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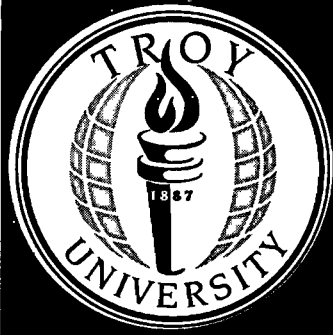


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ALTERNATIVE MEASURES OF CORPORATE LIQUIDITY

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Introduction

Liquidity is often defined as the ability to cover current liabilities. Failure to pay current liabilities or short term obligations could lead to a firm's bankruptcy. Such failure at the very least will result in financial distress. If the firm's stock is publicly held, substantial reduction in the stock price occurs. There can be no long term existence if the short term can not be satisfied.

Research has attempted to establish a link between liquidity measures and bankruptcy/financial distress. An early research study (Beaver, 1966) found that among the traditional liquidity ratios, current ratio appeared to be the best predictor of a firm's bankruptcy.

In the classic development of Z-score analysis (Altman, 1968), working capital when used in a multiple variable model served as a good predictor of bankruptcy/financial distress. Other studies (Altman, et.al., 1977; Ohlson, 1980) focused on the use of current ratio in determining a firm's liquidity strength.

Therefore, it would be desirable to measure a firm's liquidity to determine its short term financial health.

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

$$\text{Quick ratio} = \frac{\text{Cash \& cash equivalents} + \text{market securities} + \text{accounts receiv.}}{\text{Current liabilities}}$$

$$\text{Working capital} = (\text{Current assets}) - (\text{current liabilities})$$

Measuring Liquidity

Traditional liquidity ratios include current liabilities somewhere in the equations. There are several traditional measures of liquidity.

Typically, a firm's current liabilities include the following items.

1. Short term debt and/or notes payable
2. Current portion of long term debt (e.g.: sinking funds; amortized principal)
3. Accounts payable (or trade credit)
4. Accruals (for wages, taxes, dividends, etc.)
5. Advances/deposits from customers

Current liabilities are due and payable within one year. (NOTE: This assumes the firm's operating cycle is less than one year. Most U.S. firms have an operating cycle less than one year.) Nevertheless, current liabilities are short term obligations. They must be settled eventually with payment of cash. The first four items listed above are eventually settled with cash payment.

However, the fifth item above: "advance/deposits from customers" is typically not settled by future cash payment.

Instead, it is settled by the actual delivery of goods and/or services. The only possibility of cash payment is the return of the advance or deposit as a result of failure to deliver the good or service (White, et.al., 1998). For a normal going concern, delivery of the goods or services is expected.

Therefore, traditional liquidity measures may be too stringent on firms reporting advances/deposits from customers on their balance sheets. Suggestions to handle this situation follow.

Alternative Methods of Liquidity

For firms reporting advances/deposits, let's suggest that current liabilities exclude these reported amounts. So, one can calculate an adjusted ratio as follows.

$$\text{Adjusted current ratio} = \frac{\text{Current assets}}{(\text{Current liabilities}) - (\text{Advances or deposits from customers})}$$

$$\text{Adjusted quick ratio} = \frac{\text{Cash \& cash equivalents} + \text{market securities} + \text{accounts receiv.}}{(\text{Current liabilities}) - (\text{Advances or deposits from customers})}$$

For firms that do not have any advances/deposits, the traditional ratios will equal the adjusted ratios. However, for firms that report advances/deposits, the adjusted ratios will exceed traditional ratios. The adjusted ratios may be appropriate since advances/deposits do not require the future outlay of cash.

Applications to U.S. Defense/Aerospace Industry

Perhaps more so than any other industry, the U.S. defense/aerospace industry has substantial amounts of customer advances or deposits. These customers include the U.S. Department of Defense, NASA, and the airlines. The customers give advances as part of the contracts for future delivery of the goods or services. Often these advances are given as part of "progress payments" for long term contracts.

It would be feasible to apply alternative liquidity measures to this industry. So, nine major defense/aerospace firms are shown in Exhibit 1. Traditional current ratio, adjusted current ratio, and the percent differences are shown for the ten-year period 1994-2003. Note that the adjusted current ratio increases the liquidity measure substantially.

Some may argue that the current ratio may overstate liquidity. Indeed, current assets such as inventory and prepaid items may not be liquid. Furthermore, defense firms report "contracts in progress" as a current asset. This item is sometimes included with inventory. Contracts in progress probably do not provide liquidity.

Because of this situation, one can use the quick ratio to better measure liquidity. Exhibit 2 shows both the traditional quick ratio and the adjusted quick ratio for the nine firms during

the ten-year period. Adjusted quick ratio substantially raises the liquidity measure.

Exhibit 3 summarizes Exhibits 1 & 2 by showing the average and range of percent improvement by using the adjusted ratios.

Other Considerations

It is realistically assumed that the corporations will meet their obligations by delivering the products/services in the future. However, failure to deliver would cause the appropriate advances/deposits to be returned to the customers. In this scenario, such advances/deposits would resemble traditional liabilities – i.e., an outlay of cash would be required.

Products with manufacturing defects could be rejected by the customer. To ensure quality delivery, the firms would have to incur additional expenses to remedy the situation. Thus, it is desirable to examine the experiences of firms in budget and quality issues.

When examining recent “Management and Discussion Analysis” reports of the sample firms, it appears that most programs/projects have been completed within budget at satisfactory quality. In a few cases, some firms have acknowledged the adverse budgetary impact of technical problems. However, the dollar amount was considered immaterial. Thus, this satisfactory track record would not jeopardize the proposed use of alternative liquidity measures.

In the sample of firms studied, the recent (i.e., 2003) percentage of total revenue attributed to U.S. government contracts ranged from 11percent (Loral) to 87 percent (Northrop Grumman). The top defense giants: Boeing, General Dynamics, Lockheed Martin, and Northrop Grumman had percentages of 54, 66, 78, and 87 respectively.

Although the percentages are substantial, the numbers understate the effect of long term contracts. For example, Boeing sells to major commercial airlines. Advances/deposits are also received from commercial customers, not just U.S. government.

Conclusions

Adjusted ratios tend to boost measured liquidity by substantial percentages. The traditional ratios may understate liquidity for firms with advances/deposits. It is interesting to note that the differentials are more pronounced in the most recent period (1999-2003) vs. the earlier period (1994-1998). The firms under study reported more advances/deposits during the most recent five-year period.

Corporations reporting significant advances/deposits tend to belong to industries selling products/services with long term contracts. Such industries would include contractors to the U.S. Department of Defense and NASA, corporations that manufacture aircraft, especially to major airlines, and corporations that deal with products delivered over several years. Using traditional liquidity ratios would unfairly penalize the liquidity measures for these firms.

Adjusted ratios may be more appropriate to measure liquidity. The study has shown that perhaps management, securities analysts, and other interested parties should consider using adjusted liquidity ratios to better analyze firms in the industries such as defense/aerospace.

References

Altman, E.I. (1968, September). Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy. *Journal of Finance*, 589-609.

Altman, E.I., Haldeman, R.G., & Narayanan, P. (1977, June). Zeta Analysis: A New Model to Identify Bankruptcy Risk of Corporations. *Journal of Banking and Finance*, 29-54.

Beaver, W.H. (1966). Financial Ratios as Predictors of Failure. *Journal of Accounting Research*, Supplement, 71-111.

Ohlson, J.A. (1980, Spring). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 109-131.

White, G.I., Sondhi, A.C., & Fried, D. (1998). *The Analysis and Use of Financial Statements* (2nd ed., pp 475-476). New York: John Wiley & Sons.

(Continued Exhibits 1, 2, and 3)

REFEREED ARTICLES

Exhibit 1
Current Ratios: Traditional vs. Adjusted
(Ratio units in times; Difference in percents)

	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
Boeing										
CR	0.94	0.85	0.79	0.87	1.15	1.22	1.36	1.18	1.78	1.53
Adj	1.15	1.01	1.00	1.07	1.26	1.35	1.53	1.28	1.91	1.59
%Diff	22.3	18.8	26.6	23.0	9.6	10.7	12.5	8.5	7.3	3.9
General Dynam.										
CR	1.14	1.11	1.07	1.22	1.01	1.28	1.31	2.23	2.34	2.87
Adj	1.47	1.38	1.28	1.52	1.23	1.42	1.44	N/A	N/A	N/A
%Diff	28.9	24.3	19.6	24.6	21.8	10.9	9.9	-	-	-
Lockheed Martin										
CR	1.05	1.08	1.11	1.11	1.21	1.03	1.10	1.14	1.55	1.45
Adj	2.02	2.01	2.30	2.09	2.57	1.70	1.82	1.63	2.20	2.00
%Diff	92.4	86.1	107.2	88.3	112.4	65.0	65.5	43.0	41.9	37.9
Loral Space										
CR	2.08	0.85	0.98	1.68	1.55	2.50	2.07	N/A	1.26	1.12
Adj	5.00	1.12	1.32	1.96	1.71	3.32	2.49	N/A	2.00	2.06
%Diff	140.4	31.8	34.7	16.7	10.3	32.8	20.3	-	58.7	83.9
North.Gruman										
CR	0.90	1.39	0.89	0.94	1.13	1.28	1.08	1.00	1.21	1.24
Adj	1.13	1.53	1.03	1.15	1.30	1.51	1.27	1.10	1.28	1.37
%Diff	25.6	10.1	15.7	22.3	15.0	18.0	17.6	10.0	5.8	10.5
Orbital Sciences										
CR	1.87	1.75	0.78	0.65	0.92	1.21	1.25	1.66	1.78	1.49
Adj	2.13	2.28	0.85	0.93	1.25	1.71	1.59	2.20	2.52	1.70
%Diff	13.9	30.3	9.0	43.1	35.9	41.3	27.2	32.5	41.6	14.1
Raytheon										
CR	1.71	1.41	1.45	1.65	1.13	1.29	0.78	1.19	1.43	1.52
Adj	2.34	1.68	1.72	2.15	1.42	1.49	0.81	1.29	1.58	1.77
%Diff	36.8	19.1	18.6	30.3	25.7	15.5	3.8	8.4	10.5	16.4
Textron										
CR	1.59	1.74	1.31	1.20	1.15	1.11	0.80	0.78	N/A	N/A
Adj	1.73	1.90	1.44	1.31	1.24	1.17	0.84	N/A	N/A	N/A
%Diff	8.8	9.2	9.9	9.2	7.8	5.4	5.0	-	-	-
United Technol.										
CR	1.20	1.49	1.35	1.14	1.15	1.21	1.26	1.30	1.34	1.26
Adj	1.32	1.65	1.53	1.27	1.29	1.32	1.40	1.44	1.48	1.38
%Diff	10.0	10.7	13.3	11.4	12.2	9.1	11.1	10.8	10.4	9.5

NOTES: General Dynamics did not report advances/deposits 1994-1996.
Loral Space became reorganized in 2003. 1996 calculations not done due to only nine months data reported.
Textron calculations based on manufacturing divisions only (1996-2003). No advances reported in 1996.

Sources: Corporate annual reports. 10-K reports filed with SEC.

REFEREED ARTICLES

Exhibit 2
Quick Ratios: Traditional vs. Adjusted
(Ratio units in times; Difference in percents)

	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994
Boeing										
QR	0.50	0.37	0.28	0.32	0.51	0.43	0.58	0.57	0.70	0.63
Adj	0.61	0.44	0.36	0.40	0.56	0.47	0.66	0.62	0.75	0.66
%Diff	22.0	18.9	28.6	25.0	9.8	9.3	13.8	8.8	7.1	4.8
General Dynam.										
QR	0.40	0.31	0.31	0.34	0.29	0.37	0.52	1.19	1.40	1.86
Adj	0.51	0.38	0.38	0.42	0.36	0.41	0.57	N/A	N/A	N/A
%Diff	27.5	22.6	22.6	23.5	24.1	10.8	9.6	-	-	-
Lockheed Martin										
QR	0.59	0.65	0.51	0.56	0.55	0.43	0.55	0.57	0.86	0.73
Adj	1.14	1.21	1.06	1.06	1.16	0.71	0.90	0.82	1.22	1.01
%Diff	93.2	86.2	107.8	89.3	110.9	65.1	63.6	43.9	41.9	38.4
Loral Space										
QR	0.80	0.21	0.34	0.91	0.68	1.25	0.56	N/A	0.37	0.21
Adj	1.92	0.27	0.46	1.06	0.76	1.66	0.67	N/A	0.60	0.38
%Diff	140.0	28.6	35.3	16.5	11.8	22.4	19.6	N/A	62.2	81.0
North.Grumman										
QR	0.56	0.38	0.62	0.70	0.63	0.66	0.55	0.54	0.71	0.62
Adj	0.70	0.41	0.71	0.86	0.72	0.77	0.65	0.59	0.75	0.68
%Diff	25.0	7.9	14.5	22.9	14.3	16.7	18.2	9.3	5.6	9.7
Orbital Sciences										
QR	1.73	1.54	0.69	0.46	0.78	0.92	0.97	1.39	1.37	1.19
Adj	1.97	2.00	0.76	0.66	1.06	1.30	1.23	1.84	1.94	1.36
%Diff	13.9	29.9	10.1	43.5	35.9	41.3	26.8	32.4	41.6	14.3
Raytheon										
QR	0.30	0.24	0.29	0.28	0.14	0.16	0.11	0.20	0.31	0.36
Adj	0.41	0.28	0.35	0.37	0.17	0.18	0.12	0.22	0.34	0.42
%Diff	36.7	16.7	20.7	32.1	21.4	12.5	9.1	10.0	9.7	16.7
Textron										
QR	0.72	0.65	0.45	0.49	0.48	0.30	0.33	0.34	N/A	N/A
Adj	0.78	0.72	0.50	0.54	0.52	0.32	0.35	N/A	N/A	N/A
%Diff	8.3	10.8	11.1	10.2	8.3	6.7	6.1	-	-	-
United Technol.										
QR	0.66	0.80	0.68	0.56	0.57	0.59	0.62	0.66	0.69	0.63
Adj	0.73	0.89	0.77	0.62	0.64	0.64	0.69	0.72	0.76	0.69
%Diff	10.6	11.3	13.2	10.7	12.3	8.5	11.3	9.1	10.1	9.5

NOTES: See Exhibit 1

SOURCES: Corporate Annual Reports; Form 10-K filed with the SEC

Exhibit 3
% Differential of Adjusted Ratio over Traditional Ratio
1994-2003

	Current Ratio		Quick Ratio	
	Average	Range	Average	Range
Boeing	14.3	3.9 - 26.6	14.8	4.8 - 28.6
General Dynamics	20.0	9.9 - 28.9	20.1	9.6 - 27.5
Lockheed Martin	74.0	37.9 - 112.4	74.0	38.4 - 110.9
Loral Space	47.7	10.3 - 140.4	46.4	11.8 - 140.0
Northrop Grumman	5.1	5.8 - 25.6	14.4	5.6 - 25.0
Orbital Sciences	8.9	9.0 - 43.1	29.0	10.1 - 43.5
Raytheon	8.5	3.8 - 36.8	18.6	9.1 - 36.7
Textron	7.9	5.0 - 9.9	8.8	6.1 - 11.1
United Technologies	10.9	9.1 - 13.3	10.7	8.5 - 13.2

NOTES: General Dynamics calculations from 1997 to 2003 only.
 Loral Space reorganized in 2003. Average & range may be misleading.
 Textron calculations from 1998 to 2003 only.