

A MODEL SUGGESTION FOR CASH CONVERSION OF INVENTORY AND BASEMENT OF MODEL FINANCIAL RATIOS ANALYSIS

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Abstract

Companies are trying to compete with each other with different management techniques such as cost management, sales management etc. Financial analysis is a very important tool for companies in measuring efficiency, measuring the degree of success, and in measuring the determination of companies' target and cost volume. Although companies focus on cost management, they do not consider financial ratio analysis on the same platform. Traditionally, companies usually consider material costs. However, the aim of this study is to give vision beyond the material costs according to the financial statement ratio analysis. We aimed at looking at material costs as a finished cost with their performance result. Thus, it will give a more competitive power to companies. Also, we considered to see through analytical liquidity analysis simulation tables, material costs cash collection and their effects on financial ratios. In addition, we analyzed the current assets cash flow and cash balance and their effects. On the other hand, we aim to simulate with different current assets, scenarios effects on companies' financial structure and cash balances through this model. Consequently, we aim to make risk analysis (risk simulation) for different current assets scenarios. Thus, this is done in order to simulate effects on companies' financial structure and cash balance.

Keywords: Financial ratio analysis, cash flow, risk analysis, cash balance, analytical liquidity analysis.

Introduction

Financial analysis technique is very important for companies to see their performance result. However, it is a very important tool to plan a companies' future. Conventional financial analysis ensures a company's

financial results through efficient calculation techniques. We aim to show that in a company's production, there is a relationship between the production department and the finance department of the company. In addition, our model shows companies' cash flow situation before the start of the production process. Then, it shows what will happen next when the company starts production. We built a new model titled "Cash Conversion of Inventory and Basement of Model Financial Ratios Analysis" to show production cost with efficient financial ratio analysis and proactive cash flow management to company. We developed our model known as "cash conversion of inventory" to be able to show cash flow situation beyond the conventional financial management techniques. Consequently, according to this model, we aim to make special link in the middle of the production and finance department with new and effective interfaces.

1. Financial Statements

1.1 Income Statement

Income statement presents information on the financial results of a company's business activities over a period of time. The income statement communicates how much revenue the company generated during a period and what costs it incurred in connection with generating that revenue. Net income (revenue minus all costs) on the income statement is often referred to as the "bottom line" because of its proximity to the bottom of the income statement. Income statements are reported on a consolidated basis. Thus, this means that they include the revenues and expenses of affiliated companies under the control of the parent (reporting) company. Sometimes, income statement is referred to as a statement of operations or profit and loss (P & L) statement (Robinson & Thomas, 2008).

1.2 Balance Sheet

The balance sheet (also known as the statement of financial position or statement of financial condition) presents a company's current financial position by disclosing the resources that the company controls (assets) and what it owes (liabilities) at a specific point in time. Owners' equity represents the excess of assets over liabilities. This amount is attributable to the owners or shareholders of the business. Thus, it is the residual interest in the assets of an entity after deducting its liabilities. The three parts of the balance sheet (assets, liabilities, and owner's equity) are formulated in an accounting relationship known as the accounting equation. However, this equation is expressed as: $Assets = Liabilities + Owners' equity$ (that is the

total amount for assets must balance with the combined total amounts for liabilities and owners' equity) (Robinson & Thomas, 2008).

1.3 Cash Flow Statement

Although the income statement and balance sheet provides a measure of a company's success in terms of performance and financial position, cash flow is also vital for a company's long-term success. Disclosing the sources and uses of cash helps creditors, investors, and other statement users to evaluate the company's liquidity, solvency, and financial flexibility. In addition, financial flexibility is the ability to react and adapt to financial adversities and opportunities (Robinson & Thomas, 2008).

2. Financial Analysis

In general, analysts seek to examine the performance and financial position of companies as well as forecast future performance and financial position. Analysts are also concerned about factors that affect the risks of the company's future performance and financial position. Analysts usually work in a variety of positions. Some are equity analysts whose main objective is to evaluate potential equity (share) investments. Therefore, this is used to determine whether a prospective investment is attractive and what an appropriate purchase price might be. Others are credit analysts who evaluate the creditworthiness of a company to decide whether (and with what terms) a loan should be made or what credit rating should be assigned. Analysts may also be involved in a variety of other tasks, such as evaluating the performance of a subsidiary company, evaluating a private equity investment, or finding stocks that are overvalued for purposes of taking a short position (Robinson & Thomas, 2008).

3. Scope and Purpose of Financial Analysis

The role of financial reporting by companies is to provide information about their performance, financial position, and changes in their financial position. Thus, this is useful to a wide range of users in making economic decisions. The role of financial statement analysis is to take financial reports prepared by companies, combined with other information, in evaluating the past, current, and prospective performance and financial position of a company. This is done for the purpose of making investment, credit, and other economic decisions. In evaluating financial reports, analysts typically have an economic decision in mind. Thus, their decisions include:

- Determining the creditworthiness of a company that has made a loan request.
- Extending credit to a customer.
- Examining compliance with debt covenants or other contractual arrangements.
- Assigning a debt rating to a company or bond issue.
- Valuing a security for making an investment recommendation to others.
- Forecasting future net income and cash flow.

These are certain themes in financial analysis. In general, analysts seek to examine the performance and financial position of companies. In addition, it also forecast the future performance and financial position of the company. Analysts are also concerned about factors that affect the risks of the company's future performance and financial position (Robinson & Thomas, 2008).

4. Financial Analysis Techniques

Financial statements are analyzed by financial analysis techniques and obtained results are reviewed. The techniques used in financial analysis are (Arat, Finansal Analiz Aracı Olarak Oranlar, 2005):

- Horizontal Analysis
- Vertical Analysis
- Trend Analysis
- Ratios

4.1 Horizontal Analysis

Horizontal analysis is the calculation of changes on financial statements which are prepared for financial analysis in two sequential periods (Yazıcı, 1976). In other words, horizontal analysis technique provides changes in accounts of assets, liabilities, and income statements over two consecutive periods in the fastest way (Arat & Durmuş, Mali Tablolar Tahlili, 1997). In horizontal analysis technique, the income and balance sheets of two sequential periods are compared with each other. Also, variance is calculated by the subtraction of the last period from the previous period. Difference between two period with (+) and (-) sign is put on the variance column. In addition, increasing and decreasing values are put on additional column in order to see variances on accounts in a better way.

Therefore, the following example shows the horizontal analysis of balance sheets in two sequential periods.

ASSETS	2013	2014	Variance	Increase	Decrease
<i>CASH AND CASH EQUIVALENTS</i>	41.000	26.000	-15.000		-15.000
<i>BUYERS</i>	76.262	120.309	44.047	44.047	
<i>NOTES RECEIVABLE</i>	415	347	-68		-68
<i>FINISHED GOODS</i>	234.694	222.420	-12.274		-12.274
<i>RAW MATERIALS AND SUPPLIES</i>	120.000	100.000	-20.000		-20.000
<i>CURRENT ASSETS</i>	472.371	469.076	-3.295		-3.295
<i>FIXED ASSETS</i>	97.889	146.909	49.020	49.020	
TOTAL OF ASSETS	570.260	615.985	45.725	45.725	

LIABILITIES					
<i>BANK LOANS</i>	308.129	361.857	53.728	53.728	
<i>ACCOUNTS PAYABLE</i>	4.534	4.860	326	326	
<i>OTHER PAYABLES</i>	5.785	10.955	5.170	5.170	
<i>SHORT TERM EXTERNAL RESOURCES</i>	318.448	377.672	59.224	59.224	
<i>TOTAL OF LONG TERM EXTERNAL RESOURCES</i>	5.287	19.189	13.902	13.902	
<i>EQUITY</i>	136.234	134.428	-1.806		-1.806
TOTAL LIABILITIES	459.969	531.289	71.320	71.320	

4.2 Vertical Analysis

Vertical analysis technique is an analysis of financial statements by assuming the value of an item as 100, and calculating other items value as a percentage of this item (Yazıcı, 1976). In vertical analysis of balance sheet, the total of assets and total of liabilities are assumed as 100. Percentages of other lines are calculated based on the total assets and total liabilities. Sales value is assumed as 100 in income statement. In addition, the percentages of other lines are calculated based on sales value.

Therefore, the following example shows the vertical analysis of balance sheets in two sequential periods.

ASSETS	2013	2014			
<i>CASH AND CASH EQUIVALENTS</i>	41.000	7,2	26.000	4,2	
<i>BUYERS</i>	76.262	13,4	120.309	19,5	
<i>NOTES RECEIVABLE</i>	415	0,1	347	0,1	
<i>FINISHED GOODS</i>	234.694	41,2	222.420	36,1	
<i>RAW MATERIALS AND SUPPLIES</i>	120.000	21,0	100.000	16,2	
<i>CURRENT ASSETS</i>	472.371	82,8	469.076	76,2	
<i>FIXED ASSETS</i>	97.889	17,2	146.909	23,8	
TOTAL OF ASSETS	570.260	100,0	615.985	100,0	

LIABILITIES					
<i>BANK LOANS</i>	308.129	67,0	361.857	68,1	
<i>ACCOUNTS PAYABLE</i>	4.534	1,0	4.860	0,9	
<i>OTHER PAYABLES</i>	5.785	1,3	10.955	2,1	

SHORT TERM EXTERNAL RESOURCES	318.448	69,2	377.672	71,1
TOTAL OF LONG TERM EXTERNAL RESOURCES	5.287	1,1	19.189	3,6
EQUITY	136.234	29,6	134.428	25,3
TOTAL LIABILITIES	459.969	100,0	531.289	100,0

In this example, the percentage of “CASH AND CASH EQUIVALENTS” line is calculated by the following formula:

$$x = \frac{41.000 \times 100}{570.00}$$

$$x=7.2.$$

Thus, this means that 7.2% of the total assets are cash and cash equivalents line.

4.3 Trend Analysis

Trend analysis technique aims to show changes on financial statements over the periods which is based on the first period (Arat, Finansal Analiz Aracı Olarak Oranlar, 2005). In this technique, the value of the first period of each line is assumed as 100. Then, other periods of each line are calculated based on the first value as percentage. The following formula shows the trend value of a line:

$$x = \frac{\text{Value of current period} \times 100}{\text{value of base period}}$$

Increases and decreases in accounting components can be easily observed when we view the trend analysis in an easy way. The results which are above 100 show this increase. Furthermore, results which are below 100 show the decrease (Aktan & Bodur, 2006).

Therefore, the following example shows the trend analysis of balance sheets in two sequential periods.

ASSETS	2012	Trend I	2013	Trend II	2014	Trend III
<i>CASH AND CASH EQUIVALENTS</i>	40.000	100,0	41.000	102,5	26.000	65,0
<i>BUYERS</i>	72.273	100,0	76.262	105,5	120.309	166,5
<i>NOTES RECEIVABLE</i>	120	100,0	415	345,8	347	289,2
<i>FINISHED GOODS</i>	247.893	100,0	234.694	94,7	222.420	89,7
<i>RAW MATERIALS AND SUPPLIES</i>	110.000	100,0	120.000	109,1	100.000	90,9
CURRENT ASSETS	470.286	100,0	472.371	100,4	469.076	99,7
FIXED ASSETS	89.735	100,0	97.889	109,1	146.909	163,7
TOTAL OF ASSETS	560.021	100,0	570.260	101,8	615.985	110,0
LIABILITIES						
<i>BANK LOANS</i>	298.325	100,0	308.129	103,3	361.857	121,3
<i>ACCOUNTS PAYABLE</i>	8.412	100,0	4.534	53,9	4.860	57,8
<i>OTHER PAYABLES</i>	65.982	100,0	5.785	8,8	10.955	16,6
SHORT TERM EXTERNAL	372.719	100,0	318.448	85,4	377.672	101,3

RESOURCES**TOTAL OF LONG TERM**

EXTERNAL RESOURCES	4.591	100,0	5.287	115,2	19.189	418,0
EQUITY	140.123	100,0	136.234	97,2	134.428	95,9
TOTAL LIABILITIES	517.433	100,0	459.969	88,9	531.289	102,7

5. Ratios

The word “ratio” can be defined as a reasonable relationship between two quantities. In other words, rate describes the links (connections) between the actives or passives in balance sheet and income statement items by a percentage or a fraction (Arat, 2005, s. 89). Ratio analysis is different from the other techniques in that it is applicable to all financial statements and it reveals the relationships between items which are hidden in the financial statements. In this way, it provides a better understanding of the financial statements. When credit institutions and finance managers want to obtain an overview of key statistics of a business, they use the ratio analysis. By following these ratios over time, they obtain information about the performance of the business (Aktan & Bodur, 2006).

However, commonly used ratios are divided into four main groups (Akaytay, Çatı, & Yücel, 2015):

- **Liquidity Ratios:** The aim of the ratio in this group is to measure the power of the short-term loan payments and to determine whether the company has enough capital. For this reason, it is even more important for lenders. While calculating this ratio, we build various relationships between the sum of items of assets or components and short-term foreign sources.
- **Financial Structure Ratios:** This is the ratio that indicates to what extent the business is financed by debt, the degree of the financial risk, and the safety margins of the people providing credit to a business.
- **Profitability Ratios:** These ratios indicate to what extent that funds brought to the company by shareholders or provided by external sources allocated to the investment are used efficiently and profitably. Through these ratios, it is possible to reach the ultimate information about business regarding what extend it is managed effectively. However, this is possible by measuring profitability from different dimensions.
- **Turnover (Activity) Ratios:** Turnover ratios indicate whether or not the assets of businesses are managed effectively. Furthermore, it also states if the asset investments are sufficient or not. If there is a high turnover of assets of businesses, it can be stated that the assets are

being used efficiently. Hence, because of this, profitability is positively affected.

6. Liquidity Ratios

Liquidity ratios are used to examine the short-term debt repayment capability of the business. Ratios are calculated by dividing the current assets to short-term debt on the balance sheet. The reason is that sources used for the repayment of the business' short-term debt are the current assets. If these rates are extremely very high, this shows that the business could not reach profitability targets by holding liquid assets. If these rates are low, this shows that the business had difficulties in the repayments of the debts coming days (Berk, 2002). In loaning to a business, firstly we should look at the liquidity ratios. Therefore, bankers and credit analysts examine the various liquidity ratios (Brealey, Richard and Markus, 2001). A full liquidity analysis requires the use of cash budgets. Consequently, by relating the amount of cash and other current assets to current obligations, ratio analysis provides a quick and easy-to-use measure of liquidity (Brigham & Ehrhardt, 1999, s. 73).

More especially, we need to give attention to the following points in the analysis of company's liquidity ratios (Berk, 2002, s. 35). Thus, these points include:

- Trend in which the current assets is compared to the volume of the business.
- Trend in which the liquid assets is compared to previous periods.
- The collection ability, times, appearance reasons, and sales compliance of the registered receivables
- Appearance reason of debts on specialty.
- Nature of stocks.
- Appropriateness of the term structure of short-term debt.
- Appropriateness of the net working capital compared to business volume.
- Consideration of the other factors that affect the company's ability to pay its short-term debt.

Consequently, the analysis of the company's solvency often uses three main rates. These are: current ratio, acid-test ratio or liquidity ratio, and cash ratio (Berk, 2002).

Therefore, the example of the following balance sheet will be used in the explanation of current ratio, acid-test, and cash ratios.

ASSETS	2014
<i>CASH AND CASH EQUIVALENTS</i>	26.000
<i>BUYERS</i>	120.309
<i>NOTES RECEIVABLE</i>	347
<i>INVENTORIES</i>	322.420
<i>CURRENT ASSETS</i>	469.076
<i>FIXED ASSETS</i>	146.909
TOTAL OF ASSETS	615.985

LIABILITIES	
<i>BANK LOANS</i>	361.857
<i>ACCOUNTS PAYABLE</i>	4.860
<i>OTHER PAYABLES</i>	10.955
<i>TOTAL CURRENT LIABILITIES</i>	377.672
<i>TOTAL OF LONG TERM EXTERNAL RESOURCES</i>	19.189
EQUITY	134.428
TOTAL LIABILITIES	531.289

6.1 Current Ratio

Current ratio refers to the ability of the firm to meet short-term obligations. Current assets normally include cash, marketable securities, accounts receivable, and inventories. Current liabilities consists of accounts payable, short-term notes payable, current maturities of long term debt, accrued taxes, and other accrued expenses. The current ratio is calculated by dividing current assets by current liabilities (Brigham & Ehrhardt, 1999, s. 73). Thus, this can be expressed as:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Current ratio indicates how many dollars of current assets the company have corresponding to the company's short-term foreign sources of 1 dollar. The purpose of calculating the current ratio is to measure the ability to pay short-term debts of the company and to determine whether there is enough of the business source or not. It is a better measure that shows the company's debt repayment capacity compared to net working capital amount (Arat, 2005). When the current ratio is above the standard, it shows that there are current assets which are more than enough. Although this is viewed positively by the lenders and creditors, it is not good in terms of the adverse impact on the return on equity. This can mean that there is the presence of idle operation and it is not well evaluated (Arat, 2005). This situation can be thought negatively by shareholders. Current account ratio is calculated as follows according to the sample of balance sheet:

$$\text{Current ratio} = \frac{469.076}{377.672}$$

Current Ratio = 1.24

In the balance sheet sample, 1.24 dollars of current assets corresponds to the company's short-term foreign sources of 1 dollar.

6.2 Acid Test or Quick Ratio

The quick ratio or acid test is calculated by deducting inventories from current assets, and then dividing the remainder by current liabilities (Brigham & Ehrhardt, 1999, s. 73):

$$\text{Acid Test, or Quick Ratio} = \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$$

This ratio completes the current rate ratio and makes it more meaningful because it ignores inventories which are the least liquid item in a balance sheet (Acar, 2003).

Acid-test ratio calculation is as follows according to a balance sheet sample:

$$\text{Acid Test, or Quick Ratio} = \frac{469.076 - 322.420}{377.672}$$

Acid-test ratio = 0.39

6.3 Cash Ratio

Cash ratio means the ability of the firm to meet short-term obligations with only cash and cash equivalents. Cash ratio is calculated by adding cash and cash equivalents, and dividing it by the total current liabilities. This can be described as shown below:

$$\text{Cash ratio} = \frac{\text{Cash} + \text{Cash Equivalents}}{\text{Current Liabilities}}$$

This rate is more accurate than the other rates. It demonstrates the ability of the company to pay its short-term debt in case of interruption in sales, uncollected receivables, and if they encounter difficulties during the redemption of stocks.

Cash ratio calculation is as follows according to a balance sheet sample:

$$\text{Cash ratio} = \frac{26.000}{377.672}$$

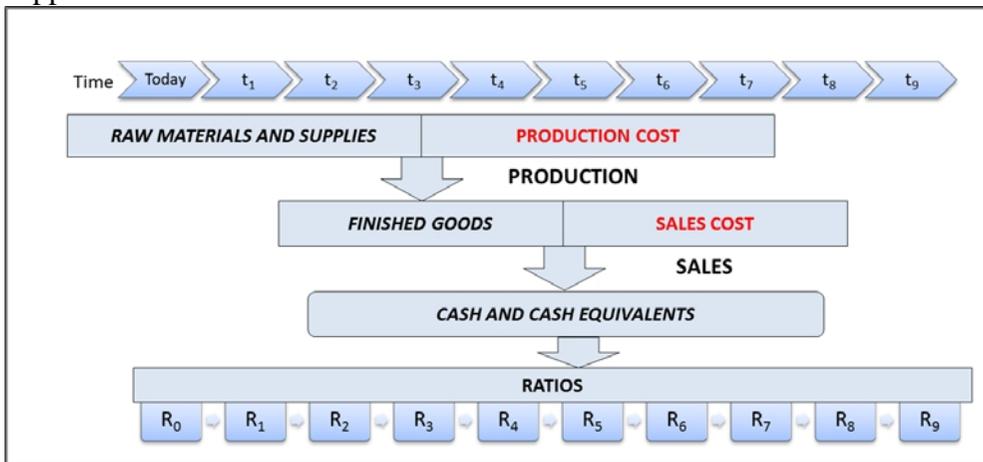
Cash Ratio = 0.07

In a related example, if the company's sales are completely stopped and the company cannot collect the receivables, they are able to pay only 7% of the short-term debt.

7. A Model Proposition for Cash Conversion of Inventory and Raw Materials

While the evaluation of businesses is being carried out using the rates of raw materials and supplies, inventories are evaluating their current value. In fact, raw materials and supplies can be converted to inventories by enduring production costs. During this conversion, the value of the inventory is greater than the value of raw materials. Inventories can be converted to cash and receivables by enduring sales cost. The obtained value as a result of the sale of the inventory cost by enduring sales costs is lower than the value of inventories. In addition, it is more than the value of the raw materials used to produce these inventories. These conversions change the financial ratio of companies.

The following proposed model shows the effect of raw materials and supplies on ratios.



In this model, raw materials are converted to finished goods, but it consumes cash and cash equivalents for production. In this case, the value of finished goods is greater than the difference in the value of raw material and production cost. It can be shown in the following formula: Value Finished Goods > Value of Raw Materials – Production Cost. For example, \$ 15,000 worth of products can be produced with materials worth of \$ 10,000 and \$ 1,000 cost. Finished goods are converted to cash and cash equivalents, but it consumes cash and cash equivalents for sales cost. In this case, cash changes on balance sheets can be shown in the following formula: Cash Changes = Value Sold Goods – Sales Cost. In both cases, liquidity ratios may change. In this model, effect of raw materials and finished goods on ratios and cash flows are considered in a right way.

The following example is used to illustrate the above.

ABC Company is in the manufacturing industry with production of machine. In the management of ABC Company, the identified activities they perform are as follows:

1. ABC Company produced 10 ratios as $R_0, R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8,$ and R_9 . These are different ratios requiring different amount and volume of production activity.
2. ABC Company has 9 due dates to organize cash flow management as $T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8,$ and T_9 . Thus, these represent the due date for payment in planning a wide range of cash flow.
3. ABC Company has 3 financial analysis ratio types which are current ratio, acid test ratio, and cash ratio. Thus, these represent due date for payment in planning a wide range of cash flow. They are shown according to each item types under the due date financial situation basement of production activity.

BALANCE SHEET CHANGES										
ASSETS	t_0	t_1	t_2	t_3	t_4	t_5	t_6	t_7	t_8	t_9
CASH AND CASH EQUIVALENTS	50.000	102.550	155.100	207.650	260.200	312.750	365.300	417.850	470.400	523.170
BUYERS	120.000	120.000	120.000	120.000	120.000	120.000	120.000	120.000	120.000	120.000
NOTES RECEIVABLE	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
FINISHED GOODS	250.000	223.000	196.000	169.000	142.000	115.000	88.000	61.000	34.000	6.780
RAW MATERIALS AND SUPPLIES	200.000	180.000	160.000	140.000	120.000	100.000	80.000	60.000	40.000	20.000
CURRENT ASSETS	621.000	626.550	632.100	637.650	643.200	648.750	654.300	659.850	665.400	670.950
FIXED ASSETS	150.000	146.909	146.909	146.909	146.910	146.911	146.912	146.913	146.914	146.915
TOTAL OF ASSETS	771.000	773.459	779.009	784.559	790.110	795.661	801.212	806.763	812.314	817.865
LIABILITIES										
BANK LOANS	361.857	361.857	361.857	361.857	361.857	361.857	361.857	361.857	361.857	361.857
ACCOUNTS PAYABLE	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860
OTHER PAYABLES	10.955	10.955	10.955	10.955	10.955	10.955	10.955	10.955	10.955	10.955
SHORT TERM EXTERNAL RESOURCES	377.672									
TOTAL OF LONG TERM EXTERNAL RESOURCES	19.189									
EQUITY	134.428									
TOTAL LIABILITIES	531.289									
PRODUCTION & SALES										
Production										
Consumed Raw Material and Supplies		20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000	20.000
Production Cost		1.400	1.400	1.400	1.400	1.400	1.400	1.400	1.400	1.400
Produced Finished Goods		28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000
Sales										
Sales Cost		1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050
Saled Finished Goods		55.000	55.000	55.000	55.000	55.000	55.000	55.000	55.000	55.220
RATIO CHANGES										
	R_0	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	R_9
Current Ratio	1,64	1,66	1,67	1,69	1,70	1,72	1,73	1,75	1,76	1,78
Acid Test	0,45	0,59	0,73	0,87	1,01	1,15	1,29	1,43	1,57	1,71
Cash Ratio	0,13	0,27	0,41	0,55	0,69	0,83	0,97	1,11	1,25	1,39

8. Conclusion

Information technology provides very effective and well detailed information quickly to companies. However, management is responsible to choose the right tool for their operation. Companies need to check their financial situation timely and fairly. In addition, financial planning is a very

important part of the management system. Management departments need to be sure when they budget their activities. Furthermore, we give an assurance to companies so as to plan their management activities in their financial management difficulties. Our model ensures the effects on cash inflow and financial ratios of the material stock. In addition, our model ensures the effects of analysis on cash return and cash balance of the current assets on a monthly basis. On the other hand, through this model, we can simulate effects of activities on companies' financial structures and the cash balance of the different current assets scenarios.

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