



Review Paper

Can Current Earnings Predict Future Cash Flows? A Literature Survey

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Abstract

Investors consider cash flows to be more value relevant than profitability disclosures. This value relevance emerges from low discretionary control of managers on cash flows compared to net income. The accrual accounting is based on recognizing revenues and expenses as they occur and not when the cash transaction takes place. This will result in a variance of net income from cash flows. However, given the nature of accounting system, in general it is assumed that earnings and cash flows are co integrated. As a result, an exhaustive literature exists that attempts to explore the capacity of current earnings in predicting future cash flows of a firm. The findings on the subject are mixed with some studies validating the hypothesis that earnings can be a good predictor of future cash flows, while others refute it questioning the value relevance of earnings. In this literature survey, we present and discuss some notable findings on this important financial issue.

Keywords: Earnings, cash flows, value relevance.

Introduction

The profitability of a firm is a function of its revenues and expenses, the composition and contribution of which varies on industry wide basis. The revenue side comprises of operating and non operating revenues, while expenses include variable and overheads along with administrative and financial costs. The accounting statements are prepared using accrual practices; therefore, there is a strong tendency that the net profit differs from the actual cash proceeds to the firm. The simplest reason for the difference in net income and cash flows could be the possible future bad debts on account of credit sales that have been recorded as revenues but were never collected. Since investors incorporate accounting data in their investment decisions, quality of accruals questions the value relevance of earnings.

An alternative measure to gauge the firm's performance is the operating cash flows. These cash flows represent internally generated cash from core operations. The financing and investing cash flows are a function of cash flows from operations since its level will determine the need for external financing and future investment. While operating cash flows represents real cash as opposed to net income, there exists an exhaustive debate in financial literature on cash flows being more value relevant vis-à-vis earnings. The earnings and cash flows are based on the recognition of asset liability values on balance sheet and revenues and expenses in income statement. Financial accounting uses two approaches for valuation purposes namely balance sheet and income statement approach. In a balance sheet approach the values for the assets and liabilities are determined using accounting principles and

expenses and revenues emanate from the variation in the values of assets and liabilities while in an income statement approach the revenues and expenses are documented first and these warrants for an update in the asset liability value.

In balance sheet approach, the assets recognized are real assets and Generally Accepted Accounting Principles (GAAP), while following balance sheet approach, does not recognize deferred expenses or losses as assets since these do not represent any rights as attached with real assets. This makes more sense for investors as they are more comfortable with physical assets as compared to *numbers* appearing due to accounting practices. However, there might be some problems with this approach. Investors base their investment decisions on the discounted future cash flows. These future cash flows are derived from the expected earnings and thus investors must have some *income statement numbers* to estimate future earnings.

The operating cash flows are net of cash inflows and outflows related to the core operating activities. Cash inflows might differ from the revenues because of unearned and credit portion while cash outflow will differ from the expenses because of accrued and prepaid expenses. The cash inflow or outflow against these accruals normally takes place in the next accounting period thus the future cash flows are a function of current earnings. As mentioned earlier, the firm's ability to generate cash flow affects its stock value; therefore, Financial Account Standard Board (FASB) indicates that the primary objective of financial reporting is to provide information to investors enabling them to assess the amount and timing of future cash flows (FASB 1978, 37 – 39).

Moreover, predicting cash flows is important for liquidity and solvency analysis. Cheng Liu and Schaefer¹ commented that operating cash flow provides a substantial role when earnings are of lower persistence. This makes estimation of future cash flows very critical from investors' as well as creditors' view. Considering the importance of cash flows, FASB suggest that the current earnings reveal more information about future cash flows than do current cash flows (FASB 1978, 44). Therefore, current earnings have a strong potential to predict future cash flows and these estimates than could be used by investors and creditors.

The predictive power of earnings has been widely discussed in the literature and there are empirical evidences that suggest either strong or weak relation between future cash flow and current earnings. Another aspect of this relationship is the value relevance of cash flows and earnings for stock returns.

Theoretical Framework

The theoretical framework has been developed in almost all studies that examine link between accounting data and future cash flows. The cash flows are the operating earnings adjusted for non cash expenses and changes in working capital. Mathematically this could be written as

$$\text{Cash Flows} = \text{Operating Earnings} + \text{Depreciation Charges} - \text{Increase in Inventory} - \text{Increase in Debtors} + \text{Increase in Creditors}$$

From the above equation it is evident that cash flows are driven by accruals. These accruals can be affected by many factors. Different accounting policies can result in variations in measurement. A simple example could be that of depreciation treatment. The variations can be caused by either a change in the useful life of the asset or by switching to another depreciation method. Similarly inventory valuation methods can be changed to alter the reported earnings. In a period of high prices, management using First in First Out (FIFO) valuations will report lower cost of goods sold and consequently high profits as opposed to a management using Last in First Out (LIFO) methods. The revenue and expense recognition can cause similar variations. The sale of goods can be recognized before the end of accounting period to report higher net earnings. The research and development can be delayed to show lower expenses in a particular accounting period. The later, however, could deter the performance of the firm in long run.

The use of accounting techniques to over or understate earnings for a particular period makes earnings vulnerable to management manipulations. The research has shown that these manipulations are – at times – not detected by the equity or financial analysts. Hirst and Hopkins² conducted experimental research to see that whether such practices can be detected by the analysts. They created three hypothetical industrial firms. The firms were identical in operations and structure except in their earnings growth. The source and rate of growth for the

three companies was different. The first company reported no growth for the three years study period. The second firm reported 11% growth by liquidating available for sale securities and purchasing the same amount of marketable securities. The third company reported 11% increase owing to an increase in sales. Among these three firms, second used accounting policies to book the gain on securities while the first firm, despite of the possibility, did not recognized the gain.

The financial data (including income statement, balance sheet and cash flows) for these three firms were sent to analysts (on average 16 analysts per firm) and were asked to provide their judgment on stock prices, earning quality and potential growth. The results indicated that analysts could not identify the “manipulation” by the second company as the difference in analysts' estimates about growth and stock prices was not significant for the second and third firm although the growth prospects and stock price should be similar for first and second firm.

In addition to revenue recognition, the managers' discretion on accruals can alter the earning quality. Green³ argued that if the quality of earnings can be taken as the relation between profit and cash generating ability, then the decomposition of earnings as cash flows and accruals provides more information about the firm as compared to information revealed by earnings alone. These studies reveal that there exist a weak relation between current earnings and future cash flows. However, if we consider the accrual portion of earnings, the prediction power is somewhat stronger. The revenue recognition and matching provide more insight about the future cash flows. The revenue recognition requires revenues to be reported when they occur and matching requires expenses to be booked as they are incurred. The revenue recognition and matching does not require actual flow of funds. The aim, therefore, is to record expenses and revenues in the particular accounting period and this might give accruals an edge over earnings to predict patterns of future cash flows.

Dechow et al⁴ developed a model that identify the relation between cash flows, earnings and accruals. They assumed that current earnings E_t as a constant percentage of current sales S_t . These sales are expected to follow a random walk

$$E_t = \tau S_t$$
$$S_t = S_{t-1} + \epsilon$$

Where τ represents net profit margins and ϵ is the stochastic change with zero mean.

The model incorporates balance sheet items i.e. account payable, account receivable and inventories. Since payables are linked with purchases and receivable are linked with sales, therefore, a change in purchases and sales will bring a change in level of receivables and payables. Purchases are dependent on the current period inventory which is a function of expected sales. Furthermore, purchases also depend on deviation of actual

inventory from target inventory. The authors inferred the following equation for the theoretical model.

$$CF_t = \alpha_i - [\alpha + (1 - \tau)\gamma_1 - \beta(1 - \tau)\epsilon_t + \gamma_1(1 - \tau)[\beta + \gamma_2(1 - \beta)]\Delta\epsilon_t + \beta\gamma_1\gamma_2(1 - \tau)\Delta\epsilon_{t-1}$$

The model suggests that cash flows can be represented as a function of earnings and net operating cash flows. These net operating cash flows are derived from cash inflows for credit sales and cash outflow for credit purchases. In the equation α represents credit sales, γ_1 and γ_2 represent next period estimated cost of sales and current sales volatility respectively. These variables also accounts for the firm's inventory policy. Dechow et al.⁴ assumed that the changes in accruals emanating from the current shock to sales and changes in shocks from lagged periods (third and fourth variables in equation) were empirically closed to zero and thus the best predictor of future cash flow is the current level of earnings. The notations used are same as reported in Dechow et al.⁴

Barth et al.⁵ criticized Dechow et al.⁴ results and concluded that current earnings are not an unbiased estimator of future cash flows and accruals provide incremental information about cash flows. Moreover, they proposed current cash flows as an important determinant of future cash flows.

Empirical Literature

As mentioned earlier there is vast literature on future cash flow determinants. Some researchers observed earnings as a vital source for future cash flows while others report a weak or non existing relationship. Nevertheless, even if earnings on aggregate basis fail to explain the future cash flow, accruals do explain the patterns in cash flows. Therefore we cannot discard the earnings as a whole and some of its components are the explanatory factor for the future cash flows.

Greenberg, Johnson and Ramesh⁶ empirically tested that relationship between current earnings and current cash flows as an explanatory factor of future cash flows. They used a sample of 157 industrial companies for the period 1963-1982. The operating cash flows were used and were estimated by adjusting earnings for non-cash items and changes in current assets and current liabilities. However, they excluded the current portion of long term debt from current liabilities. They use ordinary least squares to estimate the linear relationship between each firm's current cash flows and previous period earnings. A similar relationship was estimated between current cash flow and previous period's cash flow. They examined data taking yearly lag as well as multi period lags including two and three years. The results demonstrated that earnings have a stronger ability to forecast future cash flows than do current cash flows for each period i.e. with lag of one to five years and for multi lagged period of two or three years.

Bowen, Burstahler and Daley⁷ researched on two aspects. In the first instance they studied the relation between earnings and

different cash flow measures. Secondly, they used various cash flow variables and compared their ability to predict cash flows with that of earnings. They used the following definitions of cash flows for their analysis: i. The first definition is the usual cash flow measure (NIDPR) that is estimated by adjusting for non cash expenses. This is calculated by adding back depreciation and amortization (DPR) to net income. ii. The second definition relates to working capital from operations (WCFO). It is calculated by adjusting earnings to remove the effects of accounting gains and losses mainly arising from gains and losses on asset sales, amortization of bond premiums or discounts, and deferred taxes. iii. The third measure is cash flow from operations (CFO) calculated by adjusting WCFO by changes in non cash current assets and current liabilities. The change in cash, notes payable and the current portion of long term debt was excluded. iv. Cash flow after investment but before financing (CFAI) which is calculated by adding CFO for the proceeds from the sale of property, plant and equipment and investment. This excludes amount of capital expenditures during the period, and new investment. v. Change in cash (CC) during the period.

The data used was taken from financial statements of 324 firms for the period 1971-1981. The results showed a high level of correlation between accrual earnings and traditional measures (NIDPR and WCFO) of cash flows. However, the correlation was low with alternative measures (CFO, CFAI and CC). They also considered random walk prediction models in examining the relative performance of each cash flow variable to future cash flows. The main findings suggested that net income plus depreciation and amortization, and working capital from operations, provide the best predictive power of cash flow from operating activities. Lastly, the results provide weak evidence about the earnings as a better signal for future cash flows as compared to cash flow variables.

Murdoch and Krause⁸ analyzed the percentage changes in annual cash flow return. They deployed net income, working capital and cash flow from operations as variables. Cash flows from operating and working capital were measured by adjusting net income. The time period for the study was 1966-1985. The sample companies were mainly selected considering size, industry categorization and fiscal year. They controlled the difference in sizes and changes in purchasing power of the dollar over time by deflating these variables by common equity. The independent variables (cash flow return, working capital return and return on equity) were analyzed in the form of percentage changes to forecast percentage changes of cash flow return. They addressed three main questions. These questions were i. Either current earnings or operating cash flows, a better predictor of future cash flows? ii. How important are current and noncurrent portion of earnings in explaining future cash flows? iii. Whether the prediction power of present earnings or cash flows improves for long period as compared to short period?

The results supported the notion of FASB that earnings are a better predictor than cash flow from operations. In response to second question, they found that the current component of earnings included in the measurement of working capital has higher prediction power than the non-current component included in measuring earnings. Finally, they reported that the power of the model can be improved by using a long period of data.

Percy and Stokes⁹ simulated the study of Bowen, Burstahler and Daley⁷ on Australian data. Their research employed two cash flow measures that included net income adjusted for amortization and depreciation, and working capital from operations. Furthermore, they used an even better measure of working capital from operations adjusted for changes in non-cash current assets and current liabilities. They extended their study by studying the relationship between cash flows and earnings across industries. The data used was from the Australian Graduate School of Management (AGSM) Annual Report File. The total sample comprises of 107 companies and the time period was 1974-1985. This was the similar period as was employed by Bowen, Burstahler and Daley⁷. They used Australian Stock Exchange grouping criteria to classify companies in industry categories for the purpose of industry analysis. They excluded companies that changed the industry grouping over time. Based on this criterion 99 companies from 23 industries were studied in the industry analysis.

The results confirmed the evidence from Bowen, Burstahler and Daley⁷. The observed correlation of traditional cash flow measures with accrual income was higher than the more refined cash flow measure. Moreover, the correlation between the traditional cash flow measures and the more refined cash flow measure was low. These results did not vary across companies. The results remain the same for forecasting cash flows for either one or two years ahead. However, the result indicated that the prediction power differed across various industries. The authors attributed these differences to the limitations of the sample size.

McBeth¹⁰ studied the power of cash flows and earnings to predict future cash flows. He used cash flows from operation directly from the statement of cash flows and net income from the income statement. The sample consisted of 4,415 companies. The sample selection was based on the availability of cash flow statements. The study period was limited to three years since the companies were required to report statement of cash flows since 1988. Moreover, only those firms were included that had a fiscal year end of December. The study period comprised of 1988 to 1990.

The simple regression analysis was employed. The depended variable was the current year cash flow from operations where as earnings and cash flows from operation for last one or two years were used as independent variables. The results suggested that neither past net income nor past cash flows from operations provide a better predictor of future cash flows.

Finger¹¹ examined the value relevance of earnings measured by their capacity to predict future earnings and cash flows. The sample consisted of 24 firms for a time period between 1935 and 1987. Finger concluded that earnings are a significant predictor of future earnings and cash flows. The analysis reveals that earnings remained a significant variable for future cash flows on standalone basis as well as in combination with present cash flows. However, author concluded that the evidence could not support FASB statement that present earnings as compared to present cash flows are better measure of gauging future cash flows.

Quirin et al.¹² examined the comparative power of earnings-based and cash flow-based measures to predict next year cash flows from operations. They used actual cash flows from the statement of cash flows for the study period of eight years. The sample selection criterion was the availability of complete accounting information for the sample period that was 1988 – 1996. This enabled a sample selection of 1,442 firms per year over the 8-year prediction period of 1989-1996. They employed four different predictors of actual cash flows from operations. These include net income before extraordinary items (NIBEI), net income adjusted for depreciation (NIDPR), working capital from operations (WCFO) and actual cash flow from operations (ACFO). The technique used in the analysis was simple ordinary least squares regression.

The results of four predicting variables for each year from 1989 to 1996 were inconsistent. Actual cash flows from operations appeared as having the highest explanatory factor of future cash flows in five of the eight years. WCFO showed better prediction capacity than others in 1989 and 1990, whereas NIDPR had the maximum predictive power in 1996. NIBEI could not be ranked as the best explanatory variable in any of the sample period. Moreover, the result for the pooled sample supported that ACFO was the best predictor for the study period followed by WCFO, NIDPR and NIBEI respectively. They concluded that accrual based earnings demonstrated a lower predictive ability than cash flow based predictors.

Barth et al.⁵ examined the capacity of earnings, cash flows and accruals components to predict future cash flows. The sample for their study consisted of industrial firms over the period 1987–1996. They used regression models to explain the variables for future cash flows. The models used several sets of explanatory variables including past earnings, past cash flow data and aggregate accruals data; and past cash flow data and disaggregated accruals data. To examine whether the disaggregation of earnings provide a better rationale for future cash flows, the explanatory power of the models was compared using the traditional adjusted R-squared, and the Vuong Z-statistic for non-nested tests.

They used three models for regression. The regression results demonstrated that the model containing cash flows and

aggregate accruals had greater explanatory power than the model containing only earnings. The other model that contained cash flows and disaggregated accruals components had the greatest explanatory power for future cash flows, with an adjusted coefficient of determination of 35%. In this model, all independent variables had significant positive coefficients, except for accounts payable for which the coefficient was negative and significant. Barth et al. controlled the model by placing restrictions on the values of the different explanatory variables. They concluded that the cash flows explained maximum variability in future cash flows followed by aggregate accruals and components of accruals.

Conclusion

Accounting data constitutes an important source of information for investment and financing decisions. Since firm valuation is based on cash flow analysis, it is crucial to analyze the determinants of cash flows. Earnings of a firm are a mix of cash revenues, cash expenses and accruals. These accruals cause the operating cash flows to deviate from the earnings of the firm. Since accounting principles link balance sheet and income statement items, there exist a systematic relationship between earnings and cash flows. The net cash flow is a function of cash inflow – mainly from credit sales of the previous period, and cash out flow – from the credit purchases. This establishes a theoretical link between earnings and cash flows. The literature on accruals, earnings and cash flow establishes a mix relationship between earnings and future cash flows. Some studies suggest that future cash flow patterns can be predicted by current earnings or cash flows; while others argue that the relationship is either weak or non-existing so present earnings will provide a biased estimate of future cash flows.

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