

AN INVESTIGATION ABOUT THE INFORMATION CONTENT OF EARNINGS & CASH-FLOWS IN ANTICIPATING OF LIQUIDITY POSITION OF LISTED COMPANIES IN TEHRAN STOCK EXCHANGES

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Abstract:

Many decisions within the existing economic environment of countries are made using accounting information systems which play a significant role in organizational activities. For this purpose, earnings, as a key piece of information in financial statements, are used as a measure to assess performance and liquidity of firms and institutions. In the present study, a sample consisting of 70 firms listed on the Tehran Stock Exchange (2006-2010) was taken, and the relevance of earnings and cash flows in predicting liquidity was assessed by making use of multiple linear regression, Durbin-Watson test, Kolmogorov–Smirnov test, variance analysis, and squared correlation coefficient for data analysis. The findings suggest that both net operating income and net cash expand cash conversion cycle and can explain a large part of variations in cash conversion cycle.

Keywords: Cash Flows, Liquidity, Income, cash conversion cycle

1. Introduction

Financial reports, as products of accounting information system, play an important role in today's economic world, with a more prominent role played by income statement and cash flow statement. Since accounting information systems should provide users of financial reports with "relevant" and "reliable" information that can be applied into decision-making models, a related question arises: Do the existing accounting systems provide information requires for measuring the status of liquidity? A key piece of information reflected in financial statements provided by firms is "accounting income" which is often used as a measure of performance and liquidity in firms and institutions. In other words, many financial analysts use "accounting income" to evaluate performance and liquidity of economic firms. However, since measurement of accounting income requires estimation, forecast, and application of different accounting methods, and because of potential conflict of interests among managers and other users of financial statements, some analysts have cast doubt on using income while preferring use of "cash flow" instead. Given particular advantages and disadvantages of both items, one cannot replace the other; rather, cash flow and income should be used together in analysis, as the present study describes their explanatory function and value relevance of these measures when used in isolation or in conjunction. In the following sections, a review of the literature is presented in Section 2 while Section 3 describes research methodology. Finally, analysis and conclusion are provided in Sections 4 and Section 5, respectively.

2. Theoretical Bases and Research Background

A mechanism for precise measurement of a firm's liquidity plays a significant role in sustaining commercial activities, maintaining proper economic and accounting status, covering unwanted situations resulting from potential risks caused by default in payments at maturity dates, including the risks associated with bankruptcy, payment of realized credit for dividends to shareholders, payment of salary and benefits to production and operational staff, financial costs, payment of principal and interests of loans obtained from banks and financial institutions, and payment of income taxes to public authorities. As indicated by such concepts as liquidity or cash flow management, this variable demonstrates a for-profit entity's ability in repayment of short- and long-term operating debts from current and noncurrent operating assets, whether in short-term or long-term, as creditors and financial and monetary institutions assess indices related to a firm's ability in covering debts and liabilities, when deciding to provide loans and facilities to firms. Therefore, using a liquidity management mechanism in risk-taking, balanced, or conservative approaches can lead to different combinations for managing financial statements or balance sheets, thereby affecting the firm's ability in fulfilling its long- and short-term obligations. To investigate firm solvency in payment of short- or long-term debts from its current or long-term assets and its impacts on other variables, previous studies often employed static measures of liquidity, including current ratio, quick ratio, and the ratio of working capital to current liabilities. The parameters used in determining these ratios are extracted from the information disclosed on static financial statements or balance sheets, noting that the latter provides a snapshot of financial state of the firm only for a particular period of time (analysis for a given point in time). In order to predict status of liquidity in firms by making use of such variables as average inventory turnover to materials, goods, and parts, average collection period for accounts and trade note receivables, and average payment period for accounts and trade note payables, the present study aims to address the disadvantages of static measures of liquidity and financial flexibility, by employing a dynamic measure of liquidity (dependent variable) known as operating cycle or cash conversion cycle and by illustrating the impacts of estimators such as operating income before extraordinary income (OIEI) and net cash flow from operating activities (NCFFO) (as independent variables) on the dependent variable. In other words, the present study attempts to explain the increased value relevance of components of operating income, operating cash flows, and their combined effects on estimating firms' operating cycles. Some of the recent studies in the area of assessing value relevance of income and operating cash flow have examined operating income in isolation while others have only considered operating cash flow as having increased value relevance in predicting dependent variable. A few number of studies argued that combining components of income and operating cash flows may improve predicting factor for the dependent variable. In the present study, three prediction models, namely operating income-based model, operating cash flow-based model, and combination of the two, are used to assess the sensitivity coefficient of firm's operating cycle as the dependent variable. Thus, in terms of manipulation of independent variables by researcher, the present study employs a quasi-experimental methodology, while in terms of data collection, this is an ex post facto study (making use of historical data for predicting a variable) which uses the information obtained from field studies. In terms of application, the present study is an applied research since it provides measures required to develop the scope of human knowledge and science. However, by its nature, this study is a correlation or causal study. The findings of the present study may be applied by natural and legal creditors, managers of credit departments in businesses, banks, financial institutions, financial analysts, potential and actual investors, and tax and insurance authorities into evaluating solvency of loan applicants.

3. Research Hypotheses

H1: Net operating income (NOI) has a significant explanatory power (increased value relevance) in predicting the dynamic measure of liquidity (cash conversion cycle) for the firms listed on the Tehran Stock Exchange (TSE).

H2: NCFFO has a significant explanatory power (increased value relevance) in predicting the dynamic measure of liquidity (cash conversion cycle) for the firms listed on the Tehran Stock Exchange (TSE).

H3: NOI combined with NCFFO has a significant explanatory power (increased value relevance) in predicting the dynamic measure of liquidity (cash conversion cycle) for the firms listed on the Tehran Stock Exchange (TSE).

4. Research Methodology

In terms of manipulation of independent variables by researcher, the present study employs a quasi-experimental methodology, while in terms of data collection, the study uses the information obtained from field studies. In terms of application, the present study is an applied research since it provides measures required to develop the scope of human knowledge and science. However, by its nature, this study is a correlation or causal study. Since the data corresponding to dependent and independent (explanatory) variables are of interval type, methods and techniques of parametric statistics have been used here. Pearson cross-sectional correlation was used to test the hypotheses. The required data were obtained through field study, and in some cases, through making use of library resources and taking notes from relevant documents. Over the time span covered by this study, we selected those firms that

- (1) Their fiscal year ends on March 20;
- (2) Operate in production industries;
- (3) Had their ticker symbol open in the TSE during the time span of this study;
- (4) Were profitable and have positive financial performance during this period; and
- (5) Made their financial information available.

5. Research Model and its Variables

A) Dependent variable

Cash conversion cycle (CCC) or the operating cycle of the firm t in the period j given by the following equation: (the time period T covers 365 days):

$$\begin{aligned} CCC_{j,t+1} &= ACI_{j,t} + ACR_{j,t} - ADP_{j,t} \\ ACI_{j,t} &= (\frac{1}{2})[INV_{j,t} + INV_{j,t-1}]/[CGS_{j,t}/T] \\ ACR_{j,t} &= (\frac{1}{2})[AR_{j,t} + AR_{j,t-1}]/[Net Credit sales_{j,t}/T] \\ ADP_{j,t} &= (\frac{1}{2})[AP_{j,t} + AP_{j,t-1}]/[Net Credit Purchases_{j,t}/T] \end{aligned}$$

1. Cash conversion cycle ($CCC_{j,t+1}$): average length of time (in days) in which current receivables from credit sales are collected and used to purchase inventories of raw materials, parts, or goods, and current liabilities resulting from buying materials, parts, or goods on credit.

2. Average cycle of inventory ($ACI_{j,t}$): average length of time (in days) in which purchased materials, spare parts, or goods are taken out from the warehouse and put into use in production or assembly line, or sold as the case may be.

3. Average cycle for collecting current receivables for credit sales ($ACR_{j,t}$): average length of time (in days) during which current receivables from selling finished products are paid by customers to the seller after allowing for discounts and returns.

4. Average cycle for payments of current operating liabilities for credit purchases ($ADP_{j,t}$): average length of time (in days) during which current operating liabilities arising

from buying raw materials, spare parts, or goods are paid by buyers to sellers, after accounting for cash discounts and returns.

B) Independent (explanatory) variables:

1. Net operating income before extraordinary items ($EBEI_{jt}$): the net income from ordinary activities before adjustment for extraordinary items (items which are naturally non-recurring and not expected to occur in short term).

2. Net cash flow from operating activities ($NCFFO_{jt}$): net income from ordinary activities adjusted based on cash accounting method (indirect method in preparing cash from operating activities in the first section of cash flow statement).

Data Analysis Methods

SPSS-16 was used to statistically examine the data extracted from financial statements of the selected firms, and the raw data were classified into processed data (information) using Excel spreadsheet for statistical analysis. In addition, parametric statistical tools and techniques were used. Pearson cross-sectional correlation was used to test the hypotheses. The following equations were employed as regression equations for research hypothesis and the overall validity of the models were assessed through validity test for independent variable coefficients along with co-linearity among residual errors that was determined using t-test, variance analysis, and Durbin-Watson test. Cross-sectional regression equations for testing the hypotheses are as follows:

- (1) **The model used for testing H1** is a model which relates income to liquidity using the following equation:

$$CCC_{j,t+1} = \beta_0 + \beta_1(EBEI_{jt}) + \varepsilon_{jt}$$

- (2) **The model used for testing H2** is a model which links cash flow to liquidity using the equation below:

$$CCC_{j,t+1} = \beta_0 + \beta_1(NCFFO_{jt}) + \varepsilon_{jt}$$

- (3) **The model used for testing H3** is a model which connects income to cash flow and liquidity based on the following equation.

$$CCC_{j,t+1} = \beta_0 + \beta_1(NCFFO_{jt}) + \beta_2(EBEI_{jt}) + \varepsilon_{jt}$$

6. Research Results

The table below presents mean, standard deviation, and number of observations for the independent and dependent variables.

Table 1-4 Descriptive Statistics

	Mean	Std. Deviation	N
Y	184.09	117.754	350
NFFCO	88.44	84.937	350
EBEI	53.66	50.430	350

As seen in this table, the mean value is 184.09 for CCC, 53.66 for net operating income, and 88.44 for net cash flow

		Y	EBEI
Pearson Correlation		1.000	.800
EBEI		.800	1.000
Sig. (1-tailed)		.000	.000
EBEI		.000	.000
N		350	350
EBEI		350	.350
F-Statistics	618.61	B- Unstandardized Coefficients	
Sig	.000	Constant	83.865
Adjusted R Square	.639	EBEI	1.868
Kolmogorov-Smirnov Test	1.756		
Durbin watson Test	1.925		

testing1:

Table 2-4 Net operating income& Cash conversion cycle

In addition, Pearson coefficient of correlation for CCC and net operating income is 0.8, indicating a strong correlation between the two variables. On the other hand, since this coefficient is positive, it can be argued that the larger is the net operating income, the greater will be CCC. Furthermore, the significant level obtained from t-test is 0.000, and since this value is smaller than 0.05, the null hypothesis is rejected, indicating a significant correlation between CCC and net operating income. The value obtained from Durbin-Watson test is also acceptable. Coefficient of determination shows to what extent the variations in the dependent variable can be explained by dependent variable(s). As seen in the table, net operating income can explain a large portion of variations in the dependent variable. Since the significance level obtained in F-test is smaller than 0.05, the null hypothesis is rejected, meaning that the relationship between the two variables is a linear relationship and, therefore, the regression model is an appropriate one. The model for linear regression is then given by:

$$y = 83.865 + 1.868 x_1$$

		Y	NFFCO
Pearson Correlation	Y	1.000	.796
	NFFCO	.796	1.000
Sig. (1-tailed)	Y	.000	.000
	NFFCO	.000	.000
N	Y	350	350
	NFFCO	350	.350
F-Statistics	603.7		B- Unstandardized Coefficients
Sig	.000	Constant	86.44
Adjusted R Square	.639	EBEI	1.104
Kolmogorov-Smirnov Test	1.756		
Durbin watson Test	1.95		

testing2:

Table 3-4 NFFCO & Cash conversion cycle

$$y = 86.44 + 1.104 x_2$$

testing3:

$$y = 76.52 + 1.039x_1 + 0.586x_2$$

Results and Discussion

The present study examines the effects of income and cash flows in predicting liquidity. We have attempted to investigate the predicting impact of net operating income and net cash, both in isolation and in conjunction, on liquidity in the selected firms. The data obtained from information presented by 70 firms listed on TSE over a period of 5 years were used as input to the regression model. Our findings indicate that 64% of variations in cash cycle can be explained by net operating income. The value is 63% for net cash. In addition, net operating income in combination with net cash can explain 69% of variations in cash cycle; a value which is larger than predicting power of both independent variables when used alone. The results for H1 are in line with the findings of Gambula, Ketz, *et al.* (1983), Leip (1986), Boen *et al.* (1986), Wilson (1986, 1987), Ribbon (1986), Bernard and Stuber (1989), Board and Day (1989), Charito and Ketz (1990), Jitengz 91990), Club (1995), and Barth *et al.* (2001). In general, some authors believe that a firm's assets and resources determine the state of its liquidity. If a firm holds non-operating fixed assets which can be converted to cash in short term, or if it has quick access to financial resources provided by banks or the opportunity to use credit on current account, the firm then is stronger in terms of liquidity. The results found for H2 are consistent with the findings of Lancaster and Steven (1998) who experimentally analyzed application of operating income and future cash flows for assessing static performance of corporate liquidity. In describing this finding, it should be noted that one measure of a firm's performance is net cash receipts. One problem, however, is that in short periods of times cash-related information is inadequate since it does not reflect cash flows if the income-expense reconciliation is overlooked (Dichow, 1994: 4). The results pertaining to H3 are consistent with some studies which have shown that all current assets, including liquid

or semi-liquid assets or assets which are not liquid but can be converted to cash in short term, contribute to the liquidity of a firm, and since it is relatively more difficult to convert inventory to cash, therefore it is no regarded as a factor contributing to prediction of liquidity, and in calculating quick ratio, current asset is used after deducting inventory. In this way some issues related to current ratio can be addressed, but the ratio still has some disadvantages. In addition, the difference between cash and account receivables in terms of liquidability is not taken into account when calculating quick ratio. Furthermore, equal weights are assumed for different types of current liabilities, and although inventory is less liquidable it may not be completely eliminated in measuring liquidity.

Recommendations and Suggestions for Further Research

Recommendations based on the findings: as discussed in the results of the present study, the three hypotheses were confirmed, and therefore it follows that both net operating income and net cash income have considerable positive effect on cash cycle. Thus, variables that, according to the existing evidence, affect firm's performance should be taken into account.

General recommendations based on the research hypotheses:

Recommendations based on H1: (1) Managers should inform employees of news, events, goals, strategies, projects, and other issues as well as actual and current situations and net operating income on an ongoing basis. (2) Employees' awareness of the impacts of net operating income on liquidity should be increased. (3) Individuals should be empowered and learn how to maintain net operating income.

Recommendations based on H2: (1) A proper and logical mechanism should be established for employees to exchange information on net cash and how it affects cash cycle of the organization. (2) An organizational culture should be created in order to enable employees to connect to different (horizontal-vertical) levels of organization and gain required information for better participation in organizational affairs.

Recommendations based on H3: (1) Performance of the firm over this period reflects managerial performance and may be used as a basis to continue or discontinue working with a manager. Eventually, a firm's success depends on how successful the firm is in creating incoming cash flows compared to outgoing flows. (2) Accruals and deferred items are used in calculating accrued income in order to assess firm performance over a certain period. Given the information asymmetry among managers and other stakeholders, ongoing activities of firms should be evaluated in shorter periods; in other words, measurement of firm performance over one period can be decided over in the next period.

Suggestions for future research:

(1) In addition to the variables examined here, there are other variables which are affected by the financial system (*e.g.* motivation, absenteeism, intention to leave, *etc.*), and future research can examine how financial systems impact these variables.

(2) Since most hypotheses proposed in this study were confirmed, future researchers are recommended to examine the reasons behind unsuccessful current income and operating income systems in firms.

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