

EVA VERSUS EARNINGS: EVIDENCE FROM IRAN

*Bitu MASHAYEKHI¹, Sayeid Ahmad TALEBI
and Vahideh BAHAVARNIA*

M.A. Marketing, University of Tehran, Iran

ABSTRACT

Today, financial reporting has been criticized for low-quality and lack of relevance in today's information-rich environment. As a result, there is a general consensus that the traditional measures ought to be revised due to these shortcomings. One of the measures, that the companies, investors, academic bodies and accounting policy makers have been showing increasing interest to as a replacement for earnings and cash flows from operation, as proxies for traditional measures is Economic Value Added.

This study provides evidence that we hope might be of use to companies, investors and accounting policy makers who might be interested in Economic Value Added or Residual Income as replacements for earnings and cash flows from operations as the key measures to firm performance. Our findings of relative information content test show no evidence of any superiority of residual income and economic value added over earnings and cash flows from operation. On the contrary, these findings have shown equal relative information content for all measures. Likewise, the findings of the test of incremental information content has shown that the special components of residual income and economic value added provided insignificant incremental information content in comparison to special contents of earnings and cash flows from operation.



Economic value added, Residual income, Earning before extraordinary item, Cash flow from operation, Relative and incremental information content

¹ Corresponding author: Bitu MASHAYEKHI, e-mail address: bitamashayekhi@gmail.com

INTRODUCTION

The concept of separation between proprietors' role and management of a company in modern world economy has resulted in the emergence of contradiction between the interests and the necessity of a transparent reporting system along with a protocol to control the managers according to "Agency theory", accountants have the key role in this regard. Based on this theory, the managers are the proprietors' representative in exploitation of resources with different interests from each other (Hendriksen & Breda, 1993: 207). In fact, acting in behalf of the owners, the managers, as the owner's resources, are to exploit their possessions and to make use of potential investors, capitals in order to enhance the effectiveness of the operation of the company and as a result gain more profits for them. So, since the proprietors are benefited from the outcome of the managers' activities, it is necessary to evaluate the managers' performance in a systematic and constant basis.

The proprietors make use of various criteria to control the managers' performance in order to encourage them to use their resources effectively and as a result increase their own wealth.

There are methods of diverse nature by which the performance and the value of a company can be assessed and determined respectively. In this regard, a recently noted method is Economic Value Added (EVA). This criterion was introduced by Stewart and his company during the last decade of the twentieth century. Stewart believed that the Economic Value Added has to be used instead of the Earnings and Cash from operation criteria to evaluate the performance. He said: "forget the Earnings, Earning per Share. Earning and Earning Growth are misleading criteria for evaluating the performance. The Economic Value Added is the best criterion. Forget the Return on Assets, Returns of Equity and Earning per Share." (Stewart, 1991: 20, 66).

After introducing of the EVA by Stewart, famous companies such as AT&T, CSX and Coca Cola used it to evaluate the performance. Based on the evidences prepared by Wallace, it was suggested to use the EVA instead of the Earnings in motive plans (rewarding) for managers.

The committees to formulate the accounting standards, simultaneously with companies, investigated the Stewart's claim. Therefore, in 1994 the AICPA and Jenkins committee proposed to use the EVA in internal decision making and external reporting to improve the financial reporting. Based on the prediction of the AICPA, In April 1995, in the future of financial managing, the EVA will replace the Earning per Share (Zarowin, 1995: 38).

On that time, Stewart's statement, were acclaimed in academic researches. Researches which were focused on the company's evaluating models based on the book value and expected flow of residual income or abnormal earnings.

In this paper, we tried to gather instrumental evidences for companies, investors and accounting policy makers who are trying to substitute the EVA and Residual Income for earnings and cash flow from operation as key measures of firm performance.

1. BACKGROUND OF THE RESEARCH

Biddle *et al.* (1997) investigated the information content of the EVA and Residual Income in comparison with two conventional criteria of Earning before extraordinary items and cash flow from operation. The study showed that the Earnings, Residual Income, EVA and Cash from Operation have the utmost information content respectively. Besides, the Incremental Information Content Test presented that Cash from Operation and accrual as the special components of the earning have a higher Incremental Information Content than special components of the EVA including the After Tax Interest (AT Int.), Capital Charge(Cap Chg) and Accounting Adjustments (Acc Adj).

Chen and Dodd (1996) studied the relationship between some performance measurement criteria and Stock Returns. They showed that Return on Assets, EVA and Residual Income have the maximal correlation with stock returns respectively and in other hand, Earning per Share and Return in Equity explain a little about the stock returns.

Chen and Dodd (2001) investigated the relationship between the Operating income, Residual Income and Economic value added with Stock Returns and found out that Operatig income has the maximal correlation with Stock Returns.

That study also showed that the Residual Income has Incremental Information Content in comparison with Operating income and showed EVA has Incremental Information Content in comparison with Residual Income and Operating income.

West and Worthington (2004) investigated the Information Content of the EVA, Residual Income, cash from operation and Earning before Extraordinary Items and found out that Earning before Extraordinary Items explains the variation of the Stock Returns better than the other criteria. In that study, Earning before Extraordinary Items and EVA had the maximum and minimum relationship with the Stock Returns respectively.

In Incremental Information Content it was studied that whether EVA enhances the ability to explain the earning, in comparison with Residual Income and cash from

operation or not. Analysis showed that EVA has Incremental Information Content in comparison with Residual Income and cash from operation (West & Worthington, 2004: 238).

Lehn and Makhija studied the relationship between the Performance measurement Criteria and Stock Returns. In their view, the Performance measurement Criteria were EVA, Market Value Added, Rate of the Return on Asset, Return on Equity and return on sales. Analysis showed that the EVA has the maximum relation with the Stock Returns, although this relation has not a considerable difference with the relation of the other parameters with Stock Returns. Lehm and Kakhija study was one of those researches which proved the claim of the Stewart about the superiority of the EVA in comparison with the other criteria.

In another research, Chen and Clinton investigated the relationship between 9 performance measurement criteria and the stock returns. The results show that EVA has not a strong correlation with stock returns. Besides, It is the only criteria that has a opposite relationship with the stock returns (Chen & Clinton, 1998: 38-43).

Noravesh and Mashayekhi (2005) investigated relative and incremental information content of the EVA, Cash value added, accounting earnings and cash from operation with stock returns and found out that the earnings constitutes the strongest relationship with the stock returns. Likewise, earnings has incremental information content in comparison with the other parameters. EVA and cash value added have a meaningful relationship with the stock returns and in some cases have incremental information content in comparison with each other. Cash from operation not only lacks meaningful relationship with stock returns but also doesn't possess any incremental information content in comparison with other studied parameters (Noravesh & Mashayekhi, 2005: 131).

2. RESEARCH QUESTIONS

Below are two questions which are examined in this study:

1. Do EVA and/or RI dominate present mandated performance measures of earnings and operating cash flow, in explaining annual stock returns contemporaneously?
2. Do components unique to EVA and / or RI contemporaneously help to explain stock returns beyond that explained by CFO and earnings?

Research assumptions

In order to answer the above mentioned questions, two assumptions were taken in to consideration the first assumption about the comparative information content was used for answering the first question and the second assumption about the incremental information content was used to answer the second question:

- A - Comparative information content of the X1 and X2 are equal.

X1 and X2 are dual combinations of four independent parameters (Cash from operations, Earning before extraordinary items, Residual income and Economic value added) including six different dual combinations.

B – Component X1 has not incremental information content in comparison with components X1 to X5.

X1 could be any component of the EVA and X2 to X5 are other components of the EVA such as Cash from operation, Accrual, After tax interest, Capital Charge and Accounting adjustments.

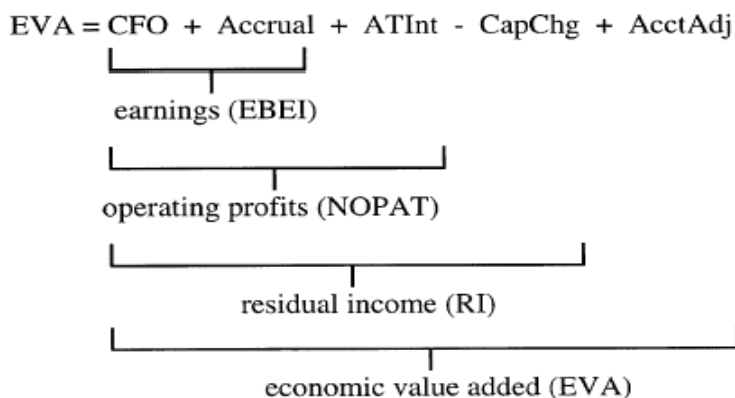
Relative and incremental Information Content

Relative information content comparisons ask which measure has greater information content, and apply when making mutually exclusive choices among alternatives, or when ranking by information content are desired. Incremental comparisons ask whether one accounting measures provides information content beyond that provided by another, and apply when one measure is viewed as given and as assessment is desired regarding the incremental contribution of another.

Variables and their Measuring Methods

In this research dependent variable is unexpected stock returns and independent variables are used to study the Relative Information Content which consists of: cash from operation, earning before extraordinary items, residual income and economic value added. Also, independent variables for the purpose of incremental information content test consist of: cash from operation, accruals, after tax interest, capital charge and accounting adjustments. Briefly the relation between the independent variables and their measurement is illustrated as follows:

(CFO) Cash from operation, Accruals, (EBEI) earning before extraordinary items, (AT Int) After tax Interest, (Cap Chg) Capital Charge, (RI) Residual income, (Acc Adj) Accounting Adjustments, (EVA) Economic value added.



Cash from Operation

Net cash provide from the operating activities. Which is obtained from the statement of cash flow or the statement of changes in financial position.

Accruals

They can be introduced as the means for transferring cash to the future time which in this research is calculated according to the following formula:

$$\text{Accruals} = \text{EBEI} - \text{CFO}$$

Earning before extraordinary items

EBEI is the earnings after deducting the tax and before deducation of the extraordinary Items which is drawn as it follows:

$$\text{EBEI} = \text{Accruals} + \text{CFO}$$

After tax interest

AT Int is the after tax equivalent of book interest expense that is calculated accordingly:

$$\text{AT Int} = \text{Interest Charge} (\text{tax rate } (T)-1)$$

Capital Charge

Capital charge defined as the firms wheighted average cost of debt and equity capital times its beginning of year capital. Both of these items are obtained from the financial statement.

Residual income

Residual income equals earnings plus after tax interest expense less a charge on all capital, which is calculated according to the following formula:

$$\text{RI} = \text{Net Operating Profit After Tax} - \text{Capital Charge}$$

Accounting Adjustments

To eliminate the differences between accounting profit and economic profit the RI is adjusted on the basis of capital equivalents. Accounting adjustments reflect Stern stewarts net annual adjustments to earnings and capital, and are defined as economic value added less residual income ($\text{Acc Adj} = \text{EVA} - \text{RI}$).This study has used the following items as accounting adjustments: advertisement cost, marketing cost, training cost, research and development cost,operating leases, allowance for bad and doubtful debts, allowance for stock devaluation, allowance for inventory obsolescence, employee pension costs and deferred tax reserve.

Economic Value Added

EVA is drawn by the differences between capital return and capital charge considering the related accounting adjustments.

$$\text{EVA} = \text{Residual income} + \text{Accounting adjustments}$$

Market Adjusted Return (Mk Adj Ret)

Market adjusted return computed as a firms 12 month compounded stock return less the 12 month compounded value-weighted market-wide return. A 12 month nonoverlapping period ending three months following the firms fiscal year-end is chosen to allow time for information contained in the firms annual report to be impounded in stock market prices.

3. STATISTICAL METHOD

In the analysis of the relative and incremental information content usually one or more variable mentioned above or some of financial ratios that use these variables, are employed in economic appraisal models.

A standard approach for assessing information content is to examine the statistical significance of the slope coefficient, b_1 , in the following ordinary least squares regression:

$$D_t = b_0 + b_1 FE_{Xt} / P_{t-1} + e_t \tag{1}$$

Where, D_t is the dependent variable, a measure of (abnormal or unexpected) returns for time period t ; FE_{Xt} / P_{t-1} is unexpected realization (or forecast error) for a given accounting measure, X (e.g., CFO, EBEI, RI, EVA), scaled by the beginning of period market value of firms equity, P_{t-1} , and e_t is a random disturbance term.

In this study, we use an approach (an equation) from Biddle and Seow (1991) that estimates market expectations jointly with slope coefficients, which is illustrated as follow:

$$D_t = B_0 + B_1 X_t / P_{t-1} + B_2 X_{t-1} / P_{t-1} + e_t \tag{2}$$

Testing Methods for incremental Information Content

In the standard method it is measured by the statistical significance of slop coefficients regression according to the following equation:

Specifically, the incremental information content of two accounting variables X , Y (with time delay – one lag), for special coefficient is tested by the T test, and for null hypothesis it is tested by the F test.

Where b_1, b_2, b_3, b_4 are from equation 2:

Also in order to control the potential effects of the heteroskedasticity; the Whites (1980) Correction is employed.

Statistical Sample, and research Period

The statistical community in this study includes all the companies admitted to the Tehran Stock market during 1999-2003. The sample society is chosen by multi level sampling; accordingly companies with the following characters this (conditions) are selected:

- 1) Until the End of the year 1998 the company must had been admitted to the Tehran Stock Exchange.
- 2) The company's financial year must end at the end of year.
- 3) The company should not be one of the financial (investment) institutions.
- 4) There should not had been any unusual halt to the exchange of companys stocks during 1999-2003.
- 5) Company's financial statements for the mentioned period time must be available.
- 6) The per share cash dividend information of the company for the period 1993 to 2003 must be available.

Implying the mentioned requirements (conditions); 48 companies out of one hundred and ninety – eight companies admitted to Tehran Stock Market at the end of the year 1998, were selected as the research sample.

Descriptive Statistics

The descriptive statistics of the dependent variable and independent variables that are employed to test the Relative Information Content and incremental Information Content are depicted in the tables 1 and 2.

Descriptive statistics of the Variables of the Relative Information Content

To reduce the heteroskedasticity in the data, all the independent variables are divided in to the market value of the equity during 3 months after beginning of the fiscal year. As it is observed in the table 1 among all the independent variables the residual income shows the least (minimum) deviation, and it is the cash from the operation that shows the most (maximum) deviation from standard. Besides, the maximum average belongs to the economic value added, and the negative Average is related to the cash from operation.

Table 1. Descriptive statistics of relative information content variables

Descriptive statistics	Dependent variable	Independent variables			
	Adj Ret _t M	CFO _t	EBEI _t	RI _t	EVA _t
Mean	-3.96	-1.05	.29	.19	.50
Std.Dev	60.84	9.99	.64	.46	.91
Minimum	-123.80	-136.13	-.90	-.81	-.64
Maximum	240.20	2.59	5.37	3.37	8.55

Descriptive statistics	Dependent variable	Independent variables			
	Adj Ret _t M _t	CFO _t	EBEI _t	RI _t	EVA _t
Correlations					
Mkt Adj Ret _t	1.00				
CFO _t	.001(.980)	1.00			
EBEI _t	.186(.009)	-.442(.000)	1.00		
RI _t	.219(.002)	-.420(.000)	.951(.000)	1.00	
EVA _t	.151(.036)	-.197(.005)	.307(.000)	.324(.000)	1.00

*All independent variables are deflated by the market value of the equity three month after the beginning of fiscal year.

Table 2. Descriptive statistics of incremental information content variables

Descriptive statistics	Dependent	Independent variables				
	Mkt Adj Ret _t	CFO _t	Accrual _t	AT Int _t	Cap Chg _t	Acc Adj _t
Mean	-3.96	-1.05	1.34	.08	.18	.30
Std.Dev	60.84	9.99	10.29	.14	.28	.88
Minimum	-123.80	-136.13	-1.94	00.	-.05	-1.54
Maximum	240.20	2.59	140.61	.75	2.17	9.36
Correlations						
Mkt Adj Ret _t	1.00					
CFO _t	.001(.980)	1.00				
Accrual _t	.010(.890)	.998(.000)	1.00			
AT Int _t	-.057(.432)	-.034(.634)	.032(.651)	1.00		
Cap Chg _t	.038(.596)	-.341(.000)	.376(.000)	.468(.000)	1.00	
Acc Adj _t	.041(.568)	.015(.830)	-.026(.715)	.386(.000)	.095(.187)	1.00

*All independent variables are deflated by the market value of the equity three month after the beginning of fiscal year.

According to the results produced by the Pearson Ranking (ordinal) Correlation and in the level of 5% error, the relation between all the 2 tails combinations (configurations) of relevant independent variables, and the relevance of the cash from operation with the three other variables has a negative relation. Also among all independent variables, residual income shows more correlation with independent variable and cash from operation has no relevant relation.

Descriptive Statistics of incremental information content Variables

As indicated by table 2, after tax interest has the minimal standard deviation and accruals have the maximum standard deviation among independent variables. More over, the only negative mean and the least mean are those of cash from operations and the highest mean is that accruals.

According to the results from Pearson's rank correlation at a 5% level of error, capital charge among the independent variables has the best correlation with the other independent variables and the only item with which it has no significant relation is accounting adjustments. More over, the worst relation is that of accounting adjustments as it has a significant relation only with after tax interest and the highest correlation concerns the cash from operations and accruals. Furthermore, none of the independent variables has a significant relation with the dependent variable of abnormal return.

Test results of relative Information content

As observed in table 3, relative information content has been assessed according to the adjusted R-squares of four distinct regressions for any of the variables of cash from operations, earning before extraordinary items, residual income and economic value added. The variables have been indicated on a left-right order respectively in terms of the highest adjusted R-squares. Considering that all P-Value are greater than the acceptable 5% error, there is no difference from pair compositions of independent variables among the adjusted R-squares. Therefore, one may assert at a confidence level of 95% that there is no significant difference among the information contents of the independent variables of cash from operations, earning before extraordinary items, residual income, and economic value added, and that the 4 variables have the same information content and hence the first assumption of the study is supported and confirmed.

Table 3. Relative information content

Rank orde of R ²	(1)		(2)		(3)		(4)
	RI	>	EBEI	>	EVA	>	CFO
Adj.R ²	.042		.039		.017		-.001
P-Value ¹		(.722)		(.627)		(.556)	
			(.615)		(.348)		
				(.338)			

**All independent variables are deflated by the market value of the equity three month after the biginning of fiscal year.*

** P-values in parentheses represent non-directional F tests of the null hypothesis of no incremental information content.*

Table 4.

	Constant	CFO _t	CFO _{t-1}	Accrual _t	Accrual _{t-1}	AT Int _t	AT Int _{t-1}	Cap Chg _t	Cap Chg _{t-1}	Acc Adj _t	Acc Adj _{t-1}	Adj.R ²
		+	-	+	-	-	+	-	+	+	-	
All firms	-11.91	63.68	3.63	62.50	1.28	-30.01	62.30	-9.14	-56.88	11.83	-8.94	.1243
t-stat	-2.12	4.61	.21	4.57	.07	-.48	.76	-.20	-.90	2.21	-1.64	
P-Value	(.035)	(.000)	(.000)	(.628)	(.845)	(.028)	(.835)	(.940)	(.447)	(.367)	(.102)	(.000)
F-stat		12.50		12.23		.30		1.28		3.385		
p-value		(.000)		(.000)		(.550)		(.355)		(.041)		

* All independent variables are deflated by the market value of the equity three month after the beginning of fiscal year.

* P-values in parentheses represent non-directional F tests of the null hypothesis of no incremental information content

Test results of incremental information content

Initially, we expected a positive relation between abnormal stock return and the three components namely cash from operations, accruals and accounting adjustments. Moreover, a negative relation between abnormal return and the two components namely after tax interest and capital charge was expected. As for the variable introduced to the model with a one lag (X_{t-1}) there was the expectation that it should have a sign opposite to that of X_t .

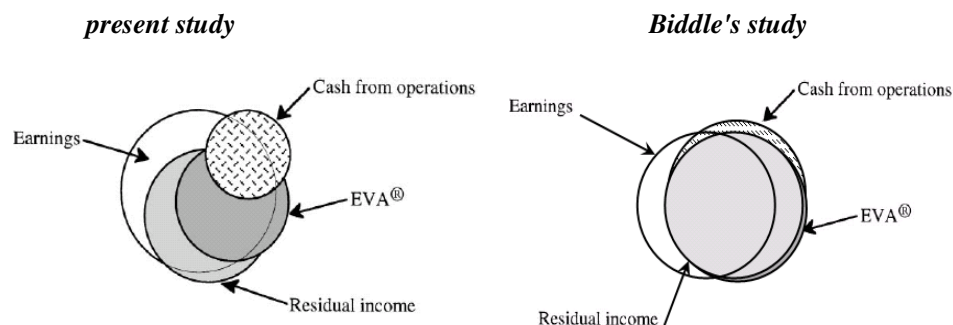
As observed in table 4, only 7 out of 10 coefficients are those with a conformity prediction for a perfect model in terms of sign and there is a contradiction with prediction sign for the cash from operations, accruals and capital charge brought forward (X_{t-1}). Moreover, the only items inconformity with prediction in terms of sign and at the same time being significant at a 5% level within the frameworks of t one-tailed test are the cash from operation, accrual and accounting adjustments have, according to F statistic, increasing informational content compared to the other components of economic value added. Further more, the incremental information content of after tax interest has not been confirmed after deduction of capital charge. Therefore, the second hypothesis of the study in respect of components of interest costs is confirmed after deduction of capital charge and tax saving. However, it is not confirmed for cash from operation, accrual and accounting adjustments.

4. A SUMMARY OF RESEARCH RESULTS

A survey of test results in comparison with those of Biddle's study (1997)

A similar study was carried out by Biddle, Bowen and Wallas on 773 American companies of New York stock market in 1997. According to the results from such a study, the earnings before extraordinary items 12,78%, residual income 7,32%, economic value added 6,49% and cash from operations 2,80% had greatest relative information content (according to statistical significance of pair wise composites of adjusted R-squares) and incremental information contents of all five components of economic value added were confirmed. In contrast, residual income 4,2%, earnings before extraordinary items 3,9%, economic value added 1/3% and cash from operations 0.01% had the highest adjusted R-square respectively. However, a uniform information content in all the 4 variables was confirmed, considering statistical insignificance of the difference among the aforesaid variables. Incremental information contents were rejected in respect of the two components after tax interest and capital charge. In contrast, incremental information content was confirmed for cash from operations, accruals and accounting adjustments. Research findings in respect of relative and incremental information contents of the variables "cash from operations", "earning before extraordinary items", "residual income" and "economic value added" have been compared to the results from Biddle's study using Venn diagram. The size of each circle is indicative of relative information content and the areas not covered by other circles are indicative of

incremental information content. As observed, in Biddle's study earning before extraordinary items, residual income, economic value added and cash from operations have the highest relative information contents in the order they have appeared here. In contrast, relative information contents of all (4) variables are the same in our study.



In Biddle's study, incremental information contents of the 4 variables have been confirmed. Such a content is greater in respect of earning before extraordinary items compared with residual income and economic value added which are small. In contrast, residual income is lacking incremental information content compared to other variables and the incremental information content of cash from operations" and "earning before extraordinary items" is greater than incremental information content of economic value added. In other words, the results from this study and those from Biddle's study are the same in respect of incremental information content.

Probable reasons for unconformity may be:

- 1- Difference in statistical universe
- 2- Difference in sample size (the sample in this study consists of 48 companies while Biddle's study consists of 773 companies)
- 3- Difference in time period of research (the time length of our study was a 5 year period while that of Biddle's study was 10 years)
- 4- Difference in familiarity of market with economic value added and its components.

Two – yearly return as dependent variables

In order to evaluate the sensitivity of the initial results reported above, time clearance of the return has been changed into a two-year period from one year in this part. It is because two-yearly data is less sensitive to the selected estimation models. To this order, the following regression model (5) was used for testing relative information content:

$$\text{2-year sums ; Mkt Adj Ret}_t = b_0 + b_1 \sum X_t / P_{t-2} + b_2 \sum X_{t-2} / P_{t-2} + e_t$$

As observed in table 5, EVA 28/5%, EBEI 21%, RI 17/9% and CFO – 0/029 have respectively the highest and lowest adjusted R- square. However, considering the results from parent statistics, there is no difference between the two compositions from variables EVA, EBEI and RI and there is a significant acceptable error at the acceptable level of 5% for the two compositions of CFO with there other variables. In other words, CFO information content is smaller than those of all three other variables. The three variables EBEI, RI and EVA have the same information contents. Furthermore, as indicated by the results from testing of incremental information content, cap chg, has no incremental information content and At Int and Acc Adj has a very small information content towards Special components of earning. Therefore, the test results obtained by using two-yearly return are in conformity with a one-yearly time.

Table 5. Two yearly return

Rank orde of R ²	(1)		(2)		(3)		(4)
	RI	>	EBEI	>	EVA	>	CFO
Adj.R ²	17.9		21		28.5		-.029
P-Value ¹		(.531)		(.424)		(.000)	
			(.375)		(.000)		
				(.000)			

**All independent variables are deflated by the market value of the equity three month after the biginning of fiscal year.*

Suggestions

Findings and suggestions have been provided in two parts here considering the research literature.

Administrative suggestion

Economic value added is indicative of financial performance with a new approach providing managers and staff with attitudes like those of shareholders and owners of companies in a way that they don't consider equities of shareholders as a free and inexpensive source of cash. Considering the limitation of capital and lack of managers attention towards capital costs in their decision making process, models based on economic value added are suggested for determinaton of the bonuses to be paid to managers.

Future Research Suggestions

- 1- Comparative study of information content of cash from operations according to Iranian Accounting standards and international accounting standards.
- 2- The present research to be repeated within a greater time intervals.
- 3- A survey of information contents of value added in cash

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