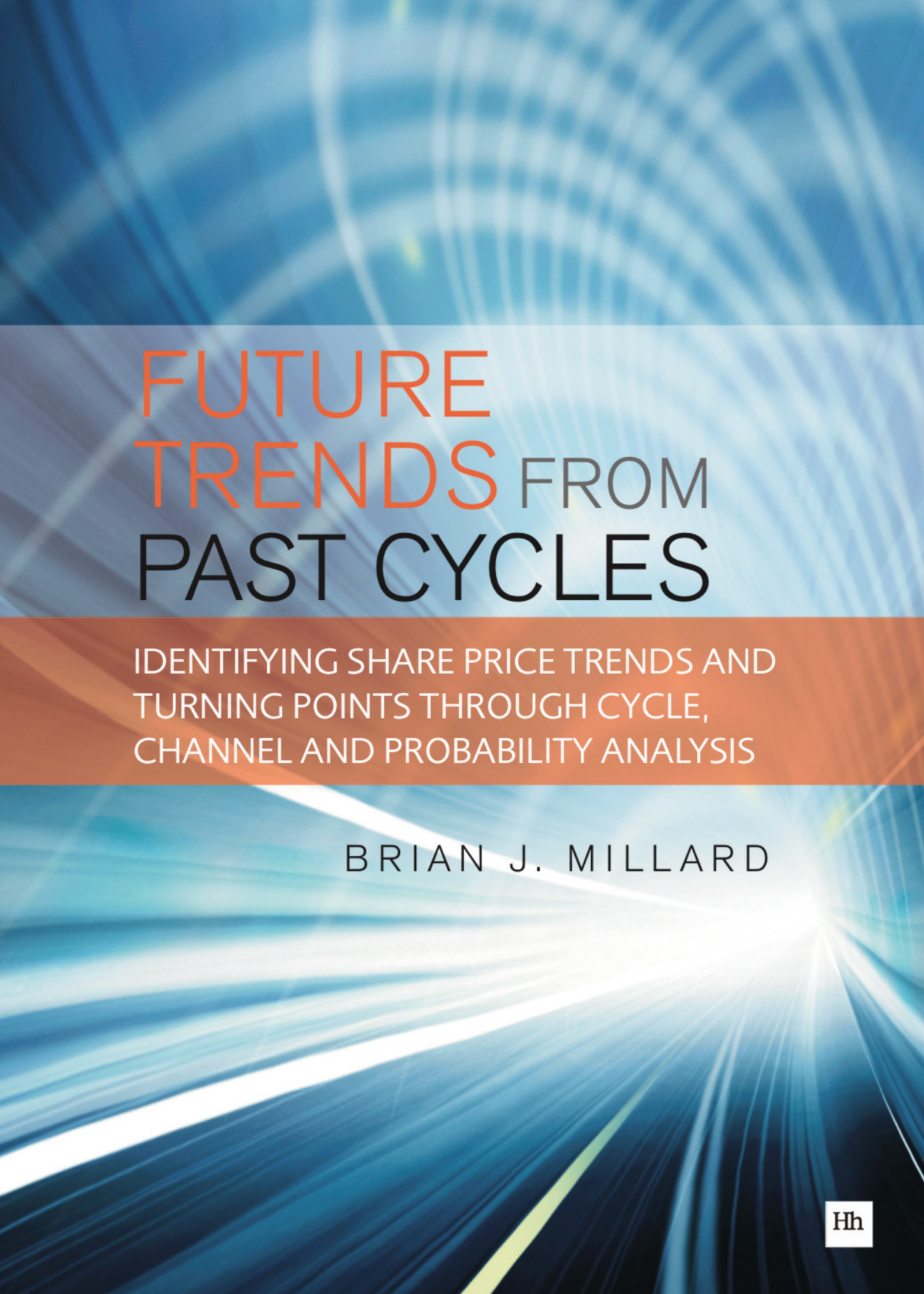

FUTURE TRENDS FROM PAST CYCLES
IDENTIFYING SHARE PRICE TRENDS AND TURNING POINTS THROUGH CYCLE, CHANNEL AND PROBABILITY ANALYSIS
BRIAN J. MILLARD
Hh

.... Sample ....

Future Trends from Past Cycles

Identifying share price trends and turning points through cycle, channel and probability analysis

by Brian J. Millard

HARRIMAN HOUSE LTD

3A Penns Road
Petersfield
Hampshire
GU32 2EW
GREAT BRITAIN

Tel: +44 (0)1730 233870
Fax: +44 (0)1730 233880
Email: enquiries@harriman-house.com
Website: www.harriman-house.com

First published in Great Britain 2010 by Harriman House

Copyright © Brian Millard

The right of Brian Millard to be identified as the author has been asserted
in accordance with the Copyright, Design and Patents Act 1988.

ISBN: 978-1-871857-04-7

British Library Cataloguing in Publication Data
A CIP catalogue record for this book can be obtained from the British Library.

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of the Publisher. This book may not be lent, resold, hired out or otherwise disposed of by way of trade in any form of binding or cover other than that in which it is published without the prior written consent of the Publisher.

Printed and bound in the UK by CPI, Antony Rowe.

No responsibility for loss occasioned to any person or corporate body acting or refraining to act as a result of reading material in this book can be accepted by the Publisher, by the Author, or by the employer of the Author.

"The further back you can look, the farther forward you can see."

Winston S. Churchill

About the Author

Brian J. Millard's background was as a scientist and until 1980 he was a senior lecturer at the University of London, publishing over 70 scientific papers.

He later became interested in the work of J. M. Hurst on cycles and channels in the stock market and, as this interest grew, spent time carrying out research in this field. Following his landmark book *Stocks and Shares Simplified*, published in 1980, Brian wrote a further five books on the application of scientific methods to the stock market.

His books on channel analysis are now universally recognised as taking forward the work of J. M. Hurst to a higher level by analysing price movement and especially the occurrence of predictable cycles in market data. Brian also published software to enable traders to apply his methods.

Other Books by Brian Millard

Quantitative Mass Spectrometry
Stocks and Shares Simplified: A Guide for the Smaller Investor
Traded Options Simplified
Millard on Channel Analysis: The Key to Share Price Prediction
Profitable Charting Techniques
Winning on the Stock Market
Channels & Cycles: A Tribute to J. M. Hurst

Brian Millard (1937-2009)

Brian worked tirelessly for the last two years, building on his earlier research and publications, to create the theories and techniques contained within this book. He died very suddenly in July 2009 before he could see the publication of this work.

I don't have a record of the many who helped in validating and testing the work presented – but I thank you for your contribution.

I would especially like to thank Martin Smart, who gave up his time to proof this work for my father, and Louise Hinchen at Harriman House, who has given me such support in bringing this book to you.

A great intellect and passion has been taken from the world; it is a lesser place for the loss.

Sandy has lost a wonderful husband, Alastair and I the best dad anyone could have, and his grandchildren – Rebecca, Eleanor, Madeline and Edward – a grandpa who was so proud of them.

I hope that this book brings you much success with your investments.

Simon Millard

Northampton, October 2009

Contents

List of Figures **xi**

List of Tables **xxix**

1 – Introduction **1**

Definition of a Trend 3

Definition of a Cycle 3

Determining Trends 3

2 – Risk and the Markets **9**

Sources of Risk 9

3 – How Prices Move (I) **19**

Coin Tossing 20

Rising and Falling Trends 22

4 – How Prices Move (II) **29**

The Normal Distribution 29

5 – Simulating Future Movement **45**

Monte Carlo Simulation 47

6 – Cycles and the Market **59**

Properties of Sine Waves 61

Cycles in the Stock Market 66

Research on Market Cycles 71

7 – Trends and the Market **75**

Mathematical Trends 76

Extrapolating a trend line 87

8 – Properties of Moving Averages **91**

Calculation of Moving Averages 91

9 – Averages as Proxies for Trends **111**

Probabilities From Centred Averages 114

Boundaries and Channels 119

10 – Trend Turning Points (I) **125**

Short-term Trends 127

11 – Trend Turning Points (II) **145**

Estimation of Channel Direction 145

12 – Trend Turning Points (III) **175**

Why Does Channel Analysis Work? 202

13 – Cycles and Sums of Cycles **207**

Extrapolation of Cycles 210

The Comparator 213

Failure of Extrapolations 234

14 – Bringing it All Together **237**

Four Key Steps 237

Conclusion 265

List of Figures

Figure 1.1 – There will be an uncertainty in the location of the central trend line. 4

Figure 1.2 – Probability boundaries if we assume that the central trend is in the correct position. In this case there is a 95% probability that the price lies between the two boundaries. 5

Figure 2.1 – The relationship between the performance of individual stocks and the market itself over three-month periods. The vertical axis is the percentage of rising stocks. This shows that once the percentage rise or fall in the index exceeds 10%, the majority of stocks follow suit. 12

Figure 3.1 – The probabilities associated with the occurrence of various outcomes. 20

Figure 3.2 – The relationship between total price rise and sequence length. 26

Figure 3.3 – The relationship between total price fall and sequence length. 27

Figure 4.1 – This shows a plot of heights of men in the United States. The average height is 69.1 inches and the standard deviation 2.9 inches. 30

Figure 4.2 – The standard normal distribution curve has a mean value of 0 and a standard deviation of 1. In this plot the x-axis represents standard deviations from -5 to +5. The shaded area represents the 95% probability limits for a future value. 31

Figure 4.3 – The area under the distribution curve can be approximated by adding up the values in each of the bins. The bins are of width 0.25 of a standard deviation. 33

Figure 4.4 – The cumulative distribution derived from the normal distribution shown in Figure 4.3. The y-axis now depicts the probability, on a scale of 0 to 1, that a point from the distribution is greater than a value on the x-axis. At the value of 0 for standard deviation the probability is 0.5 (50%), i.e. there is an equal chance of the point being greater or less than this value. 34

Figure 4.5 – The normal distribution of AstraZeneca daily price changes based solely on the mean value of -0.12 and standard deviation of 41.36. 35

Figure 4.6 – The normal and cumulative distributions from AstraZeneca daily changes. Moving the cursor over the cumulative plot gives the probability that the price change will be less than the indicated value. 36

Figure 4.7 – The actual distribution of daily changes in AstraZeneca. The changes are allocated to bins of 10p running from -230p (fall) to +310p (rise). 37

Figure 4.8 – The differences between the actual distribution of AstraZeneca daily price changes and what would be expected if these were normally distributed. 38

Figure 4.9 – The actual distribution and cumulative distribution from AstraZeneca daily changes. Moving the cursor over the cumulative plot gives the probability that the price change will be less than the indicated value. In this case there is a 16.44% probability that the price change will be less than -29.66. This means there is a 70.34% (100-29.66) probability that the price change will be greater than -29.66. 39

Figure 4.10 – The normal distribution of five-day changes in AstraZeneca (left panel). The right panel shows the cumulative distribution from which probabilities can be obtained. 40

Figure 4.11 – The actual distribution of five-day changes in AstraZeneca (left panel). The right panel shows the cumulative distribution from which probabilities can be obtained. 41

Figure 4.12 – The actual distribution of 151-day changes in AstraZeneca (left panel). The right panel shows the cumulative distribution from which probabilities can be obtained. It can be seen that now the distribution contains a wide range of changes of approximately similar probability. 42

Figure 5.1 – The future price for AstraZeneca will have a 95% probability of staying between these two straight lines if a normal distribution is assumed. 46

Figure 5.2 – The radius of the circle OA can be calculated from the vertical distance AB from the origin (y-value) and the horizontal distance OB from the origin (x-value). 47

Figure 5.3 – The distribution of five-day changes in AstraZeneca from a Monte Carlo simulation using 2000 trials. 50

Figure 5.4 – The actual distribution of five-day changes in AstraZeneca. 51

Figure 5.5 – The data from Table 5.1 are now plotted. The solid line is the actual movement of the AstraZeneca price since 23 February 2009. The dotted lines are the upper and lower limits of the 95% probable price range from the Millard distribution. The dashed lines are those derived from a Millard version of the Monte Carlo simulation. Day one is the starting day on 23 February. 52

Figure 5.6 – The distribution of 5-day changes in American Express from a Monte Carlo simulation using 2000 trials. 53

Figure 5.7 – The data from Table 5.3 are now plotted. The solid line is the actual movement of the American Express price since 6 March 2009. The dotted lines are the upper and lower limits of the 95% probable price range from the Millard distribution. The dashed lines are those derived from a Millard version of the Monte Carlo simulation. 54

Figure 5.8 – The probability level for AstraZeneca has now been reduced to 90%. The solid line is the actual movement of the AstraZeneca price since 23 February 2009. The dotted lines are the upper and lower limits of the 95% probable price range from the Millard distribution. The dashed lines are those derived from a Millard version of the Monte Carlo simulation. Day one is the starting day on 23 February. The dashed lines are now closer together compared with those for 95% probabilities shown in Figure 5.5. 55

Figure 5.9 – The predicted price range nine days into the future from the latest data point on 23 February 2009 is shown as a vertical line. 56

Figure 5.10 – Nine days into the future and the AstraZeneca price has fallen to a point not far above the low point of the predicted price range. The starting point on 23 February is indicated by the arrow. 57

Figure 6.1 – A cycloid such as that shown here is formed by a point on the circumference of a rolling circle. 59

Figure 6.2 – This short section of the closing values of the Honeywell stock price shows some characteristics of a cycloid with rounded tops and a sharp reversal from its lows. 60

Figure 6.3 – A sine wave. 61

Figure 6.4 – This shows two sine waves of different wavelengths. One wavelength (thin line) is three times that of the other (thicker line). The sine wave of shorter wavelength terminates short of the right-hand edge. 62

Figure 6.5 – This shows two sine waves of the same wavelength but different amplitudes. The phase of each is identical. 63

Figure 6.6 – This shows two sine waves out of phase by half a wavelength. One has peaks at 1108, 1149 and 1190. The other has peaks at 1128 and 1169. The wavelength of both is 41 days and the amplitudes are identical. 64

Figure 6.7 – Once the wavelength and amplitude of the sine wave (solid line) are known, then its equation can be derived. It can then be extrapolated into the future (broken line). 66

Figure 6.8 – The cycle of nominal wavelength 130 days in the Tesco stock price (lower panel). It can be seen that the amplitude and wavelength are changing. The lumpy appearance is due to the influence of cycles of shorter wavelength. The stock price is shown in the upper panel. 67

Figure 6.9 – A longer section of cycles is shown here (lower panel) which highlights the more extreme changes in amplitude and wavelength which can occur. The stock price is shown in the upper panel. 68

Figure 6.10 – The nominal cycle of wavelength 113 days in American Express (lower panel). The last half of a wavelength (broken line) has been extrapolated. The stock price is shown in the upper panel. 69

Figure 6.11 – Several months later, it can be seen that the extrapolation was exactly correct. The downward leg of the cycle agrees with the predicted position from Figure 6.10. 70

Figure 6.12 – A plot of the Australian dollar versus the euro (upper panel). The cycle shown is the nominal 83-day cycle (lower panel). 70

Figure 7.1 – The traditional way of showing uptrends and downtrends is shown by the lines on this chart. 76

Figure 7.2 – This shows a straight-line trend drawn on the closing prices of the London Stock Exchange. The chart has been produced by the Excel spreadsheet program. 77

Figure 7.3 – A quadratic trend line has been drawn (using Excel) through the same set of data as that used in Figure 7.2. 78

Figure 7.4 – A quadratic trend line has now been drawn through the first 50 points of the data used in Figure 7.3. 79

Figures 7.5 to 7.7 – Note the small change in the latest position of the trend. 81-82

Figure 7.8 – A five-point moving average of 50 points of the London Stock Exchange data. 84

Figures 7.9 to 7.11 – Note the small change in the latest position of the trend line. 85-86

Figure 7.12 – A plot where a 25-point moving average has been used. 87

Figure 7.13 – How trends can be categorised into long-term (A), medium-term (B) and short-term (C) trends. 89

Figure 8.1 – This shows why the next calculated point of the nine-point average will be lower than the previous value. The new point has a lower value than the dropped point. 93

Figure 8.2 – A cycle of wavelength 25. If the moving average has a period of 25, then each dropped point has the same value as the new point, as shown by the arrowed line. Thus the average remains at its first calculated value. 94

Figure 8.3 – The result of applying a 25-point moving average to a cycle of wavelength 25 days. The output is a straight line for the reason shown in Figure 8.2. 95

Figure 8.4 – The effect of applying nine-, 15- and 21-point averages to a cycle of wavelength 41 days. The closer the period of the average to the wavelength of the cycle, the greater is the attenuation. 96

Figure 8.5 – The effect of applying 31-, 39- and 41-point moving averages to a cycle of wavelength 41 days. The original cycle is the one with the maximum amplitude. 96

Figure 8.6 – When the nine-, 15- and 21-point centred averages are applied to the cycles of wavelength 41 days the peaks and troughs now line up perfectly. 98

Figure 8.7 – When the 31-, 39- and 41-point centred averages are applied to a cycle of wavelength 41 days the peaks and troughs of the first two line up perfectly. The 41-point average has totally removed the cycle in its output, leading to a straight line. The closer the period of the average to the wavelength of the cycle, the greater is the attenuation. 99

Figure 8.8 – The plot of a sum of three cycles of wavelengths 41, 101 and 201 days and amplitudes 25, 50 and 100 points, with a straight line of value 100 points also added. 100

Figure 8.9 – A moving average of period 151 days has been applied to the data from Figure 8.8. 101

Figure 8.10 – A centred average of period 201 days has been applied to the complex waveform. The result is an almost straight line at a value of 100 points. 102

Figure 8.11 – A centred average of period 101 days has been applied. The output is a good representation of the original 201-day cycle. The amplitude is about 60 points. 103

Figure 8.12 – The differences between the value of the centred average and the data itself will re-form the original cycle. 105

Figure 8.13 – The 41-point average difference of the mixture of cycles shown in Figure 8.8. 106

Figure 8.14 – The 101-point average difference of the mixture of cycles shown in Figure 8.8 does not isolate the 101-day cycle. 107

Figure 8.15 – The difference between the 51-point and 135-point centred averages is shown as the filled in portions of the plot. The original cycle data has been omitted for clarity. 108

Figure 8.16 – The result of plotting the differences between the two averages is shown in the lower panel. 109

Figure 9.1 – A centred 15-day moving average applied to the Motorola stock price. The price oscillates around the average but remains within certain limits. 111

Figure 9.2 – A centred 101-day moving average applied to the Motorola stock price. The price oscillates around the average but remains within certain limits. 112

Figure 9.3 – A centred 501-day moving average applied to the Motorola stock price. The price oscillates around the average but remains within certain limits. 113

Figure 9.4 – How the data is distributed around the position of the average. The -ve and +ve extremes denote the furthest that the data moves from the position of the average. 115

Figure 9.5 – The distribution of Motorola data around the centred 15-day moving average. The data has been sorted into 200 bins (slots) and the vertical axis is the number of values that fall into each bin. 116

Figure 9.6 – The dispersion of Motorola data around the centred 101-day moving average. The data has been sorted into 200 bins (slots) and the vertical axis is the number of values that fall into each bin. 118

Figure 9.7 – The dispersion of Motorola data around the centred 501-day moving average. The data has been sorted into 200 bins (slots) and the vertical axis is the number of values that fall into each bin. 119

Figure 9.8 – The centred 101-point average now has a line at a constant distance above and below the average. The position of these lines has been chosen such that only 5% of the data points lie outside of them. 120

Figure 9.9 – This expanded portion of Figure 9.8 shows the points of penetration of the boundaries. 121

Figure 9.10 – Here the channel boundaries have been adjusted so that no points lie outside the channel. 122

Figure 9.11 – The upper panel shows the 101-day channel and the lower panel the 101-day average difference. 123

Figure 9.12 – There are many ways of extrapolating a centred average from its last calculated point to the present and into the future. Each of the three possibilities shown above can be justified. 124

Figure 10.1 – This centred average could be extrapolated in many ways to bring it up to the present time and into the future. The three paths shown are just three examples, each of which can be justified. 125

Figure 10.2 – It might be possible to extrapolate the average and put 90% limits on its probable position. 126

Figure 10.3 – The centred nine-point moving average calculated with the last data point being at point 1353 (12 May 2008). The data to the right of the vertical line shows the subsequent price movement. 128

Figure 10.4 – The distribution of the American Express two-day price changes. The probability of a change of less than $1.38 can be seen to be 91.5%. Therefore the probability of a rise equal to or greater than this is 8.5%. 129

Figure 10.5 – The actual path of the centred nine-day average in American Express. The average topped out at point 1350, 7 May 2008. 131

Figure 10.6 – The centred 15-point average calculated with the last data point 1307, 7 March 2008. 132

Figure 10.7 – The distribution of the AT&T three-day price changes. The probability of a change of less than $0.7 can be seen to be 13.25%. Therefore the probability of a rise in the average is 86.75%. 133

Figure 10.8 – The actual movement of the 15-point centred average over the period for which the prediction was being made. 134

Figure 10.9 – A rising nine-point centred average in the American Express stock price. The issue is whether it is still rising at the current time. This point is at the position of the vertical line. 135

Figure 10.10 – The nine-point centred average in the American Express stock price continues to rise as predicted by the probability calculations shown in Table 10.3. 136

Figure 10.11 – A falling 15-point centred average in the Eastman Kodak stock price as calculated on 2 June 2008. The issue is whether it is still falling at the current time. This point is at the position of the vertical line. 137

Figure 10.12 – The 15-point centred average in the Eastman Kodak stock price continues to fall as predicted by Table 10.4. 138

Figure 10.13 – The turning point in the 15-point centred average in the Eastman Kodak stock price was driven by the large rise in the stock price ($2.78) between points 1383 (23 June) and 1385 (25 June). The estimated probability of such a strong rise is less than 1%. 143

Figure 11.1 – The 101-point channel of the Brunswick Corporation. The left hand vertical line is the position of the last true calculated point of the average from which the channel is derived. The right hand vertical line is the latest data point (4 September 2006). The subsequent movement of the stock price (not used in the calculation) is shown in order to clarify the discussion. 146

Figure 11.2 – By 12 September the new data has caused the channel to curve slightly. The channel has not yet been adjusted to account for the data point at the latest position being above the upper boundary. 147

Figure 11.3 – The channel has now been adjusted to account for the data point ($30.54) at the latest position (12 September) being above the upper boundary. Note the curvature has now increased and there is now the possibility that the channel is about to bottom out. 148

Figure 11.4 – The channel has now been adjusted to account for the data point ($31.4) at the latest position (20 September) being above the upper boundary. Note the increasing curvature now shows that the channel has bottomed out and is expected to rise. 149

Figure 11.5 – The channel drawn once more data was available. The actual bottom was at point 903 (21 August). 150

Figure 11.6 – The extrapolated section of the channel from Figure 11.5 shows no features that will help to determine whether the channel has changed direction. It must be assumed that it has not. 151

Figure 11.7 – The lower panel shows the nominal cycle of wavelength 15 days in a section of the Brunswick Corporation stock price. It can be seen that those points where the cycle is of higher amplitude are the points in the channel where the stock price approaches the appropriate boundary. The channel depth has been decreased in order to accentuate the channel touching points. 152

Figure 11.8 – The 301-day channel in British American Tobacco. There are very few touching points in the long upward run until the end of 2007. 153

Figure 11.9 – The 301-day channel in British American Tobacco. The channel depth has been reduced to allow 10% of the points to lie outside of the boundaries. As a result there are now many more touching points. 154

Figure 11.10 – The topping-out section of the 301-day channel in British American Tobacco. The channel depth has been reset to allow just 3.5% of the points to lie outside of the boundaries. 155

Figure 11.11 – The topping-out section of the 301-day channel in British American Tobacco. The nominal 101-day cycle is shown in the lower panel. The time axis is labelled with numbers so that the wavelength of the cycles can be checked. See text for explanation of vertical lines. 156

Figure 11.12 – The channel extrapolation at 28 May 2008 at point 1365. There is no reason to believe that the channel is topping out. 157

Figure 11.13 – The channel extrapolation at 18 June 2008 at point 1380. There is now just a suggestion that the rate of climb of the channel is decreasing. The value of the last data point on 18 June is 1831p, which is well below the lower boundary. 158

Figure 11.14 – The channel extrapolation at 18 June 2008 at point 1380 has now been adjusted by increasing the curvature to accommodate the low value (1831p) of the latest data point. 159

Figure 11.15 – The channel extrapolation at 15 July 2008 at point 1399. The channel has not been adjusted, but the fact that it has topped out is obvious. 160

Figure 11.16 – The channel extrapolation at 15 July 2008 at point 1399. The channel has now been adjusted in order to try to reduce the penetration of the upper boundaries. 161

Figure 11.17 – A later calculation enables the exact top to be determined at point 1326 (3 April 2008) as shown by the arrow. 162

Figure 11.18 – At this time in the H.J. Heinz Company stock price (point 1034 (20 February 2007, $47.69)) it is predicted that the channel will top out in the near future. 163

Figure 11.19 – A small adjustment has been made to bring the upper boundary to the level of the recent peaks. 164

Figure 11.20 – A later calculation enables the exact top to be determined, point 1106 (31 May 2008) as shown by the arrow. 165

Figure 11.21 – The 301-day channel in a chart of the British pound/US dollar with the last data point at point 770 on 12 February 2006. The indication is that the channel bottomed out around point 718 on 1 December 2005. 166

Figure 11.22 – The 301-day channel in the chart of the British pound/US dollar with the last data point at point 794 on 17 March 2006. The extrapolated channel has now straightened out with no indication of a turn having occurred at around point 718 (1 December 2005). 167

Figure 11.23 – The 301-day channel in the chart of the British pound/US dollar has now been adjusted to bring the recent troughs to the lower boundary. 167

Figure 11.24 – The 301-day channel in the chart of the British pound/US dollar has now been adjusted to bring the recent peaks to the upper boundary. 168

Figure 11.25 – The 301-day channel in the chart of the British pound/US dollar as at point 823 on 27 May 2006. The direction of the channel has now been verified as changing from falling to rising. The low point in the channel is at point 764, on 3 March 2006. 169

Figure 11.26 – Enough new data has arrived to enable the change in direction of the 301-day channel in the chart of the British pound/US dollar to be confirmed. The channel bottomed out at point 721 on 6 December 2005. 170

Figure 11.27 – The topping region of the 301-day channel in the chart of the British pound versus the US dollar. Also shown are the 51-day and five-day channels. The channels do not top at the same time. Also note the decreasing smoothness as we move to short periods in the underlying average. 171

Figure 11.28 – One of the topping regions of the nine-day channel in the chart of the British pound versus the US dollar. The last data point is at point 557 on 20 April 2005. There is no indication that the channel will be topping out in the near future. 172

Figure 11.29 – Here we show the position a few days later at point 561 on 26 April. 173

Figure 11.30 – Here the channel has been adjusted by raising the lower boundary to accommodate the fact that the data has violated the latter. 173

Figure 12.1 – The 51-day channel for Safeway Inc. Note the large number of occasions in which the price movement reached the channel boundaries. 176

Figure 12.2 – The 51-day channel for Safeway Inc. The occasions in which the price movement reached the rising channel boundaries have been circled. 177

Figure 12.3 – The 51-day channel for Safeway Inc. The price on 7 November 2006 ($29.6) is now penetrating the upper boundary. The channel therefore needs to be adjusted upwards. 179

Figure 12.4 – The 51-day channel for Safeway Inc. The channel in Figure 12.3 has now been adjusted to give a sideways direction. 180

Figure 12.5 – The 51-day channel for Safeway Inc. The channel was calculated on 29 November 2006 with the price at $30.5. The price is now violating the upper boundary again. The channel therefore needs to be adjusted upwards. 181

Figure 12.6 – The 51-day channel for Safeway Inc. The channel in Figure 12.5 has now been adjusted to give an upwards direction. The small trough two days previously on 27 November identifies the position of the lower boundary. 182

Figure 12.7 – The position of the extrapolated channel on 18 December 2006. The price is at $34.61 and violates the upper boundary. This will need an adjustment to remove the overlap. 183

Figure 12.8 – The 51-day channel for Safeway Inc. has now been adjusted to remove the violation of the upper boundary. 184

Figure 12.9 – The 51-day channel for Safeway Inc. calculated on 27 April 2007. The extrapolated channel appears to have topped out but still needs an adjustment. 185

Figure 12.10 – The 51-day channel for Safeway Inc. calculated on 27 April 2007 has now been adjusted to remove the violation by the latest price on 27 April. 186

Figure 12.11 – The 51-day channel for AstraZeneca. Note the large number of occasions in which the price movement reached the channel boundaries. 187

Figure 12.12 – The 51-day channel for AstraZeneca. The occasions in which the price movement reached the falling channel boundaries have been circled. 188

Figure 12.13 – The 51-day channel for AstraZeneca on 3 January 2007. The channel will need to be adjusted since the latest price is well above the upper boundary. 189

Figure 12.14 – The 51-day channel for AstraZeneca on 3 January 2007. The channel has been adjusted to bring the latest price (2787p) to the lower boundary. The penetration by the peak in late October cannot be removed by channel bending so it is accepted as a normal overshoot at a channel top. 190

Figure 12.15 – The 51-day channel for AstraZeneca on 7 February 2007. The price is at 2950p and is above the extrapolated boundary. 191

Figure 12.16 – The 51-day channel for AstraZeneca on 7 February 2007 has now been adjusted. 192

Figure 12.17 – The 51-day channel for AstraZeneca on 20 August 2007. No adjustment is necessary. 193

Figure 12.18 – The 51-day channel for AstraZeneca on 16 October 2007. No adjustment is necessary. 194

Figure 12.19 – The 51-day channel for AstraZeneca on 14 November 2007. No adjustment is necessary. 195

Figure 12.20 – The 51-day channel for AstraZeneca two days later on 16 November 2007. No adjustment is necessary to accommodate the new trough. 196

Figure 12.21 – The 51-day channel for AstraZeneca on 14 January 2008 with the price at 2308p. An adjustment is necessary to remove the upper boundary violation on 11 January, when the price was at 2318p. 197

Figure 12.22 – The 51-day channel for AstraZeneca on 14 January 2008. The adjustment has now been carried out. 198

Figure 12.23 – The 51-day channel for AstraZeneca on 20 March 2008. The price, at 1879p, has risen from the trough at 1748 on 17 March. No adjustment is necessary since this trough lies exactly on the lower boundary. 199

Figure 12.24 – The 51-day channel for AstraZeneca on 19 May 2008. The price at 2289p is well below the extrapolated upper boundary. Quite clearly the channel has now bottomed out. However, the extrapolated part should be more symmetrical about the low point. An adjustment downwards is required. 200

Figure 12.25 – The 51-day channel for AstraZeneca on 19 May 2008. The channel has now been adjusted so that the high price on this date is at the upper boundary. It can be seen that the turning point is now much more symmetrical. 201

Figure 12.26 – Cycle sums determined from channel depths plotted for AstraZeneca (AZN), Barclays (BARC) and British American Tobacco (BAT). Quadratic curve fitting routines have been used to show the trends in each security, with a high degree of goodness of fit as can be seen from the R^2. 203

Figure 12.27 – This shows the 41-day and 75-day centred moving averages of AstraZeneca data. The oscillations of the shorter 41-day average around the longer 75-day average are limited by the relationship between them shown in Figure 12.26. 204

Figure 13.1 – The distribution of stable cycles in AstraZeneca. The most persistent cycle is that with wavelength 86 days. 208

Figure 13.2 – The sum of the short-term stable cycles with wavelengths 11 to 37 days in AstraZeneca. Note how the peaks and troughs are aligned with the touching points within the channel. 208

Figure 13.3 – An expanded section of the plot from Figure 13.2. It can now be seen that there is much more very short-term random movement within the channel. The extrapolated part of the channel is that to the right of the vertical line in the upper panel. The extrapolated part of the cycle sum is that to the right of the vertical line in the lower panel. 209

Figure 13.4 – The intra-channel movement has now been smoothed by using a nine-point centred average. The actual price data has been removed to aid the comparison with the cycle sum in the lower panel. 210

Figure 13.5 – The cycle of wavelength 84 days is shown in the lower panel. The peaks and troughs are mostly aligned with the major touching points in the channel. 211

Figure 13.6 – The cycle sum in the lower panel now contains all cycles of wavelengths up to 96 days. 212

Figure 13.7 – The cycle sum in the lower panel now contains all cycles of wavelengths up to 300 days. Because of this large wavelength, the extrapolation of the cycle sum starting from the first vertical line in the lower panel covers almost all of the plot. Note how good the comparison is over most of the plot until the last few weeks. The vertical line in the upper panel is the start of the extrapolation of the channel. 213

Figure 13.8 – The distribution of stable cycles in British American Tobacco. There are two main groups of cycles. One is centred around a wavelength of 100 days, while the other is centred around a wavelength of 25 days. Cycles within the 100-day group are essentially the same. 215

Figure 13.9 – The 20-day stable cycle in British American Tobacco. The vertical line shows the last calculated point of the cycle. The extrapolation to the right of this is a sine wave based on the recent wavelength and amplitude. The extrapolation is only valid for a few sweeps of the cycle and not for several months as shown here. 216

Figure 13.10 – An expanded section of Figure 13.9 now shows the behaviour of the 20-day cycle in British American Tobacco more clearly. The left-hand vertical line shows the last calculated point of the cycle. The right-hand vertical line shows the position of the latest data point. The extrapolation goes from the left-hand vertical line and into the future. 217

Figure 13.11 – The behaviour of the 100-day cycle in British American Tobacco. The right-hand vertical line shows the position of the most recent data point. The left-hand vertical line shows the point from which the extrapolation of the cycle commences. 218

Figure 13.12 – The sum of all stable cycles in British American Tobacco. The nine-day centred average comparator is shown in the upper panel. The left-hand vertical line shows the point from which the highest wavelength cycle has been extrapolated. The middle vertical line shows the point from which the shortest wavelength cycle has been extrapolated. The right-hand vertical line is the position of the latest data point. A rise in the trend in the near future is forecast. 219

Figure 13.13 – The cycle distribution in Air Products at 23 April 2009. 220

Figure 13.14 – The sum of all stable cycles in Air Products as at 23 April 2009. The nine-day centred average comparator is shown in the upper panel. The left-hand vertical line shows the point from which the highest wavelength cycle has been extrapolated. The vertical line at the right is the position of the latest data point. 221

Figure 13.15 – The cycle distribution in Agilent Technology at 23 April 2009. There are a great many cycles present. 222

Figure 13.16 – The sum of all stable cycles in Agilent Technology as at 23 April 2009. The nine-day centred average comparator is shown in the upper panel. The left-hand vertical line shows the point from which the highest wavelength cycle has been extrapolated. The vertical line at the right is the position of the latest data point. 223

Figure 13.17 – The cycle distribution in Hercules Inc. at 23 April 2009. There are a great many cycles present, especially those with short wavelengths. 224

Figure 13.18 – The sum of all stable cycles in Hercules Inc. as at 23 April 2009. The nine-day centred average comparator is shown in the upper panel. The left-hand vertical line shows the point from which the highest wavelength cycle has been extrapolated. The vertical line at the right is the position of the latest data point. See text for comment on the future extrapolation. 225

Figure 13.19 – The cycle distribution in Ball Corporation at 23 April 2009. There are three distinct cycles present. This is an ideal distribution. 225

Figure 13.20 – The sum of all stable cycles in Ball Corporation as at 23 April 2009. The nine-day centred average comparator is shown in the upper panel. The vertical line at the right is the position of the latest data point. All of the cycle sum trace to the left of this line is the result of extrapolation. 226

Figure 13.21 – The cycle distribution in Wolseley at 28 November 2008. 227

Figure 13.22 – The cycle sum for Wolseley calculated on 28 November 2008. The comparator is shown in the upper panel. The vertical line at the right in the lower panel is the position of the latest data point. The section of the cycle sum shown above is extrapolated. 227

Figure 13.23 – The upper panel shows the true value of the nine-day average calculated at 23 April 2009. The lower panel shows the cycle sum calculated in November 2008. The two plots are of almost identical shape. Note that the vertical scales are of necessity different. 227

Figure 13.24 – The cycle distribution in Wolseley at 23 April 2009. 229

Figure 13.25 – The cycle distribution in United Utilities at 28 November 2009. 229

Figure 13.26 – The cycle sum in United Utilities on 28 November 2008. 230

Figure 13.27 – The cycle sum in United Utilities on 23 April 2009. The comparator can now be compared with the predicted cycle sum in Figure 13.26. 231

Figure 13.28 – The cycle sum for CSL Ltd calculated on 9 January 2009. The vertical line at the right is the position of the latest data point. The section of the cycle sum between the two vertical lines is extrapolated. 232

Figure 13.29 – The cycle sum for CSL Ltd calculated on 4 February 2009. The vertical line at the right is the position of the latest data point. The section of the cycle sum between the two vertical lines is extrapolated. 233

Figure 13.30 – The cycle sum for CSL Ltd calculated on 21 April 2009. The vertical line at the right is the position of the latest data point. The section of the cycle sum between the two vertical lines is extrapolated. 233

Figure 13.31 – The distribution of stable cycles in Rolls-Royce on 23 April 2009. 234

Figure 13.32 – The distribution of stable cycles in Rolls-Royce on 2 February 2009. 234

Figure 13.33 – The cycle sum on 2 February 2009 (upper panel) compared with the cycle sum on 23 April (lower panel). 235

Figure 13.34 – The cycle sum for Rolls-Royce on 2 February 2009 (lower panel) is consistent with the comparator (upper panel). 236

Figure 14.1 – The cycle sum in 3i Group as determined on 11 May 2009. There is no correlation between the recent cycle sum and the nine-day centred average used as the comparator. This security would not be taken forward as a possible trading situation. 239

Figure 14.2 – The 25-day, 75-day and 151-day cycles in 3i Group as determined on 11 May 2009. Visually it can be seen that the sum of these three cycles over the previous month should continue to fall, and the upward turn in the comparator at the very end of April would not be replicated in the sum of the three key cycles. This security would not be taken forward as a possible trading situation. 240

Figure 14.3 – The cycle sum in Analog Devices as determined on 11 May 2009. There is no correlation between the recent cycle sum and the nine-day centred average used as the comparator. 241

Figure 14.4 – The stable cycle distribution in Analog Devices as determined on 11 May 2009. Securities with so many stable cycles should be avoided. 242

Figure 14.5 – The recent section of the 25-day, 75-day and 151-day cycles in Analog Devices is shown in the lower panel as determined on 11 May 2009. A visual estimation of the recent sum of these three cycles would give a similar profile to that of the comparator. 242

Figure 14.6 – The 51-day channel is now shown for Analog Devices on 11 May 2009. The lower panel shows just the 75-day cycle. The relationship between the price level and the lower boundary is now at a critical point. 243

Figure 14.7 – The cycle sum in Associated British Foods as determined on 11 May 2009. The cycle sum over the recent past replicates the comparator. 244

Figure 14.8 – The recent section of the 25-day, 75-day and 151-day cycles in Associated British Foods is shown in the lower panel as determined on 11 May 2009. A visual summation would agree with the comparator. 245

Figure 14.9 – The 51-day channel is now shown for Associated British Foods on 11 May 2009. There is no indication that the channel is about to top out, as predicted by the cycle sum shown in Figure 14.7. 246

Figure 14.10 – The cycle sum in Cape Lambert Iron Ore as determined on 4 June 2009. The cycle sum over the recent past replicates the comparator. 247

Figure 14.11 – The 25-day, 75-day and 151-day cycles in Cape Lambert Iron Ore on 4 June 2009. A visual summation would be in reasonable agreement with the comparator. 248

Figure 14.12 – The 51-day channel is now shown for Cape Lambert Iron Ore on 4 June 2009. There is no indication that the channel is about to top out, as predicted by the cycle sum shown in Figure 14.10. 249

Figure 14.13 – The cycle sum in Atagas Income Trust as determined on 4 May 2009. The cycle sum over the recent past replicates the comparator. 250

Figure 14.14 – The recent section of the 25-day, 75-day and 151-day cycles in Atagas Income Trust is shown in the lower panel as determined on 4 May 2009. A visual summation would be in reasonable agreement with the comparator. 251

Figure 14.15 – The 51-day channel is now shown for Atagas Income Trust on 4 May 2009. There is no indication that the channel should have topped out in mid-April, as predicted by the cycle sum shown in Figure 14.13. 252

Figure 14.16 – The cycle sum in Dover Corporation as determined on 11 May 2009. The cycle sum over the recent past replicates the comparator. 253

Figure 14.17 – The 25-day, 75-day and 151-day cycles in Dover Corporation on 11 May 2009. A visual summation would be in reasonable agreement with the comparator. 254

Figure 14.18 – The 51-day channel is now shown for Dover Corporation on 11 May 2009. The indication is that the price is about to bounce upwards from the lower boundary of the channel which is itself rising, increasing the potential gain to be made. 255

Figure 14.19 – The vertical line shows the 90% probable price range for Dover Corporation predicted for five days ahead from 11 May 2009. 256

Figure 14.20 – The cycle sum in Addax Petroleum as determined on 4 May 2009. The cycle sum over the recent past replicates the comparator. 257

Figure 14.21 – The 25-day and 75-day cycles in Addax Petroleum on 4 May 2009. A visual summation of these would be in reasonable agreement with the comparator. 258

Figure 14.22 – The 51-day channel for Addax Petroleum on 4 May 2009. The indication is that the price is about to bounce upwards from the lower boundary of the channel. 259

Figure 14.23 – The 101-day channel is now shown for Addax Petroleum on 4 May 2009. The indication is that the price will shortly retreat from the upper boundary. 260

Figure 14.24 – The vertical line shows the 90% probable price range for Addax Petroleum predicted for five days ahead from 4 May 2009. Also shown is the 51-day channel. 261

Figure 14.25 – The vertical line shows the 90% probable price range for Addax Petroleum predicted for five days ahead from 4 May 2009. Also shown is the 101-day channel. 261

Figure 14.26 – The cycle sum in Coca-Cola Amatil Ltd as determined on 9 June 2009. The cycle sum over the recent past replicates the comparator. 262

Figure 14.27 – The 25-day, 75-day and 151-day cycles in Coca-Cola Amatil Ltd on 9 June 2009. A visual summation of these would be in reasonable agreement with the comparator. Overall, the longer-term trends illustrated by the 75-day and 151-day cycles have topped out. 263

Figure 14.28 – The 51-day channel for Coca-Cola Amatil Ltd on 9 June 2009. The indication is that the price is about to bounce downwards from the upper boundary of the channel. 264

Figure 14.29 – The vertical line shows the 90% probable price range for Coca-Cola Amatil Ltd predicted for five days ahead from 9 June 2009. Also shown is the 51-day channel. 265

List of Tables

Table 2.1 – Daily changes in AstraZeneca, Jardine Lloyd Thompson and Tesco from 2003 to 2009. 11

Table 2.2 – Synchronised daily changes for AstraZeneca (AZN), Jardine Lloyd Thompson (JLT) and Tesco (TSCO). 11

Table 2.3 – Change in some world markets over three months from the end of October 2008 to the end of January 2009. 13

Table 2.4 – Approximate percentage of rising stocks over the period from the end of October 2008 to the end of January 2009. 14

Table 2.5 – Daily changes in closing values for FTSE 100 and DJIA. The 'Next day' column is for synchronisation of the FTSE 100 Index with the previous day's close of the DJIA. 15

Table 2.6 – Daily changes in the DJIA greater than the specified percentage and whether London moved in the same direction the next day. The data was obtained over 2300 days. 16

Table 2.7 – Daily changes in the FTSE 100 Index greater than the specified percentage and if Wall Street moved in the same direction the same day. The data was obtained over 2300 days. 16

Table 3.1 – Sequences of isolated rises, falls and no change in AstraZeneca over a period of 1596 daily changes. 24

Table 3.2 – Expected sequences of isolated rises, falls and no change in AstraZeneca over a period of 1596 daily changes. 25

Table 5.1 – Comparison of the 95% probable price range for AstraZeneca price from 1 to 9 days forward. The starting price on 23 February 2009 was 2393p. The column headed Millard is from the actual distribution, and the column headed Millard M.C. is from a simulation with 2000 trials. 50

Table 5.2 – The movement of AstraZeneca nine days forward from 23 February 2009. 51

Table 5.3 – Comparison of the 95% probable range for American Express price from 1 to 9 days forward. The starting price on 6 March 2009 was $10.26. The column headed Millard is from the actual distribution and the column headed Millard M.C. is from a simulation with 2000 trials. 53

Table 6.1 – Known cycles in stock market data. 71

Table 6.2 – Market cycles according to J.M. Hurst. 72

Table 10.1 – The probability of the price changes being sufficient to keep the nine-point centred average rising. 130

Table 10.2 – The probability of the price changes being sufficient to keep the 15-point centred average falling. 133

Table 10.3 – The probability of the price changes being sufficient to keep the nine-point centred average rising. 135

Table 10.4 – The probability of the price changes being sufficient to keep the 15-point centred average falling. Point 1368 on 2 June 2008 is the last real data point. 138

Table 10.5 – The probabilities of the 15-point centred average of Eastman Kodak stock continuing to fall out over the period of half a span into the future from the last data point at point 1372 on 6 June. 140

Table 10.6 – The probabilities of the 15-point centred average of Eastman Kodak stock continuing to fall out over the period of half a span into the future from the last data point at point 1373 on 9 June. 141

Table 10.7 – The probabilities of the 15-point centred average of Eastman Kodak stock continuing to fall out over the period of half a span into the future from the last data point at point 1377 on 13 June. 142

Table 12.1 – The data from three bottom-to-top channel rises in Safeway Inc. stock. The 51-day channel is rising. 177

Table 12.2 – The data from three bottom-to-top channel falls in AstraZeneca stock. The 51-day channel is falling. 188

Table 13.1 – Predicted turning points in the cycle sum compared with actual turning points in the nine-day centred average. 231

1

Introduction

It is now just about ten years since I wrote my last book, *Channels & Cycles: A Tribute to J.M. Hurst*. I have been gratified by the response I have had to that book and the many kind comments I have received about my approach to trading on the stock market.

I still acknowledge that Hurst set me on the road along which I have been travelling since that time in 1979 (is it really 30 years ago?) when I picked up his book *The Profit Magic of Stock Transaction Timing*. This book was reprinted by Traders Press in 2000, and I urge readers to take advantage of its restored availability. For those around when it was first published in 1971 it was a breath of common sense in showing what is possible when approaching the markets with a measured, logical technique based on firm mathematical and scientific logic. New readers will see it in a different light, because now there are many authors and many software packages that use these important principles. To these new readers it might not now appear as revolutionary as it did when first published, but they will still enjoy Hurst's writing style and the book's logical approach to the improved timing of buying and selling decisions.

When considering a title for this book, I started by thinking about what goes through a trader's mind when contemplating a trade. It is usually: 'I think the price of this security will rise/fall within *n* hours/days/weeks/months.' The thought process of a much smaller number of traders will be: 'There is a high probability that the price of this security will rise/fall within *n* hours/days/weeks/months.'

Provided the second type of trader has carried out his analysis carefully, he will in the long run be more successful than the first type of trader.

You can now see my dilemma in choosing the title for this book. Should I stress the novelty aspect of using cycles in a way that hasn't been attempted before, or should

I stress the importance of making sure that probability is always on your side? In the end I opted for novelty, being aware that novelty is always appealing.

Readers of my books on channel analysis will be aware that the most difficult aspect of that technique is in deciding when a channel has changed direction. How the channel has behaved in the gap between its last calculated value (half of the span used to calculate it back in time from the present) is open to interpretation. It is this which has been the subject of my research over the last ten years and which lies behind my writings in this book.

In *Channels & Cycles* I made the point that channel analysis could be carried out with a paper and pencil and that a computer was not strictly essential. However, the study of cycles and their relationship to channels has now moved on so much that a computer is absolutely essential. Some of the scans of cycles that I will describe take tens of millions of calculations to perform and quite clearly a fast computer is therefore essential.

Except for the cycle scans described in this book that are unique to the packages Channalyze and CCS Visions, the isolation of single cycles can be performed by any software package that allows you to specify your own calculations. These types of calculation can also be carried out in a spreadsheet application such as Microsoft Excel. Of course, in all of these cases a good amount of accurate historical data is required so that long-term cycles can be studied.

Channels can be drawn by Channalyze, but for other software packages a paper and pencil can still be useful for drawing constant depth channels based on a centred moving average which has been calculated by the computer software. These constant depth channels should not be confused with Bollinger bands, which virtually all software packages can produce. Bollinger bands are not of constant depth and, unlike channels, bear no obvious relationship to cycles.

I chose the title *Future Trends from Past Cycles* because it clearly describes what the book is all about. Although no mention is made of channels in this title, channels are an essential part of taking an investment decision. The channel is based on the future trend, but knowledge of the future trend does not in itself give the trader the optimum time to place a trade. I took a rather different approach in *Channels & Cycles*, placing more weight on a discussion of channels and less on cycles. The balance in this book is reversed, since quite clearly all channels are derived from cycles, or rather sums of cycles.

Definition of a Trend

Different readers will have different perceptions of what constitutes a *trend*. There are many uses of this word in technical analysis. There is, however, one property that is often overlooked, but which is essential, and that is a timescale. Each trend should have a timescale associated with it. Once this is accepted, then it is perfectly reasonable to separate trends into short-term, medium-term and long-term.

Definition of a Cycle

A perfect cycle in the market is a sine wave. Associated with the sine wave is a wavelength, measured in minutes, hours, days, weeks, years, etc and an amplitude. The amplitude is measured in whatever units the security is quoted, such as points for an index, a ratio for foreign exchange and currency units such as pounds, dollars and euros for stocks. A third parameter is the phase, which is how far along the cycle is from some arbitrary starting point. We will see later that sine waves are described by an equation, which allows us to know its future path provided we know the three parameters which are unique to that particular sine wave.

Unfortunately, market cycles are not stable throughout their lifetime, and their amplitude will change after a period of time, rendering predictions unreliable. The way around this dilemma is to use only those cycles which have been stable for a short period of time and should remain so in the near future.

Determining Trends

The title of this book explains what it is all about. It is to determine as far as possible the future direction of a trend of interest, whatever its timescale. The title also explains that this can be done by an analysis of cycles present in market data. While stable-cycle analysis is the prime method, it is only one of the three analyses which must be carried out before a decision is taken about the future direction. These three analyses are:

1. Cycle analysis: determining those cycles which are currently stable and adding the appropriate cycles in order to estimate the future path of the trend. The current stability of the cycle sum is checked by means of a comparator, a centred nine-day moving average.
2. Channel analysis: confirming that the trend estimated by the cycle sum is supported by channel analysis.

3. Probability analysis: confirming that the trend is also supported by an analysis of the predicted probable price range a few days into the future.

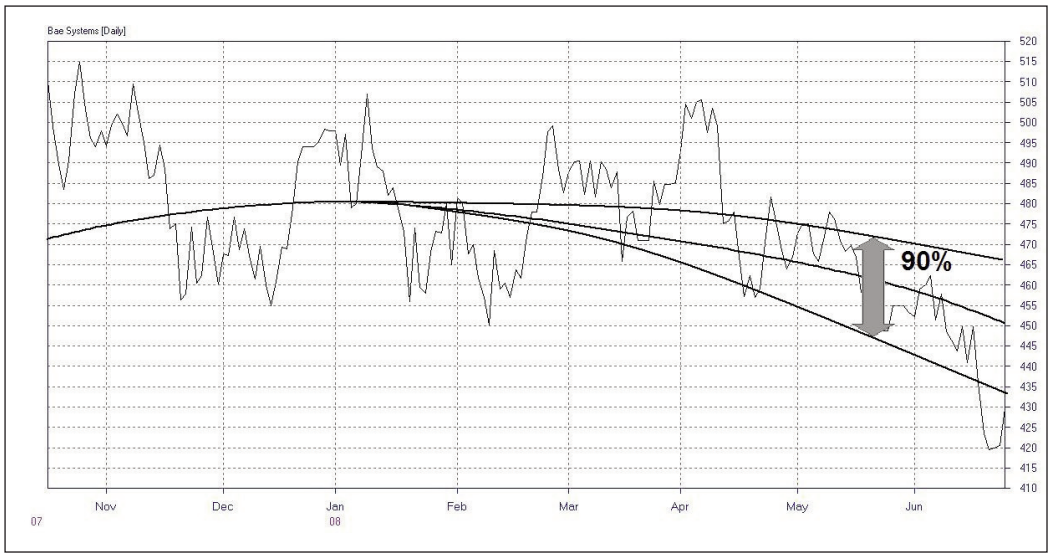
Following this sequence of analyses, the ideal situation will be when a predicted change in direction of a trend is imminent and is likely to happen a few days into the future. The progress of the estimated trend can then be followed each day as more price information arrives. If the new information indicates that the trend estimation is beginning to vary from the initial prediction, then move to another security.

Before taking a position in the security, it is essential that the change in direction is confirmed. Because of the fact that market cycles are constantly varying, changes in direction must never be anticipated.

Trend position

Naturally, an estimation of a future trend will be liable to an uncertainty in its position over the course of time. This is illustrated in Figure 1.1.

Figure 1.1 – There will be an uncertainty in the location of the central trend line.



In the example shown in Figure 1.1 there is a 90% probability that the trend line lies between the two positions indicated by the vertical arrow.

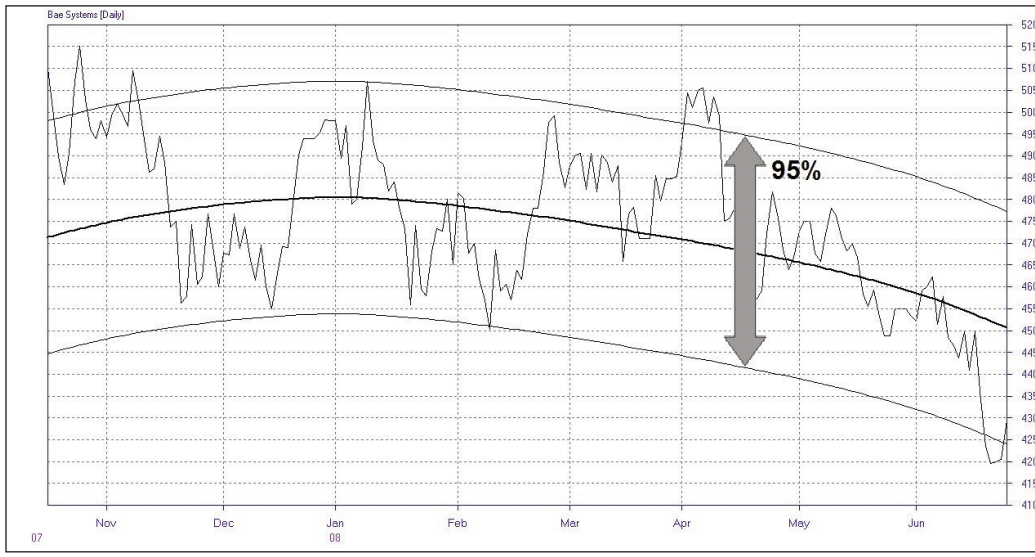
Price position

> “Before taking a position in the security, it is essential that the change in direction is confirmed.”

Once we have determined the likely position of the trend, our attention will turn to the relationship between the value of the security, stock, index or foreign exchange ratio, and the estimated position of the trend. In my previous work on channel analysis I showed that the values of securities oscillate around a central trend and that there is a limit to this oscillation. This limit depends upon the timescale of the trend and differs from one security to another.

We will be able to draw probability boundaries that will give the probability of a price being at a particular place *relative* to a predicted central trend. This concept is illustrated in Figure 1.2.

Figure 1.2 – Probability boundaries if we assume that the central trend is in the correct position. In this case there is a 95% probability that the price lies between the two boundaries.



In the example shown in Figure 1.2 the boundaries are placed at a point where there is a 95% probability that the price lies between these two. In fact we will see later that the probability of the price being at an exact position relative to the boundary changes as we move between these two boundaries can be determined at least approximately.

When we are at, say, the lower boundary there is a high probability (but *not* 100%) that the price will rebound upwards. This means that there is a low probability that the price will fall further. Conversely, when we are at the upper boundary there is a high probability (but *not* 100%) that the price will fall back. This means that there is a low probability that the price will rise further. These boundaries are at a constant vertical distance apart throughout the whole set of data. Thus they form a constant depth channel, which is the basis of *channel analysis*. The probabilities are calculated from the distances between the value of a centred moving average at each point and the price at that point. A more exact explanation of the change in probability across the channel will be given in a later chapter.

Combining these two probabilities

It can now be seen that the prediction of the future movement of a price depends upon knowing the probable position of the future trend and the position of the price value within the constant depth channel constructed around this trend. If we use p(price) to be the probability of a future value for the stock price, p(trend) to be the probability associated with the trend position and p(relative) to be the probability of the price position relative to the channel boundaries, then it follows that:

```
p(price) = p(relative) x p(trend)
```

Based on a great deal of research into channel analysis, a reasonably accurate value can be obtained for the probability relative to the central trend (p(relative)). This is provided of course that an extensive amount of historical daily closing data is available for the particular stock, currency or commodity. The greater the amount of data, the more accurate is the value obtained. At least 1000 points must be considered to be the minimum required.

We will see later that at the present state of development of cycle prediction, we can arrive at only an approximate probability for (p(trend)), i.e. the future position of the central trend.

This is because, unlike the p(relative) calculation, which is based on real data and real values for the moving average which have been used, the future cycles are themselves estimates. They are based on the assumption that a stable cycle will remain stable for a reasonable time into the future. However, as we have mentioned, cycles will change both in amplitude and wavelength. This change will add uncertainty to the estimated future position of each cycle and therefore to the estimated sum of cycles.

More about probability

Probability is rarely discussed in books on technical analysis, most likely because it appears to be an academic topic which is difficult for the lay person to understand. However, this depends upon how the topic is addressed, and whether it is absolutely essential to the understanding of the rest of the book. I have taken the view that it can be addressed in a simplified way that will make it easy for the lay person to grasp the important fundamentals and that it is not necessary to concentrate on terrifying equations with integral signs and exponential terms to achieve this.

> “You will not be 100% correct in your decision making.”

It should be stressed here that it is not essential that the reader should grasp clearly the subjects of statistics and probability in order to profit from this book. These topics are addressed purely so that the reader can understand that there is a mathematical underpinning of the issues that are discussed later. There are many texts available and many snippets on the internet that have the objective of making statistics and probability more easily comprehensible to the layperson. Thus readers may, if they wish, skip over those chapters which discuss probability. Of course, the calculations require data, and sources of data in the correct format for using in spreadsheets and at no cost to the user are widely available online. For readers who would prefer to access these probability calculations by a quicker route, they are also available in the Channalyze program.

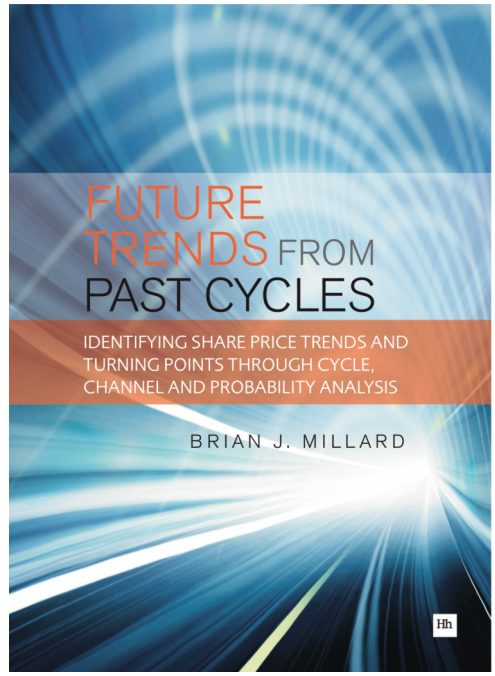
If the trader does not remain disciplined and forgets about making sure that probability is on his or her side, then failure is the almost certain outcome. Just like the casinos in Las Vegas, in the long term you will win if the odds are on your side. It only takes a small shift in the odds in your favour to improve your performance out of all recognition. Conversely, a small shift the wrong way can lead you to despair. It is essential to monitor the trend prediction constantly to make sure that a cycle that will cause an adverse shift in these trends is not rapidly gaining in amplitude.

One final message – you will not be 100% correct in your decision making. There is no such thing as a cast iron, guaranteed profit in stock, commodity or currency markets.

Future Trends from Past Cycles

Identifying share price trends and turning points through cycle, channel and probability analysis

Brian Millard



Available direct from Harriman House and all good booksellers. To order a copy of the print or eBook edition go to:

www.harriman-house.com/futuretrends

Paperback: 9781871857047
eBook: 9780857190864

Hh