HARMONIC ELLIOTT WAVE

INTRODUCTION

There is no doubt Elliott Wave is one of those techniques that traders either love or hate. For some it's almost a status symbol to be able to count waves. Others find it just too hard. I have looked over some online Elliott Wave forums on an occasional basis just to have a look at how people discuss their wave counts. It's not an infrequent comment I see when some state "I like Elliott Wave but it's like something isn't quite right." Others tend to not adhere too strictly to the rules and just observe for 5-wave moves.

Some Elliotticians swear by Robert Prechter and some find his wave counts change too much and find themselves frustrated. The appearance of extended waves confound and the retrospective failed fifth causes confusion.

In my own experience in over 20 years practicing Elliott Wave I also became aware that things were not quite right. The same anomalies in the wave structure repeated themselves over and over again. The normal Fibonacci projections which are widely quoted didn't work all that often. Impulsive waves all too often stalled early and missed out a wave. Looking at leading Elliotticians' analyses their counts rarely any adhered to any relationships…

If you are one of these Elliotticians that have had these doubts when counting waves I have news for you… You're absolutely right. R.N. Elliott made a misjudgment in the impulsive wave structure. I am 100% certain of that.

Before going on I would like to say that I do not wish to imply that R.N. Elliott failed. In my opinion he was brilliant enough to make such observations in the first place. I do not for one moment believe I could have identified and quantified the Wave Principle if I had no prior foundation on which to work.

The ability for me to identify this different structure to impulsive waves could really have only been managed with the benefit of modern calculators and charting software. With a few touches of the keyboard I am able to generate a full range of retracement levels and projections in my spreadsheet. While Elliott did have access to hourly charts, his ability to scrutinize wave relationships was limited due to the fact that he would have had to calculate a range of ratios long hand. Spreadsheets allow these to be available almost instantaneously. All that is needed is to tap in a few highs and lows.

Therefore I prefer to label my findings as a modification only. R.N. Elliott's work still remains as a remarkable feat of observation and diligence in my own mind.

THE HARMONIC WAVE STRUCTURE

Given that I believe quite strongly in the use of natural order ratios in both retracements and wave projections I have spent a great deal of time working out which waves were related. It was through this process that I thought I noticed a "Special Wave A" move that Robert Prechter noted in 1986. He observed that a diagonal triangle wave development which is normally associated with an extended Wave 5 was occasionally seen in a Wave A position.
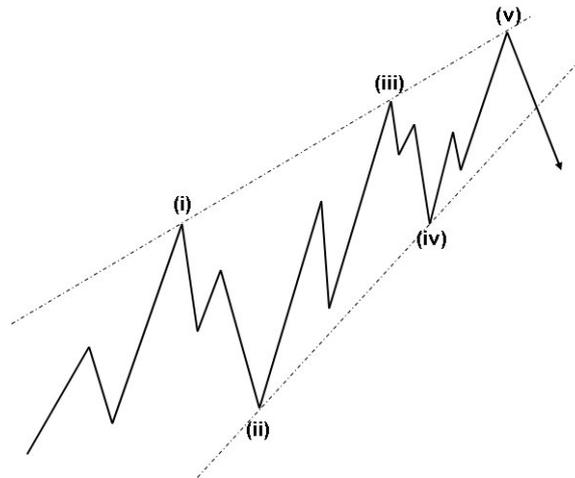
Prechter's Special Wave A developing in five sets of three-waves

However, what I was facing was a five-wave move that developed in a similar manner to a diagonal triangle, in which Waves (i), (iii) and (v) all developed in three waves and not five... This implied that any individual five-wave move could only develop in a Wave A position or in a Wave C position. In the next higher degree this ABC sequence actually formed one section of a larger five-wave sequence all constructed of three-waves.

If I attempted to apply Fibonacci relationships to the standard count that would treat these as an example of and extending wave everything fell flat. There were no relationships. When I used the three-wave structure for Waves (i), (iii) and (v) then the wave relationships were perfect – and there was no missing wave at completion.

As went through my daily ritual of tapping out various potential waves and finding relationships I suddenly found myself using this alternative all the time. The projections and retracements began to become consistently accurate.
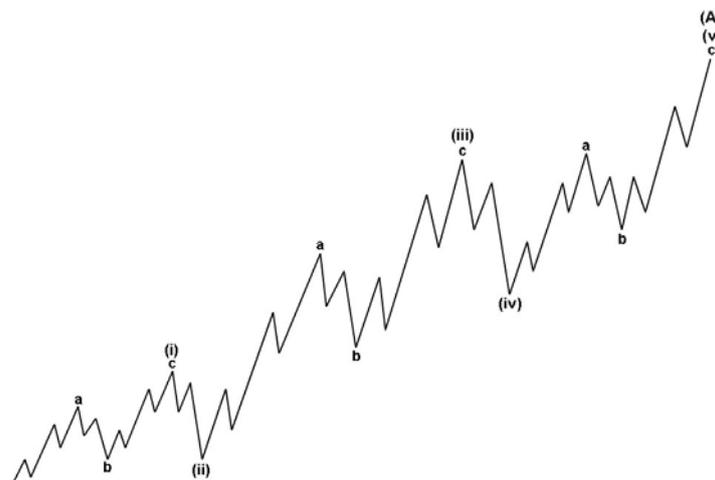
A harmonic impulse wave.

The image above displays how the harmonic impulse wave now appears. Note that each Wave a and Wave c are constructed of five waves as Elliott originally proposed. As opposed to the five wave impulse move in Elliott's original version that could form either a Wave 1, Wave 3, Wave 5, Wave A or Wave C the harmonic version can only form Wave A or Wave C.

A five-wave decline in the 10-minute USDCHF market

The chart above displays a 5-wave decline in USDCHF. While at first glance Elliotticians will declare this to be an example of an extending Wave 3 the key to confirming this harmonic structure is through the wave relationships. Before going on further I should explain how Fibonacci and harmonic ratios actually work.

APPLICATION OF FIBONCCI AND HARMONIC RATIOS

Fibonacci is widely used but not with any precise and logical manner. Harmonic ratios are hardly used at all. Let me briefly introduce how Fibonacci derived these ratios:

In the Fibonacci sequence of numbers, each number is the sum of the previous two numbers, starting with 0 and 1. Thus the sequence begins:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610 etc

At first glance it seems an innocuous sequence but as we will see it holds quite extraordinary properties.

By dividing one number in the sequence by the next the resultant ratio begins with common fractions: 1, 1/2, 2/3, 3/5... but after a while the result remains at 61.80%.

By dividing one number in the sequence by the preceding number we have similar development which sees the result remaining at 161.8%

This is the golden ratio which is found in nature, in classical architecture including the Egyptian pyramids, some Greek structures such as the Acropolis and Parthenon.

This can be developed further by dividing numbers two apart, three apart and so on in the sequence: Thus ratios a series of ratios can be generated both below 100% and also above:

Below zero:
5.6%, 9.0%, 14.6%, 23.6%, 33.3%, 38.2%, 50%, 61.8%, 66.6%, 76.4%, 85.4%, 90.0% 95.4%

Above zero:
161.8%, 261.8%, 423.6%, 685.4%, 1109.0% 1794.4%

The Square Root of Two

The square root of 2, also known as Pythagoras' constant, is the positive real number that, when multiplied by itself, gives the number 2. Geometrically the square root of 2 is the length of a diagonal across a square with sides of one unit of length; this follows from the Pythagorean theorem. It was probably the first number known to be irrational. Its numerical value truncated to 5 decimal places is: 1.41421

I do not profess to be a skilled mathematician and will go no further than this brief explanation. I was introduced to the use of the square root of two by an acquaintance in the market who described the ratio as commonly occurring within musical notes.

At first I wasn't quite sure how to use this until I began to sit down and study wave relationships and noted that two derivations of the number frequently occurred: 41.4% and it's "opposite" 58.6% being 100 − 41.4.

Alternative Wave Relationships

From the many hours of research into the common relationships between waves I noted those that are generated directly from both Fibonacci and the square root of two. However, I found more commonly in the trending wave sequence other ratios that can be derived from Fibonacci ratios.

What I noted was that specifically Wave (iii) it is possible to take the ratios less than 100% and add them to 100%, 200% and occasionally 300% and 400% etc. Earlier I listed these ratios below as:

5.6%, 9.0%, 14.6%, 23.6%, 33.3%, 38.2%, 50%, 61.8%, 66.6%, 76.4%, 85.4%, 91.0% 94.4%

To this list we can add 41.4% and 58.6%.

Mostly commonly extensions in Wave (iii) I find on a very frequent basis are:
176.4%, 185.4%, 195.4%, 223.6%, 261.8%, 276.4%, 285.4% and 295.4%

Mostly commonly extensions in Wave (c) I find on a very frequent basis are:
85.4%, 95.4%, 100%, 105.6%, 109%, 114.6%, 123.6%, 138.2% and 161.8%

APPLYING WAVE RELATIONSHIPS TO THE HARMONIC WAVE STRUCTURE

The key to the harmonic wave structure is the requirement for all degrees of the wave structure to develop with relationships that confirm each other. For example, very clearly Wave (c) must be related to Wave (a), Wave (iii) must be related to Wave (i) and the Wave (c) of Wave (iii) must have the same target areas. Within the Wave (c) of Wave (iii)

the Wave v must also develop with a ratio that confirms the same targets as the projection of Wave (i) and the projection in Wave (c). This type of harmonious development is key to confirming the structure.

Now, referring back to the earlier chart of USDCHF the following relationships were noted:

Wave (c)		Ratio		Projection	Actual
Wave -a-	1.0661				1.0661
Wave -b-	1.0661 +	Wave -a- * 100% =		1.0683	1.0682
Wave -c-	1.0682 -	Wave -a- * 194.43% =		1.0639	1.0638
Wave -i-	**1.0638**				**1.0638**
Wave -ii-	**1.0638 +**	Wave -i- * 23.6% =		1.0649	1.0650
Wave -a-	1.0557				1.0557
Wave -b-	1.0557 +	Wave -a- * 33.3% =		1.0588	1.0587
Wave -c-	1.0587 -	Wave -a- * 109.02% =		1.0486	1.0488
Wave -iii-	**1.0650 -**	Wave -i- * 361.8% =		1.0487	1.0488
Wave -a-	1.0543				1.0543
Wave -b-	1.0543 -	Wave -a- * 85.4% =		1.0496	1.0498
Wave -c-	1.0498 +	Wave -a- * 114.6% =		1.0561	1.0561
Wave -iv-	**1.0488 +**	Wave -iii- * 41.4% =		1.0555	1.0561
Wave -a-	1.0498				1.0498
Wave -b-	1.0498 +	Wave -a- * 61.8% =		1.0537	1.0537
Wave -c-	1.0537 -	Wave -a- * 161.8% =		1.0435	1.0434
Wave -v-	**1.0561 -**	Wave -i- > -iii- * 66.7% =		1.0431	1.0434

In this example the wave relationships are exceptionally accurate. It is very important to note how the internal ABC relationships confirm the projections of Waves –i- through Wave –v-. In addition, while not shown the end of Wave (c) at 1.0434 should also be a close relationship with that of Wave (a).

While a few Elliotticians with whom I have discussed the modifications have shown some shock, and in some cases horrified disbelief that I have altered Elliott's structure, this is not such a radical modification. Firstly, it merely represents what Robert Prechter noted but in special instances of a Wave A. Secondly, it actually adheres to the Dow Theory which recognizes a three wave development in price.

However, it does change the number of rising waves. In a simple five wave rally in Elliott's structure there are three impulse moves higher. In a single extended rally there are five impulse moves higher while in a double extended rally there are seven impulse moves higher. In the harmonic structure there are a standard six impulse moves higher.

Comparison of the modified rally versus a single extended Elliott rally
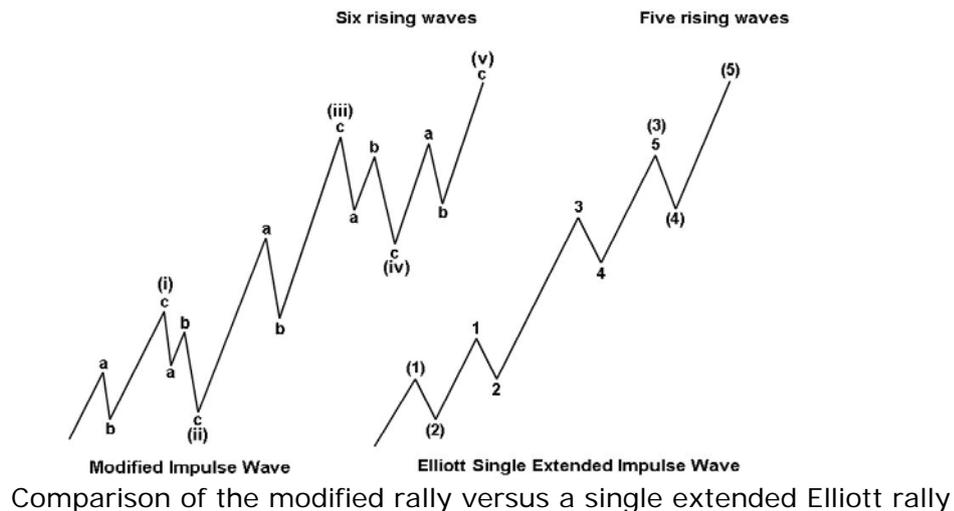
Implications in Wave Relationships

As has been mentioned on several occasions the basis quoted by leading Elliott Wave followers is that market movements follow natural ratios and therefore the sequence of waves in a structure should reflect this principle of relationships.

Elliott's Single Extended Impulse Wave

Wave (2) should be related to Wave (1)
Wave 2 should be related to Wave 1
Wave 3 should be related to Wave 1
Wave 4 should be related to Wave 3
Wave 5 should be related to a ratio of the beginning of Wave 1 to the end of Wave 3
Wave (3) should be related to Wave (1)
    NB. Therefore the target in Wave 5 should end at a projection of Wave (1)
Wave (4) should be related to Wave (3)
Wave (5) should be related to a ratio of the beginning of Wave (1) to the end of Wave (3)

The Harmonic Impulse Wave

Wave c in Wave (i) should be related to Wave a
Wave (ii) should be related to Wave (i)
Wave (iii) should be related to Wave (i)
Within Wave (iii) Wave c should be related to Wave a and match the target in Wave (iii)
Wave (iv) should be related to Wave (iii)
Wave (v) should be related to a ratio of the beginning of Wave (i) to the end of Wave (iii)
Within Wave (v) Wave c should be related to Wave a and match the target in Wave (v)

There is little difference between the two as all subsequent waves must be related to the prior Wave(s) in the sequence. However, what you will find in general is that many Elliotticians will hail the natural Fibonacci element to the wave structure and how it is therefore a natural development of waves, but will rarely actually observe them. Effectively it makes forecasting a hit-or-miss affair. This was something I could never accept.

The difference between a harmonic impulse wave and a Triple Three

On the few occasions I have mentioned my findings to others the frequent question is how to spot the difference between a harmonic impulse wave and triple three. While there will always be occasions when it is harder to follow a structure, in the majority of instances they are quite simple to identify. There are several key issues to note. While there is no single 100% solution for this there are guidelines that identify the difference on the majority of cases:

- Triple threes must develop as a corrective wave: Wave (b), Wave (ii), Wave (iv) or Wave (x). Therefore reference to the structure of the next higher wave degree is of utmost importance.

- While Waves (ii), (iii), (iv) and (v) have relationships with each other, the three groups of ABC waves in a triple three rarely have relationships between them

- While even impulse waves can get quite complex it is far more common for triple threes to display a higher level of complex structures

Let me finish this brief explanation with an example of how Elliott's structure can mislead:
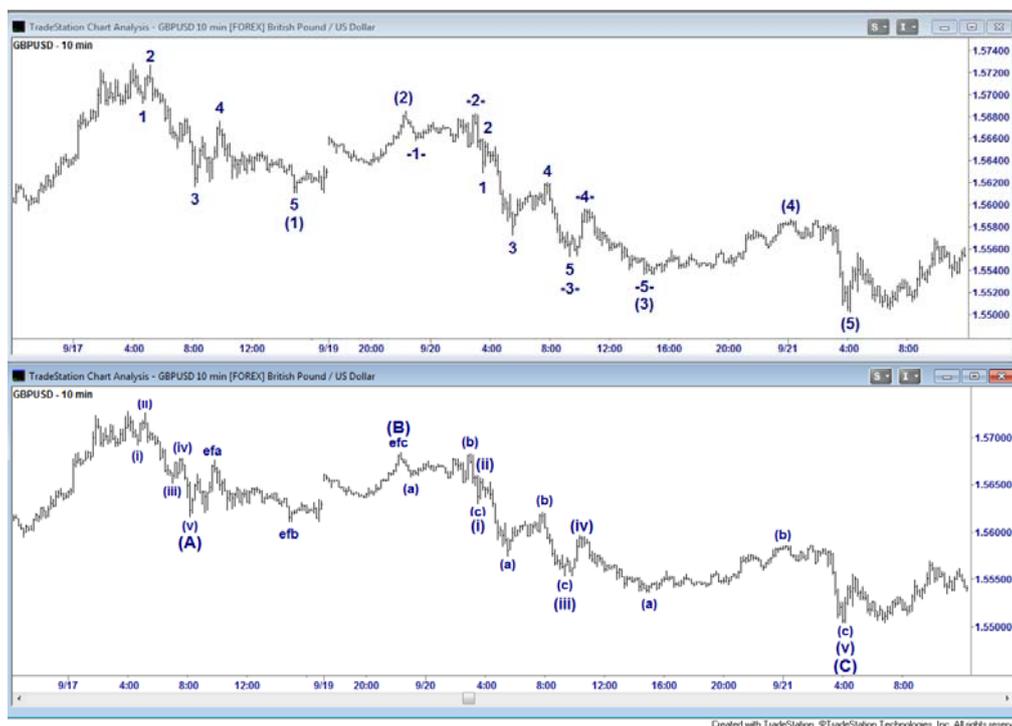
A decline in the 10-minute GBPUSD market

The charts above both display a decline in the hourly GBPUSD market. The upper chart has been labeled with what is a logical wave count under Elliott's description of the wave structure. This appears to decline in a complex five-wave move in which Wave (3) has a double extension. Apart from the correction in Wave (2) all the swing highs and swing lows are declining confirming a bearish move. This decline followed a previous move lower and therefore the implication is for another five-wave decline.

The decline in Wave (1) does follow Elliott's structure of five waves with Wave 3 being the longest and providing the main thrust of the decline. The correction in Wave (2) appears normal and this is followed by a Wave (3) which has extended twice. Wave -2- is an expanded flat with the rest of the decline developing normally.

The problems I habitually encountered with Elliott's structural development were twofold. Firstly these extended waves frequently lacked any consistent wave relationships and this generated the second problem of being able to forecast where price should stall.

The lower chart labels this completely differently as a three-wave decline. There will be many Elliott Wave practitioners that will question this but the evidence for the count come through the wave relationships which in this case provide exceptionally accurate ratios that provided me with a much easier call for a reversal higher.

Elliott complex wave		Ratio
Wave 1	1.5692	
Wave 2	1.5726	Wave 1 * 94.4%
Wave 3	1.5616	Wave 1 * 305.6%
Wave 4	1.5675	Wave 3 * 53.6%
Wave 5	1.5611	Wave 1 > 3 * 57.14%
Wave (1)	1.5611	
Wave (2)	1.5685	Wave (1) * 63.25%
Wave -1-	1.5658	
Wave -2-	1.5683	Wave -1- * 92.6%
Wave 1	1.5629	
Wave 2	1.5657	Wave 1 * 51.2%
Wave 3	1.5572	Wave 1 * 157.4%
Wave 4	1.5620	Wave 3 * 56.5%
Wave 5	1.5553	Wave 1 > 3 * 60.4%
Wave -3-	1.5553	Wave -1- * 481.5%
Wave -4-	1.5595	Wave -3- * 32.3%
Wave -5-	1.5536	Wave -1- > -3- * 44.7%
Wave (3)	1.5536	Wave (1) * 127.3%
Wave (4)	1.5585	Wave (3) * 32.9%
Wave (5)	1.5503	Wave (1) > (3) * 42.7%

Harmonic wave		Ratio	Projection	Actual
Wave (i)	1.5692			
Wave (ii)	1.5692 +	Wave (i) * 95.4% =	1.5726	1.5726
Wave (iii)	1.5726 -	Wave (i) * 198.4% =	1.5655	1.5652
Wave (iv)	1.5652 +	Wave (iii) * 33.3% =	1.5677	1.5677
Wave (v)	1.5677 -	Wave (i) > (iii) * 76.4% =	1.5619	1.5616
Wave (A)	1.5616			
Wave (B)	1.5616 +	Wave (A) * 61.8% =	1.5685	1.5685
Wave (a)	1.5658			
Wave (b)	1.5658 +	Wave (a) * 90.2% =	1.5682	1.5683
Wave (c)	1.5683 -	Wave (a) * 198.4% =	1.5629	1.5629
Wave (i)	1.5629			
Wave (ii)	1.5659 +	Wave (i) * 50.0%	1.5657	1.5657
Wave (a)	1.5572			1.5572
Wave (b)	1.5572 +	Wave (a) * 58.6% =	1.5622	1.5620
Wave (c)	1.5620 -	Wave (a) * 76.4% =	1.5555	1.5553
Wave (iii)	1.5657 -	Wave (i) * 185.4% =	1.5553	1.5553
Wave (iv)	1.5553 +	Wave (iii) * 41.4% =	1.5596	1.5595
Wave (a)	1.5536			1.5536
Wave (b)	1.5536 +	Wave (a) * 85.4% =	1.5586	1.5585
Wave (c)	1.5585 -	Wave (a) * 138.2% =	1.5503	1.5503
Wave (v)	1.5595 -	Wave (i) > (iii) * 66.7% =	1.5507	1.5503
Wave (C)	1.5685 -	Wave (A) * 161.8% =	1.5504	1.5503

Elliott's original structure   Harmonic wave structure

The table to the left displays the wave relationships implied by Elliott's original wave structure. As can be seen there is a mixture of wave relationships. While there are some that have the normal wave relationships I look for, within a reasonable deviation, I have highlighted those which really would have posed serious issues in forecasting. Indeed, there would be no real way to accurately anticipate the end of the waves.

It was this type of imprecision that I found difficult to accept. On many occasions the failure to be able to identify turns within a reasonable margin saw reversals much earlier and left me in no-man's land wondering whether a correction was being seen and not a reversal. Anticipating extended waves and where each Wave 1 would stall was a hit-or-miss affair and then everything became much more problematic.

The table to the right displays the relationships in the harmonic wave structure. The clarity of the wave relationships stand out from the first five-wave decline in Wave (A). Every single relationship is common for its own position, the 198.4% projection in Wave (iii), the 33.3% retracement in Wave (iv) and the 76.4% projection in Wave (v). The maximum variance was just 3 points.

The correction in Wave (B) developed as an expanded flat with the pullback being exactly 61.8%. These common relationships continued throughout the entire decline even to the end where the extension in Wave (v) of Wave (C) was only 4 points while the projection in Wave (C) was 1 point away from the exact 161.8% projection of Wave (A).

From that 1.5503 low price raced higher in apparent defiance of Elliott's structure. However, it was an easy call for me to make...

THE HARMONIC WAVE STRUCTURE IN OTHER MARKETS

So far I have given examples in the Forex market in which I have worked for most of my 28 years in markets. I had always found forecasting other markets a lot tougher. However, the harmonic wave structure has changed this and provides further evidence that it reflects the correct impulsive structure through all markets.

Here I present the Dow Jones Industrial Average market.

Development in Wave –i- and Wave –ii- of Wave (c) in Wave (iii) higher

I have been bullish on the Dow Jones Industrial Average and have made several successful calls on the business networking group LinkedIn. This has been contrary to Prechter's view and the view of many Elliotticians who have been exceptionally bearish. The larger picture is included in my book, Harmonic Elliott Wave which is due to be published by around the end of the first quarter of 2011 by John Wiley.

According to the implied wave count there should be a five-wave rally to new highs to reach a projection drawn from the daily Wave (i) that should match a projection in Wave (c). Therefore the initial move should begin with a three-wave Wave –i-. The hourly chart above provides the development of the Wave –i- and Wave –ii- of Wave (c) of Wave (iii) higher from the 9,614.32 Wave (b) low.

The first rally would most probably stall just below the last Wave –b- in the decline from 11,258.01. Indeed, the Wave (a) of Wave –i- did just that and provoked a correction in Wave (b) that slipped just below the previous Wave iv of Wave (a) and to a 50% retracement. From there a further five-wave rally developed that extended 4.0 of Wave (a) to complete Wave –i- and generate a pullback in Wave –ii- that corrected between 66.7% and 76.4%.

The following tables provide the wave relationships for each section of the entire rally and correction:

Wave (a) & (b) of Wave -i-		Ratio	Projection	Actual
Wave i	9857.60			9857.60
Wave ii	**9857.60 -**	Wave i * 85.4% =	**9649.90**	**9659.16**
Wave a	9898.24			9898.24
Wave b	**9898.24 -**	Wave a * 23.6% =	**9841.82**	**9854.20**
Wave c	**9854.20 +**	Wave a * 109.2% =	**10115.28**	**10115.08**
Wave iii	**9659.16 +**	Wave i * 185.4% =	**10110.07**	**10115.08**
Wave iv	**10115.08 -**	Wave iii * 14.6% =	**10048.52**	**10032.73**
Wave a	10216.64			10216.64
Wave b	**10216.64 -**	Wave a * 38.2% =	**10146.39**	**10146.56**
Wave c	**10146.56 +**	Wave a * 141.4% =	**10406.51**	**10407.52**
Wave v	**10032.73 +**	Wave i > iii * 76.4% =	**10415.26**	**10407.52**
Wave (a)	**10407.52**			**10407.52**
Wave a	10240.56			10240.56
Wave b	**10240.56 +**	Wave a * 85.4% =	**10383.14**	**10378.98**
Wave c	**10378.98 -**	Wave a * 223.6% =	**10005.66**	**10008.21**
Wave (b)	**10407.52 -**	Wave (a) * 50.0% =	**10010.96**	**10008.21**

All the projections were reflective of the normal ratios for each respective move with the exception of Wave c of Wave v which extended by an unusual 141.4% representing a harmonic extension. However, this was within 10.00 of the 76.4% projection in Wave v. The correction in Wave (b) was just about exactly 50.0% with a 223.6% projection in Wave c, a ratio that doesn't occur frequently but one I have noted in the Forex market also.

Wave (c) of Wave -i-		Ratio	Projection	Actual
Wave (a)	10008.21			10008.21
Wave i	10264.85			10264.85
Wave ii	**10264.85 -**	Wave i * 76.4% =	**10068.78**	**10065.66**
Wave a	10363.09			10363.09
Wave b	**10363.09 -**	Wave a * 23.6% =	**10292.90**	**10282.45**
Wave c	**10282.45 +**	Wave a * 100.0% =	**10579.88**	**10584.69**
Wave iii	**10065.66 +**	Wave i * 198.4% =	**10574.83**	**10584.69**
Wave a	10388.22			10388.22
Wave b	**10388.22 +**	Wave a * 66.7% =	**10519.19**	**10522.25**
Wave c	**10522.25 -**	Wave a * 90.2% =	**10345.03**	**10347.50**
Wave iv	**10584.69 -**	Wave iii * 41.4% =	**10369.81**	**10347.50**
Wave a	10495.99			10495.99
Wave b	**10495.99 -**	Wave a * 66.7% =	**10397.01**	**10393.59**
Wave c	**10393.59 +**	Wave a * 223.6% =	**10725.61**	**10719.94**
Wave v	**10347.50 +**	Wave i > iii * 66.7% =	**10732.01**	**10719.94**
Wave (c)	**10008.21 +**	Wave (a) * 90.2% =	**10723.61**	**10719.94**
Wave -i-	**10719.94**			**10719.94**

The five-wave rally in Wave (c) developed with greater correlation of projected targets throughout culminating in a 66.7% projection in Wave v implying a target 12.6 above the final stalling point which matched with the 90.2% projection in Wave (c) after a solid bearish divergence.

Wave -ii- retraced between 66.7% and 76.4% of Wave -i- and from there we have seen a rally that is currently challenging the 11,258 high which will form Wave -a- of Wave -iii-.

CONCLUSION

I have been able only to include a limited number of examples in this article but I hope sufficient to provide solid evidence that R.N. Elliott did unfortunately make a misjudgment in the impulsive wave structure, but an understandable one given the limited resources in being able to thoroughly research all wave relationships without extensive manual calculations.

However, I should add that the harmonic wave structure is not a holy grail and there is always a strong element of subjectivity which can occur, specifically when Waves (i) and (ii) are difficult to identify with any certainty.

I provide more detailed explanations on the various implications of the harmonic wave structure in my book and a greater number of examples.

I have been working with this structure for several years, slowly learning the various rules and guidelines that have required a degree of adaptation including alternation, deep Wave (b)'s and common ratios.

There is no doubt in my mind whatsoever that the harmonic wave structure provides a stronger framework on wave recognition and improves the ability to forecast by a very significant degree.

Ian Copsey
www.harmonic-ewave.com