

## The impact of net value added on predicting the earnings and operating cash flow: An empirical study based on Tehran Stock Exchange

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### ABSTRACT

Information content of earnings and its components and other issues except the earnings such as the operating cash flow (OCF) have been tested widely in the accounting and finance literature. Since they have had an essential role in most cases including financial reporting, contracts and evaluation models, specifying the items and financial variables that have had a significant relationship with these two variables are expected to be of utmost importance. One example of these variables and indicators is the value added. Although this variable has an economic concept, reporting of value added to the beneficiaries of business entity as the value-added statement has been observed in the field of accounting theories for many years. The main objective of this study was to investigate the effect of net value added (NVA) as the basic result of value-added statement in predicting the accounting earnings and operating cash flow. For this purpose, the relationship of changes in net value added with the changes in accounting earnings and operating cash flow of listed companies in Tehran Stock Exchange from 2007 to 2011 was tested. Firstly the Single variable cross-sectional regression was analyzed and then the panel data analysis with the PLS technique was used to do a pooled analysis. The results of testing research hypothesis imply the significant relationship between changes in net value added and accounting earnings in the listed companies as cross-sectional and pooled forms. The results showed no significant relationship between changes in net value added and operating cash flow in the listed companies neither in cross-sectional nor pooled form.

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## 1. Introduction

Accounting practices have been under significant changes over the centuries and they have evolved from the relatively simple record in the past to sophisticated accounting systems. However, during this transition, the primary objective of accounts has been to provide the required unchanged information. External users of financial information meet their necessary information in the context of the financial statements and its supplementary notes. External financial reporting has always tried to create some

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methods to meet users' demands (Ghorbani, 2004). To meet these demands, and to achieve the accounting financial reporting objectives, some financial information must be provided about position and performance of the business entity. It also needs the preparation and presentation of different financial statements. The main results of financial statements are the accounting earnings and operating cash flow, which play essential roles on financial reporting and various evaluations. For this reason, researchers are always looking for items to be able to predict these variables. Today, on the other hand, in some developed countries, the value-added statement is prepared which provide valuable required information (Ahmadi, 2006). In fact this statement provides valuable information as accrual or cash value added for the users of financial information. These items were considered because of their values created for the firm. In fact, they are the accounting approach of value added and are different from the financial management approach namely the economic value added (EVA). This paper investigates the effect of value added as a new item in predicting the accounting earnings and operating cash flow which is the primary information of basic financial statements. In this paper, we describe the theoretical background of the subject and provide the hypotheses, methods and research models and finally present the conclusions and recommendations.

## 2. Literature Review

The concept of value added rooted in macroeconomics where the value added is applied in many developed countries to measure the national wealth or gross domestic product (GDP). It represents the share of enterprises from GDP and also represents the firm's ability to increase production of goods and services (ForghanDoost & BaniMahd, 2002). Vernon Cum in his Accounting Theory book introduced the value added as a performance criterion. This criterion measures the value or wealth created by the firm in a given period. In other words, this criterion measures the performance of different agents that collaborate with the organization. Factors such as employees, providers of capital (shareholders and creditors) and the government are working together to make extra wealth (Ghorbani, 2004).

As the result of how to create value in a company, the concept of value added was introduced as the value-added statement in terms of a new financial reporting. It represents the wealth created by the efforts of a group contributed to the business entity. In other words, the value added represents the sum of output from the institutional investors, creditors, employees and the government. A part of this wealth or created value will be distributed among them in the form of dividends, interest, salaries and wages and taxation. The remaining portion will be used as the reserves for the reinvestment in the business entity (Riahi-Belkaoui, 1993). American accounting association (AAA) in 1992 and International Accounting Standard Boards (IASB) in 1997 suggested that the value-added statement and other financial reports should be presented by the companies. It should be noted that there is no generally accepted principles for the value-added statement.

Using the definition of value added, the value-added statement can be expressed in terms of the following equation.

$$1) \text{ SR} - \text{M} = \text{S} + \text{I} + \text{D} + \text{T} + \text{DP} + \text{R} \quad (\text{Gross Value Added})$$

$$2) \text{ SR} - \text{M} - \text{DP} = \text{S} + \text{I} + \text{D} + \text{T} + \text{RE} \quad (\text{Net Value Added})$$

SR= sales revenue

D= dividends

M= materials and services Bought-in

T= taxation

S= salaries and wages

DP= depreciation

I= interest

RE= retained earnings

As can be seen, when calculating the value added and in relationship into the depreciation expense, two methods are considered to provide the added value statement:

**First method:** To consider the depreciation on the right side of the equation, which would lead to gross value added (GVA).

**Second method:** To consider the depreciation along with the goods and services from the outside the business entity and deduct the amount of sales, which would result in net value added (NVA). In fact, wealth is shown in a better way in this method because its value added is actually distributed among those who have contributed to its creation (Riahi-Belkaoui, 1999).

Based on the described issues about how to provide the value-added statement, it can be seen that this financial statement has two parts of the added side and the subtractive side. The added value can be obtained separately by determining the items in each part. In the subtractive side that is called the wealth creation, although the calculation of value added is simple from the theoretical perspective, its calculation is difficult in practice. Problems that we encounter with in the calculation of value added result from the treatment with some items which different natures in different conditions and implementing them requires a conscious judgment (ForghanDoost & BaniMahd, 2002). On the other hand, the added side is called the wealth distribution. The aforementioned value added is described as gross, but it can become a net value added by removing the depreciation expense from the right side of the equation. As previously mentioned, in this method the value added is distributed among those who have been involved in its creation. Accordingly, the net value added was used in this study.

Note that in the section of salary, wages and fringe benefit (labor costs) we need to explore different parts of the financial statements, including direct labor, factory overhead, selling expenses, general and administrative items associated with employees (including insurance, bonuses, etc.). According to the material presented, providing the value-added statement will be possible (Khaki, 1997).

In recent years due to the undermined value added items derived from accrual accounting, cash value added (CVA) arose, which indicates the cash wealth created during a fiscal period. In fact the cash value added is the remaining of cash returns created using the productive capacity of a company such as labor and capital. In other words, the cash value added is the value added with removed non-cash items. To calculate the cash value added, the following two methods are used:

$$CVA = CSR + IR - MP \quad (\text{Subtractive method})$$

In the subtractive method, CVA is the cash value added, CSR is the cash sales of products or services, IR is the cash income from investments (cash interest), and MP is the payments for purchase of materials and services from outside the company. To calculate the cash value added of this method, the aforementioned items must become cash like the required items in the case of cash flow statement. The added method is as follows:

$$CVA = SP + IP + DP + TP + OCF \quad (\text{Added method})$$

SP = Salaries paid to employees

IP = Interest paid to lenders

DP = Dividends paid to shareholders

TP = Taxes paid to the government

OCF = Operating Cash Flow

As can be seen, all the above items are the same items that were used under the accounting concepts to calculate the value added. However, these items are generally transformed to cash. It should be noted that in this study, due to the researches in this field to calculate the value added, the net value added based on the accrual assumption in the added side is used and cash value added just was introduced.

### 3. Previous Research

Over the past few decades, many studies were conducted on the value-added statement and its calculated value added. These studies have examined different aspects of value added.

Riahi-Belkaoui (1993) examined the relative and incremental information content of value added, earnings and operating cash flow in the United States. In this study, the hypothesis that the value added has more relative information than earnings and operating cash flow was approved. Hoong et al. (1994) analyzed the correlation between gross value added (GVA) and profitability of some firms in Singapore (excluding financial institutions), as well as the impact of companies' size on this correlation. The results showed that over the period 1991-1986, the value added had a close correlation with the optimal performance. But when the companies incur net losses, the value added had a stronger correlation with the changes in the net profit. When there was a net loss, the correlation is very low, which also seems that the bigness of company is an effective factor on this correlation. Riahi-Belkaoui and Picur (1994) studied the explanatory power of the market returns based on the two variables of accounting earnings and value added. The results indicated that the relative changes of net value added and the relative changes of earnings had incremental content of the information to each other.

Riahi-Belkaoui and Picur (1994) in another study investigated the net value added as an explanatory variable for stock returns and reported that the relative information content of value added was more than the accounting earnings. Also the accounting earnings and the value added had incremental information content on each other. In other words, the relative changes of net value added and the relative changes of earnings provided information for the market that cannot be provided by another. They also showed that the coefficient of value added was significantly lower than the coefficient of changes in earnings and operating cash flow. Also the long-term continuity in the figures of value added was much more than the earnings items and operating cash flow. Riahi-Belkaoui (1996) in another study compared the relationship between stock returns and earnings with stock returns and value added. The results indicated that the relative information content of the net value added was more than the relative information content of earnings, especially when the non-linear models are used.

Bao and Bao (1996) examined the time series behaviors of value added and the predictability of value added data. The results indicated that the random walk process was the best procedure to measure the value added. Researchers believe that the findings of this study are consistent with the results of research conducted to identify the behaviors of accounting earnings and stock prices. Van Staden (2004) investigated the incentives of managers in providing the value-added statement and the various aspects of value-added statement in South Africa as an emerging economy. Based on the received questionnaires, the managers of companies considered these financial firms useful from the perspective of employees. While trade unions in the country did not consider the value added appropriate and reliable due to the government regulation.

Malgwi and Purdy (2009) studied the understanding of companies' managers about the usefulness of value-added statement in Nigeria. They investigated the managers' views through questionnaire and interview with managers and also grouping them to the two groups of Providers and those that do not present the financial statement. The providers group did not consider it useful from the employee's perspective but considered it useful to measure the efficiency and its complementarities for key performance indicators. In contrast, the other group questioned the usefulness of the indicators.

Aruwa (2009) examined the importance of providing the value-added statement and the wealth distribution part in Nigeria. For this purpose, the views of shareholders and users of these financial statements were questioned using the financial ratios of value added and questionnaires. According to the results, shareholders considered the information of value-added statement reliable and effective to evaluate the performance and their level of using information was known as low. Neves junior et al. (2009) studied the correlation between liquidity of company and distribution of value added in textile companies of Brazil. For this purpose, they tested the relationship between operating cash flow and debt

coverage measures with the value added from the wealth distribution part of the value-added statement. The results indicated no significant relationship between these factors. In addition, in Iran, Shahriari (2002) in a study analyzed the information content of value added in contrast with the earnings and operating cash flow. The result of statistical tests suggested that the value added had information value for decision making by users. It also had more relative information content compared with the earnings and operating cash flow.

Mashayekhi (2004) examined the incremental information content of NVA and CVA against the accounting earnings and operating cash flow. To do this, the relationship between stock returns and changes in the net value added, cash value added, accounting earnings and operating cash flow were tested for companies listed in the Tehran Stock Exchange. The results of testing hypotheses showed that the accounting earnings had incremental information content relative to other variables. NVA and CVA could enter potentially into the decision making models of the market. However operating cash flow was not significantly correlated with stock returns and had not incremental information relative to other variables. Noravesh and Mashayekhi (2004) examined the profitability of value added in predicting the accounting earnings of companies listed in Tehran Stock Exchange. Thus the relationship of changes in accounting earnings and data associated with the net value added and cash value added was tested. The results showed the significant relationship between the changes of accounting earnings and net value added and the lack of significant relationship between the changes of accounting earnings and cash value added in all the listed companies.

Ahmadi (2006) examined the incremental information of value-added statement for investment decisions of users coupled with the profit and loss statement. In this study, a questionnaire containing financial information of five companies listed in the Stock Exchange was developed. The population was studied as two groups of witness (questionnaire recipients such as profit and loss statement) and control (questionnaire recipients such as profit and loss statement and value-added statement) were studied. The results show that there is no evidence on the incremental information in statement and figures related to the value added.

#### **4. Research hypotheses**

Based on preliminary studies, literature review and the background of previous researches and to achieve the purposes of this study, the two following hypotheses are developed and tested. Its results will be separately analyzed and interpreted.

**H<sub>1</sub>:** There is a significant relationship between the changes of net value added and the changes of accounting earnings of the companies.

**H<sub>2</sub>:** There is a significant relationship between the changes of net value added and the changes of operating cash flow of the companies.

#### **5. Methodology**

This research is of experimental type and based on real information about financial statements of the companies. In this research, Panel Data Analysis method with cross-section–time series information has been used to test hypotheses and estimate the coefficients. The required data was extracted from the context of the financial statements and supplementary notes by visiting the [www.rdis.ir](http://www.rdis.ir). Information related to each variable for each year is calculated through the definition of the relevant formula as in Excel spread sheet. In order to analyze the results, the data were entered into SPSS and EViews.

The study period covers the years from 2007 to 2011 and statistical population includes all accepted companies in Tehran Stock Exchange. In this study, all the companies in the population which have had the following conditions were selected as the member companies of population:

A. Because the changes in variables are evaluated each year, thus the information at the beginning of the year through which the financial statements of the previous year can be obtained is needed.

Accordingly; the company must have been accepted in the stock and active from 2006 to the end of 2011.

- B. Financial year must be ended to 20 March (in Iran) and according to the A part, the company should have not changed the financial year between the years of 2006 and 2011. This issue increases the comparability.
- C. The company's financial statements including the supplementary notes must be accessible.
- D. The study of companies with investment structures and holding companies and all the companies with such a structure in other industries must be avoided due to the difference in classification of financial statements and their specific nature.

From 239 eligible companies, 87 companies were considered as the studied companies using the Cochran formula. They were selected through a group sampling among the 7 Industry Groups in Tehran Stock Exchange based on the weight ratio of each industry and the simple random within these groups. This is well illustrated in Table 1.

**Table 1**  
Frequency distribution of the studied Companies

Industry Groups	%	Num.
Basic metals	6.25	6
Motor vehicles, Trailers and Semi-Trailers	10	9
Machinery, Electrical equipment and devices	10	10
Non-metallic minerals products	13.75	12
Food products and Beverages	13.75	11
Chemicals and By-Products	17.5	15
Others	28.75	24
Total	100	87

## 6. Hypotheses Testing

In regression analysis, the researcher tries to indicate a variable according to the constant values of the variable or the other variables. To test the hypotheses of this study, the following regression models are used:

$$\text{(H1 model)} \quad \Delta E_{it} / E_{it-1} = \beta_0 + \beta_1 [ \Delta NVA_{it} / NVA_{it-1} ] + \varepsilon_{it}$$

$$\text{(H2 model)} \quad \Delta OCF_{it} / OCF_{it-1} = \beta_0 + \beta_1 [ \Delta NVA_{it} / NVA_{it-1} ] + \varepsilon_{it}$$

Here,  $\Delta E_{it} / E_{it-1}$  is the change ratio of accounting earnings in the company  $i$  in the year  $t$ ,  $\Delta NVA_{it} / NVA_{it-1}$  is the change ratio of net value added in the company  $i$  in the year  $t$ , and  $\Delta OCF_{it} / OCF_{it-1}$  is the change ratio of operating cash flow in the company  $i$  in the year  $t$ . To obtain variables at the beginning of each year the information of the previous year is needed ( $t - 1$ ). Accounting earning (E) which is the earnings before tax in this study, is extracted from the loss and profit statement and also operating cash flow (CFO) is extracted from the cash flow statement. The net value added (NVA) is also used as the representative of value-added statement. According to the models, if  $\beta_1$  is at a reasonable significance level which is 95 % in this study, there is a significant relationship between the variables of each hypothesis. Then a significant test of model coefficients can be carried out.

To evaluate the significance of the relationship between the study variables, the descriptive statistics is used to represent the statistical distribution of these variables. Then the best relationship (if any relationship) between the independent and dependent variables is estimated through the analysis of Panel data. Panel data analysis, as previously mentioned, is used to estimate parameters according to the data collection (year and company). Regression Presuppositions such as the normal distribution of variables and the lack of Autocorrelation are controlled using suitable test.

## 7. Descriptive Statistics

Table 2 contains descriptive statistics of the studied data. Since the Skewness and Kurtosis of the normal distribution is zero, thus the closeness of these parameters to zero values indicates that the variable is normally distributed.

**Table 2**  
Descriptive statistics

Variable	Mean	Kurtosis	Skewness	Std. Deviation
$\Delta E_{it} / E_{it-1}$	0.341008	1.461	1.320	0.301
$\Delta CFO_{it} / CFO_{it-1}$	-0.854903	0.889	-0.101	0.501
$\Delta NVA_{it} / NVA_{it-1}$	0.220151	1.311	0.879	0.319

## 8. The Results of Hypotheses Testing

Firstly the Kolmogorov–Smirnov test was used to evaluate the normality of the variables. The results indicated that the variables data follow a normal distribution at the 5% significance level. To test the hypotheses in this study, regression analysis at the 95% confidence level was carried out for cross-sectional data. The statistical results are shown in Table 3 and Table 4

**Table 3**  
Results of the first hypothesis (H1) significance tests per year

Year	F-statistic	Prob(F-statistic)	R <sup>2</sup>
2007	20.131	0.000	0.231
2008	115.431	0.000	0.499
2009	23.109	0.000	0.221
2010	22.112	0.000	0.237
2011	161.232	0.000	0.715

The significance level for all years is less than 0.05. Thus it can be said that there was a significant relationship between the changes of net value added and the changes of accounting earnings at the 95% confidence level in all the years.

**Table 4**  
Results of the second hypothesis (H2) significance tests per year

Year	F-statistic	Prob(F-statistic)	R <sup>2</sup>
2007	2.672	0.087	0.031
2008	1.779	0.175	0.020
2009	0.823	0.414	0.018
2010	0.051	0.901	0.003
2011	0.453	0.476	0.005

The significance level for all years is more than 0.05. Thus it can be said that there was no significant relationship between the changes of net value added and the changes of operating cash flow at the 95% confidence level in all the years. To confirm the aforementioned results, the coefficients are also very close to zero in most years.

Then according to the results of year to year, Panel Data Analysis is used to evaluate the general model. This method is used due to the nature of data because, in general, the data are collected as the Cross Section-Time Series. The purpose is to estimate the parameters of  $\beta_1$ ,  $\beta_0$  in our models using the Pooled least Square technique (PLS). Finally, the results of the model test for the first hypothesis can be seen in Table 5.

**Table 5**

Results of the panel analysis to test the first hypothesis (H1) model

Variable	Coefficient	t-Statistic	Prob(t-statistic)
Constant value ( $\beta_0$ )	-0.0377	-0.6623	0.5599
$\Delta NVA_{it} / NVA_{it-1}(\beta_1)$	1.8676	6.1123	0.0000
R <sup>2</sup>	0.3722	Durbin-Watson Statistic	2.0012
F-statistic	177.8934	Prob(F-statistic)	0.0000

Significance level or probability value (p-value) of F is equal to 0/000. Because this amount is less than 0.05, so we can say that there was a significant model at the 95% confidence level. Durbin-Watson test examines whether the residuals from a linear regression or multiple regressions are independent or not. The values close to 2 indicate no autocorrelation. Durbin –Watson statistic value in this test is 2.0012, which shows the absence of autocorrelation. Then, for a meaningful analysis of the model coefficients the t-statistic significance levels should be considered. Since the t-statistic significance level for  $\beta_0$ (Constant values of the model) is 0.5599, which is more than 0.05. Thus, the coefficient is not significant for the model. But the t-statistic significance level for  $\beta_1$ (Changes in net value added) is 0.0000 and it is less than 0.05. Thus, the coefficient for the model was significant and is equal to 1.8676. Accordingly, the first hypothesis (H<sub>1</sub>) model can be estimated as follows:

$$\Delta E_{it} / E_{it-1} = 1/8676 \Delta NVA_{it} / NVA_{it-1}$$

The results of the second hypothesis (H<sub>2</sub>) model test can be seen in Table 6.

**Table 6**

Results of the panel analysis to test the second hypothesis (H2) model

Variable	Coefficient	t-Statistic	Prob(t-statistic)
Constant value ( $\beta_0$ )	-0.1891	-1.4151	0.1732
$\Delta NVA_{it} / NVA_{it-1}(\beta_1)$	0.4876	2.5031	0.0071
R <sup>2</sup>	0.0822	Durbin-Watson Statistic	2.0587
F-statistic	3.5514	Prob(F-statistic)	0.0901

Significance level or probability value (p-value) of F is equal to 0.0901. Because these values are greater than 0.05, the null hypothesis is rejected at the 95% confidence level. The model is not significant. Durbin–Watson statistic value in this test is 2.0587 and this value indicates the absence of autocorrelation. Given that the significance of the model is rejected, it is meaningless to investigate the T-statistic significance levels for meaningful analysis of the model coefficients.

## 9. Conclusion and recommendations

The main objective of the present study is to obtain empirical evidence about the potential of the net value added in predicting the accounting earnings and operating cash flow as the most important financial data. Thus 87 companies out of 239 eligible companies listed in Tehran Stock Exchange during over the period 2007-2011 were chosen randomly according to the 7 Industry Groups. Therefore, the variable data were collected according to the 435 observations of year-company to study the relationship between the net value added and the basic information of financial statement namely the accounting earnings and operating cash flow which have a great role in most of the financial events.

According to the results of the first hypothesis test that were shown fully in Table 5, the significant relationship between the changes of net value added and accounting earnings were approved. This result indicates the ability of net value added in predicting the accounting earnings that also correspond with the study of Mashayekhi (2004). Accordingly, it is noteworthy that this factor can enter into the decision making models and indication of the most important accounting variables such as the accounting earnings. In contrast, according to the results of the second hypothesis test shown in Table 6, there is no significant relationship between changes in operating cash flow and changes in net added value. This result is also

consistent with the study of Neves Junior et al. (2009) and accordingly the value added cannot be used in predicting the operating cash flow. Perhaps the lack of a significant relationship in the second hypothesis may be due in part to the accrual basis of value added against the cash basis of operating cash flow.

However, it should be noted that the items contained in the body of the financial statements have not been modified by the effects of inflation. Since the business entities are established at different times and they have gained their assets at different times, thus the quality of the items' comparative capability can affect the research results. It's also important to consider that the items associated with the labor costs are very diverse in companies and industries and the necessary standard has not been developed in Iran to separate these items as the labor cost (as a component of value added). Based on this study and similar studies, there is a need for a suitable standard in this field and accessible database.

However, the results suggest that studies and researches must be carried out in this area in each industry due to the specific characteristics of them. Other important variables of accounting must be applied to determine their relationship with the value added. The effect of cash value added on predicting the basic variables of accounting must be studied. The value added must be used in terms of productivity ratios to predict and evaluate the models. The usefulness of value-added statement must be discussed from the stockholders' perspectives (such as investors, government, etc.). Finally, researchers and investors in the Tehran Stock Exchange are suggested to continue their studies for a better understanding of the main factors that can anticipate their decision-making variables and use the results of these researches.

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