

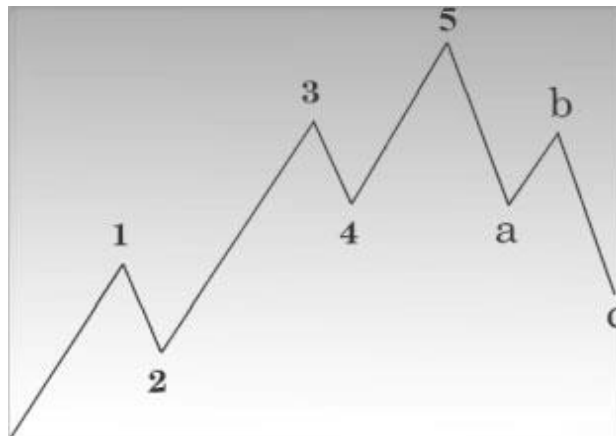
## Lecture № 11

### Wave Analysis Elliott Wave Principle

In this lecture we will take a look at the basis of one of the best existing forecast instruments which is called the Elliott Wave Principle. The Wave Principle is a discovery by Ralph Nelson Elliott showing that the public behavior (or crowd psychology) improves and changes in the form of identifiable models. Using the exchange market data as the main instrument, Elliott discovered that the ever-changing price configuration of the exchange market shapes up a certain structured pattern, which describes a fundamental natural harmony. On the basis of this discovery he developed a rational market analysis system. Elliott pointed out there are movement patterns, or waves, emerging repeatedly in the market price movements and they are similar in form, but not always in timeframe and amplitude. He named these models, gave definitions and illustrations. Thereafter, he described how these structures link together to form a zoomed version of these models, and how they build the extended identical models. To be brief, the Wave Principle is a catalogue of price adjustments models and explanations of where it is most likely to see such figures in the market development process. Elliott classifications present a rule set for the market behavior explanation. Elliott posited the prediction significance of the Wave principle, which was named after him.

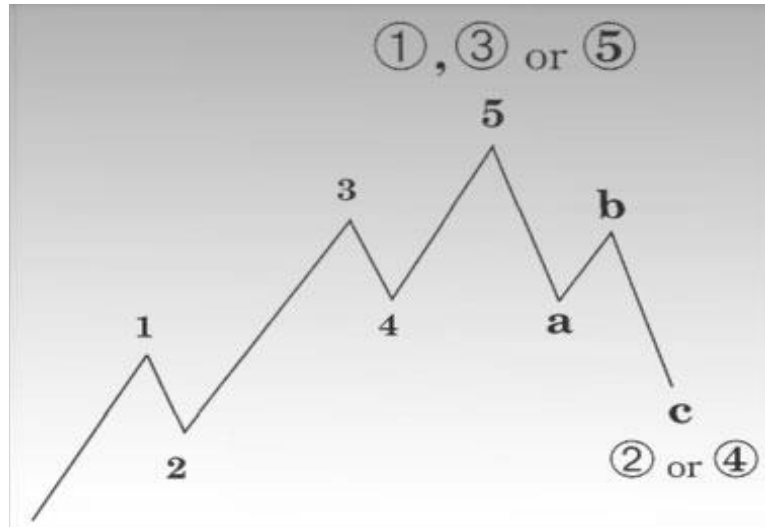
#### Essential concepts

The main market cycle motion runs up according to the structure consisting from a 5-wave sequence, which is corrected by a 3-wave structure in the opposite direction (pic1).



*Picture 1. The Wave Principle.*

The enumerated phases called ‘cardinal waves’ by R.N. Elliott are now known as ‘impulsive waves.’ The sideward phases nowadays are now ‘corrective waves’ or sometimes just ‘triplets.’ Wave 2 corrects wave 1; wave 4 corrects wave 3. The full sequence of waves 1-5 is corrected by the a-b-c sequence. Looking at a larger-scale image the wave sequence 1-5 shapes up a higher level wave. Thus, the 1-5 wave movement and the a-b-c sequence complete the wave (picture 2).



*Picture 2 Schematic wave diagram*

In the microscale each wave in picture 2 can be divided into small wave components:

- wave 2 corrects wave 1;
- wave 4 corrects wave 3;
- The a-b-c sequence corrects the sequence of waves 1-5 (picture 3).



*Picture 2a The EUR/USD pair graph*

In picture 2a on the EUR/USD currency pair graph we can see the full Elliott wave cycle. The main cycle waves are traced with a red line, while yellow lines signal the small wave components of the main waves.

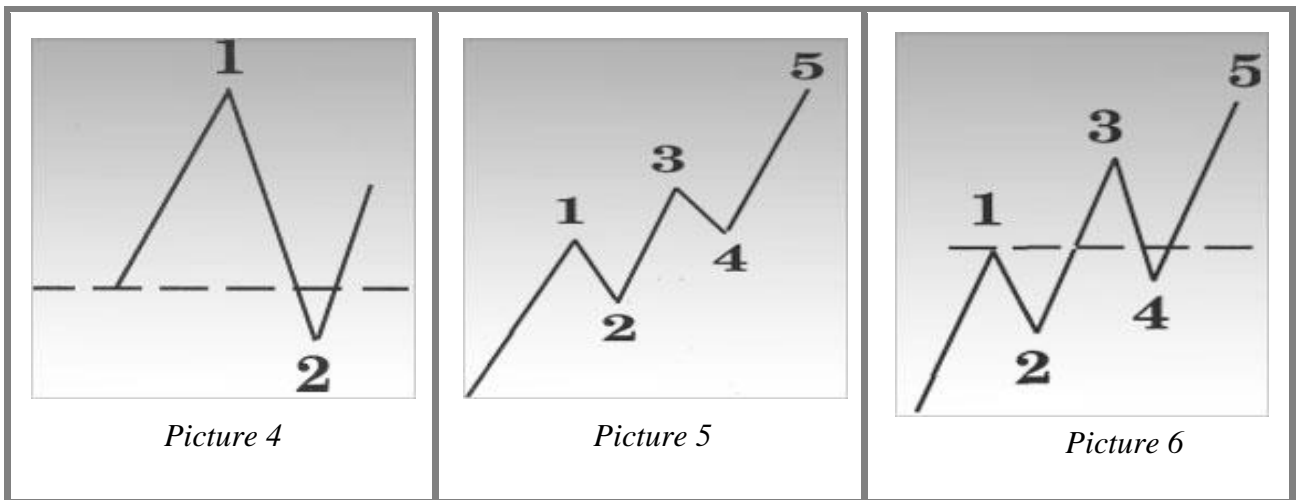


*Picture 3 Wave fragmentation into small wave components.*

*There are three unbreakable rules:*

- Wave 2 never turns back (reverses) further than wave 1. If the impulsive waves are directed up, wave 2 cannot slide below the starting point of wave 1 (see picture 4). If the impulse sequence goes down, wave 2 cannot surge above the peak from which wave 1 rose.
- Wave 3 cannot be the shortest among the impulsive waves (see picture 5). Wave 3 is not required to be the longest, but it almost always is.
- In an increasing sequence wave 4 cannot step out of wave 1's peak range. In a falling sequence wave 4 cannot tick above wave 1.

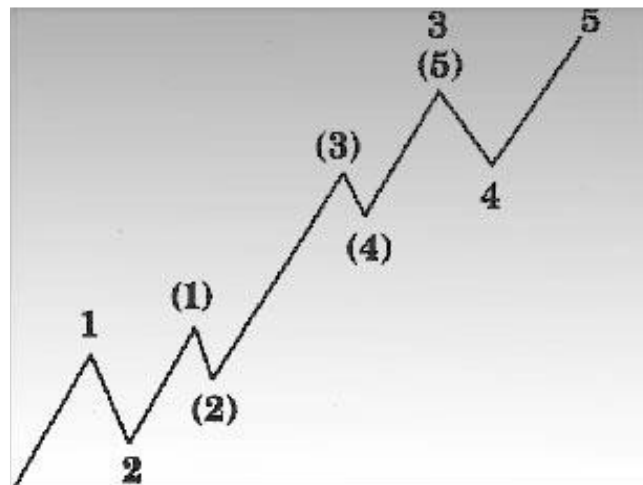
*If even one of these rules is broken, the sequence is not impulsive (picture 6).*



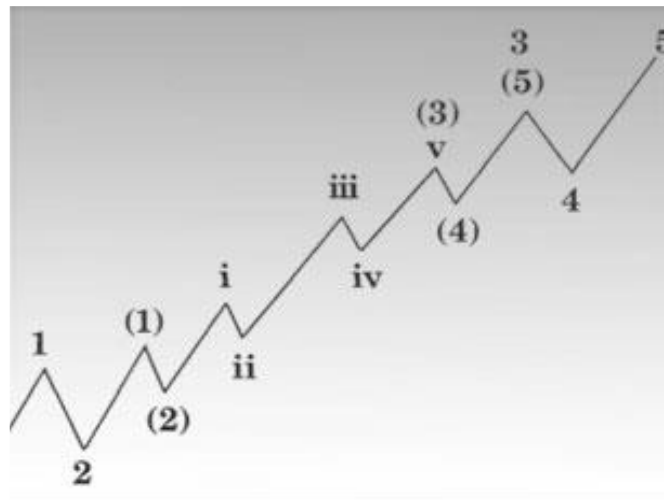
In pictures 4, 5 and 6 the wave markings are shown, according to the principle.

### Impulsive waves

In one of the waves a variation known as an *extension* may take place. An extension is an exaggerated or overextended movement which doesn't fit into the scale, compared to other impulse waves. Take into account that extensions can be only in one of the impulsive waves (in the 1<sup>st</sup>, 3<sup>rd</sup> or 5<sup>th</sup>). Most often these extensions occur in the 3<sup>rd</sup> wave. They can also emerge in an extended wave.



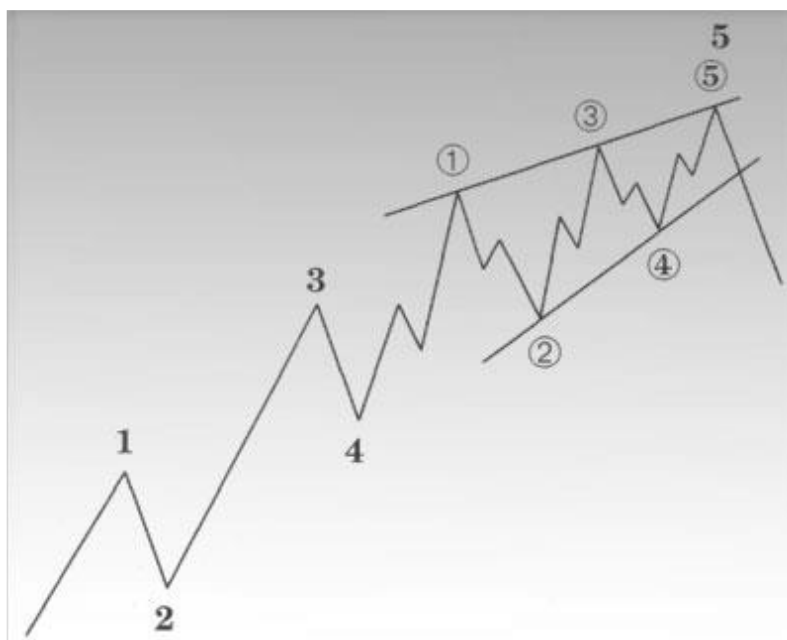
Picture 7. Sequence from (1) to (5) in wave 3.



*Picture 8 Sequence from I to V – an extended wave (3); it is the part of the extended wave 3.*

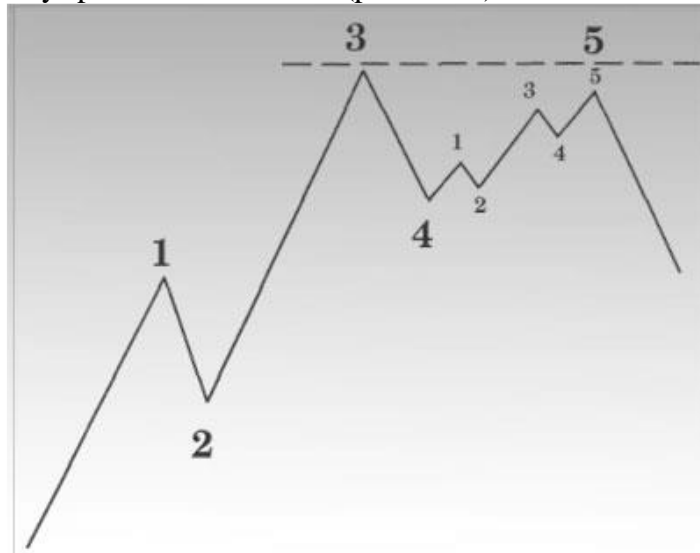
There is one more variety of impulsive waves – the diagonal triangle, a wedge-shaped structure formed by two concurrent lines (in their normal form). Such structures may be witnessed in wave 5, usually after a drastic and short-term motion of the previous wave 3. Usually in such a wedge the sub-waves have a triplet or a quintuplet form. A crossover between the endings of lines 1 and 4 is also frequently seen. It is the only well-known exception from Elliott's non-crossing rule about waves 1 and 4.

An example is given in picture 9. Diagonal triangles can also be found as a part of the sideward phase, i.e. in the corrective waves. In case of wedges in wave 5, these formations signal the movement is ending one level above the predicted one.



Picture 9. Wave 5 — a diagonal triangle

Meanwhile, the 5<sup>th</sup> wave is not able to overcome the previous wave 3 ending level. A concept with this meaning is negatively inspired – a failure. You can make sure of the existence of such a structure if the internal waves of the failed 5<sup>th</sup> wave correspond to all three rules related to the impulse waves. Failure is a reversal structure which generated the double tops or double lows, well known in classical charts. This structure is rarely seen at the minutes or minors, but it is widely spread at the minuets (picture 10).



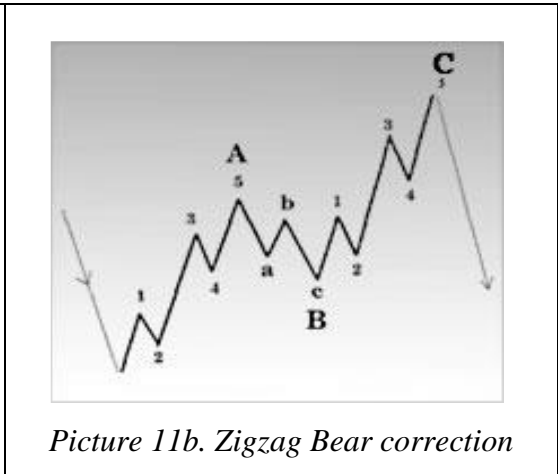
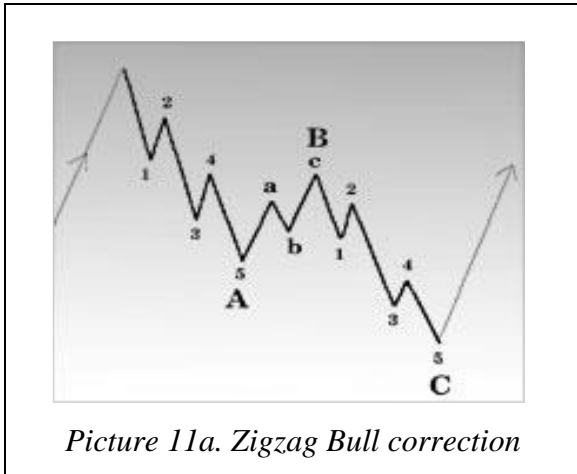
Picture «Double top» structure or «failure».

### Corrective waves

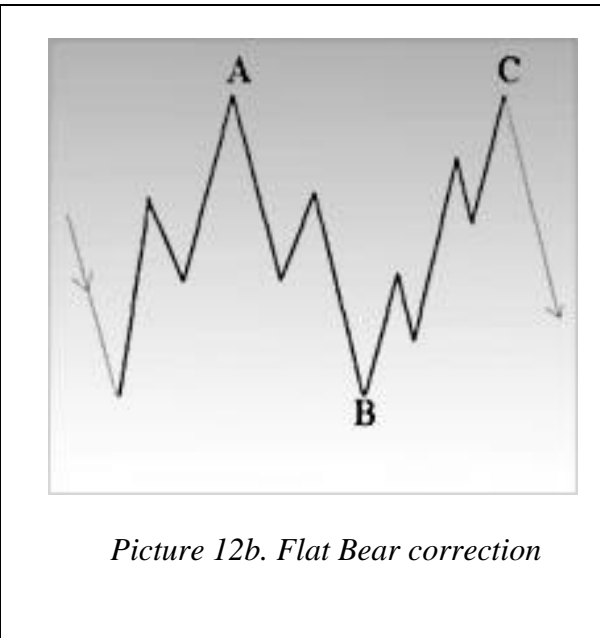
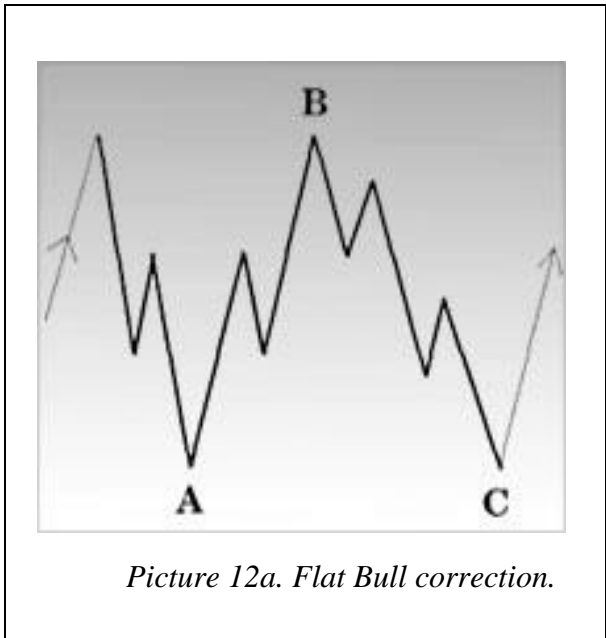
Movements directed against the trend are called **corrective waves** or simply **corrections** (retracements). Sometimes they might be called consolidations or a lateral phase. The sole, most essential rule derived from the examination of different corrective patterns, is that the rollbacks can never turn into **quintuplets**. Only moving waves can be the quintuplets. For this reason, the starting 5-wave motion against the older wave level is never a correction end; it is just a part of it.

Correctional processes are carried out in two ways. Sharp kick-backs bend steeply against the movement direction of the older wave level. Although the sideways corrections always carry out the total rollback from the preceding wave, usually they include a move to its starting point or even outside of its bounds, shaping up a lateral movement facade. The separate corrective patterns break down into the following main categories:

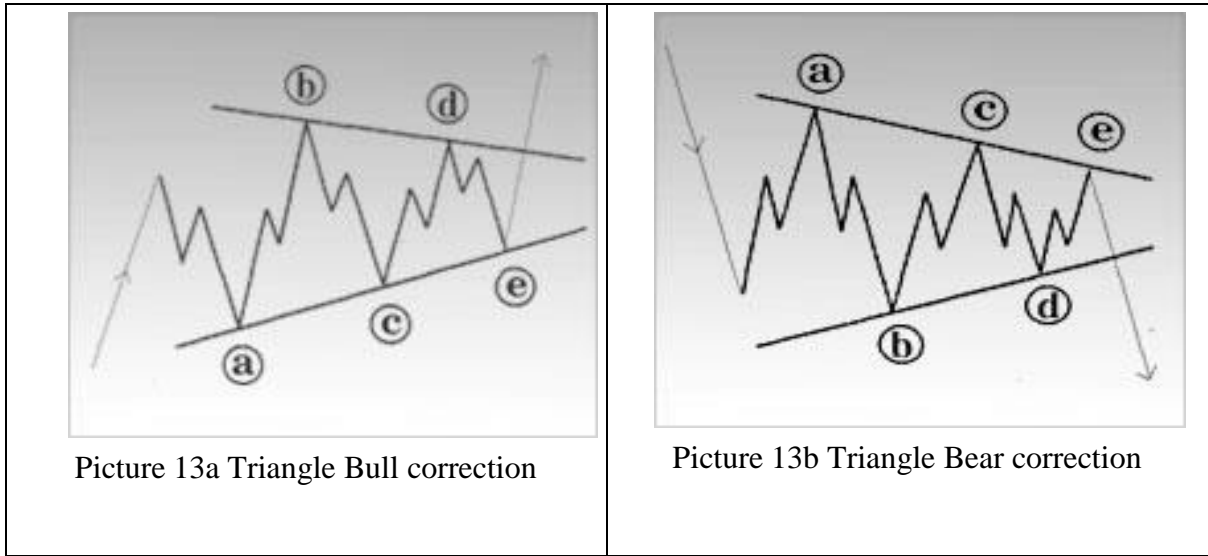
- Zigzags (5-3-5), (pictures 11a-b).



- Flats (3-3-5), (picture 12a-b).



- Triangles (3-3-3-3), (picture 13a-b)

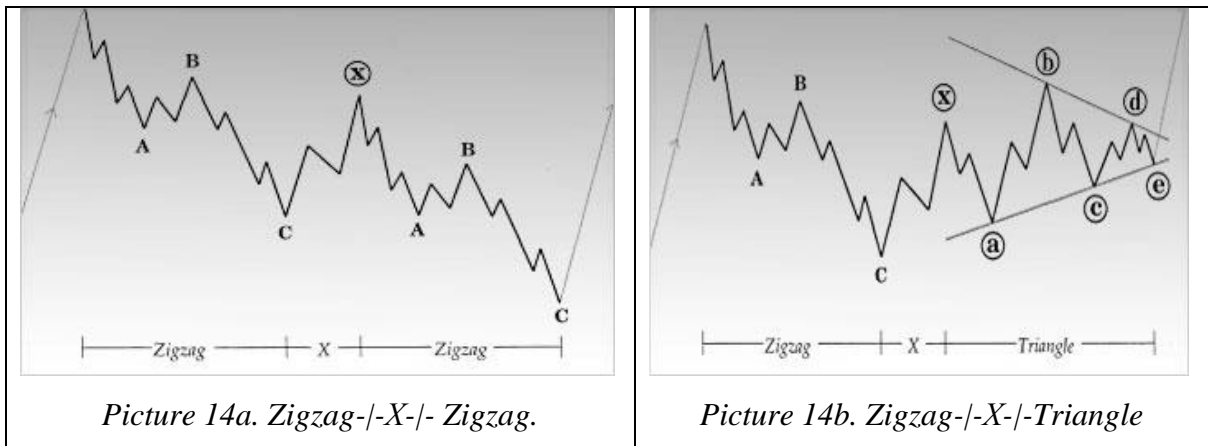


Picture 13a Triangle Bull correction

Picture 13b Triangle Bear correction

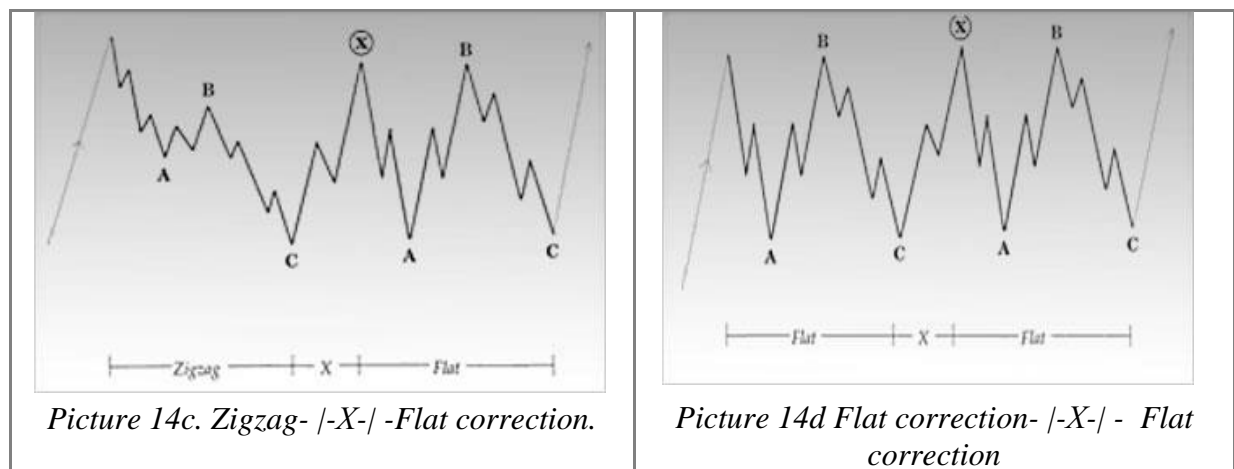
These standard pattern combinations comprise the 4<sup>th</sup> category:

- Double triplets and triple triplets (combined structures)
  - a) Composite corrective forms - Double triplets/Flat-complex (picture 14a — e).



Picture 14a. Zigzag-|-X-|- Zigzag.

Picture 14b. Zigzag-|-X-|- Triangle



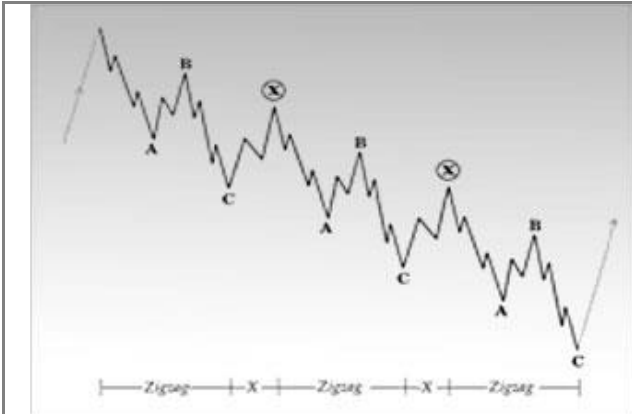
Picture 14c. Zigzag-|-X-|- Flat correction.

Picture 14d Flat correction-|-X-|- Flat correction

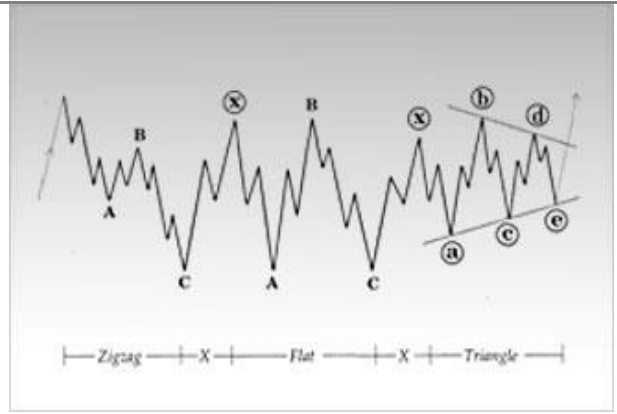


b) Composite corrective forms

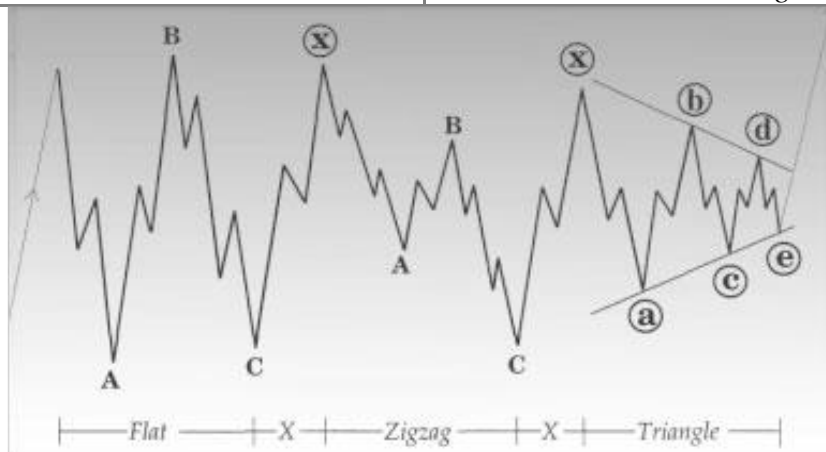
Triple triplets (picture 15a-d)



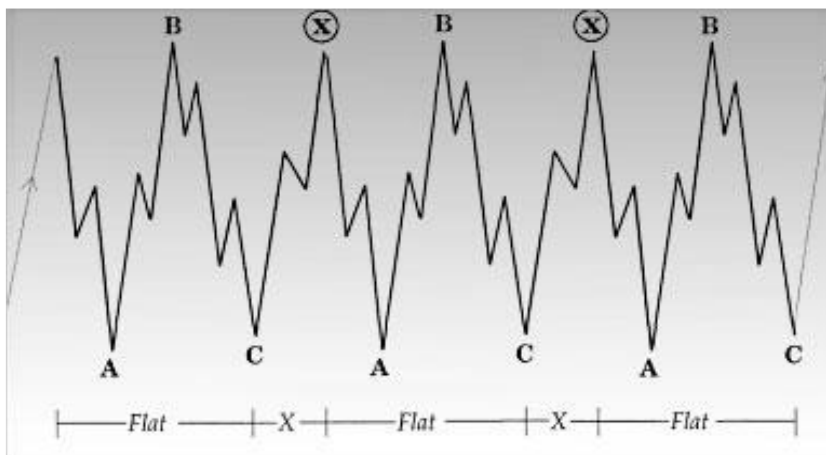
Picture 15a. Zigzag-/-X-/-Zigzag-/-X-/-Zigzag.



Picture 15b Zigzag-/-X-/-Flat correction-/-X-/-Triangle



Picture 15c. Flat correction-/-X-/-Zigzag-/-X-/-Triangle



Picture 15d. Flat correction-/-X-/-Flat correction-/-X-/- Flat correction.

You might have already noticed that the basic patterns in double and triple triplets are linked by wave X, which also turns out to be a triplet (a corrective wave) and it may be flat, zigzag or a triangle one.

### **Alternation Principle**

Despite its title, the alternation principle is exactly a principle, i.e. a valuable norm, but not a changeable rule in the wave methods. The market experience shows that the principle is valid during 90% of the time between waves 2 and 4 in a 5-wave structure. In the statement made by R. N. Elliott the principle requires the alternating occurrence of simple and composite correctional structures in waves 2 and 4. A simple deep correction (zigzags, double zigzags) in wave 2 must construct a composite sideward one (flat, triangle, double and triple triplets) in wave 4.

However, on the Forex market the Alternation principle is right mostly concerning the extent, not the *structure* of the corrections. For instance, if wave 2 rolls back by 61.8% or more from wave 1, it is most likely that wave 4 would pull back by 38.2% or less from wave 3.

If wave 2 rushes back by 38.2% from wave 1, then wave 4 will correct wave 3 by 23.6% or 50%. The opportunity of structure alternation still remains, but from time to time there may emerge significant exceptions. More often than not, the alternation process determines the extent or depth of the corrections, rather than their structure or form. This principle also requires us to look for different formations in *double* and *triple triplets*. In the double triplet the most commonly used structure is a *flat correction* or a *zigzag*. If the *triangle* is shaping up, it almost always appears to be the last structure in the correctional phase. Two consequent flat corrections signal that there will be a third one, usually a triangle. A triple triplet may be constructed from three flat corrections. The Theory requires to look for different structures in the tangent and integral subwaves in the triangle. Subwave A is not similar to subwave B; subwave B differs from subwave C, etc.

### **Fibonacci Relationships**

Elliott noticed in his *Nature's Law* that the Fibonacci sequence is a small basis of the Wave Principle. Here are the Fibonacci figures: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, etc. The sum of any two neighbor figures is equal to the next number in the sequence. For example:  $3 + 5 = 8$ ;  $5 + 8 = 13$ ;  $8 + 13 = 21$ ;  $13 + 21 = 34$ , and so on. Dividing a number from the Fibonacci sequence by the previous one gives 1.618 (for instance,  $34/21=1.618$ ). Furthermore, any Fibonacci number divided by the one that comes after it yields 0.618 (e.g.  $34/55 = 0.618$ ). The figure opposite to 1.618 is equal to 0.618. Likewise, the contrary to 0.618 is 1.618. For example:  $1/0.618 = 1.618$ , and  $1/1.618 = 0.618$ . The division of any Fibonacci figure by the previous one by two positions in the sequence increases the result to 2.618. Dividing this figure by the one two positions later in the sequence amounts to 0.382. For example  $55/144 = 0.382$ . The reciprocal figure to 2.618 is 0.382, and the figure opposite to the proportion 0.382 is 2.618. Example:  $1/2.618 = 0.382$ ;  $1/0.382 = 2.618$ . Any Fibonacci figure divided by the figure which is 3 positions before it yields 4.236. Example:  $144/34 = 4.236$ . And the same figure divided by the next one 3 positions away from it in the sequence, gives a reading of 0.236. Example:  $144/610 = 0.236$ .

The opposite figure to 4.236 is equal to 0.236, and the figure opposite to the proportion 0.236 is 4.236. Example:  $1/4.236 = 0.236$ ;  $1/0.236 = 4.236$ . A proportion which equals to 1 (par) shows the equality relation between the first two figures in the Fibonacci sequence; thus,  $1/1 = 1$ . A relation of 0.5 appears as the second and third figures ratio in the sequence, therefore,  $1/2 = 0.5$ .

Fibonacci figures don't have any value during the market extension's forecast regarding the absolute price value. The key elements here are the relations between the sequence figures. More frequently and reliably the Fibonacci figures can be seen between the alternating waves, rather than between the neighboring ones. As an example, the length of wave 3 in a 5-wave structure is influenced mostly by the length of wave 1, rather than that of wave 2. The target orientations provided by the Fibonacci relationships usually turn out to be essential support or resistance levels, even if after that their breakthrough follows. An important addition to Elliott Wave Principle appears to be a comprehension that Fibonacci proportions are the **initial determinants**, measuring the price **duration** through time in the market. The Elliott Wave Principle gives us the form and structure and Fibonacci relationships give us an instrument for measuring any price movement's potential, including the limits of a possible finishing date of these movements. This is a very powerful combination.

Let us take a more detailed look at how Fibonacci ratios behave during wave formation.

#### Impulse waves

The ending point of wave 3 is the hardest one to predict, compared to the other three impulse waves. As the third wave may be shorter than the first one (rather seldom), its closing forecast is a real trap for imprudent analysts.

If it is shorter than wave 1, wave 3 may equal to wave 1 or be longer by 1.618. In case of extensions, wave 3 may be longer even by 2.618 or 4.236 than wave 1.

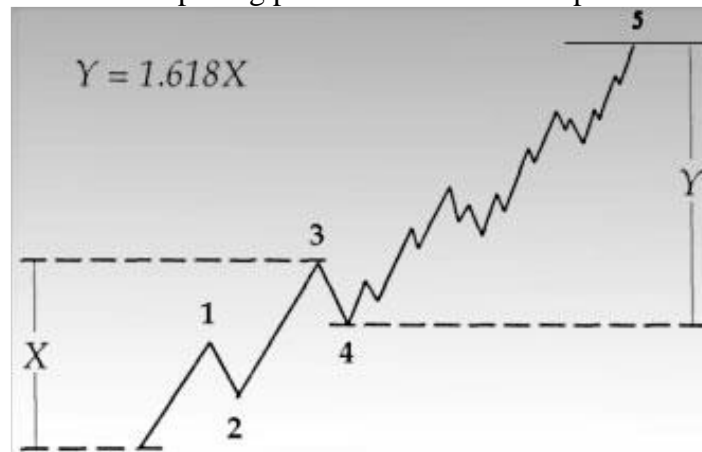
The length of wave 5 can be obtained by means of Fibonacci ratios used for the price movement between the opening of wave 1 and the closing of wave 3. A typical ratio in a 5-wave structure is: wave 5 equals to 0.382 and 0.618 from the difference between the opening of wave 1 and the closing of wave 3. Very often wave 5 happens to be longer than wave 1 by 1.618. In these ratios it is considered that waves 1 and 3 are extended.

#### Extensions

In each 5-wave structure it is worth taking into account that only one of the impulse waves (the first, third or fifth) will be extended. If wave 3 is extended, then waves 1 and 5 have the equality tendency on a price distance or an equality tendency on movement length from the opening point to the closing one. An extension in the middle of wave 3 within wave 3 usually points at the central part of the whole movement of wave 3.

Such a mysterious thing as an extension still remains one of the least clear matters in the Wave Principle. If we see a series of overlapping waves in such wave structure points, when there are no horizontal or diagonal triangles, usually it is an extension. In Forex markets about 60% of extensions appear in three forms. Extended fifth waves can occur 35% of the time, and the remaining 5% are the extended first waves. If an extended wave is found in the first 5-wave structure, the next correction of the whole structure should be expected around wave 2, instead of in the regular wave-4 range. This is especially true when wave 5 is much shorter than wave 3 in the sequence.

Within the extensions the corrections are smoother. A normal percentage of reversal against the previous wave is 23.6%; the corrections rarely exceed 38.2%. If wave 2 pullbacks from the first one by less than 50%, most probably wave 3 will be extended. Such a tendency becomes more possible if the structure of wave 2 is similar to a flat or an irregular correction. If wave 5 in any 5-wave structure is extended, then in about 80% of the cases this structure is wave 3 in the larger formation. If wave 5 is extended, its length is often 1.618 greater than the full price distance between the opening point of wave 3 and its peak. See the picture below:



Picture 16 A schematic description of wave 5 extension.

### Corrective waves

There are various methods used during the predictive modeling of the depth of corrective waves according to the Elliott Wave Principle, though the main approach applies to the multiplication of the Fibonacci ratios 0.236, 0.382, 0.5 and 0.618 by the preceding impulse wave length. The corrections have an inclination to price reversals to the range of the previous wave 4, at a lower rate frequently a little bit further than its extremum.

Elliott named 8 types of correctional structures in total and found out that they can double or triple in the long-term lateral consolidations. Of all of them the double triplet is the most complicated correctional structure within the Wave Principle. That is sole reason for mistakes in forecasts and temporary targets (pictures a-f). The double triplets do not occur frequently in higher rate waves. However, it is not a rarity at one-hour and ten-minute charts. If the correction starts from a compound sideward structure (a flat correction or a triangle), the rollback from the dominating impulse trend usually confines itself to the depth of 38.2% or at the very outside - 50%. Generally, this is true even if this correction is wave 2. A correction which doesn't run beyond 38.2% of the previous motion signals the restraining power of the major trend. Identically, a consolidation requiring time for closing is a curtain-raiser prior to the crash which will take place after correctional structure ending. Fifty per cent corrections in 5-wave structures are an everyday occurrence, but they don't happen so often as 61.8% corrections. Still, 50% corrections are frequently seen in the Rally internal waves taking place in the bear market, i.e. inside wave B in the zigzag. The end of the zigzag doesn't guarantee that the whole retracement has finished, as the **rollback** forms may contain complicated structures. But the analyst has to follow the most straightforward explanation of a completed structure. R. N. Elliott also affirmed that the simplest structure often appears to be a correct interpretation.

Elliott did not try to give exact prediction rules for longer correctional structures. In double zigzag structures the second zigzag must close significantly lower than the bottom

boundary of the first one (in the bull market). On the contrary, in the falling market the second zigzag must close much higher than the first zigzag peak.

The Wave Principle doesn't give an opportunity to predict the ending point of wave 2. Unfortunately, even reliable Fibonacci ratios are useless. Elliott can offer only the points that might be a good idea for stop levels. That is why it's better to avoid trading in the second waves. More often the second waves are simple (zigzag, double zigzag), and the fourth waves are complicated (a flat retracement, an irregular correction, triangles, double or triple triplets, etc.). Wave 2 usually pulls back deeper than wave 4. Wave 2 has a rollback trend of 61.8% or further against wave 1. If that does not happen, the next most likely reading is 50%. The most typical rollback depth of wave 4 equals to 38.2% from wave 3. In case of a wave 5 failure, it can be expected that the next depth retracement will turn out to be the most possible for a correctional structure.



*Picture 17 demonstrates a typical rollback depth of wave 2.*



*Picture 18 demonstrates a typical rollback depth of wave 4.*



*Picture 19 The full Elliott wave cycle: an impulse wave made up from 5 waves which are corrected by a 3-wave structure (triplet), in this case it is shown as a zigzag. Note that the retracement closed at a Fibonacci level - 61,8%.*

Fibonacci correction levels are constructed as follows. First of all, the trend line is traced between two extreme points— for example, from the bay to the opposite top. After that, 9 horizontal lines are designed which cross the trend line at the Fibonacci levels: 0,0%, 23,6%, 38,2%, 50%, 61,8%, 100%, 161,8%, 261,8% and 423,6% (due to the selected scale some of these lines may not fit on the graph).

After a strong rise or fall the prices often reverse back, correcting a huge part of its original movement. During such a reversal motion the prices frequently meet the support/resistance at the Fibonacci correction levels or around them.

Fibonacci proportions comprehension: the first pullback level (23.6%) is usually insignificant, but the next level (38.2%) as a rule is a substantial one - the market rolls back from it almost all the time. If the market reversal goes on afterwards, the next essential consolidation level will be at 50%, and the pullback continuation to 61.8% usually signals the final closure of the preceding trend.



*Picture 20: On the EUR/CHF plot we can see the full Elliott wave cycle with traced Fibonacci lines. It is obvious that the Fibonacci levels 23.6%, 38.2%, 50%, 61.8% - are important orientations of price adjustments.*

#### **Test questions:**

- Name the basic corrective patterns.
- List the obligatory rules which must be followed during the formation of impulse waves.
- Find and mark the full Elliott wave cycle on any currency pair graph.
- What is an alternation in the Elliott Wave Principle?
- What are the strongest support and resistance levels you know, according to Fibonacci ratios?
- At any currency pair graph trace out the Fibonacci lines. Take notice how the price graph behaves in relation to % Fibo levels. Describe the features.