Comparing US-GAAP and Iran-GAAP operating cash flows to predict future cash flows

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Received 24 June 2013
Revised 3 October 2014
Accepted 13 November 2014

Abstract

Purpose – The main objective of this paper is to compare the ability of US-generally accepted accounting principles (GAAP) operating cash flows versus Iran-GAAP operating cash flows in predicting future cash flows.

Design/methodology/approach – The sample comprises 240 firms (1,200 firm-years) during the period from 2004 to 2008 for which operating cash flows and other variables are available. Cross-sectional and panel data regression models are used in testing the hypotheses.

Findings – This study finds that operating cash flows based on Iran-GAAP are no more effective in predicting future cash flows than those based on USA-GAAP, and the predictive ability of the model is improved by adding the earnings accrual components to the operating cash flows.

Originality/value – The study suggests that the Iranian accounting standard setting committee recommends that the statement of cash flows be prepared based on the three-category model instead of the five-category model in an attempt to converge with the International Financial Reporting Standards. Consistent with Financial Accounting Standards Board and financial analyst recommendations, the results reveal that earnings are a better predictor than cash flows from operations.

Keywords Earnings, Accruals, Cash flows, Iran-GAAP, US-GAAP

Paper type Research paper

1. Introduction

Cash flow data provide useful information about a firm's activities in generating cash through operations, in repaying debt, distributing dividends or reinvesting to maintain or expand operating capacity. An entity's current cash receipts and payments allow assessment of factors such as the entity's liquidity, financial flexibility, profitability and risk (Wolk and Michael, 2001). To make economic decisions, financial statement users require an understanding of a firm's ability to generate cash in a timely manner. Cash flows play an important role in assessing the firm's value, thus making sound credit and/or investment decisions by both shareholders and creditors (Pung, 2005).

The Financial Accounting Standards Board (FASB) states that financial reporting should help users estimate the amount, timing and risk of future cash flows (FASB, 1978). International Accounting Standards Board states that the objective of Statement of Cash Flows (IAS 7) is to assess cash flows during the period from operating, investing and financing activities. The Iran Accounting Standards Committee (IRASC) contends

The author acknowledges Zabihollah "Zabi" Rezaee, PhD, CPA, CMA, CIA, CGFM, CFE, CSOXP, CGRCP, CGOVP, CGMA, CRMA; Thompson-Hill Chair of Excellence/Professor of Accountancy/PhD coordinator; and Fogelman College of Business and Economics at The University of Memphis for his contribution in reviewing this paper.

Journal of Financial Reporting and Accounting
Vol. 13 No. 1, 2015
pp. 39-65

1985-2517
DOI 10.1108/JFRA-06-2013-0047

that historical information related to cash flow can help financial statement users estimate the amounts, timing and risk of future cash flows. This information indicates the relation between the profitability of the enterprise and its ability to generate cash flow and, thereby, it is a proxy for earnings quality of the enterprise. In addition, financial analysts and other users apply models for evaluating and predicting future cash flow, informally or formally. Historical information on cash flow is useful for controlling the accuracy of past evolution, and it indicates the relation between the enterprise's activities and its payments and receipts (Standards of Iran Accounting, 2001). Thus, if future cash flows are predicted properly, the majority of informational needs related to cash flow will be satisfied. This study compares the predictive ability of cash flows under US-generally accepted accounting principles (GAAP) and Iran-GAAP.

According to the above standards, while the objectives of financial reporting are the same, the components of operating cash flows and the structure of statements of cash flows differ between Iran-GAAP and US-GAAP. According to US-GAAP, the statement of cash flows is classified into three categories: operating activities, investment activities and financing activities. Iran-GAAP, on the other hand, divides the statement of cash flows into five categories: operating activities, returns on investments and finance servicing, taxation, investing activities and financing activities. While there is no evidence that one model (either the three category or five category) is superior for financial statement users, both models have many critics and advocates. For example, Moradzadeh (2002), as a proponent of the three-category model, reasons that the statement of cash flows based on Iran-GAAP decreases the consistency between the statement of cash flows and the income statement, with the following consequences:

- no improvement in the economic decision-making of users;
- no effect in management responsibility;
- no relationship between dividend or interest and investment structure, non-analyzable results of creating the returns on investments and finance servicing categories; and
- no convergence with international procedures.

In contrast, Bozorg Asl (2002), as a proponent of the five-category model, reasons that the different methods of international standards ignore the comparability of financial statements. Another important defect is the definition of "operating", as net income not only includes operating and non-operating activities but also extraordinary items. Thus, providing operating cash flows based on net income is not entirely accurate.

Generally, cash flow prediction literature can be divided into two groups: studies that use current aggregate earnings and current aggregate cash flows for predicting future cash flows and/or for comparing their predictive ability (Fisher, 1980; Greenberg *et al.*, 1986; Bowen *et al.*, 1986; Wilson, 1986; Lorek *et al.*, 1993; Finger, 1994; Lorek and Willinger, 1996; Ismail and Choi, 1996; Dechow *et al.*, 1998; Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Kim and Kross, 2005; Yoder, 2006; Farshadfar *et al.*, 2008; Brochet *et al.*, 2009; Ebaid, 2011); and studies that disaggregate current earnings or current cash flows for predicting future cash flows (Clinch *et al.*, 2002; Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Cheng and Hollie, 2005; Nam *et al.*, 2007; Arthur *et al.*, 2007; Cheng and Hollie, 2008; Brochet *et al.*, 2009; Ebaid, 2011; Farshadfar and Momeni, 2013). In the second type of study, researchers have two main objectives. First, they investigate the

role of cash flows and accruals components for future cash flow prediction; second, they compare the explanatory powers of current disaggregated earnings or current disaggregated cash flows with current aggregate earnings or current aggregate cash flows in predicting future cash flows.

The results of the first kind of study are mixed and adverse. For example, Finger (1994), Barth *et al.* (2001), Al-Attar and Hussain (2004) and Farshadfar *et al.* (2008) show that historical cash flows are better predictors for future cash flow anticipation than historical earnings, while the results of Greenberg *et al.* (1986), Dechow *et al.* (1998) and Ebaid (2011) indicate that current aggregated earnings have greater power than current aggregate cash flows in predicting future cash flow. Despite the conflict within the empirical research results of the first group, almost all the results of the second group of studies reveal that decomposition of earnings or cash flows into their components increases the predictive power of cash flows. While some prior research provides evidence that current disaggregated cash flows have more power for predicting future cash flows than current aggregate cash flows (Clinch *et al.*, 2002; Cheng and Hollie, 2005, 2008; Farshadfar and Momeni, 2013), other studies document that decomposition of earnings into its components enhances the predictive ability of aggregate earnings in future cash flow prediction (Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Nam *et al.*, 2007; Ebaid, 2011).

While the cash flow prediction literature is well developed, relatively little research that compares the ability of operating cash flow based on US-GAAP and non-US-GAAP in forecasting future cash flows exists. In this area, the experience from Malaysian firms indicates that the financial reporting regime's change has no significant effect on earnings – operating cash flow relation (Kadri *et al.*, 2009). The results also show that USA GAAP companies have a significantly lower current ratio, a significantly higher asset turnover ratio, and a significantly higher debt-to-asset ratio than International Financial Reporting Standards-country firms (Bao *et al.*, 2010). Further investigation in this area is necessary, particularly in the accounting prediction literature, because the question arises whether countries should follow the same/different procedures and whether universal procedures should govern worldwide or whether it is better that countries modify their standards according to their domestic economic, political and cultural circumstances.

The main objective of this paper is to compare US-GAAP operating cash flows with that of Iran-GAAP to determine whether US-GAAP or Iran-GAAP standards provide better cash flow prediction. To achieve this objective, as in previous investigations, this study uses current cash flows and current earnings based on Iran-GAAP and US-GAAP and their decompositions. I suggest that operating cash flows based on US-GAAP and Iran-GAAP have the same ability for cash flow prediction because, as prior studies have shown (Cheng and Hollie, 2008; Arthur *et al.*, 2007), the core components of current cash flows are much more significant for predicting future cash flows than non-core components. On the other hand, differences between Iran-GAAP and US-GAAP operating cash flows are related to non-core components of current cash flows. This conclusion is important because there is evidence to show that there is no necessity for the Iran accounting standards setting committee to change the structures of the statement of cash flows from the three-category model to the five-category model (as a new model).

This study aims to extend the cash flow prediction literature in three ways. First, similar to prior studies (Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Nam *et al.*, 2007), I use historical cash flows, but I develop these cash flows based on the two standards (Iran and USA). In this section, I show both the differences and relations of operating cash flows and decompose current aggregate cash flows provided by Iran-GAAP and US-GAAP to forecast future cash flows. I have two intentions with this decomposition: first, the role of each of the cash flow components based on the two standards is investigated and, second, the ability of Iran-GAAP and US-GAAP operating cash flows to predict future cash flows is compared.

Second, this study uses disaggregation of historical operating earnings and earnings after tax but before extraordinary items, in which Iran-GAAP operating cash flows and US-GAAP operating cash flows are based, respectively, to predict future cash flows. The first objective of earnings decomposition is to investigate the role of each earnings component, i.e. cash flow and accrual components, (regardless of whether these components were considered in prior studies) based on the two standards considered. Second, earnings decomposition reveals whether, by adding the earning accrual components to the cash flow models (three-category model and five-category model), the predictive ability of Iran-GAAP operating cash flows versus US-GAAP operating cash flows improves. In addition, this result demonstrates whether historical operating earnings have a greater ability to predict future cash flows than earnings after tax, but before extraordinary items. This result is quite important with respect to the cash flow prediction literature because it shows whether the behavioral approach that FASB uses for providing financial statements or the structural approach that IRASC uses to prepare cash flow statements is more useful for investors and other users.

Third, because of conflicting results in prior studies that show that reported cash flows from operations is more effective in forecasting future cash flows than is an accrual-based system (Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Nam *et al.*, 2007) and because researchers find that earnings are better predictors of future cash flows than cash flows (Greenberg *et al.*, 1986; Dechow *et al.*, 1998; Ebaid, 2011), this study compares the ability to explain earnings and operating cash flow based on both standards. This approach is taken to indicate whether adding earnings accrual components to cash flow models in both standards has the same effect on the predictive ability of this model or whether the influence of the two models (three-category model and five-category model) differs. This section investigates the predictive ability of operating earnings versus Iran-GAAP operating cash flows and earnings after tax but before extraordinary items, versus US-GAAP operating cash flows. I suggest that accounting earnings based on the accrual system have higher information content than cash flows for predicting future cash flows because the accrual components, such as accounts receivable, inventory and accounts payable, yield information about future cash flows.

This paper proceeds as follows: Section 2 provides a brief background about Tehran Stock Exchange (TSE) and standard setting process in Iran. Section 3 develops the hypothesis, and Section 4 presents the research design. Section 5 explains the empirical results and, finally, Section 6 sets forth a discussion and conclusion.

2. Hypothesis development

According to FASB, the statement of cash flow has three classifications: operating activities, investing activities and financing activities. In US-GAAP, operating cash

flows provide net income, and, because net income consists of operating earnings, interests, taxes, etc., operating cash flows reflect the cash of operating earnings (i.e. receipts from customers, payments in cash to materials and goods sellers and payment in cash of operating expenses), tax, interests and dividends received. However, Iran-GAAP requires for operating cash flows to be based on the definition of "operating activities". Because operating earnings do not include interest, taxes, etc., operating cash flows simply reflect cash earned from operating earnings (i.e. receipts from customers, payments in cash to materials and goods sellers and payment in cash of operating expenses). In Iran-GAAP, tax is presented in an independent section, while dividends received, interest received, interest paid and dividends paid are categorized as returns on investments and financial servicing. Thus, in the Iranian Statements of cash flow, operating cash flows based on US-GAAP can be classified in three groups: operating activities; return on investment and finance servicing; and taxation. Because we want to predict Iran-GAAP operating cash flows without interest, taxes, etc., as these items are not related to the definition of "operating activities", it is not expected that they have an important role in predicting Iranian operating cash flows. Therefore, classifying these items into segregated groups (according to Iran-GAAP) rather than into operating cash flows as a single (according to US-GAAP) does not increase the predictive ability of future cash flows. Thus, to determine whether the separate provision of cash flow components based on Iran-GAAP is beneficial to users, the first hypothesis is formulated as follows:

H1. The five-category model (Iran-GAAP) is not superior to the three-category model (US-GAAP) in terms of predicting future cash flows.

The operating cash flows based on US-GAAP include both core and non-core components, while the operating cash flows based on Iran-GAAP consists of core components. The findings of prior studies on the predictive ability of core components show that core components of current cash flows are useful for predictions. For example, Cheng and Hollie (2005) show a significant relation between cash received from customers, cash paid to suppliers and employees and operating expenses and future cash flows. Moreover, Cheng and Hollie (2008) indicate that core components of current cash flows can be used to predict future cash flows, although they play different roles in forecasting future cash flows, whereas separation of cash flows into core and non-core components increases the predictive ability of the cash flow prediction model. Furthermore, Arthur *et al.* (2007) indicate that core components are highly significant in predicting future earnings.

However, the results of previous research indicate that non-core components have less significance (or insignificance) in cash flows/earnings prediction. For example, findings of Cheng and Hollie (2005) imply that tax does not persist much to next period. They present two reasons for it: first, persistence of taxes depends on the sources of income that the taxes are levied on and, second, tax is affected by firms' tax strategy. Also, Cheng and Hollie (2008) show that cash flows related to taxes has the least persistence in predicting future cash flows. In addition, Arthur *et al.* (2007) demonstrate that non-core components are insignificant in predicting future earnings.

Based on the prior research, I argue that omitting non-core components from operating cash flows does not increase the predictive ability of operating cash flows, as these items do not play an important role in forecasting future cash flows from

operations. As a result, I propose that operating cash flows based on Iran-GAAP are not more capable of anticipating future operating cash flows than methods based on US-GAAP. Therefore, to examine whether operating cash flows based on the operating activity definition (CFO under Iran-GAAP) are more useful to users than operating cash flows that consist of non-core factors, the second hypothesis is formed as follows:

H2. Iran-GAAP operating cash flows do not have greater ability to predict future cash flows than US-GAAP operating cash flows.

3. Research design

The first model, which uses current operating cash flows based on US-GAAP for predicting future cash flows, is designated Model (1). In fact, this model (USA model) shows the explanatory power of the three-category model (USA model):

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CFO_t(US) + \varepsilon \quad \text{(Model 1)}$$

Where i and t denote firm and year, respectively; and CFO_{t+1} (IR) is the future operating cash flows based on IRAN-GAAP and CFO(USA) is the current operating cash flows based on US-GAAP.

Because operating cash flow under US-GAAP is equivalent to the sum of three parts under Iran-GAAP, operating cash flow, return on investment and servicing of finance and taxation, the second model (IR model), which indicates the explanatory power of the five-category model (IR), is described as follows:

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CFO_t(IR) + \alpha_2 \text{Return} + \alpha_3 \text{Tax} + \varepsilon \quad \text{(Model 2)}$$

Where CFO(IR) is the current operating cash flows based on Iran-GAAP, Return is cash flow related to return on investment and servicing of finance and Tax is cash flow related to tax payments.

To test *H2*, first aggregated cash flows and disaggregated cash flows without control variables are used, and then earnings or cash flows with accruals as control variables are used.

3.1 Aggregated and disaggregated cash flows as a predictor of future cash flows

I compare the explanatory power of Model (3), which uses current operating cash flows based on Iran-GAAP for predicting future cash flows, and the explanatory power of Model (2), which uses current operating cash flows based on US-GAAP to predict future cash flows. Model (3) is described as follows:

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CFO_t(IR) + \varepsilon \quad \text{(Model 3)}$$

Based on Iran-GAAP, operating cash flow is performed as below:

$$CFO_{(IR)} = CF\_SA–CF\_CO–CF\_OE + /-CFOO + /-OCFO_{(IR)} \quad \text{(Equation 1)}$$

Where CF_SA is cash flow from sales; CF_CO is cash flow from cost of goods sold; CF_OE is cash flow from operating and administrative expenses; CFOO is cash flow

from non-operating expenses and income; and $OCFO_{(IR)}$ is another cash flow based on Iran-GAAP[1]. The first model that tests the operating cash flow based on Iran-GAAP and its core components in predicting future cash flows is established by equation (1) and Model (3) as below:

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_2 CF\_CO_t + \alpha_3 CF\_OE_t + \alpha_4 CFOO_t + \alpha_5 OCFO_{t(IR)} + \xi \quad \text{(Model 4)}$$

Based on equation (1), I expect that the coefficient on CF_SA (cash flows from sales) has a positive sign, while the coefficient on CF_CO (cash flow from cost of goods sold) and that of CF_OE (cash flow from operating and administrative expenses) has a negative sign in Model (2).

Based on the statement of cash flows structure (Appendix 2), the operating cash flow based on US-GAAP equals the operating cash flow based on Iran-GAAP, minus the cash flow related to tax payments, plus cash flow received from interest, minus cash flow related to interest payments, plus cash flow related to dividend receipts:

$$CFO\,(US) = CFO\,(IRAN) - TAX + INTREC - INTPAD + DIVREC \quad \text{(Equation 2)}$$

CFO (US) is net cash flow from operating activities based on US-GAAP; $CFO_{(IRAN)}$ is net cash flow from operating activities based on Iran-GAAP; TAX is cash flow related to tax payments; INTREC is cash flow received from interest; INTPAD is cash flow related to interest payments; and DIVREC is cash flow related to dividend receipts. The second model, which tests operating cash flow based on US-GAAP and its core components in predicting future cash flows, is performed by considering equation (2) and Model (4) below:

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_3 CF\_CO_t + \alpha_4 CF\_OE_t + \alpha_5 CFOO_t + \alpha_6 TAX_t + \alpha_7 INTREC_t + \alpha_8 INTPAD_t + \alpha_9 DIVREC_t + \alpha_{10} OCFO_{t(US)2} + \xi \quad \text{(Model 5)}$$

Where $OCFO_{(USA)}$ is other cash flow based on US-GAAP. Based on equation (2), I predicts that coefficients on TAX (cash flow related to tax payments) and INTPAD (cash flow related to interest payments) have negative signs, while coefficients on INTREC (cash flow received from interest) and DIVREC (cash flow related to dividend reception) have positive signs, as in Model (5).

3.2 Disaggregated earnings as a predictor of future cash flows

The aggregate operating earnings model is performed as below:

$$CFO_{t+1} = \alpha_0 + \alpha_1 OE_t + \xi \quad \text{(Model 6)}$$

Where OE is operating earnings. To examine the predictive ability of operating cash flows based on US-GAAP and that of Iran-GAAP based on the accrual model, I extend Model (4) by decomposing the operating earnings into their accrual and cash flow components. Based on Iran-GAAP, operating earnings equal cash flow from operations, plus accruals:

$$OE = CFO_{(IR)} + Ac_{(IR)} \quad \text{(Equation 4)}$$

Where $Ac_{(IR)}$ is accruals calculated as the difference between OE and $CFO_{(IR)}$. I also extend equation (4) by separating accruals into their components, i.e. equation (5):

$$Ac_{(IR)} = \Delta AR + \Delta OAR + \Delta INV + \Delta PP + (DE + AM) + \Delta AP + \Delta OAP + \Delta PD + \Delta OTA_{(IR)} \quad \text{(Equation 5)}$$

Where ΔAR is change in accounts receivable; ΔOAR is change in other accounts receivable; ΔPP is change in prepayment; ΔINV is change in inventory per the statement of cash flows; (D+A) is depreciation expense plus amortization expense; ΔAP is change in accounts payable; ΔOAP is change in other accounts payable; ΔPD is change in advances; $OTA_{(IR)}$ is other accruals based on Iran-GAAP; and $OTA_{(USA)}$ is other accruals based on US-GAAP[3]. The first model that adds accruals to the cash flow Model (2) as control variables for predicting future cash flows is established by considering Model (6) and equations (1), (4) and (5):

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_2 CF\_CO_t + \alpha_3 CF\_OE_t + \alpha_4 CFOO_t + \alpha_5 OCFO_{t(IR)} + \alpha_6 \Delta AR_t + \alpha_7 \Delta OAR_t + \alpha_8 \Delta INV_t + \alpha_9 \Delta PP_t + \alpha_{10}(DE_t + AM_t) + \alpha_{11} \Delta AP_t + \alpha_{12} \Delta OAP_t + \alpha_{13} \Delta PD_t + \alpha_{14} \Delta OTA_{t(IR)} + \xi \quad \text{(Model 7)}$$

Earnings before unanticipated items and stopped items are used for predicting future cash flow based on US-GAAP. Barth *et al.* (2001) use the following model:

$$CFO_{t+1} = \alpha_0 + \alpha_1 E_t + \xi \quad \text{(Model 8)}$$

Where E is income before extraordinary items and discontinued operations. I extend Model (8) by decomposing earnings before unanticipated items and stopped items into their accrual and cash flow components. Based on US-GAAP, earnings before unanticipated items and stopped items equals cash flows from operations, based on US-GAAP, plus accruals:

$$E = CFO_{(US)} + Ac_{(US)} \quad \text{(Equation 6)}$$

Where $Ac_{(USA)}$ is accruals calculated as the difference between E and $CFO_{(USA)}$. I also extend equation (4) by separating accruals into their components, i.e. equation (7):

$$Ac_{(US)} = \Delta AR + \Delta OAR + \Delta INV + \Delta PP + (DE + AM) + \Delta AP + \Delta OAP + \Delta PD + \Delta OTA(US) \quad \text{(Equation 7)}$$

The second model adds accruals to the cash flow Model (5) as control variables for predicting future cash flows. This model is established by considering Model (8) and equations (1), (6) and (7):

$$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA + \alpha_2 CF\_CO + \alpha_3 CF\_OE + \alpha_4 CFOO + \alpha_5 TAX + \alpha_6 INTREC + \alpha_7 INTPAD + \alpha_8 DIVREC + \alpha_9 OCFO_{(US)} + \alpha_{10}\Delta AR + \alpha_{11}\Delta OAR + \alpha_{12}\Delta INV + \alpha_{13}\Delta PP + \alpha_{14}(DEPR + AMORT) + \alpha_{15}\Delta AP + \alpha_{16}\Delta OAP + \alpha_{17}\Delta PD + \alpha_{18}\Delta OTA_{(US)} + \xi \quad \text{(Model 9)}$$

Consistent with the literature, in the present study, all explanatory variables are scaled by lagged total assets for firm *i*.

3.3 Sample selection

The statistical portion of this study consists of all firms listed on the TSE since 2004. In this research, the systematic elimination method is used for sample selection. My initial sample contains 433 firms. The sample selection process is summarized in Table I. In the first stage, I delete firms whose end-of-period was not March 20 (year-end in Iran). In the second stage, I exclude investment and financial firms because the nature of these firms differs from other firms. In the third stage, I omit firms that changed their year-ends because they ignored voluntary disclosure in financial reporting. Accordingly, the sample of firms investigated is 240 firms (1200 firm-years). In fact, the sample includes all non-financial firms whose final financial year was March 20, whose financial information was available during the time of research, and whose financial year had not changed. This study covers the time period of 2004 to 2008, as cash flow operations derived from statements of cash flows and other variables are available for this period.

4. Research findings

4.1 Descriptive statistics

Table II presents descriptive statistics, including mean value, standard deviation and median of each variable. The mean value of OE and E (0.162 and 0.130, respectively) is higher than that of $CFO_{(IR)}$ and $CFO_{(US)}$ (0.131 and 0.080, respectively). This is expected, as OE (E) is increased by some non-cash accruals such as accounts receivable, but cash flow measures are not. The mean values of OE (E) and $CFO_{(IR)}$ ($CFO_{(US)}$) are positive, so that of $AC_{(IR)}$ ($AC_{(US)}$) is positive as well.

The positive means and medians of accruals in this study are inconsistent with the negative means of accruals found in prior studies (Dechow *et al.*, 1998; Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Cheng and Hollie, 2008) because, based on their data, the means and median values of long-term accruals, such as depreciation, are higher than short-term accruals, such as accounts receivable and inventory. However, based on Iranian data, the variation in accounts receivable and inventory is higher than

Table I. Description of the sample selection for analysis during the 2004-2008 time period

Steps	No. of firms
1. All Firms with available cash from operations and earnings	433
2. Deletion of firms that end of their periods has not been at 20 March	(120)
3. Exclusion of observations that have belonged to investment and financial firms	(50)
4. Exclusion of observations that have changed their year-ends	(23)
Total Sample Firms	240

Table II.
Descriptive statistics

STATS	OE	AC(IR)	E	AC(US)	ΔAR	ΔOAR	ΔINV	ΔPP	D_A	ΔAP	ΔOAP	ΔPD	OTA(IR)
Mean	0.162	0.031	0.130	0.050	0.054	0.014	0.046	0.002	0.027	0.028	0.036	0.010	0.016
SD	0.227	0.195	0.264	0.302	0.120	0.119	0.132	0.058	0.021	0.115	0.231	0.084	0.235
Median	0.149	0.027	0.109	0.038	0.034	0.003	0.030	0.000	0.021	0.007	0.012	0.000	0.005

STATS	CFO(IR)	CFO(US)	CF_SA	CF_CO	CF_OE	CFOO	INRE	INPA	DIV	TAX	OCF(IR)	OCF(US)	OTA(US)
Mean	0.131	0.080	0.906	0.721	0.049	0.000	0.004	−0.040	0.006	−0.036	−0.002	−0.141	0.034
SD	0.212	0.262	0.423	0.617	0.118	0.025	0.019	0.136	0.027	0.146	0.587	0.659	0.326
Median	0.110	0.109	0.875	0.679	0.036	0.000	0.000	−0.019	0.000	−0.018	−0.002	−0.112	0.012

Notes: This panel presents descriptive statistics that are based on panel data; see Appendix 1 for variable definitions

depreciation. This conflict indicates that total accruals, on average, are heavily affected by long-term accruals and short-term accruals based on the respective American and Iranian data. In addition, the standard deviation of OE and E is 0.227 and 0.264, respectively, which is higher than the standard deviations of $CFO_{(IR)}$ and $CFO_{(US)}$ (0.212 and 0.262, respectively). These results contrast with the findings of prior research, which report that the standard deviation of EARNS is lower than that of CFO (Dechow *et al.*, 1998) and consistent with studies that show the standard deviation of EARNS as higher than the standard deviation of CFO (Farshadfar *et al.*, 2008). I reason that these differences may be related to sample selection criteria or due to the fact that Iranian firms are generally smaller and younger than companies listed on the US capital markets. Also, I reason that these dissimilarities may be due to the fact that companies listed on the Iran capital market report more frequent losses than those listed on the US capital markets. Tables III and IV also indicates the mean, median value and standard deviation value for components of cash flows and accruals. The mean and median value of change in accounts receivable (0.054 and 0.034, respectively) are higher than those of other accrual components of earnings. Further, I find that the highest mean and median values among components of cash flows belong to cash flows from sales (0.906 and 0.875, respectively).

Table III, presents Pearson correlations between EARNS, CFO, ACCRUALS and accrual components. As expected, while there is a positive and significant relationship between CFO and EARNS, the correlation between CF and ACCRUALS is significantly negatively based on US-GAAP and Iran-GAAP. Both OE and E are significantly positively correlated with accrual components (ΔAAR, ΔINV, D_A, ΔAP, OTA [IR] and OTA [USA]) and significantly negatively correlated with ΔOAP. Table IV also shows the Pearson correlations between accrual components. Since the highest correlation coefficient is between ΔOAR and ΔOAP (0.65), multicollinearity could not be a cause of problems in the regression. Panel B reports the correlation between CFO and its components. Based on Iran-GAAP, the correlation between CFO and CF_SA, OCFO (IR), INRE and INPA is positive and significant, while CFO is significantly negatively correlated with CF_OE, CFOO and TAX. Based on US-GAAP, CFO is significantly positively associated with CFS, INRE and SP, while CFO is significantly negatively correlated with CF_OE and CFOO. According to Panel B, the highest correlation between components of CFO based on Iran-GAAP is related to CFP and OCFO (IR), with a value of 0.74, and that based on US-GAAP is associated with CF_CO and OCFO (USA), with a value of 0.65. These results reveal that there is not high multicollinearity among the independent variables in Models (4), (5), (7), and (9).

4.2 Results

4.2.1 The first hypothesis. Panel A of Table V reports the relationship between three components of cash flow (i.e. CFO t (IR), TAX and RETURN) and future operating cash flows based on the five-category model (IR). The results in Panel A show that the relationship between operating cash flows based on the five-category (CFO t (IR)) model and future cash flow is positive, while the relationship between cash flow related to tax payments (TAX) and cash flow from operations is negative and significant at the 0.05 level for all five years (2004-2008). I also re-estimate the regression Model (2) using the panel data method. The coefficients for the three-part model are significant at the 0.05 level. CFO t (IR) has a coefficient of 0.384 with a *t*-statistic of 13.97, RETURN has a

Table III. Correlation matrix between earnings, cash flows and accruals

Variables	OE	E	CFO(IR)	CF(US)	AC(US)	AC(IR)	AAR	OAR	INV	PP	D_A	AP	OAP	PD	OTA(IR)	OTA(US)
OE																
E	0.484**															
CFO(IR)	0.612**	0.347**														
CF(US)	0.222**	0.293**	0.321**													
AC(US)	0.194**	0.433**	−0.03	−0.73**												
AC(IR)	0.472**	0.180**	−0.40**	−0.09**	0.250**											
AAR	0.263**	0.115**	−0.04	0.01	0.070**	0.351**										
OAR	0.01	−0.01	0.04	0.01	−0.01	−0.04	0.04									
INV	0.194**	0.065*	0.00	0.091**	−0.04	0.221**	0.187**	0.112**								
PP	0.04	0.02	−0.03	−0.03	0.04	0.069*	0.01	0.04	0.02							
D_A	0.069*	0.105**	0.105**	0.04	0.04	−0.04	0.00	−0.01	0.077**	0.04						
AP	0.078**	0.02	0.062*	0.04	−0.02	0.02	0.286**	0.110**	0.341**	0.130**	−0.01					
OAP	−0.10**	−0.07**	0.01	0.00	−0.055*	−0.12**	0.02	0.656**	0.190**	0.079**	0.01	0.03				
PD	0.03	0.02	0.162**	0.03	−0.01	−0.14**	0.130**	0.059*	0.222**	0.108**	0.064*	0.139**	0.116**			
OTA(IR)	0.072**	0.01	−0.22**	−0.09**	0.116**	0.332**	−0.14**	0.054*	−0.10**	−0.08**	0.04	0.145**	0.468**	0.165**		
OTA(US)	0.061*	0.348**	0.02	−0.70**	0.098**	0.05	−0.10**	0.02	−0.14**	−0.02	0.062*	0.04	0.180**	0.107**	0.403**	

Notes: **Correlation is significant at the 0.01 level; *correlation is significant at the 0.05 level; see Appendix 1 for variable definitions

Variables	CFO(IR)	CF_SA	CF_CO	CF_OE	CFOO	OCFO	INRE	INPA	DIV	TAX	E	CFO(US)	OCFO(US)
CFO(IR)													
CF_SA	0.22**												
CF_CO	−0.06	0.48**											
CF_OE	−0.18**	0.09*	0.08*										
CFOO	−0.10**	−0.03	0.03	0.09*									
OCFO(IR)	0.12**	−0.10**	0.74**	0.15**	−0.01								
INRE	0.09*	−0.02	−0.04	−0.07*	−0.09*	0.00							
INPA	0.06*	−0.01	−0.02	−0.05	−0.16**	0.01	0.05						
DIV	−0.02	−0.02	0.00	−0.02	0.00	0.00	0.02	−0.03					
TAX	−0.06*	−0.08	−0.04	0.00	0.01	0.00	−0.01	−0.05	0.05				
E	0.47**	0.27**	−0.03	−0.25**	−0.13**	−0.08*	0.15**	0.15**	−0.04	−0.09*			
CFO(US)	0.74**	0.10**	0.03	−0.18**	−0.11**	0.23**	0.13**	0.08	0.22**	0.02	0.34**		
OCFO(US)	0.04	−0.15**	0.65**	0.12**	0.07*	0.88**	−0.02	−0.05	0.31**	0.26**	−0.15	0.37**	

Notes: **Correlation is significant at the 0.01 level; *correlation is significant at the 0.05 level; see Appendix 1 for variable definitions

Table IV. Correlation matrix between cash flows' components

Table V. Comparing the explanatory power of the five-category model (IR) to that of the three-category model (US): cross-sectional (2004-2008) and panel data (common effect method) analysis

Variables	2004 Coefficient	2004 *t*-statistic	2005 Coefficient	2005 *t*-statistic	2006 Coefficient	2006 *t*-statistic	2007 Coefficient	2007 *t*-statistic	2008 Coefficient	2008 *t*-statistic	Panel Coefficient	Panel *t*-statistic
Panel A. The relationship between the cash flow components of the five-category model (IR) and the future cash flow $CFO_{t+1}\,(IR) = \alpha_0 + \alpha_1 CFO_t\,(IR) + \alpha_2 RETURN + \alpha_3 TAX + \xi$												
α_0	0.078	3.41*	0.040	2.044*	−0.029	−0.49	0.101	6.19*	0.021	1.241	0.050	6.053*
CFO	0.438	7.00*	0.411	7.607*	0.437	2.36*	0.012	1.193	0.422	6.703*	0.384	13.97*
RETURN	0.881	0.858	0.827	1.392	−0.528	−0.587	−0.238	−0.846	−0.072	−0.185	0.573	3.182*
TAX	−0.820	−3.34*	−0.828	−2.03*	−0.523	−3.67*	−1.02	−2.66*	−2.02	−3.13*	−0.413	−3.37*
Adjusted R^2 (%)	10.88		24.79		72.08		14.25		25		18.2	
n (N)	240		240		240		240		240		1,200	
Panel B. The relationship between the cash flow based on US-GAAP and the future cash flow $CFO_{t+1}\,(IR) = \alpha_0 + \alpha_1 CFO_t\,(US) + \xi$												
α_0	0.130	7.041*	0.107	7.29*	0.132	2.84*	0.121	9.00*	0.099	8.61	0.105	16.68*
CFO	0.318	4.088*	0.327	6.881*	0.418	2.544*	0.012	1.157	0.212	5.52*	0.208	13.22*
Adjusted R^2 (%)	6.47		23.74		70.13		12.27		39.4		19.3	
n (N)	226		227		219		219		216		1,067	
Voung Z-Stat	1.49		0.177		0.97		1.31		−0.51		−0.141	

Notes: *Significant at the 0.05 level, respectively; see Appendix 1 for variable definitions

coefficient of 0.573 with a *t*-statistic of 3.182; and TAX has a coefficient of −0.413 with a *t*-statistic of −3.37. By comparing the results from the two approaches, we notice that in contrast with the cross-sectional method, in the panel data approach, RETURN plays an important role in predicting future cash flows. This difference is one reason for using two approaches in testing the study hypotheses. Because the panel data method has several advantages over the cross-sectional method, my conclusion is based on this approach. Thus, based on the panel data method, the results in Panel A show that all three parts, i.e. operating cash flow, return on investment and servicing of finance and taxation are able to predict future cash flows. As a result, moreover, with respect to cash flows related to operating activities, we should consider return on investment and servicing of finance and taxation in predicting future cash flows; further, because of their importance, I suggest that we should not omit these items from operating cash flows.

Panel B of Table V reports the relationship between current cash flows based on the three-category model (USA) and future operating cash flows. The results in Panel B show that the relationship between operating cash flows based on the three-category [CFO t (USA)] model and future cash flow is positive and significant at the 0.05 level for all five years (2004-2008). Similarly, the coefficient on CFO t (USA) (0.208) is positive and significant at the 0.05 level in the panel data regression approach. These results indicate that current cash flows based on US-GAAP are able to predict future cash flows.

The results of the Vuong's (1989) Z-statistic are presented near the end of Table V. If the Z-statistic is significantly positive, the test shows that the five-category model (IR) has greater ability to predict future cash flows, whereas if the Z-statistic is significantly negative, the three-category model (USA) is a better predictor. Table V reports that the Z-statistic is positive and insignificant for all four years of the sample period (2004-2007) and negative and insignificant for 2008 and the panel data approach. Results for the Vuong test for Models (1) and (2) show that the five-category model (IR) is not a superior predictor with respect to future cash flows than the three-category model (USA). Thus, I conclude that the five-category model (Iran-GAAP) and the three-category model (US-GAAP) have the same ability to predict future cash flows.

4.2.2 The second hypothesis. Panel A of Table VI reports the relationship between current cash flows based on Iran-GAAP and future operating cash flows. The results in Panel A show that the relationship between operating cash flows based on Iran-GAAP and future cash flow is positive and significant at the 0.05 level for all five years (2004-2008), as well as in the panel data regression approach. The results in Panel A reveal that current cash flows based on Iran-GAAP have predictive ability with respect to future cash flows.

Panel B of Table VI reports the predictive ability of cash flow based on US- and Iran-GAAP for future cash flows at the aggregate level. If the Z-statistic is significantly positive, the test shows that operating cash flows under Iran-GAAP have greater ability to predict future cash flows, whereas if the Z-statistic is significantly negative, operating cash flow under US-GAAP is a better predictor. Panel B of Table VI reports that the Z-statistic is positive and insignificant for all four years of the sample period (2004-2007), and negative and insignificant for 2008 and for the panel data approach. Results for the Vuong test for Models (1) and (3) indicate that operating cash flow under Iran-GAAP is not a superior predictor of future cash flows than operating cash flow under US-GAAP. Accordingly, *H2* is accepted at the aggregate level.

Table VI. Comparing the explanatory power of the operating cash flow under Iran-GAAP with the cash flow under US-GAAP: cross-sectional (2004-2008) and panel data (Common effect method) analysis

Variables	2004 Coefficient	2004 *t*-statistic	2005 Coefficient	2005 *t*-statistic	2006 Coefficient	2006 *t*-statistic	2007 Coefficient	2007 *t*-statistic	2008 Coefficient	2008 *t*-statistic	Panel Coefficient	Panel *t*-statistic
Panel A. The relationship between the cash flow based on IRAN-GAAP and the future cash flow $CFO_{t+1} = \alpha_0 + \alpha_1 CFO_t (IR) + \xi$												
α_0	0.084	3.92*	0.070	4.261*	0.083	1.61	0.120	8.92*	0.047	3.285	0.065	9.21*
CFO	0.463	5.469*	0.444	8.329*	0.602	3.291*	0.012	1.193	0.495	8.33*	0.448	16.45*
Adjusted R^2 (%)	11.29		22.99		70.67		12.29		22.9		19.2	
n (*N*)	240		240		240		240		240		1,200	

Models	2004 *z-statistic*	2004 *p-value*	2005 *z-statistic*	2005 *p-value*	2006 *z-statistic*	2006 *p-value*	2007 *z-statistic*	2007 *p-value*	2008 *z-statistic*	2008 *p-value*	Panel *z-statistic*	Panel *p-value*
Panel B. The Predictive Ability of Cash Flow Based on US and That of Iran GAAP for Future Cash Flows at Aggregate level: Vuong's Test Analysis												
Model 3 vs Model 1	1.379	0.169	−0.129	0.896	1.393	0.164	0.372	0.709	−0.634	0.526	−0.029	0.976

Notes: Model (1): $CFO_{t+1} = \alpha_0 + \alpha_1 CFO_t (US) + \xi$; Model (3): $CFO_{t+1} = \alpha_0 + \alpha_1 CFO_t (IR) + \xi$; *significant at the 0.05 level; see the Appendix 1 for variable definitions

Panels A and B of Table VII report the relationship between components of cash flows and future operating cash flows based on Iran-GAAP and US-GAAP, respectively. The results in Panels A and B of this Table show that all core cash flow components (CF_SA, CF_CO and CF_OE) are significant in both the cross-sectional and the panel data approach. The signs of the coefficients are consistent with my expectations; that is, an increase in CF_SA should reflect higher cash flows for the next period, while CF_CO and CF_OE are negatively related to future cash flows. These findings reveal that core components of current cash flows are able to predict future cash flows based on Iran-GAAP and US-GAAP. Also similar to the cross-sectional approach results, the *t*-statistic of the panel data method indicates that all non-core cash flow components (CFOO, TAX, INRE, INPA and DIV) are not significant, with the exception of OCFO, which is significant. These results confirm my expectations that core cash flow components (non-core cash flow components) are (are not) significantly able to predict next-period cash flows.

The results of the Vuong (1989) Z-statistic are presented near the end of Table VII. If the Z-statistic is significantly positive, the test shows that Iran-GAAP cash flow from operations has greater ability to predict future cash flows, whereas if the Z-statistic is significantly negative, the US-GAAP cash flow from operations is a better predictor. Table VII reports that the Z-statistic is negative and insignificant for all five years of the sample period in both the cross-sectional and the panel data approach for Models (4) and (5). Results for the Vuong test for Models (4) and (5) indicate that US-GAAP cash flow from operations is not a superior predictor for predicting future cash flows than do Iran-GAAP operating cash flows.

Table VIII reports summary statistics from estimating Models (7) and (9), which disaggregate current earnings into cash and accrual components. The cross-sectional results in Panels A and B of Table VIII indicate that all core components of cash flow are significant at the 0.05 level with signs consistent with expectations, across each of the sampled years, while coefficients of the accrual components are inconsistent across those years. The coefficients on the accrual components reveal that estimated signs for all accrual components are constant through the sample period, but their significance is not permanent across the sample period, with the exception of INV and AP, which are permanent. These findings demonstrate that, with the exception of INV and AP, the other components of accrual are not reliable predictors of future cash flow based on the cross-sectional approach. Table VIII (Panels A and B) also indicates that, as predicted, all coefficients on the accrual components and core cash flow components are significant at the 0.05 level in the panel data regression model. Thus, the components of accruals and core cash flows based on both US-GAAP and Iran-GAAP are all significant in predicting future cash flow.

The results of the Vuong test are reported in Table IX. The Vuong (1989) Z-statistic compares the explanatory power of the accrual models [Models (7) and (9)) with that of the cash models [Models (4) and (5)]. This comparison helps me to know whether earnings have more power than operating cash flow in explaining future cash flow. The results shown in Table IX indicate that the adjusted R^2 of the disaggregated current cash flow and the accrual components specifications exceed that of the disaggregated current cash flow specification and, based on a Vuong (1989) Z-statistic, I find that this increase is statistically significant at the 0.05 level. Consistent with this evidence, I find that adding accrual components – change in: accounts receivable, other accounts

Table VII. Summary statistic regressions of future cash flow on current cash flow: cross-sectional (2004-2008) and panel data (Common effect method) analysis

Variables	2004 Coefficient	2004 *t*-statistic	2005 Coefficient	2005 *t*-statistic	2006 Coefficient	2006 *t*-statistic	2007 Coefficient	2007 *t*-statistic	2008 Coefficient	2008 *t*-statistic	Panel Coefficient	Panel *t*-statistic
Panel A. The relationship between the cash flow components based on IRAN-GAAP and the future cash flow												
$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_2 CF\_CO_t + \alpha_3 CF\_OE_t + \alpha_4 CFOO_t + \alpha_5 OCFO\,(IRAN) + \xi$												
α_0	0.114	3.33*	0.046	1.42	0.105	2.060*	0.011	0.34	0.023	0.906	0.032	4.158*
CF_SA	0.511	7.00*	0.507	8.08*	0.428	4.90*	0.216	4.90*	0.407	7.32*	0.407	20.93*
CF_CO	−0.55	−6.59*	−0.49	−8.01*	−0.46	−5.35*	−0.09	−1.97*	−0.34	−5.76*	−0.438	−18.28*
CF_OE	−0.74	−4.43*	−0.43	−3.33*	−0.78	−4.43*	−0.42	−3.57*	−0.47	−4.04*	−0.531	−13.03*
CFOO	0.841	0.91	0.004	0.005	0.326	0.539	−0.14	−0.32	0.227	0.429	0.103	0.646
OCFO	0.369	4.38*	0.369	4.13*	0.491	3.099*	0.197	3.64*	0.286	5.408*	0.417	17.340*
Adjusted R^2 (%)	20.18		27.48		15.75		9.29		20		30.2	
n (*N*)	240		240		240		240		240		1,200	
F-statistic	35.043*		26.999*		13.677*		7.998*		19.595*		157.439*	
Panel B. The relationship between the cash flow components based on US-GAAP and the future cash flow												
$CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_3 CF\_CO_t + \alpha_4 CF\_OE_t + \alpha_5 CFOO_t + \alpha_6 TAX_t + \alpha_7 INTREC_t + \alpha_8 INTPAD_t + \alpha_9 DIVREC_t + \alpha_{10} OCFO_{(US)} + \xi$												
α_0	0.108	3.09*	0.032	0.96	0.108	2.09*	0.003	0.03	0.014	0.525	0.030	3.94*
CF_SA	0.466	5.55*	0.483	8.03*	0.349	3.65*	0.186	3.39*	0.322	5.27*	0.463	21.02*
CF_CO	−0.51	−5.57*	−0.478	−7.56*	−0.397	−4.25*	−0.07	−1.67**	−0.27	−4.45*	−0.432	−18.08*
CF_OE	−0.71	−4.19*	−0.35	−2.51*	−0.724	−4.05*	−0.40	−3.32*	−0.38	−3.30*	−0.53	−13.10*
CFOO	0.960	1.01	0.257	3.77*	−0.286	−0.43	−0.22	−0.47	0.40	0.763	0.081	0.509
TAX	−0.15	−0.50	−0.53	−1.24	−0.68	−1.01	−1.39	−2.70*	−1.79	−3.24*	−0.26	−0.908
INTREC	3.04	1.39	1.23	0.635	2.98	1.07	−0.29	−0.707	−0.023	−0.006	−0.027	−0.137
INTPAD	−0.06	−0.194	0.120	1.105	0.044	0.286	0.05	0.192	−0.01	−0.34	−0.042	−1.469
DIVREC	−0.21	−0.50	1.138	1.64	−0.837	−1.97*	−0.20	−0.45	0.09	0.156	−0.031	−0.203
OCFO	0.331	3.58*	0.257	3.77*	0.428	4.12*	0.176	3.27*	0.176	3.27*	0.418	17.54*
Adjusted R^2 (%)	19.18		28.20		16.78		11.12		22.67		32.04	
n (*N*)	226		227		219		219		216		1,067	
Young z-Statistic	−1.19		−1.04		−1.607		−1.603		−1.436		−0.556	

Notes: *, **significant at the 0.05, 0.10 level; see the Appendix 1 for variable definitions

Table VIII.
Summary statistic regressions of future cash flows on current earnings: cross-sectional (2004-2008) and panel data (Common effect method) analysis

Variables	2004 Coefficient	2004 *t*-statistic	2005 Coefficient	2005 *t*-statistic	2006 Coefficient	2006 *t*-statistic	2007 Coefficient	2007 *t*-statistic	2008 Coefficient	2008 *t*-statistic	Panel Coefficient	Panel *t*-statistic
Panel A. The relationship between the operating earning components and the future cash flow CFO_{t+1} *(IR)* $= \alpha_0 + \alpha_1 CF\_SA + \alpha_2 CF\_CO + \alpha_3 CF\_OE + \alpha_4 CFOO + \alpha_5 OCFO\ (IRAN) + \alpha_6 \Delta AR + \alpha_7 \Delta OAR + \alpha_8 \Delta INV + \alpha_9 \Delta PP + \alpha_{10}\ (DEPR + AMORT) + \alpha_{11} \Delta AP + \alpha_{12} \Delta OAP + \alpha_{13} \Delta PD + \alpha_{14} \Delta OTA\ (IRAN)$											
α_0	0.08	2.21*	−0.00	−0.22	0.026	0.53	0.039	1.098	0.032	1.22	0.018	2.44*
CF_SA	0.687	9.38*	0.641	9.47*	0.524	6.80*	0.472	7.88*	0.567	10/02*	0.543	25.02*
CF_CO	−0.79	−9.21*	−0.60	−8.54*	−0.558	−6.85*	−0.45	−7.41*	−0.553	−8.57*	−0.538	−23.1*
CF_OE	−0.84	−4.35*	−0.42	−2.99*	−0.776	−4.61*	−0.43	−3.97*	−0.539	−4.56*	−0.539	−13.8*
CFOO	0.731	0.838	−0.12	−0.175	0.525	1.006	0.417	1.000	0.780	1.548	0.422	2.88*
OCFO	0.787	7.55*	0.221	2.98*	0.622	6.32*	0.389	6.86*	0.557	8.32*	0.537	23.67*
AR	0.56	4.072*	0.00	0.28	0.34	2.15**	0.47	3.94*	0.077	0.839	0.184	6.392*
OAR	1.02	4.05*	0.17	0.746	0.53	2.69*	0.28	1.43	0.174	1.516	0.289	7.396*
INV	0.72	5.14*	0.29	2.24*	0.37	2.44*	0.39	3.58*	0.608	5.17*	0.351	10.48*
PP	0.346	1.400	0.14	0.57	0.516	1.85**	0.41	1.83**	0.403	1.82**	0.280	3.07*
A_D	0.158	0.243	0.579	0.946	0.822	1.095	−0.92	−1.44	0.296	0.607	0.558	3.66*
AP	−1.120	−4.89*	−0.29	−2.20*	−0.59	−3.46*	−0.50	−6.25*	−0.552	−4.95*	−0.497	−13.3*
OAP	−0.86	−4.77*	−0.10	−0.77	−0.232	−1.610	−0.19	−1.8**	−0.363	−3.95*	−0.361	−10.9*
PD	−0.48	−1.9**	−0.53	−4.13*	−0.33	−1.9**	−0.07	−0.460	−0.523	−2.531	−0.371	−7.49*
OTA	0.960	1.01	0.08	0.86	0.273	2.214	0.299	3.80*	0.394	4.81*	0.329	11.83*
Adjusted R^2	36.57		33.65		20.55		29.49		35.49		47.24	
n (*N*)	221		224		217		220		216		1,099	
Panel B. The relationship between the earning components before the unanticipated items and the future cash flow CFO_{t+1} *(IR)* $= \alpha_0 + \alpha_1 CF\_SA + \alpha_2 CF\_CO + \alpha_3 CF\_OE + \alpha_4 CFOO + \alpha_5 TAX + \alpha_6 INTREC + \alpha_7 INTPAD + \alpha_8 DIVREC + \alpha_9 OCFO_{(US)} + \alpha_{10} \Delta AR + \alpha_{11} \Delta OAR + \alpha_{12} \Delta INV + \alpha_{13} \Delta PP + \alpha_{14}\ (DEPR + AMORT) + \alpha_{15} \Delta AP + \alpha_{16} \Delta OAP + \alpha_{17} \Delta PD + \alpha_{18} \Delta OTA_{(US)} + \xi$											
α_0	0.065	1.69**	−0.026	−0.67	1.25	2.115*	0.042	1.07	0.026	0.951	0.024	3.378
CF_SA	0.725	8.25*	0.629	8.64*	0.433	4.6211*	0.452	7.245*	0.505	7.495*	0.540	24.57*
CF_CO	−0.84	−8.52*	−0.599	−7.99*	−0.536	−4.986*	−0.433	−6.921*	−0.498	−6.808*	−0.540	−22.76*
CF_OE	−0.87	−4.39*	−0.282	−1.3**	−0.757	−3.759*	−0.443	−3.890*	−0.480	−3.904*	−0.549	−14.07*
CFOO	0.557	0.626	−0.001	−0.002	0.019	0.028	0.308	0.710	0.886	1.703	0.337	2.29*
TAX	0.405	1.384	−0.515	−1.19	−0.319	−0.467	−0.686	−1.443	−0.997	−1.80**	−0.012	−0.580
INTREC	1.78	0.884	0.308	0.161	2.133	0.775	−0.419	−1.102	−0.143	−0.385	−0.049	−0.244
INTPAD	−0.54	−1.8**	0.224	2.016*	0.062	0.404	−0.065	−0.236	0.009	0.222	−0.006	−0/347
DIVREC	1.52	1.604	1.06	1.544	−0.875	−2.07*	−0.371	−0.899	0.047	0.089	−0.034	−0.236

(*continued*)

Table VIII.

Variables	2004 Coefficient	2004 t-statistic	2005 Coefficient	2005 t-statistic	2006 Coefficient	2006 t-statistic	2007 Coefficient	2007 t-statistic	2008 Coefficient	2008 t-statistic	Panel Coefficient	Panel t-statistic
OCFO	0.848	7.126*	0.191	2.56*	0.602	4.802*	0.376	6.396*	0.506	6.864*	0.545	23.43*
AR	0.631	4.413*	−0.004	−0.04	0.304	1.545	0.462	3.807*	0.028	0.298	0.193	6.656*
OAR	1.096	4.65*	1.396	0.599	0.585	2.464*	0.273	1.349	0.152	1.308	0.311	7.446*
INV	0.76	5.37*	0.287	2.140*	0.430	2.347*	0.384	3.363*	0.575	4.724*	0.369	10.92*
PP	0.34	1.35	−0.237	−0.95	0.605	1.82**	0.434	1.88**	0.316	1.395	0.300	5.459*
A_D	0.225	0.341	0.889	1.431	0.002	0.002	−1.028	−1.571	0.383	0.772	0.360	2.42*
AP	−1.18	−5.09*	−0.255	−1.8**	−0.655	−3.189*	−0.495	−6.009*	−0.488	−4.147*	−0.499	−13.13*
OAP	−0.83	−4.57*	−0.089	−0.64	−0.320	−1.838*	−0.199	−1.88**	−0.330	−3.51*	−0.369	−11.115*
PD	−0.53	−2.12*	−0.510	−3.89*	−0.295	−1.436	−0.066	−0.407	−0.479	−2.270*	−0.377	−7.788*
OTA	−0.73	−5.64*	−0.122	−1.15	0.375	2.506*	0.295	3.601*	0.355	4.170*	0.370	8.625*
Adjusted R^2	37.14		34.53		20.93		29.81		35.73		47.85	
n (N)	240		240		240		240		240		1,200	

Notes: *, ** significant at the 0.05, 0.10 level; see the Appendix 1 for variable definitions

Table IX. The predictive ability of the earnings and the operating cash flow for predicting the future cash flow based on IRAN and US-GAAP: Vuong's test analysis

Models	2004		2005		2006		2007		2008		Panel	
	z-statistic	*p*-value	*z*-statistic	*p*-value	*z*-statistic	*p*-value	*z*-statistic	*p*-value	*z*-statistic	*p*-value	*z*-statistic	*p*-value
Model 4 vs Model 7	2.155	0.032	2.044	0.042	2.152	0.032	3.237	0.001	2.421	0.016	3.387	0.000
Model 5 vs Model 9	2.160	0.031	2.101	0.036	2.143	0.033	3.179	0.001	2.433	0.015	2.823	0.004

Notes: Model (4): $CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_2 CF\_CO_t + \alpha_3 CF\_OE_t + \alpha_4 CFOO_t + \alpha_5 OCFO_t(IRAN) + \xi$; Model (5): $CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_3 CF\_CO_t + \alpha_4 CF\_OE_t + \alpha_5 CFOO_t + \alpha_6 TAX_t + \alpha_7 INTREC_t + \alpha_8 INTPAD_t + \alpha_9 DIVREC_t + \alpha_{10} OCFO_{t(US)} + \xi$; Model (7): $CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA_t + \alpha_2 CF\_CO_t + \alpha_3 CF\_OE_t + \alpha_4 CFOO_t + \alpha_5 OCFO_t(IR) + \alpha_6 \Delta AR_t + \alpha_7 \Delta OAR_t + \alpha_8 \Delta INV_t + \alpha_9 \Delta PP_t + \alpha_{10}(DE_t + AM_t) + \alpha_{11} \Delta AP_t + \alpha_{12} \Delta OAP_t + \alpha_{13} \Delta PD_t + \alpha_{14} \Delta OTA_t(IR) + \xi$; Model (9): $CFO_{t+1}(IR) = \alpha_0 + \alpha_1 CF\_SA + \alpha_2 CF\_CO + \alpha_3 CF\_OE + \alpha_4 CFOO + \alpha_5 TAX + \alpha_6 INTREC + \alpha_7 INTPAD + \alpha_8 DIVREC + \alpha_9 OCFO_{(US)} + \alpha_{10} \Delta AR + \alpha_{11} \Delta OAR + \alpha_{12} \Delta INV + \alpha_{13} \Delta PP + \alpha_{14}(DEPR + AMORT) + \alpha_{15} \Delta AP + \alpha_{16} \Delta OAP + \alpha_{17} \Delta PD + \alpha_{18} \Delta OTA_{(US)} + \xi$; see the Appendix 1 for variable definitions

receivable, inventory, prepayment, depreciation and amortization, accounts payable, other accounts payable, advances and other accruals – to the disaggregated cash flow model significantly enhances the predictive ability of cash flows.

5. Discussion and conclusion

This study suggests a new approach to testing two common facets of accounting theory, i.e. a behavioral and structural approach based on the two different structures of statements of cash flows. This study is the first to document a comparison between the predictive ability of operating cash flows under Iran-GAAP and US-GAAP for future cash flows. This is an important issue because it reveals whether the method of classifying items of statement of cash flows affects future cash flow prediction and, thereby, users of financial statements for economic decision making, such as investing and lending. Some of my key findings are discussed and explained in the paragraphs below.

First, the results of this study provide evidence that Iran-GAAP operating cash flows do not have greater ability to predict future cash flows than US-GAAP operating cash flows. Second, historical operating earnings and earnings after tax but before extraordinary items have the same ability to forecast future cash flows. Third, each accrual and cash flow component reflects different information relating to future cash flows. Finally, the findings of this study show that adding earnings accrual components to operating cash flows (whether three-category or five-category) increases the predictive ability of the model.

This study indicates that the five-category model (Iran-GAAP) is not superior to the three-category model (US-GAAP) in predicting future cash flows because of the significant relationship between the core components and future cash flows, and the insignificant relationship between the non-core components (which differ in the two models) and future cash flows. Also, as previous studies show (Dechow *et al.*, 2004; Arthur *et al.*, 2007; Cheng and Hollie, 2008), non-core components are not closely related to operating activities, but are related to the capital structure of a firm, such as interest or taxes. These results support my suggestion that, to converge with international procedures, the Iranian accounting standards setting committee should not change its cash flow statement structure from the three-category to the five-category model.

My findings show that adding accruals to operating cash flows based on US-GAAP and Iran-GAAP does not enhance predictive ability. In other words, neither operating earnings nor earnings after tax but before extraordinary items show greater ability in forecasting future cash flows. I reason that their differences are related to items such as non-operating expenses or non-operating revenues not classified as operating activities. As a result, the equal predictive ability of Iran-GAAP operating cash flows, which is based on structural theory, and of US-GAAP cash flow from operations, which is based on behavioral theory, reveals that there is no significant difference between these approaches in providing useful information to financial statement users for economic decision-making.

In addition, this study, based on accrual components and future cash flow relations, highlights that, similar to the accrual components used by Barth *et al.* (2001) (i.e. accounts receivable, inventory, depreciation expense, amortization and other accruals or other accrual components, including other receivable accounts, prepayments, other payment accounts and advance receipts), the components used in this study are able to

predict future cash flows – results that have not been reported in the literature thus far. These results confirm the empirical evidence provided by Barth *et al.* (2001). However, in this paper, other receivable accounts, prepayments, other payment accounts and advanced receipts are developed to predict future cash flow; Barth *et al.* failed to consider the role of these items for cash flow prediction. Finally, this study is consistent with the FASB, financial analysts' recommendations and the findings in other research that earnings are better predictors than cash flow from operations (Dechow *et al.*, 1998; Nam *et al.*, 2007). This study's findings contrast with those of some prior studies that show that operating cash flows are more informative than earnings (Barth *et al.*, 2001; Al-Attar and Hussain, 2004; Farshadfar *et al.*, 2008). I speculate that the accrual accounting system and accrual income numbers, in particular, are more useful for predicting future cash flow than the cash-based system, and this superior ability is associated with accruals that play an important role in future cash flow prediction. As such, both accounts receivable and accounts payable give information about future cash flows. But this study's results show that operating earnings are not more useful than earnings after tax but before extraordinary items.

Following the recommendations of Krishnan (2003), I contend that the results of this study should be viewed as a first step toward comprehension of the predictive abilities of the various operating cash flows from the FASB Cash Flows Statement versus US-GAAP cash flows for predicting future cash flows. Future research should also include countries from Asia, the UK and Eastern Europe to generate further evidence of the probable predictive ability differences between US-GAAP and non-US-GAAP cash flows with respect to future cash flows.

Notes

1. The detailed definitions of these variables are provided in Appendix 1.
2. In this study, the core and non-core cash flows are defined based on operating activities definition. The cash flows related to operating activities of the income statement such as sales, cost of goods sold and operating expenses are classified as core cash flows and non-core cash flows are defined as items that are not closely related to operation such as interest, tax and dividend reception like study of Cheng and Hollie (2008).
3. The detailed definitions of these variables are provided in Appendix 1.

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Appendix

Variables	Definition
OE	Operating earnings scales by beginning total assets
AC (IR)	Accruals based on the IRAN-GAAP that calculated as the difference between OE and CFO $_{(IR)}$ scales by beginning total assets
CFO (IR)	Net cash flow from operating activities based on IRAN-GAAP scales by beginning total assets
E	Income before extraordinary items and discontinued operation scales by beginning total assets
CFO (US)	Net cash flow from operating activities based on US-GAAP scales by beginning total assets
AC (US)	Accruals calculated as the difference between E and CFO $_{(US)}$ scales by beginning total assets
ΔAR	Change in accounts receivable that equals (AR_t - AR_{t-1}) scales by beginning total assets
ΔOAR	Change in other accounts receivable equals (OAR_t–OAR_{t-1}) scales by beginning total assets
ΔPP	Change in prepayment equals (PP_t–PP_{t-1}) scales by beginning total assets
ΔINV	Change in inventory per the statement of cash flows equals (INV_t–INV_{t-1}) scales by beginning total assets
D_A	Depreciation expense plus Amortization expense scales by beginning total assets
ΔAP	Change in accounts payable equals (AP_t–OAP_{t-1}) scales by beginning total assets
ΔOAP	Change in other accounts payable equals (OAP_t–OAP_{t-1}) scales by beginning total assets
ΔPD	Change in advances equals (PD_t–PD_{t-1}) scales by beginning total assets
OTA (IR)	Other accruals based on Iran-GAAP scales by beginning total assets that obtained from the below equation: $Ac_{(IR)} - \Delta AR_t - \Delta OAR_t - \Delta PP_t - \Delta INV + (DEPR + AMORT) + \Delta AP_t + \Delta OAP_t + \Delta PD_t$
OTA $_{(US)}$	Other accruals based on US-GAAP scales by beginning total assets that obtained from the below equation: $Ac_{(US)} - \Delta AR_t - \Delta OAR_t - \Delta PP_t - \Delta INV + (DEPR + AMORT) + \Delta AP_t + \Delta OAP_t + \Delta PD_t$
CFO	Net cash flow from operating activities scales by beginning total assets
CF_SA	Cash flows from sales are calculated as sales minus change in accounts receivable - trade plus change in advanced receipts scales by beginning total assets
CF_CO	Cash flow from cost of goods sold calculated as cost of goods sold minus change in accounts payable plus change in inventory plus change in purchase prepayment scales by beginning total assets
CF_OE	Cash flow from operating and administrative expenses are calculated as operating expenses plus change in expense prepayment minus deprecation scales by beginning total assets
CFOO	Cash flow from non-operating expenses and incomes scales by beginning total assets
INRE	Cash flow received from interest scales by beginning total assets
INPA	Cash flow related to interest payment scales by beginning total assets
DIV	Cash flow related to dividend reception scales by beginning total assets
TAX	Cash flow related to tax payments scales by beginning total assets

(*continued*)

Table AI.
Definition of variables

Variables	Definition
OCFO) IRAN)	Other cash flow based Iran-GAAP calculated as cash flow from operating activities $_{(IRAN)}$ minus [cash flows from sales minus cash flow from cost of goods sold minus cash flow from operating and administrative expenses minus/plus cash flow from non-operating expenses and incomes] scales by beginning total assets
OCFO (US)	Other cash flow based on US-GAAP calculated as cash flow from operating activities $_{(US)}$ minus [cash flows from sales minus cash flow from cost of goods sold minus cash flow from operating and administrative expenses minus/plus cash flow from non-operating expenses and incomes minus tax minus cash flow related to interest payment plus cash flow receive from interest plus cash flow related to dividend reception] scales by beginning total assets.

Table AI.

Consolidated statement of cash flows (Direct method)			
Cash flow from operations (US-GAAP)		Cash flow from operations (IR-GAAP)	
Cash received from customers	$10,000	Cash received from customers	$10,000
Cash paid to suppliers	(5,000)	Cash paid to suppliers	(5,000)
Cash paid to employees and operating expenses	(1,000)	Cash paid to employees and operating expenses	(1,000)
	–	Cash provided by operation	$4,000
	–	Cash flow from investments and servicing of finance	
Interest received	700	Interest received	$700
Interest paid	(500)	Interest paid	(500)
Dividend received from affiliate	200	Dividend received from affiliate	200
		Cash provided by Investments and Servicing of Finance	$400
Cash flow from tax:			
Income taxes paid	(250)	Income taxes paid	$(250)
Cash provided by operation	$4,150	Cash provided by taxation	$(250)

Table AII.
Comparing statements of cash flows (except the investment activities and financing) based on the IRAN-GAAP and US-GAAP

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