

The views expressed by the speakers at the Technical Analysis conference are solely the views of the speakers and are not the views of Dow Jones Telerate. Such views are not intended to constitute investment advice and should not be relied on to govern action in particular circumstances.

TAG XVII • Las Vegas '95

Perry J. Kaufman — Trending Techniques

Perry Kaufman, known for his knowledge and experience in computer-based trading systems applied to world futures and financial markets, has an extensive background of academic scholarship as well as commercial trading. His publication, *The New Commodity Trading Systems and Methods* (John Wiley & Sons, 1987), has become the technician's required reference.

In 1984 he brought all areas of the industry together in the *Handbook of Futures Markets* (Wiley). An earlier book of research papers, *Technical Analysis in Commodities* (Wiley, 1980) has been translated into Japanese. Perry founded the *Journal of Futures Markets* (Columbia University and John Wiley & Sons), a vehicle to allow the building of an academic base for market analysis. He is series editor of *Wiley's Trader's Advantage*.

Perry's work applies technical and fundamental (statistical) analysis in the development of trading and risk management programs for both commercials and investors. Much of this work is based on price theories and techniques he has researched and developed since 1972.

Perry has developed Prudential-Bache's most successful commodity management program - CCTP-1; has served as a major consultant to large international commercial firms and security houses; established the commodities research department at Thomson McKinnon; and assessed corporate risk for Heindol. As a consultant to Transworld Oil Limited (Bermuda) for ten years, Perry developed and coordinated trading strategies. As a partner in a mid-west farm management firm he developed expertise in commercial hedging programs. The scope of this work, which gives equal emphasis to agricultural, interest rate, foreign exchange, global equity and index markets, and their interrelationships, has given him a unique understanding of the interaction of many aspects of complex market structure.

Perry continues international consulting and research from his farm in Wells River, Vermont. He publishes a new quarterly research report, *Kaufman on Market Analysis*, for the development of trading strategies, which is translated into six languages. McGraw Hill released his new book, *Smarter Trading*, in January, 1995.

• Topic: Trending Techniques and System Selection Index

The conflict between trending and non-trending markets poses one of the greatest dilemmas for the systems trader. To trade effectively you must decide whether to trade with a trend or against it or to wait for a better entry position altogether. In his workshop Perry will present what he considers the best technique for making these decisions. He will combine this trending technique with a System Selection Index to determine which markets exhibit signs of a reversal and which indicate a continuing trend.

Based on these concepts Perry will show you how to improve your entry timing. He will explain why profit-taking improves results while stop-losses make them worse. Perry will also describe some useful programs written for his own use, providing you with code written in Omega's TradeStation user programming language to illustrate his concepts. (Users of other software packages (on- and off-line) can easily adapt these concepts to work with their systems.)

Copyright KAUFMAN 1995. All Rights Reserved.

A complete catalogue of all TAG XVII tapes may be ordered from:
Telerate Seminars
701 Poydras, Suite 3900
New Orleans, LA 70139-3901
(800) 535-7990
(504) 592-4550
FAX (504) 592-4553

telerate Seminars

Perry J. Kaufman



PERRY J. KAUFMAN
Maple Hill Farm
P.O. Box 7
Scotch Hollow Road
Wells River, VT 05081
Phone: 802-429-2121
FAX: 802-429-2122

**TELERATE
TAG XVII
LAS VEGAS : OCTOBER 1995**

**TRADING SYSTEMS
VERSUS
MARKET NOISE**

**PERRY J. KAUFMAN
KAUFMAN DIAMOND & YEONG**

OVERVIEW

1

A LOOK AT FOUR POPULAR
TRENDING METHODS

2

NOISE AND VOLATILITY

3

RELATIONSHIP OF MARKET NOISE
TO TRENDS AND PROFITS

4

HOW NOISE AFFECTS MARKET TIMING
AND STOP-LOSSES

1. ABOUT TRENDING METHODS

KEEP IN MIND.....

 WHAT IS A TREND?

 WHY DOES IT EXIST?

 ARE TRENDS BETTER OVER
CERTAIN TIME PERIODS?

 HOW DO YOU KNOW WHEN
A TREND STARTS OR ENDS?

 HOW FAR *MUST* PRICES MOVE?

 DO WE NEED TO KNOW THE TREND
IN ORDER TO TRADE?

WE MUST CHOOSE A STRATEGY
THAT IS SENSIBLE

1. FOUR POPULAR TRENDING METHODS

✓ SIMPLE MOVING AVERAGE

$MA = @AVERAGE(PRICE, PERIOD)$

- USED TO FIND ECONOMIC TRENDS (Figure 1)



1. FOUR POPULAR TRENDING METHODS

✓ SIMPLE MOVING AVERAGE

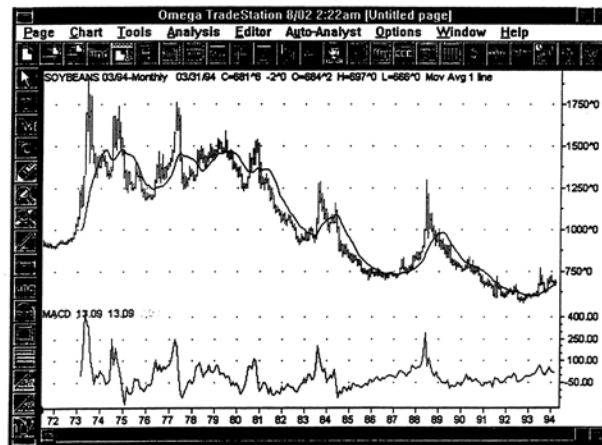
☐ WORKS WELL IN THE LONG-TERM (Figure 2)



1. FOUR POPULAR TRENDING METHODS

✓ SIMPLE MOVING AVERAGE

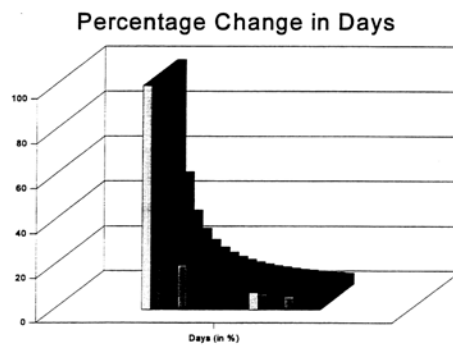
☐ GOOD FOR SEASONAL DETRENDING (Figure 3)



1. FOUR POPULAR TRENDING METHODS

✓ SIMPLE MOVING AVERAGE

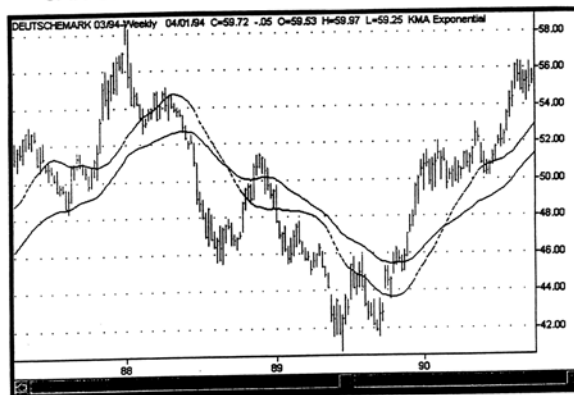
- CONSERVATION OF CAPITAL IN TRADING
- INSENSITIVE TO ACTUAL EVENTS (LAGS)
- LARGE % CHANGE FROM 2 TO 3 TO 4 DAYS,
SMALL CHANGE FROM 99 TO 100 DAYS (Figure 4)



1. FOUR POPULAR TRENDING METHODS

✓ EXPONENTIAL SMOOTHING

- SIMPLE TO CALCULATE
 $EXP = EXP[1] + S \times (PRICE - EXP[1])$
- GOOD FOR ADAPTIVE METHODS
SMOOTHING CONSTANT TAKES ON ANY VALUE
 $S = 1 / (N + 1)$, where N = number of days
- CONSERVATION OF CAPITAL IN TRADING
- CAN ONLY APPROXIMATE A TIME PERIOD



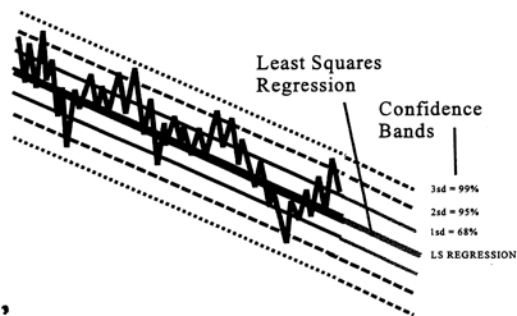
1. FOUR POPULAR TRENDING METHODS

✓ LINEAR REGRESSION

$LRS = LinearRegSlope(Price, Length)$

$LRV = LinearRegValue(Price, Length, BarsFwd)$

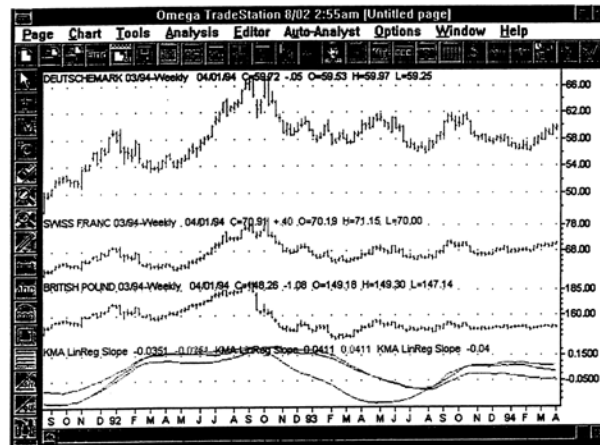
- BASIC ECONOMETRIC METHOD FOR FINDING A FUNDAMENTAL TREND
- GIVES CONFIDENCE BANDS



1. FOUR POPULAR TRENDING METHODS

✓ LINEAR REGRESSION

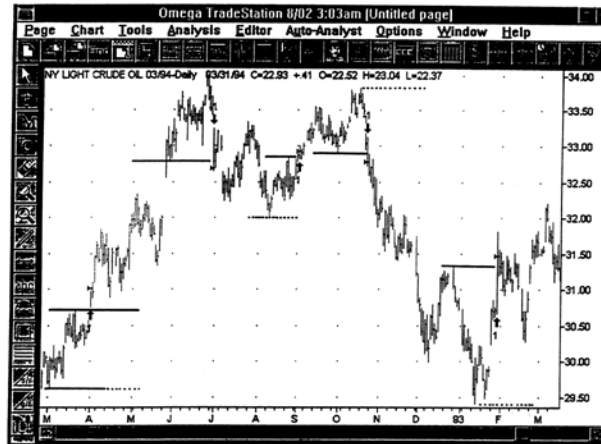
- GOOD FOR COMPARING RATE OF CHANGE
- GOOD FOR COMPARING LONG-TERM DIRECTION OF TWO RELATED SERIES



1. FOUR POPULAR TRENDING METHODS

✓ PRICE BREAKOUTS

- EVENT DRIVEN SIGNALS
- CAN HAVE VERY LARGE RISK
- HAS LITTLE TIME RELATIONSHIP
..... WILL STAY IN TRADE UNTIL ANOTHER EVENT



1. TRADING RULES FOR TRENDING METHODS

TRADING RULES FOR TESTING

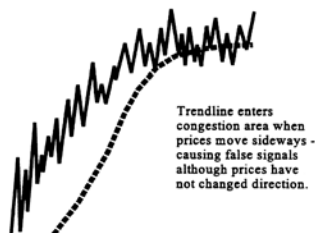
- Always in the market
- Buy when
 - ☞ the trendline turns up
 - ☞ the slope turns up
 - ☞ a new high occurs
- Sell when
 - ☞ the trendline turns down
 - ☞ the slope turns down
 - ☞ a new low occurs
- Use \$100 round-turn commissions
- No stops or filters
 - we want to see the natural pattern of risk and reward for each system

1. FOUR POPULAR TRENDING METHODS

DIFFERENT PHILOSOPHIES DIFFERENT INDIVIDUAL TRADE RISK

SMOOTHING

- ☐ CONSERVATION OF CAPITAL
- ☐ CAN REPRESENT A REAL TREND
- ☐ HAS A TIME AGENDA



REGRESSION

- ☐ GIVES PROBABILITY OF A FORECAST
- ☐ CAN FIND THE FUNDAMENTAL DIRECTION
- ☐ SLOPE IS MORE STABLE THAN SMOOTHING

BREAKOUT

- ☐ "EVENT DRIVEN" – TIME IS NOT A FACTOR
- ☐ HIGH RISK BETWEEN EVENTS
- ☐ NO LAG

1. TRENDING METHODS TEST DETAIL

1. MOVING AVERAGE						2. EXPONENTIAL SMOOTHING						
	Days	#Prf	#Trds	Rel Rad%	%Tr		Days	#Prf	#Trds	Rel Rad%	%Tr	
ED	4	131	433	30.3	-79	-0.18	4	136	515	26.4	-88	-0.17
	8	88	274	32.1	51	0.19	8	90	316	28.5	-17	-0.05
	16	51	182	28.0	134	0.74	16	51	214	23.8	44	0.21
	32	37	111	33.3	566	5.10	32	32	117	27.4	365	3.12
	50	31	95	32.6	208	2.19	50	25	87	28.7	91	1.05
	75	17	65	26.2	267	4.11	75	19	73	26.0	135	1.85
	100	15	43	34.9	281	6.53	100	22	51	43.1	257	5.04
	150	8	21	38.1	468	22.29	150	12	27	44.4	472	17.48
	200	9	44	20.5	5	0.11	200	9	42	21.4	5	0.12
Avg	70.6	43.0	141	30.66	211.2	4.56	70.56	44.0	160.2	30	140.4	3.18
	Days	#Prf	#Trds	Rel Rad%	%Tr		Days	#Prf	#Trds	Rel Rad%	%Tr	
US	4	185	527	35.1	-69	-0.13	4	197	593	33.2	-88	-0.15
	8	115	351	32.8	-27	-0.08	8	109	371	29.4	-41	-0.11
	16	79	255	31.0	6	0.02	16	74	245	30.2	30	0.12
	32	57	152	37.5	254	1.67	32	57	165	34.5	209	1.27
	50	41	157	26.1	-33	-0.21	50	48	157	30.6	-11	-0.07
	75	33	101	32.7	26	0.26	75	31	127	24.4	-4	-0.03
	100	26	75	34.7	481	6.41	100	32	85	37.6	263	3.09
	150	14	55	25.5	60	1.09	150	18	49	36.7	143	2.92
	200	15	41	36.6	276	6.73	200	12	43	27.9	147	3.42
Avg	70.6	62.8	190	32.43	108.2	1.75	70.56	64.2	203.9	31.6	72	1.16
	Days	#Prf	#Trds	Rel Rad%	%Tr		Days	#Prf	#Trds	Rel Rad%	%Tr	
DM	4	168	525	32.0	-80	-0.15	4	183	565	34.2	-88	-0.16
	8	112	348	32.2	-71	-0.20	8	124	376	33.0	-24	-0.06
	16	64	240	26.7	-51	-0.21	16	72	244	29.5	16	0.07
	32	46	154	29.9	103	0.67	32	55	172	32.0	-23	-0.13
	50	42	138	30.4	137	0.99	50	48	144	33.3	152	1.06
	75	20	78	25.6	269	3.45	75	31	98	31.6	137	1.40
	100	23	54	42.6	399	7.39	100	20	60	33.3	282	4.70
	150	12	46	26.1	394	8.57	150	15	44	34.1	341	7.75
	200	11	38	28.9	94	2.47	200	11	34	32.4	65	1.91
Avg	70.6	55.3	180	30.49	132.7	2.55	70.56	63.2	193	32.6	95.33	1.84
	Days	#Prf	#Trds	Rel Rad%	%Tr		Days	#Prf	#Trds	Rel Rad%	%Tr	
SP	4	186	553	33.6	-89	-0.16	4	201	575	35.0	-58	-0.10
	8	119	393	30.3	-92	-0.23	8	140	425	32.9	-82	-0.22
	16	87	299	29.1	-71	-0.24	16	102	311	32.8	-58	-0.19
	32	66	211	31.3	-28	-0.13	32	75	231	32.5	-34	-0.15
	50	49	185	26.5	-69	-0.37	50	49	177	27.7	-66	-0.37
	75	52	163	31.9	-67	-0.41	75	44	153	28.8	-45	-0.29
	100	37	121	30.6	-75	-0.62	100	34	121	28.1	-73	-0.60
	150	25	83	30.1	49	0.59	150	30	69	43.5	104	1.51
	200	13	65	20.0	-73	-1.12	200	14	61	27.5	-72	-1.41
Avg	70.6	70.4	230	29.26	-57.2	-0.30	70.56	76.6	234.8	32.1	-43.78	-0.20

1. TRENDING METHODS TEST DETAIL

3. LINEAR REGRESSION SLOPE					4. N-DAY BREAKOUT				
Days	#Prf	#Trds	Rel Radj%	%Tr	Days	#Prf	#Trds	Rel Radj%	%Tr
4	171	557	30.7	-90 -0.16	4	108	283	38.2	84 0.30
8	91	259	35.1	-4 -0.02	8	58	143	40.6	240 1.68
16	41	127	32.3	27 0.21	16	29	77	37.7	188 2.44
32	21	55	38.2	238 4.33	32	17	37	45.9	459 12.41
50	16	39	41.0	216 5.54	50	12	27	44.4	347 12.85
75	13	29	44.8	156 5.38	75	8	15	53.3	423 28.20
100	5	15	33.3	141 9.40	100	6	13	46.2	215 16.54
150	8	11	72.7	279 25.36	150	4	7	57.1	431 61.57
200	1	6	16.7	105 17.50	200	1	6	16.7	106 17.67
70.56	40.8	122	38.32	118.7 7.50	70.6	27.0	67.6	42.2	277.0 17.07

Days	#Prf	#Trds	Rel Radj%	%Tr	Days	#Prf	#Trds	Rel Radj%	%Tr
4	199	594	33.5	-77 -0.13	4	121	331	36.6	-66.0 -0.20
8	96	289	33.2	-49 -0.17	8	58	155	37.4	-12.0 -0.08
16	45	143	31.5	-35 -0.24	16	30	79	38.0	-1.0 -0.01
32	23	71	32.4	141 1.99	32	17	45	37.8	58.0 1.29
50	16	46	34.8	37 0.80	50	10	27	37.0	65.0 2.41
75	14	39	35.9	-14 -0.36	75	7	17	41.2	124.0 7.29
100	10	25	40.0	-1 -0.04	100	4	13	30.8	93.0 7.15
150	4	15	26.7	65 4.33	150	3	5	60.0	495.0 99.00
200	3	8	37.5	85 10.63	200	3	5	60.0	348.0 69.60
70.56	45.8	136.7	33.94	16.9 1.87	70.6	28.1	75.2	42.1	122.7 20.72

Days	#Prf	#Trds	Rel Radj%	%Tr	Days	#Prf	#Trds	Rel Radj%	%Tr
4	198	607	32.6	-92 -0.15	4	123	358	34.4	-77 -0.22
8	94	291	32.3	-56 -0.19	8	56	168	33.3	-28 -0.17
16	53	131	40.5	179 1.37	16	30	82	36.6	11 0.13
32	30	63	47.6	308 4.89	32	21	42	50.0	188 4.48
50	19	45	42.2	474 10.53	50	12	23	52.2	418 18.17
75	11	25	44.0	178 7.12	75	8	17	47.1	130 7.65
100	9	17	52.9	194 11.41	100	6	15	40.0	53 3.53
150	6	16	37.5	101 6.31	150	5	9	55.6	224 24.89
200	4	10	40.0	-13 -1.30	200	4	7	57.1	39 5.57
70.56	47.1	133.9	41.07	141.4 4.44	70.6	29.4	80.1	45.1	106.4 7.12

Days	#Prf	#Trds	Rel Radj%	%Tr	Days	#Prf	#Trds	Rel Radj%	%Tr
4	221	621	35.8	-72 -0.12 SP	4	134	389	34.4	-99 -0.25
8	100	325	30.8	-79 -0.24	8	53	191	27.7	-92 -0.48
16	53	168	31.5	-60 -0.36	16	25	107	23.4	-95 -0.89
32	27	88	30.7	-50 -0.57	32	15	52	28.8	-75 -1.44
50	12	54	22.2	-38 -0.70	50	9	34	28.5	-58 -1.71
75	9	41	22.0	-92 -2.24	75	6	16	50.0	84 5.25
100	8	21	38.1	-46 -2.19	100	7	15	46.7	-18 -1.20
150	6	16	37.5	-79 -4.94	150	5	11	45.5	-4 -0.36
200	2	9	22.2	-76 -8.44	200	1	4	25.0	-87 -21.75
70.56	48.7	149.2	30.06	-65.8 -2.20 Avg	70.6	28.6	91.0	34.2	-49.3 -2.54

1. TRENDING METHODS TEST SUMMARY

AVERAGE RETURNS

	MA	EXP	LRS	ND	Avg
ED	211	140	119	277	187
US	108	72	17	123	80
DM	133	95	141	106	119
SP	-57	-44	-66	-49	-54
Avg	99	66	53	114	83

AVERAGE OF TRADES FROM 24-260

	MA	EXP	LRS	ND	Avg
ED	276	196	127	309	227
US	153	111	26	28	79
DM	192	139	285	57	168
SP	-44	-31	-60	-80	-54
Avg	144	104	94	78	105

1. TRENDING METHODS TEST DETAIL

AVERAGE NUMBER OF TRADES

	MA	EXP	LRS	ND	Avg
ED	141	160	122	68	123
US	190	203	137	75	151
DM	180	193	134	80	147
SP	230	235	149	91	176
Avg	185	198	136	79	149

PERCENT PROFITABLE TRADES

	MA	EXP	LRS	ND	Avg
ED	31	30	38	42	35
US	32	32	34	42	35
DM	30	33	41	45	37
SP	29	32	30	34	31
Avg	31	32	36	41	35

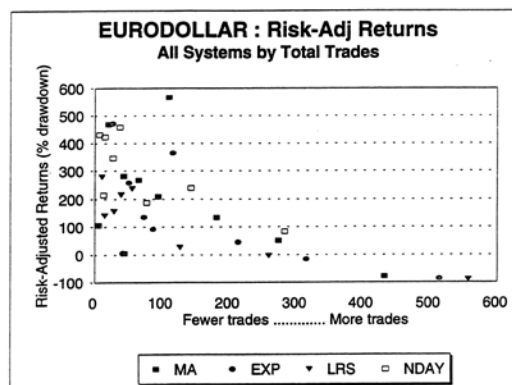
ANNUAL RISK ADJ RATE OF RETURN

	MA	EXP	LRS	ND	Avg
ED	21	14	12	28	19
US	11	11	2	12	9
DM	13	10	14	11	12
SP	-6	-4	-7	-5	-5
Avg	10	8	5	11	9

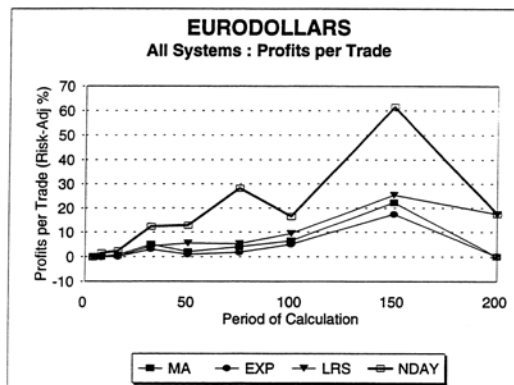
% PROFITS PER TRADE (LEVERAGED)

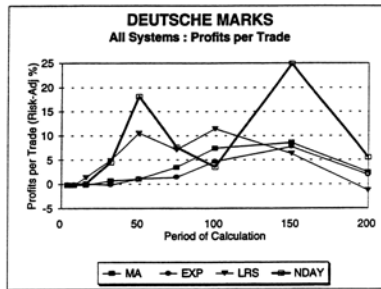
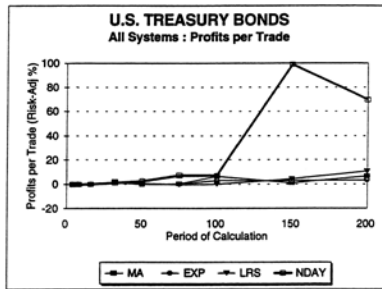
	MA	EXP	LRS	ND	Avg
ED	4.6	3.2	7.5	17.1	8.1
US	1.8	1.2	1.9	20.7	6.4
DM	2.6	1.8	4.4	7.1	4.0
SP	-0.3	-0.2	-2.2	-2.5	-1.3
Avg	2.1	1.5	2.9	10.6	4.3

1. EURODOLLAR TRENDING METHODS



1. TRENDING METHODS PROFITS PER TRADE





1. TRENDING METHODS

SUMMARY

PREFER BREAKOUT SYSTEMS
BECAUSE

- NO LAG
- ASSUME THE LEAST ABOUT PRICES
- HIGHER PROFITS PER TRADE
- GREATER CHANCE OF BEING CORRECT

AND

- IT IS DIFFICULT TO REDUCE THE NUMBER
OF TRADES FOR SMOOTHING

,

2. NOISE AND VOLATILITY

*NOISE IS CREATED BY MANY PARTICIPANTS
ENTERING AND EXITING FOR DIFFERENT REASONS*

FRAME OF REFERENCE

- LONG-TERM BENEFITS FROM FUNDAMENTALS
 - ☐ HIGH ABSOLUTE RISK, BUT ACCEPTABLE
RELATIVE RISK
 - ☐ UNDERLYING NOISE LESS IMPORTANT
- AS TRADING HORIZON BECOMES SHORTER
 - ☐ SIZE OF PROFITS BECOMES SMALLER
 - ☐ NOISE BECOMES VERY IMPORTANT
 - ☐ FUNDAMENTALS ARE LESS IMPORTANT
- FOR INTRADAY TRADING THERE IS ONLY NOISE

← MARKET NOISE BECOMES MORE IMPORTANT

SHORT-TERM

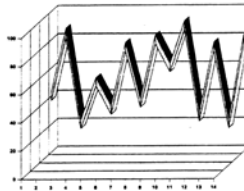
LONG-TERM

FUNDAMENTALS BECOME MORE IMPORTANT→

2. NOISE AND VOLATILITY

VOLATILITY

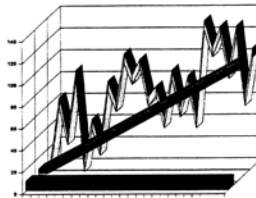
THE TOTAL UP AND DOWN PRICE MOVEMENT



NOISE (Efficiency Ratio)

THE TOTAL UP AND DOWN PRICE MOVEMENT
COMPARED TO THE NET MOVE

$$\text{ER} = \frac{\text{NET}}{\text{TOTAL}}$$



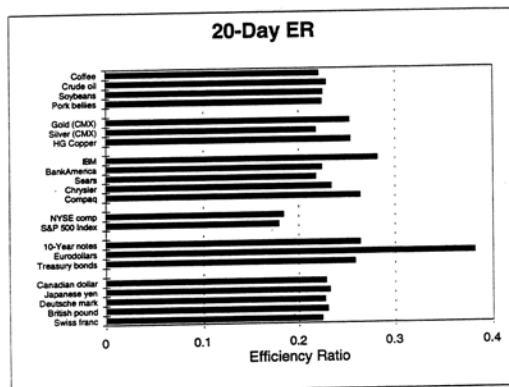
2. NOISE AND VOLATILITY

EFFICIENCY RATIO AND VOLATILITY VALUES (Daily for 10 years)

ANALYSIS OF NOISE												
Test:	Volatility	Average percent volatility (Largest move from prior close to next high or low)										
	Direction	Average percentage price change over period										
	Efficiency Ratio	Abs value (price change over interval / sum of absolute price changes over interval)										
	Test period	2 year test, in order of highest % volatility										
CLASS	MARKET	5-DAYS		20-DAYS		65-DAYS		DIRECTION COMPONENT				
		% Vity	ER	% Vity	ER	% Vity	ER	5-Day	20-day	65-day		
FOREX	Swiss franc	1.994	0.455	5.861	0.224	11.548	0.136	IMM	1.535	2.966	6.280	
	British pound	1.830	0.450	5.366	0.230	10.631	0.136	IMM	1.433	2.976	5.848	
	Deutsche mark	1.755	0.456	5.227	0.227	9.785	0.136	IMM	1.365	2.655	5.356	
	Japanese yen	1.400	0.451	4.210	0.232	8.134	0.151	IMM	1.095	2.207	4.579	
	Canadian dollar	0.774	0.464	2.294	0.228	4.054	0.123	IMM	0.594	1.186	2.033	
RATES	Treasury bonds	2.528	0.496	6.921	0.259	12.431	0.166	CBT-y	1.850	3.633	6.995	
	% Yield	2.020	0.572	6.480	0.382	13.127	0.225	IMM-y	1.491	3.977	7.277	
	10-Year notes	1.720	0.481	4.941	0.264	9.120	0.166	CBT-y	1.258	2.650	5.170	
STOCKS	S&P 500 Index	1.401	0.455	3.803	0.179	6.299	0.080	CME	0.988	1.481	2.135	
	NYSE comp	1.378	0.454	3.801	0.184	6.366	0.085		0.974	1.495	2.237	
	Compaq	6.714	0.452	20.783	0.264	40.410	0.182	NYSE	5.005	11.528	24.208	
	Chrysler	6.573	0.452	19.452	0.234	37.839	0.134	NYSE	4.836	10.107	20.053	
	Sears	4.090	0.459	11.883	0.218	23.323	0.128	NYSE	2.996	6.066	13.067	
	BankAmerica	3.779	0.471	10.844	0.224	18.647	0.103	NYSE	2.711	5.290	7.279	
	IBM	3.688	0.475	11.274	0.282	21.067	0.167	NYSE	2.768	6.733	11.673	
	HG Copper	2.558	0.474	7.757	0.254	15.212	0.174	CMX	1.977	4.170	8.927	
	Silver (CMX)	1.952	0.430	5.792	0.218	10.552	0.134	CMX	1.387	2.847	5.439	
OTHER	Gold (CMX)	1.545	0.434	4.811	0.253	9.136	0.149	CMX	1.110	2.562	4.582	
	Pork bellies	4.687	0.446	13.731	0.224	25.585	0.107	CME	3.497	7.316	11.393	
	Soybeans	2.152	0.456	6.152	0.225	11.676	0.111	CBT	1.583	3.308	5.230	
	Crude oil	2.000	0.447	5.852	0.229	10.530	0.145	NYME	1.455	2.938	5.967	
	Coffee	1.336	0.457	3.835	0.221	6.920	0.130	NYME	0.987	1.903	3.624	
	Average	2.630	0.463	7.776	0.239	14.655	0.139		1.95	4.09	7.71	
	Standard Dev	1.595	0.028	4.838	0.039	9.456	0.032		1.180	2.674	5.427	

2. NOISE AND VOLATILITY

EFFICIENCY RATIOS BY GROUP



3. NOISE AND TREND PROFITS

HOW NOISE AFFECTS TREND PROFITS

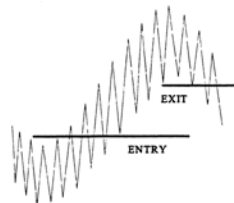
EURODOLLARS

WITH LOW NOISE,
ENTRIES AND EXITS
OCCUR SOON AFTER
THE DIRECTION CHANGES



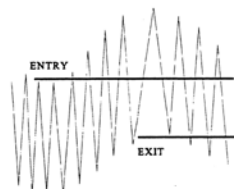
SWISS FRANCS

WITH MEDIUM NOISE,
A LONGER MOVE IS
NEEDED TO NET PROFITS



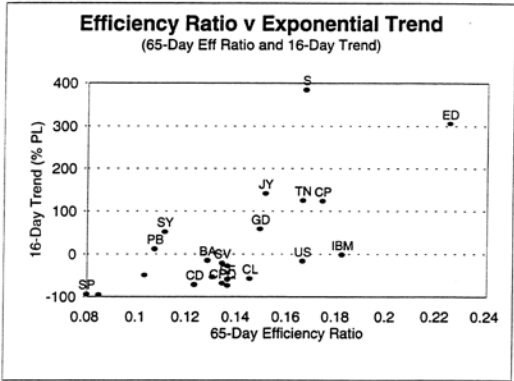
S&P 500

WITH HIGH NOISE,
VERY FEW TREND
SYSTEMS CAN PROFIT



3. NOISE AND TREND PROFITS

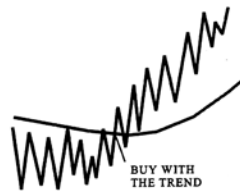
SAMPLING OF U.S. MARKETS
A CLEAR RELATIONSHIP BETWEEN
TREND PROFITS AND MARKET NOISE



4. HOW NOISE AFFECTS . . . ENTRIES

IF THERE IS LOW NOISE, THEN ENTER QUICKLY

EURODOLLARS



IF HIGH NOISE, WAIT FOR A RETRACEMENT

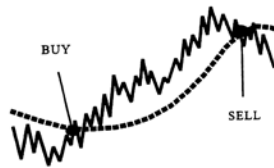
S&P



4. HOW NOISE AFFECTS . . . PROFITS

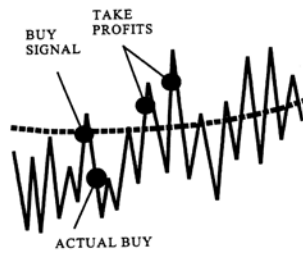
IF LOW NOISE, STAY WITH THE TREND

EURODOLLAR
S



IF HIGH NOISE, TAKE PROFITS OFTEN

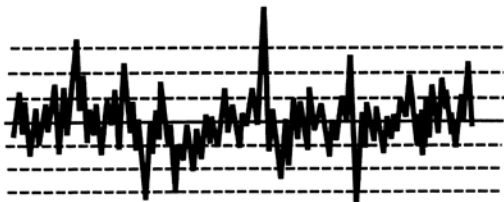
S&P



4. HOW NOISE AFFECTS . . . STOP-LOSSES

FINANCIAL STOP LOSSES ARE HIT ARBITRARILY

- ☐ THEY FIGHT WITH ANY SYSTEM
(YOU ARE OUT AND THE SYSTEM IS IN)
- ☐ OCCURANCES ARE PREDICTABLE
- ☐ IF THEY WORK, THEN THE SYSTEM IS TOO SLOW



Stop-losses are similar to standard deviations.

The near-random distribution of prices will reach financial or percentage stops at random.

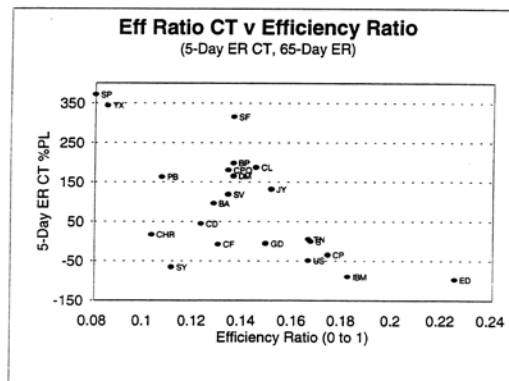
4. NOISE AND COUNTERTREND SYSTEMS

USE COUNTERTREND WITH HIGH NOISE

SELL WHEN *ER* GOES ABOVE .60
AND PRICES ARE RISING

BUY WHEN *ER* GOES BELOW .60
AND PRICES ARE FALLING

A SHORT-TERM SYSTEM EMPHASIZES NOISE



SUMMARY

1. PREFER BREAKOUTS FOR TRENDS BECAUSE THEY ASSUME VERY LITTLE AND ARE ROBUST
2. UNDERLYING MARKET NOISE MUST BE USED TO DETERMINE YOUR STRATEGY
3. AS YOUR TIME HORIZON BECOMES SHORTER, NOISE BECOMES A DOMINANT FACTOR
4. FIXED STOP LOSSES FIGHT WITH THE STRATEGY AND ARE HIT RANDOMLY. BASE YOUR STOPS ON EVENTS.

5. COMPUTER PROGRAMS

```
{ KDYma: moving average system
  Copyright 1994, Kaufman Diamond & Yeong. All rights reserved. }
{ period = length of moving average trend
  filter = whole percent trend change to give signal }

input: period(200), filter(0);
vars: ma(0), change(0);

ma = @Average(close,period);
change = (ma - ma[1])*100/close[1];
if change >filter then buy on close;
if change <-filter then sell on close;

{ KDYexp: exponential system
  Copyright 1994, Kaufman Diamond & Yeong. All rights reserved. }
{ period = length of exponential trend
  filter = whole percent trend change to give signal }

input: period(10), filter(0);
vars: exp(0), change(0);

Exp = @SmoothedAverage(close,period);
change = (Exp - Exp[1])*100/close[1];
if change >filter then buy on close;
if change <-filter then sell on close;

{ KDYlrs: Linear Regression Slope user function: Least squares method
  Copyright 1994, Kaufman Diamond & Yeong. All rights reserved. }

{ period = length of exponential trend
  filter = whole percent trend change to give signal }

input: period( numericsimple ), filter( numeric );
vars: slope(0), signal(0);

{ linear regression slop calculations }
slope = KDYlrsalc(close,period);
signal = signal[1];
if slope >filter then signal = 1;
if slope <-filter then signal = -1;
KDYlrs = signal;
```

```

if signal = 1 then buy on close;
if signal = -1 then sell on close;
if signal = 0 then begin
    exitlong on close;
    exitshort on close;
end;

```

```

{ KDYndb: Nday Breakout user function
Copyright 1994 Kaufman Diamond & Yeong. All rights reserved. }

```

```

{ INPUT for N-day Breakout System
signal rules:
    buy when high is above N-day high and close > prior close
    sell when low is below N-day low and close < prior close }

input: period(numeric);
vars: nhigh(0), nlow(0), signal(0);

nhigh = highest(high[1],period-1);
nlow = lowest(low[1],period-1);
{ Buy and sell signals }
signal = signal[1];
if high > nhigh and close > close[1] then signal = 1;
if low < nlow and close < close[1] then signal = -1;
KDYndb = signal;

```

```

{ KDY Noise & Volatility Study : Noise (fractal efficiency) & Volatility vs Time
Copyright 1995, Kaufman Diamond & Yeong. All rights reserved. }

```

```

input: period(5), indat(940331), yield(0);
vars: sum(0), aclose(0), ahigh(0), alow(0), sumER(0), sumvity(0),
    change(0), netchange(0), pcnet(0), pcchange(0), maxrange(0), crange(0),
    ER(0), avgER(0), avgvity(0), avgmaxv(0), sumrange(0), summax(0);

{ Noise(%) = Absolute price range per day, in percent
Mom = Momentum, net price change over time }

if yield = 0 then begin
    aclose = close;
    ahigh = high;
    alow = low;
end
else if yield = 1 then begin
{ Euros, T-Bills and 3 month rates }
    aclose = 100 - close;

```

```

alow = 100 - high;
ahigh = 100 - low;
end
else if yield = 2 then begin
{ Bonds and Notes: approx 100=8%, each 8 points = 1% then 164 = 0 }
aclose = 164 - close;
alow = 164 - high;
ahigh = 164 - low;
end;

change = @absvalue(aclose - aclose[1]);
pcchange = 0;
if aclose[1] <> 0 then pcchange = change*100/aclose[1];
sum = @summation(pcchange,period);
netchange = @absvalue(aclose - aclose[period]);

{ close-only and maximum calculations, in percent }
pcnet = 0;
crange = 0;
maxrange = 0;
if aclose[period] <> 0 then begin
pcnet = netchange*100/aclose[period];
crange = (@highest(aclose,period) - @lowest(aclose,period))*100/aclose[period];
maxrange = (@highest(ahigh,period) - @lowest(alow,period))*100/aclose[period];
end;
sumrange = sumrange + crange;
summax = summax + maxrange;

ER = 1.0;
if sum<>0 then ER = pcnet / sum;
sumER = sumER + ER;
print (currentbar:5:0," ", p=" ", period:3:0," ", avgER=" ", avgER:2:3,
" ", avity=" ", avgvity:3:2,"% ", amaxv=" ", avgmaxv:3:2,"%");

end;

```

```

{ KDYefratio : Countertrend entry system
Copyright 1994 Kaufman Diamond & Yeong. All rights reserved.
Countertrend entry when EF ratio is high, exit when low }

input: ERperiod(10), EREntry(.25), ERexit(.03), maxavg(1.00), maxchg(1.5), option(2);
vars: change(0), pchange(0), noise(0), signal(0), diff(0), efratio(0),
      ERavg(0), ERsd(0), ERsd3a(0), ERsd3(0);

{ CALCULATE EFFICIENCY RATIO }
diff = @AbsValue(close - close[1]);
if currentbar > ERperiod then begin
  change = close - close[ERperiod];
  pchange = change*100/close[ERperiod];
  signal = @AbsValue(change);
  noise = @summation(diff,ERperiod);
  efratio = 1.00;
  if(noise <> 0) then efratio = signal/noise;
  ERavg = @average(efratio,21);
  ERsd = @stddev(efratio,21);
  ERsd3a = @average(ERsd,3);
  ERsd3 = @average(ERavg - ERsd,3);

{ Entry signals }
  if efratio > EREntry and pchange > 0 then sell on close;
  if efratio > EREntry and pchange < 0 then buy on close;
end;

if efratio < ERexit then exitshort on close;
if efratio < ERexit then exitlong on close;

```