Studying the relationship between total capital productivity indexes and operating profit in private companies listed on Iran Stock Exchange

Parviz Saeidi (Corresponding author) *, Neda Jorjani **

* Department of management and Accounting, Aliabad katoul Branch, Islamic Azad University, Aliabad katoul, Iran. E-mail: dr.parvizsaeedi@yahoo.com
** Master of Government Management (Financial Trends), Iran.

Abstract: The purpose of this study is to examine the performance of total productivity factors indexes and its relationship with operational profit in companies listed on Iran's Stock Market Exchange. For this 19 companies from 5 industries were chosen they included food and beverage production industries, chemical substances and products, pharmaceutical products, other non metal mineral products and machinery and equipments. In order to determine the relationships between independent variable – which included capital productivity indexes and total productivity index- and dependent variable of the study –which was operating profit linear and logarithmic regressive models were used. Results showed, if capital accumulation variable was kept constant, for each unit increase in fixed asset circulation logarithm, logarithm value of operating profit increases 0.083 in average. And there is a direct relationship between the two variables, total productivity and operating profit, this indicates that, with increased productivity, increases operating profit in companies. Results showed with increase of each unit in total productivity logarithm, increases operating profit logarithm by 0.042 in average.

1. Introduction

Now days, all developed and developing countries emphasis on the importance of productivity as a necessity in taking advantage in international competitiveness and economical growth. Accordingly, as to promote productivity as a pervasive cultural knowledge and its improvement, a great deal of investments has been done. Reviewing performances of countries with significant economical growth in past few decades, indicates the fact that these countries have gained a substantial share of their economical growth by ways of productivity improvement.

In the "Act of the fourth economic, social and cultural development plan of Iran", much emphasis is put in productivity growth, and it is set that 31.3 percent of economical growth should be obtained through productivity improvement.

According to article 5 of the act administrative government departments, national and provincial are obligated to prepare growth process, assign national, provincial and district documents to determine share of productivity development in TPF in each section, and take necessary measures to define its realization, so that share of TPF is at least 31.3 percent of GDP growth. (Act of the fourth economic, social and cultural development plan of Islamic republic of Iran).

In historical view point the term productivity was used for the first time in year 1766 by Quesenary. Year 1883 Litereh defined productivity as power and ability to produce. International labor organization states that, various products are produced by combining four major factors (land, capital, labor and entrepreneur) output relationship of three out of these four factors in combination with the fourth factor, determines the rate of productivity.

Europe productivity agency defines productivity as effective usage of each production factor. Japan productivity organization describes productivity as maximum usage of physical resources, manpower and other production factors, defined scientifically, so that productivity improvement leads to reduction in production costs, market expansion, and employment growth and raised living standards in all aspects of the society.

Strategic importance of productivity in any company or organization clearly proves the necessity of monitoring productivity, assessing productivity helps companies to create an explicit connection between productivity and company's other strategic

objectives. Measuring productivity, apart from strategic benefits, also fulfills other useful and advantageous functions.

Today productivity improvement is recognized as most essential in economical, social and cultural development all nations, and success in easing the productivity improvement process, is a major factor for achieving an appropriate position in a competitive world, and raising people's living standards.

A company's performance could be measured by different methods; one is to focus on company's productivity, and the other is to assess a company by annual accounting rapports that are based on company's economical information and then evaluated.(kitaeva,2003,1)

Evaluating productivity could be defined as technical effectiveness and efficiency. Technical efficiency means the process of executive operations in organization, turning inputs to outputs, and effectiveness in strategic scope actually stands for extent of realized objectives of an organization on the basis of outputs. (Rouse,putterill,Ryan ,1997,135)

By and large productivity improvement is the responsibility of management, increased productivity is not possible, but by analyzing and understanding it. Measuring productivity in private firms aids us to recognize influencing factors in productivity improvement. Based on gained experience in industrial countries, measuring productivity is so significant that, merely having and enforcing an evaluating system for productivity on its own, without any alteration, could lead to 5 to 10 percent increased productivity.

2. Research Background

Kawn defines productivity as, "the measurable relation between the proportion of products and the proportion of used factors(resources) needed for making the product."(Kawn ,1969)

Krueger and Tancer, with the growth of productivity in manufacturing industries in Turkey in terms of public and private sectors, Reduction in productivity in the industries of this country are caused by trade restrictions. Furthermore, the result shows that while overall growth in productivity in private industry and government of Turkey was almost identical, the amount of resources and factors of production in state-owned industries has been far more than private industry.(Krueger& Tancer,1982,307-325).

Robbins defines productivity like this; "the quantity or proportion of products or the main services are presented by organization." (Robbins,1987)

Seshaiah and Reddy studied the trend of productivity over the years (1976-1986) on Andhra Pradesh artificial of India.They conclude that the total factor productivity in the industries of cotton textile industry, has a decreasing trend and the total factor productivity index for cotton textiles industry has increased during a period with a mild oscillations. (Seshaiah & Reddy,1993,100-108).

Haltiwanger et.al, studied the difference in productivity between workers in different industries over the years (1996-1985) through the production function method and concluded that the number of workers, age and human capital has had an impact on their productivity. (Haltiwanger et. al 1994-1998,1999,94-98).

Rao studied Increase in productivity also can affect the society in a wide way with producing earnings mprovement and life standards growth. The real meaning of productivity is this: more production with the same attempt of manpower. Productivity increase is a key for competition in domestic, national and international levels.(Rao ,2002)

Chun and Nadiri, Sources of productivity growth in the computer industry in America during the years (1978 -1999), were investigated. Their results showed that the total factor productivity growth comes from technological innovation and economies of scale in this industry have increased. (Chun & Nadiri,2008, 174-180)

Yilmazkuday studied the productivity in the manufacturing cycle of public and private sectors in Turkey. They consider the timing of business cycles and found that the public sector has higher productivity growth than the private sector and the total factor productivity in the two parts of the high and low is oscillating(Yilmazkuday , 2009,21-40).

Bario and mathias studied total productivity is a ratio totally that considers the common and the same time effect of all basess such as labor , material , mechanical tools , capital , energy and so on in relation to the rate and value of the rate and value of production.(Bario & Mathias,2009,29-46)

Brownlees et.al studied the Operating profit or Earnings Before Interest and Taxes (EBIT) equals sales revenue minus cost of goods sold and all expenses except for interest and taxes. This is the

surplus generated by operations. It is also known as Operating Profit Before Interest and Taxes (OPBIT) or simply Profit Before Interest and Taxes (PBIT).(Brownlees & et.al 2010,1-37).

3. Research Method

The study in its purpose is application and its methods, description and post- event by use of past data. The research was conducted from 2001 to 2008 period**.**

Statistical population includes 19 private companies which are active in Stock Market. So sampling is not performed in this study. Statistical population in this study includes industries that, according to primary evaluations, show profitability and their data during the time interval are available and also are active in Stock Market. So the 5 industries included food and beverage production industry, chemical products and materials, pharmaceutical products and materials, other non metal mineral products and machinery and equipments.

In order to examine relationships between capital productivity indexes and operation profit, we will use linear regression method. In this method, operating profit variable is used as dependent variable and each of the productivity indexes as the independent variable. In each section, first by using a drawing, a diagram for each independent variable against dependent variable, is objectively presented to see presence or absence of relationship between variables. Then using hypothesis testing we will examine the relationship between them. Furthermore after formation of regression model we will examine residual obtained from regression. Two basic hypotheses that must be established in each regression models are normal residual and constant variance hypothesis. So in each part to ensure validity of obtained model, each of the hypotheses will be examined. Also symbols below will be used for each variable of regression model, shown in table (1).

Table (1). Symbols used for each variable of regression model

symbol	Independent variable	Index type	Symbol	dependent variable
X_{21}	Capital productivity			operation profit
X_{22}	Output value to fixed assets		Y_2	
X_{23}	Capital accumulation	Capital productivity indexes		
X_{24}	Output value to operation capital			
X_{25}	Operation capital circulation			Operation profit
X_{26}	Fixed assets circulation		Y_2	
X_{27}	Total assets circulation			
X_3	Total productivity index			

4. Research Findings

4-1 hypothesis testing

4-1-1 First hypothesis testing:

First hypothesis - there is a significant relationship between capital productivity and operation profit in private companies

We will test the following hypothesis;

H_o "there is no significant relationship between capital productivity and operation profit in private companies"

H_1 "there is a significant relationship between capital productivity and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/51	$Ln(Y_1) = 26.169 + .044 \times Ln(X_{21})$	there is no significant relationship between capital productivity and operation profit in private companies	1-5

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.513[a]	.263	.259	.17683

a. Predictors: (Constant), ln_bahrevari_sarmaye

b. Dependent Variable: ln_sood_amaliat

According to the value of R-Square almost 26 percent of changes in operation profit logarithm are explained by capital productivity logarithm. Also according to R the correlation coefficient between capital productivity logarithm and operation profit logarithm is 0/51.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	26.169	.014		1862.638	.000
	ln_bahrevari_sarmaye	.044	.006	.513	7.635	.000

a. Dependent Variable: ln_sood_amaliat

As the Sig value (equals to zero) is less than 0/05 percent null hypothesis is rejected and we can say there is a significant relationship between capital productivity logarithm and operation profit logarithm, regression model is as follows:

$$Ln(Y_1) = 26.169 + .044 \times Ln(X_{21}) \qquad (1)$$

Interpretation of first hypothesis regression model:
According to this model, since the logarithm coefficient of capital productivity has a positive sign, it could be said, in private companies the two variables, capital productivity and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to capital productivity's logarithm coefficient, it could be concluded that, for each unit increase in capital productivity logarithm, operation profit logarithm value increases 0/044 in average.

4-1-2 Second hypothesis testing of the study:
Second hypothesis - there is a significant relationship between output value on fixed assets and operation profit in private companies
We will test the following hypothesis;
H_o "there is no significant relationship between output value on fixed assets and operation profit in private companies"
H_1 "there is a significant relationship between output value on fixed assets and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/54	$Y_1 = 1.832E10 + 1.500E10 \times Ln(X_{22})$	there is no significant relationship between output value on fixed assets and operation profit in private companies	2-5

.Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543[a]	.295	.290	4.05202E10

a. Predictors: (Constant), ln_arzesh_stande_daraye_sabet

b. Dependent Variable: sood_amaliati

According to the value of R-Square almost 29 percent of changes in operation profit logarithm are explained by output value on fixed assets logarithm. Also according to R the correlation coefficient between these two variables is approximately 0/54.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
تو Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	1.832E10	4.638E9		3.950	.000
ln_arzesh_stande_daraye_sabet	1.500E10	1.828E9	.543	8.204	.000

a. Dependent Variable: sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between output value on fixed assets logarithm and operation profit logarithm, regression model is as follows:

$$Y_1 = 1.832E10 + 1.500E10 \times Ln(X_{22}) \qquad (2)$$

Interpretation of second hypothesis regression model:
According to this model, since the logarithm coefficient of output value on fixed assets has a positive sign, it could be said, in private companies the two variables, output value on fixed assets and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to output value on fixed assets logarithm coefficient, it could be concluded that, for each unit increase in output value on fixed assets logarithm, operation profit logarithm value increases 1.5×10^{10} in average.

4-1-3 Third hypothesis testing of the study:
Third hypothesis - there is a significant relationship between capital circulation and operation profit in private companies
We will test the following hypothesis;
H_o "there is no significant relationship between capital circulation and operation profit in private companies"
H_1 "there is a significant relationship between capital circulation and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/25	$Ln(Y_1) = 25.386 + .041 \times Ln(X_{23})$	there is no significant relationship between capital circulation and operation profit in private companies	3-5

According to residual diagram, residual variance is constant.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	B	Std. Error	Beta	t	Sig.
1 (Constant)	25.386	.235		108.001	.000
ln_tarakom_sarmaye	.041	.012	.248	3.293	.001

a. Dependent Variable: ln_sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between capital circulation logarithm and operation profit logarithm, regression model is as follows:
$$Ln(Y_1) = 25.386 + .041 \times Ln(X_{23}) \qquad (3)$$

Interpretation of third hypothesis regression model:
According to this model, since the logarithm coefficient of capital circulation has a positive sign, it could be said, in private companies the two variables, capital circulation and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to capital circulation logarithm coefficient, it could be

concluded that, for each unit increase in capital circulation logarithm, operation profit logarithm value increases 0/041 in average.

4-1-4 Fourth hypothesis testing of the study:

Fourth hypothesis - there is a significant relationship between output value on operation capital and operation profit in private companies

We will test the following hypothesis;

H_o "there is no significant relationship between output value on operation capital and operation profit in private companies"

H_1 "there is a significant relationship between output value on operation capital and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/77	$Y_1 = 1.808E10 \times X_{24}$	there is no significant relationship between output value on operation capital and operation profit in private companies	4-5

Model Summary[c,d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.770[a]	.593	.591	4.45707E10

a. Predictors: arzesh_stande_sarmaye_amaliati
c. Dependent Variable: sood_amaliati

According to the value of R-Square almost 59 percent of changes in operation profit logarithm are explained by output value on operation capital logarithm. Also according to R the correlation coefficient between these two variables is approximately 0/77.

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	arzesh_stande_sarmaye_amaliati	1.808E10	1.170E9	.770	15.459	.000

a. Dependent Variable: sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between output value on operation capital logarithm and operation profit logarithm, regression model is as follows:

$Y_1 = 1.808E10 \times X_{24}$ (4)

Interpretation of fourth hypothesis regression model:

According to this model, since the logarithm coefficient of output value on operation capital has a positive sign, it could be said, in private companies the two variables, output value on operation capital and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to output value on operation capital coefficient, it could be concluded that, for each unit increase in output value on operation capital, operation profit value increases 1.808×10^{10} in average.

4-1-5 Fifth hypothesis testing of the study:

Fifth hypothesis - there is a significant relationship between operation capital circulation and operation profit in private companies

We will test the following hypothesis;

H_o "there is no significant relationship between operation capital circulation and operation profit in private companies"

H_1 "there is a significant relationship between operation capital circulation and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/75	$Y_1 = 1.827E10 \times X_{25}$	there is no significant relationship between operation capital circulation and operation profit in private companies	5-5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.749	.561	.558	4.78886E10

According to the value of R-Square almost 55 percent of changes in operation profit logarithm are explained by operation capital circulation logarithm. Also according to R the correlation coefficient between these two variables is approximately 0/74.

Coefficients[a,b]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 gardesh_sarmaye_amaliati	1.827E10	1.256E9	.749	14.554	.000

a. Dependent Variable: sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between operation capital circulation logarithm and operation profit logarithm, regression model is as follows:

$$Y_1 = 1.827E10 \times X_{25} \qquad (5)$$

Interpretation of fifth hypothesis regression model:
According to this model, since the logarithm coefficient of operation capital circulation has a positive sign, it could be said, in private companies the two variables, operation capital circulation and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to operation capital circulation coefficient, it could be concluded that, for each unit increase in operation capital circulation, operation profit value increases 1.827×10^{10} in average.

4-1-6 Sixth hypothesis testing of the study:
Sixth hypothesis - there is a significant relationship between fixed assets circulation and operation profit in private companies
We will test the following hypothesis;
H_o "there is no significant relationship between fixed assets circulation and operation profit in private companies"
H_1 "there is a significant relationship between fixed assets circulation and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/76	$Y_1 = 2.136E10 \times Ln(X_{26})$	there is no significant relationship between fixed assets circulation and operation profit in private companies	6-5

Model Summary[c,d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.575	.572	4.71066E10

a. Predictors: ln_gardesh_daraey_sabe
c. Dependent Variable: sood_amaliati

According to the value of R-Square almost 57 percent of changes in operation profit logarithm are explained by fixed assets circulation logarithm. Also according to R the correlation coefficient between these two variables is approximately 0/75.

Coefficients[a,b]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 ln_gardesh_daraey_sabe	2.136E10	1.426E9	.758	14.982	.000

a. Dependent Variable: sood_amaliati
b. Linear Regression through the Origin

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between fixed assets circulation and operation profit logarithm, regression model is as follows:

$$Y_1 = 2.136E10 \times Ln(X_{26}) \qquad (6)$$

Interpretation of sixth hypothesis regression model:
According to this model, since the logarithm coefficient of fixed assets circulation has a positive sign, it could be said, in private companies the two variables, fixed assets circulation and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to fixed assets circulation coefficient, it could be concluded that, for each unit increase in fixed assets circulation logarithm, operation profit value increases 2.136×10^{10} in average.

4-1-7 Seventh hypothesis testing of the study:
Seventh hypothesis - there is a significant relationship between total assets circulation and operation profit in private companies
We will test the following hypothesis;
H_o "there is no significant relationship between total assets circulation and operation profit in private companies"
H_1 "there is a significant relationship between total assets circulation and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/44	$Ln(Y_1) = 26.172 + .134 \times Ln(X_{27})$	there is no significant relationship between total assets circulation and operation profit in private companies	7-5

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.441[a]	.194	.190	.20323

a. Predictors: (Constant), ln_gardesh_majmoo_daraey
b. Dependent Variable: ln_sood_amaliati

According to R-Square almost 19 percent of changes in operation profit logarithm are explained by total assets circulation logarithm, which is not much. It could be said that there are other variables affecting the operation profit which are not present in this model. Also according to R the correlation coefficient of these two variables is approximately 0/44.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	26.172	.016		1653.772	.000
ln_gardesh_majmoo_daraey	.134	.021	.441	6.329	.000

a. Dependent Variable: ln_sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between total assets circulation and operation profit logarithm, regression model is as follows:

$$Ln(Y_1) = 26.172 + .134 \times Ln(X_{27}) \qquad (7)$$

Interpretation of seventh hypothesis regression model:

According to this model, since the logarithm coefficient of total assets circulation has a positive sign, it could be said, in private companies the two variables, total assets circulation and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to total assets circulation logarithm coefficient, it could be concluded that, for each unit increase in total assets circulation logarithm, operation profit logarithm value increases 0.134 in average.

4-2　　Testing study's main hypothesis:

4-2-1 Testing study's first main hypothesis:

First main hypothesis: there is a significant relationship between capital productivity indexes and net profit in private companies

We will test the following hypothesis:

H_o "there is no significant relationship between capital productivity indexes and net profit in private companies"

H_1 "there is a significant relationship between capital productivity indexes and net profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/71	$Ln(Y_1)=260.24+.083 \times Ln(X_{26})+.069 \times Ln(X_{23})$	there is no significant relationship between capital productivity indexes and net profit in private companies	5

Taking this hypothesis we will examine the relationship between capital productivity indexes and operation profit. As to use variables that had more influence on operation profit changes, we will use Stepwise method. In this method variables that show higher and more effective relationship with operation profit variable are presented in regression model. Results from this model are presented as follows.

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	ln_gardesh_daraey_sabe	.	Stepwise (Criteria: Probability-of-F-to-enter <= .100, Probability-of-F-to-remove >= .200).
2	ln_tarakom_sarmaye	.	Stepwise (Criteria: Probability-of-F-to-enter <= .100, Probability-of-F-to-remove >= .200).

a. Dependent Variable: ln_sood_amaliati

> According to above table, Stepwise Method suggests two models, in first model only fixed assets circulation variable is present in second model in addition to fixed assets variable capital accumulation variable is also present.

Excluded Variables[c]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	ln_bahrevari_sarmaye	.045[a]	.399	.690	.031	.326
	ln_arzesh_stande_daraye_sabet	-.035[a]	-.020	.984	-.002	.001
	ln_tarakom_sarmaye	.448[a]	7.676	.000	.516	.909
	ln_arzesh_stande_sarmaye_amaliati	-.066[a]	-.513	.609	-.040	.254
	ln_gardesh_sarmaye_amaliati	-.067[a]	-.512	.609	-.040	.250
	ln_gardesh_majmoo_daraey	.044[a]	.472	.638	.037	.484
2	ln_bahrevari_sarmaye	.063[b]	.644	.520	.051	.326

ln_arzesh_stande_daraye_sabet	-1.005[b]	-.684	.495	-.054	.001
ln_arzesh_stande_sarmaye_a maliati	-.045[b]	-.411	.682	-.032	.254
ln_gardesh_sarmaye_amaliati	-.035[b]	-.312	.755	-.025	.249
ln_gardesh_majmoo_daraey	-.001[b]	-.012	.990	-.001	.481

a. Predictors in the Model: (Constant), ln_gardesh_daraey_sabe
b. Predictors in the Model: (Constant), ln_gardesh_daraey_sabe, ln_tarakom_sarmaye
c. Dependent Variable: ln_sood_amaliati

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.562[a]	.316	.312	.17388
2	.706[b]	.499	.493	.14936

a. Predictors: (Constant), ln_gardesh_daraey_sabe
b. Predictors: (Constant), ln_gardesh_daraey_sabe, ln_tarakom_sarmaye
c. Dependent Variable: ln_sood_amaliati

According to above model, when only fixed assets circulation is presented in model, R-Square value equals to 0.316 and when fixed assets circulation variable is added to the model, R-Square value increases to 0.499, so the second model could be chosen as a more appropriate model.

ANOVA[c]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.281	1	2.281	75.437	.000[a]
	Residual	4.928	163	.030		
	Total	7.209	164			
2	Regression	3.595	2	1.798	80.582	.000[b]
	Residual	3.614	162	.022		
	Total	7.209	164			

a. Predictors: (Constant), ln_gardesh_daraey_sabe
b. Predictors: (Constant), ln_gardesh_daraey_sabe, ln_tarakom_sarmaye
c. Dependent Variable: ln_sood_amaliati

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	26.024	.020		1317.158	.000
	ln_gardesh_daraey_sabe	.067	.008	.562	8.685	.000
2	(Constant)	24.701	.173		142.620	.000
	ln_gardesh_daraey_sabe	.083	.007	.697	11.953	.000
	ln_tarakom_sarmaye	.069	.009	.448	7.676	.000

a. Dependent Variable: ln_sood_amaliati

As the Sig value is less than 0/05, it could be said that null hypothesis is rejected at 5 percent level. Suggested model by Stepwise method is explained below;

$$Ln(Y_1) = 260.24 + .083 \times Ln(X_{26}) + .069 \times Ln(X_{23}) \qquad (8)$$

Interpretation of first main hypothesis regression model:

According to this model, if capital accumulation variable is kept constant, for each unit increase in fixed assets circulation logarithm, operation profit logarithm value increases 0.083 in average, on the other hand when keeping, fixed assets circulation variable constant, for each unit increase in capital accumulation logarithm, operation profit logarithm value increases 0/069 in average. It should be noted that the mentioned model was suggested by Stepwise method, as the most appropriate.

4-2-2 Second main hypothesis testing of the study:

Second main hypothesis: there is a significant relationship between total productivity index and operation profit in private companies

We will test the following hypothesis;

H_o "there is no significant relationship between total productivity index and operation profit in private companies"

H_1 "there is a significant relationship between total productivity index and operation profit in private companies"

Test result	Sig	R	model	As hypothesized	Hypothesis 0
Null hypothesis was rejected	0	0/35	$Ln(Y_1) = 26.225 + .042 \times Ln(X_3)$	there is no significant relationship between total productivity index and operation profit in private companies	6

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.352[a]	.124	.119	.16939

a. Predictors: (Constant), ln_bahrevari_kol

b. Dependent Variable: ln_sood_amaliati

According to R-Square which equals to 0.124 almost 12 percent of changes in operation profit logarithm are explained by total productivity logarithm, which is not much. It could be said that there are other variables affecting the operation profit which are not present in this model. According to R the correlation coefficient of these two variables is 0/35.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	26.225	.024		1104.161	.000
	ln_bahrevari_kol	.042	.009	.352	4.687	.000

a. Dependent Variable: ln_sood_amaliati

As the Sig value is less than 0/05 percent, null hypothesis is rejected and we can say there is a significant relationship between total productivity logarithm and operation profit logarithm, this model is as follows:

$Ln(Y_1) = 26.225 + .042 \times Ln(X_3)$ (9)

Interpretation of second main hypothesis regression model:

According to this model, since the logarithm coefficient of total productivity has a positive sign, it could be said, in private companies the two variables, total productivity and operation profit, have direct relationship. It means if one increases so does the other one and vice versa. Also according to total productivity logarithm coefficient, it could be concluded that, for each unit increase in total productivity logarithm, operation profit logarithm value increases 0.42 in average.

5. Conclusion:

As productivity improvement, which is achieved by efficient usage of production factors, and attaining a continues economical growth and sustained development opens new horizons, on these basis it should seriously be acknowledged that, productivity as a subject and methods of its improvement, leads to economical growth. Accordingly results of this study show, there is a significant relationship between productivity capital index and operation profit in

companies listed in Iran's Stock Market Exchange. Results showed, if capital accumulation variable is kept constant, for each unit increase in fixed assets circulation logarithm, operation profit logarithm value increases 0.083 in average, on the other hand when keeping, fixed assets circulation variable constant, for each unit increase in capital accumulation logarithm, operation profit logarithm value increases 0/069 in average.

The results also showed there is a direct and significant relationship between the two variables, total factor productivity and operation profit, which means with increase of total factor productivity, increases companies' operation profit, and with decrease rate of productivity, decreases operation profit. As logarithm coefficient is 0.042 it shows for each unit increase in total factor productivity logarithm, increases operation profit logarithm this much in average.

Results also showed that all capital productivity indexes including (capital productivity, output value on fixed assets, capital accumulation, output value on operation capital, operation capital circulation, fixed assets circulation and total assets circulation) show direct and positive relationship with operation profit.

References:
1-Bario, Claudio, Mathias Drehmann, (2009)"Assessing the Risk of Banking Crises revisited, "BIS Quarterly Review, March,pp. 29-46.

2-Brownlees, Christian, Robert Engle,(2010) "Volatility, Correlation and Tails for Systematic Risk easurement, "Working Paper, NYU-Stern.

3-Chun, Hyunbae , Nadiri, M. Ishaq, (2008)**Decomposing Productivity Growth in the U.S.** Computer Industry ,MIT Press The Review of Economics and Statistics . Volume: 90,issue:1 (November) ,pp: 174-180

4-Haltiwanger, John c., Lane J.u1ia I. and Spletzer James R.(1999), **Productivity Differences Across Employers: The Roles of Employer Size, Age and Human Capital**, American Economic Review, No.2,Vol.89,pp:94-98

5-Kawn H.Lie, (1969)"Productivity and Economic Growth". Tokyo:Apo.

6-Kitaeva,Daria**,(2003)"The Relation Between Productivity Measures And Financial Information"** - vidence from the Airline Industry -, Göteborg University. School of Business, Economics and Law,, 98 pages Student essay Masters Thesis, no 2002:46

7-Krueger.Anne.O.and Tancer. Baran**.(1982)"Growth of Factor Productivity in Turkish Manufacturing Industries"**. Journal of Devolopment Economics. Vol.11,No:3,December.pp 307-325.

8-Mahboubi J (2003) **Increase productivity in the services sector**, Tadbir Journal monthly D No.137:39-46

9-Rouse, Paul. Putterill, Martin . Ryan , David**, (1997) "towards General managerial frame work for performance measurement"**,Journal of Productivity Analysis Volume: 8, Number: 2No: 8, p:135.

10-Rao, ME Thukaram,(2002) **"Management Accounting".** New Age International Pub.

11-Robbins, Stephan, P**.(1987) "Organization Theory".** 2 nd edition. Newjersey, prentice-Hall.

12-seshaiah,s. venkata. &reddy, v.k**, (1993) "Productivity Trends in some Industries of Anthrapradesh Manufacturing Sector"** .The Indian economic journal, vol:41, no:2,PP:100-108.

13-Yilmazkuday, Hakan**, (2009) "Productivity Cycles in Public and Private Manufacturing Sectors: Evidence from Turkey"**, International Journal of Applied Economics, Vol. 6, No. 2, ,pp. 21-40.

11/17/2013