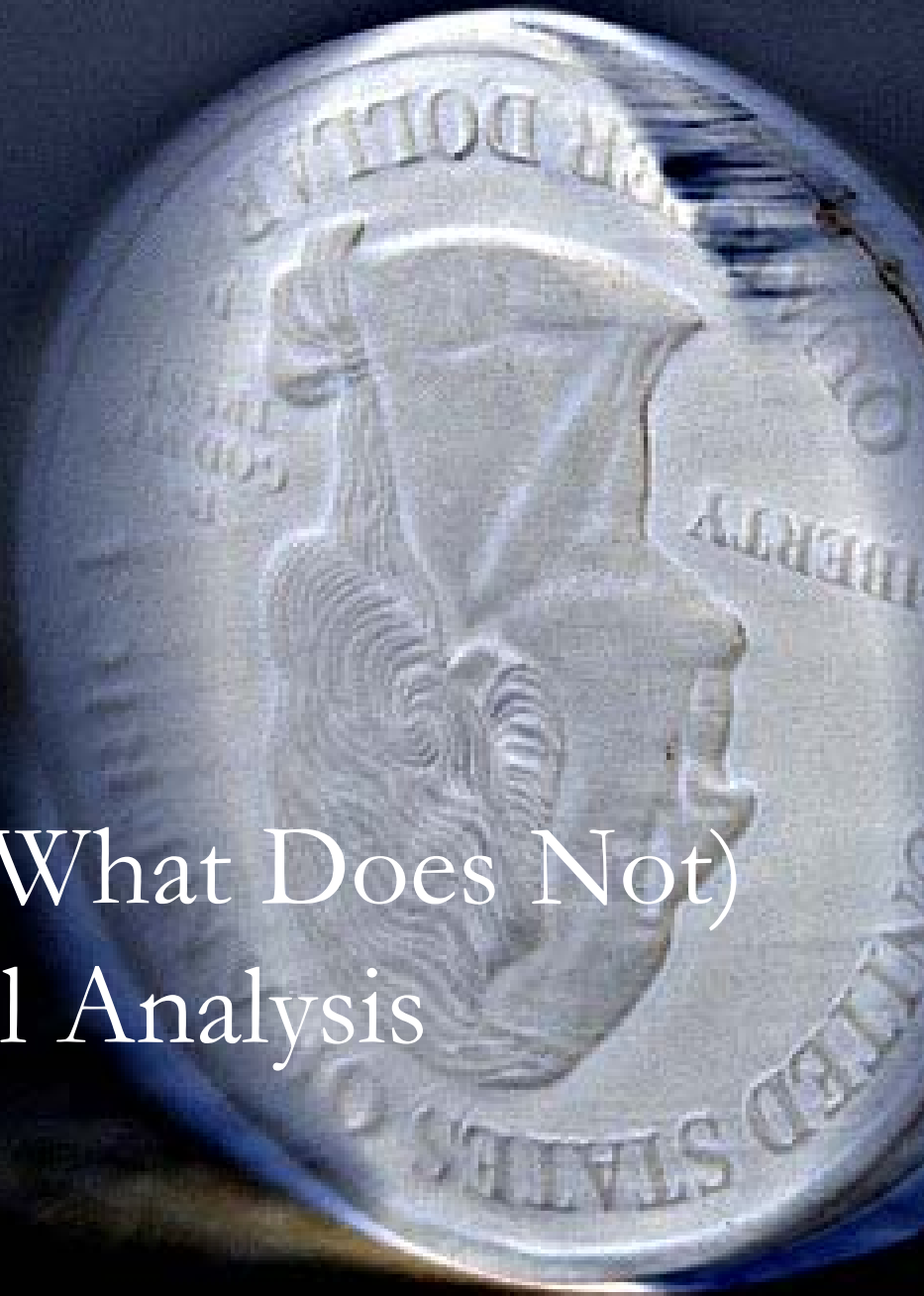




What Works (and What Does Not) in Technical Analysis



Outline:

- What does it mean to have an edge in the market?
- A look at some tools from traditional technical analysis
- A valid framework for market analysis
- Basic price tendencies
- What does it take to trade successfully?



Key Assumptions:

- Markets are very close to efficient.
- New information is quickly and properly assimilated into prices.
- Financial markets are extremely competitive with many smart, well-capitalized players.
- It is extremely difficult to make money in the market.
- **It is absolutely essential to have an edge in the market to make money.**



What Does It Mean to Have an Edge?

- Several possible definitions:
 - Relative returns
 - Superior risk-adjusted profits
 - Implies a benchmark
 - Absolute returns
- Over a large set of trades, a trader working with an edge will (quite likely) realize a return greater than the baseline return of the market or markets he is trading.



The Lesson of Expected Value:

$$E(\) = p(\text{win}) * \text{size of avg. win} - p(\text{loss}) * \text{size of avg. loss}$$


- $E(\)$ must be positive.
- The whole equation matters.
 - There is no advantage to “high probability” trading and also no advantage to only focusing on “risk/reward” ratios.
- The relationship between the two matters.



Where Do People Look for an Edge?

- Fundamental Analysis
- Macro
- Arbitrage
- Trading Volatility
- Traditional Technical Analysis
- Relative Value (Spread trading)



 WILEY Trading

MARKET STRUCTURE,
PRICE ACTION, AND
TRADING STRATEGIES

THE
ART AND SCIENCE OF
TECHNICAL
ANALYSIS

ADAM GRIMES



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A Pattern Analysis Methodology:

- Define the test universe.
 - Asset classes
 - Market environments
 - Consider correlation
- Define pattern(s) to be tested.
 - Must be testable
 - Simple is better
- Find all occurrences of the pattern and record subsequent returns
- Compare qualified returns with baseline returns



Traditional Technical Analysis:

- Technical Analysis is largely market lore and superstition.
- Mostly untested and much of it is untestable
- Concepts are often poorly defined and subjective.
- Traders often do not understand the reasons for their own success, so transmission of valid trading methods has been problematic.



Testing Moving Averages:

- Are there any distinguishable differences between price movement after price engages a moving average?
- Are there special moving averages? (50 day, 200 day, etc?) If so, they should be different from non-special averages.
- Test many different periods of MAs.
- Consider both ‘touch and hold’ and ‘penetration’ scenarios.



Testing Moving Averages:

Touch and Hold Test, 200-Day SMA

Days	Equities—Buy			Futures—Buy			Forex—Buy		
	$\mu_{sig}-\mu_b$	Diff. Med.	%Up	$\mu_{sig}-\mu_b$	Diff. Med.	%Up	$\mu_{sig}-\mu_b$	Diff. Med.	%Up
1	(13.3)**	(4.5)	48.1%	(5.7)	0.0	50.8%	(3.1)	2.9	55.7%
2	(10.6)**	(3.3)	50.0%	0.8	(4.8)	50.8%	(0.0)	14.5	59.4%
3	(13.2)**	2.2	51.0%	(12.3)	(22.4)	47.1%	9.5	18.4	60.4%
4	(16.6)**	6.1	51.4%	(6.3)	(14.0)	49.5%	4.3	12.1	58.5%
5	(11.0)*	10.5	51.9%	(12.1)	(8.2)	51.1%	(0.6)	(1.5)	54.7%
10	(57.5)**	(6.2)	51.1%	9.2	(23.2)	51.1%	12.9	1.5	52.8%
15	(78.6)**	11.9	52.6%	31.2	(13.1)	53.8%	11.6	(23.3)	53.8%
20	(97.4)**	9.6	53.1%	23.5	(20.1)	56.9%	5.5	(15.2)	53.8%

Days	Equities—Sell			Futures—Sell			Forex—Sell		
	$\mu_{sig}-\mu_b$	Diff. Med.	%Up	$\mu_{sig}-\mu_b$	Diff. Med.	%Up	$\mu_{sig}-\mu_b$	Diff. Med.	%Up
1	(3.6)	(2.3)	49.5%	(4.0)	(13.4)	41.2%	0.1	(6.8)	44.4%
2	(8.5)*	0.6	50.5%	(11.3)	(8.8)	49.1%	3.2	(3.1)	50.9%
3	(15.0)**	4.6	51.4%	(15.6)	(10.5)	49.8%	(1.0)	(4.8)	50.9%
4	(6.3)	9.3	52.3%	(10.9)	(34.2)	46.8%	9.5	8.4	54.6%
5	(11.3)	8.7	52.4%	(11.0)	(12.9)	50.6%	11.3	(1.8)	52.8%
10	(28.0)**	30.2	54.0%	(9.0)	(22.7)	50.9%	13.9	25.3	59.3%
15	(49.4)**	43.1	54.7%	(26.4)	(52.8)	49.8%	5.1	12.7	57.4%
20	(62.4)**	48.7	54.5%	(14.0)	(50.0)	53.2%	(1.3)	(14.8)	52.8%

Results for means and medians are in basis points, excess returns over the baseline for that asset class. %Up gives the number of days that closed higher than the entry price on the day following the signal entry. For comparison, the percent of one day Up closes in the Equity sample is 50.07%; in the Futures sample, 50.59%, and in Forex 51.0%.

*Indicates difference of means are significant at the 0.05 level, and **Indicates they are significant at the 0.01 level.



A Moving Average Trend Indicator:

Triple Moving Average Trend Indicator, Categorical Returns

	Equities	Futures	Forex	Random	Total
Down					
N=	365,690	12,372	4,204	14,621	396,887
Excess Ret	166.9	(203.0)	43.6	(74.9)	144.5
StDev Raw Returns	319.2	158.8	78.0	119.9	308.6
Mean HisVol	40.8	20.7	10.7	18.5	39.0
% Close Up	50.2%	49.8%	50.5%	50.9%	50.2%
Up					
N=	537,896	14,652	6,137	17,515	576,200
Excess Ret	(157.9)	80.7	43.9	98.6	(141.5)
StDev Raw Returns	217.6	152.3	66.4	114.6	212.7
Mean HisVol	30.2	20.2	9.6	17.2	29.4
% Close Up	49.9%	51.5%	51.7%	52.0%	50.0%
All					
N=	903,586	27,024	10,341	32,136	973,087
Raw Returns	2.0	1.3	1.9	1.4	2.0
StDev Raw Returns	263.5	155.3	71.3	117.0	256.2
Mean HisVol	34.5	20.4	10.1	17.8	33.3
% Close Up	50.0%	50.7%	51.2%	51.5%	50.1%



Moving Averages - Conclusions:

- Across a very wide sample universe, no moving average shows a departure from baseline tendencies.
- Moving averages do not provide support and resistance.
- Trend indicators based on moving averages provide no edge.
- There is no quantifiable justification for moving averages, yet these are one of the most-used tools in technical analysis.



Traditional TA: Fibonacci Ratios:

- Traders look for support and resistance at common Fibonacci retracements
 - 38.2%
 - 61.8%
 - 50.0%
- Retracement ratios are used in many ways
- Entering trades near retracement ratios
- Placing stops just beyond retracement ratios
- Using “Fibonacci numbers” as inputs into other technical studies
- How to test this?

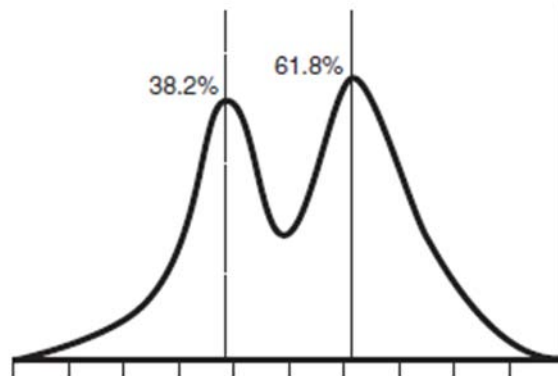


How Retracement Ratios Are “Supposed to” Work:

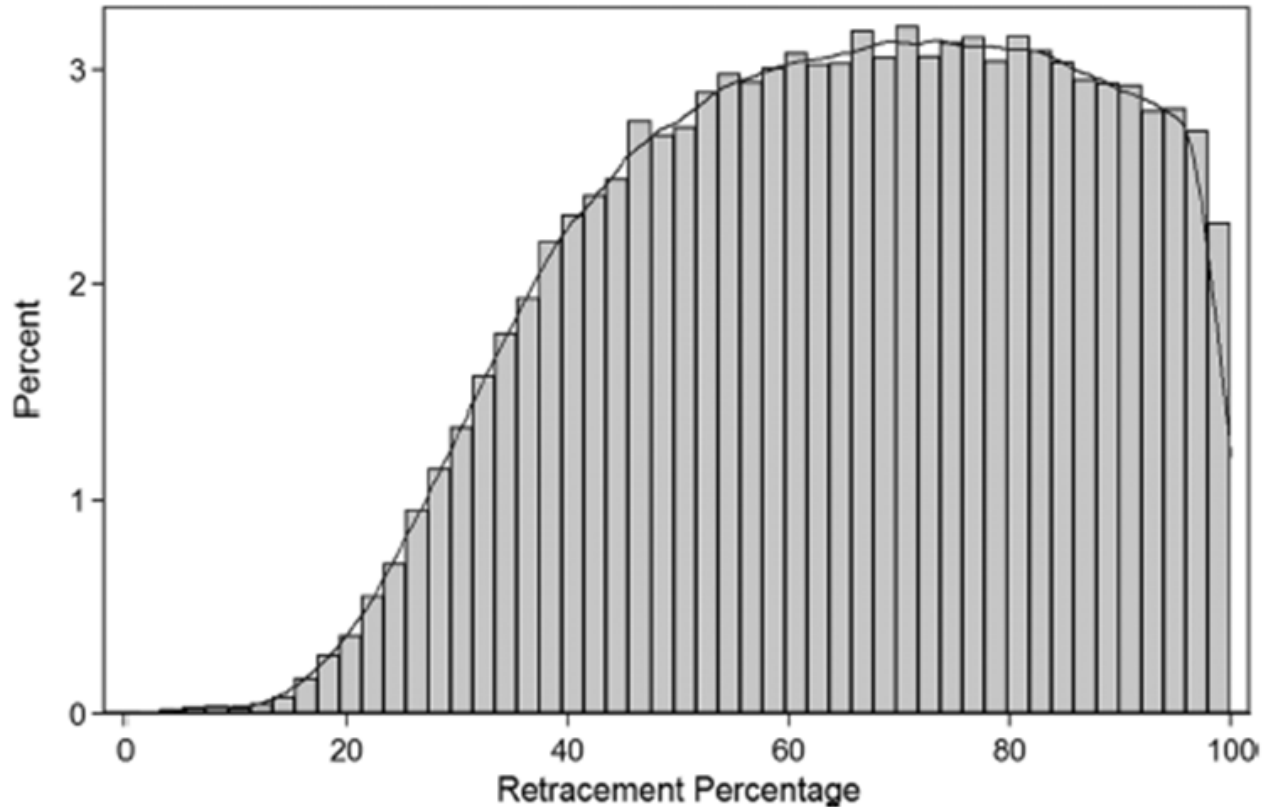


Fibonacci Retracement Ratio Test:

- Create a tool that defines “swings” in markets
- Many ways to do this
- Consider volatility, price movement, etc.
- Measure each swing relative to previous swing
- Can qualify in other ways
- “Good” trades vs. “bad” trades
- If Fibonacci ratios work, a histogram of retracements should look like this:



Retracement Ratios: What the Data Says



Enough of What Doesn't Work... What Does?

- Markets are usually in equilibrium and usually move randomly.
 - No technical edge is possible in such an environment.
- Patterns in prices are determined by the interaction of buying and selling interests.
 - This is profoundly important—behavioral factors influence price patterns.
- Every technical edge we have, as technical traders, comes from an imbalance of buying and selling pressure.



A Framework for Technical Analysis:

- Two basic forces in price movement:
 - Mean reversion
 - Range expansion
- Which of the forces is more likely to be in play?
- Find patterns that have a statistical edge.
- We only want to be involved in markets when there is an edge.
- Exposure = risk

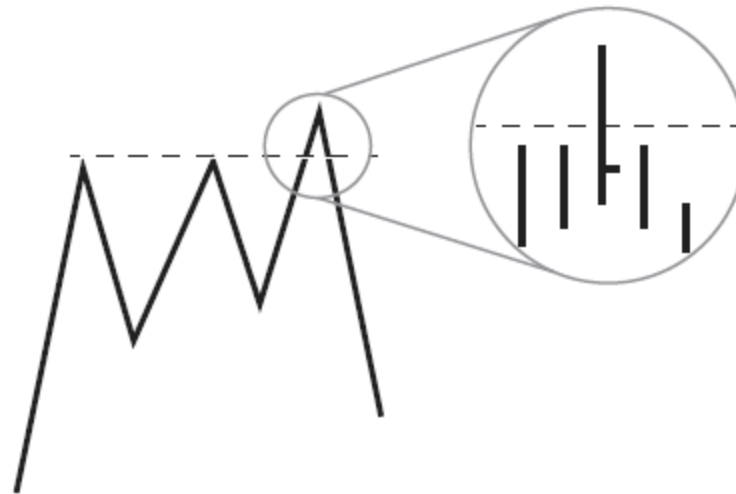


Some Basic Patterns:

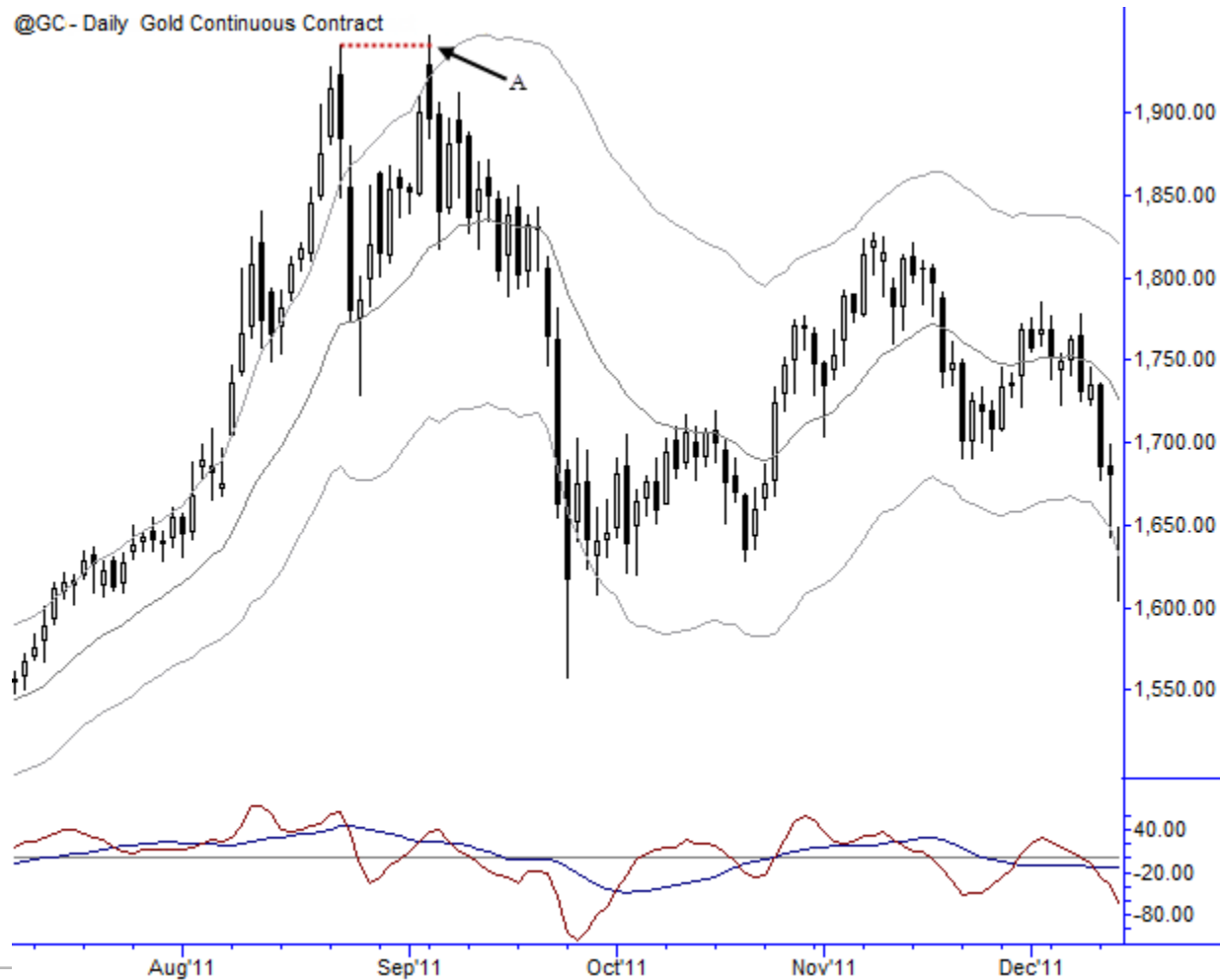
- A market makes a sharp move in one direction followed by a pause or pullback. This sets up another move in the same direction.
 - Pullback trades
 - Flags
- A market probes beyond a previous level, but finds no conviction there.
 - Failure test
 - “2B trade”
 - Bull or bear traps
 - Wyckoff springs and upthrusts



The Failure Test:

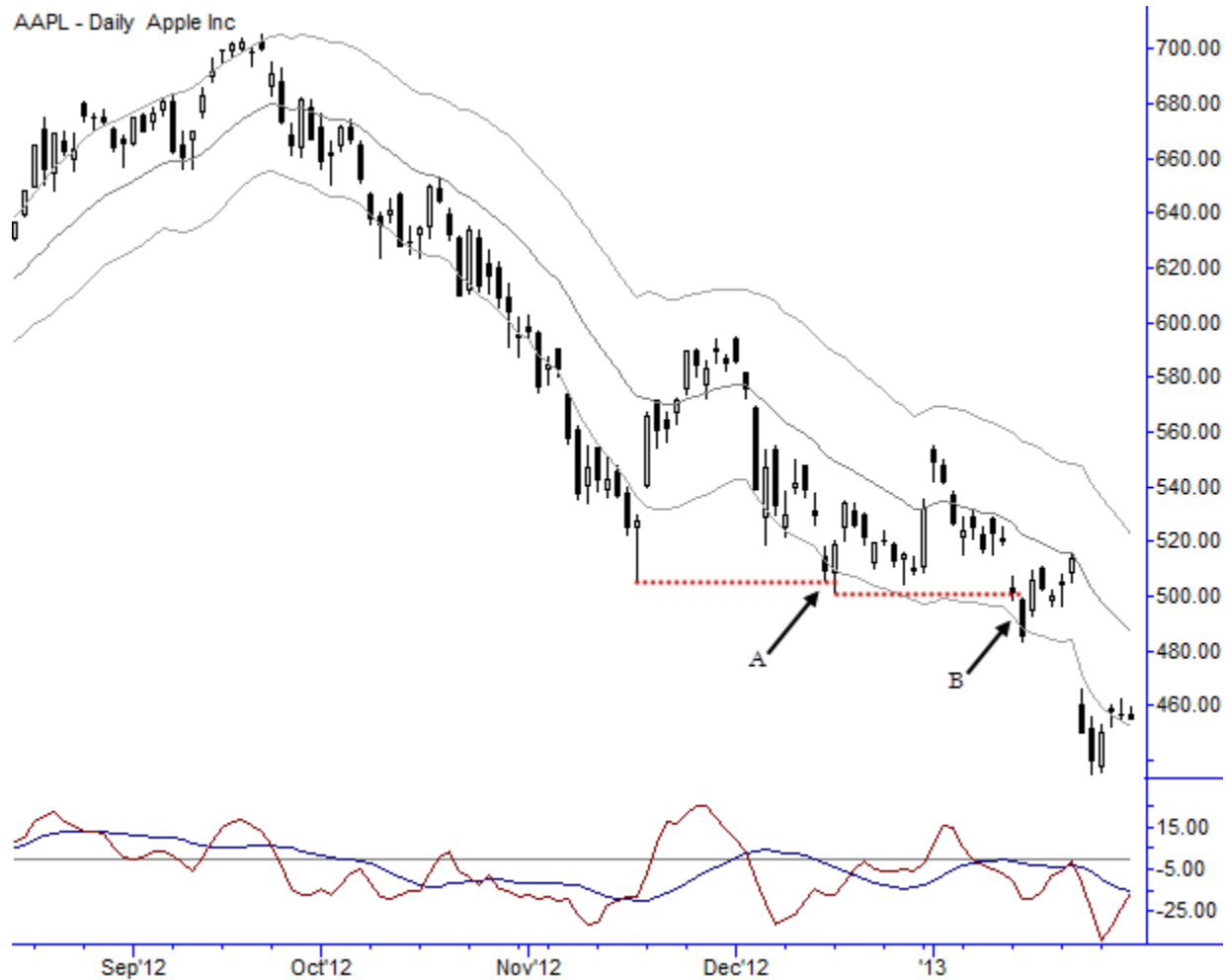


The Failure Test:



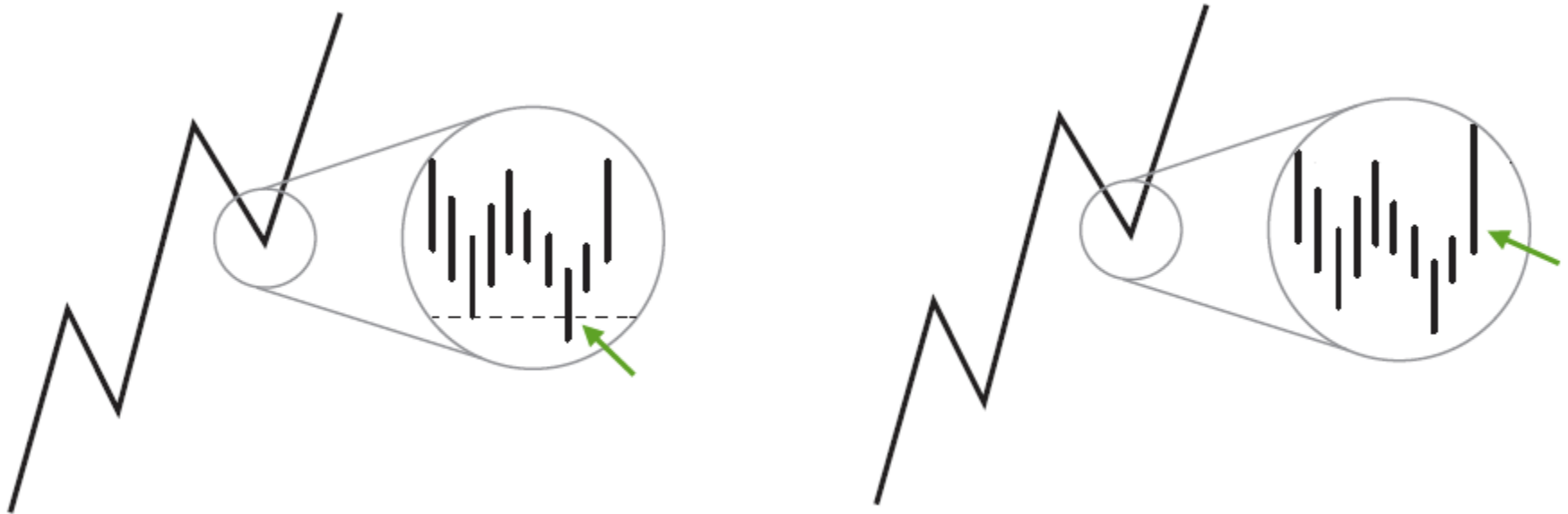
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The Failure Test:



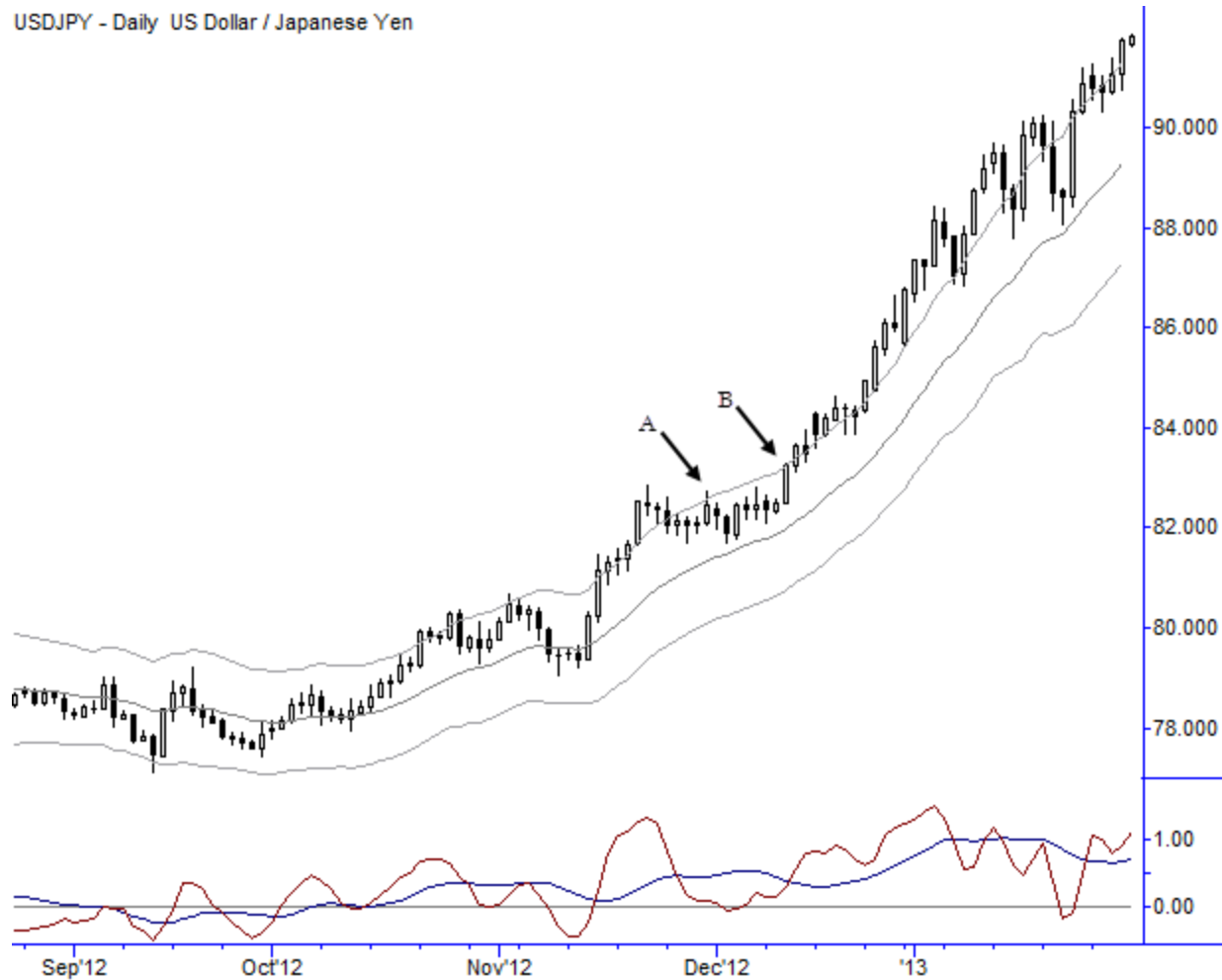
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The Pullback:



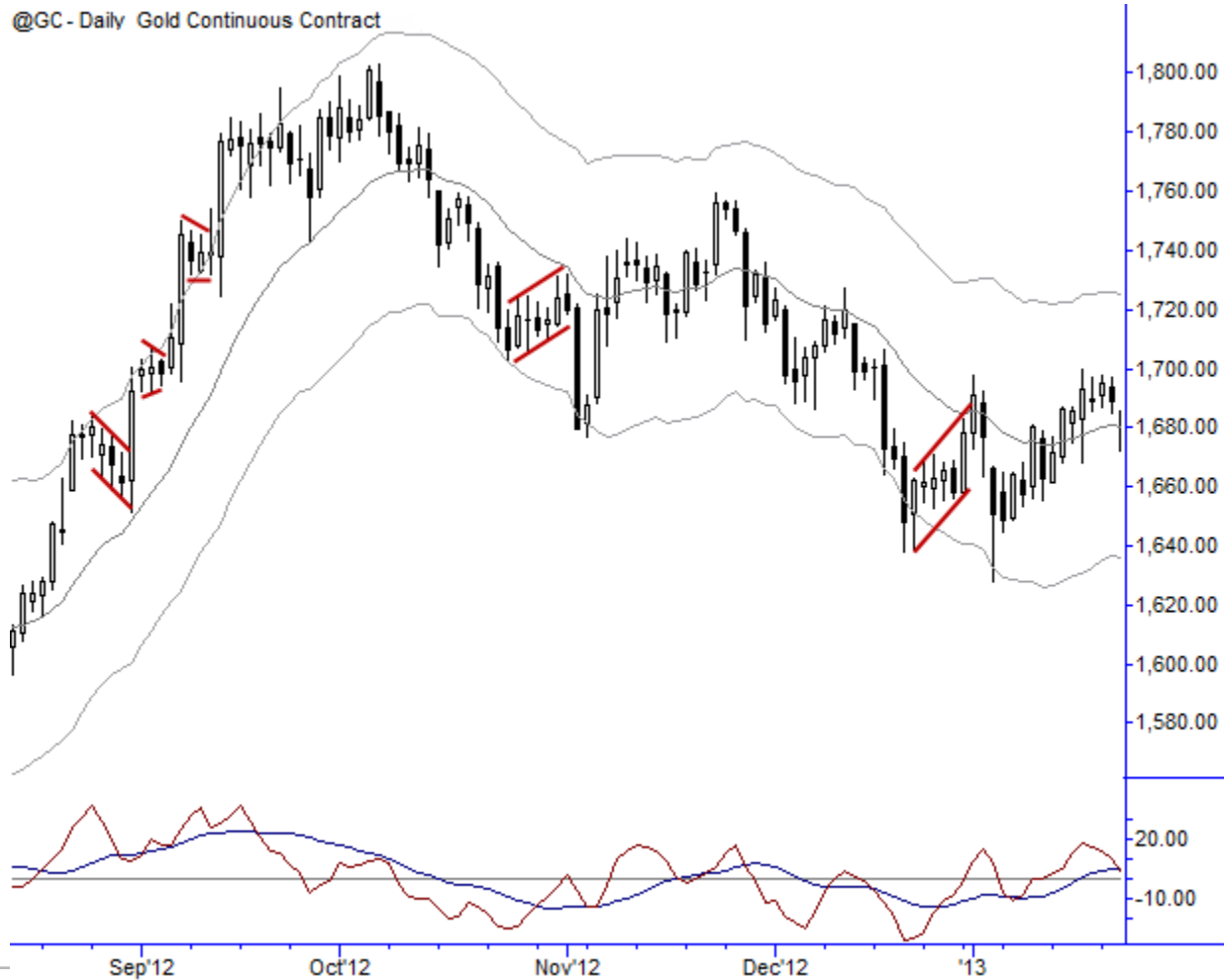
The Pullback:

USDJPY - Daily US Dollar / Japanese Yen



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The Pullback:



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A Few More Thoughts:

- Entry patterns are only one small piece of the puzzle.
- The decisions you make after you get into a position (trade management) are at least as important for profitability.
- (The same patterns inform both sets of decisions.)



Behavioral Considerations:

- As technical traders, all we are doing is playing the slight probabilistic tilts in markets. Flipping a coin, but the coin is weighted in our favor.
- Most people can't trade successfully. Why?
- The market has evolved to put our normal cognitive tools and behavior adaptations against us.



Essential Tools for Success:

- Understanding how markets move
- Using this information to know when to get in and out of trades.
- Discipline
- Consistency
- Correct position sizing



About Waverly Advisors, LLC

- Waverly Advisors, LLC is an SEC Registered Investment Advisor
- Our firm was founded by professional portfolio managers, traders and risk managers
- Broad and deep experience in the capital markets covering primary global equity, equity derivative, commodity, futures, currency and rate markets
- Our investment process is built upon our disciplined research process and risk management acumen
- We provide world class research as well as bespoke advisory and derivative services and count some of the largest asset managers in the US and Canada among our clients



About Waverly Advisors, LLC:

Tactical Playbook – **Available on Interactive Brokers - IBIS**

- In-depth Monday report
 - Technical setups for all major asset classes
 - Exact trade recommendations
 - Macro perspective on major events and risk factors
- Daily update
 - Updates to positions, stops, and trade management decisions

Options Market Outlook

- Quantitative analysis of options market
- Macro risk factors and analysis of market environment



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