Krzysztof Bednarz
The John Paul II Catholic University of Lublin

# THE POTENTIAL REVERSAL ZONE IN FUTURES CONTRACT EVALUATION. PRACTICAL APPLICATION OF THE HARMONIC BUTTERFLY PATTERN

## Introduction

Risk is a difficult term to be unambiguously defined. Indeed, Encyklopedia Powszechna (Universal Encyclopaedia) associates it with the civil law, where it means „the chance of damage that the injured is burdened with"[1], but in everyday life it is largely a subjective term.

It is generally believed that investing in derivatives on markets with high volatility is too risky for an average investor. For that reason, those who do so, must at one time define the right timing to initiate transaction and determine related risk. Therefore, the purpose of this article is to demonstrate investment efficiency using the concept known as the PRZ (*the potential reversal zone*[2]). The presented concept is noted for a high rate of return and takes into account an investment risk accepted by investor as well (calculated with respect to the value). Therefore, the harmonic Butterfly pattern (graphical structure of price) will be introduced; the pattern was described with the use of the Fibonacci retracements. It will serve to determine the moment of transaction initiation by marking out the PRZ. Exit technique (closing of a position) by means of the so-called *R* coefficient, which takes into account initial risk accepted by investor, will also be the subject of this article. Naturally, it is also possible to do statistical calculations considering the variance and standard deviation which are widely accepted as a measure of risk. However, the risk will be further herein marked as *R* (see: 4.1).

---

1 *Encyklopedia powszechna*. PWN, Warsaw 1996, vol. 5, p. 662.
2 S.M. Carney: *Harmonic Trading. Profiting from the Natural Order of the Financial Markets* (Vol. 1). Pearson Education, Inc., New Jersey 2010, p. 39.

The use of „harmonics" in investing shows that capital investments in progress are noted for insignificant risk (arising both from the Butterfly pattern structure and initial losses accepted by investor), and accordingly increased efficiency. The foregoing paper contains charts generated with the help of professional stock exchange programmes, namely: Fibotrader and AmiBroker, which the author hereof uses for the purposes of real investments. In this article, the method requiring observation of facts (analysis stock exchange quotations: *end-of-day* historical data and *on-line* intraday data:) and the method requiring comparison with standards (comparison with demanded qualities) have been applied.

## 1. Harmonic pattern: explanation of the term[3]

The term „harmonic pattern" is directly linked to „harmonic division" (the golden ratio, the golden cut), which is defined in Universal Encyclopaedia[4] as a division of certain quantity ***a*** into such two parts, i.e. ***x*** and ***a-x,*** that the whole is to the larger quantity ***x*** like the larger quantity is to the smaller quantity **a-x**, i.e. $\frac{a}{x} = \frac{x}{a-x}$ it follows that:

the larger quantity is equal to: $x = \frac{\sqrt{5}-1}{2} \cdot a$ the smaller quantity is equal to:

$$a - x = \frac{3-\sqrt{5}}{2} \cdot a$$

The relationships described above are graphically depicted in Figure 1.

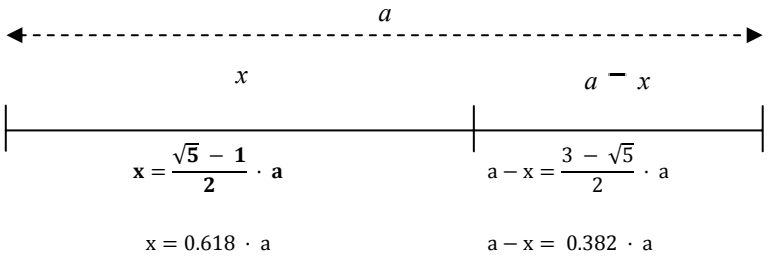



Figure 1. Harmonic ratio (the golden ration, the golden cut)

Source: K. Bednarz: *Formacja harmoniczna Gartley 222 jako sposób na zmniejszenie ryzyka i zwiększenie efektywności inwestycji na rynku kapitałowym*. In: *Rynki finansowe. Nowe wyzwania i możliwości*. Dissertations by Wyższa Szkoła Bankowa in Gdańsk, CeDeWu, Warsaw 2011, p. 205.

[3] The term „harmonic pattern" is directly linked to such terms as: „harmony", „harmonic", „harmonic division"; all these terms are more accurately presented in: K. Bednarz: *Formacja harmoniczna Gartley 222 jako sposób na zmniejszenie ryzyka i zwiększenie efektywności inwestycji na rynku kapitałowym*. In: *Rynki finansowe. Nowe wyzwania i możliwości*. Dissertations by Wyższa Szkoła Bankowa in Gdańsk, CeDeWu, Warsaw 2011, p. 203-222.

[4] *Encyklopedia powszechna*. PWN, Warsaw 1997, vol. 6, p. 1035.

The presented ratios (0.618 and 0.382) will be further herein used to described the Butterfly pattern harmoniousness. They are also linked to the Fibonacci sequence: 1,1,2,3,5,8,13,21,34,55,89,144,233,377 (etc.)[5]. Many relations can be seen in the Fibonacci sequence, the most important one of which looks as follows: the ratio of a selected number to the next one is approximately 0.618. The ratio of a selected number to the preceding one is approximately 1.618, whereas between the numbers separated by two places to the right, these values amount to: 0.382 and 2.618, respectively. The value is accurate especially when higher numbers of the sequence are divided, e.g. 34/55 = 0.618 or 55/34 = 1.618. The value of 0.618 is called the *phi* (φ). This fundamental property of the Fibonacci numbers is linked to other ratios, which are widely known as „the Fibonacci ratios". They are depicted in Table 1.

Table 1

The Fibonacci coefficients were developed by raising the numbers: 0.382; 0.618 and 1.618 to the right Power

| | Right power: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Number: | 4 | 3.5 | 3 | 2.5 | 2 | 1 | 0.5 | 0.25 | 0 |
| 0.382 | | | | | 0.146 | 0.382 | 0.618 | 0.786 | 1 |
| 0.618 | 0.146 | 0.186 | 0.236 | 0.3 | 0.382 | 0.618 | 0.786 | 0.886 | 1 |
| 1.618 | 6.854 | | 4.236 | | 2.618 | 1.618 | 1.272 | 1.128 | 1 |
| | the Fibonacci coefficients | | | | | | | | |

Source: K. Bednarz: *Formacja harmoniczna Gartley 222 jako sposób na zmniejszenie ryzyka i zwiększenie efektywności inwestycji na rynku kapitałowym*. In: *Rynki finansowe. Nowe wyzwania i możliwości*. Dissertations by Wyższa Szkoła Bankowa in Gdańsk, CeDeWu, Warsaw 2011, p. 208.

## 2. The Butterfly Pattern

### 2.1. Retracements

The rations depicted in Table 1 find common application on capital market by using the so-called „Fibonacci retracements". Retracements alone are price movements in the opposite direction to the previous wave: this is the correction of previous move. At this point however, another terms should be explained, namely internal price retracements and external price retracements:

a) internal price retracement: this type of retracement occurs when the correction fits within price range of the previous wave and retraces it by less than 100% (Figure 2); the Fibonacci ratios used for this purpose are less than 1,

b) external price retracement (extension): this type of retracement occurs when the correction retraces the previous waves of more than 100% (Figure 3); the Fibonacci ratios used for this purpose are less than 1.

[5] S.M. Carney: Op. cit., p. 11; A.J. Frost, R.R. Prechter: *Elliott Wave Principle. Key to Market Behavior*. New Classics Library, Inc., Gainesville, Georgia 2005, p. 105.

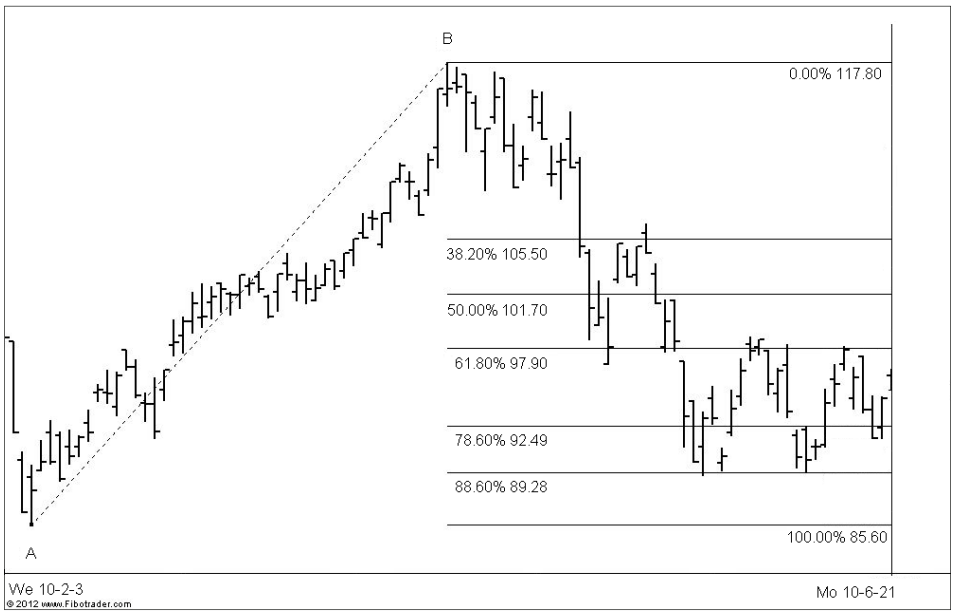



Figure 2. Internal price retracements for upward wave AB – KGHM (daily)

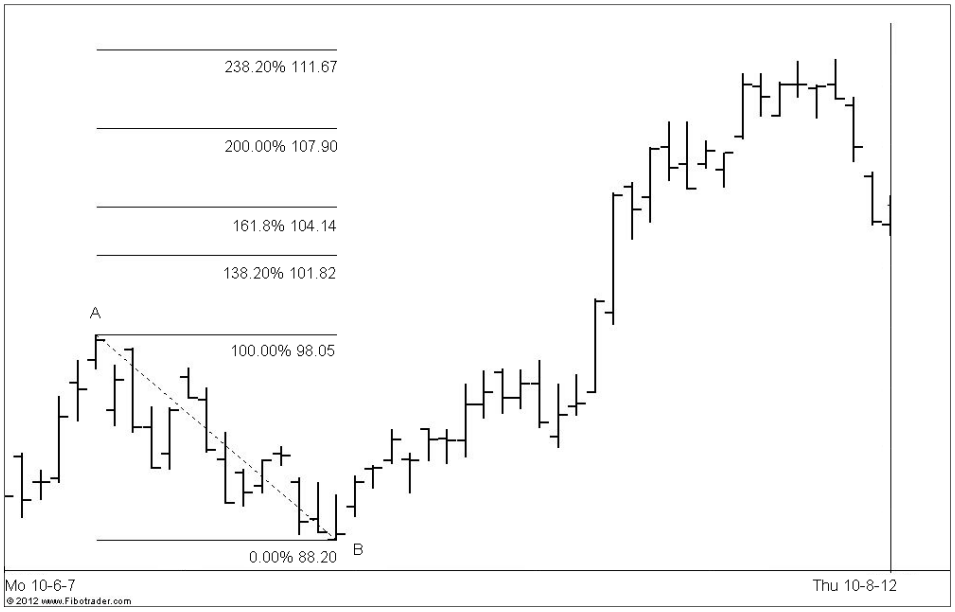



Figure 3. External price retracements for downward wave AB – KGHM (daily)

## 2.2. Ratios describing the pattern

According to *Technical Analysis of the Financial Markets* by John J. Murphy (referred to as the „bible of technical analysis"), the pattern is defined as „certain shapes or formations that appear in charts of equity or goods prices. Patterns can be presented in separate categories and used to forecast future price movements"[6]. Harmonic structure can certainly be regarded as such formations (shapes), in which the relations between individual waves are described with the Fibonacci ratios presented above. One of them is the Butterfly pattern shown in Figure 4. Harmonic patterns are also called the XABCD patterns.

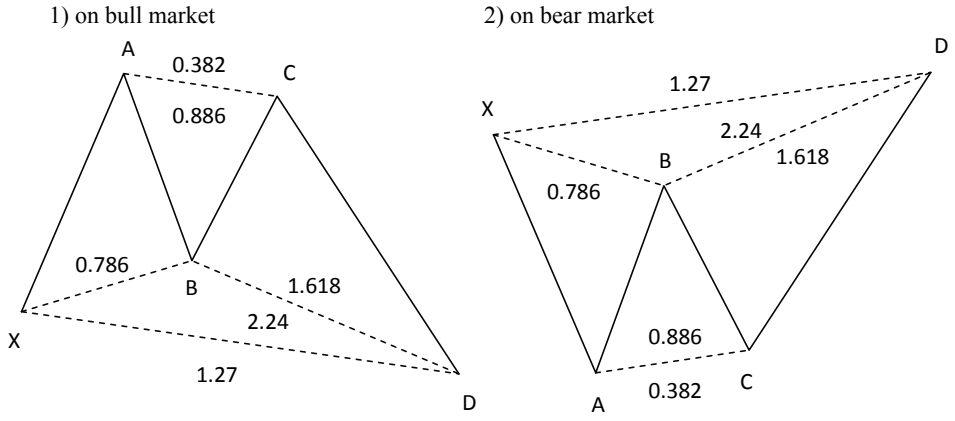



Figure 4. The harmonic Butterfly pattern

Source: S.M.Carney: *Harmonic Trading. Profiting from the Natural Order of the Financial Markets* (Vol. 1). Pearson Education, Inc., New Jersey 2010, p. 99, 150, 158.

In Figure 4, the Fibonacci ratios retrace (correct) the previous waves:

1) the AB wave accounts for 0.786 of the XA wave range (internal price retracement = 78.6% of the XA wave) i.e. AB = 0.786 x XA,

2) the BC wave accounts for from 0.382 to 0.886 of the AB wave range (it retraces the AB wave from 38.2% to 88.6%), i.e. BC = 0.382 x AB (maximally: BC = 0.886 x AB); in the perfect structure, this range is slightly narrower (from 0.5 to 0.886),

3) the CD wave is the external price retracement for the BC wave; it retraces the BC wave within the range from 161.8% to 224%; in the perfect structure, this value amounts to 1.618 precisely,

[6] J.J. Murphy: *Analiza techniczna rynków finansowych*. WIG-Press, Warsaw 2008, p. 88.

4) the waves sequence: ABCD accounts for 1.27 of the XA wave range (it retracts 127% of the XA wave), i.e. ABCD = 1.27 x XA.

At this point, one should pay particular attention to the fact that in the whole XABCD pattern, from among 5 points (vertexes) only 4 points are known (namely: X, A, B, C). Point D is determined before it actually appears in the chart. The proximity of retracement of 127% and the projection of point D indicates harmony and compatibility. This is where the potential reversal zone (PRZ) is marked out. It is known from experience that the probability of trend continuation after the ABCD correction is very high in the PRZ. This is the reason why marking the PRZ is so important when harmonic patterns are used. Thanks to these zones, entering the market reduces the risk and allows making profit of high rate of return[7].

## 3. The use of the Butterfly pattern in transactions on the futures market – investment efficiency

### 3.1. Description of transaction: the level of market entry and market exit, the ***stop-loss*** order

In the presented methodology, market entry (WE) will take place in the middle of the PRZ value, usually based on daily data (this will be the first order initiating the transaction), while market exit (WY) (closing of a position) will be determined by the *stop-loss* order, the value of which is calculated for each subsequent day in the following way[8]:

– for long futures positions in subsequent days (support ):
  $SL_{Long} = 3MA_L - R$ (calculated values shall be rounded down)
– for short futures positions in subsequent days (resistance):
  $SL_{Short} = 3MA_H + R$ (calculated values shall be rounded up)
  where:
  SL – *stop-loss*
  $3MA_L$ – the value of a three-day moving average of minimal prices form the day before
  $3MA_H$ – the value of a three-day moving average of maximal prices form the day before

[7] K. Bednarz: Op. cit., p. 211.
[8] The presented formulas can be freely modified. They have been developed specifically for the purposes of this article.

*R* – initial risk accepted by investor (in points); for the purpose of this analysis ***R*=13** points (PLN 130), which approximately accounts for 10% of the required margin[9].

The *stop-loss* order on the day of concluding transaction refers to the level of market exit initial risk-adjusted:

– for long futures positions (support): $SL_{Long(WE)} = WE - R$
– for short futures positions (resistance): $SL_{Short(WE)} = WE + R$

where:

WE – instrument value (expressed in points) followed by market entry.

It should be noted at this point that the *stop-loss* order is the second order which must be unconditionally submitted immediately after given transaction is concluded. This is consistent with common sense because capital markets are emotional, not rational, and things might take an unfavourable turn at any time. „Serious investors place stop orders the moment they enter the market. As time goes by, stop-loss orders must be adjusted so as to reduce the amount exposed to risk and secure a greater part of profits. Stop orders should be manoeuvred only towards the transaction"[10]. This is why the concept of risk reduction herein presented, the *stop-loss* order (which is the support/resistance) in each subsequent day has different value according to previously introduced formulas. Based on this methodology, transactions on futures market will be initiated by taking a position (long or short one) for futures contract on the WIG20 index (i.e. FW20Z11; the instrument „life" time: from 20 December 2010 to 16 December 2011).

## 3.2. Butterfly patterns noticed in the FW20Z11 futures contract quotation

### 3.2.1. 1st Butterfly pattern

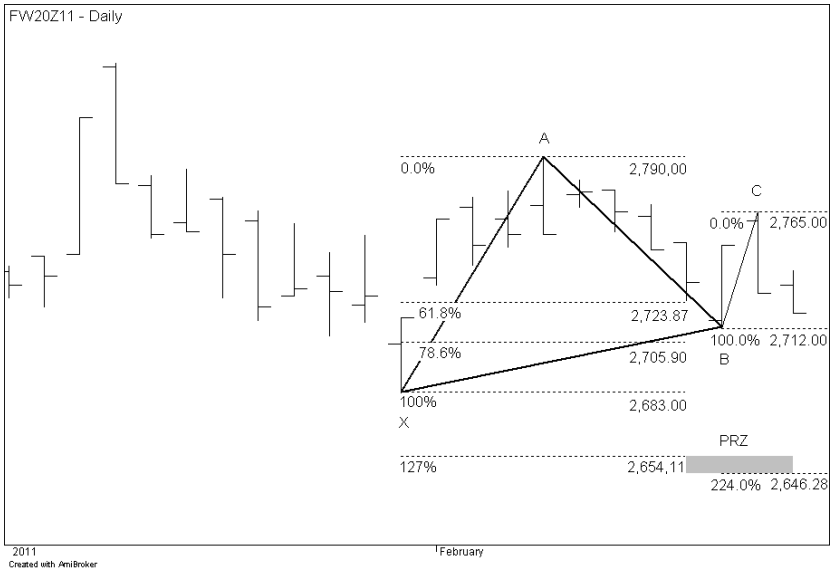
Figure 5 shows the first noticeable Butterfly pattern. The PRZ covers the range between:

– 2,654.11 (external price retracement 127% for the XA wave),
– 2,646.28 (external price retracement 224% for the BC wave).

Half of the range rounded down to the nearest whole points is 2,650 points. Thus, it will be the value of point D calculated many days before the instrument price reaches it. Stop-loss, at the moment of concluding the transaction, is 2,637 [2,650 – R; R=13].

[9] As of 9 January 2012, average value of the margin amounted to PLN 1,290.15. For further calculation, the value of initial margin was assumed to amount to PLN 1,300.

[10] A. Elder: *Zawód – inwestor giełdowy*. Oficyna Ekonomiczna, Krakow 2006, p. 309.




WE=2,650 $SL_{Long(WE)}$ = 2,637 PRZ (2,654.11; 2,646.28)
**X**=2,683 **A**=2,790 **B**=2,712 **C**=2,765

Figure 5. FW20H11 (daily) – 1st pattern (part 1)

The PRZ is marked with grey rectangle in Figure 5. Market exit (WY) took place when the price reached the *stop-loss* value (the support line marked with a dotted line). This is depicted in Figure 6 and Table 2.

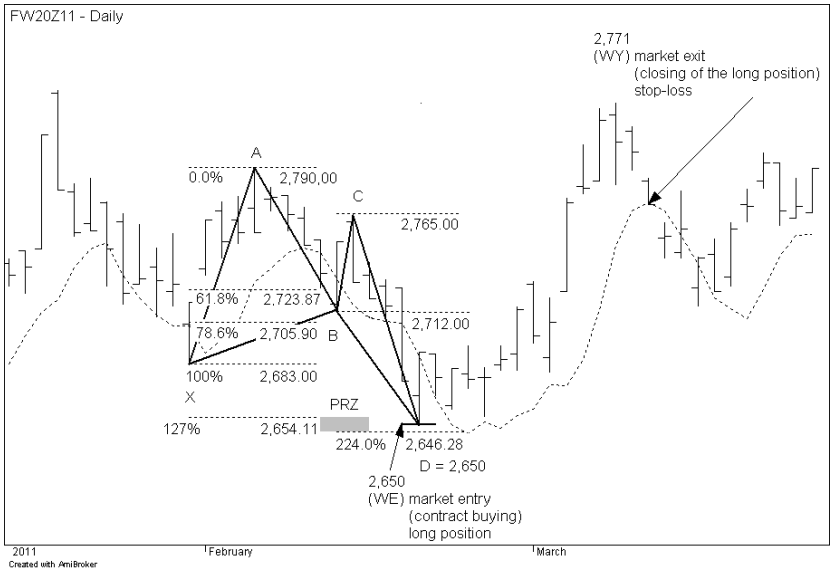



Figure 6. FW20H11 (daily) – 1st pattern (part 2)

As shown in Figure 6, market entry (WE) (contract buying) was held exactly at the point of minimum quotation: Low=2,650 (Table 2; 18 February 2011). It is worth noting that this value was calculated already five days earlier, i.e. once the BC wave had been fully formed.

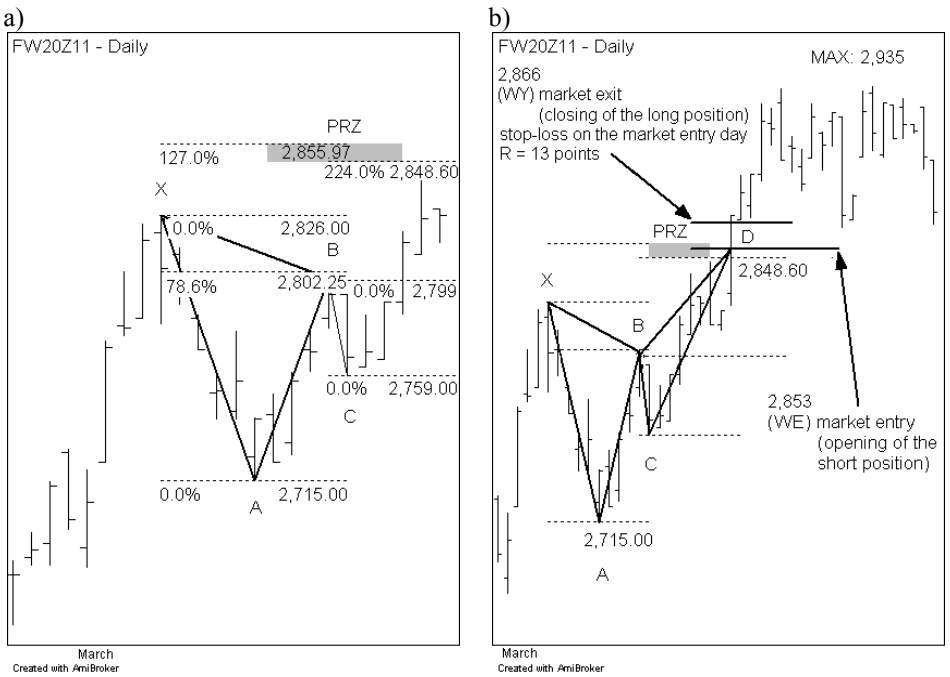
Table 2

*Stop-loss* values (rounded down, long futures position) for the 1st pattern and calculations as regards the earned profit

| DATE | Low | Stop-loss | Explanation |
|---|---|---|---|
| 16/02/2011 | 2,709 | | |
| 17/02/2011 | 2,674 | | |
| **18/02/2011** | 2,650 | **2,637** | market entry: WE = **2,650** |
| 21/02/2011 | **2,666** | **2,664** | *stop-loss* is 2 points under the Low |
| 22/02/2011 | 2,659 | 2,650 | |
| 23/02/2011 | 2,670 | 2,645 | |
| 24/02/2011 | **2,655** | **2,652** | *stop-loss* is 3 points under the Low |
| 25/02/2011 | *2,680* | 2,648 | |
| 28/02/2011 | *2,680* | 2,655 | |
| 01/03/2011 | *2,695* | 2,658 | |
| 02/03/2011 | 2,679 | **2,672** | 2672 = [(*2680* + *2680* + *2695*)/3] – 13 |
| 03/03/2011 | 2,723 | 2,671 | |
| 04/03/2011 | 2,776 | 2,686 | |
| 07/03/2011 | 2,783 | 2,713 | |
| 08/03/2011 | 2,781 | 2,747 | |
| 09/03/2011 | 2,789 | 2,767 | |
| 10/03/2011 | **2,770** | **2,771** | market exit: WY = **2,771** |

Profit = WY – WE = 2,771 – 2,650 = 121 points x PLN 10 = PLN 1,210
(i.e. 93.08% within 15 days).

Another Butterfly pattern is shown in Figure 7. PRZ marked out by the XA wave external retracement (127%) and the BC wave external retracement (224%) fits within the range from 2,848.6 to 2,855.97. Half of this range is 2,852.29 points [2,852.29 = (2,855.97 – 2,848.6)/2 + 2,848.6]. Market entry order (short sale) after rounding up will be 2,853. *Stop-loss* for such transaction is 2,866 [2,866 = 2,853 + *R*].



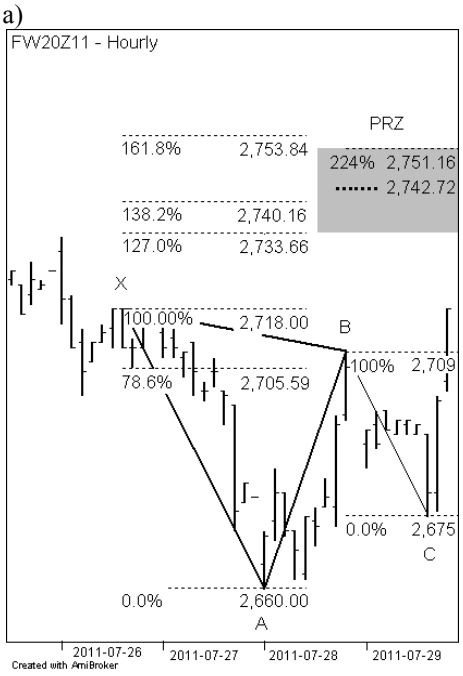

WE=2,853 $SL_{Short\ (WE)}$ = 2,866 PRZ (2,855.97; 2,848.6)
**X**=2,826 **A**=2,715 **B**=2,799 **C**=2,759

Figure 7. FW20H11 (daily) – 2nd pattern

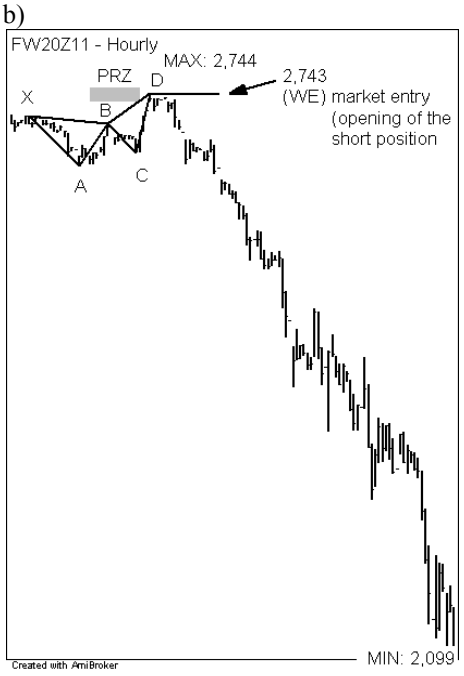
As one can see, the transaction presented in Figure 7 ended with a loss of 13 points, which is equal to the accepted initial risk (*R*=13 points). Therefore, the *stop-loss* order protected given investment from greater losses.

When planning the transaction conclusion, the moment of its initiation usually refers to shorter time perspective, e.g. hourly perspective. An example of such market entry is presented in Figure 8. PRZ marked out by the XA wave external retracement (127%) and the BC wave external retracement (224%) fits within the range from 2,733.66 to 2,751.16. Half of this range is 2,742.41 points [2,742.41 = (2,751.16 – 2,733.66)/2 + 2,733.66]. Market entry order (short sale) after rounding up will be 2,743. *Stop-loss* for such transaction is 2,756 [2,756 = = 2,743 + *R*].

a)




b)




WE=2,743 $SL_{Short\ (WE)}$= 2,756 PRZ (2,733.66; 2,751.16)
**X**=2,718 **A**=2,660 **B**=2,709 **C**=2,675

**AB**=49 **BC**=34

Figure 8. FW20H11 (hourly) – 3rd pattern

On the order carrying out day (1 August 2011), the order was opened almost at the highest point of quotation recorded that day (the ceiling price was 2,744 points – Table 3). It should also be noted that the projection of the AB wave from point C falls at 2,742.72 (dotted line in the PRZ), which accounts for 138.2 % of the AB wave length [2,742.72 = (1.382 x 49) + 2,675], which is consistent (after being rounded up: 2,743) with previously calculated level of market entry. External price retracement of the BC wave measured with this wave multiple falls exactly in the same place. [2,743 = (2 x 34) + 2,675]. Furthermore, external price retracement of the XA wave described with 1.382 ratio also falls in the proximity of 2,743 level, as shown in Figure 8a. Ultimately, the transaction turned out to be extremely profitable. Assuming the *stop-loss* order (daily data) given in Table 3, the profit amounted to PLN 4,070. It is worth noting that the potential of drops reached the level of 2,099, which brought „paper" profit of PLN 6,440, that is more than 495.3 % within 9 days of being on the market. Ultimately, closing of a transaction took place 2 days later after the *stop-loss* order. at the rate of 2,336.

Table 3

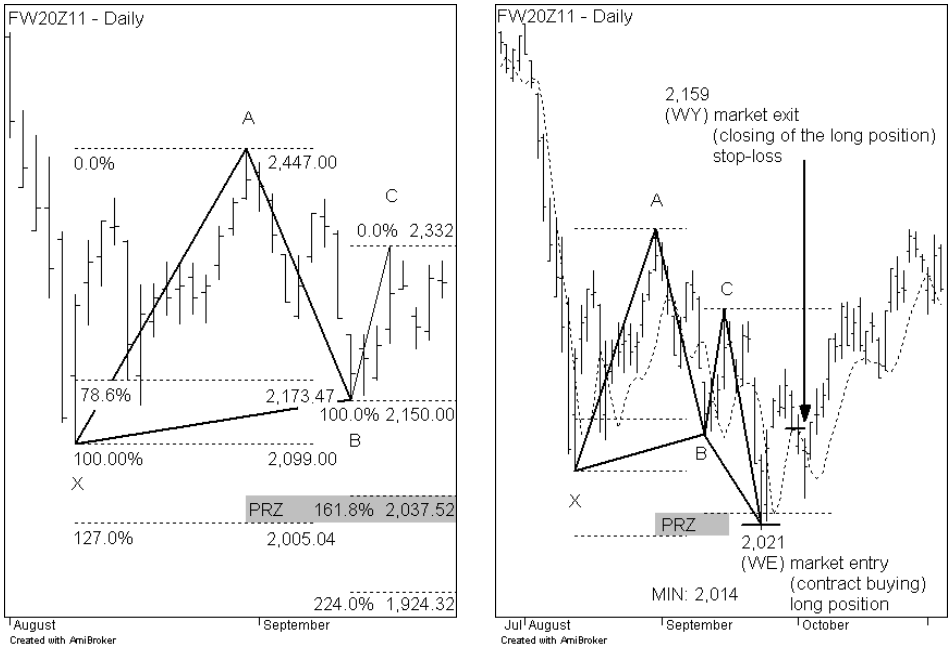
*Stop-loss* values (rounded up, short futures position) for the 3rd pattern and calculations as regards the earned profit

| DATE | High | Low | Stop-loss | Explanation |
|---|---|---|---|---|
| 28/07/2011 | 2,709 | 2,660 | | |
| 29/07/2011 | 2,725 | 2,675 | | |
| **01/08/2011** | 2,744 | 2,699 | **2,756** | market entry: WE = **2,743** |
| 02/08/2011 | 2,692 | 2,651 | **2,739** | |
| 03/08/2011 | 2,645 | 2,550 | 2,734 | |
| 04/08/2011 | 2,585 | 2,460 | 2,707 | |
| 05/08/2011 | 2,494 | 2,402 | 2,654 | |
| 08/08/2011 | 2,464 | 2,350 | 2,588 | |
| 09/08/2011 | *2,438* | 2,271 | 2,528 | |
| 10/08/2011 | *2,350* | 2,125 | 2,479 | |
| 11/08/2011 | *2,277* | **2,099** | 2,431 | 2,099 – minimum of the decrease movement |
| 12/08/2011 | 2,340 | 2,239 | **2,368** | 2,368 = [(*2,438* + *2,350* + *2,277*)/3] + 13 |
| 16/08/2011 | 2,362 | 2,286 | **2,336** | market exit: WY = **2,336** |

Profit = WY – WE = 2,743 – 2,336 = 407 points x PLN 10 = PLN 4,070
(i.e. 313.08% within 11 days).

Another Butterfly pattern is shown in Figure 9. PRZ marked out by the XA wave external retracement (127%) and the BC wave external retracement (224%) fits within the range from 2,005.04 to 1,924.32 (the difference of 80.72 points). It therefore seems necessary to shorten the BC wave external retracement by smaller Fibonacci ratio, i.e. by the value of 1.618 (which is characteristic for perfect pattern; Figure 4). This being the case, the PRZ fits within the range from 2,005.04 to 2,037.52. Half of this range is 2,021.28 points [2,021.28 = = (2,037.52 – 2,005.04)/2 + 2,005.04]. Market entry order (long sale) after rounding down will be 2,021. *Stop-loss* for such transaction is 2,008 [2,008 = 2,021 + *R*]. It is worth noting that the day before the transaction conclusion (22 September 2011) was noted for a very high volatility rate (125 points) and was opened with bear market gap (decline) of 67 points [67 = 2,290–2,223].

a) b)




WE=2,021 $SL_{Long\ (WE)}$ = 2,008 PRZ (2,005.04; 2,037.52)
**X**=2,099 **A**=2,447 **B**=2,150 **C**=2,332

Figure 9. FW20H11 (daily) – 4th pattern

Table 4

*Stop-loss* values (rounded down, long futures position) for the 4th pattern and calculations as regards the earned profit

| DATE | Open | High | Low | Close | *Stop-loss* | Explanation |
|---|---|---|---|---|---|---|
| 21/09/2011 | 2,292 | 2,316 | 2,271 | 2,290 | | |
| 22/09/2011 | 2,223 | **2,235** | **2,110** | 2,110 | | very high volatility rate (125 points), bear market gap |
| **23/09/2011** | 2,115 | **2,124** | *2,014* | **2,099** | **2,008** | market entry: WE = **2,021** |
| 26/09/2011 | 2,051 | 2,160 | *2,028* | 2,133 | 2,118 | |
| 27/09/2011 | 2,164 | 2,206 | *2,162* | 2,201 | 2,037 | |
| 28/09/2011 | 2,185 | 2,224 | 2,179 | 2,192 | **2,055** | 2,055 = [(*2,014* + *2,028* + *2,162*)/3] – 13 |
| 29/09/2011 | 2,190 | 2,248 | 2,176 | 2,222 | 2,110 | |
| 30/09/2011 | 2,208 | 2,216 | 2,155 | 2,192 | **2,159** | market exit: WY = **2,159** |

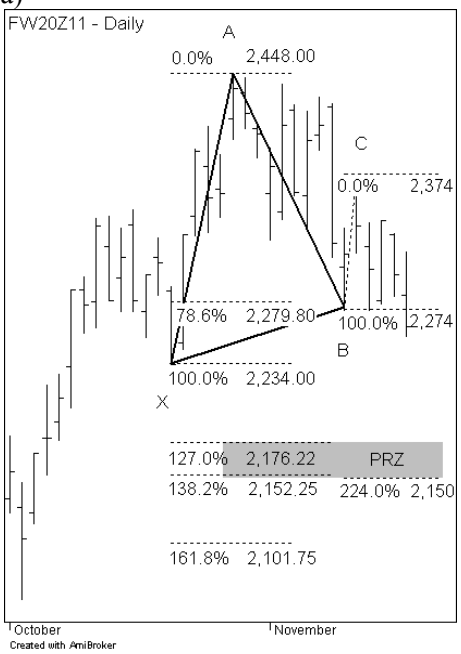
Profit = WY – WE = 2,159 – 2,021 = 138 points x PLN 10 = PLN 1,380
(i.e. 106.15% within 6 days).

On the day of entering the market (23 September 2011), the minimum of quotation was only 7 points less [7=2,021–2014] than initiated transaction (with daily spread of quotation on that day amounting to 110 points: 110 = 2,124 – 2,014). However, the closing rate was 2,099, which means „paper" profit in the amount of PLN 780 [780 = (2,099 – 2,021 ) x PLN 10]. But the following day the market opened with a gap of 48 points [48 = 2,099 – 2,051]. Naturally, it is possible to close a position which, once the quotation started, loses its value (on the opening) compared to the previous day, yet still remains profitable. However, it makes more sense to re-accept the risk as on the previous day, i.e. close the position when the price falls down to the 2,008 level and once again use the moving *stop-loss* order as in Table 4. In the latter case, the profit earned amounts to PLN 1,380.

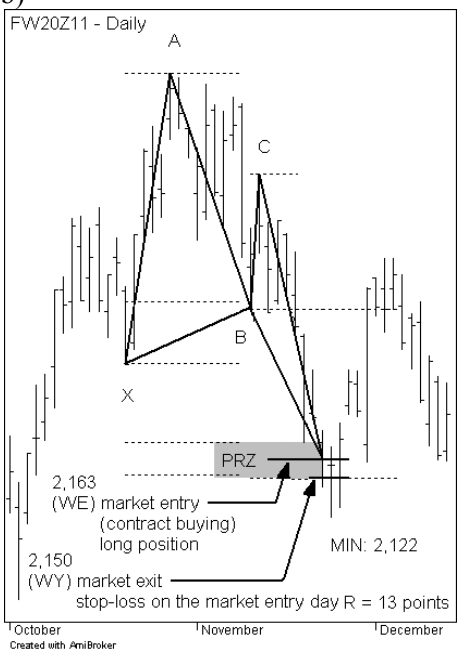
While presenting the 4$^{th}$ pattern (Figure 9), it is worth paying attention to its context: the bear market gap (–67 points) on the opening on the eve of contract buying and high volatility (125 points and 110 points within two consecutive days). For that reason, placing the purchase order in such situation might seem irrational, which can be called „fear buying".

Another Butterfly pattern is shown in Figure 10. PRZ marked out by the XA wave external retracement (127%) and the BC wave external retracement (224%) fits within the range from 2,150 to 2,176.22. Half of this range is 2,163.11 points [2,163.11 = (2,176.22–2,150)/2 + 2,150]. Market entry order (long position) after rounding up will be 2163. *Stop-loss* for such transaction is 2,150 [2,150 = 2,163 – *R*]. As one can see, stop-loss order caused closing of a position, the loss of which amounted to PLN 130 (that is, 10% of the margin value).

a)




b)




WE=2,163 $SL_{Long\ (WE)}$ = 2,150 PRZ (2,150; 2,176.22)
**X**=2,234 **A**=2,448 **B**=2,274 **C**=2,374

Figure 10. FW20H11 (daily) – 5th pattern

## Summary of investments

The transactions have proven to be extremely profitable. Their total rate of return amounts to 492.31 %. However, some transactions resulted in a loss equal to the initial risk *R*, i.e. PLN 130. *Stop-loss* orders allowed for closing such positions at that level. Table 5 contains profit and loss statement for the harmonic Butterfly patterns described herein. Column H shows the profit/loss attributable to each zloty put at risk.

Table 5

Comparison of the harmonic Butterfly patterns transactional efficiency
margin (investment value) = PLN 1,300
initial risk accepted by investor *R* = PLN 130

| Butterfly pattern | position | | | profit/loss [PLN] | rate of return | time of investment | profit to *R* |
|---|---|---|---|---|---|---|---|
| | | WE | WY | | | | |
| **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| I | long | 2,650 | 2,771 | 1,210 | 93,08% | 15 days | 9,31 |
| II | short | 2,853 | 2,866 | -130 | -10,00% | 1 day | -1,00 |
| III | short | 2,743 | 2,336 | 4,070 | 313,08% | 11 days | 31,31 |
| IV | long | 2,021 | 2,159 | 1,380 | 106,15% | 6 days | 10,62 |
| V | long | 2,163 | 2,150 | -130 | -10,00% | 1 day | -1,00 |
| | | | TOTAL: | 6,400 | ≈492,31% | 34 days | ≈49,24 |

## Summary

The charts and calculations presented herein show that the harmonic Butterfly harmonic pattern is in a way a unique structure. This is evidenced by the following qualities:

1) one might see relations between individual waves of the pattern (waves: XA, AB, BC, CD), which are described with the Fibonacci ratios,

2) the PRZs, marked out several days before, have a very high degree of reliability as support/resistance; this is the best place to initiate transaction, close the existing position or reverse the current position (for instance, from short one to long one),

3) opening of a position (long or short one) in the PRZ is burdened with a predetermined risk, accepted by investor,

4) indeed, the proximity of internal and external retracements, expansion and alternative price thresholds (harmony, conformity) does not guarantee that given transaction will be profitable, but it does increase likelihood thereof to a large extent,

5) transactions in the PRZ are concluded contrary to common trend prevailing on the market since the potential reversal zone might be called: „fear buying" when prices fall sharply (Figure 9), „greed selling" when prices rise rapidly (Figure 8), which ultimately favours taking the positions with extra reduced risk, thereby increasing capital investments efficiency.

## References

Bednarz K.: *Formacja harmoniczna Gartley 222 jako sposób na zmniejszenie ryzyka i zwiększenie efektywności inwestycji na rynku kapitałowym*. In: *Rynki finansowe. Nowe wyzwania i możliwości*. Ed. M. Kalinowski. Dissertations by Wyższa Szkoła Bankowa in Gdańsk. CeDeWu, Warsaw 2011.

Carney S.M.: *Harmonic Trading. Profiting from the Natural Order of the Financial Markets.* (Vol. 1). Pearson Education, Inc., New Jersey 2010.

Elder A.: *Zawód – inwestor giełdowy*. Oficyna Ekonomiczna, Krakow 2006.

*Encyklopedia powszechna*. PWN, Warsaw 1996, 1997, Vol. 5 and 6.

Frost A.J., Prechter R.R.: *Elliott Wave Principle. Key to Market Behavior.* New Classics Library, Inc., Gainesville, Georgia 2005.

Murphy J.J.: *Analiza techniczna rynków finansowych*. WIG-Press, Warsaw 2008.

## POTENCJALNY OBSZAR ODWRÓCENIA W WYCENIE KONTRAKTU TERMINOWEGO FUTURES. PRAKTYCZNE ZASTOSOWANIE FORMACJI HARMONICZNEJ BUTTERFLY

### Streszczenie

Ryzyko inwestowania (w tym w kontrakty terminowe) zależy od zmian wyceny instrumentu finansowego (zmienność). Jednak w większym stopniu dotyczy indywidualnych predyspozycji podejmującego decyzje inwestycyjne. To inwestor określa jaką kwotę może zaryzykować. Natomiast odpowiedni moment zawarcia transakcji często pokazuje analiza techniczna. W artykule zaprezentowano właśnie taki moment w postaci PRZ. Jest on wyznaczany za pomocą formacji harmonicznej Butterfly, opisanej ważnymi współczynnikami Fibonacciego. W artykule zamieszczono wykresy notowań giełdowych oraz skrócone tabele z danymi zawierającymi wartość zlecenia zabezpieczającego *stop-loss*, które chroni przed stratą, jak również ochrania zyski.

Istotą wszystkich formacji harmonicznych XABCD (w tym prezentowanej formacji Butterfly) jest obliczenie dogodnego momentu zainicjowania transakcji na wiele dni (czasem tygodni lub miesięcy) przed jego pojawieniem się. Tym momentem jest punkt D, który obliczany jest za pomocą zniesień zewnętrznych oraz zniesień wewnętrznych. Z zamieszczonych wykresów i obliczeń wynika, że omówiona struktura charakteryzuje się bardzo dużą rentownością (492,31% w ciągu 34 dni przebywania na rynku) przy pewnym akceptowanym poziomie ryzyka, które wynosi $R$=130 zł na jedną pozycję.