The Function Synthesis as a Prognosis Instrument of the Preventing Risk Management Activities

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Abstract. The following paper starts from the basic idea that risk management is an organic part of the current management activities. During the last Financial Crisis 2008-2009 the preventing influence of the risk management activities assured the economic health of the different companies in various ways and with different tools. Furthermore the paper focuses the function synthesis as a prognosis instrument of the current, preventing risk management. The materials involve the concrete situation of the Wienerberger Corporation, which is the world’s largest producer of bricks. The used method of this paper is the function synthesis by means of the TI-84 Plus. The results zoom in on the different advantages and disadvantages of the functions synthesis by giving the development prognosis of the focused variable for the year 2011. The conclusion emphasizes two main points: On the one hand the great significance of the preventing risk management activities during the Financial Crisis 2008-2009 and on the other hand the summarized description of the function synthesis and its influence on the decision maker.

Keywords: business forecasts, financial crisis, variable matrix, Wienerberger

INTRODUCTION

One of the most interesting questions of our post financial crisis time is the question about the utility and the costs-benefits-relation of identification, quantification and active prevention of the different kinds of risks by means of an active risk management (Zurek, 2009). Which prognosis instrument has got good or at least acceptable results and is easy to use and easy to understand, as well?

In the last years 2008-2009 we had the biggest financial crisis of all the times. Its shadows still hang over our global economical activities. Has the risk management activity a right of existance? (Münkler et al., 2010) Does the risk management - with all its costs - bring a well founded benefit and an objective advantage? Is this work not too time expensive? (Wolke, 2008)

The following paper describes the possibility of using the function synthesis for the quantifying of the further development of the different focussed economical variables as a prognosis instrument of the risk management. The development of the numbers and the given prognosis will underline the importance of the preventing risk management activities.

A possible general answer to the question if the risk management is useful is given by a 40 years experienced and very famous captain whose name was Edwar John Smith. He has sailed over 40 years across several oceans and has got the opinion that his life was quite boring, without a remarkable risk, without an important or dangerous point of time. Quotation Edward John Smith in 1907: “When anyone asks me how I can describe my experience at nearly forty years at sea, I merely say uneventful. Of course, there have been winter gales and storms and fog and
the like, but in all my experience, I have never been in an accident of any sort worth speaking about. I have seen but one vessel in distress in all my years at sea… I never saw a wreck and have never been wrecked, nor was I ever in any predicament that threatened to end in disaster of any sort.” (Knigge, 2006).

One Sunday night, on April, the 14th, 1912, 23:40, the unsinkable R.M.S. Titanic collides with a huge iceberg and sinks in 2 hours and 40 minutes in the deep waters of the Atlantic Ocean. 1504 people freeze to death. One of this people is the experienced captain, Edward John Smith.

The financial crisis 2008-2009 was the iceberg of a lot of well known companies. The prime example was the Lehman Brothers Holdings Incorporation, which was one of the biggest and most famous global financial services company until declaring its bankruptcy in 2008. A lot of other companies had got the biggest losses in their history. One of these various examples is the Wienerberger Corporation, which was and is the world's largest producer of bricks and clay roof tiles in Europe with 227 factories in 27 countries. Wienerberger Corporation also holds the leading positions in concrete pavers in Central and East Europe. However, Wienerberger had got -25% losses in revenues and -53% losses in EBITDA (Wienerberger, 2009).

MATERIALS AND METHODS

One of the definitions describes the risk management as being the identification, assessment and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and the impact of unfortunate events or to maximize the realization of opportunities (Hubbard, 2009). Both sides are mentioned, the minimization of the possible risks and the maximization of the possible opportunities.

For Wienerberger the years 2008 and 2009 were very problematic because the whole building and construction industry had to manage big losses in these years. The roots of the financial crisis were fixed in the Subprime Crisis, which expanded from the USA all over the world in the last years. Wienerberger’s earnings per share were still positive with 0.81 € in 2008, but in 2009 the earning per share became negative with -3.17 € per share. Furthermore, a few important information of its development may be synthesized as presented in Table 1:

| Tab. 1 | Corporation and Stock Exchange Data |
| --- | --- | --- | --- | --- | --- |
| Corporate Data | 2005 | 2006 | 2007 | 2008 | 2009 |
| Revenues in € mill. | 1954.6 | 2225.0 | 2477.3 | 2431.4 | 1816.9 |
| Free cash flow in € mill. | 212.5 | 271.7 | 293.8 | 195.4 | 250.8 |
| Total investments in € mill. | 338.7 | 530.4 | 645.6 | 505.6 | 134.2 |
| Employees | 13327 | 13639 | 14785 | 15162 | 12676 |
| Stock Exchange Data | | | | | |
| Earnings per share in € | 2.66 | 2.95 | 3.46 | 0.81 | -3.17 |

Source: Wienerberger Databases – Annual Report 2009

There are a lot of possibilities to quantify and to make a prognosis for the next years. The function synthesis based upon the last data can be used as a prognosis instrument for the risk management for the future development of the focused variables.
The function synthesis defines a certain point of time as being the moment 0 (here for example the year 2005) and sets these moments in relation to the wanted variable, for example the earnings per share as follows:

<table>
<thead>
<tr>
<th>Points of Time / Economic Years (X-axis)</th>
<th>Earnings in € per Share (Y-axis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X = 0, year 2005</td>
<td>2.66</td>
</tr>
<tr>
<td>X = 1, year 2006</td>
<td>2.95</td>
</tr>
<tr>
<td>X = 2, year 2007</td>
<td>3.46</td>
</tr>
<tr>
<td>X = 3, year 2008</td>
<td>0.81</td>
</tr>
<tr>
<td>X = 4, year 2009</td>
<td>-3.17</td>
</tr>
</tbody>
</table>

Source: Wienerberger Databases – Annual Report 2009

Furthermore the variable matrix is built for this database by means of the general form of the function to the power of four because we have got 5 different pairs of data:

\[ f(x) = ax^4 + bx^3 + cx^2 + dx + e \]

For our example of Wienerberger the 5 x 6 matrix has got the form as presented in the next lines:

\[
\begin{array}{cccccc}
0 & 0 & 0 & 0 & 1 & 2.66 \\
1 & 1 & 1 & 1 & 1 & 2.95 \\
16 & 8 & 4 & 2 & 1 & 3.46 \\
81 & 27 & 9 & 3 & 1 & 0.81 \\
216 & 64 & 16 & 4 & 1 & -3.17 \\
\end{array}
\]

The results of the function synthesis are obtained by using one of the different mathematical programs or graphic calculators.

RESULTS AND DISCUSSION

The described relation between the years 2005-2009 and the earnings per share of Wienerberger contain 5 different points of time, so the function synthesis will have as a result a function to the power of four: \( f(x) = ax^4 + bx^3 + cx^2 + dx + e \) with 5 unknown variables.

For Wienerberger the TI-84 Plus calculated upon the typed matrix the following results:
- \( a = +0.2171 \)
- \( b = -1.8658 \)
- \( c = +4.1879 \)
- \( d = -2.2491 \)
- \( e = +2.66 \)

so that the results of the executed function synthesis are:

\[ f(x) = 0.2171x^4 -1.8658x^3 +4.1879x^2 -2.2491x + 2.66. \]

For the end of the year 2010 (\( X = 5 \)) the function synthesis has got the result of -1,426 euro per share and for the end of the year 2011 (\( X = 6 \)) it has got the positive result of 18,279 euro per share. These results mean that the earnings per share will be still negative at the end of 2010, but they will get highly positive for the year 2011, as presented by Fig. 1 and Fig. 2:
If we want to have quarterly results for the year 2011 the chart between X = 5 (end of the year 2010) and X = 6 (end of the year 2011) must be divided into 4 steps as follows:

The calculated and predicted results upon the TI-84 Plus for the four quarters of the year 2011 are:

- First quarter 2011: 1.2231 euro per share,
- Second quarter 2011: 5.2115 euro per share,
- Third quarter 2011: 10.802 euro per share and
- Fourth quarter 2011: 18.279 euro per share.

A constant, quarterly increase of the earnings per share can be noticed for Wienerberger for all the quarters of the year 2011 upon these predicted results. Remarkable is the fast 326.09% calculated increase of the earnings per share between the first and the second quarter, which decreases between the second and the third quarter (107.27%) and between the third and the fourth quarter (69.22%). Although the percentage of increase minimizes for the next quarters, the absolute differences in euro per share between the next months get constantly bigger.

If the results are needed monthly, the chart between X = 5 (end of the year 2010) and X = 6 (end of the year 2011) can be divided into 12 steps as follows:
The monthly, predicted results upon the TI-84 Plus are:

January: -0.6761 euro per share, July: 6.8835 euro per share,
February: 0.20378 euro per share, August: 8.7436 euro per share,
March: 1.2231 euro per share, September: 10.802 euro per share,
April: 2.3912 euro per share, October: 13.07 euro per share,
May: 3.7174 euro per share, November: 15.559 euro per share,
June: 5.2115 euro per share, December: 18.279 euro per share.

Like in the previous calculation a constant, monthly increase of the earnings per share can be noticed upon these predicted results. Notable are here the relative big increases of the earnings per share starting with the months March or April. The difference between April and March is 1.1681 euro earnings per share and between May and April 1.3262 euro earnings per share. Furthermore the absolute differences (in euro earnings per share) and even the relative differences (in percentage, till September) between the next months increase both constantly.

The function synthesis is one of the tools of the large palette of risk management instruments and can be used in connection with other quantification tools. The function synthesis is like shown in this paper a convenient and agreeable prognosis instrument for the risk management, but it has got its own limits. It has got, like the other risk management tools, a few advantages and a few disadvantages, as well.

The disadvantages of the function synthesis are the followings:

- The high dependency on the numbers of different data pairs because the results get more inaccurate when the number of different data pairs decreases,
- The high dependency on the chosen period because the results get more imprecise when the prognosis period increases.

Therefore, the function synthesis should be used only as a short term prognosis tool or in a mix with other risk management tools.

But there are a few advantages of the function synthesis, as well, as presented:

- The easy way of calculating the results,
- The short needed time for the quantification of the given data,
- The easy understanding of the method and of the given results by all the decision makers,
- The possibility of fragmentation of the temporary scale, so that the results can be obtained yearly, quarterly, monthly, maybe even daily etc.
CONCLUSIONS

Summarizing up, the risk management is an organic component of the actual management process of all the companies. Although the last financial crisis has made a lot of economical devastations, without the different tools of the risk management the economical situation of many companies would not develop so well, like it actual develops. The actual increases of the earnings per share of Wienerberger are an argument for the preventing activity of the risk management.

Concluding, it should be mentioned that the function synthesis is a short term prognosis tool, which can be used by the decision maker during his decision process to minimize the potential risks of its economical action in the next future. Thereby it is important to know its advantages and its disadvantages. When the decision maker uses only the tool of the function synthesis for his decision, he should use it only as a short term prognosis tool because of its high dependency on the numbers of different data pairs. Alternatively, he can increase the numbers of different data pairs so that his results get more precise.

For Wienerberger the function synthesis predicts a constant increase of the earnings per share for the year 2011 upon the database of the years 2005-2009 (Wienerberger, 2007, 2008, 2009). For the first quarter of the year 2010 the earnings per share increased compared to 2009 (Wienerberger, 2010). The near future will show if the predicted, calculated increases for 2011 by means of the function synthesis will get real.

REFERENCES