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Comparing the Effect of Information Quality on Economic Profit and Accounting Profit with the Artificial Intelligence Approach

Fatemeh Parvaneh

Ph.D. Candidate in Accounting, Faculty of Economics and Accounting, South Tehran Branch, Islamic Azad University, Tehran, Iran. (Email: f.parvaneh64@gmail.com)

Roya Darabi *

*Corresponding Author, Associate Professor, Faculty of Economics and Accounting, South Tehran Branch, Islamic Azad University, Tehran, Iran. (Email: royadarabi110@yahoo.com)

Shahram Chaharmahali

Assistant Professor, Faculty of Economics and Accounting, South Tehran Branch, Islamic Azad University, Tehran, Iran. (Email: sh.chaharmahali@gmail.com)

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Abstract

Profit is one of the financial statement items that significantly impact user decision-making and has received a lot of attention. Evaluating goal achievement is one of the essential aspects of any economic activity. With the increasing progress of economic activities and the need for more accurate evaluation methods to reality and complete older methods, this issue undoubtedly enters a new field. Economic value added is a performance measure that accurately calculates how a company's value increases or decreases, considering the opportunity cost of shareholders and the time value of money. This research aims to identify the most influential factors for explaining economic and accounting profit using an artificial intelligence approach. There is no such internal research given the subject. The financial data of 127 companies from 2011 to 2019 was used to test the hypotheses. The findings indicate that the variables "profit quality," "profit stability," "profit predictability," "profit smoothing," "profit transparency," "close proximity to cash," "awareness," "conservatism," and "timeliness" have a significant relationship with economic and accounting profit. However, there is no meaningful relationship between economic profit and accounting profit and the variable "Profit relevance."

Keywords: Economic Profit, Accounting Profit, Information Quality, Artificial Intelligence Algorithm

Introduction

The ability to predict the future is used in the accounting literature to assess quality. This method is used primarily for criteria that deal with numbers and figures; profit is one of these criteria (Du et al., 2020). Profit rate provides valuable information about the quality of a company's profits, and companies that pay dividends report higher quality profits than those that do not (lawson et al., 2016).

Today, the information constitutes a significant portion of an organization's assets and lifeblood. Because of the importance of information in surviving in a competitive market, business managers are increasingly focusing on it. The dimensions of information quality ensure that organizations have good information quality to support the information they collect during their activities. Decisions are made well based on information that can be trusted in

quality and accuracy (Bateni et al. 2019). Accounting information, as a summary of the records produced by a company in the past, is the primary source of information for various business decisions, including operational decisions in the company, and on the other hand, is the primary source of information for investors, providing them with a variety of options. Accounting data can be used for performance planning and control (Azhar, 2016).

Access to high-quality accounting data is required for investors, creditors, and corporate leaders to make the best investment and credit decisions. Because corporate accounting information is regarded as an essential component in the capital market, the accuracy of accounting data can influence creditors' pricing decisions (Lim et al., 2021). If information is of high quality and accurately reflects the company's current performance, it has the potential to predict future performance and assess the company's worth. (Sobhani et al., 2021)

No attempt has been made in previous studies with the approach of artificial intelligence and using the most critical criteria of information quality to predict and model accounting profits and economic benefits. This is the innovative aspect of the current study. The theoretical foundations, research background, statistical analysis method, and research conclusions are presented in the following sections.

Literature Review

Indeed, appropriate literature related to a research's main topics can make theoretical development more straightforward and more possible. Previous works and studies have a good history and show the superiority of other works. This section of the research focuses on the literature and results related to the title and issues in this research, with a literature review and definitions of key concepts. Profit is one of the most fundamental elements of financial statements and has always been considered a criterion for evaluating the continuity of activity efficiency, reviewing the structure of profit contracts, and forecasting future cash flows for investors. People are looking for quality returns to predict future cash flow because if quality financial statements are presented, investors will use them more. Although evidence suggests that accounting profit is a good predictor of stock returns, the use of a trading approach and conservative constraints, as well as the importance of determining accounting profit, have led some analysts to conclude that economic profit is a better predictor of cash flows than accounting profit (Du et al., 2020). Accounting profit is measured using managers' personal judgments

and motivation to achieve the expected amounts of profit, which reduces the quality of profit and limits its use in profit-based valuation models, which outperform non-profit models in estimating stock market value (Courteau et al., 2015). The profit figure is used to value the company by investors and forecast and recommend by analysts. Despite the positive economic consequences and broad benefits of providing quality financial reporting to stakeholders, corporate financial reports have different information content, and variables appear to lead to differences in financial information content (Lotfi et al., 2021).

Accounting information quality based on information content has a positive effect on the capital market, i.e., by making reliable information available to the public, the amount of data to predict expected future profits and total cash and visual flows about the company's performance is presented (Khaleghi Kasbi et al., 2020). Information quality is one of the most critical factors in the success of information systems. When information quality could be better, the organization faces numerous risks. The quality of accounting information based on the reflection of information content has a positive effect on the capital market, i.e., by making reliable information available to the public, the amount of data to predict expected future profits and full cash and visual flows about the company's performance is presented (Khaleghi Kasbi et al., 2020). Information quality is a critical factor in the success of information systems. When the quality of information could be better, the organization faces numerous risks.

Research Background

Hosseini et al. (2021) used Markov chains to simulate the stability and reversibility of accounting profits. The study's findings show that current year profit is linked to upcoming year profit, and this problem provides a foundation for studying profit stability using Markov process approaches. Other findings indicate that the effect of the current accounting profit situation on predicting long-term profit stability decreases over time, and measuring accounting profit status stability and reversibility using operating profit-to-sales ratio and net profit-to-sales indicators is not significantly different. With the auditor quality adjusting variable, Ajam (2021) investigated the effect of accounting information quality on investment performance. The findings revealed that better accounting information leads to better investment efficiency and less over- and under-investment. Lotfi et al. (2021) discussed the role of profit-enhancing characteristics in increasing stock price information content:

Evidence from a simultaneous volatility model. The findings indicate that higher-quality accounting information lowers the risk and cost of obtaining information and increases stock price information content, as measured in the current study using the simultaneous volatility model.

Jamei et al. (2020) explained stock returns through economic value added and its components by varying earnings quality. According to the findings, the information content of value-added economic components is more cumulative than economic value-added, and the quality of profit to the model causes a change in the information content of the models. The relationship between economic value added and stock returns interact with earnings quality, which was also discovered at the level of economic value added components. Nobakht et al. (2017) investigated the impact of profit management on economic value added. The findings indicate that using the Matsumoto and Jones models to manage earnings significantly impacts economic value added or that earnings management impacts the value-added of firms listed on the Tehran Stock Exchange.

Aflatooni (2016) investigated how earnings management affects the performance of earnings-based accounting models. The results show that the residual accounting earnings model performs significantly worse in companies with questionable earnings management than the cash flow model. Oguz (2021) discovered that the criteria of annual adjustments and operating profit volatility have the greatest impact on future assets growth and sales revenue when examining the usefulness of financial reporting quality criteria on the components of companies' future growth in the life cycle process. Furthermore, only the operating profit volatility measure greatly impacts future stock market value growth. Ahmadi et al. (2020) investigated accounting data quality, auditor types, and profit management. The findings show a negative and inverse relationship between the earnings management index and accounting information quality. The findings suggest that improving management performance, and thus increasing company profitability, improves accounting data quality. Reduced earnings management is another way to improve the quality of accounting data.

Abedini et al. (2014) conducted a careful study on accounting earnings and their relationship to accruals on the Tehran Stock Exchange. The findings show that accounting earnings are approximately 66.3 times more sensitive to negative than positive stock returns, and accruals account for approximately 78 percent of the time asymmetry in accounting profit. Shu (2021) conducted a study titled "Study of the relationship between earnings smoothing and stock

price information content" and discovered that earnings smoothing has a negative effect on stock price information content for companies with less debt and CEOs. In a study, Du et al. (2020) investigated using the latent Markov process to measure the stability of accounting profit. They demonstrate that the new measure of sustainability is valid and that this criterion is directly related to the profitability response coefficient.

Nakhaei (2020) researched to determine the impact of EPS, ROI, and EVA on company stock prices. They stated that the return on assets, price-to-profit ratio, and economic value added could all be used to calculate a company's return. According to the findings of this study, the return on assets has a significant effect on stock returns; additionally, the price-to-earnings-per-share ratio has no effect on economic value added and stock returns. Furthermore, economic value added has no impact on stock returns. Al-Mamun et al. (2016) assessed the information content of accounting profits in predicting current and future economic conditions. According to the researchers, certain accounting events, such as profit and loss on divestiture, have the necessary explanatory power to forecast future economic growth.

Lim et al. (2015) investigated the relationship between educated businesses' financial reporting quality and the return on investment of training businesses. The findings show that improving the financial reporting quality of invested firms increases the return of educated firms. Wang et al. (2015) published "The Impact of Earnings Management on Economic Value Added: A Chinese Study" 2015. Earnings management (Jones model, voluntary working capital accruals) and economic value added has a significant relationship.

Research Methodology

This research is applied in terms of purpose and post-event in terms of data collection because it uses historical information from sample firms and is descriptive-correlation in data collection and inference (research design). Because some variables require prior years, this study's statistical population includes all companies listed on the Tehran Stock Exchange between 2011 and 2019. As a result, the years 2011 to 2019 have been studied. In this study, the systematic elimination procedure was used to ensure that the statistical sample represented the statistical population well. For this purpose, the following four criteria are used, and if a firm meets all of them, it is chosen as a study sample, while the others are eliminated. The company was listed on the Tehran Stock Exchange before 2011 and remained there until 2018. It is still functional.

1- Due to the distinct nature of holding, insurance, leasing, banks, financial and

investment institutions activities, and their significant differences from manufacturing and trade enterprises, the selected firms should not be among the listed companies.

2- The company's fiscal year should end on March 20, and the fiscal year should stay the same during the research period.

3- Company financial information is available.

Finally, 127 companies were chosen as a statistical sample to test hypotheses due to the abovementioned constraints.

Research variables

The following accounting information quality measures are chosen as research variables. Information quality measures were used as primary dependent variables in this study:

Profit quality method, information quality

Earnings quality was determined in Penman's (2001) model by dividing operating cash flow by net profit. The higher this ratio, the higher the profit quality.

$$EQ = \frac{CFO}{NI} \tag{1}$$

Information quality, profit stability method

The current study employs the equation proposed by Freeman, Ohlson, and Penman (1982), in which the coefficient, alpha, represents earnings stability; thus, the closer the coefficient is to one, the greater the profit stability (higher profit quality).

$$Earning_{t+1} = \alpha_0 + \delta_1 Earning_t + \upsilon_t \tag{2}$$

EARNING: The company's operating profit is equal to the profit from the activities that are the central axis of the productive activities of the company. This figure is extracted directly from the profit and loss of companies. The coefficient of explanatory variable $EARN_{i(t)}, i.e., \lambda_{1\,i}$ in the above model, which is a first-order regression model (^{AR_1}), represents the profit stability. When the value obtained for the explanatory coefficient $\lambda_{1,i}$ is closer to one; the profit stability is more excellent. When it is closer to zero, the temporality

of profit is more extraordinary.

Information caliber Profitability Prediction Method

The profit predictability measure is the standard deviation of residuals (errors) in the first-order autoregressive equation because, according to Lipe (1990), the higher the model error, the lower the profit predictability and vice versa. The aforementioned metric is computed as follows:

$$\text{Predictability} = \sqrt{\sigma^2(\varepsilon_{it})} \quad (3)$$

The above measures' larger (smaller) values indicate low (high) predictability.

Information quality Profit smoothing method

$\frac{CV\Delta I}{CV\Delta S}$ = Eckel index to calculate profit manipulation

ΔI= Profit changes over several periods

ΔS= Sales changes over several periods

CV= The coefficient of variation for the considered variable (which is obtained by dividing the considered standard deviation of the variable by the mean of the same variable). If the Eckel index is less than 1, profit manipulation has occurred.

Quality of information, method of profit relevance

The simplest model for calculating the relevance of Filip and Rafournier's (2010) profits is as follows:

$$R_{i,t} = \alpha_0 + \alpha_1 \frac{E_{it}}{P_{it-1}} + \varepsilon_{i,t} \quad (4)$$

$R_{i,t}$: Company's market return I at the end of year t

$E_{i,t}$: Profit per share of the company i at the end of year t

P_{it-1}: Market price per share of the company i at the end of year t-1

In this context, accounting profit figures are called relevant if their regression coefficient is statistically significant.

Information quality, profit transparency method

The earnings transparency measure (*TRANS* i,t) in this study, according to Barth and Clinch (2009), is equal to the R2 regression coefficient due to stock returns on earnings and change in profitability in accordance with:

$$R_{i,t} = \alpha_0 + \alpha_1 \frac{E_{i,t}}{P_{i,t-1}} + \alpha_2 \frac{\Delta E_{i,t}}{P_{i,t-1}} + \varepsilon_{i,t} \quad (5)$$

Which the variables are:

$R_{i,t}$: Annual shares return i in year t;

$E_{i,t}$: Earning per share before unusual items company i in year t;

$\Delta E_{i,t}$: Profit change per share before unusual items from year t-1 to t;

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

The quality information close proximity method

Close proximity (EQ8) is obtained using the model's net profit. This variable is calculated according to the following equation:

$$CFO_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \varepsilon_{i,t} \quad (6)$$

$CFO_{i,t}$: Operating cash flow divided by the total assets of the company

$NI_{i,t}$: Net profit divided by total assets of the company

This variable is calculated from the coefficient (β_1) of net profit ($NI_{i,t}$).

Information quality Awareness method

This variable is calculated according to the following equation:

$$RET_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \beta_2 \Delta NI_{i,t} + \varepsilon_{i,t} \quad (7)$$

$RET_{i,t}$: Twelve-month average return of company shares

$NI_{i,t}$: Net profit divided by total assets of the company

This variable is calculated from the adjusted coefficient of determination of the model.

Information quality Conservative method

The model of Givoly and Hayn (2000) was used to measure the accounting conservatism index. The Conservatism Index is calculated based on the model as follows:

Accounting conservatism= operational accruals/Total assets in the first period × (-1)

Quality of information Timeliness method

The timeliness of the financial statements is measured by the number of days between the end of the fiscal year and the date of publication of the audited financial statements.

Profit quality by Profit management method

In the modified Jones model, accruals are first calculated using the following equation:

$$TA_{t,i} = \Delta CA_{t,i} - \Delta CL_{t,i} - \Delta CASH_{t,i} + \Delta STD_{t,i} - DEP_{t,i} \quad (8)$$

After calculating the total accruals, the parameters α_3 α_2 ,α1 to determine involuntary accruals are estimated through the following equation:

$$TA_{i,t}/A_{i,t-1} = \alpha_1(1/A_{i,t-1}) + \alpha_2[(\Delta REV_{i,t} - \Delta REC)/A_{i,t-1}] + \alpha_3(PPE_{i,t}/A_{i,t}) = +\varepsilon_{i,t} \quad (9)$$

After calculating the parameters α_3 α_2, α_1 through the least squares method according to the following formula, nondiscretionary accruals (NDA) are determined through the following equation:

$$NDA_{t,i} = \alpha_1(1/A_{i,t-1}) + \alpha_2[(\Delta REV_{i,t} - \Delta REC)/A_{i,t-1}] + \alpha_3(PPE_{i,t}/A_{i,t-1}) \quad (10)$$

After determining the NDA, the discretionary accruals (DA) are determined using the following equation:

$$DA_{i,t} = (TA_{i,t}/A_{i,t-1}) - NDA_{i,t} \quad (11)$$

Where:

$TA_{i,t}$ = total accruals of Company i in year t

$\Delta REV_{i,t}$ = Change in sales revenue of company i between year t and t-1

ΔREC = Change in accounts receivable of Company i between year t and t-1

PPE_{it} = Gross property, plant, and equipment of company i in year t

$A_{it,-1}$= total book value of company assets i in year t-1

ε_{it}= Uncertain effects of random factors

$\alpha_3\ \alpha_2, \alpha_1$ = Estimated parameters of the company i

Development of hypothesis

According to financial analysts, reported earnings differ from actual profits. Profit manipulation by managers is one of the reasons for this disparity. Financial analysts attempt to assess a company's profit outlook, which refers to the combination of favorable and unfavorable net profit characteristics. In terms of profit and loss, companies with recurring accounting profits have higher profit quality than other companies. Analysts can then more reliably forecast the company's future profitability (Kharatyan et al., 2016).

Anandarjan and Hassan (2010) investigated the factors influencing the value connection of accounting profit stated in financial statements in the Middle East and North Africa. According to their findings, the level of financial reporting information disclosure and transparency, the legal environment, the source of accounting standards, and the level of company privatization all have a positive and significant relationship with the level of corporate accounting profit. According to Loughran and McDonald (2017), the information content of operating and gross profit in relatively large companies is equal. The lower the level of transparency, the higher the operating profit of information content. Based on the foregoing, it is reasonable to expect that if accounting information, particularly profit, is of higher quality, more specific information about the company's shares will be available to all investors. Furthermore, this issue will result in the low cost of obtaining company-specific information for capital market participants (Lotfi et al. 2021).

According to the preceding, the central hypothesis is developed as follows:

The main hypothesis is that information quality indicators impact economic profit more than accounting profit.

H1: Profit quality has a more significant effect on economic profit than accounting profit.

H2: Profit stability has a more significant effect on economic profit than accounting profit.

H3: Profit predictability has a more significant effect on economic profit than accounting profit.

H4: Profit smoothing has a more significant effect on economic profit than accounting profit.

H5: Profit relevance has a more significant effect on economic profit than accounting profit.

H6: Profit transparency has a more significant effect on economic profit than accounting profit.

H7: Close proximity to cash to cash has a more significant effect on economic profit than accounting profit.

H8: Awareness has a more significant effect on economic profit than accounting profit.

H9: Conservatism significantly affects economic profit more than accounting profit.

H10: Timeliness has a more significant effect on economic profit than accounting profit.

Research analysis

Descriptive statistics

The descriptive statistics of variables are shown in Table 1.

Table 1. Descriptive statistics

Variable	Mean	medium	Maximum	Minimum	standard deviation	kurtosis	skewness
Accounts receivable to assets	0.28	0.25	0.92	0	0.17	0.02	0.66
Accounts receivable to sale	0.40	0.30	4.21	0	0.36	14.51	2.71
Fixed assets to sale	0.41	0.22	16.90	0.01	0.76	206.51	11.33
Long-term debt to assets	0.07	0.04	0.93	0	0.08	16.46	3.16
Company size	14.23	14.10	20.14	10.16	1.44	1.32	0.74
Financial risk	0.58	0.59	1.56	0.03	0.20	0.51	0.5
Current debt to total assets	0.51	0.52	1.14	0.02	0.18	-0.22	0.03
Return on equity	0.16	0.24	9.48	-72.69	2.36	797.80	-26.35

Dividend ratio	0.00	0.00	0.06	0	0.00	484.71	18.83
Stock returns	0.99	0.27	24.24	-0.68	2.04	26.20	4.05
Price to earnings per share ratio	117.74	7.88	7.96	-144.87	2364.21	1107.98	33.05
Operating cash flow ratio	0.11	0.09	0.68	-0.46	0.13	1.61	0.47
Sales returns	0.15	0.10	7.80	-1.38	0.33	234.89	10.89
Operating profit margin	0.16	0.14	0.97	-1.39	0.21	7.16	-0.86
Q-Tobin	1.61	1.54	168.50	0.58	7.75	301.65	16.42
Systematic risk	0.67	0.62	5.94	-2.82	0.91	2.39	0.49
Operating cash flow risk	13.04	11.24	17.42	6.14	14.57	5.06	2.45
Stock price risk	8.24	7.32	10.52	2.35	8.75	3.26	1.43
Current assets to current debt	0.64	1.31	22.31	2.20	1.27	83.30	7.14
Current assets to total assets	0.67	0.70	0.97	0.06	0.19	-0.25	-0.68
Fixed assets to whole assets	0.24	0.20	0.93	0.1	0.17	0.93	1.12
cash to total assets ratio	0.04	0.02	0.59	0.00	0.05	19.74	3.37
Cost to sell	0.75	0.77	1.41	0.17	0.17	0.22	-0.36
Size of the audit committee	0.28	3	3	0	1.39	-0.066	-0.79
The expertise of the Audit Committee	0.53	0.66	1	0	0.38	-1.39	-0.26
Existence of an internal audit	0.78	1	1	0	0.40	0.00	-0.41
Board size	5.02	5	7	5	0.23	66.74	8.28
Board Specialty	0.31	0.2	0.8	0	0.13	1.46	0.93
Institutional owners Percentage	14.35	76.9	99.59	0	18.55	1.4	-1.2
Dual role of CEO	0.26	0	1	0	0.44	-0.85	1.07
Non-executive managers ratio	0.65	0.6	1	0	0.18	0.10	-0.19
CEO tenure	3.90	3	20	1	3.53	2.59	1.68
Independence of Audit Committee	0.26	0.33	1	0	0.22	2.65	1.11
Ownership management	63.21	68.9	99.45	0	24.05	0.13	-0.96
Family ownership	0.15	0	1	0	0.36	1.68	1.91
Governmental ownership	0.58	1	1	0	0.49	-1.86	-0.36
Board gender	0.01	0	0.4	0	0.05	11.34	3.42
Accounting profit	0.11	0.09	0.62	-0.40	0.13	1.24	0.49
Economic profit	-0.09	-0.00	1.29	-3.45	0.41	15.57	-3.17

Statistical Analysis

Independent variables importance methods based on Relief-F

In this case, the characteristics are chosen using a statistical solution. The method randomly selects a company year from this subset as a sample. Then it employs the Euclidean distance evaluation function to determine the Near Hit and Near Miss based on the sample's attributes (independent variables).

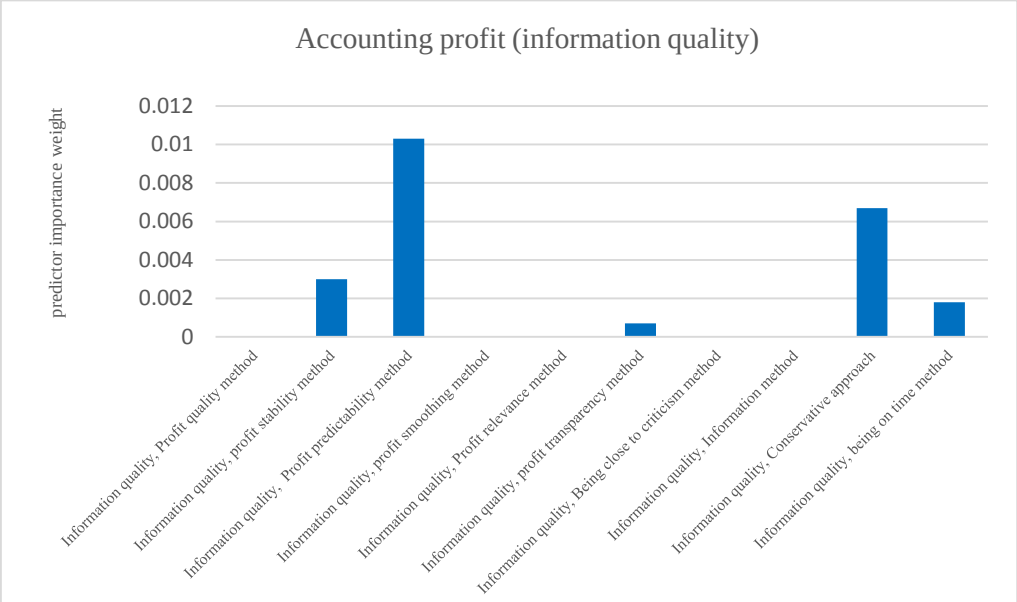

Figure 1. 5 variables from the perspective of the Relief-F algorithm in order to predict economic profit

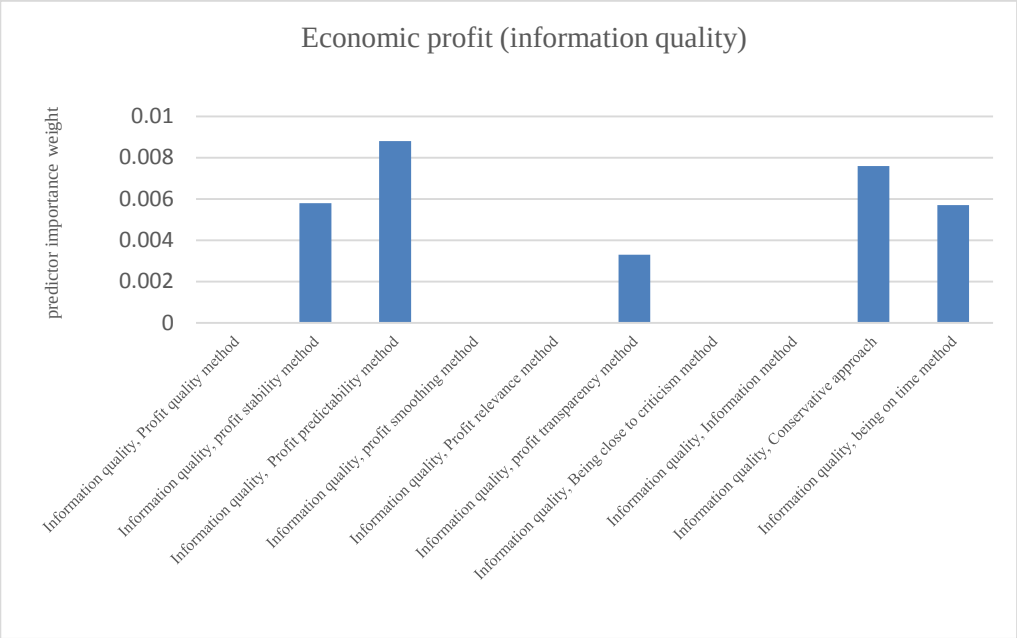

Figure 2. 5 variables from the perspective of the Relief-F algorithm in order to predict economic profit

For accounting profit variable

The variables "Information Quality of Profit Predictability Method," "Information Quality of Conservative Method," "Information Quality of Profit Stability Method," "Information Quality of Timeliness Method," and "Information Quality of Profit Transparency Method" were chosen based on the information quality criteria.

For economic profit variable

The variables "Information Quality of Profit Predictability Method," "Information Quality of Conservative Method," "Information Quality of Profit Stability Method," "Information Quality of Timeliness Method," and "Information Quality of Profit Transparency Method" were chosen based on the information quality criteria.

Lasso (Least Absolute Shrinkage and Selection Operator) algorithm

After selecting the problem's independent variables, these independent variables are fed into the operator algorithm for Shrinkage and Selection, which constructs the model with the Least Absolute value. Lasso first

introduces its model to solve the problem. The Lasso algorithm is a linear regression algorithm that produces the following linear regression model coefficients.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_p x_p \quad (12)$$

Where $x_1, x_2, ..., x_p$ are the independent variables related to a sample, and what y is the dependent variable β_j, $j = 1, ..., p$? When do the coefficients of the regression model p show the number of independent variables? These parameters are called regression model coefficients. The Lasso algorithm uses the following objective function to estimate the coefficients of the above regression model:

$$\hat{\beta}^{lasso} = \underset{\beta}{argmin} \sum_{i=1}^{N} \left(y_i - \beta_0 - \sum_{j=1}^{p} x_{ij} \beta_j \right)^2 \; subject\ to \sum_{j=1}^{p} |\beta_j| \leq t \quad (13)$$

Where N is the number of instruction samples, Lasso uses a combination of two methods to reduce the dimension of variables and to minimize the sum of modified squares. Thus, the number of parameters is controlled using a Penalty function on the sum of the absolute values of the regression model coefficients. All training samples placed in the matrices X line x_{ij} indicate the variable's value j for instruction i . In the above relation, it is assumed $n > p$ i.e., the number of pieces is greater than the number of independent variables. The proposed algorithm delves deeper into the process of selecting independent variables.

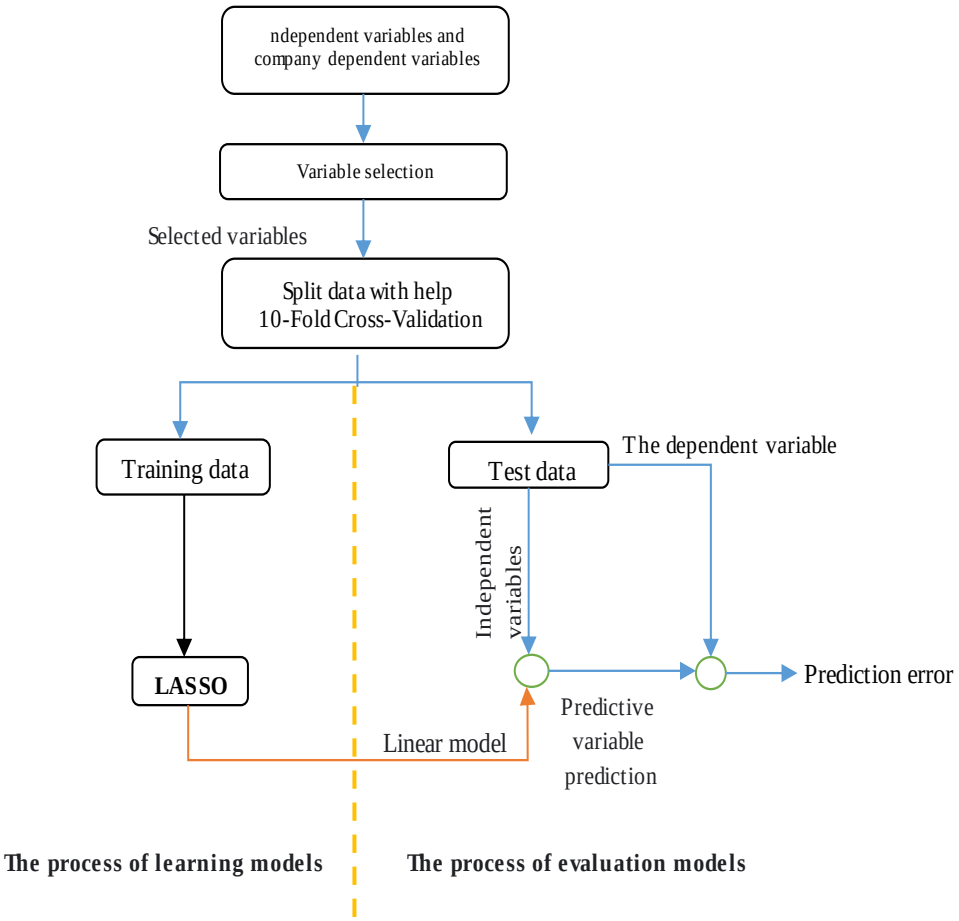

Figure 3. The performing analysis method

After dividing the company years into two groups of training validation and test data using 10-cross validation to evaluate linear and nonlinear models, two evaluation criteria called mean absolute error (MAE) and mean square error (MSE) that are calculated using the following equations have been used:

$$MAE = \frac{1}{n}\sum_{i=1}^{n}|y_i - d_i| \tag{14}$$

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(y_i - d_i)^2 \tag{15}$$

The above relations y_i d_i are the actual dependent variable and the predicted dependent variable by the models for the company year i and n show the number of company years (in the training or testing phases).

Accounting profit prediction using information quantity criteria

The results of accounting profit prediction are reported in this section using information quantity criteria.

Table 2. Lasso weight for accounting profit prediction using information quantity criteria

Accounting profit - Information quality - Next year						Accounting profit - Information quality - Current year					
Information quality Timeliness method	Information quality Conservatism method	Information quality Profit transparency method	Information quality profit predictability method	Information quality profit stability method	B+	Information quality Timeliness method	Information quality Conservatism method	Information quality Profit transparency method	Information quality profit predictability method	Information quality profit stability method	B+
-0.001	-0.113	0.014	0.742	0.008	0.118	-0.001	-0.227	0.027	0.794	0.008	0.084
-0.001	-0.128	0.019	0.771	0.006	0.117	-0.001	-0.271	0.022	0.748	0.005	0.081
-0.001	-0.116	0.005	0.706	0.004	0.129	-0.001	-0.236	0.016	0.733	0.009	0.098
-0.001	-0.111	0.018	0.734	0.002	0.126	-0.001	-0.228	0.016	0.780	0.009	0.091
-0.001	-0.130	0.025	0.751	0.005	10976	-0.001	-0.224	0.026	0.736	0.009	0.090
-0.001	-0.099	0.014	0.754	0.006	0.113	-0.001	-0.229	0.025	0.764	0.009	0.090
-0.001	-0.128	0.010	0.773	0.006	0.123	-0.001	-0.239	0.026	0.752	0.009	0.088
-0.001	-0.128	0.010	0.759	0.008	0.118	-0.001	-0.229	0.029	0.756	0.009	0.093
-0.001	-0.011	0.013	0.721	0.006	0.119	-0.001	-0.220	0.022	0.796	0.011	0.086
-0.001	-0.105	0.019	0.755	0.006	0.118	-0.001	-0.230	0.014	0.800	0.006	0.100
-0.001	-0.116	0.015	0.747	0.006	0.119	-0.001	-0.233	0.022	0.766	0.008	0.090

Table 2 shows the weights obtained for accounting profit prediction using quantity information criteria for the current and subsequent years. The table's final row shows the average consequences for ten repetitions.

Table 3. Average error criteria for evaluating the training and predictive power of the model in the current year and next year (accounting profit - quantity information)

Accounting profit - Information Quality - Training				
	MAE		MSE	
Repetition	Current year	Next year	Current year	Next year
1	0.08460	0.09618	0.01289	0.01650
2	0.08456	0.09706	0.01282	0.01639
3	0.08634	0.09529	0.01351	0.01600
4	0.08716	0.09612	0.01366	0.01652
5	0.08566	0.09621	0.01329	0.01664
6	0.08682	0.09637	0.01341	0.01624
7	0.08715	0.09542	0.01360	0.01609
8	0.08652	0.09646	0.01347	0.01670
9	0.08594	0.09704	0.01313	0.01681
10	0.08631	0.09697	0.01345	0.01673
Mean	0.08610	0.09631	0.01332	0.01646

Accounting profit - Information Quality - Evaluation				
	MAE		MSE	
Repetition	Current year	Next year	Current year	Next year
1	0.09871	0.09928	0.01741	0.01634
2	0.09934	0.09019	0.01885	0.01738
3	0.08580	0.10497	0.01193	0.02095
4	0.07763	0.09910	0.01049	0.01626
5	0.08996	0.09775	0.01386	0.01512
6	0.08019	0.09770	0.01277	0.01878
7	0.07692	0.10500	0.01105	0.02003
8	0.08443	0.09456	0.01229	0.01454
9	0.08783	0.09104	0.01536	0.01356
10	0.08747	0.09049	0.01251	0.01426
Mean	0.08683	0.09701	0.01365	0.01672

Table 3 also displays the errors obtained during the learning and assessment phases. As can be seen, the MAE error in the training phase is similar to the error in the assessment phase. With an error of 0.08683, the Lasso algorithm was able to predict accounting profit using the information quantity criterion.

Predicting economic profit using information quantity criteria

The results of economic profit prediction using quantity information criteria are reported in this section.

Table 4. Lasso weights for predicting economic profit using information quantity criteria

Accounting profit - Information quality - Next year						Accounting profit - Information quality-Current year					
Information quality Timeliness method	Information quality Conservatism method	Information quality Profit transparency method	Information quality profit predictability method	Information quality profit stability method	B+	Information quality Timeliness method	Information quality Conservatism method	Information quality Profit transparency method	Information quality profit predictability method	Information quality profit stability method	B+
-0.001	0.187	0.145	-0.348	0.005	-0.080	-0.003	0.400	0.118	-0.209	-0.008	0.095
-0.001	0.121	0.129	-0.482	0.007	-0.059	-0.003	0.384	0.117	-0.345	-0.023	0.087
-0.001	0.125	0.124	-0.276	0.013	-0.051	-0.003	0.348	0.114	-0.233	-0.011	0.095
-0.001	0.157	0.103	-0.380	0.016	-0.047	-0.003	0.401	0.152	-0.332	-0.012	0.088
-0.001	0.172	0.117	-0.392	0.009	-0.075	-0.003	0.353	0.124	-0.284	-0.005	0.078
-0.001	0.237	0.111	-0.328	0.008	-0.047	-0.003	0.403	0.126	-0.300	-0.007	0.083
-0.001	0.092	0.136	-0.141	0.022	-0.096	-0.003	0.424	0.115	-0.289	0.001	0.108
-0.001	0.140	0.126	-0.479	0.028	-0.100	-0.003	0.264	0.130	-0.240	-0.012	0.086
-0.001	0.195	0.106	-0.527	0.016	-0.034	-0.003	0.366	0.128	-0.345	-0.015	0.114
-0.001	0.193	0.104	-0.447	0.004	-0.057	-0.003	0.364	0.146	-0.431	-0.014	0.065
-0.001	0.162	0.120	-0.380	0.001	-0.065	-0.003	0.371	0.127	-0.301	-0.011	0.090

Table 4 displays the weights obtained for the current and following years to forecast economic profit using information quantity criteria. The table's final row shows the average weights for ten repetitions.

Table 5. Average error criteria for evaluating training and predictive power of the model in the current year and next year (economic profit - quantity of information)

Accounting profit - Information quality- Evaluation						Accounting profit - Information Quality - Training				
MSE		MAE				MSE		MAE		
Next year	Current year	Next year	Current year	Repetition		Next year	Current year	Next year	Current year	Repetition
0.24838	0.13608	0.27603	0.23408	1		0.18290	0.16591	0.25652	0.24511	1
0.43489	0.23022	0.37071	0.26499	2		0.16256	0.15561	0.23985	0.23954	2
0.23728	0.15835	0.26737	0.24452	3		0.18415	0.16347	0.25425	0.24452	3
0.12390	0.11712	0.22244	0.23031	4		0.19663	0.16806	0.26298	0.24718	4
0.07851	0.12254	0.20891	0.20465	5		0.20175	0.16743	0.26696	0.24881	5
0.10404	0.28419	0.23061	0.29512	6		0.19901	0.14958	0.26585	0.23556	6
0.26623	0.16457	0.28879	0.26455	7		0.18128	0.16296	0.25265	0.24182	7
0.17900	0.20419	0.26423	0.27902	8		0.19079	0.15889	0.25898	0.23590	8
0.14175	0.12219	0.23834	0.21105	9		0.19478	0.16749	0.26199	0.24701	9
0.12136	0.12130	0.24428	0.22712	10		0.19698	0.16763	0.26204	0.24578	10
0.19353	0.16608	0.26117	0.24554	Mean		0.18908	0.16270	0.25821	0.24312	Mean

Table 5 also displays the errors obtained during the learning and assessment stages. As can be seen, the MAE error in the training phase is similar to the error in the assessment phase. With an error of 0.24554, the Lasso algorithm was able to predict economic profit using information quantity criteria.

Findings

The accounting system provides specific financial facts in the form of information used to make rational decisions. Profit and its components are among the most crucial accounting data, and they are most likely valuable data for investors to make decisions. Earnings and their components have always been significant to financial reporting audiences, as evidenced by changes in how earnings are reported throughout accounting history. There is little doubt that earnings are a vital accounting system output (Hosseini et al., 2021).

This study aims to use artificial intelligence to find the best criteria for explaining economic and accounting profit. To evaluate the research assumptions, financial data from 127 firms were analyzed from 2011 to 2019. The findings revealed that the variables "earnings quality," "earnings stability," "earnings predictability," "earnings smoothing," "earnings transparency," "close proximity to cash," "awareness," "Conservatism," and "timeliness" have a significant relationship with economic and accounting profit. According to the findings, the variable "profit relevance" has no significant relationship with economic or accounting profit. The findings indicate that higher quality accounting profit increases the usefulness and improves the quality of information for investors to make decisions, i.e., the quality of profit makes accounting valuable information for decision-making. The findings of this study are consistent with those of Barua (2006). He concludes that firms with high-profit reliability relevance have greater profitability explanatory power than firms with low-profit reliability relevance. Ahmadi et al. (2006) also concluded that companies with high-profit reliability have higher profit quality.

Related research in this area can be mentioned as follows:

The results of the research of Ghanizadeh et al. (2021) entitled Recognizing the relationship between residual profit and economic value added with profit quality, indicates a significant relationship between residual profit and economic value added with profit quality. According to Ajam (2021), there is a strong relationship between the Louise model's quality of profit and economic and market value added. In contrast, no such relationship exists between the Penman model's quality of profit, economic value contributed, and market value added. Oğuz (2021) investigated the variables influencing the value connection of accounting profit reported in financial statements between the Middle East and North Africa. According to their findings, the level of financial reporting information disclosure and transparency, the legal environment, the source of accounting standards, and the level of company

privatization all have a positive and significant relationship with the level of corporate accounting profitAccording to Nobakht et al. (2021), high-profit quality makes accounting valuable information for users making decisions. According to Nikoomaram et al. (2010), when users of accounting information make decisions, they emphasize reliability more than relevance, and information about profit quality is not reflected in their decisions. Furthermore, based on the theoretical foundations of the research, the following studies can be considered similar and related; Lim et al. (2015), Abedini et al. (2014), Wang et al. (2015), Aflatooni (2015), Nakhaei (2018), Jamei et al. (2020), Lotfi and Delshad (2021), Ahmadi et al. (2021) and Nobakht et al. (2021).

Discussion and Conclusion

According to the findings, investors, shareholders, and managers should assess the impact of the quality of accounting information calculated using various evaluation criteria. Also, to make efficient decisions, combine economic value added and its components with other net profit criteria. Managers of the Tehran Stock Exchange are advised to encourage companies to inform and disclose additional information to prevent inefficient allocation of limited capital market resources and the occurrence of reverse selection. Analysts and other stakeholders should pay closer attention to the quality of primarily published profit accounting data and incorporate it into their decision-making models.

In order to provide more transparency in the presentation of financial information on stock prices, financial analysts' involvement in financial intermediation in stock trading must be increased. Accounting information users need to be aware of the importance of relevance. As a result, users are advised to pay close attention to this crucial feature when deciding. A more in-depth examination of the reasons for the failure to confirm the relationship between the relevant variable and accounting benefits. Researchers are looking into the relationship between information openness and accounting profit information content in a specific industry.

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