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Investigating the Relationship between Accounting earning and Gross Domestic Product in Companies Listed in Tehran Stock Exchange

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ABSTRACT

Accounting earning represents the positive performance of companies during their pertinent financial periods, thus it is assumed that accounting earning will be noted by investors, which could contribute to the optimum allocation of resources to successful companies. It can also play a major role in the economic growth and development of a society. This research focuses in the relationship between accounting earning and gross domestic product (GPD). The research population includes all companies listed in Tehran Stock Exchange. Due to the limitations of sample size, 65 companies between 2009 and 2013 were studied. The findings showed that there is a significant relationship between accounting earning and GPD growth rate. A similar relationship was also observed between accounting earning and forecast errors of GPD growth. The control variables including inflation and employment rate had a significant relationship with GPD growth rate and forecast errors of GPD growth.

1. Introduction

One of the objectives of financial reporting is to present information to help investors, creditors and other potential users make decisions on investment, crediting and other relevant issues. Current and past profits are vital criteria for the mentioned groups to estimate profitability, associated risks and management performance. Financial reporting is the most important product of accounting system as an information system and a subcategory of management information system. The most significant goal of financial reporting is to provide information necessary for the evaluation of the performance and profitability of the enterprise's capabilities [2]. Net profit is one of the accounting items presented

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in terms of profit and loss in a financial report. Financial reports give information on the amount of profit and its constituents, which is of interest to the users of financial statements.
Investors, creditors, managers, employers, analysts, government and other users of financial statements use profit as their basis to make decisions on investment, giving loans, dividend policy, corporate evaluation, tax estimation and other decisions related to a company [8]. On the other hand, gross domestic product (GPD) is a very important macroeconomic variable and indicator. The aim of this study is to determine the relationship between accounting earning and gross domestic product in companies listed in Tehran Stock Exchange.
Although many studies have provided evidence on the information content of companies accounting data [6, 10], we have witnessed that no study has yet addressed the relationship between accounting earning and gross domestic product.

2. Literature Review

Cheung and Ng [7] used Johansen co-integration test to analyze quarterly data of Canada, Germany, Italy, Japan and US. They found that there is a long run comovement between stock market indexes and measures of aggregate realactivity including the real oil price, real consumption, real money, and real GPD in these five countries.

Lili and Zviliv[11] in their new study entitled as Responses of the Stock Market to Macroeconomic Announcements across Economic States, analyzed the impact of macroeconomic news on US stock market under different economic conditions. They mapped the effect unpredicted changes on economic variables including money supply, the discount rate and real economic activity on stock market. With respect to money, their findings indicated that the sudden increase of money leads to the immediate increase of interest rate. The raise of interest rate reduces the present value of future cash flows and consequently decreases stock price.
Maysami and Koh[12] used monthly data in the form of time series andJohansen co-integration test in vector error correction model to study the long run relationship between stock market index in Malaysia and a collection of macroeconomic variables. The findings showed that changes in US and Japan stock market have a significant impact on Singapore stock market, especially since Singapore stock market has a long run positive relationship with the stock market of the both countries.
Ferdousi et al, [9] carried out a research in Bangladesh to analyze the relationship between development of the banking sector and GDP growth rate. The findings of the research between 1990 and 2001 showed that the policy makers should make decisions to take effective measure with the goal of improving the economy in terms of cost and expenses.
Panos and Yaniv[5] research, entitled as Accounting Earnings and Gross Domestic Product showed that accounting earnings could predict GPD growth.
Karimzadeh[4] studied the long-term relationship between the stock price index of Tehran Stock Exchange and monetary macroeconomic variables. To fulfill this objective, monthly data (1991-2003) of Stock price index variables, liquidity, exchange rate, and bank real interest rate. To estimate the econometric of equation, he used Auto Regressive Distributed Lag (ARDL). The results showed that a co-integration vector exists between stock price index and monetary macroeconomic variables. The estimated long run relationship shows the significant positive impact of liquidity and the significant negative impact of exchange rate and bank real interest rate on bank stock price index.

In their research known as the use of economic leverage in order to assess the impact of macroeconomic variables on corporate performance,
Roudposhti and Amir Hosseini[1] considered five economic variables including inflation, exchange rate, unemployment rate, export and financial costs as financial fluctuation. The impact of these variables on the sale patterns of 67 companies listed in Tehran Stock Exchange during an eight-year period was analyzed. Using Pearson correlation coefficient and multivariate regression analysis, their study focused on the relationship between the independent variables and dependent variable of sale. The findings finally showed that in Del model framework, the influence of two economic indexes i.e. percentage of exchange rate change and the percentage of financial cost change on the companies' sales was positive and significant yet negligible. The percentages of export change and inflation rate change as well as the percentage of unemployment change had no impact on the companies' sale patterns.
Hosseini and Karimi[3] studied the relationship between some macroeconomic variables (Changes in inflation rates, GDP, money supply and interest rate) and stock returns of companies listed on the stock exchange. The findings showed that the research variables (inflation rate, GDP, money supply and interest rate) had negative impact on stock returns of companies listed on the stock exchange.

3. Method

This is an applied research. Since the researcher had no intervening role in establishing the data, this is a quasi-experimental study. Due the fact that the research data were formed prior to the research this is a retrospective study whose statistical population included all of the companies listed in stock market, which met the following criteria:

A) The financial statements of the companies had to address the end of the financial year.

B) There should be no bank or financial intermediary.

C) They should not change their course during the research.

D) There should be access to their data.

To analyze the data and estimate the model, panel data techniques were used.

3.1 Research variables and model

$g_{q+k}=\alpha_k+\beta_1\Delta X_q+ \beta_2 \text{Inflation} + \beta_2 \text{Unemployment}+€_{g+k}$
$g_{q+k}=\alpha_k+\beta_1\Delta X_q+ \beta 2 g_q+\beta_3 \text{Inflation} + \beta_4 \text{Unemployment}+€_{g+k}$
where ΔX is the profit change in one season, which is equal with the accounting earnings during season t subtracted from accounting earnings during season t-1, the change of accounting earning during t-1; G is the GPD growth in a season which is the GPD during season t subtracted from GPD during season t-1, the change of GPD during season t-1

$$GDP\ Growth\ Forcast\ Error_{q+k} = g_{q+k} - E_q^{SPF}(g_{q+k}) \quad (1)$$

is the mean GPD growth forecast, and is the GPD growth forecast error.

3.2 Control variables

The control variables are:

- Inflation
- Employment

And the hypothesis are as follows:

First hypothesis: there is significant relationship between accounting earning and GPD growth.

Second hypothesis: There is significant relationship between accounting earning and GPD growth forecast error.

4. Research Findings

4.1. Descriptive statistics

In this section, the descriptive statistic will be presented. They include mean, median, maximum, minimum and standard variation. The findings show that GPD growth rate enjoyed a mean of 3%, the maximum of which was almost 6% and the minimum was 3%. The seasonal earning was 9% which shows that the performance of the companies was improved. The mean rate of inflation over the period of investigation was 20% and the mean employment rate was 89%.

Table 1. Descriptive statistics

Variables	mean	median	maximum	minimum	Standard variation
G	0.03	0.05	0.058	-0.058	0.031
ΔX	0..9	0.10	0.54	0.03	0.12
E^{spf}	5.32	3.32	37.332	0.05	0.87
GDP^{q+k}	4.67	3.78	21.13	0.09	0.65
inflation	0.20	0.108	0.305	0.108	0.065
employment	0.89	0.878	0.91	0.877	0.076

G is GPD growth rate; ΔX is seasonal earning change; E^{spf} is the mean GPD forecast, and $GDP^{q+k}$is GPD growth rate forecast error.

4.2 Pearson correlation coefficient

Table 2 shows the Pearson correlation coefficient between the variables. The findings show that there is 17% correlation between the accounting earning and GPD growth rate. Since the significance level is less than the research error rate, one could claim that this correlation is significant.

There is a -12% correlation between the accounting earning and GPD growth rate forecast error, and since the significance level is less than the research error rate, it is safe to state that this correlation is significant. There is 7% correlation between the mean GPD growth rate forecast and GPD growth rate. Since the significance level is less than the research error rate, we are allowed to say that this correlation is significant. There is also a correlation (-56%) between inflation rate and GPD growth rate, and since the significance level is less than the research error rate; the significance of this correlation is proved.

Table 2: correlation coefficient between the variables

Variables	**G**	ΔX	E^{spf}	GDP^{q+k}	inflation	Employment
G	1					
ΔX	+0.17	1				
E^{spf}	-*0.12	*-0.37	1			
GDP^{q+k}	*-0.7	0.09	0.02	1		
inflation	*-0.56	*0.17	*0.26	-0.004	1	
employment	*-0.52	0.12	0.16	0.08	*0.76	1

Significant at error rate of 5% (Source: the author's estimations)

4.3 Heterogeneity of variance test

Arch test was used to analyze the heterogeneity of variance in this research. If the significance level of the test is more than 5%, it shows the homogeneity of variance and illustrates that the research model is efficient enough to test the hypotheses. The results of heterogeneity of variance test showed that the model variance was homogenous and efficient.

Table 3: Heterogeneity of variance test

Model	Statistic	**Sig level**	***Result***
First model	0.02	0.87	The variance homogeneity is accepted
Second model	0.03	0.85	The variance homogeneity is accepted

Source: the author's estimations

4.4 The auto-correlation test of error terms

To analyze the lack of auto-correlation between the model error terms, LM test was used. The findings are shown in Table 4. If there is a correlation between the error terms of the model, the variables coefficients in the model are not biased and thus are inefficient. The findings of the test showed that given the value of F test and significance level, which is more than 5%, The research model for testing the hypotheses has no correlation of their error terms, and thus the findings of hypothesis test are not efficient.

Table 4. The correlation test of error terms

Model	Statistic	Sig level	Result
First model	0.87	0.43	The auto-correlation is accepted
Second model	1.84	0.08	The auto-correlation is accepted

Source: the author's estimation

4.5 Test of collinearity between the independent variables

To analyze the collinearity between the research model variables, VIF test was used. The results are presented in the following table. Since the centered VIFs of all variables were less than 5, no collinearity existed between the research variables.

Table 5. VIF test

	First model		*Second model*	
	COF VAR	Centered VIF	COF VAR	Centered VIF
ΔX	0.0005	1.02	0.0005	0.01
E^{spf}	-	-	0.11	1.01
inflation	0.02	1.43	0.021	1.41
employment	0.003	1.03	0.003	1.024

Source: the author's estimation

4.6 The results of Chow test

Table 6 shows the results of Chow test. Chow test is used to select the type of Panel data model (the common effects and fixed effects). If significance level in this test is higher than 5%, the data of common effects should be used. The result show that the F value and significance level for the research model is indicative of the individual or group impacts, and fixed factor data method should be used to estimate the models.

Table 6. Chow test

Model	Statistic	Sig level	Result
First model	1.83	0.000	The data of fixed effect are accepted
Second model	1.61	0.000	The data of fixed effect are accepted

Source: the author's estimation

4.7 Testing the first hypothesis

There is a significant relationship between GPD growth and accounting earning

H0: there is no significant relationship between accounting earnings and GPD growth.
H1: there is a significant relationship between accounting earning and GPD growth.

Fisher F Test

The results of regression analysis of ordinary least square with a combined approach are shown in Table 7. F statistic and the significance level show the significance of model to test the research hypotheses.

Durbin-Watson Test

The results of Durbin-Watson test showed the lack of auto-correlation between the error terms (which should be between 1.5 and 2.5).

Hypothesis Rejection or Approval

According to the following, ΔX shows the existence of positive significant relationship between the accounting earnings and GPD growth at 0.05 error rate because the estimated p-value for this independent variable coefficient was less than 0.05. Therefore, it could be stated that there is a significant relationship between accounting earnings and GPD growth at 95% significance level. The estimated coefficient for inflation in the following table shows the existence of a negative significant relationship between inflation rate and GPD growth at 0.05 error rate. This is due to the fact that the estimated p-value for this control variable coefficient is less than 0.05. Therefore, one could conclude that there is a significant relationship between inflation rate and GPD growth at 95% significance level. The estimated coefficient for employment in the following table shows the existence of a positive significant relationship between employment rate and GPD growth at 0.05 error rate since the estimated p-value for this variable coefficient is less than 0.05. As a result, it could be said that there is a significant relationship between employment rate and GPD growth at 95% significance level.

Table 7. Estimated coefficient for employment

Variable	coefficient	T statistic	Sig level
C	0.07	0.07	0.89
ΔX	-0.07	-3.45	*0.000
Inflation	-0.02	-2.17	*0.03
employment	-0.07	-2.74	*0.002
Modified R^2	0.34		
F test	24.41		
F test significance level	0.000		
Durbin-level	1.78		

Significant at 5% error rate source: the author's estimation

4.8 Second Hypothesis

There is a significant relationship between GPF growth forecast error and accounting earnings.

Statistical hypotheses

H0: There is no significant relationship between GPF growth forecast error and accounting earnings.
H1: There is a significant relationship between GPF growth forecast error and accounting earnings.

F test

The results of regression analysis of ordinary least square with a combined approach are shown in Table 7. F statistic and the significance level show the significance of model to test the research hypotheses.

Durbin Watson Test

The results of Durbin-Watson test showed the lack of auto-correlation between the error terms (which should be between 1.5 and 2.5).

Hypothesis rejection or approval

According to the following results, ΔX shows the existence of positive significant relationship between the accounting earnings and GPD growth forecast error at 0.05 error rate because the estimated p-value for this independent variable coefficient was less than 0.05. Therefore, it could be stated that there is a significant relationship between accounting earnings and GPD growth forecast error at 95% significance level. The estimated coefficient for E^{spf} in the following table indicates the existence of a positive significant relationship between the mean of GPD growth forecast and GPD growth forecast error at 0.05 error rate since the estimated p-value for this independent variable coefficient is less than 0.05. Therefore, one could conclude that there is a significant relationship between the mean of GPD growth forecast and GPD growth forecast error at 95% significance level.

The estimated coefficient for inflation in the following table shows the existence of a negative significant relationship between inflation rate and GPD growth forecast error at 0.05 error rate. This is because the estimated p-value for this control variable coefficient is less than 0.05. Therefore, it is safe to say that there is a significant relationship between inflation rate and GPD growth forecast error at 95% significance level.

The estimated coefficient for employment in the following table shows the existence of a positive significant relationship between employment rate and GPD growth forecast error at 0.05 error rate since the estimated p-value for this control variable coefficient is less than 0.05. Consequently, it could be said that there is a significant relationship between employment rate and GPD growth forecast error at 95% significance level.

Table 8. Testing the second hypothesis

Variable	coefficient	T statistic	Sig level
C	0.004	0.11	0.79
ΔX	-0.07	-3.78	*0.000
E^{spf}	0.032	4.08	*0.000
Inflation	-0.27	-6.13	*0.000
employment	0.12	-8.66	*0.000
Modified R^2	0.21		
F test	13.73		
F test significance level	0.000		
Durbin-level	1.84		

Significant at 5% error rate source: the author's estimation

5. Conclusion

The accounting earnings of stock companies are the result of the companies' activities during the financial period, which shows the establishment of profitable activities to gain the mentioned earnings. This could lead to important economic consequences and thus the economic growth of our country.
This research studied the relationship between accounting earnings and GPD.
The research population includes all companies listed in Tehran Stock Exchange. Due to the limitations of sample size, 65 companies between 2009 and 2013 were studied. The findings showed that there is a significant relationship between accounting earning and GPD growth rate. A similar relationship was also observed between accounting earning and forecast errors of GPD growth. Accordingly, it can be stated that accounting earnings is an important factor in the decision making of investors in Tehran Stock Exchange in particular and in financial market in general.
The increase of investment as a result of improving the performance and earning of accounting could be a motivating factor for the companies' production cycle, which consequently leads to the increase of their potentials and liquidity. This raises the production and improves the economic prosperity, rendering a positive impact on countries' GPD. Our findings are in line with those of Panos and Yaniv.

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