Impacts of management decision-making on economic situation of the enterprise
(case study)

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Abstrakt

Na výrobní podnik lze pohlížet jako na dynamickou strukturu, která se skládá z prvků a vzájemných vazeb mezi těmito prvky. Zejména meziprvkové vazby v systému způsobují tzv. dynamickou složitost systému, který se pak vyznačuje, mimo jiné, zpožděním mezi učiněným rozhodnutím a jeho dopadem. Další vlastnosti takového komplexního sociálního systému (jakým je podnik) pak ztěžují managementu učinit rychlá rozhodnutí v odpovídající míře. Tyto požadavky na řízení podniku se staly staly palčivými otázkami zejména v období zvýšené turbulence podnikatelského prostředí posledních let. Příspěvek se zabývá konkrétními rozhodnutími managementu na základě rozboru finančních výkazů podniku.

Klíčová slova

finanční analýza podniku, systémová dynamika, rozhodování, rozhodování za nejistoty

1. Preface

The enterprise can be considered as a dynamic structure which consists of elements and its mutual linkage – this linkage is called interdependence. Interdependence is the main cause of so called dynamic complexity of the system [2]. From this point of view, we can look at the enterprise from three perspectives [2]:

- complexity – this concept indicates the system comprehension is much more difficult than by general human intuitive abilities
- social dimension – elements of the system are people who are dynamically changing through time and they usually effect each other – they tend to create a social network which is also constantly developing in some way (and of course in time)
- system – it means it is important to emphasize the compact approach, the integrality; this quality is represented by emergent- type characteristics which can be recognized only through the whole system and not by its particular parts.

There are other system characteristics like time delays, non-linearity and uncertainty in the system that cause its dynamic complexity. Time delays are one of the most well-know characteristic of complex systems, yet it is still often neglected in strategy plans. Time delays between the decision made and its impact and other attributes of complex social system (like the enterprise is) make it difficult for management to make decisions in corresponding extent. There are presented results from analysis of financial reports of an industrial enterprise from year 2005 until September 2009. All the reports are available from online business register.

2. Financial analysis

Decisions made by management of the enterprise have impacts on its economic situation. These impacts can by partially evaluated by financial reports of enterprise economic activity.

The enterprise presented in this case study is a middle-size industrial company situated in the Central Bohemian Region. The company has developed quite varied portfolio of products and services provided. There about 160 employees in the company in the present.

2.1 Methodology an tools used

For purposes of financial analysis there were used following tools:

– vertical and horizontal analysis of balance-sheet and financial statement

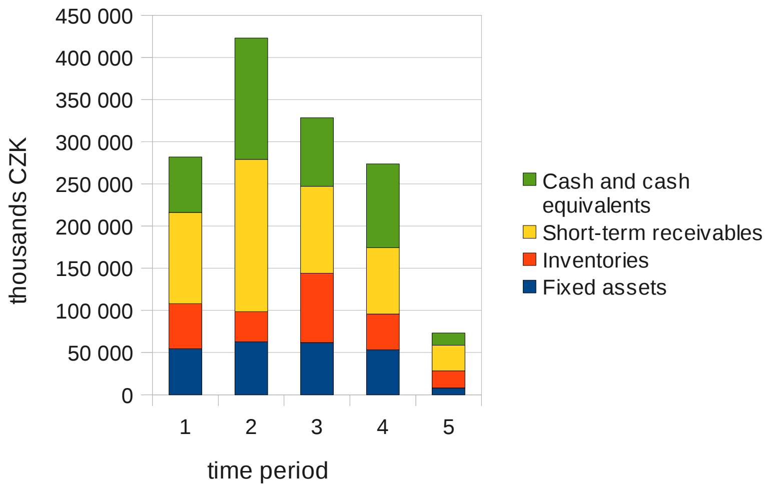
Balance-sheet
(thousands CZK)

	Ratio analysis horizontal (growth index)		
Assets	**2/1**	**3/2**	**4/3**
Fixed assets	**1.1**	**1.0**	**0.9**
Intangible assets	0.8	0.2	0.1
Tangible assets	1.2	1.0	0.9
Financial assets			
Current assets	**1.6**	**0.7**	**0.8**
Inventories	0.7	2.3	0.5
Long-term receivables	0.2	0.0	
Short-term receivables	1.7	0.6	0.8
Trade receivables – customers	1.7	0.6	0.6
Cash and cash equivalents	2.2	0.6	1.2
Prepaid expenses	**0.7**	**0.6**	**0.8**
Total assets	**1.5**	**0.8**	**0.8**
	2/1	**3/2**	**4/3**
Liabilities			
Owner's Equity	**1.8**	**0.9**	**0.7**
Issued capital	1.0	1.0	1.0
Retained earnings	4.6	0.4	5.7
Profit for the period	1.8	1.0	0.3
Liabilities	**1.5**	**0.8**	**0.8**
Non-current payable	1.0	0.9	0.9
Current payable	1.6	0.8	0.8
Account payable	1.8	0.6	0.8
Loans payable			
Retained earnings	**1.0**	**0.1**	**7.7**
Total liabilities	**1.5**	**0.8**	**0.8**

Table 1: Ratio analysis of assets and liabilities - horizontal

Company assets decrease during the four-year period. This drop is caused by later decrease of current assets and mainly by reducing the volume of inventories and short-term receivables. A significant decrease in area of cash assets was observed at the end of 2007. On the liabilities site of balance-sheet is the declination caused by several factors: profit declination and account payable declination. This could be considered as the first sign of economic crisis – worse financial situations of customers lead to demand decrease for company's products. As seen on Graph 1 the highest values of short-term receivables were reached in 2006.

Table 2 shows the vertical analysis of assets and liabilities. The structure of assets is stable during the period: the ratio between current assets and fixed assets is about 80:20. From the ratio analysis of liabilities is evident that only 20% are created by owner's equity, thus, the assets are funded by current liabilities – account payable mainly. The company management keeps the funding balanced – almost all current assets are funded by account payable.



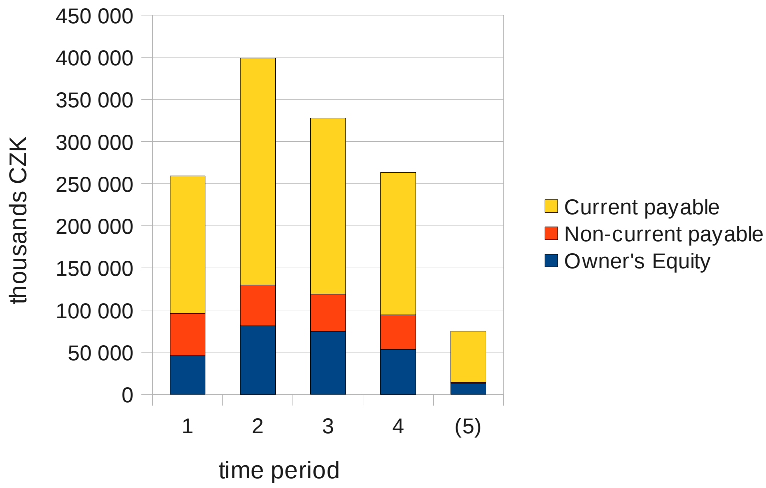
Graph 1: Assets development in years 2005-2008 (2009)

Balance-sheet (thousands CZK) — **Ratio analysis vertical**

	1	2	3	4	(5)
Assets	**100%**	**100%**	**100%**	**100%**	**100%**
Fixed assets	**19%**	**15%**	**19%**	**19%**	**11%**
Intangible assets	0%	0%	0%	0%	0%
Tangible assets	19%	15%	19%	19%	11%
Financial assets	0%	0%	0%	0%	0%
Current assets	**80%**	**85%**	**81%**	**80%**	**89%**
Inventories	19%	8%	25%	15%	28%
Long-term receivables	0%	0%	0%	0%	0%
Short-term receivables	38%	43%	31%	29%	41%
Trade receivables – customers	31%	36%	25%	17%	38%
Cash and cash equivalents	23%	34%	25%	36%	20%
Prepaid expenses	**1%**	**0%**	**0%**	**0%**	**0%**
Total assets					
	1	**2**	**3**	**4**	**(5)**
Liabilities	**100%**	**100%**	**100%**	**100%**	**100%**
Owner's Equity	**16%**	**19%**	**23%**	**19%**	**17%**
Issued capital	4%	2%	3%	4%	13%
Retained earnings	1%	2%	1%	8%	0%
Profit for the period	12%	14%	18%	7%	4%
Liabilities	**75%**	**75%**	**77%**	**76%**	**81%**
Non-current payable	18%	11%	14%	15%	1%
Current payable	58%	64%	63%	61%	80%
Account payable	40%	50%	38%	35%	14%
Loans payable	0%	0%	0%	0%	0%
Retained earnings	**9%**	**6%**	**0%**	**4%**	**2%**
Total liabilities					

Table 2: Ratio analysis of assets and liabilities - vertical

From Table 2 is also obvious that there is a zero loans payable row in the balance-sheet. According the assets structure, it means that company has been funding fixed assets partially by current liabilities – this kind of funding is also know as aggressive funding [3].



Graph 2: Development of items of assets and liabilities

Financial statement
(thousands CZK)

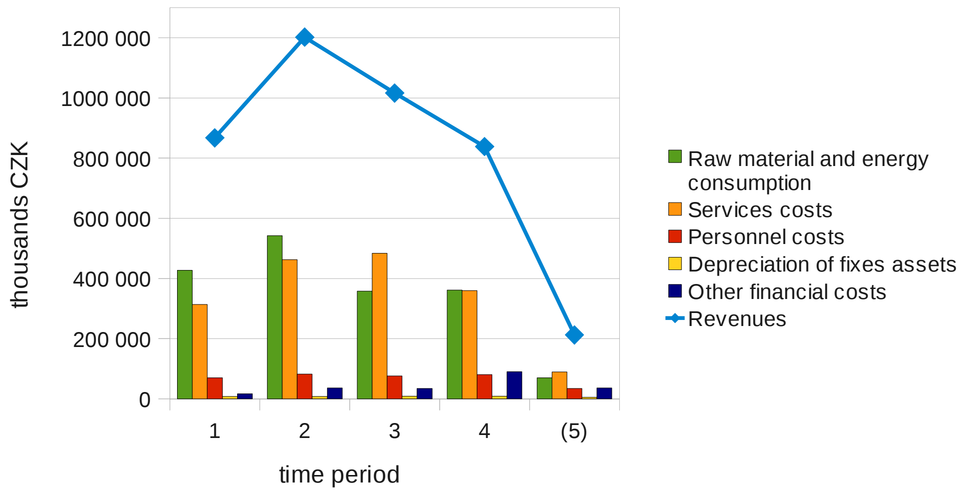
	Ratio analysis horizontal (growth index)		
Time period	**2/1**	**3/2**	**4/3**
Output	1.4	0.8	0.8
Output consumption	1.4	0.8	0.9
Raw material and energy consumption	1.3	0.7	1.0
Services costs	1.5	1.0	0.7
Added value	1.5	0.9	0.7
Personnel costs	1.2	0.9	1.0
Depreciation of fixes assets	1.0	1.2	0.9
Operating profit	**1.8**	**0.8**	**0.2**
Other financial revenues	2.3	1.3	2.4
Other financial costs	**2.2**	**0.9**	**2.6**
Profit from financial oeprations	1.2	-2.8	1.1
Tax on profit	**2.0**	**1.0**	**0.2**
Earning before tax	**1.8**	**1.0**	**0.3**
Earnings after tax	**1.9**	**1.0**	**0.3**

Table 3: Ratio analysis of financial statement - horizontal

Table 3 and Table 4 present horizontal and vertical ratio analysis of financial statement within the period of years from 2005 to 2009. Reports indicates that output are during the period decreasing along with the operating costs and output costs (consumption) while other operating costs are at its maximum during the 2007 – this was probably due to export as a reaction to first signs of spreading the global economic crisis into European states; this statement is supported by increase of operating revenues which are slowly rising and are at maximum in 2008. In Table 4 (vertical ratio analysis) is apparent the output consumption is 80% of returns – the raw material and energy consumption decreases but the services costs are slowly increasing (as a result of export increase). Declination of personnel costs in 2008 is caused by a dismissal of employees (the number was reduced from 207 to 160).

Financial statement (thousands CZK)	Ratio analysis vertical				
	1	2	3	4	(5)
Time period					
Output	**100%**	**100%**	**100%**	**100%**	100%
Output consumption	85%	84%	83%	86%	75%
Raw material and energy consumption	49%	45%	35%	43%	33%
Services costs	36%	38%	48%	43%	42%
Added value	15%	16%	17%	14%	25%
Personnel costs	8%	7%	8%	10%	17%
Depreciation of fixes assets	1%	1%	1%	1%	3%
Operating profit	6%	7%	7%	2%	3%
Other financial revenues	2%	3%	4%	12%	15%
Other financial costs	2%	3%	3%	11%	17%
Profit from financial oeprations	**0%**	**0%**	**1%**	**1%**	**-2%**
Tax on profit	1%	2%	2%	1%	0%
Earning before tax	**4%**	**5%**	**6%**	**2%**	**1%**
Earnings after tax	**5%**	**7%**	**8%**	**3%**	**1%**

Table 4: Ratio analysis of financial statement - vertical



Graph 3: Operating costs development during 2005 - 2009

– financial ratios of profitability, liquidity (solvency), activity and productivity

Input values (thousands CZK)	**1**	**2**	**3**	**4**
EBIT – earnings before interest and tax	45 579	84 795	82 085	25 683
EBT – earnings before ax	45 568	84 766	82 081	25 519
EAT – earnings after tax	33 396	60 697	58 619	19 891
Assets	283 691	424 086	329 068	274 448
Equity	45 663	81 360	74 479	53 470
Sales	867 486	1201 944	1016 415	838 216
Ratios of profitability				
ROA – return on assets	16%	20%	25%	9%
ROE – return on equity	73%	75%	79%	37%
ROS – return on sales	5%	7%	8%	3%
NPM – net profit margin	4%	5%	6%	2%

Table 5: Ratios of profitability in period of years 2005 - 2008

The return on assets (ROA) has tendency of increase until 2007 when the company started to encounter impacts of global economic crisis – production decrease. The highest value among ratios of profitability has the return on equity (ROE) which is always higher than ROA – relative yield of whole capital is lower than yield of equity. The lowest values of ratios are with return on sales (ROS), i.e. the amount of profit from one crown of sales.

Input values (thousands CZK)	**1**	**2**	**3**	**4**
Current assets	227 224	360 247	266 351	220 688
Inventories	53 492	35 961	82 192	42 431
Short-term receivables	108 109	180 398	102 944	78 890
Financial assets	65 623	143 888	81 215	99 367
Short-therm payable	163 458	269 367	208 612	168 627
Ratios of liquidity				
Current ratio	1.4	1.3	1.3	1.3
Quick asset ratio	1.1	1.2	0.9	1.1
Cash position ratio	0.4	0.5	0.4	0.6

Table 6: Ratios of liquidity (solvency) in period of years 2005 - 2008

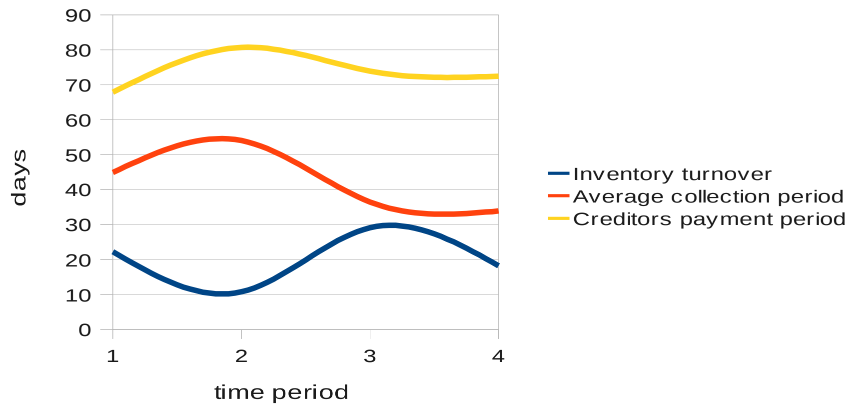
The current ratio value is permanently below recommended values (1,5 – 2,5). Recommended value for quick asset ratio is in (1,0 – 1, 5) and the only year the real value is below the limit is in 2007. The cash position ratio value fluctuates between recommended values (0,2 – 0,5).

Input values (thousands CZK)	**1**	**2**	**3**	**4**
Sales	867 486	1201 944	1016 415	838 216
Assets	283 691	424 086	329 068	274 448
Inventories	53 492	35 961	82 192	42 431
Receivables	108 202	180 416	102 944	78 890
Short-term payables	163 458	269 367	208 612	168 627
Ratios of activity				
Total assets turnover ratio	3.1	2.8	3.1	3.1
Inventory turnover ratio	16.2	33.4	12.4	19.8
Receivables turnover ratio	8.0	6.7	9.9	10.6
Short-term turnover ratio	5.3	4.5	4.9	5.0
Inventory turnover	22	11	29	18
Average collection period	45	54	36	34
Creditors payment period	68	81	74	72

Table 7: Ratios of activity in period of years 2005 - 2008

The total assets turnover ratio is over recommended value (1) and it fluctuates in a thin interval of values. Inventory turnover ratio decreased in 2007 but started to rise in next year when it increased by 50%. The average collection period decreases while the creditors payment period (short-term payables) increases – the company uses supplier credit.

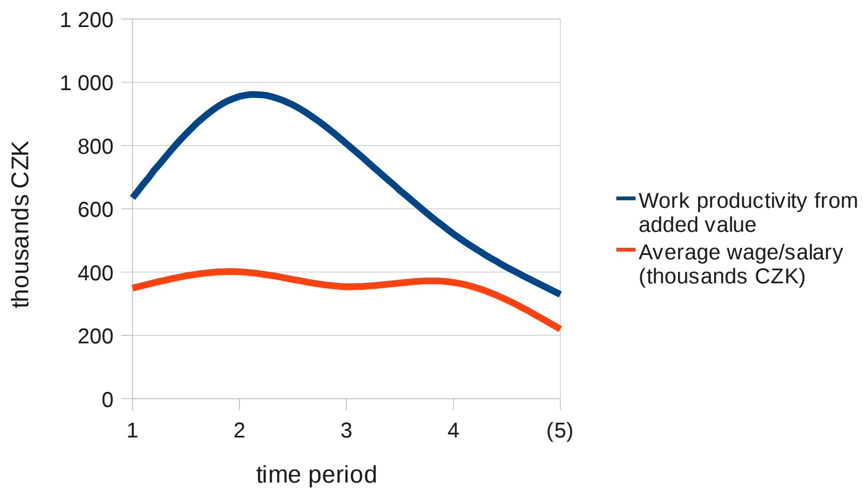
The financial reports indicates high percentage of debt of company. Nevertheless, considering the capital structure (equity-liabilities ratio) this debt ratio (total debt to total assets) is probably caused by significant share of supplier credit usage. According to this fact it would be more convenient to consider only long-term indebtedness which is about 15%. Because the company does not use any kind of long-term loan it is not burdened by loan interests.



Graph 4: Periods of inventory turnover, collection and payment

Input values	1	2	3	4
Number of employees	200	205	217	219
Personnel costs (thousands CZK)	69 907	82 212	76 796	80 485
Added value (thousands CZK)	126 837	195 728	174 943	114 123
Ratios of productivity				
Personnel costs from added value	55%	42%	44%	71%
Work productivity from added value	634	955	806	521
Average wage/salary (thousands CZK)	350	401	354	368

Table 8: Ratios of productivity in period of years 2005 - 2008



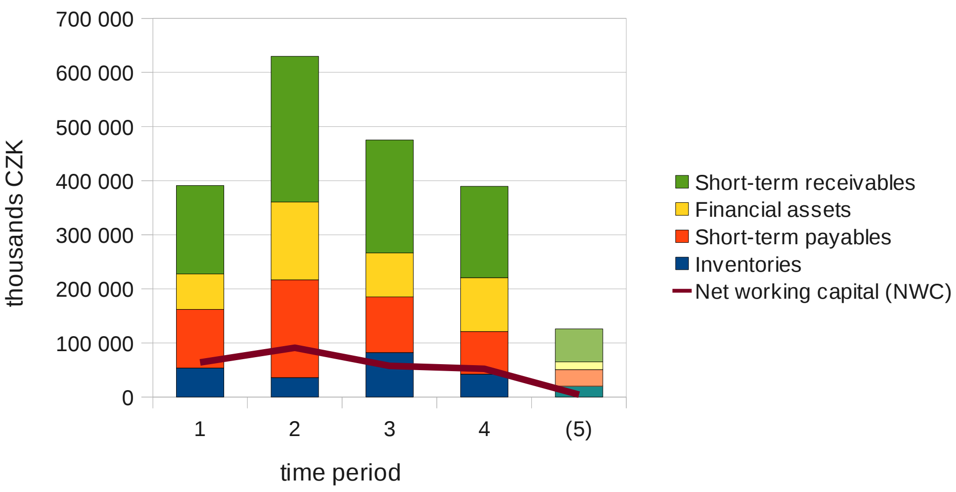
Graph 5: Ratios of productivity

– net working capital (NWC) analysis

As seen in Table 9 the net working capital decreases during the period. From financial aspect, the company always tries to keep the NWC as low as possible (and invest the capital wisely), however, it is always desired to keep to NWC higher due to needs of operations process.

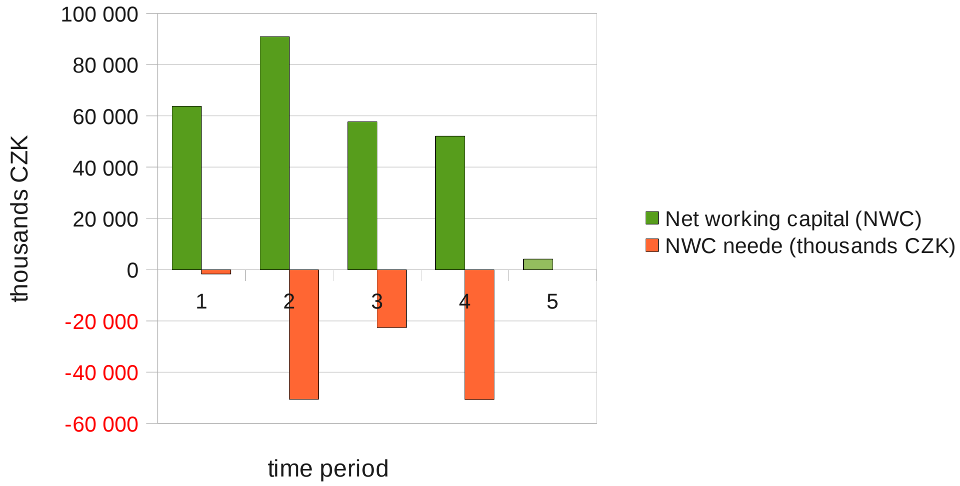
Net working capital (NWC)				
up to 31.12. of a year	**1**	**2**	**3**	**4**
Current assets	227 224	360 247	266 351	220 688
Short-term receivables	163 458	269 367	208 612	168 627
Inventories	53 492	35 961	82 192	42 431
Short-term payables	108 202	180 416	102 944	78 890
Financial assets	65 623	143 888	81 215	99 367
Net working capital (NWC)	63 766	90 880	57 739	52 061
Annual growth		43%	-36%	-10%
NWC needed for period 1-4				
Input values	**1**	**2**	**3**	**4**
Inventory turnover (days)	22	11	29	18
Average collection period (days)	45	54	36	34
Creditor payment period (dasy)	68	81	74	72
Annual expenses (thousands CZK)	839 998	1148 100	977 763	899 035
Ratios of activity				
Cash turnover period (days)	- 1	- 16	- 8	- 20
Average daily expenses (thousands CZK)	2 333	3 189	2 716	2 497
NWC neede (thousands CZK)	-1 708	-50 616	-22 583	-50 738
NWC ratios				
up to 31.12. of a year	**1**	**2**	**3**	**4**
Net working capital (NWC)	63 766	90 880	57 739	52 061
Sales	867 486	1201 944	1016 415	838 216
Assets	283 691	424 086	329 068	274 448
NWC/A	22%	21%	18%	19%
NWC/T	7%	8%	6%	6%

Table 9: Net Working Capital (NWC) - real values, optimal values and ratios



Graph 6: Development of NWC components

The negative cash turnover period means that company collects cash for its products and services provides earlier than it pays for products and services to its suppliers. This was obvious in earlier phases of the analysis (ratios of activity, Table 7). As seen in Table 9, the NWC value needed for separate time of period is negative. This is caused because of the cash turnover period values are also negative. Nevertheless, the style of financing operations (very high share of supplier credit usage) it is possible that the net working capital value is needed for smooth and continuous financing of operations and sustaining the adequate liquidity level.



Graph 7: Real NWC value and NWC needed - comparison

- The Altman's Z-score (index) for companies non-traded on capital markets

Ratios	Weights	1	2	3	4
X_1 (= NWC/A)	0.717	0.22	0.21	0.18	0.19
X_2 (= HV min. let./A)	0.847	0.01	0.02	0.01	0.08
X_3 (= EBIT/A = ROA)	3.107	0.16	0.20	0.25	0.09
X_4 (= VK/CZ)	0.420	0.21	0.26	0.29	0.26
X_5 (= T/A = obrat aktiv)	0.998	3.06	2.83	3.09	3.05
Z-score		3.81	3.73	4.12	3.65

Table 10: Altman's Z-score

Z-score of the company reached very high levels in period of years between 2005 and 2008. The limit level for the Z-score is a 2,99 value. Values above this limit means the company is financially healthy and it is not threatened by going bankrupt in next few years [3].

- Index 05

Ratios	Weights	1	2	3	4
Assets/Liabilities	0.13	1.33	1.33	1.30	1.31
EBIT/Costs interest		4 143.55	2 923.97	20 521.25	156.60
EBIT/Costs interest – correction	0.04	9.00	9.00	9.00	9.00
EBIT/Assets = ROA	3.97	0.16	0.20	0.25	0.09
Revenues/Assets	0.21	3.06	2.83	3.09	3.05
Current assets/Short-term receivables	0.09	1.39	1.34	1.28	1.31
IN05		1.94	2.04	2.28	1.66

Table 11: Index 05

If the Index values exceed 1,6 the company creates added value with probability of 67%.

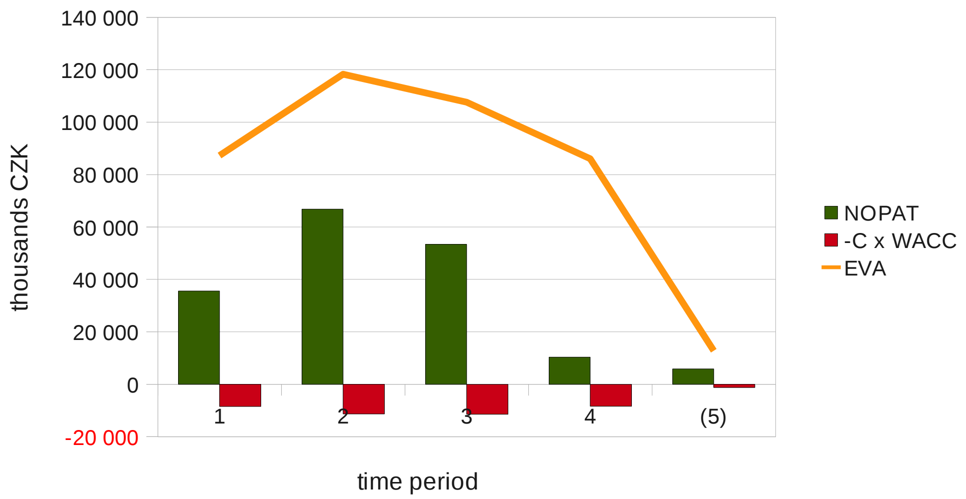
- EVA – economic value added [3], [1]

Weighted average capital costs were set by “rating model” [3]. The risk-free rate r_f was derived from long-term securities.

Input values	1	2	3	4	(5)
Operating profit	48 102	87 903	70 314	13 165	7 315
Tax*	26%	24%	24%	21%	20%
NOPAT	35 595	66 806	53 439	10 400	5 852
C	95 744	129 685	118 982	94 405	14 013
WACC	8.88%	8.78%	9.58%	8.88%	8.92%
-C x WACC	-8 502	-11 384	-11 399	-8 383	-1 251
EVA	87 242	118 301	107 583	86 022	12 762

*http://www.euroekonom.cz/grafy-data.php?type=cesko-dpo-rok

Table 12: EVA (Economic Value Added) for period 1-4(5)



Graph 8: Generating EVA

3. Conclusions

Profit of the company slowly decreases within considered time period. Total assets decrease as well. This was obviously caused by evolving global economic crisis. However, the assets structure is stable during the period – current assets are about 80% of total assets as well as the share of short-term liabilities. The company use partially short-term financing of fix assets – it is cheaper but also more risk. The company has probably strong negotiating position.
Ratios of profitability are solid – mainly the return on assets and very good return on equity. The worst ratio value is the return on sales. Activity of the company is stable; company increases the creditor payment period and decreases the average collection period. Liquidity (solvency) of the company is usually near the recommended values (however, it is not excluded that the limits in literature are currently conservative [3]). With expanding economic crisis the company reduced the number of employees. Simultaneously, the productivity of the work from added value has been decreasing since its maximum in 2006. According the last exceptional financial statement from August 2009, the company posted a profit in amount of 3 million CZK. The company is managed tightly yet still with a potential to flexibility.

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