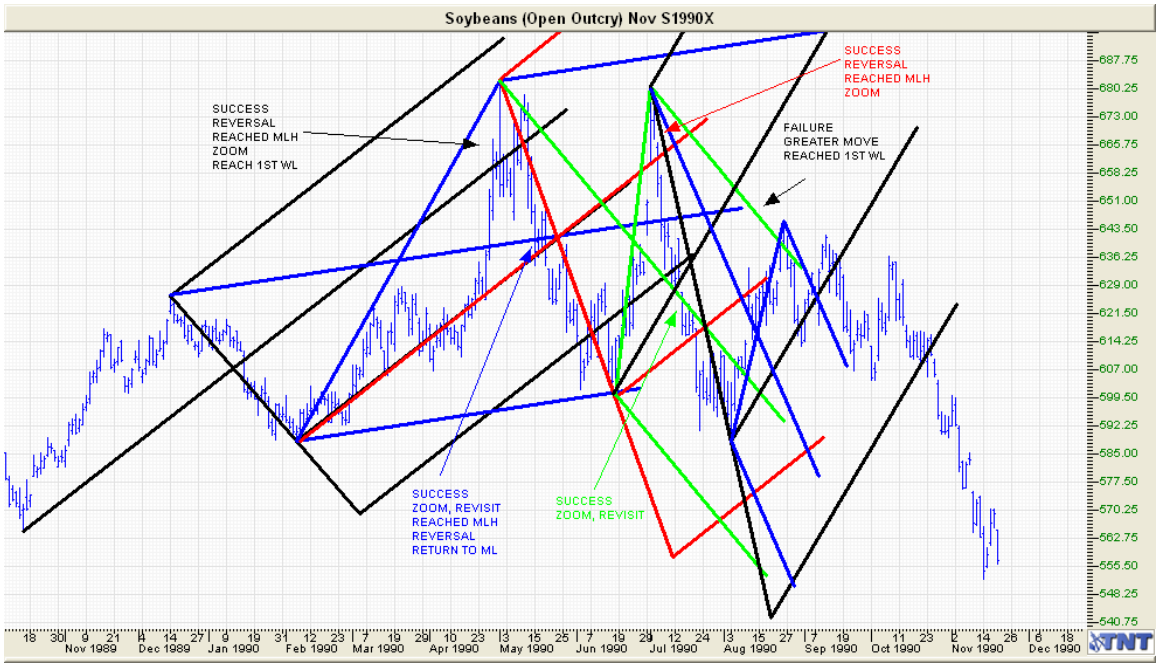


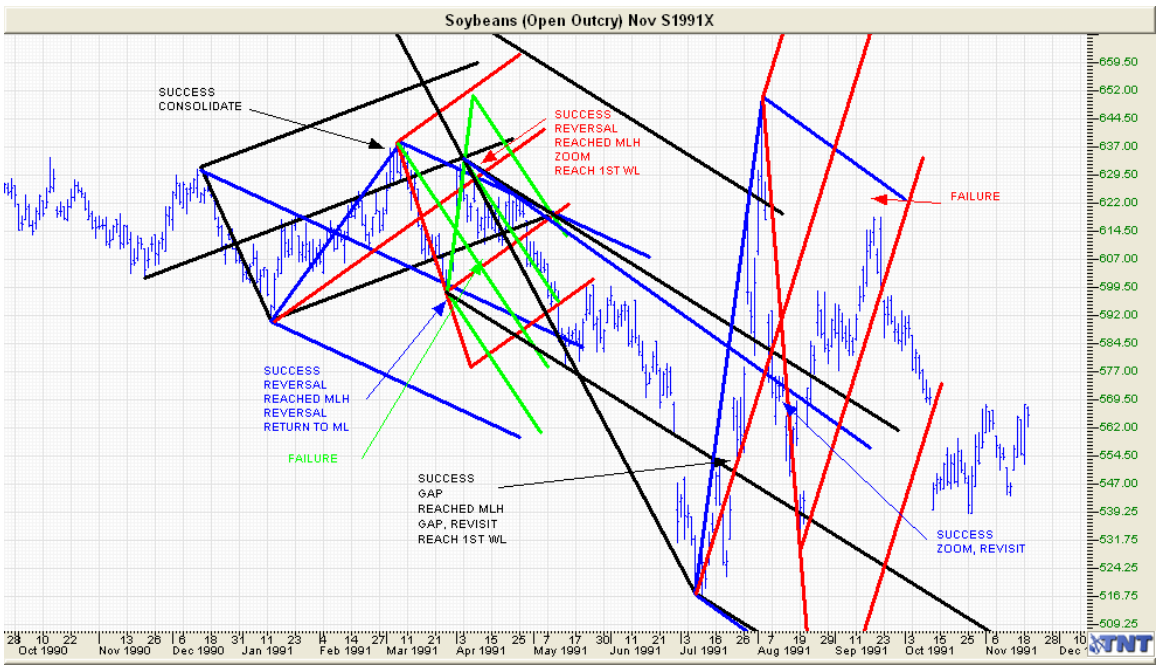
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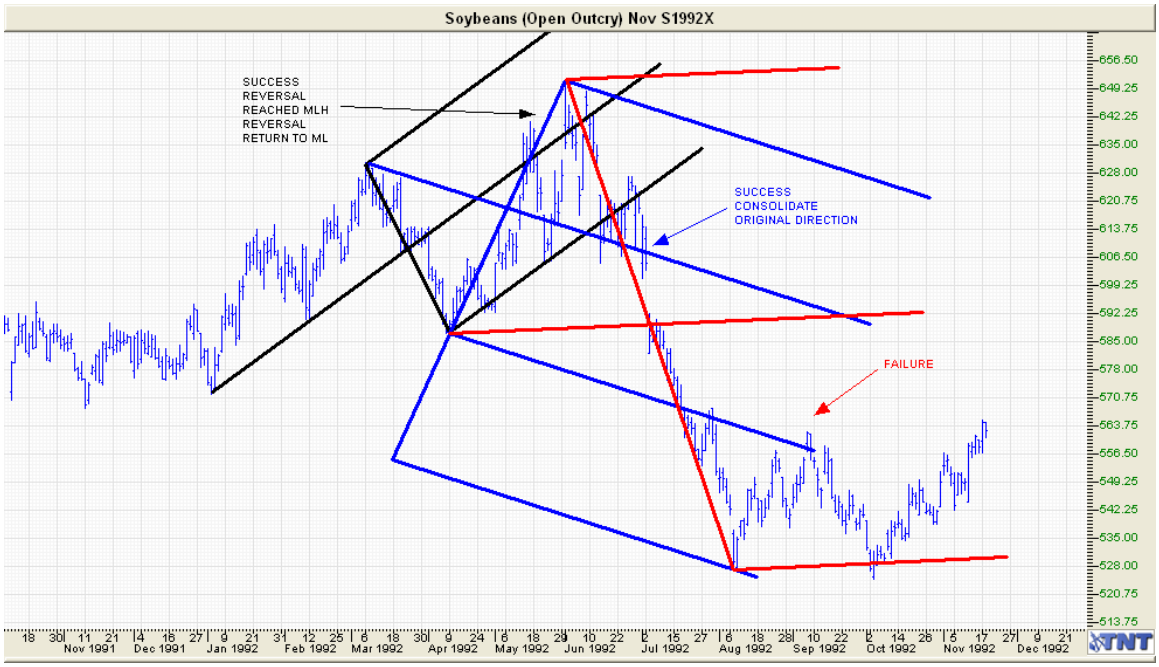


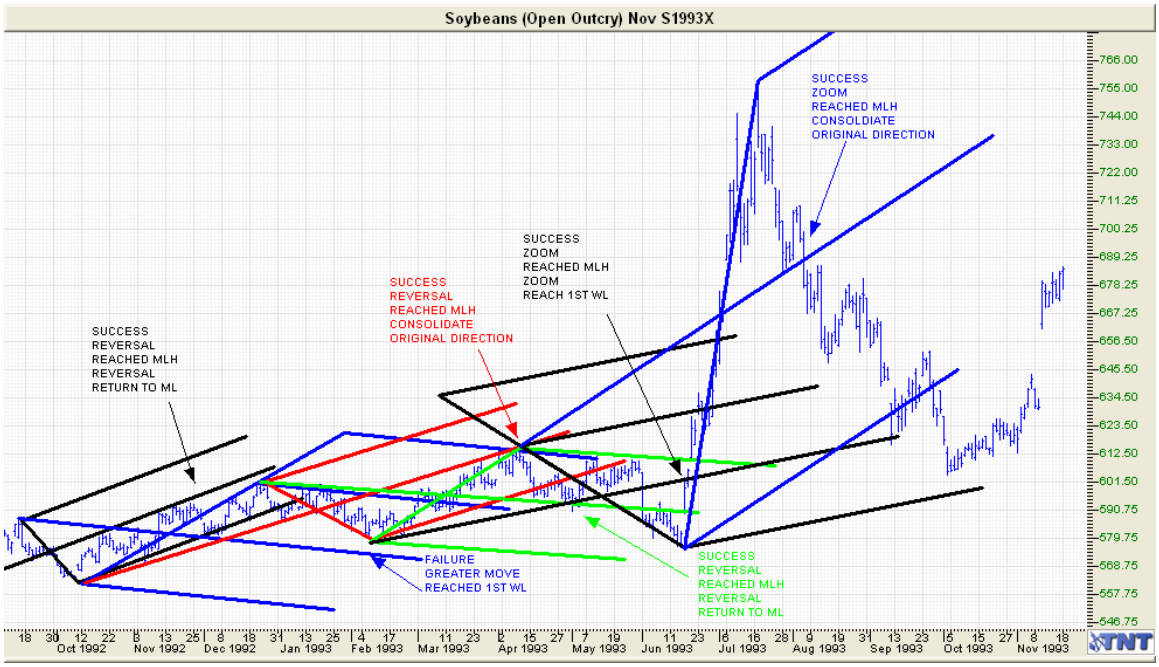
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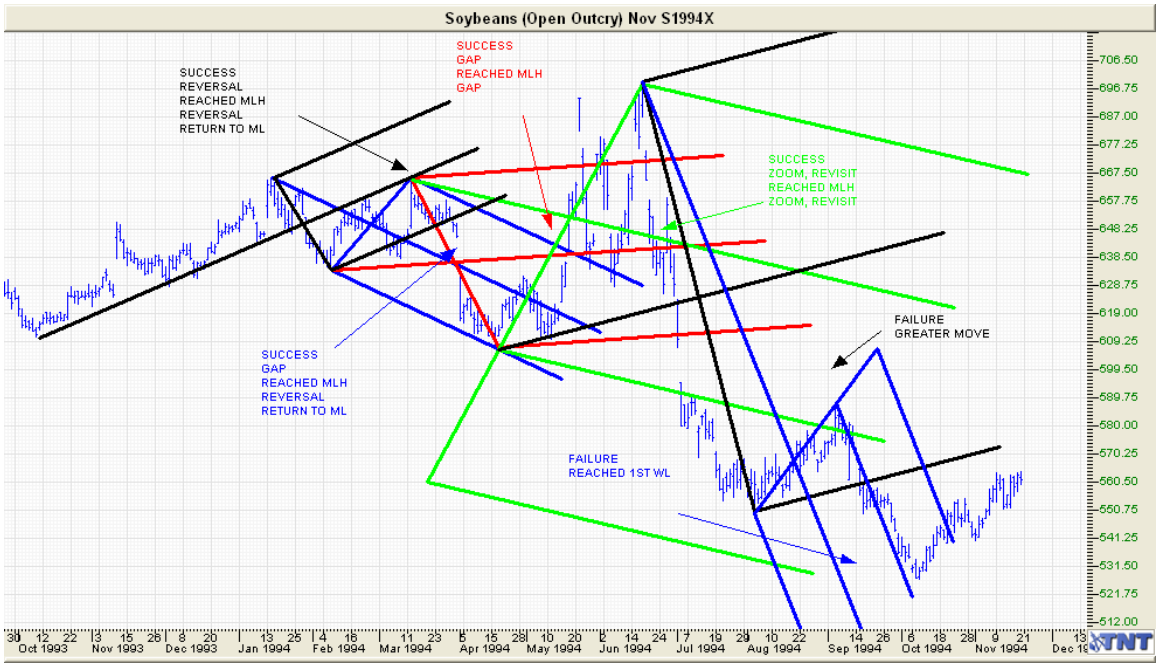


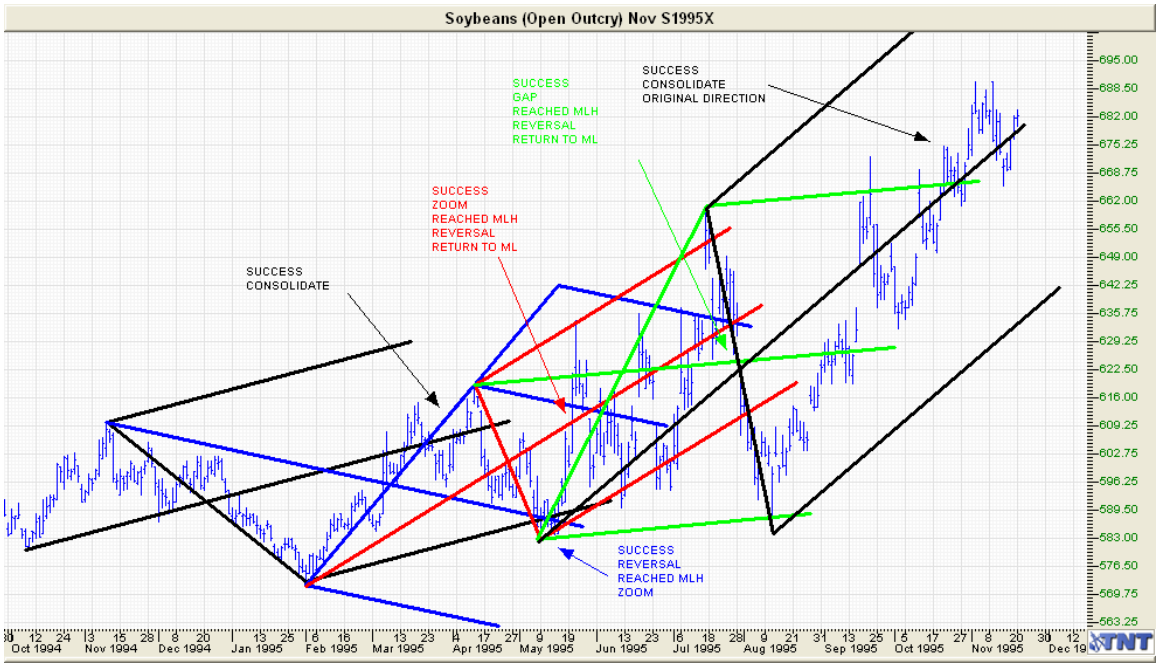
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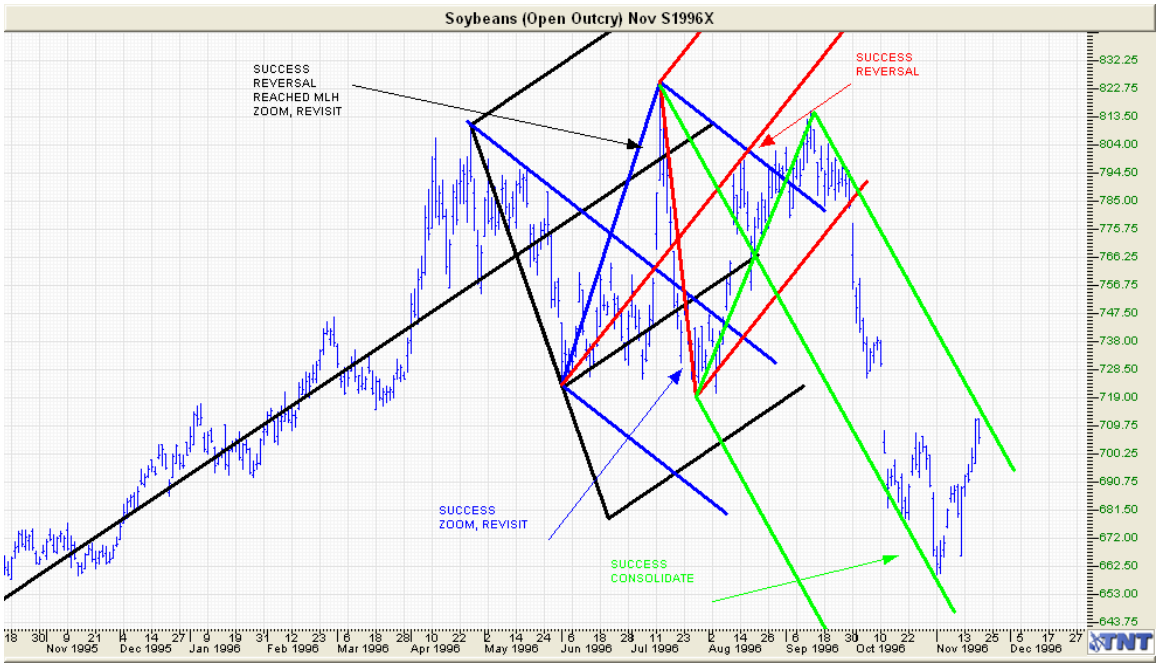


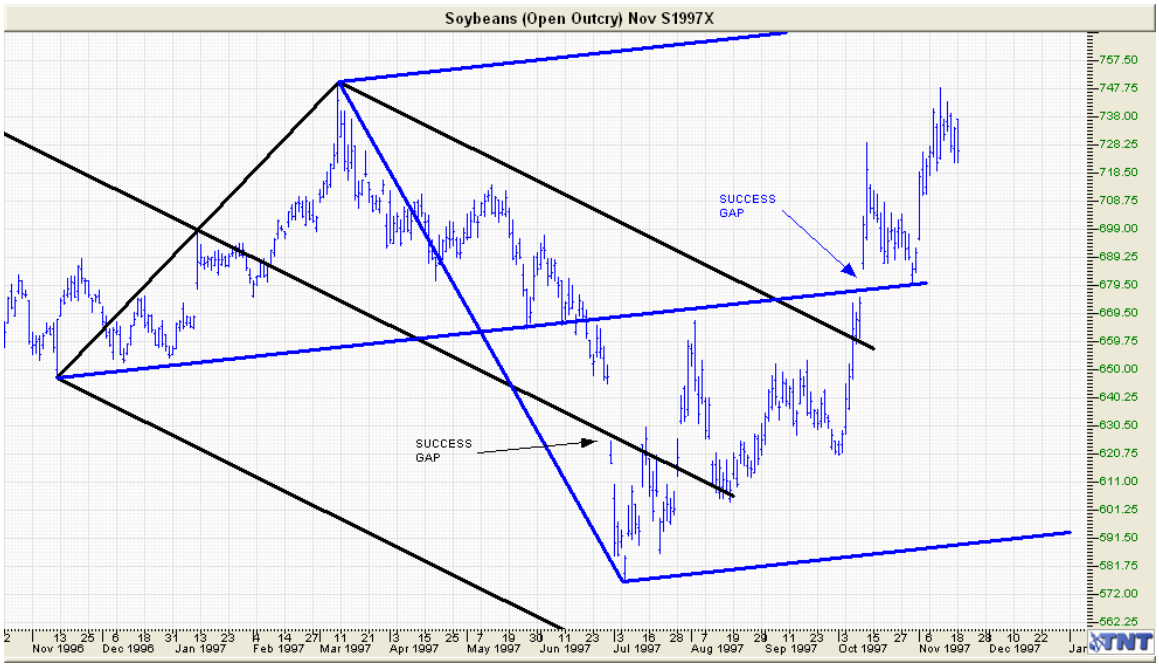
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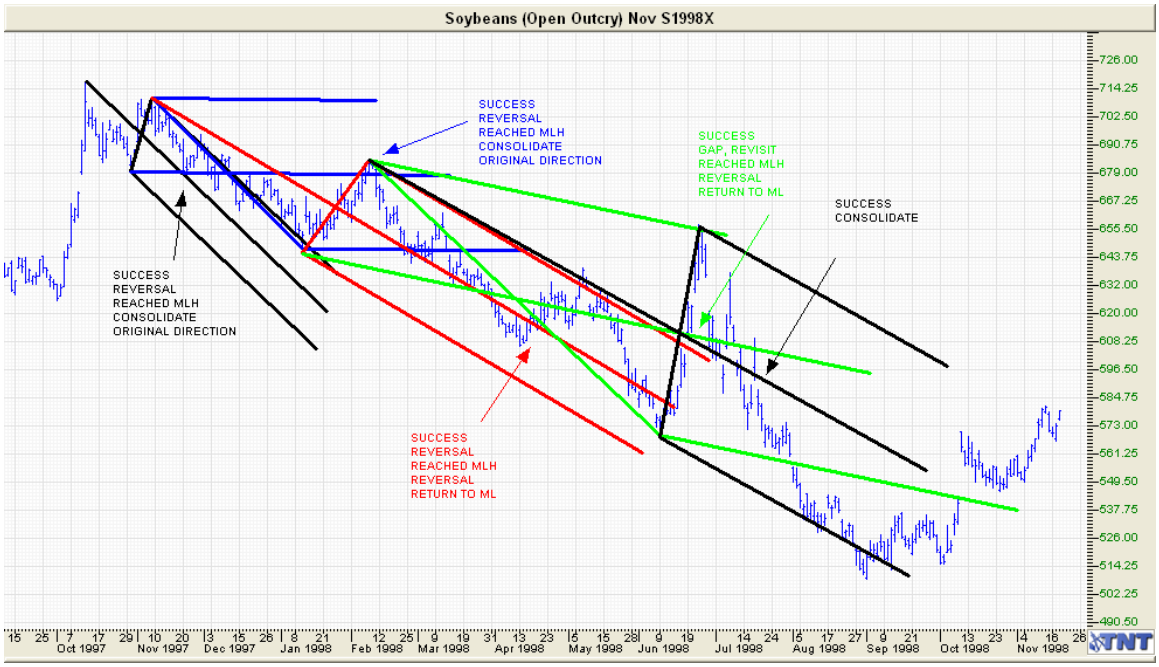


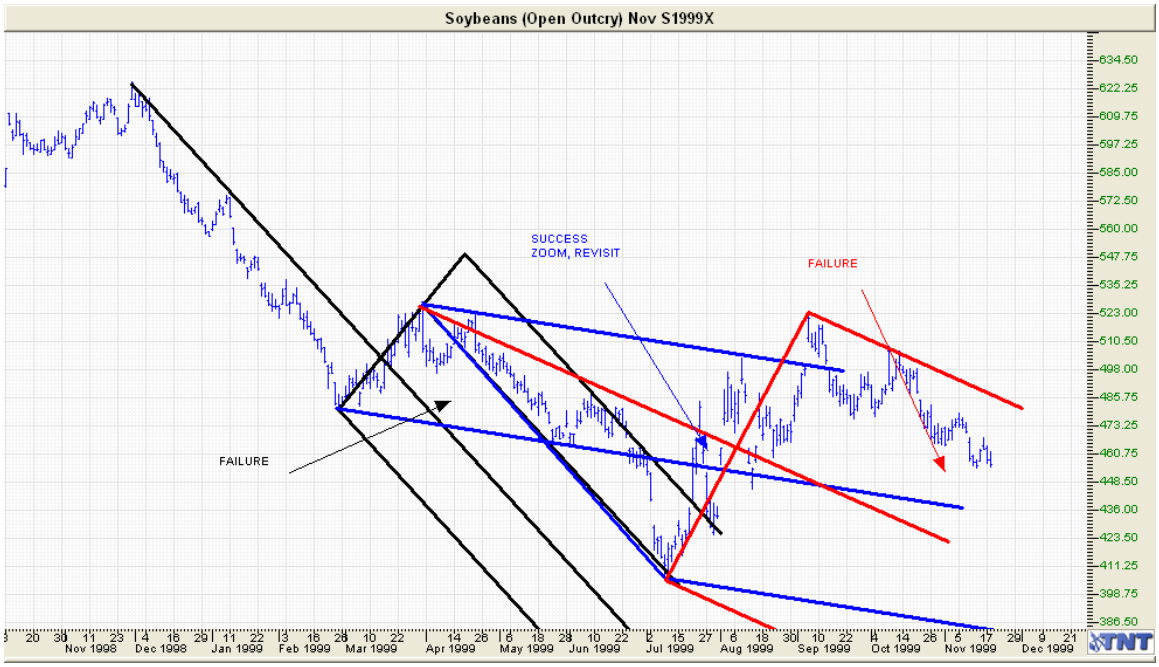
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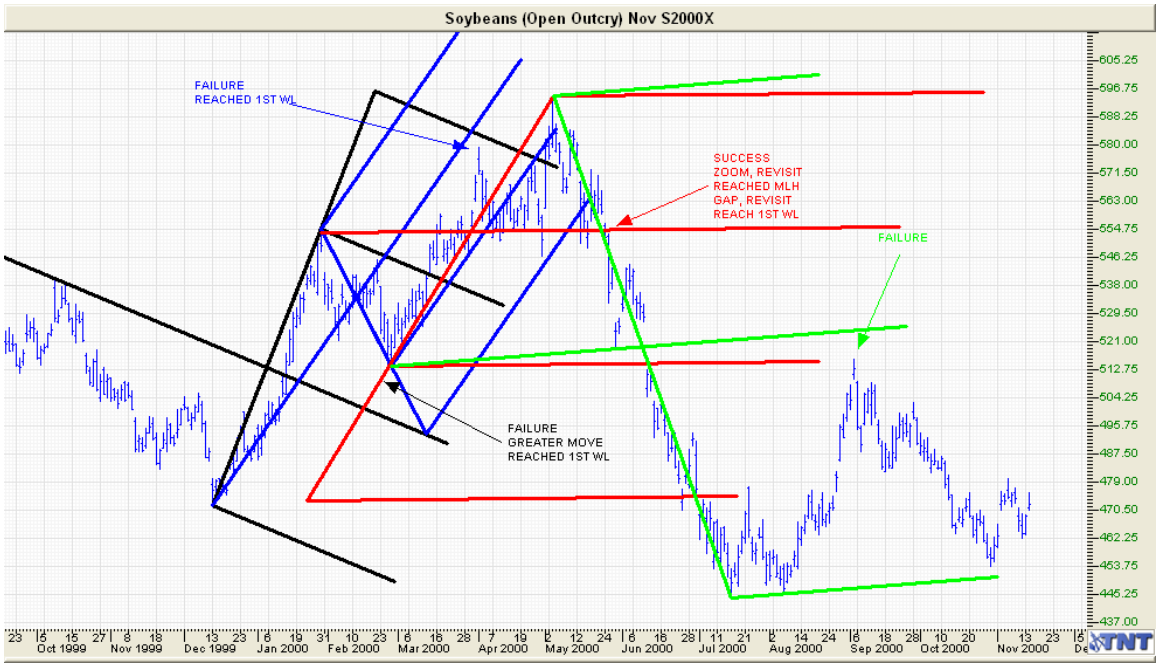


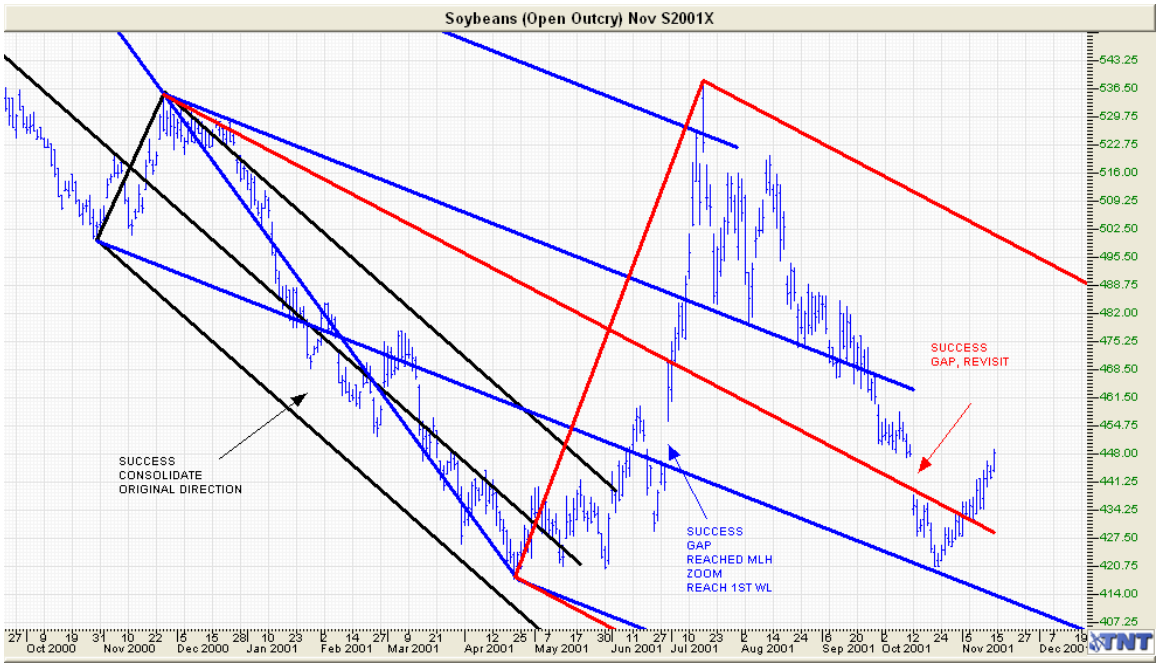
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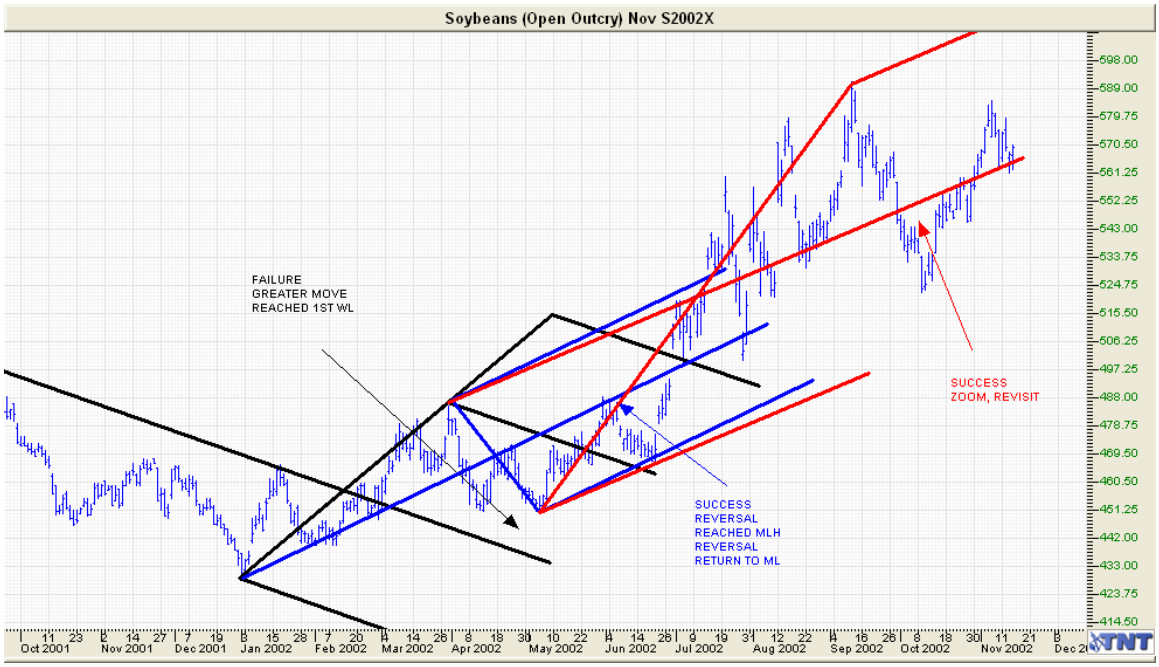


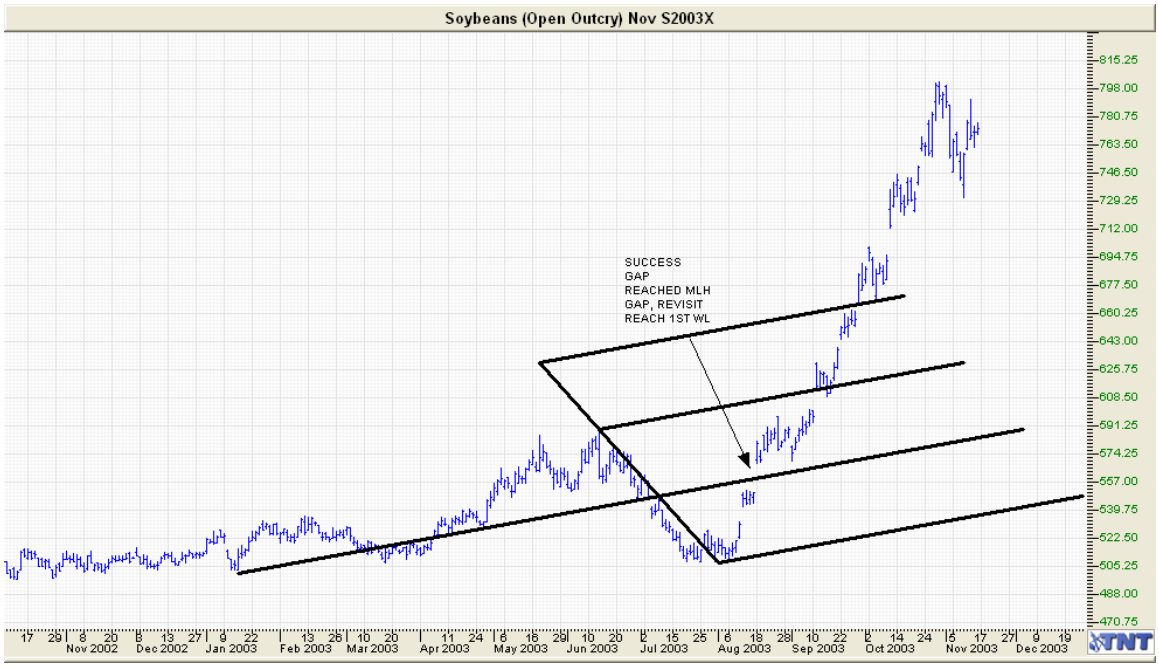
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