

## Information Content of Value Added Data: An Empirical Evidence from IRAN

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### Abstract

Various calls have been made for the disclosure of value added data, and information content of it, has been examined in the accounting and finance literatures in recent decades. This study examines the relative and incremental information content of value added (including value added and cash value added) beyond traditional data (earnings and operating cash flow). Thus, the relationship between stock returns and changes in value added, cash value added, earnings and operating cash flow, was examined for production Companies at Tehran Stock Exchange (TSE), in the period of 1998 through 2003. For testing the hypotheses of this research, regression method and OLS technique was used, for both of cross-sectional and pooled data.

Despite of Belkaoui et al's (1991-1999) and Firer's (2004) studies that showed value added data has greater information content than conventional data, this study's results show that earnings has the highest information content in comparison to value added data and operating cash flow. In accordance to Belkaoui (1994), the value added data provides incremental information content beyond traditional data, and vice versa. Besides the results of this research is the same as some previous study about greater explanatory power of accruals versus cash flows such as Arabmazar (1995), Subramanyam (1996) and Haw et al (2001).

**Key words:** Value Added; Cash Value Added; Traditional Data; Relative Information Content; Incremental Information Content

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## 1. Introduction

The role of accounting earnings in pricing securities has been an important question in accounting research. Earnings occupy a central position in accounting. It is accounting's summary measure of a firm performance (Dechow, et al, 1998). Many previous studies were about value relevance of earnings in comparison the other measure(s), for example cash flow. Value relevance is defined as the power of specific financial statement variables to explain changes in equity values (Hasan and Anandarajan, 2003). The greater the explanatory power of specific financial statement variables, the greater the value relevance (Hasan and Anandarajan, 2003). Prior evidence indicates that accrual earnings play an important role in valuation process because it mitigates timing and mismatching problems inherent in cash flow measures of firm performance (Dechow, 1994). Despite theoretical models that value cash flows, accounting earnings is widely used in share valuation and to measure performance in management and debt contracts (Dechow, et al, 1998). Some other studies, examined explanatory power of earnings in comparison with other accounting numbers. One of this numbers, is value added that is examined in some studies (for example, Bannister and Belkaoui (1991), Belkaoui (1993), Van Staden (1998) and Firer (2004)).

This study examines the relative and incremental information content of Value Added (VA) and Cash Value Added (CVA) versus and beyond traditional accounting numbers, including earnings (E) and operating cash flow (OCF).

The examination of incremental and relative information content of VA and CVA data in IRAN place could help evaluate whether this new information is useful, at the margin, in explaining the performance of stock price or returns.

## 2. The Concept of Value Added

The most basic concept to measure the income and performance of an economic entity or even a whole economy is the value added created by its economic activities. This concept has been discussed and used

in several countries as a useful measure for different purposes in accounting and other economic areas (Haller & Stolowy, 1995).

Value added is a measure of economic performance of an economic entity which has a fairly long history of application in economics (Haller & Stolowy, 1995). Value added can be defined as a value created by the activities of a firm and its employees, i.e. sales less the cost of bought in goods and services. In other hand, value added represents the firm earned by all providers of capital, plus employees and government (Belkaoui, 1993).

The first above definition of value added refers to wealth generation in the firm, so it is a performance measure; and, the second definition of it refers to distribution of wealth among each participant of the process of a firm.

So, there are two ways for calculating value added. The first way is the so-called "*subtractive method*" and is defined as below:

$$VA = S - M \quad (1)$$

Where, VA is value added, S is sales revenue, and M is materials and services purchased from out of firm. The second way is the so-called "*additive method*" and represents distribution of the created wealth, as below:

$$VA = W + I + DP + DD + T + RE \quad (2)$$

$$\text{and: } VA = W + I + DD + T + RE \quad (3)$$

Where, RE is retained earnings, W is wages, I is interests, DD is dividends, T is taxes, and DP is depreciation. Wages in this formula refer to total salaries in the companies payable to all employees including social expenses.

Equation (2) expresses the gross value added, and equation (3) represented the net value added (Belkaoui, 1993). These two formulas (1 and 3) reveal the characteristic content of value added concept which can be split up into a performance and a social aspect. The subtractive method and the social aspect express the performance aspect by the additive one (Haller & Stolowy, 1995).

As it is represented above, computed value added includes accrual items and they are not necessary to pay or receive in cash. Moreover, in recent decade in some financial reports a new accounting index is introduced, that is so-called "Cash Value Added". In fact, cash value

added represents the value added items that have been received or paid in cash.

Cash value added is calculated, as you see about value added, in two ways: subtractive and additive method. In subtractive method, cash value added is computed as below:

$$CVA=CS-CM \text{ (4)}$$

Where, CS is cash sales revenue, and CM is cash paid for material and services purchased from out of firm. In additive method, cash value added is computed as below:

$$CVA =WP+IP+TP+DDP+OCF \text{ (5)}$$

Where, WP is wages paid, IP is interests paid, TP is taxes paid, DDP is dividends paid, and OCF is operating cash flow.

The value added statement reports on the calculation of value added and its application among the stakeholders in the company. As such it introduces little new information to that already contained in the income statement, but it presents the information in a different and supposedly more understandable format (Van Staden, 2002). The value added statement is published voluntarily with the annual financial statements.

The value added statement is regarded as a social disclosure and therefore the socially related arguments can be used to establish a theoretical case for publication. These theories include organizational legitimacy, social contract and political cost theory (Mathews and Perera (1996) – Gray, et al (1995)). The concept of organizational legitimacy suggests that management can influence the perception that the stakeholders have of the organization and in this way obtain the support of those stakeholders without which it might be difficult for the company to continue to operate. The social contract of business with society is based on the premise that society provides corporations with their legal standing and attributes and the authority to own and use natural resources and to hire employees and that a social contract is therefore implied. Political cost theory is based on the premise that companies do have political visibility and that companies have an incentive to use accounting methods and disclosure to influence political visibility (Van Staden, 2002).

The disclosure of value added information became popular in most European countries starting in the late 1970's. What followed in the United Kingdom was an increased use of value added statements as well as increased interest by the professional accounting institutes (Morley, 1978). In France, extensive use of value added information has been established for a long time in public company reporting and professional financial analysis, due to the adoption by the "Bank de France" and other large state-owned banks (Bank de France, 1998). In South Africa, there is the highest incidence of publication of such statements reported in the world to date (Van Staden, 1999).

In the United States of America (USA), suggestions for its inclusions in companies' annual reports have been frequently made (Meek and Gray, 1988; Belkaoui, 1992 and 1996).

### **3. The Concept of Information Content**

The information content of one accounting number (variable) versus or beyond one or more other variables have examined in increasing number of studies. For example, several studies (Ashiqe Ali, 1944; Pfeiffer et al, 1998; Colin, 1997; McLeay et al; Cheng et al, 1997; Elgers and Lo, 1993; Arabmazar, 1995) have examined the information content of accruals versus cash flows, and others (Belkaoui, 1993; Beaver et al, 1982) have examined the incremental information content of other specific accounting numbers (indices) beyond the others.

There are two types of information content: incremental information content and relative information content. Incremental comparisons ask whether one accounting measure provide information content beyond that provided by another, and relative comparisons ask which measure has greater information content (Biddle et al; 1995).

Tests for incremental information content have been used broadly in accounting research to deal with questions such as the incremental information content of supplemental financial disclosures. Questions of relative information content arise frequently in accounting, too. For example, when standard setting authorities make either/or choice among competing accounting standard and when managers choose from among alternative accounting treatments for reporting the results

of their operations (Biddle et al;1995).In other words, incremental information content comparisons, assess whether one accounting measure (or set of measures) provides information content beyond that provided by another. Notationally, incremental and relative information content comparisons, between two accounting measures  $X_1$  and  $X_2$  can be depicted as follow, whether the dependent variable( $Y$ ) is implicit: (Biddle et al; 1995)

Incremental information content comparisons:

*Information content of  $(X_1, X_2) \geq$  Information content of  $(X_1)$ ?*

*Information content of  $(X_1, X_2) \geq$  Information content of  $(X_2)$ ?*

Relative information content comparisons:

*Information content of  $(X_1) \leq$  Information content of  $(X_2)$ ?*

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#### 4. Literature Review

Bao and Bao(1989) studied about association between productivity and firm value and they used Litzenberg and Rao (1971) valuation model and concluded that the association between productivity and firm value in the refining and apparel industries is stronger than between firm value and earnings measures.

Karpic and Belkaoui (1989) used market model and found that value added variables process incremental information beyond accrual earnings and cash flows in the context of explaining market risk.

Bannister and Belkaoui (1991) suggested that value added was worthy of consideration as a tool for the evaluation of the performance of a company as it showed a clear dominance over both earnings and cash flow information.

Belkaoui (1993) studied about relative and incremental information content of value added, earnings and cash flow; and by using earnings valuation model, concluded that value added information can supply some explanatory power beyond that provided earnings or cash flow measures.

Belkaoui and Fekrat (1994) investigated about merits of derived accounting indicator numbers. They used accounting indicator numbers (Barlev and Levy, 1979) and concluded that the derived performance indicator numbers based on net value added have lower

variability and higher persistency than corresponding numbers based on either earnings or cash flows.

Belkaoui and Picur (1994) studied about relative and incremental information content of value added and earnings and they used a combined earnings and value added valuation model and found that an association exists between both relative changes in earnings and net value added and the relative changes in security prices.

Belkaoui and Picur (1994) did again a research about Information content of level versus change in net value added and by using book value and wealth models, they found that both the levels of net value added and the changes in net value added play a role in security valuation.

Belkaoui (1996a) found that value added information published concurrently with earnings did have additive information content. He also found that productivity (as measured by value added) did not provide information about future profitability incremental to that provided by current profitability.

Belkaoui (1996b) investigated functional specification of relating unexpected earnings or net value added to market-adjusted returns. He used linear and nonlinear valuation models and concluded that models relating to accounting and market returns have more explanatory power when the accounting returns are expressed by the relative changes in net value added, and when the relation is a nonlinear convex -concave function.

***Boshoff (1996) found that value added information did not have predictive value regarding market price per share, economic value added (EVA) and the price earnings ratio.***

Belkaoui in another study (1997), went to Informational content of net value added components disclosed con-currently with earnings and with an earnings valuation model , found that earnings component of value added is viewed favorably by the market while the non-earnings components (interest , tax and wages) are negatively related to market return.

Belkaoui (1999) examined the substitution of net value added for earnings in equity valuation. In this study, he tested descriptive validity of the Feltham and Ohlson (1995) model and concluded that

when net value added is substitute as a measure of wealth for earnings, the resulting accounting valuation model is better descriptive than the conventional Feltham-Ohlson (1995).

Van Staden (1998) found that value added information does not have additional explanatory and predictive power when compared to earnings. However, the study found meaningful correlation between the value added measures and share price, but it wasn't more significant than the correlation between earnings and share price.

Firer and Saunders (2000) found sufficient evidence of the usefulness of value added information in order to incorporate value added data as an integral part of generally accepted accounting practice.

Shahriari (2001) in his study about relative information content of value added data in Iran, concluded that value added data has greater information content than earnings and operating cash flow.

Firer (2004) studied about relative and incremental information content of value added and earnings in South Africa .He used a capitalization market model and found that value added concept dominates earnings in terms of relative information content, while earnings dominate value added in terms of the incremental information content. However, value added is statically significant in respect of explaining and predicting company performance.

## **5.-Financial Market in Iran**

The idea of having a well-organized stock market and speeding up the process of industrialization of the country dates back to 1930's when Iran Melli Bank started a study about the subject. A report completed in 1936 worked out the details for the formation of a stock market and laid down the preliminary foundation to proceed with the plan.

The outbreak of the Second World War and subsequent economic and political events, delayed the establishment of the stock exchange up to the year 1967 when the Stock Exchange Act was ratified. The Tehran Stock Exchange (TSE) opened in April 1968. Initially only Government bonds and certain State-backed certificates were traded in the market. During 1970's the demand for capital boosted the demand for stocks. At the same time, institutional changes, like the transfer

public companies' shares and large private firms owned by families, to the employees and the private sector led to the expansion of the stock market activity. The restructuring of the economy following the Islamic Revolution expanded public sector control over the economy and reduced the need for private capital. At the same time, the abolishment of interest-bearing bonds terminated their presence in the stock market. Because of these events, Tehran Stock Exchange started a period of standstill.

This stop ended in 1989 with the revitalization of the private sector through privatization of state-owned enterprises and promotion of private sector economic activity based on the First Five-year Development Plan of the country. Since then the Stock Exchange has expanded continuously.

The TSE Council is the highest authority in the stock exchange. State officials as well as the private sector representatives and specialists are members of the Council. The Governor of the Central Bank presides over the Council. Other constituent organizations of TSE are Acceptance Committee, Arbitration Board and Brokers Organization. The Board of Directors of the latter is the highest policy-making authority in TSE and appoints the secretary general as the chief executive officer, CEO, for a period of two years. Re-appointment is permitted without any restriction. There are two Senior Deputies acting under the Secretary General who are responsible for economic and technical affairs and administration and finance respectively.

Trading in TSE is based on orders sent by the brokers. Trading hours are 09:00-12:30 Saturday to Wednesday, with the exception of public holidays. A CDS is operating in TSE and clearing process is automated. TSE Services Company, TSESC, who is in charge of computerized site, supplies computer Services. Presently, TSE trades mainly in securities offered by listed companies. The introduction of project-based participation certificates that bear a fixed annual return during the period of the project and promise the final settlement of the profit at the date of its completion have diversified the market.

TSE is a full member of FIBV, a founding member of Federation of Euro-Asian Stock Exchanges (FEAS).

## 6- Sample Design and Data Collection

Emerging markets face a major weakness in not having inappropriate data. Databases rarely exist and if they exist, they are often incomplete. Computerized databases are found less frequently in developing markets. TSE has started to computerize its data in recent years. But for this study, that computerized database was not complete, so required data from 1998 -2003, was collected manually and then transformed to a computerized format.

The sample data of this study was restricted to non-financial companies, which were listed in TSE and with available annual trading data during the period of 1998 through 2003. The financial companies such as holdings and investments, are excluding from the sample data, in order to have consistent interpretation on certain company characteristics such as earnings and size .I used Criteria-Filtering Technique to select sample companies. The used companies in this study must meet the following criteria:

1. The end of fiscal year is 20, March.
2. The company is listed in TSE, before 20, March 1997.
3. They have non-stop stock transaction in TSE during the period under study.
4. They have non-missing data available in TSE financial statement files (annual reports) during the period under study.

Hence, our sample size is composed of 408 firm-years. Using weekly and/ or monthly reports of TSE, monthly returns were computed. Then these monthly returns were accumulated for the purpose of annual returns computing. I adjusted all returns for cash dividends, stock dividends, and new stock offerings. Financial statement's data that were obtained from various TSE reports and publications are as follow:

1. Value Added (VA): the sum of wages, corporate taxes, dividends, interest expenses, depreciation, minority shareholders in subsidies and retained earnings (gross value added as introduced by Belkaoui, 1993).
2. Cash Value Added (CVA): the sum of wages paid, corporate taxes paid, dividends paid, interests paid, and operating cash flow.
3. Earnings (E): income that is available to common equity.

4. Operating Cash Flows (OCF): cash flow generated from continuing operations, where cash flows are defined as income available to common equity plus depreciation deferred taxes and the changes in the non-cash working capitals.

## 7- Hypothesis Development

Value relevance evaluation of alternatives to earnings and other traditional data such as cash flows, is important for increasing of financial reporting quality. As noted previously, value added is one of these alternatives. Previous studies (e.g. Belkaoui, et al (from 1991 to 1999), Boshoff (1996), Firer (2004), and Shahriari (2001)) show that the predictive and explanatory power of value added information could indicate that it has decision usefulness concerning financial decision makers such as financiers and investors. Because of emerging Iranian capital market and its need to increase in financial reporting quality, the value relevance of information contained in accounting numbers other than conventional data, such as value added, remains to be an empirical issue. This study investigates the relative information content of value added, cash value added and conventional data, that is earnings and operating cash flows. Also, it examines whether value added data, including cash value added, provides incremental information content beyond that contained in earnings and operating cash flows. Moreover, because of importance of information content of accruals versus cash flows that has been tested in many previous studies (e.g. Bowen, et al,1987; Bernard and Stober,1989; Arabmazar,1994), this study also investigate the incremental information content of earnings versus operating cash flows, and value added (as an accrual data) versus cash value added(as a cash data).

So, in this study these following two groups of questions have to be answered:

The first group (that is about relative information content):

1. Is information content of value added items (including VA and CVA) greater than information content of conventional data (including E and OCF)?

2. Is information content of conventional data (including E and OCF) greater than information content of value added items (including VA and CVA)?

Moreover, the second group (that is about incremental information content):

1. Do changes in value added items (including VA and CVA) provide incremental information content beyond changes in conventional data (including E and OCF), and vice versa?
2. Do changes in OCF provide incremental information content beyond changes in E, and vice versa?
3. Do changes in VA provide incremental information content beyond change in CVA, and vice versa?

## 8- Model Specification

A usual linear valuation model rests on expressing a relationship between relative changes in price and earnings (e.g., Beaver et al, 1980; Collins and Kothari, 1989; Belkaoui, 1993). A generally accepted return valuation model used is as follow (Belkaoui, 1994):

$$(1) \text{RET}_{jt} = a_0 + a_1 (\Delta \text{AR}_{jt} / \text{AR}_{jt}) + e_{jt}$$

Where RET is annual market adjusted stock returns measured over a 12-month period ending 4 months after the fiscal year-end, i.e. 20, March<sup>1</sup>. And, AR is accounting return that can be substitute by Value Added (VA), Cash Value Added (CVA), earnings (E) and operating cash flow (OCF), So, the above model may be expressed by one of the following four equations:

$$(1-1) \text{RET}_{jt} = a_0 + a_1 (\Delta \text{VA}_{jt} / \text{VA}_{jt}) + e_{jt} \quad \hat{R}_{VA}^2$$

$$(1-2) \text{RET}_{jt} = a_0 + a_1 (\Delta \text{CVA}_{jt} / \text{CVA}_{jt}) + e_{jt} \quad \hat{R}_{CVA}^2$$

$$(1-3) \text{RET}_{jt} = a_0 + a_1 (\Delta E_{jt} / E_{jt}) + e_{jt} \quad \hat{R}_E^2$$

$$(1-4) \text{RET}_{jt} = a_0 + a_1 (\Delta \text{OCF}_{jt} / \text{OCF}_{jt}) + e_{jt} \quad \hat{R}_{OCF}^2$$

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<sup>1</sup> - In Iran, listed firms in Tehran Stock Exchange (TSE) have to release their annual financial statement within four month from the fiscal year-end, up to 20 July.

Where,  $\hat{R}_{VA}^2$ ,  $\hat{R}_{CVA}^2$ ,  $\hat{R}_E^2$  and  $\hat{R}_{OCF}^2$ , and are adjusted R square statistics from equations (1-1), (1-2), (1-3) and (1-4), respectively.

When examining the information content of two or more measures of accounting returns, the following equation will be used:

$$(2) \quad RET_{jt} = a_0 + a_1 (\Delta AR_{1jt}/AR_{1jt}) + a_2 (\Delta AR_{2jt}/AR_{2jt}) + \dots + a_n (\Delta AR_{njt}/AR_{njt}) + e_{jt}$$

For the aim of this study, model (2) may be expressed by one of the following four equations:

$$(2-1) \quad RET_{jt} = a_0 + a_1 (\Delta VA_{jt}/VA_{jt}) + a_2 (\Delta CVA_{jt}/CVA_{jt}) + e_{jt}$$

$$\hat{R}_{VA,CVA}^2 = R_{VAD}^2$$

$$(2-2) \quad RET_{jt} = a_0 + a_1 (\Delta E_{jt}/E_{jt}) + a_2 (\Delta OCF_{jt}/OCF_{jt}) + e_{jt}$$

$$\hat{R}_{E,OCF}^2 = R_{TRD}^2$$

$$(2-3) \quad RET_{jt} = a_0 + a_1 (\Delta E_{jt}/E_{jt}) + a_2 (\Delta OCF_{jt}/OCF_{jt}) + a_3 (\Delta VA_{jt}/VA_{jt}) + a_4 (\Delta CVA_{jt}/CVA_{jt}) + e_{jt}$$

$$\hat{R}_{E,OCF,VA,CVA}^2 = \hat{R}_{VAD,TRD}^2$$

Where,  $\hat{R}_{VAD}^2$ ,  $\hat{R}_{TRD}^2$  and  $\hat{R}_{VAD,TRD}^2$  are adjusted R square statistics from equations

(2-1), (2-2) and (2-3), respectively; and VAD is value added data and TRD is traditional data.

I estimate all models using both a pooled regression and a separately run regression approach each year during the period from 1998-2003. Because pooling is inappropriate if there are shifts in the cross-sectional parameters over time or if the error terms are auto correlated (Kersten and Kim, 1995), I also run separated annual regression.

For testing relative information content of independent variables, whichever performance measure (VA, CVA, E and OCF) has a

higher association ( $\hat{R}^2$ ) with stock returns, is interpreted as more effectively summarizing firm performance or relatively more value-relevant (Haw, et al, 2001).

For testing incremental information content of independent variables, as Theil (1971) did in his research, incremental explanatory power of performance measures is defined in terms of differences in

the coefficient of determination ( $\hat{R}^2$ ). That is, when entrance of a new independent variable to a model that has another independent

variable(s) increase old  $\hat{R}^2$ , so it can be concluded that new independent variable has incremental information content beyond the old one(s), and vice versa. The differences between old and new  $\hat{R}^2$ , are sometimes called the *semi-partial coefficient of determination* (Cohen & Cohen, 1975). In fact, when they are positive, they are which a measure of the incremental explanatory power of one variable given the remaining independent variables, show that incremental information content exists. So, the incremental explanatory power is defined as (Graham & King, 2000):

$\hat{R}^2_{VAD TRD} = \hat{R}^2_{VAD,TRD} - \hat{R}^2_{TRD}$	<p>The incremental explanatory power of value added data beyond traditional data is the total explanatory power of value added data and traditional data less explanatory power of traditional data alone.</p>
$\hat{R}^2_{TRD VAD} = \hat{R}^2_{VAD,TRD} - \hat{R}^2_{VAD}$	<p>The incremental explanatory power of traditional data beyond value added data is the total explanatory power of value added data and traditional data less explanatory power of value added data alone.</p>
$\hat{R}^2_{CVA VA} = \hat{R}^2_{VA,CVA} - \hat{R}^2_{VA}$	<p>The incremental explanatory power of cash value added beyond value added is the total explanatory power of value added and cash value added less explanatory power of value added alone.</p>
$\hat{R}^2_{VA CVA} = \hat{R}^2_{VA,CVA} - \hat{R}^2_{CVA}$	<p>The incremental explanatory power of value added beyond cash value added is the total explanatory power of value added and cash value added less explanatory power of cash value added alone.</p>
$\hat{R}^2_{E OCF} = \hat{R}^2_{E,OCF} - \hat{R}^2_{OCF}$	<p>The incremental explanatory power of earnings beyond operating cash flow is the total explanatory power of earnings and operating cash flow less explanatory power of operating cash flow alone.</p>
$\hat{R}^2_{OCF E} = \hat{R}^2_{E,OCF} - \hat{R}^2_E$	<p>The incremental explanatory power of operating cash flow beyond earnings is the total explanatory power of earnings and operating cash flow less explanatory power of earnings alone.</p>

## 9- Empirical Finding

Table 1 summarizes the results of the pooled and cross-sectional regressions on the relative information content of value added, cash value added, earnings and operating cash flows. Panels A, B, C and D

report results of the simple regressions for testing the relative information content.

Table 1- Relative information content of value added, cash value added, earnings and operating cash flows

	<i>Pooled data</i>	1998	1999	2000	2001	2002	2003
<i>Panel A. Regression results of market-adjusted return on value added</i>							
Intercept	16.345 (0.128)	45.423 ***(0.000)	32.543 ***(0.000)	20.36 ***(0.000)	30.941 ***(0.000)	47.665 ***(0.000)	-2.579 (0.949)
VA	0.319 ***(0.001)	0.102 ***(0.000)	0.731 ***(0.000)	0.102 *(0.018)	0.959 ***(0.000)	0.341 ***(0.009)	3.663 ***(0.019)
$\hat{R}^2$	0.047	0.458	0.344	0.193	0.268	0.114	0.228
<i>Panel B. Regression results of market-adjusted return on cash value added</i>							
Intercept	24.934 ***(0.021)	53.173 ***(0.000)	30.456 ***(0.000)	22.896 ***(0.000)	52.11 ***(0.000)	51.797 ***(0.000)	62.978 ***(0.031)
CVA	0.06 (0.498)	1.141 ***(0.012)	0.083 *(0.069)	0.153 (0.120)	0.052 (0.249)	0.053 (0.236)	0.29 *(0.055)
$\hat{R}^2$	0.004	0.203	0.059	0.066	0.007	0.009	0.144
<i>Panel C. Regression results of market-adjusted return on earnings</i>							
Intercept	-12.040 (0.351)	33.57 ***(0.009)	34.133 ***(0.000)	19.69 ***(0.000)	47.28 ***(0.000)	30.629 ***(0.000)	36.805 *(0.094)
E	0.786 ***(0.000)	0.701 ***(0.003)	0.551 ***(0.000)	0.05 ***(0.000)	0.346 ***(0.010)	0.96 ***(0.000)	1.034 ***(0.000)
$\hat{R}^2$	0.093	0.285	0.456	0.428	0.113	0.268	0.542
<i>Panel D. Regression results of market-adjusted return on operating cash flow</i>							
Intercept	26.809 ***(0.013)	30.498 *(0.067)	36.119 ***(0.000)	22.77 ***(0.000)	53.703 ***(0.000)	53.247 ***(0.000)	35.344 (0.118)
OCF	0.005 (0.785)	0.806 *(0.056)	0.0003 (0.953)	0.045 (0.196)	0.069 (0.638)	-0.007 (0.644)	2.025 ***(0.000)
$\hat{R}^2$	-0.004	0.109	-0.026	0.033	-0.016	-0.016	0.519

VA is value added, CVA is cash value added, E is earnings and OCF is operating cash flow.

Numbers in parentheses are *p-values*.

\*Indicates significant at the 0.10 level.

\*\* Indicates significant at the 0.05 level.

\*\*\* Indicates significant at the 0.01 level.

In Panel A, with value added alone as the explanatory variable, the adjusted  $R^2$  for the full sample is 4.7%. The coefficient on value added is 0.319 and significant at the .01 level. The annual regression results present a similar pattern, but the coefficients appear unstable over time. The explanatory power of value added is higher for 2003 than for other periods (In 2003, Tehran Stock Exchange, had a big volume of stock trading and most of stock returns were very high).

Panel B presents the results with cash value added alone as the explanatory variable. The adjusted  $R^2$  for the full sample is only 0.4%. The regression coefficient is 0.06, and it's not significant. The coefficients in annual regressions are positive but not significant at the conventional levels except for 1998. The explanatory powers of cash value added in the cross-sectional regressions are quite low.

Panel C presents the results with earnings alone as the explanatory variable. The adjusted  $R^2$  for the full sample is about 10%. The regression coefficient is 0.79, and it's significant at the 0.01 level. The coefficients in annual regressions are positive and significant at the 0.01 levels. The explanatory powers of earnings in the cross-sectional regressions are pretty high.

Panel D presents the results with operating cash flow alone as the explanatory variable. The adjusted  $R^2$  for the full sample is -0.4% and it's meaningful. Besides, the regression coefficient is 0.005, and it's not significant. Also, the coefficients in annual regressions are positive but not significant at the conventional levels except for 2003. The explanatory powers of cash value added in the cross-sectional regressions are quite low.

Table 2 summarize adjusted  $R^2$ s of model (1-1), (1-2), (1-3) and (1-4).

Table 2- Adjusted  $R^2$ s of model (1-1), (1-2), (1-3) and (1-4).

	<i>Pooled data</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>
$\hat{R}_{VA}^2$	0.047	0.458	0.344	0.193	0.268	0.114
$\hat{R}_{CVA}^2$	0.004	0.203	0.059	0.066	0.007	0.009
$\hat{R}_E^2$	0.093	0.285	0.456	0.428	0.113	0.268
$\hat{R}_{OCF}^2$	-0.004	0.109	-0.026	0.033	-0.016	-0.016

As you see in table 3, the explanatory power of earnings is the highest in comparison to value added, cash value added and operating cash flow, in the full sample and all periods under study except to 1998 and 2001. In mentioned periods, value added has the highest explanatory power. On the other hand, in full sample and in all period under study, operating cash flow has the lowest information content, except for 2003. So, I can summarize relative information content of explanatory variables in this study as below:

$$\hat{R}_E^2 > \hat{R}_{VA}^2 > \hat{R}_{CVA}^2 > \hat{R}_{OCF}^2$$

And then:

***Information content of earnings > Information content of value added > Information content of cash value added > Information content of operating cash flow***

In summary, these results reveal that in Iran's emerging capital market, accruals have incremental information content beyond that contained in operating cash flows and the market attaches rather similar value to both operating cash flows and accruals. Our results are consistent with some earlier studies, such as Arabmazar (1995), Subramanyam (1996) and Haw et al (2001).

Table 3 examines incremental information content of value added data and traditional data (earnings and operating cash flows) in multiple regressions. In Panel A, regression results of market-adjusted return on value added and cash value added is shown. Comparison results that are shown in table 2 and 4 demonstrate that the coefficients of value added are positive and significant, in average, at the 0.01 level, except for pooled data and year 2003; and the coefficients on cash value added are statistically significant at the conventional levels, except for 2000-2002. On the other hand, adjusted R square statistics from equation (2-1) is greater than (1-2). That is,  $\hat{R}_{CVA|VA}^2$  is positive for full sample and all periods under study, and this indicates that value added has incremental information content beyond that provided by cash value added. Moreover, adjusted R square statistics from equation (2-1) isn't greater than (1-1) except for 1998 and 1999. That is,  $\hat{R}_{VA|CVA}^2$  is negative for full sample and all periods under study, except for 1998, 1999; and this indicates that cash value added has incremental information content beyond that provided by value added, only for years 1998 and 1999. So, in mentioned years, both value added and cash value added have incremental information content beyond each other. Besides, differences in  $R^2$ s are significant for all regressions according to *F-tests* of coefficient quality.

In Panel B, regression results of market-adjusted return on earnings and operating cash flows is shown. Comparison results that is shown in table 2 and 4 demonstrate that while the coefficients on earnings are positive and significant at the 0.01 level, the coefficients on operating cash flows are not statistically significant at the conventional levels, except for 2003. On the other hand, adjusted R square statistics from equation (2-2) is greater than (1-4) but not (1-3). That is,  $\hat{R}_{E|OCF}^2$  is positive, but  $\hat{R}_{OCF|E}^2$  is negative. This indicates that earnings has incremental information content beyond that provided by operating cash flows, but not vice versa. These results are same for pooled data and all period under study, except for 2000 and 2003. In mentioned

years, the coefficients of operating cash flows and earnings are 1.2 and 1.12 and significant at the 0.05 and 0.01 levels, respectively. So, both earnings and operating cash flow have incremental information content beyond each other in these years. Besides, differences in  $R^2$ s are significant for all regressions according to  $F$ -tests of coefficient quality.

In Panel C, regression results of market-adjusted return on value added, cash value added, earnings and operating cash flows, is shown. Results that is shown in table 4 demonstrate that adjusted R square statistics from equation (2-3) is greater than both equations (2-1) and (2-2). That is, both  $\hat{R}_{VAD|TRD}^2$  and  $\hat{R}_{TRD|VAD}^2$  are positive in full sample and all periods under study, except for 2001 that its  $\hat{R}_{TRD|VAD}^2$  is negative, and 2002 that its  $\hat{R}_{VAD|TRD}^2$  is negative. This indicates that in 2001 value added data has incremental information content beyond that provided by traditional data, but not vice versa; and in 2002 traditional data has incremental information content beyond that provided by value added, but not vice versa. For other periods and for pooled data, both value added data

Table 3- Incremental information content of value added data and traditional data (earnings and operating cash flows)

	Pooled data	1998	1999	2000	2001	2002	2003
<i>Panel A. Regression results of market-adjusted return on value added and cash value added</i>							
Intercept	15.753 (0.148)	46.637 ***(0.000)	27.532 ***(0.000)	19.752 ***(0.000)	31.159 ***(0.001)	47.547 ***(0.000)	6.43 (0.875)
VA	0.026 (0.714)	0.09 ***(0.000)	0.717 ***(0.000)	0.088 *(0.059)	0.935 ***(0.000)	0.322 **(0.016)	0.17 (0.268)
CVA	0.316 ***(0.001)	0.821 **(0.017)	0.075 **(0.040)	0.072 (0.462)	0.023 (0.564)	0.030 (0.492)	2.865 *(0.086)
$\hat{R}^2$	0.043	0.56	0.398	0.177	0.257	0.104	0.221
F stat.	5.713	16.897	14.208	3.471	9.308	3.913	4.023
<i>Panel B. Regression results of market-adjusted return on earnings and Operating cash flows</i>							

Intercept	-11.669 (0.374)	27.236 *(0.071)	34.665 ***(0.000)	17.459 ***(0.000)	47.330 ***(0.000)	28.719 ***(0.002)	22.575 (0.206)
E	0.786 ***(0.000)	0.613 **(0.018)	0.556 ***(0.000)	0.047 ***(0.000)	0.345 ***(0.013)	1.001 **(0.000)	0.701 ***(0.002)
OCF	0.003 (0.862)	0.318 (0.445)	-0.003 (0.560)	0.037 (0.159)	0.0003 (0.983)	0.008 (0.506)	1.318 ***(0.004)
$\hat{R}^2$	0.089	0.273	0.446	0.456	0.094	0.260	0.70
F stat.	22.49	5.702	17.12	10.635	3.478	9.786	23.954

Panel C. Regression results of market-adjusted return on earnings , operating cash flows , value added and cash value added

Intercept	-13.36 (0.306)	39.439 **(0.001)	28.6 ***(0.000)	16.911 ***(0.000)	29.93 ***(0.002)	29.82 ***(0.002)	4.216 (0.876)
E	0.695 ***(0.000)	0.498 ***(0.007)	0.387 ***(0.002)	0.067 **(0.001)	0.05 (0.723)	0.913 ***(0.003)	0.616 **(0.041)
OCF	-0.0001 (0.994)	-0.191 (0.523)	-0.007 *(0.089)	0.016 (0.693)	0.007 (0.588)	0.008 (0.573)	1.203 **(0.030)
VA	0.214 **(0.027)	-0.191 (0.523)	0.347 **(0.049)	-0.083 (0.163)	0.915 ***(0.003)	0.057 (0.697)	1.009 (0.408)
CVA	-0.032 (0.663)	0.844 ***(0.007)	0.09 **(0.014)	0.205 *(0.056)	0.02 (0.687)	0.017 (0.681)	0.042 (0.750)
$\hat{R}^2$	0.102	0.664	0.547	0.534	0.231	0.234	0.70
F stat.	6.950	13.359	13.072	7.587	4.595	4.822	12.022

VA is value added, CVA is cash value added, E is earnings and OCF is operating cash flow.

*F-stat* is a test of coefficient equality among independent variables.

Numbers in parentheses are *p-values*.

\*Indicates significant at the 0.10 level.

\*\* Indicates significant at the 0.05 level.

\*\*\* Indicates significant at the 0.01 level.

and traditional data have incremental information content beyond each other. In summary, in average, model (2-3) has more explanatory power than models (2-1) and (2-2). Besides, differences in  $R^2$ s are significant for all regressions according to *F-tests* of coefficient quality.

Table 4 summarize adjusted  $R^2$ 's of model (2-1), (2-2), and (2-3).

Table 4- Adjusted  $R^2$ 's of model (2-1), (2-2), and (2-3)

	Pooled data	1998	1999	2000	2001	2002	2003
$\hat{R}_{VA,CVA(VAD)}^2$	0.043	0.56	0.398	0.177	0.257	0.104	0.221
$\hat{R}_{E,OCF(TRD)}^2$	0.089	0.273	0.446	0.456	0.094	0.260	0.70
$\hat{R}_{E,OCF,VA,CVA(VAD,TRD)}^2$	0.102	0.664	0.547	0.534	0.231	0.234	0.70
$\hat{R}_{VAD TRD}^2 = \hat{R}_{VAD,TRD}^2 - \hat{R}_{TRD}^2$	0.013	0.391	0.101	0.78	0.137	-0.026	0
$\hat{R}_{TRD VAD}^2 = \hat{R}_{VAD,TRD}^2 - \hat{R}_{VAD}^2$	0.056	0.104	0.149	0.357	-0.026	0.13	0.479

I can summarize relative information content of explanatory variables in this study as below:

$$\hat{R}_{VAD,TRD}^2 > \hat{R}_{VAD}^2 \ \& \ \hat{R}_{VAD,TRD}^2 > \hat{R}_{TRD}^2$$

And then:

<i>Information content of (value added data &amp; traditional data) &gt; Information content of (value added data)</i>
<i>Information content of (value added data &amp; traditional data) &gt; Information content of (traditional data)</i>

## 10. Conclusion and Suggestions

Our results imply that Iran's capital market may be functionally fixated on earnings (Arabmazar (1995), Sloan (1996) and Haw et al (2001)). While value added isn't presented in Iranian financial reports, but value added plays an important role in market valuation.

Prior research (e.g., Belkaoui, Van Staden and Firer) examines the relation of stock returns with value added data. Although they found meaningful correlation between the value added measures and share

price but their results were different about incremental information content.

As it's shown in table 1, explanatory power of earnings is the highest in comparison to value added; cash value added and operating cash flow, in the full sample and all periods under study except to 1998 and 2001. In mentioned periods, value added has the highest explanatory power. On the other hand, in full sample and in all period under study, operating cash flow has the lowest information content, except for 2003.

Following the table 3, the results indicate that in full sample and all periods under study, except for 2001 and 2002, both value added data and traditional data have incremental information content beyond each other. In 2001 value added data has incremental information content beyond that provided by traditional data, but not vice versa; and in 2002 traditional data has incremental information content beyond that provided by value added, but not vice versa. Besides value added has incremental information content beyond cash value added, except for 2000-2002, and cash value added has incremental information content beyond value added only for 1998 and 1999. Moreover, in all cases, earnings have incremental information content beyond operating cash flow, and opposite of it is true, only for 2000 and 2003.

To come to the point, the results of this empirical study show:

- a) Earnings have the greatest explanatory power and information content;
- b) Value added data provides incremental information content beyond that contained in traditional data, and vice versa;
- c) Earnings provides incremental information content beyond that contained in operating cash flow ;
- d) Value added dominates cash value added in respect to both relative and incremental information content.

Therefore, I conclude that in IRAN context and in under studied Iranian companies in TSE:

1) accrual data dominates cash data, and 2) value added information can supply some explanatory power of security return beyond that provided by traditional data including earnings and cash

flow measures. So, it's suggested that value added statement had been prepared and represented popularly. It may constitute a definite improvement over the present reporting of TSE companies.

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