The investigation of the relationship between dividend policies, cash-flow uncertainty, contributed capital mix and investment opportunities: the case of emerging markets (Tehran Stock Exchange)

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Abstract

Financial performance measurement of companies is among the most important subjects considered by investors, creditors, governments and managers. Mangers use performance measurement in order to evaluate the performance of parts under their coverage. Investors (shareholders) evaluate the performance in order to assess the success rate of management in applying their capital and decisions making for maintain, increase or selling investment and creditors use it to make decision about rate of credit granting. The most important aspect that investors consider in evaluating performance is that whether any value has created for them or not. In recent years many efforts have been done to introduce indices that could better fulfill the goals of shareholders. In this study, the relationship between dividend policy, cash-flow uncertainty, contributed capital mix and investment opportunities is investigated in Tehran Stock Exchange (TSE) during the period of 2006-2010. First, the variables of research were identified and then data were obtained from RahavardNowin Software. These data were analyzed to test hypotheses by using SPSS software through descriptive and inferential statistics such as correlation analysis. The following research results have been obtained: there is a negative and significant relationship between dividend policy, cash flow uncertainty and investment opportunities and positive and significant relationship between dividend policy and contributed capital mix.

Key words: Performance Measurement, Dividend Policies, Cash-Flow Uncertainty, Contributed Capital Mix and Investment Opportunities.

Introduction

Investors as the key providers of the companies' resources want full and accurate information from companies. Efficient market postulates that information is absorbed by individuals and it affects on security's price. In fact, individual's judgment and decisions appear at security's price. It seems that this point of view stems from the Miller & Modigiliani (1961) arguments who believe that dividend policy does not affect on the firms value so shareholders show no interest for it. Accounting information is presented in financial statements (Henderiksen, 1982). On the other hand, one of the most important financial statements is profit and loss statement. Investors pay mostly attention to the income figure as the product of the financial statements. Reported income can help users in performance and profitability evaluation and also investors in predicting their expected return when information is presented in a way that enables them in past performance evaluation and future profitability prediction.

Therefore, not only the reported figure is important for investors, but also earnings quality as a one of income information dimensions is respected (Francis and Lafond, 2004). Therefore, the investigation of the relationship between dividend policies with cash-flow uncertainty, contributed capital mix and investment opportunities increases returns predictive power which in turn helps to select prior stocks and create suitable portfolio. The applied purpose of this research is to determine whether there is a relationship between dividend policies, cash-flow uncertainty, contributed capital mix and investment opportunities in TSE.

Moreover, most of the studies have been conducted in the developed countries and there is a dramatic need to investigate this matter in emerging markets to show the difference of the results. This study tries to close this gap in its proportion.

Research review

There have been many researches conducted about the relationships between return, firm performance, profitability and dividend payout. However, there are a few studies as to the relationship between cash flow uncertainty and dividend policy. The importance of this study is to reveal the relationship between dividend policies, cash-flow uncertainty, contributed capital mix and investment opportunities to help users of financial information in the best decision making.

French and Fama in 2001 conducted a leading study in the U.S. firms between 1926 and 1999. They observed that the proportion of firms paying dividend declines dramatically after 1978. They found that the reason was new listed firms in the U.S. stock market so they argue that firm`s life cycle affect on the dividend policy. After them DeAngelo, DeAngelo and Stulz (2006) in an important study observe a highly significant relation between the decision to pay dividends and the earned/contributed capital mix, controlling for profitability, growth, firm size, total equity, cash balances, and dividend history. They show that the mix of earned/ contributed capital has a quantitatively greater impact than measures of profitability and growth opportunities. These results also are supported by Malkawi (2007) who find that size, age, and profitability of the firm seem to be determinant factors of corporate dividend policy in Jordan. Their contribution to the scope of financial management was introduction of mix of earned/ contributed capital as a basic measure for firm's life cycle measurement. After this point most of studies have used mix of earned/ contributed capital as a basic measure for firm's life cycle measurement (Chay and Suh, 2009; Thanatawee, 2011; Wang et al. 2011).

However, Chay and Suh (2009) highlighted other aspect of dividend policy. They mostly emphasize on cash-flow uncertainty and introduce it as the most factors impacting on dividend policy. They assert that the impact of cash-flow uncertainty on dividends is generally stronger than the impact of other potential determinants of payout policy—such as the earned/contributed capital mix, agency conflicts, and investment opportunities. Using a sample of 5000 firms from 7 countries during the period of 1994-2005 they show that across countries, cash-flow uncertainty has a negative impact on the amount of dividends as well as the probability of paying dividends.

Al-Kuwari (2009) investigated the impact of government ownership, free cash flow, firm size, growth rate, growth opportunity, business risk, and firm profitability on dividend payout ratios. His results suggest that government ownership, firm size and firm profitability have positive and the leverage ratio negative with dividend policy.

Wang et al. (2011) studied the relationship between dividend policy and the life cycle hypothesis. Their results indicate that dividend payers (cash dividends, stock dividends, or both) are associated with higher profitability, higher asset growth rate, and higher market-to-book ratio than non-payers (none dividends). In addition, their results are consistent with the life cycle hypothesis of dividend payment in that younger firms with higher growth potential but lower profitability tend to distribute more stock dividends than cash dividends. Thanatawee (2011) examined the dividend policy of Thai listed companies over the period 2002-2008. He highlights that larger and more profitable firms with higher free cash flows and retained earnings to equity tend to pay higher dividends. In addition, the evidence indicates that firms with higher growth opportunities tend to pay lower dividend payout ratio but higher dividend yield. In the whole, his results provide support for the free cash flow and life-cycle hypotheses. Further, he shows that financial leverage is positively related to dividend payouts. Ahmed & Javid (2009) explored the determinants of dividend policy in Pakistan. They found that the ownership concentration and market liquidity have the positive impact on dividend payout policy. Besides, the investment opportunities and leverage have the negative impact on dividend payout policy.

They also demonstrate that the market capitalization and size of the firms have the negative impact on dividend payout policy which shows that the firms prefer to invest in their assets rather than pay dividends to their shareholders. As you can see the issue of dividend policy is very important issue and there are so many loose ends to tie.
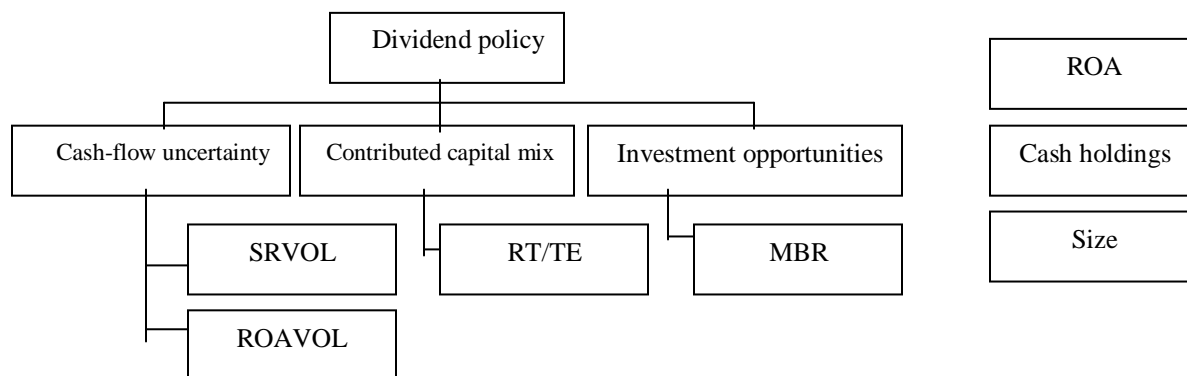
Methodology

Present study is applied research regarding classification based on goal. The aim of the applied research is to develop applying knowledge in the given subject. In addition, the study is descriptive-correlation research. The aim of this sort of study is to determine the relationship between the research variables. The research data consists of all companies listed in TSE during the period of 2006 to 2010. The sampling method is the systematic-elimination method and the sample firms must have following conditions:

1. Information must be available for the past 5 years.
2. Fiscal year must be ended at the end of year.
3. Transaction intervals must not be more than 6 month.
4. Data must be available for testing hypotheses.

As a result of these conditions a sample of 92 firms was obtained (for each research variable 460 firm-year) to test the hypotheses. Literature and conceptual framework were gathered by documental method. Financial statement and notes issued by TSE were used as a research tool. In addition, RahavardeNovin software was applied to extract the research data. It should be mentioned that research data is secondary data which is reliable. Moreover, regression postulates are 1- normality of dependent variable (Kolmogorov-Smirnov) 2- error independence 3- $E_{(ei)}=0$ 4- variation model error fixed 5-dependent variables independence.

Illustration 1. Research analytical model and variables measurement methods

Variables definition
A) Dependent variable
Dividend policy: Dividend to earnings ratio is used to test dividend policy.

$$pay-p_{it} = \frac{Dividend_{it}}{Earnings_{it}}$$

pay-p $_{it}$: dividend policy of firm i in year t
Dividends $_{it}$**:** dividend of firm i in year t
Earnings $_{it"}$: earnings of firm i in year t

B) Independent variable
1- Cash flow uncertainty
According to Brav and Graham (2005) and Chay and Suh (2009), we use stock return volatility (SRVOL) and return on assets volatility (ROAVOL) to test cash-flow uncertainty.

Brav and Graham model (2005): return on assets volatility (ROAVOL) is used to test cash flow uncertainty which is defined as the standard deviation of operating rate of return (i.e., operating income/total assets) over the most recent four years including the current fiscal year. They argue that cash flow uncertainty results in return on assets volatility. However, return on assets volatility is used as a proxy for cash flow uncertainty (Brav and Graham, 2005).

$$ROAVOL_{it} = STD(ROA)$$

$ROAVOL_{it:}$ return on assets volatility

STD (ROA): standard deviation of operating rate over the most recent four years including the current fiscal year. Chay and Suh (2009): according to this model, cash flow uncertainty results in stock price and return volatility. However, using of stock return volatility (SRVOL) as a proxy for cash flow uncertainty is more accurate. SRVOL is defined as the standard deviation of monthly stock returns over the most recent two years (Chay and Suh 2009):

$$SRVOL_{it} = STD(R_{it})$$

$R_{it:}$ monthly stock returns

The following formula is used to calculate monthly stock returns:

$$R_{it} = \frac{P_{it}(1 + \alpha + \beta) + D_{it} - P_{it-1} - C\alpha}{P_{it-1} + C\alpha}$$

R_{it}: Actual return of stock i in year t

P_{it}: Stock price i at the end of year t

P_{it-1}: Stock price i at the end of year t-1

D_{it}: Cash dividend of stock i

α: Percentage of capital increasing from liabilities and contributed cash

β: Percentage of capital increasing from reserves

C: contributed capital for capital increasing

2- Earned/Contributed Capital Mix

Earned/Contributed Capital Mix shows that how many of capital in balance sheet attributed to retained earnings. DeAngelo, DeAngelo, and Stulz (2006) argue that dividends are paid usually by mature firms and vice versa. According to DeAngelo, DeAngelo, and Stulz (2006), the following equation is used to measure Earned/Contributed Capital Mix:

$$Contributed \underset{\rightarrow}{\ } Capital \underset{\rightarrow}{\ } Mix = \frac{RE_{it}}{TE_{it}}$$

RE_{it}: retained earning of firm i in year t

$TE_{it:}$ total capital of firm i in year t

3- Investment opportunities

According to Fama and French (2001), firms with higher investment opportunities, need more cash so distribute fewer cash dividend. Market to book value is used to measure investment opportunities:

$$MBR = \frac{MV_{it}}{BV_{it}}$$

MV_{it} : market value of firm i in year t

$BV_{it :}$ book value of firm i in year t

C) Control variables

Control variables of this research are return on assets, firm's size and level of cash holdings.

1. Firm's size: total assets logarithm

$$Size = \log(TA_{it})$$

NP_{it}: Total assets of firm i in year t

2- Return on assets (ROA): operating profitability is measured by dividing operating revenue by total assets as following:

$$ROA = \frac{NP_{it}}{TA_{it}}$$

NP_{it} : Net profit after tax of firm i in year t

TA_{it}**:** Total assets of firm i in year t

3- **Cash**: cash plus short term investment

Hypotheses development

H_1: there is a relationship between cash flow uncertainty and dividend policy.

H_{1-1}: there is a relationship between cash flow uncertainty and dividend policy according to Chay and Suh model (2009).

H_{1-2}: there is a relationship between cash flow uncertainty and dividend policy according to Brav and Graham model (2005).

H_2: there is a relationship between earned/contributed capital mix and dividend policy.

H_3: there is a relationship between investment opportunities and dividend policy.

H_4: Firm's size affects on the relationship between cash flow uncertainty, earned/contributed capital mix and investment opportunities.

H_5: operating profitability affects on the relationship between cash flow uncertainty, earned/contributed capital mix and investment opportunities.

H_6: Firm`s level of cash holdings affects on the relationship between cash flow uncertainty, earned/contributed capital mix and investment opportunities.

Empirical results

After determination and measurement of independent and dependent variables, research hypotheses are analyzed. First, the relationship between independent and dependent variables is tested and then multiple regression is applied to determine the mathematical relationship between independent and dependent variables. In fact, regression analysis helps to study the liner relationship between variables. Since the normality of dependent variable (dividend policy) leads to the normality of other models, it is necessary to control it before regressing. Null and alternative hypotheses are provided as following:

Kolmogorov-Smirnov test is used to test above hypotheses.

Table 1. Kolmogorov-Smirnov test

model	observation	mean	Standard deviation	most Standard deviation	Absolute value of the most	most positive deviation	most negative deviation	K=S	Sig
Dividend policy	460	0.2149	0.2439	0.085	0.08	-0.038		1.512	0.07

Table 1 show that since significance level for dividend policy is more than 5 percent, however, null hypothesis is accepted.

First hypothesis test

H_1**:** there is a relationship between cash flow uncertainty and dividend policy.

To test our first main hypothesis, we firstly test sub-hypotheses.

First sub-hypothesis test

H_{1-1}: there is a relationship between cash flow uncertainty and dividend policy according to Chay and Suh model (2009).

We represent first sub-hypothesis statistically as following:

$$\begin{cases} H_0 : B = 0 \\ H_1 : B \neq 0 \end{cases}$$

there is not a relationship between cash flow uncertainty and dividend policy.

there is a relationship between cash flow uncertainty and dividend policy.

Table 2. Summary results of first sub-hypothesis in one variable regression (Chay and Suh model)

variables \ statistic	Person coefficient of correlation	R^2	Adjusted R^2	K-S	F-statistic	T-statistic	β	α	sig	Accepted hypothesis
cash flow uncertainty and dividend policy	0.3	0.1	0.10	1.91	38.3	-6.19	-0.374	0.25	0.0	H_1

Looking at Table 2, you will see that adjusted R^2 regarding to the relationship between cash flow uncertainty and dividend policy according to Chay and Suh model (2009) is significant (0.105) which means that 10.5 percent of changes in dividend policy is related to firms cash flow uncertainty. Duebin-Watson (1.915) shows that there is no autocorrelation problem. The linearity of regression model with regard to significance level and T and F-statistic is accepted, however, the relationship between cash flow uncertainty and dividend policy according to Chay and Suh model (2009) is accepted.

Second sub-hypothesis test

H_{1-2}: there is a relationship between cash flow uncertainty and dividend policy according to Brav and Graham model (2005).

The results of sub-hypothesis test are shown in table 3.

Table 3. Summary results of second sub-hypothesis in one variable regression (Brav and Graham model, 2005)

variables \ statistic	Person coefficient of correlation	R^2	Adjusted R^2	K-S	F-statistic	T-statistic	β	α	sig	Accepted hypothesis
cash flow uncertainty and dividend policy	0.292	0.085	0.082	2.015	29.66	-5.44	-0.46	0.282	0.00	H_1

Looking at Table 3, you will see that adjusted R^2 regarding to the relationship between cash flow uncertainty and dividend policy according to Brav and Graham model (2009) is significant (0.082) which means that 8.2 percent of changes in dividend policy is related to firms cash flow uncertainty. Duebin-Watson (2.015) shows that there is no autocorrelation problem. The linearity of regression model with regard to significance level and T and F-statistic is accepted, however, the relationship between cash flow uncertainty and dividend policy according to Brav and Graham model (2009) is accepted. Now, first we analyze 1and 2 sub-hypotheses to infer about the first main hypothesis regarding the relationship between cash flow uncertainty and dividend policy.

Table 4. The results of 1and 2 sub-hypotheses

variables \ statistic	Pearson coefficient of correlation	R^2	Adjusted R^2	K-S	F-statistic	T-statistic	observation	Error level	sig	Accepted hypothesis
cash flow uncertainty and dividend policy Chay and Suh (2009) model	0.328	0.108	0.105	1.915	38.320	-6.190	460	0.05	0.00	H_1
cash flow uncertainty and dividend policy Brav and Graham (2005)	0.292	0.085	0.082	2.015	29.664	-5.446	460	0.05	0.00	H_1

With regard to the results (Pearson coefficient of correlation, R^2 and adjusted R^2) which show that there is a reverse relationship between cash flow uncertainty and dividend policy (both Brav and Graham (2005) and Chay and Suh (2009) model) in TSE, the first hypothesis is accepted.

Second hypothesis test

H_2: there is a relationship between earned/contributed capital mix and dividend policy. The results of the second hypothesis are shown in Table 5.

Table 5. The results of second hypothesis

variables / statistic	Person coefficient of correlation	R^2	Adjusted R^2	K-S	F-statistic	T-statistic	β	α	sig	Accepted hypothesis
Earned/Contributed Capital Mix and dividend policy	0.209	0.044	0.041	2.070	14.566	3.817	0.209	0.193	0.00	H_1

Looking at Table 3, you will see that adjusted R^2 regarding to the relationship between earned/contributed capital mix and dividend policy is significant (0.041) which means that 4.1 percent of changes in dividend policy is related to firms cash flow uncertainty. Duebin-Watson (2.070) shows that there is no autocorrelation problem. The linearity of regression model with regard to significance level and T and F-statistic is accepted, however, the relationship between earned/contributed capital mix and dividend policy is accepted.

Third hypothesis test

H_3: there is a relationship between investment opportunities and dividend policy.

The results of third hypothesis are shown in Table 6.

Table 6. Summary results of third hypothesis in one variable regression

variables / statistic	Person coefficient of correlation	R^2	Adjusted R^2	K-S	F-statistic	T-statistic	observation	β	α	sig	Accepted hypothesis
investment opportunities and dividend policy	0.225	0.065	0.062	2.103	22.079	-4.69	460	-0.22	0.272	0.00	H_1

Looking at Table 6, you will see that adjusted R^2 regarding to the relationship between investment opportunities and dividend policy is significant (0.062) which means that 6.2 percent of changes in dividend policy is related to firms cash flow uncertainty. Durbin-Watson (2.103) shows that there is no autocorrelation problem. The linearity of regression model with regard to significance level and T and F-statistic is accepted, however, the relationship between investment opportunities and dividend policy) is accepted.

Fourth hypothesis test

H_4: Firm's size affects on the relationship between cash-flow uncertainty, earned/contributed capital mix and investment opportunities.

In addition, the relationship between research independent variables and dividend policy is tested by control variable of firm's size separately. Table 7 shows these results

Table 7. Results of research hypotheses by control variable of firm's size separately

profitability	small				average				large			
hypotheses	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig
1st sub-hypothesis	0.27	34.2	-5.8	0.00	0.083	11.0	-3.3	0.00	0.007	0.31	0.56	0.57
2nd sub-hypothesis	0.08	8.99	-3.1	0.00	0.047	6.44	-2.4	0.01	0.115	13.4	-3.6	0.00
2ed hypothesis	0.06	7.46	2.73	0.00	0.096	12.1	3.5	0.00	0.01	0.21	-0.4	0.94
3rd hypothesis	0.00	0.34	-0.5	0.55	0.019	3.10	-1.7	0.08	0.282	38.1	-6.3	0.00

The results of Table 7 indicate that adjusted R² regarding to the relationship between independent variables and dividend policy in different sizes of small, average and large (also accepted hypotheses) is different. However, it is obvious that control variable of firm's size affects on the relationship between dependent and independent variables, so the fourth main hypothesis is accepted.

Fifth hypothesis test
H5: operating profitability affects on the relationship between cash flow uncertainty, earned/contributed capital mix and investment opportunities.
The relationship between research independent variables and dividend policy is tested by control variable of operating profitability. Table 8 shows these results.

Table 8. Results of research hypotheses by control variable of operating profitability separately

profitability	low				average				high			
hypotheses	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig
1st sub-hypothesis	0.12	13.8	-3.7	0.00	0.00	0.08	0.3	0.77	-0.01	0.00	0.05	0.95
2nd sub-hypothesis	0.08	9.09	-3.0	0.00	0.03	6.84	-2.6	0.01	0.08	9.14	-3.0	0.00
2ed hypothesis	0.12	14.3	3.73	0.00	0.00	015	-0.5	0.80	-0.01	0.25	-.0.0	0.61
3rd hypothesis	0.03	4.34	-2.5	0.03	0.13	24.1	-4.7	0.00	-0.06	0.51	-0.7	0.47

The results of Table 8 indicate that adjusted R² regarding to the relationship between independent variables and dividend policy in different level of operating profitability of low, average and high (also accepted hypotheses) is different. However, it is obvious that control variable of operating profitability affects on the relationship between dependent and independent variables, so the fifth main hypothesis is accepted.

Sixth hypothesis test
H6: Firms level of cash holdings affects on the relationship between cash flow uncertainty, earned/contributed capital mix and investment opportunities.
In addition, the relationship between research independent variables and dividend policy is tested by control variable of cash holdings. Table 9 shows these results.

Table 8. Results of research hypotheses by control variable of firms level of cash holdings separately

profitability	low				average				high			
hypotheses	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig	Adjusted R²	F-statistic	T-statistic	sig
1st sub-hypothesis	0.11	12.8	-3.71	0.00	0.048	5.46	-2.3	0.02	0.141	22.5	-4.75	0.00
2nd sub-hypothesis	0.14	17.0	-4.11	0.00	0.082	8.94	-2.9	0.00	0.015	3.02	-1.06	0.08
2ed hypothesis	0.16	20.7	4.53	0.00	0.041	4.79	2.18	0.03	-0.007	0.09	0.02	0.75
3rd hypothesis	0.06	7.66	-2.76	0.00	0.071	7.79	-2.7	0.00	0.033	5.51	-2.34	0.02

The results of Table 9 indicate that adjusted R^2 regarding to the relationship between independent variables and dividend policy in different level of cash holdings of low, average and high (also accepted hypotheses) is different. However, it is obvious that control variable of cash holdings affects on the relationship between dependent and independent variables, so the sixth main hypothesis is accepted.

Conclusion

What we can conclude about testing research hypotheses regarding the relationship between research independent variable and dividend policy in listed firms of TSE during the period of 2006-2010 is that the variables of cash flow uncertainty and investment opportunities have liner and negative relationship and earned/contributed capital mix has liner and positive relationship with dividend policy. It should be mentioned that cash-flow uncertainty according to Chay and Suh model (2009) and dividend policy have the most relationship. This level of correlation indicates that cash-flow uncertainty can be a substitution for dividend policy in order to investors, financial managers and lender's decision making. In addition, the impact of control variables of firm's size, profitability and level of cash holdings on the relationship between dividend policy and cash-flow uncertainty, earned/contributed capital mix and investment opportunities in TSE is accepted. Another issue here is economy globalization and its high trend of development. In this sort of environment, firms have more opportunities for gathering their financial needs from internal and external resources. Therefore, considering the financial resources providers expectations that is value adding for them and the methods which can be help in value adding (dividend policy) is necessary. The results of this study are completely consistent with Chay and Suh research.

Suggestions based on research hypothesis results
 1- With respect to the first hypothesis test; it is suggested that cash-flow uncertainty to be used in addition to other measures of financial performance evaluation.
2- With respect to the first sub-hypotheses test; it is suggested to investors, shareholders and managers to aquatint with cash flow uncertainty models and its calculation procedure and use it in decision makings regarding dividend policy.
3- With respect to the second hypothesis test; it is suggested to the capital market practitioners that use earned/contributed capital mix in addition to other measures of financial performance evaluation.
4- With respect to the third hypothesis test; it is suggested to the capital market practitioners that use investment opportunities in addition to other measures of financial performance evaluation.
5- With respect to the fourth, fifth and sixth hypotheses test; because of the impact of control variables of firm's size, profitability and level of cash holdings on the relationship between dividend policy and cash-flow uncertainty, earned/contributed capital mix and investment opportunities in TSE, it is suggested to the capital market practitioners that use these variables in addition to other measures of financial performance evaluation.

Suggestions for future researches
1- The relationship between cash flow uncertainty and other financial and consolidated ratios in TSE for different industries to be investigated of and compared with the results of the previous models.
2- The relationship between cash flow uncertainty and stock earnings or value added of future years to be investigated.

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