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Article in *Accounting and Finance Research* · March 2017

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The Review of Literature on the Role of Earnings, Cash Flows and Accruals in Predicting of Future Cash Flows

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Received: February 14, 2017

Accepted: March 13, 2017

Online Published: March 22, 2017

doi:10.5430/afr.v6n2p59

URL: <https://doi.org/afr.v6n2p59>

Abstract

The purpose of this paper is to review academic literature on prediction of firm's future cash flow, which is the fundamental issue in accounting and finance investigated under capital market-based accounting research. We begin by presenting the main findings regarding the important role played by earnings, cash flow from operations and accruals in predicting future cash flows followed by the methodology used. The findings from this literature show that the results are inconsistent with FASB assertion. Instead, most of the studies report that cash flow from operations is a better predictor of future cash flows, whereas some researchers support the assertion. However, other researchers have shown that the ability of earnings improved when it is disaggregated into its major accruals components. This inconsistency in the results was due to the following reasons; methodological differences; measurement error in the predictor variables and the period covered by the study. Overall the paper provides additional insight to readers who wish to familiarize with this line of research and provides possible areas for further research.

Keywords: Cash flow from operations, Earnings, Accruals, Prediction, Capital market based accounting research

1. Introduction

The concept of cash flow prediction is not only interesting and important for the company's business, investors, creditors, financial analysts among others but also for academic researchers. Through prediction of cash flow financial statements users are able to assess firm's liquidity, financial flexibility and risks (Barth, Beaver, & Landsman, 2001; Bhatia & Dhamija, 2015). From the 1980s, many researchers addressed interest in cash flows information. One portion of that interest focused on the Financial Accounting Standards Board (FASB) assertion which says that information about earnings based on accrual accounting is powerful in predicting future operating cash flows than cash flows itself, the assertion was questioned directly and indirectly by various researchers. The literature on future cash flow prediction is vast and focused on three main streams of research. The first stream of study concentrated on the usefulness of accrual earnings and operating cash flows in predicting stock prices or stock returns (Sloan, 1996; Vishnani & Shah, 2008; Sharma, Kumar & Singh, 2012). The second stream of studies concentrated on the usefulness of cash flows information and accrual accounting for predicting business failures (Boritz, Kennedy & Sun, 2007; Shyam & Rajesh, 2013). The third stream of research directly questioned FASB's assertion (Dechow, Kothari & Watts, 1998; Finger, 1994; Kim & Kross, 2005).

This study makes a specific contribution and the objective is not only to provide a brief academic literature but also to synthesize and conceptualize the publications that directly questioned FASB's assertion. We reviewed 40 studies, the emphasis is made in the publications critically examine the role of cash flow from operations, earnings and its components in predicting firm's future cash flows. The majority of articles discussed here published and selected through online library databases such as EBSCO, ProQuest, and Google Scholar. The keywords used for searching the existing literature were cash flow from operations, earnings, accruals, prediction, and capital market-based accounting research. Due to the limited number of published articles from different sources we also comment on the important results from other journals, no references is made to unpublished working papers. Moreover, we use the following inclusion criteria to confirm the quality of each paper.

- The paper focus is on the topic of cash flow prediction by using cash flow from operations, earnings and its components as predictor variables

- The paper is written in English language and peer review.
- The paper published with dates ranging from 1986 to 2016

The search engines lead to 40 studies, of which 36 published articles and 4 unpublished theses as illustrated in table 1 and table 2 provide a count of the empirical studies we review, grouped by the source of the journal.

Table 1. Number of published articles selected from the initial search.

Database	Found Articles	Selected Published Articles	Total
Google Scholar	68	22	22
EBESCO	20	8	8
ProQuest	20	10	10
Total	108	40	40

Source: prepared by authors

Table 2. Breakdown of empirical studies reviewed grouped by source of journal

Empirical studies reviewed (by source of journal)	Number of papers reviewed
<i>Management Research Review</i>	2
<i>Pacific Accounting Review</i>	1
<i>Mid-Atlantic Journal of Business</i>	3
<i>Accounting and Finance</i>	1
<i>Accounting and Finance Research</i>	1
<i>Accounting and Business Research</i>	1
<i>Journal of Accounting and Economics</i>	1
<i>Journal of Accounting Research</i>	2
<i>The Accounting Review</i>	4
<i>Journal of Business Finance and Accounting</i>	1
<i>Review of Quantitative Finance and Accounting</i>	2
<i>Malaysian Accounting Review</i>	1
<i>The Journal of Applied Business Research</i>	2
<i>Journal of Accounting, Auditing and Finance</i>	1
<i>Review of Development Finance</i>	1
<i>Journal of Accounting and Finance Research</i>	1
<i>Review of Accounting Studies</i>	1
<i>Australian Accounting Review</i>	1
<i>The Indonesian Accounting Review</i>	1
<i>Oil and Gas Quarterly</i>	1
<i>Other Journals</i>	11
Total	40

Source: prepared by authors

The following research questions are asked:

1. What has been investigated concerning the ability of cash flow from operations, earnings and its components in predicting future cash flows?
2. What recommendation can be made about the role of cash flow from operations, earnings and its components in predicting future cash flows?

In order to answer the above research questions, the literature on future cash flow prediction discussed into two categories. The first category covers the literature on cash flow prediction, where earnings and operating cash flow act as the predictor variables. The second category covers the literature on cash flow prediction where cash flow from operations, earnings, and its components are used as the combined predictor variables of future cash flows. The structure of the paper is organized as follows. The following section provides the conceptual background and covers the definition of key concepts. Section three presents summary of empirical evidence on cash flow prediction. Section four provides the summary of findings from the literature; Section five and six presents possible areas for future research and conclusions.

2. Conceptual Background

Cash flow is an index of the money that is received in or paid out by a firm for a particular period of time, which is required to keep the business running on a continuous basis (Ijeoma, 2016). Every business operations require cash as the basic input and without it, the firm's operations will disrupt and can even lead to insolvency (Akinyomi, 2014). A firm can become insolvent when it is not capable either of generating enough cash from internal sources or obtain from external sources for sustaining operating, investment and financing activities of the firm (Keige, 1991). For this reason, proper monitoring, management and accurate determination of cash movement is needed to enable the business to make important financial decisions (Olowe, 1998).

Prediction of cash flow is a key aspect of a business which is used by business owners to plan for the future movement and requirement of cash to avoid any crisis like solvency and liquidity (Barth et al., 2001). Also, as per Financial Accounting Standard Board (1978; para 37-44), the task of predicting future cash flow is the primary objective of financial reporting. It is through predicting cash flows that the relevant information is provided to the users within and outside the organization (Javedan & Largani, 2014). Further FASB asserted in its Conceptual Framework No.1 that information about earnings based on accrual accounting is more powerful than cash flows in predicting future cash flows. We have reviewed 40 studies which directly questioned the FASB's assertion. A potential reason for the focus on this nature of research could be that the concept of cash flow prediction is not only interesting and important for the company's business, investors, creditors, financial analysts among others but also is therefore of great interest for academic researchers.

2.1 Definitions of Key Concepts

This section gives definition of key concepts, which includes definition of predictor variables of future cash flow

2.1.1 Cash Flow from Operations

This accounting information is normally available from cash flow statement of a particular company. Researchers have used in their cash flow prediction studies as predictor variable and measured differently; for example, McBeth (1993), Farshadfar, Ng and Brimble (2008); Varun (2015) used cash flow information directly reported in cash flow statement, others researchers mathematically calculated by taking the difference between net income and accruals (Finger, 1994; Ebaid, 2011)

2.1.2 Earnings

Earnings considered as a key measure in evaluation of company's performance and is an important factor for management of debt and debt contracts (Dechow et al., 1998). It is also used as key variable and plays important role in predicting firm's future cash flows (Ebaid, 2011; Greeberg, Johnson & Ramesh (1986))

2.1.3 Accruals

Apart from cash from operations, the accrual has also been used as predictor variable of future cash flows among researchers and it is measured differently by various researchers. For example, Beisland (2011) used the following formula for accruals

Accruals = Change in total current assets – Change in cash - Change in total current liabilities + Change in interest bearing-short term debt - Change in deferred taxes – depreciation and impairment.

Others researchers mathematically calculated accruals by taking the difference between earnings and cash flow from operations (Barth et al., 2001; Al-Attar & Hussain, 2004)

2.1.4 Cash Flow Prediction

Cash flow prediction found to be the most important and useful factor required in the various economic decision like investment decision, lending decision and other financial decision by accounting information users (Chotkunakitti, 2005), because it helps them in assessing firm's liquidity, financial flexibility and risks (Barth et al.,

2001). Furthermore, FASB (1978) observed the task of predicting future cash flow as the primary objective of financial reporting.

3. Prior Literature

Since FASB assertion, accounting and finance researchers have been studying the ability of cash flow, earnings and its components in predicting future cash flows. In this section, we will briefly review studies conducted from different countries that focus mainly on the (1) prediction of future cash flow by using cash flow and earnings as predictor variables (2) prediction of future cash flows by using cash flow, earnings, and accruals as a combined predictor variables.

3.1 Empirical Evidence from Prediction of Future Cash Flows Where Cash Flows from Operations and Earnings Used as Predictor Variables

Many researchers have concluded that earnings and cash flow play the important role, however, results are mixed. The study by Greenberg et al (1986) provides evidence which supporting FASB's assertion regarding the superiority of earnings over cash flow from operations on future cash flows. The study concluded that earnings are more powerful in predicting future operating cash flows. Similarly, Kim and Kross (2005) used similar regression model previously used by Dechow et al (1998) and cross-sectional approach and concluded earnings is more powerful than cash flow from operations in predicting future cash flows and coefficients on earnings increased over the time period. In contrast, Bowen, Burgstahler, and Daley (1986) showed that earnings are weak in predicting future cash flows, instead of working capital from operations and earnings plus depreciation and amortization are more powerful. The results are in line with the general conclusions of Murdoch and Krause (1990) and Percy and Stokes (1992). However, Jordan and Waldron (2010) concluded that earnings plus depreciation and amortization achieve superior results than other predictor variables used in the study.

Many studies concluded that working capital from operations and net income before extraordinary items and discontinued operations plus depreciation and amortization are powerful than other cash flow measures (Arnold, Clubb, Manson & Wearing, 1991; Quirin, O'Bryan, Wilcox & Berry, 1999; Quirin, O'Bryan & Berry, 2000)

Study by Jordan, Waldron, and Clark (2007) in USA compared ability of cash flow from operations, earnings and sales in predicting future cash flow of 100 companies of the Fortune 1000 companies and finds that sales are a better predictor of future cash flow than cash flow from operations and earnings.

Al Attar and Hussein (2004) predicted future cash flow of UK firms by using cash flow from operations, earnings, and its components and reported that the cash flow from operations alone outperform earnings in predicting future cash flows. Mc Beth (1993) findings rejected the above conclusions and claimed that neither earnings nor cash flows provide a better power in predicting future cash flows of USA listed firms. These results do not support FASB's assertion of the superiority of earnings as a predictor of future cash flow.

Finger (1994) presents findings suggesting that cash flow from operations appear to be the best predictor of future cash flow than earnings. Lorek and Willinger (1993) also predicted future cash flow of USA firms by using quarterly cash flow data. They developed their own model and compared with Wilson's model and other time series model. They concluded that their model which was based on quarterly cash flow data is more powerful than other models. Lorek and Willinger (1996) also predicted future cash flow of USA firms from 1990 to 2004 and found that cash flow from operations outperforms earnings. Similar results reported by Lev, Li, and Sougiannis (2010) in the USA.

Farshadfar et al. (2008) and Habib (2010) predicted future cash flows by using a sample of listed Australian firms and found that cash flow from operations has more power in predicting future cash flows compared to other predictor variables used in their study. Al Debie (2011) also provide evidence for the superior ability of cash flow from operations in predicting future cash flows of listed firms at Amman stock exchange. Similar conclusions were drawn in India, Iran, and Malaysia by Mulenga (2015); A. Ahmadi and V. Ahmadi (2012); Mooi (2007) respectively. On the other hand, the conclusion is in line with the findings of Shubita (2013), who reports that earnings plus depreciation and amortization are a better predictor of future cash flow.

Another study by Takhtae and Karimi (2013) and Moeinaddin, Ardakani, & Akhoondzadeh (2013) predicted future cash flow of Iranian firms and report different results. A study by Takhtae and Karimi (2013) find that earnings outperform cash flow from operations which support FASB assertion on the superiority of earnings in predicting future cash flows. While Moeinan et al (2013) concluded that earnings and earnings plus depreciation and amortization outperform other predictor variables in the prediction of future cash flows.

Telmoudi & Noubbig (2010) predicted future cash flow of listed Tunisian firms and found that ability of cash flow from operations model in predicting future cash flow is low compared to the model with elements related to operating cycle. Further, concluded that earnings are not a better predictor of future cash flows. These results are inconsistent with Ijeoma (2016), Efayena (2015) and Jemaa et al (2015), who reported that cash flow from operations is a better predictor of future cash flows.

Table 3. Studies on the prediction of future cash flow (where cash flow and earnings act as predictors)

No.	Author (s)	Period	Country	Method	Findings
1.	Greenberg et al (1986)	1963-1982	United States of America (USA)	Ordinary Least Square (OLS)	Earnings outperform cash flows
2.	Bowen et al (1986)	1971-1984	USA	Random Walk as the prediction model.	Net income plus depreciation and amortization and working capital from operations
3.	Murdoch and Krause (1990)	1966-1985	USA	OLS	Earnings and Working capital from operations
4.	Anorl et al (1991)	1965-1984	United Kingdom (UK)	OLS	Working capital from operations
5	Percy and Stokes (1992)	1974-1985	USA	OLS	Net income plus depreciation and amortization and working capital from operations
6.	Lorek and Willinger (1993)	1976-1984	USA	Autoregressive Integrated Moving Average Models.	Cash flow
7	Mc Beth (1993)	1998-1990	USA	Simple regression analysis	Neither earnings nor cash flow from operations
8.	Finger (1994)	1935-1987	USA	Regression Analysis	Cash flow from operations is more powerful in short horizon. In long term horizon both earnings and cash flow
9.	Lorek and Willinger (1996)	1979-1991	USA	OLS	Cash flow from operations.
10.	Quirin et al (1999)	1988-1996	USA	Simple OLS	Cash flow from operations
11	Quirin et al (2000)	1988-1997	USA	Simple OLS	Net income plus depreciation and amortization and working capital from operations
12.	Al-Attar and Hussain (2004)	1991-2000	UK	OLS	Cash flow outperform earnings
13.	Kim & Kross (2005)	1972-2001	USA	Out of sample as forecasting test	Prediction power of Cash Flow from operations and aggregate earnings has increased over the period of study.
14	Jordan et al.(2007)	2002-2003	USA	OLS	Sales
15.	Mooi (2007)	1997-2005	Malaysia	Multivariate regression models	Cash flow from operations.

16.	Farshadfar et al (2008)	1992-2004	Australia	OLS and Panel regression model (FEM)	Cash flow from operation.
17.	Jordan and Waldron (2010)	1994-2004	USA	OLS	Earnings plus depreciation and amortization
18.	Habib (2010)	1992-2007	Australia	Regression analysis and out of sample as forecasting measure	Cash flow
19.	Lev et al (2010)	1988-2004	USA	OLS	Cash Flow
20.	Telmoudi & Noubbigh (2010)	1998-2008	Tunisia	OLS,FEM and REM	Model with elements related to operating cycles is more powerful.
21.	Al-Debie (2011)	2000-2009	Jordan	OLS and FEM	Cash flow from operations
22.	A.Ahmadi and V.Ahmadi (2012)	1999-2009	Iran	FEM,REM (Random Effect Model) and MAPE as forecasting measure.	Current cash flow from operations
23.	Moieinaddin et al.(2013)		Iran	OLS	Earnings and Earnings plus depreciation and amortization
24.	Shubita (2013)	2006-2013	Jordan	OLS	Earnings plus depreciation and amortization
25.	A.Ahmadi,Bashirimesh and V.Ahmadi (2013)	1999-2000	Iran	FEM and REM	Past cash flow from operations
26.	Takhtae and Karimi (2013)	2005-2009	Iran	Ordinary Least Squares	Earnings
27.	Jemaa et al (2015)	1998-2012	Tunisia	OLS,FEM and REM	Cash flow from operation in simple model and earnings in multi-year models
28.	Mulenga (2015)	2002-2014	India	OLS	Cash flow from operations
29.	Efayena (2015)	2001-2013	Nigeria	OLS	Cash flow from operations
30.	Ijeoma (2016)	2004-2013	Nigeria	OLS	Cash flow from operations

Source: Compiled by authors.

Table 3 provides a list of selected studies which gives emphasis on the prediction of future cash flow by using cash flows and earnings as predictors. As shown in table 3, the findings of the earlier studies are not conclusive among researchers. Some researchers concluded that earnings is the better predictor of future cash flows (Greenberg et al., 1986;Kim & Kross,2005;Dechow et al.,1998;Takhtae & Karimi,2013) while others evidenced that cash flows are a better predictor of future cash flow from operations than earnings (Lorek & Willinger,1993; Finger, 1994; Bowen et al., 1986).On the other hand, Mc Beth (1993) found inconclusive results.

3.2 Empirical Evidence from Prediction of Future Cash Flows Where Cash Flows from Operations, Earnings and Accruals Act as a Combined Predictor Variables

The role of cash flows, earnings and accrual earnings in predicting future cash flows is a key issue underlying financial reporting, however, presents mixed and contradictory results. Barth, Cram, and Nelson (2001) extended Dechow et al (1998) model and disaggregated earnings into six accruals components and cash flow. Their results concluded that the disaggregation of earnings into six accruals component and cash flow outperforms other

prediction models in predicting future cash flows. Similarly, Hollister, Shoaf & Tully (2002) expanded the previous work of Barth et al (2001) in predicting future cash flows of listed firms in the USA, UK, Germany, and Japan stock market and report similar results documented by Barth et al (2001). These are inconsistent with the general conclusion of Lorek and Willinger (2009), who find cash flow from operations to be more powerful than earnings and disaggregated model.

On the other hand, Arnedo and Lizarraga (2011) predicted future cash flow of Spanish companies by using three different prediction models i.e. cash flow model, accrual based model (aggregated) and accrual based model (disaggregated) and research results reports that accruals are more powerful in predicting future cash flows better than other variables.

Li, Mountinho, Opong and Pang (2015) predicted future cash flow of South African firms and found that accruals (depreciation and change in inventory) do not appear to enhance prediction of future cash flow.

In India, Varun (2015) predicted future cash flows of Shariah companies listed on NSE. The study used panel regression model to statistically compare the predictive ability of each predictor variables on future cash flows. The results of the study show that cash flows from operations outperform earnings in predicting future cash flow. The results do not clearly support the FASB's assertion of the superiority of earnings as a predictor of future cash flow.

Ebaid (2011) predicted future cash flow of Egyptian firm by using prediction models previously developed by Barth et al (2001) and find that earnings are more powerful in predicting future cash flow than cash flow from operation. Further, the study finds that the disaggregation of earnings into two components (cash flow from operations and accruals) enhances the ability of earnings in predicting future cash flows.

Bagheri, Pouraghajan, Emmgholipour, Mansourinia and Adrang (2012) studied the ability of cash flows, earnings, and its components to predict future cash flow of Iranian firms. The study found that the disaggregated earnings model has greater power in predicting future cash flows, over the period of 2006 to 2010.

Jemaa, Toukabri, and Jilani (2015) predicted future cash flow of listed Tunisian companies and find that earnings are a better predictor of future cash flow than cash flow from operations. Further, the results show that, the disaggregation of earnings into two components (cash flow from operations and total accruals) and the disaggregation of total accruals into its major components (change in accounts receivable; change in inventory; change in accountants payable, amortization, and other accruals) significantly enhance ability of earnings in predicting future cash flows. Dechow et al. (1998) predicted future cash flow of USA firms and finds that earnings are a better predictor of future cash flow than the cash flows.

Table 4. Studies on prediction of future cash flow (where cash flow, earnings and its components act as combined predictors of future cash flows)

No.	Author (s)	Period	Country	Methodology used	Findings
1	Dechow et al (1998)	1963-1992	USA	Simple and Multiple regression	Earnings
2	Barth et al (2001)	1987-1996	USA	Regression analysis and R-Squared and Vuong Z-statistics	Cash flow and accruals
3.	Hollister et al.(2002)		UK,USA and German and Japan	Simple and Multiple Regression	Disaggregated earnings model
4	Lorek & Willinger (2009)	1990-2004	USA	Regression	Cash flow model
5.	Arnedo & Lizarraga (2011)	1997-2003	Spain	Multivariate regression analysis	The model that combines cash flow from operations and earnings
6.	Ebaid (2011)	1999-2007	Egypt	Ordinary Least Square	Earnings
7.	Bagheri et al (2012)	2006-2010	Iran	Simple and Multiple regression	Disaggregation of earnings into six components of cash flow and accruals predict future cash flow
8.	Li et al (2015)	1994-2012	South Africa	Linear Regressions and Autoregressive Moving Average Model	Disaggregation of cash flows into does not appear to enhance cash flow prediction
9.	Jemaa et al (2015)	1998-2012	Tunisia	Fixed Effects Model, Random Effects Model and Likelihood test.	Aggregate earnings
10.	Varun (2015)	2002-2011	India	Panel regression techniques (FEM & REM)	Cash flow from operation

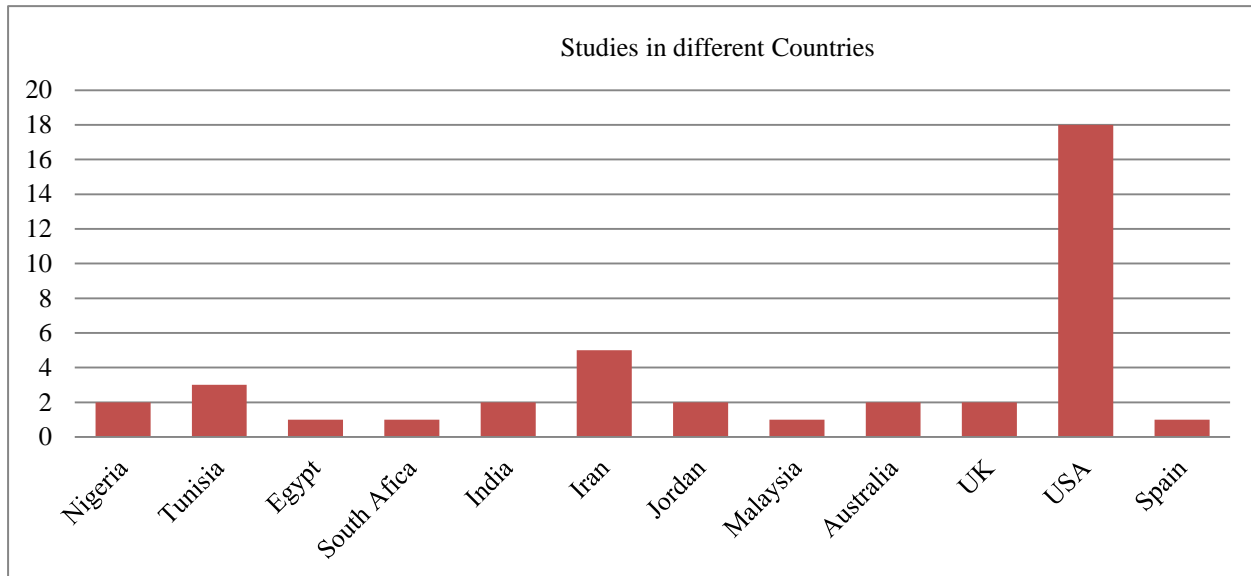
Source: Compiled by authors

Table 4 provides a list of selected studies which gives emphasis on the prediction of future cash flow by using cash flows, earnings and its components as combined predictor of future cash flows. As shown in table 4, most studies which gives much emphasis on prediction of firm's future cash flow by using cash flows from operations and the accruals components of earnings as combined predictors of future cash flow revealed that the components of earnings model including both cash flows and total accruals provide better prediction of future cash flows than does the model based only on earnings.

4. Findings

The literature indicates that (1)The findings are not consistent with FASB assertion of the superiority of earnings as a predictor of future cash flow (Lorek & Willinger,1993; Lorek & Willinger, 2009; Finger, 1994; Bowen et al.,1986).Instead, they report that cash flow from operations is a better predictor of future cash flows, though some researchers support the assertion given out by FASB (Greenberg et al 1986; Kim & Kross,2005; Dechow et al.,1998; Murdoch & Krause,1990).Researchers have shown that the ability of earnings improved when it is disaggregated into its major accrual components than the model with cash flow or earnings alone (Jemaa et al.,2015; Hollister,2002; Barth

et al,2001; Ebaid,2011).This inconsistency in the results is due to the following reasons; measurement in the predictor variables, methodological differences, sample size and the period covered by the study. (2) Most of these studies are primarily based on the USA. The findings of this review show an increase in the number of studies in other countries such as Iran and Tunisia, little is empirical known about this issue in some of the developed and developing countries and this would mean an entry point for future studies in developing countries as shown in Figure 1 below.



Source: Author's Analysis

(3) Studies used cash flow data which was calculated as net income adjusted for non-cash items and change in current assets and current liabilities derived from the financial statements i.e. balance sheet and income statement (Greenberg et al.,1986;Bowen et al.,1986;Percy & Stokes,1992;Murdoch & Krause,1990).After the official announcement releasing cash flow statement, some researchers tested the ability of cash flow from operations in predicting future cash flow by using cash flow data available in the cash flow statement (McBeth,1993; Quirin et al.,1999).Researchers found that the use of different measures of predictor variable provides different power in predicting future cash flows.(4) Studies discussed the above used quantitative method in addressing the question whether cash flow from operations or earnings and its components are better predictors of future operating cash flows. The Ordinary least squares (OLS) found as the most commonly used method of estimation and different statistical tools such as adjusted-R2, coefficient tests and Mean Absolute Percentage Error and TIC (Theil Inequality Coefficient) and its proportions used as prediction measures. Out of 40 studies reviewed, 32 studies ignored the uses of panel data methods which including (Fixed effect and Random effect models), and only 8 studies have attempted to use panel data techniques in estimating prediction models.

5. Possible Area for Future Research

The prior literature on cash flow prediction is vast and contains three main streams of research. The first and second stream indirectly questioned FASB's assertion, while the third stream of research directly questioned FASB assertion on the superiority of earnings in predicting future cash flow. Our review paper has not exhausted other two major streams of research which indirectly testing FASB assertion. Further research may also review important roles played by cash flow, earnings and its components in predicting market measures (such as stock prices or returns) and business failures.

Additionally, we noted that cash flows from operations, earnings, and accruals dominated as the key predictors of firm's future cash flow while other traditional cash flow measures, reported cash flows and other predictor variables, particularly cash flow ratios, and sales have been ignored in some studies. Future researchers could examine the important role of other cash flow measures (including working capital from operations, earnings after tax plus depreciation and amortization), reported cash flow (including cash flow from financing and cash flow from investing), sales and cash flow ratios in predicting future cash flows.

From the review, this study proposed that the investigation of future cash flow prediction should involve the use of cash flow data directly sourced from the cash flow statement and not accruals based statements (balance sheet and

income statement). The use of reported cash flow from operations rather than estimated from accrual statements is appropriate since previous work of Austin and Bradbury (1995); Hribar and Collins (2002), who finds that cash flow from operations as estimated by balance sheet information, contains substantial errors and thus is a deficient proxy of reported cash flow from operations

Moreover, the review has shown that most studies have used the quantitative method and the Ordinary least squares (OLS) found as the most commonly used method of estimation prediction models since 1986. Later 2008, few studies have attempted to use panel data techniques. This study proposes that since the nature of the study involves the use of panel data, which is the combination of time series and cross section data, the application of panel regression techniques (FEM and REM) will be more useful and these methods allows intercepts to vary across firms and may help to minimize the potential problem of the Ordinary Least Square approach that assumes intercept and slope coefficient (s) are constant across firms (Gujarati, 2004).

6. Concluding Remarks

One of the primary objectives of financial reporting is to provide information to the users including investors, creditors, management and others for the purpose of assisting them in evaluating company's ability in the generation of future cash flows. An empirical study on future cash flow prediction focused on measuring predictive power of accounting variables like (earnings, cash flow, and accruals). Based on the assertion FASB assertion stated that earnings and its components are more powerful in the future cash flow prediction as compared to cash flow. There are a number of previous and recent empirical studies on this nature investigated but only a few succeed to match with FASB assertion.

This study provides in-depth empirical literature to various readers who wish to get familiarity with this line of financial accounting research and also act as a set of guidance for future researchers. The review also gives an introduction to the methodology used and presents empirical results related to the predictive ability of mentioned accounting information. Based on the different methodology used by different researchers results were found to be mixed among researchers.

References

- Ahmadi, A., & Ahmadi, V. (2012). Evaluating the ability of operating cash flow predictive indexes. *Interdisciplinary Journal of Contemporary Research in Business*, 4(7).
- Ahmadi, A., Bashirimanesh, N., & Ahmadi, V. (2013). Evaluating the effects of firm size on predictive value of future cash flows. *Journal of Basic and Applied Scientific Research*, 3(5), 343-346.
- Al-Attar, A., & Hussain, S. (2004). Corporate data and future cash flow. *Journal of Business Finance and Accounting*, 31(78), 861-903. <https://doi.org/10.1111/j.0306-686X.2004.00560.x>
- Al-Debie. (2011). Are operating cash flows a superior predictor of future operating cash flows than earnings? Evidence from Jordan. *European Journal of Economics, Finance and Administrative Sciences*, 40.
- Akinyomi, O.J. (2014). Effect of cash management on profitability of Nigerian manufacturing firms. *International Journal of Marketing and Technology*, 4(1).
- Arnold, A.J., Clubb, C.D., Manson, S. & Wearing, R.T. (1991). The relationship between earnings, funds flows, and cash flows: evidence for the UK. *Accounting & Business Research*, 22(1), 13-19. <https://doi.org/10.1080/00014788.1991.9729413>
- Arnedo, L., Lizarraga, F., & Sanchez, S. (2012). *The role of accounting accruals for the prediction of future cash flows: evidence from Spain*, 3, 499-520. <https://doi.org/10.1007/s13209-011-0070-7>
- Barth, M.E., Cram, D.P., & Nelson, K.K. (2001). Accruals and the prediction of future cash flows. *The Accounting Review*, 76(1), 27-58. <https://doi.org/10.2308/accr.2001.76.1.27>
- Bagheri, Pouraghajan, Emmgholipour, M., Mansourinia, E., & Adrang, F. (2012). The evaluation of accounting earnings components ability in predicting future operating cash flows: Evidence from the Tehran Stock Exchange. *Journal of Basic and Applied Scientific Research*, 2(12).
- Bowen, R. M., Burgstahler, D., & Daley, L.A. (1986). Evidence on the relationships between earnings and various measures of cash flow. *The Accounting Review*, 61(4), 713 – 725.
- Boritz, J., Kennedy, D., & Sun, J. (2007). Predicting business failure in Canada. *Accounting Perspective*, 141-165. <https://doi.org/10.1506/G8T2-K05V-1850-52U4>

- Bhatia, M., & Dhamija, S. (2015). Voluntary Disclosure of Financial Ratios in India. *South Asian Journal of Management*, 22(1), 29-51.
- Chotkunakitti, P. (2005). Cash flows and accruals accounting in predicting future cash flows. Unpublished doctoral dissertation, University of Southern Cross.
- Dechow, P.M., Kothari, S.P. & Watts, R.L. (1998). The relation between earnings and cash flows. *Journal of Accounting and Economics*, 25(2), 13-68. [https://doi.org/10.1016/S0165-4101\(98\)00020-2](https://doi.org/10.1016/S0165-4101(98)00020-2)
- Ebaid, I.E. (2011). Accruals and the prediction of future cash flows: empirical evidence from emerging market. *Management Research Review*, 34(7), 1-32. <https://doi.org/10.1108/01409171111146715>
- Efayena, O. (2015). The role of accrual accounting basis in the prediction of future cash flows: The Nigerian evidence. *Research Journal of Finance and Accounting*, 6(4).
- Farshadfar, S., Ng, C., & Brimble, M. (2008). The relative ability of earnings and cash flow data in forecasting future cash flows. *Pacific Accounting Review*, 20(3), 251-268. <https://doi.org/10.1108/01140580810920236>
- Financial Accounting Standards Board (1978). Objectives of Financial Reporting by Business Enterprises. Statement of Financial Accounting Concepts No. 1 Stamford, CT: FASB.
- Finger, C.A. (1994). The ability of earnings to predict future earnings and cash flows. *Journal of Accounting Research*, 32(2), 210-23. <https://doi.org/10.2307/2491282>
- Greenberg, R.R., Johnson, G.L., & Ramesh, K. (1986). Earnings versus cash flows as a predictor of future cash flow measures. *Journal of Accounting, Auditing and Finance*, 1, 266-77.
- Gujarati, D.N. (2004). Basic Econometrics (Fourth.).The McGraw–Hill Companies. Retrieved on 15th October, 2014 available at www.mhhe.com/econometrics/gujarati4.
- Habib, A. (2010). Prediction of operating cash flows: Further evidence from Australia. *Australian Accounting Review*, 2 (2), 134-143. <https://doi.org/10.1111/j.1835-2561.2010.00086.x>
- Hollister, J., Shoaf, V., & Tully, G. (2002). An international comparison of accruals and the prediction of future cash flows. *Journal of Accounting and Finance Research*, 10(6), 1-9.
- Ijeoma, N.B. (2016). Relationship between earnings and cash flow in estimating cash flows: evidence from listed Nigerian banks. *Journal of Research in Business, Economics and Management*, 6(1).
- Javedan, F.A., & Largani, S.M. (2014). The effect of cash-flow component (core and non-core) on predicting future cash flow. *Bulletin of Applied and Research Science*, (4)2.
- Jemâ, O.B., Toukabri, M., & Jilani, F. (2015). The examination of the ability of earnings and cash flow in predicting future cash flows: Application to the Tunisian context. *Accounting and Finance Research*, 4(1). <http://dx.doi.org/10.5430/afr.v4n1p1>.
- Jemâ, O.B., Toukabri, M., & Jilani, F. (2015). Accruals and the prediction of future operating cash-flows: Evidence from Tunisian companies. *International Journal of Accounting and Economics Studies*, 3(1). <https://doi.org/10.5430/afr.v4n1p1>
- Jordan, C., Waldron, M.A, & Clark, S.S. (2007). An analysis of the comparative predictive abilities of operating cash flows, earnings, and sales. *The Journal of Applied Business Research*, 23(3).
- Jordan, C.E & Waldron (2010). The comparative predictive abilities of accrual earnings and cash flows in periods of economic turbulence; the case of the IT bubble. *The Journal of Applied Business Research*, 26(1), 85-97.
- Kim, M., & Kross, W. (2005). The ability of earnings to predict future operating cash flows has been increasing– not decreasing. *Journal of Accounting Research*, 43(5), 753-780. <https://doi.org/10.1111/j.1475-679X.2005.00189.x>
- Keige. (1991). *Business failure prediction using discriminate analysis*. Unpublished MBA-Thesis, University of Nairobi.
- Lev, B., Li, S., & Sougiannis, T. (2010). The usefulness of accounting estimates for predicting cash flows and earnings. *Review of Accounting Studies*, 15, 779-807. <https://doi.org/10.1007/s11142-009-9107-6>
- Li, Y., Mountinho, L., Opong, K.K., & Pang, Y. (2015). Cash flow forecasting for South African firms. *Review of Development Finance*, 5, 24-33. <https://doi.org/10.1016/j.rdf.2014.11.001>

- Lorek, K. S., Schaefer, T. F & Willinger, G. L. (1993). Time-series properties and predictive ability of funds flow variables. *The Accounting Review*, 68, 151-63.
- Lorek, K.S. & Willinger, G.L. (1996). A multivariate time-series prediction model for cash flow data. *The Accounting Review*, 71(1), 81-101.
- Lorek, S., Kenneth,L., & Willinger,G. (2009). New evidence pertaining to the prediction of operating cash flows. *Review Quantitative Finance*, 32, 1–15. <https://doi.org/10.1007/s11156-007-0076-1>
- McBeth, K.H. (1993). Forecasting operating cash flow: Evidence on the comparative predictive abilities of net income and operating cash flow from actual cash flow data. *The Mid-Atlantic Journal of Business*, 29(2), 173-87.
- Mooi, T.L. (2007). Predicting future cash flows: Does cash flow have incremental information over accruals earnings? *Malaysian Accounting Review*, 6(2).
- Moeinaddin, M., Ardakani, S., & Akhoondzadeh, F. (2013). Examination of the ability of earning and cash flow in predicting future cash flows. *Interdisciplinary Journal of Contemporary Research in Business*, 4, 94-101.
- Mulenga, M. (2015). The relative ability of earnings and cash flow from operations in predicting future cash flows: Evidence from India. *International Journal of Accounting and Financial Reporting*, 5(2). <https://doi.org/10.5296/ijafr.v5i2.8468>
- Sharma, A, Kumar, S, & Singh, R (2012). Value relevance of financial reporting and its impact on stock prices: Evidence from India. *South Asian Journal of Management*, 19(2), 60- 77.
- Shyam, B.B., & Rajesh, I. (2013). Predicting business failure using cash flow statement based measures. *Managerial Finance*, 39(7), 667676. <https://doi.org/10.1108/03074351311323455>
- Sloan,R. (1996). Do stock prices fully reflect information in accrual and cash flows about future earnings? *The Accounting Review*, 71.
- Olowe, R. A. (1998). *Financial management: concepts, analysis and capital investments*. Lagos: Brierly Jones Nigeria Ltd.
- Percy, M. & Stokes, D.J. (1992). Further evidence on empirical relationships between earnings and cash flows. *Accounting and Finance*, 32(1), 27-49. <https://doi.org/10.1111/j.1467-629X.1992.tb00175.x>
- Quirin, J. J., O'Bryan, D., Wilcox, W. E., & Berry, K. T. (1999). Forecasting cash flow from operations: Additional evidence. *Mid -Atlantic Journal of Business*, 35, 135-142.
- Quirin, J.J., O'Bryan, D. & Berry, K.T. (2000). Forecasting cash flow from operations: Evidence from the oil and gas industry. *Oil, Gas & Energy Quarterly*, 48(3), 517-28.
- Shubita, M. (2013). The forecasting ability of earnings and operating cash flow. *Interdisciplinary Journal of Contemporary Research in Business*, 5(3).
- Takhtaei, N., & Karim, H. (2013). Relative ability of earnings data and cash flow in predicting future cash flows. *International Journal of Accounting and Financial Reporting*, 3(1). <https://doi.org/10.5296/ijafr.v3i1.3803>
- Telmoudi, A. Noubbigh, H. & Ziadi, J. (2010). Forecasting of Operating Cash Flow: Case of the Tunisian Commercial Companies. *International Journal of Business and Management*, 5(10). <https://doi.org/10.5539/ijbm.v5n10p198>
- Varun, D. (2015). The relative predictive ability of earnings and cash flows. *Management Research Review*, 38(4), 367–380. <https://doi.org/10.1108/MRR-06-2013-0156>
- Vishnani, S., & Shah, K.B. (2008). Value relevance of published financial statements with special emphasis on impact of cash flow reporting. *International Research Journal of Finance and Economics*, 17(3), 84-90.