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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

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APPENDIX/ANNEXURE

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- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, KurukshetraUniversity, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

USING ARTIFICIAL NEURAL NETWORKS TO EXAMINE SEMIOTIC THEORIES OF ACCOUNTING ACCRUALS IN TEHRAN STOCK EXCHANGE

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ABSTRACT

*The main objective of accounting is to report information. However, few studies have examined the nature of accounting information service. Thus, this study use semiotics, a theory of signs and signals to examine the informational content and efficiency of accruals through a method which based on prediction-artificial neural network. This research focus on two basic theories: **1**.The functions of accounting accruals and **2**. Theory of the Pragmatic of Information of accounting accruals examines informational content of accounting accruals by comparing the capability to predict future cash flow by considering cash-flow accounting data and accruals accounting data. The backpropagation artificial neural network has been furthermore considered in order to predict future cash flow. The results indicate that syntactic and semantic accruals have information value (informational content) to predict future cash flows. Thus, they will strengthen the information and reporting aspects of accounting, confirming the semiotic theories of accounting accruals.*

KEYWORDS

Semiotic theories of accounting accruals, Syntactic accounting accruals, Semantic accounting accruals, Theory of the pragmatic information of accounting accruals, Theory of the functions of accounting accruals.

INTRODUCTION

In today's world where logical thinking and reasoning is more common and applicable than any other periods, accounting can never remain as one of the worldwide sciences regardless of theoretical framework and foundations. The fact that fact that sciences like physics and chemistry have progressed and outran other sciences is due to the discursive and logical basis of these sciences and accounting has to organize its genesis basis theoretically and scientifically so that it can remain among the worldwide live sciences. Shamakhi et al (***2000***).

Accounting theory is a logical reasoning system that provides a framework so as to create inclusive principles. These principles are used both to evaluate accounting function and as a guideline to develop new accounting procedures. ghaemi (***1996***).

Since accounting may be considered as a kind of language, evolution of the financial reporting aspects should be a part of the accounting system evolution. The theories which describe the reporting process should improve the significance of accounting reporting, i.e. accounting reports and their components. Accruals are one of the components of accounting reports which can be reviewed through reporting theory .Etheridge et al (***2004***).

Accruals accounting has a decisire role to play in the process of evaluation, because they minimize the problems of timing and non-compliance hidden in cash figures. However, reliability and usefulness of accruals are dubitable, because considering the subjective and estimative nature of these accruals; managers are able to manipulate them to adjust the reported earnings consistent with the accepted accounting principles according to their own desire. Hence, despite the consensus on the usefulness of accruals in prediction and decision-making, it has some importance among the experts. Arabmazar et al (***2006***).

However, the efforts of Accounting Standards Board in reducing the accepted accounting procedures, the importance of auditors' reports and etc. are solutions that have been considered in recent decades.

THEORETICAL FOUNDATIONS AND REVIEW OF LITERATURE

Accruals accounting system accomplishes financial events in time and identifies them regardless of time of receipt or payment of the respective cash. If in a cash accounting system, the entering or exiting cash is the identification criterion, in the conditions that the time of occurrence of economic event is different from the time of entering or exiting the cash, the accrual system always provides more information for financial information users. This additional information that are accruals signs, are signs and signals of the events that will occur in the future. In other words, due to the treatment and disclosure of financial events, accrual accounting provides surprise value information which provides more accurate predictions on future conditions and especially prediction of future cash flows through sending signs and signals to information users.

The subject of semiotics is data exchange or in other words, "Communication". Semiotics reviews "implication". Thus, it can be considered as a central branch of the organized knowledge of communication. Knowledge of communication mainly discusses message. Message is a sign or a series of signs which are transferred from a signs' source to a specific sign receiver or a destination. Seboek (***1944***).

With a focus on linguistic aspects of financial information, Semiotic Theories of Accounting Accruals examine the signs and signals of accruals as a linguistic element in accounting with capability of data transference.

Given the stated facts and the definition that accounting is the language of business, we will first compare language generally and accounting as the language of business.

Every language must respond to the questions of what is the reason of words. What is the meaning of words? How they affect the audience? The answer to each of the mentioned questions presents one of the separate classes of theory.

1. Syntactic Theories: Theories which explain the rules and how to prepare words.
2. Semantic Theories: Theories which help us explain, interpret and analyze words.
3. Theory of the Pragmatic Information: The theory which helps the effectiveness of words on the audience. Khatami (1998).

Accounting as the language of business, must also respond to the questions of what are the rules of financial information preparation? What is the meaning of reported financial information? And how does financial information effect users? Hence:

1. Syntactic theories: Theories which explain the rules and how to prepare financial information.
2. Semantic theories: Theories which help us explain and interpret financial information.
3. Theory of the Pragmatic Information: through applying certain rules, we collect and report information or explain the meanings of information, for the purpose of influencing users of financial information and their decision-making. The theory which helps us in the influence of financial information on users is called the theory of pragmatic information. Shabahang (***1998***).

Since accruals are among the components of financial reports, these theories can be generalized for accruals as well, therefore:

Accruals syntactic theory: the theory which explains that how accruals should be prepared and tries to describe the current accounting procedures on accruals and is related to the structure of the process of collecting data and information.

Accruals semantic theory: the theory which helps us to explain, interpret and analyze accruals.

Theory of the Pragmatic of Information of accounting accruals: Applying certain rules, we collect and report some information or explain the meanings of information, for the purpose of influencing users of financial information and their decision-making. The theory which helps us in the influence of accruals on users is called theory of the pragmatic of Information of accounting accruals.

THEORY OF THE FUNCTIONS OF ACCOUNTING ACCRUALS

Accruals are mostly considered as the indicators of the difference between accounting and its cash component. Aliabadi (***2009***). In other words, it is the difference between timing of cash flows and timing of transactions identification.

But the definition' describing the nature of accruals suggests that they are created premature items. In recognition of some accruals such as receivables and payables, it is enough to consider the rules and principles which are based on accrual assumption. However, it is not always the same. Sometimes, financial events mislead financial information if addressed syntactically. Therefore, the identification criterion in these cases is their economic content, such as depreciation. Hence, examining financial events, the theory of the functions of accounting accruals divides accruals into two categories of syntactic and semantic accruals, according to their functions.

A) Syntactic accruals (rules and definitions) are the product of syntactic theories' determining how information should be prepared and trying to describe the current accounting procedures and are related to the process of collecting data and information. These accruals report that part of financial events that although occurred, the cycle of receipt or payment of the cash from them is unfinished.

The Logic for this classification is that syntactics is pertained to the "surprise value" of information, and accruals that reverberates economic events not reported under cash-flow accounting should possess "surprise value" relative to the associated cash-flow data. Etheridge et al (***2004***).

B) Semantic accruals (associated with the economic facts), is resulted from interpretation and analysis of economic events that mislead financial information if addressed syntactically. Accounting and financial reporting emphasize the economic content of functions and events, although the form of actions and events is inconsistent with their content and will require another way of action. For example, purchase of long life equipment to disclose this event can be addressed in two ways:

1. Syntactic → Belief in the influence of this event only on the occurrence period

2. Semantic → Belief in the influence of this event on the period of assets exploitation

Addressing syntactically means to accept that the assets have profit only in the purchase period and after that they will become unsuitable and remain unused. But the fact is that only in exceptional conditions (floods, earthquakes, fires, etc.); assets are likely to be unsuitable and have usually a long life. We use assets during their life cycles. However, the obtained benefits are decreasing due to their depreciation. Thus, it is very clear that allocation of costs to the purchase period and use of their interests to the asset exploitation period, are defective of the applied information system. On the other hand, when we consider assets purchase in the purchase period as costs, inconsistency between the obtained revenues and the imposed costs causes inflation of costs during the occurrence period and makes the profits low, so that we would not have a correct interpretation of the management function, status of the economic unit and etc. In addition, identification of benefits alone in future periods, will create a tentative income. This, on the one hand, provides wrong information on the financial information users and on the other hand, the main capital will be divided if the profit is supposed to be dividend.

Generally in structural approach, economic events that affect only the current period "discrete" and does not reflect that these economic events affect firm's future cash flows and future performance "are continuous". Etheridge et al (***2004***).

THEORY OF THE PRAGMATIC INFORMATION OF ACCOUNTING ACCRUALS

Identification of the effects of accruals on entry and exit of future cash flows through semiotics, which is possible by decoding financial information, will allow more accurate prediction of the expected cash flow. Each of the various accruals has a different effect on the future cash flows which is caused by the difference in their function.

The theory of the pragmatic information of accounting accruals expresses why accounting accruals Includes pragmatic information In other words, valuable. Three axioms are used to comprehend the theory of the pragmatic information of accounting accruals:

Axiom ***1***: Adding up of syntactic accruals to cash-flow data can improve prediction of future cash flows***.***

Axiom ***2***: Adding up of semantic accruals to cash-flow data can improve prediction of future cash flows***.***

Axiom ***3***: Data that was added to cash-flow data and future cash flow forecasts are to improve contains pragmatic information***.***

Axiom ***1*** and Axiom ***2*** are insulate from the Financial Accounting Standards Board's (FASB's) position in the Statement of Financial Accounting Concepts (SFAC) No. ***1***. The content of this statement is that accounting accruals cooperation financial statement users in forecasting future cash flows.

The FASB (***1978***, ***21***) states that investors' and creditors' . . . interest in an enterprise's future cash flows and its ability to generate favorable cash flows leads primarily to an interest in information about its earnings rather than information directly about its cash flows. . . accrual accounting generally provides a better indication of enterprise performance than information about current cash receipts and payments.

Axiom 3 is derived from the FASB's position in SFAC No. ***1*** that data which forecast future cash flows for financial statement users is useful (provides pragmatic information) to investors and creditors. The FASB (***1978***, ***17-19***) Insists that:

. . . Financial reporting should provide information to help investors, creditors, and others assess the amounts, timing, and uncertainty of prospective cash inflows . . .

. . . Investors, creditors, and others need information to help them form rational expectations about . . . prospective cash receipts and assess the risk that the amounts or timing of the receipts may differ from expectations. Etheridge et al (***2004***).

Sterling has presented "Usefulness" of information for accounting system planning and suggests that given the diversity of the groups using accounting information and the diversity of their information needs and lack of possibility to provide all their required information, application of the above criterion allows us to emphasize a variety of information in the accounting system, the effectiveness of which has been proven to fulfill the goals of decision makers. Tehrani et al (***2008***).

Proponents of prediction-based accounting theory also use "usefulness criterion in prediction" to develop accounting theory, based on which choosing among accounting procedures depends on the ability of specific methods, in terms of prediction of users' events of interest. It means that in an intended event, an event with the highest predictive power is known as the best method for that specific purpose. According to this point of view, those accounting figures and numbers which can help accounting products users to predict their desired events, have information content (Ibid).

On the other hand, given the relative freedom of managers to use different methods legally in the framework of the general ledger generally accepted accounting principles, it seems that the accruals are resulted from the manager's impetuous practices in identification, registration and reporting events as well as managers' capital in the distortion of financial statements .Hashemi et al (***2010***).

Hence, reliability and usefulness of accruals are very much in doubt.

However, through efforts to reduce the accounting procedures and information asymmetry among the accounting information users and employing well reputed practice offices, the investors can be protected against manipulation and management of earnings, which according to Schafer, is the targeted involvement of managers in the process of extra-organizational financial reporting in order to achieve personal interests. Accordingly, some of the most important studies related to this research will be discussed.

Ali Saghafi (***2004***), has analytically examined the operating cash flows and historical earnings as well as their components. The study results indicate that there is a significant relationship between the operating cash flows and accounting earnings and their components. Overall, the findings of this research are consistent with the theory of ability of accounting earnings and its components in prediction of operating cash flows as well as the theory of superiority of earnings ability to cash flows in prediction of cash flows.

Arab Mazar Yazdi et al (***2006***), have examined the information content of cash flows and accruals in capital market of Iran. The results suggest that earnings have greater information content than operating cash flows. On the other hand, other studies conducted in this research indicates the increasing information content of accruals compared to the operating cash flows, which is more represented through breakdown of total accruals into its discretionary and non-discretionary components, as well as the increasing information load of discretionary accruals compared to non-discretionary accruals.

In a study, Syed Abbas Hashemi et al (***2010***), assessed the ability of cash and accrual components of earnings in prediction of abnormal earnings and determination of the value of the companies listed in Stock Exchange. The study results represent the ability of cash flows and total accruals in determining the value of company and predicting abnormal earnings. Another result of this study indicates that the components of accruals have the ability to predict abnormal earnings. However, at the level of the selected sample, only some of the coefficients of accruals components are statistically significant.

Howe et al (***2001***), have examined the information content of accruals and cash flows and has indicated that earnings have more information content than the operating cash flows, because earnings include accruals. Another result of this study indicates more stability and predictability of earnings than that of operating cash flows.

Through an investigation, Barth et al (***2005***), realized that dividing earnings into two components of accruals and cash flows or into five components including cash flows, and four accruals components, reduces the average prediction error and thereby, helps to predict the value of the company.

Bracket et al (***2007***), realized that the average absolute prediction errors for future cash flows when accruals are added as a predictor of operating cash flows, is smaller than when the cash flows from operations are used alone as a predictor.

Hollister et al (***2008***), have conducted their studies in ***9*** countries and showed that the accrual components of accounting earnings provide increasing information in explaining the operating cash flows of the next year.

Through an investigation, El-Sayed Ebaid (***2011***), realized that aggregate earnings have superior predictive ability than cash flows for future cash flows. Also, the results reveal that disaggregating accruals into major components – changes in accounts receivable and payable, and in inventory, depreciation, amortization, and other accruals – significantly enhances predictive ability of earnings.

Arnedo et al (***2011***), in the research has been to analyze the role of accruals in a private dominated setting, namely the Spanish one And they found that that accruals do play a role in directly predicting future cash flows in Spain, a country that used the accounting reform that resulted from the implementation of EU directives (***1990***) to eliminate the traditional link between taxation and financial laws and, since then, has had a highly regulated accounting framework they have also found that the importance of accruals increases significantly for large and growing firms and for firms with persistent earnings and decreases with failure probability and accruals subjectivity. Finally, they also empirically defend that Barth et al. (***2001***)'s earnings decomposition in current cash flow plus five individual accruals categories produces lower prediction errors than both the use of aggregate earnings and of a more simple disaggregation into short and long term.

RESEARCH HYPOTHESES

Hypothesis ***1***: Adding up of syntactic accruals to cash items can improve prediction of future operating cash flows.
Hypothesis ***2***: Adding up of semantic accruals to cash items can improve prediction of future operating cash flows.
Hypothesis ***3***: Adding up of syntactic and semantic accruals together to cash items can improve prediction of future operating cash flows.
Hypothesis ***4***: Syntactic and semantic accruals equally improve prediction of future operating cash flows.

SAMPLE SELECTION AND DATA COLLECTION

Statistical population of this research includes the companies listed in Stock Exchange. Due to the high volume of statistical population, the following conditions were considered for selection of the statistical population:

1.The company should be listed in Stock Exchange from the beginning of 2007 financial year.
2. The financial year of the company should terminate at the end of March, every year.
3. The company should not change the financial year from 2007 to 2009.
4. The company should not be a financial trading company or an investment company.
5. Stabilization of procedure should be observed during the studied period during 2007 to 2009.
6. Operating cash flows, accrual components of earnings and balance sheet data should be available for all under test periods.

Among the companies that have the above conditions, a total of ***60*** companies were selected during 2007 to 2009. The following data were collected for each company:

Cash - flow accounting data***:*** Cash and Operational flows

Syntactic accounting accruals: Receivables - total, Receivables - Increase (Decrease), Accounts payable and deferred expense - total, Accounts payable and deferred expense - Increase (Decrease), Advances from customers – total.

Semantic accounting accruals: Advances from customers - Increase (Decrease), Prepaid expense - total, Prepaid expense - Increase (Decrease), Orders, Inventories - total, Inventories - Increase (Decrease), Depreciation and amortization, Compensated absences.

RESEARCH METHOD

This study is inductive in terms of the logic used; it is also a field and library-based study in terms of the type of research and is applied in terms of its results. Theory of the Pragmatic of Information of accounting accruals relies on the theory of the functions of accounting accruals to classify accruals according to their functions and thus, direct test of the theory of the pragmatic of information of accounting accruals leads to indirect test of the theory of the functions of

accounting accruals. The pragmatic of information of accounting accruals cannot be directly tested. The information content representative in this study is the increase of accuracy of prediction of the future cash flow from operations. As Financial Accounting Standards Board argues in Statement No. ***1***, the data that enhance accuracy of prediction of future operating cash flows for financial statements users have information content. Therefore, increase of the accuracy of prediction of the future cash flow from operations is selected as representative of accruals information content. Comparing the accuracy of prediction of future cash flows based on accruals and cash items accurately predict future cash flows based on accruals and cash items, the information content of accruals can be determined. The ability to predict future operating cash flow is measured through the following Error Metric:

Error Metric= (The predicted operating cash flow - The actual operating cash flow)

The actual operating cash flow

Back Propagation artificial neural network is used to organize the relationship between dependent and independent variables and to predict future operating cash flow. The network was examined and tested for each independent variable through the data in 2007 and operating cash flow in 2008 (dependent variable). The operating cash flow in 2009 was predicted for four independent variables using the trained network and financial data of 2008. The Error Metric of each prediction (the ability to predict future operating cash flow) was calculated and analyzed. To determine the appropriate test method in inferential statistics, the most basic assumption is to examine the normality of observations we have collected. It was performed through Kolmogorov–Smirnov test and considering the abnormality of observations, nonparametric statistical methods, specifically wilcoxon test were used. However, parametric methods such as correlation analysis and Student's t-test were also used to confirm the results of nonparametric methods.

DATA ANALYSIS

The results of the descriptive statistics are presented in Table ***1***. However, for more appropriate review, remote observations relating to Iranian textile industry, Kosar Pharmaceutical and Damavand Mineral Companies were removed from the list of observations.

TABLE 1: DESCRIPTIVE STATISTICS FOR THE OBSERVATIONS

Descriptive criteria Group	Total	Average	Minimum	Maximum	Standard deviation	Skewness coefficient
Error Metric of prediction of future operating cash flow considering cash items	*57*	*0.5923*	*0.0116*	*3.3699*	*0.6515*	*2.204*
Error Metric of prediction of future operating cash flow considering cash items and syntactic accruals	*57*	*0.3005*	*0.0101*	*0.9798*	*0.2644*	*1.170*
Error Metric of prediction of future operating cash flow considering cash items and semantic accruals	*57*	*0.2507*	*0.0043*	*2.1434*	*0.3293*	*3.959*
Error Metric of prediction of future operating cash flow considering cash items and syntactic and semantic accruals	*57*	*0.1848*	*0.0023*	*0.9972*	*0.1983*	*2.628*

In order to determine the appropriate test method in inferential statistics, the most basic assumption is to examine the normality of observations we have collected. It was performed through Kolmogorov–Smirnov test, the results of which are presented in Table ***2***.

TABLE 2: ONE-SAMPLE KOLMOGOROV-SMIRNOV TEST

Normality test [1]		Error Metric related to adding syntactic accruals to cash items	Error Metric related to adding semantic accruals to cash items	Error Metric related to adding syntactic and semantic accruals to cash items	Error Metric associated with considering only cash items
Normal parameters	Mean	*0.216*	*0.375*	*1.466*	*1.546*
	Standard deviation	*0.263*	*0.823*	*8.598*	*7.789*
Smallest upper bounds	Absolute value D_n	*0.222*	*0.342*	*0.473*	*0.400*
	D_n^+	*0.222*	*0.342*	*0.473*	*0.400*
	D_n^-	*-0.207*	*-0.326*	*-0.433*	*-0.395*
Z		*1.718*	*2.649*	*3.660*	*3.100*
p-value		*0.005*	*0.000*	*0.000*	*0.000*

In all four cases in the above Table, the significance level is lower than ***0.05*** (*P< **0.05***). Thus, the normality hypothesis will be rejected in all cases and in fact caution should be taken in using classic tests. Therefore, nonparametric methods should be used in inferential statistics. To evaluate the hypotheses using nonparametric methods, Wilcoxon test is used the results of which are presented as follows.

This study intends to explore the difference of Error Metric of operating cash flow considering cash items, and Error Metric of operating cash flow considering cash items along with syntactic and semantic accruals, which are respectively and separately evaluated in three hypotheses. In general, these hypotheses were formulated as follows:

$$\begin{cases} H_\circ: \mu_1 - \mu_j \leq \circ \\ H_1: \mu_1 - \mu_j > \circ \end{cases}$$

In The fourth hypothesis, the Error Metric of prediction of operating cash flow is compared when syntactic and semantic accruals are added to cash items.

$$\begin{cases} H_\circ: \mu_1 - \mu_j = \circ \\ H_1: \mu_1 - \mu_j \neq \circ \end{cases}$$

It is related to Error Metric of operating cash flow by only considering the cash items and Error Metric of operating cash flow by considering cash items along with syntactic, semantic accruals, and both (it is respectively for the first, second and third hypotheses).

***1*) FIRST HYPOTHESIS**

The results of Table ***1*** indicate that the calculated test statistic of the differences of Error Metric of prediction of operating cash flow in two modes (considering only cash items - considering cash items added with syntactic accruals) is equal to ***4.215***. Also, given that the significance level is ***0.00*** and less than ***0.05*** (*P< **0.05***), with the probability of ***0.95***, we conclude that there is a significant difference between the Error Metric of the prediction of operating cash flow in both modes (considering only cash items - considering cash items added with syntactic accruals).

[1] One-Sample Kolmogorov-Smirnov Test

TABLE3: WILCOXON TEST FOR DIFFERENCES OF ERROR METRIC OF THE PREDICTION OF OPERATING CASH FLOW IN TWO MODES (CONSIDERING ONLY CASH ITEMS - CONSIDERING CASH ITEMS ADDED WITH SYNTACTIC ACCRUALS)

Test Statistics[b]	
	differences of Error Metric of the prediction of operating cash flow in two modes (considering only cash items - considering cash items added with syntactic accruals)
Test Statistics	[a] -5.510
Asymp. Sig. (2-tailed)	0.000
a. Based on positive ranks.	
b. Wilcoxon Signed Ranks Test	

2) SECOND HYPOTHESIS

The results of Table **4** indicate that the calculated test statistic of the differences of Error Metric of the prediction of operating cash flow in two modes (considering only cash items - considering cash items added with semantic accruals) is equal to **-5.51**. Also, given that the significance level is **0.00** and less than **0.05** (*P*< **0.05**), with the probability of **0.95**, we conclude that there is a significant difference between the Error Metric in both modes (difference of the Error Metric of prediction of operating cash flow in two modes of considering only cash items and considering cash items added with semantic accruals).

TABLE 4: WILCOXON TEST FOR DIFFERENCES OF ERROR METRIC OF THE PREDICTION OF OPERATING CASH FLOW IN TWO MODES (CONSIDERING ONLY CASH ITEMS - CONSIDERING CASH ITEMS ADDED WITH SEMANTIC ACCRUALS)

Test Statistics[b]	
	differences of Error Metric of the prediction of operating cash flow in two modes (considering only cash items - considering cash items added with semantic accruals)
Test Statistics	[a] -4.215
Asymp. Sig. (2-tailed)	0.000
a. Based on positive ranks.	
b. Wilcoxon Signed Ranks Test	

3) THIRD HYPOTHESIS

The results of Table **5** indicate that the calculated test statistic of the differences of Error Metric of the prediction of operating cash flow in two modes (considering only cash items - considering cash items added with syntactic and semantic accruals) is equal to **-5.375**. Also, given that the significance level is **0.00** and less than **0.05** (*P*< **0.05**), with the probability of **0.95**, we conclude that there is a significant difference between the Error Metric of the prediction of operating cash flow in both modes (considering only cash items - considering cash items added with syntactic and semantic accruals).

TABLE 5: WILCOXON TEST FOR DIFFERENCES OF ERROR METRIC OF THE PREDICTION OF OPERATING CASH FLOW IN TWO MODES (CONSIDERING ONLY CASH ITEMS - CONSIDERING CASH ITEMS ADDED WITH SYNTACTIC AND SEMANTIC ACCRUALS)

Test Statistics[b]	
	differences of Error Metric of the prediction of operating cash flow in two modes (considering only cash items - considering cash items added with syntactic and semantic accruals)
Test Statistics	[a] -5.375
Asymp. Sig. (2-tailed)	0.000
a. Based on positive ranks.	
b. Wilcoxon Signed Ranks Test	

4) FOURTH HYPOTHESIS

In order to examine this hypothesis, the Error Metric for prediction of operating cash flow with adding up of syntactic accruals to cash items was compared with the Error Metric for prediction of operating cash flow with adding up of semantic accruals to cash items using Student's t-test, the results of which are presented in table **4** and **5**.

TABLE 6: EVALUATION OF THE CORRELATION OF ERROR METRIC FOR PREDICTION OF OPERATING CASH FLOW WITH ADDING UP OF SYNTACTIC ACCRUALS TO CASH ITEMS AND THE ERROR METRIC FOR PREDICTION OF OPERATING CASH FLOW WITH ADDING UP OF SEMANTIC ACCRUALS TO CASH ITEMS

Total	The correlation coefficient	Significance level
58	0.906	0.00

The results of Table **4** indicate that the calculated correlation between the Error Metric of the prediction of operating cash flow with adding up of syntactic accruals to cash items and the Error Metric for prediction of operating cash flow with adding up of semantic accruals to cash items is equal to **0.906**. Also, given that the significance level is **0.00** and less than **0.05** (p< **0.05**), with the probability of **0.95**, we conclude that there is a significant linear relationship between the Error Metric in the two mentioned modes. To compare the effect of adding syntactic and semantic accruals, the paired t-test is used the results of which are presented in table **5**.

TABLE 7: EVALUATION OF THE CORRELATION OF ERROR METRIC FOR PREDICTION OF OPERATING CASH FLOW WITH ADDITION OF SYNTACTIC ACCRUALS TO CASH ITEMS AND THE ERROR METRIC FOR PREDICTION OF OPERATING CASH FLOW WITH ADDITION OF SEMANTIC ACCRUALS TO CASH ITEMS

	The mean difference	Standard deviation	The test statistic	Degrees of freedom	Significance level
Subtracting the Error Metric	0.0498	0.321	1.18	57	0.243

The results of Table **5** indicate that the amount of the statistics calculated is **1.118** and less than t-statistic criterion (**1.96**). Therefore, considering the collected data and significance of Zero hypothesis, we conclude that the researcher's claim suggesting that syntactic and semantic accruals are equally effective in improving the prediction of future operating cash flows, will be confirmed.

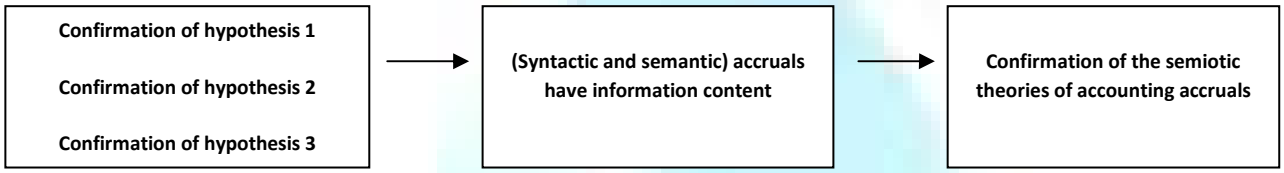
CONCLUSIONS

The average prediction error of operating cash flow which is predicted in four modes by considering only cash items, cash items added to syntactic accruals, and semantic accruals and both, will be respectively reduced. The best prediction is related to the operating cash flow in Rose Daru Company, with error of **0.23**%, which is almost close to zero. The minimal percentage of error reveals the strength of accruals in prediction of operating cash flows; because the average prediction error is reduced by adding accruals. According to the Statement of Financial Accounting Standards Board and Standards Committee of Iran, any information that will improve cash flow prediction has information content. Thus, it can be concluded that increase in accuracy of cash flows prediction indicates the information content of accruals. The comparison of standard deviation of four types of prediction also shows that accuracy of the fourth type of cash operating flows prediction has less standard deviation than others. Standard deviation in the second and third types of prediction is far more than the fourth

type, because only one type of accruals is considered in each prediction and standard deviation is also very high in the first prediction, due to elimination of accruals. Considering more accruals in predictions, the sample will be more homogeneous and more consistent, consequently density of errors will be increased around the mean, and thus, error fluctuation will be reduced. Finally, the selection of added information will move on the right direction.

The remarkable issue in this study about the other dispersion index, i.e. skewness coefficient is that unlike the other results, it does not follow a specific rule. Its high level also indicates abnormality of the distribution. The causes of abnormality of distribution cannot be exactly discussed the main reason of which is perhaps sample selection from various industries. However, due to the low number of companies in each industry, there is practically no other choice. Abundant economic fluctuations in ***2008*** and their different effects on industries can strengthen this possibility. The following chart shows stock index changes during 2007 -***201***0**.**

As mentioned in previous sections, the results of testing the first three hypotheses of research are as follows:



Hypothesis ***4*** of this research also suggests that syntactic and semantic accruals are equally effective in improving the prediction level of future operating cash flows. It means that the information contents of syntactic and semantic accruals are almost at the same level. Many studies have examined the information content of accruals. The result of such studies has confirmed the information content of accruals in prediction of operating cash flow, return on equity, abnormal earnings, company's value and company's valuation. However, the only study which has specifically tested semiotic theories of accounting accruals is a study conducted by Etheridge and Hsu in ***2004***. However, presenting the information content of accruals in prediction of future operating cash flow in this study, the researchers confirmed the semiotic theories of accounting accruals. This study is inconsistent with the research of Etheridge and Hsu in terms of data types used in prediction of operating cash flow, which results from different divisions in the classification of cash flow statement (in Iran: five classifications and in Etheridge and Hsu research: three classifications) and the definition of cash (in Iran, cash equivalents are not considered cash).

SCOPE FOR FURTHER RESEARCH

According to the results of this study, the managers, investors, creditors and analysts are recommend to scrutinize accruals in making their decisions and predictions, because accruals have information content and surprise value due to the full disclosure of an economic events, thus, they make a clearer picture of the future. Meanwhile, the following recommendations are presented in order to be applied in further studies:

1) Testing of the semiotic theories of accounting accruals and Genetic Algorithms

2) Testing of the semiotic theories of accounting accruals and fuzzy logic

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