An investigation on how to estimate future cash flows: Evidence from Tehran Stock Exchange

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CHRONICLE	ABSTRACT
	This paper presents an empirical investigation to predict future cash flows using present cash flow and accruals using the information of 96 selected firms listed on Tehran Stock Exchange over the period 2007-2011. The proposed study uses linear regression techniques to forecast future cash flow and the results indicate that cash flow and accruals together could provide more power to forecast cash flow. In addition, accrual provides future cash flow better than cash flow. The survey also performs an investigation on discretionary accrual and finds that the firms with higher accruals maintain lower return compared with firms with lower return. This means there is a clear evidence of discretionary accruals on Tehran Stock Exchange.

1. Introduction

One of the primary concerns on investment strategies is to study the quality of earnings and methods for predicting the future cash flow and there are several studies associated with this issue (Collins & Hribar, 2000; Doyle et al., 2003; Francis et al., 2005; Hribar & Craig Nichols, 2007). Dechow and Dichev (2002) recommended a new method for measuring the quality of working capital accruals and earnings. Accruals is able to shift or to adjust the recognition of cash flows over time so that the adjusted earnings could provide better prediction on firm performance. They argued that the quality of accruals and earnings is decreasing in the magnitude of estimation error in accruals and derived an empirical measure of accrual quality as the residuals from firm-specific regressions of changes in working capital on past, present, and future operating cash flows. Nam et al. (2012) reinvestigated the effect of the cash and accrual components of accounting earnings in forecasting future cash flows using out-of-sample predictions and market value of equity as a proxy for all possible future cash flows. They reported that, on average, accruals could improve upon current cash flow from operations (CFO) in forecasting future cash flows. In the cross-section, accruals' contribution was positively

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related to proxies for quality of accruals and governance. They also investigated the implications of accruals' predictive value for accrual-based market anomalies and reported that portfolios formed on stock return forecast using information from current CFO and accruals could result substantially positive returns on average, as opposed to CFO alone. They also reported that Sloan's accrual anomaly was associated to their accrual contribution anomaly. In fact, when accruals' contribution to future cash flow prediction was the highest, the accrual anomaly disappears. Collectively, the results recommended that the predictive value of accruals and market participants' capability to process it were a significant driver of accrual-based anomalies.

2. The proposed study

This paper presents an empirical investigation to predict future cash flows using present cash flow and accruals using the information of 96 selected firms listed on Tehran Stock Exchange over the period 2007-2011. The proposed study uses linear regression techniques to forecast future cash flow based on both cash flow and discretionary accrual. In selection process, we consider the following criteria,

1. The shares of firms must be listed on Tehran Stock Exchange prior to year 2007.

2. All necessary information must be available during the time span.

3. The fiscal year must be March, 23, which is the official calendar in Iran.

4. No selected firm should have changed its fiscal calendar.

5. No holding firm is permitted for this study.

The proposed model of this paper considers different regression models. The first model considers the relationship between future cash flow (CFO_{it+1}) as a function of present cash flow (CFO_{it}) as follows,

$$CFO_{it+1} = \gamma_0 + \gamma_1 CFO_{it} + \varepsilon_{it}, \tag{1}$$

where γ_0 and γ_1 are coefficients to be estimated and ε represents the residual. Future cash flow can be stated as a function of accruals (ACC_{it}) as follows,

$$CFO_{it+1} = \gamma_0 + \gamma_1 ACC_{it} + \varepsilon_{it}. \tag{2}$$

In addition, future cash flow can be stated as a function of both present cash flow and accruals as follows,

$$CFO_{it} = \gamma_0 + \gamma_1 CFO_{it-1} + \gamma_2 ACC_{it-1} + \varepsilon_{it}. \tag{3}$$

The other regression model investigates whether previous earnings ($EARN_{it-1}$) could help present cash flow or not through the following regression model,

$$CFO_{it} = \mathcal{P}_0 + \mathcal{P}_1 EARN_{it-1} + \varepsilon_{it}. \tag{4}$$

Similarly, in Eq. (4), $\mathcal{P}_0$ and $\mathcal{P}_1$ represent coefficients to be estimated and ε is the residuals. Another hybrid model predicts cash flow through the following regression model,

$$CFO_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 \Delta AR_{it-1} + \beta_3 \Delta INN_{it-1} + \beta_4 \Delta AP_{it-1} + \beta_5 DEPAMOR_{it-1} + \beta_6 Other_{it-1} + \varepsilon_{it}, \tag{5}$$

where ΔAR_{it-1} represents the change in working capital from the previous year, ΔINN_{t-1} is the change in receivable accounts from the previous year, ΔAP_{it-1} represents changes on payable accounts, $DEPAMOR_{it-1}$ states depreciation and amortization of the previous year and finally $Other_{it-1}$ states the

difference between *ACC* and *ΔAR+ΔINV-ΔAP-DEPAMOR*. In addition, β_i i=0, …, 6 represents coefficients to be estimated and ε represents the residual. The proposed study considers the following regression model,

$$ABSE_1\text{-}ABSE_3 = \alpha_0 + \beta_1 \, ABS\_Disc\_ACC + \beta_2 \, ABS\_NONDISC\_ACC + \beta_3 \, SIGN\_ACC + \beta_4 \quad (6)$$
$$CFO\_Volatility + \beta_5 \, Firm\_Size + \beta_6 \, Book\_to\_Market + \beta_7 \, Audit + \varepsilon_{it}$$

In Eq. (6), $ABSE_j$ represents the absolute deviation of cash flow, which is calculated as follows,

$$ABSE_j = \frac{CFO_{t+1} - CFO_{t+1}^*}{Assets_t} \qquad (7)$$

In Eq. (7), *j* represents the models presented in Eqs. (1-4), *ABS_Disc_ACC* and *ABS_NONDISC_A* state the absolute value of discretionary and non-discretionary accruals, respectively. *SIGN_ACC* is a dummy variable, which is one if accrual predicts more future cash flow and zero, otherwise. In addition, *CFO_Volatility* measures cash flow volatility, *Firm_Size* represents the firm size, *Book_to_Market* represents book value to market value, and finally *Audit* is dummy variable, which receives one if the firm is audited by a governmental auditing firm and zero, otherwise.

3. The results

In this section, we present details of our findings on testing the hypotheses of the survey.

3.1. The first model

We first compare the coefficient of determinations for the first and the second models, which are 0.149 and 0.375, respectively. Therefore, we understand the second model provides better prediction power than the first model. In other words, accruals is a better predictor of future cash flow than present cash flow.

3.2. The second model

The second hypothesis of this survey investigates whether cash flow itself predicts better than cash flow and accruals together. Coefficient of determinations for the first and third models are calculated as 0.149, 0.547, respectively. Therefore, we state that the present cash flow and accruals together are able to provide better forecast for future cash flow.

Next, we present details of our findings on examining the effects of firms with various levels of accruals. In our study, we have decided to categorize the firms into four groups from the lowest degrees of accruals to the highest degrees of accruals. Table 1 demonstrates the results of some basic statistics of accruals on these four groups.

Table 1
The summary of some basic statistics on different levels of accruals

Return variable	Number	Mean	Standard deviation	Min	Max
Group 1: The lowest level of accruals	175	0.1576	0.679	-0.74	7.34
Group 2	175	0.2314	0.5757	-0.57	4.52
Group 3	185	0.2932	0.6194	-0.59	4.78
Group 4: The highest level of accruals	180	0.3733	0.6256	-0.70	3.86

As we can observe from the results of Table 1, there are some meaningful difference between the means of the first and the last group. Performing Levin and one-way F tests on the data yields 1.886 with Sig. = 0.142 and F-value = 3.806 with Sig. = 0.010. This means there are some meaningful

differences between different groups. Table 2 shows the results of LSD tests between different groups.

Table 2
The summary of LSD test

Sub-group I	Sub-group J	Difference	Sig.	Result
Group 1	2	-0.07378	0.271	Meaningful
	3	-0.1356	0.04	Not Meaningful
	4	-0.2156	0.001	Meaningful
Group 2	1	0.0738	0.271	Meaningful
	3	-0.06182	0.349	Meaningful
	4	-0.1418	0.033	Not Meaningful
Group 3	1	0.1356	0.006	Not Meaningful
	2	0.0618	0.249	Meaningful
	4	-0.080	0.222	Meaningful
Group 4	1	0.2156	0.001	Meaningful
	2	0.1418	0.033	Not Meaningful
	3	0.08	0.222	Meaningful

According to the results of Table 2, we can observe that the firms with higher accruals maintain lower return compared with firms with lower return. This means there is clear evidence of discretionary accruals on Tehran Stock Exchange.

4. Conclusion

In this paper, we have presented an empirical investigation on learning the effect of present cash flow as well as accruals on predicting future cash flow on selected firms on Tehran Stock Exchange. The proposed study has implemented various regression models for learning this effect and the results have indicated that cash flow and accruals together are better predictors of future cash flow than individual models, i.e. present cash flow or accruals. In addition, the study has concluded that the firms with higher accruals maintain lower return compared with firms with lower return.

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