

Measurement and Analysis of Productivity of the Islamic Azad University of OMIDIYEH during 2002 – 2010

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ABSTRACT

Productivity as the key variable in the economic development of various countries has been accepted. In this study based on three methods: EVA method, TFP method and gold method, productivity of Islamic Azad University of OMIDIYEH during 2002 – 2010 is reviewed and analyzed. This analysis is mainly a statistical analysis that is based on information of levels of the third type of university. The results of the study indicate a very good performance of university during 2002, 2002, 2003, 2005 and 2007 and relatively poor performance during other years. Key variables in the study include: Total revenue, total costs, capital and net profit that during the mentioned period, have been increasing that is indicating the successful performance of the college. Finally, it is proposed that the university emphasizes more on the key variables that are present in each of the three mentioned methods and eliminates weaknesses and enhances the strengths of key variables during 2002-2010 for future plans.

KEYWORDS: productivity, measuring productivity.

INTRODUCTION

Researches have shown that productivity measurement and analysis is the main subject which have been forced the scholars and organizations managers to effort and work and thinking. Today has been well established that the main factor of the competitive gap between different countries and different organizations is productivity. Due to low productivity, a country or an organization falls behind its competitors and again, due to the high level of productivity, a country or an organization is ahead of its competitors (ABTAHI and KAZEMI 1996).

By measuring and analyzing productivity can achieve better results in life, creating comfort in the thought of the work force and equipment, as well as antiquity as intelligent human life on planet earth. In other words, any decision based on reason and sense which lead to action or effort, considers productivity as the concept for achieving the better result and enhance productivity is the more quality of life and live better (OREEI, 2003).

Productivity is a comprehensive and generally concept that its increase is considered as a necessity for improving living standards, greater prosperity, peace and human welfare which is the basic goal for all countries. Productivity is crucial for government officials and economic policy (PEYMAN, 1995).

Productivity improvement is achieved when the organizations can become their strategic objectives into practical results that are improving the quality and quantity of goods and services that this is a very challenging task for most organizations. Because to achieve goals, should make a balance between short and long term expectations, and also should establish coordination between strategic thinking and operational plans (PROKOPENKO, 2000).

The aim of the present study is to measurement and analysis the productivity of Islamic Azad University of OMIDIYEH during 2002-2010. In fact, this study is an answer to this question: How was the productivity of the university from 2002 until 2010? To answer this question, total productivity model (TPM), Value Added model and Gold Model are used.

Importance and role of productivity

Importance of the productivity in national prosperity increase is accepted now generally. Improving productivity directly affects the living. Therefore, increasing productivity has huge impact on many economic phenomena such as rapid economic growth, increasing employment, improving living level, controlling inflation, improving the balance of payments and even the amount and quality of leisure time. Productivity largely determines how competitiveness of national products in the international arena (TABATABAEI, 2000).

Resources limitations, population growth, and increasing human needs and intense competition in the production and sales have created an environment that any economic activity regardless of productivity won't be

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successful. Productivity is a basic tool for economic development. In some developing countries, economic development has created because of productivity revolution (TAHERI, 2008).

The benefits of improving productivity through increasing profit will be for producer, through increasing wages and improving working conditions will be for workers, through improving product quality and reducing its price will be for the consumer and through increasing ability for taxation payment will be for government and society (TAHERI, 2000).

Increasing productivity also must be followed by each organization to the extent that it is important for governments, because productivity illustrates the efficiency of the company in the future. In other words, an organization can only be hoped continued profitability when pays attention to improve productivity a lot. Therefore, the productivity is considered as one of the most important performance measures of organization. Productivity means doing the right things right, measures the situation of organization in different situations and with regard to internal and external factors and guides managers to the achievement of organizational goals (ABTAHI and KAZEMI 1996).

Review of relevant researches and conceptual framework

Kroger and TENCER by studying the growth of productivity in Turkish manufacturing know the country's industrial productivity decrease as a result of trade restrictions. This study showed that although the overall productivity growth in the private and the public industries are the same, but the use amount of resources and factors of production in public industries is much higher than private industries.(Economic Assistance of Foundation of the Oppressed, 1993).

SESHA and RADI have studied productivity trend for the years 1997-2007 about artifacts of Andhra state of the India. The results indicate that total productivity of factors in all industries has downward trend and total productivity index has increased. HASHEMIAN has also attempted to calculate the productivity of the major industries of the Iran which the results suggest that a partial productivity of labor has increased 48% and capital productivity of capital has decreased 13 percent. JAMALI in his master's thesis is discussed measure and analyze the productivity of cooperative projects of shrimp nourishment during 1995 to 1997 in BUSHEHR Province and concludes that many factors had an impact on the productivity of these projects, such as education, planning for repairs and maintenance, loan repayment period, R & D, marketing and so on.(Brinkerhoff and DRESSLER,1998).

ZOHEIRI has reviewed productivity and profitability of the Islamic Azad University of OMIDIYEH during 1997 to 2006 using a rapid assessment of the productivity and has concluded that the productivity of this university is assessed at the appropriate level (Chandra,2007).

Value Added model

Added value is net sum of the production value of goods and services in one company during one year. In other words, the total added value created during the production of goods and services during one year is called added value. Samuelson has defined as part of the surplus output relation to data which is attributable for wages, interest, rent and profits (National Iranian Productivity Organization, 1997).

Calculation of added value occurs to avoid double counting. This means that the value of goods and services which are used as intermediate data of an activity is the output of a production process. Gross value added minus consumption of fixed capital, the added value created in the company or organization is shared among people who had a role in creating and are calculated as wage and salary workers and depreciation for re-investment of equipment (National Iranian Productivity Organization, 1997).

EVA which is based on the theory of economic benefit and also known as residual income is based on it that value is created when a business unit is able to cover all capital costs and fees and also has payments as profit or Economic Value Added. The basic difference between accounting profit and economic profit at is used for cost of resources capital (National Iranian Productivity Organization, 1997).

Fundamental concept of economic value added is not: whether the business unit is profitable or not. But is that a) it has sufficient funds to cover the cost accounting profit or not? Does accounting profits sufficient to cover the capital costs or not? b) Does efficiency of investment create value for the company or not? And therefore we can say that: Economic value Added specifies whether the operating profit is sufficient for total used capital costs or not?(National Iranian Productivity Organization, 1997)

Stewart defines Economic value Added as follows:

Economic value Added = Net profit – (weighted average cost of capital× beginning capital)

In general, if EVA is positive number indicates that the organization operation is successful and was able to create wealth for shareholders. If economic value is zero, meaning that organization only had a return equal to the cost of capital and if EVA is negative number meaning loss of shareholder wealth. In the private companies, in these cases, usually a stock is sold as fraction.

For Islamic Azad University of OMIDIYEH, the economic value added is calculated based information extracted from balance of third type during 2002-2010 and is shown in Table 1. In this calculation by

subtracting the total revenue and total cost, gross profit (operating) is obtained. Since educational institutions are exempt from taxes on profits, to obtain the net profit, it is enough that long-term debt interest or fees for the mentioned period be deducted from gross profit (operational). Through the above solution, net profit is calculated and is shown in Table 1.

The **weighted average cost of capital (WACC)** is the rate that a company is expected to pay on average to all its security holders to finance its assets. The WACC is the minimum return that a company must earn on an existing asset base to satisfy its creditors, owners, and other providers of capital, or they will invest elsewhere. Because, its calculation is very difficult for university, we have been forced to use annual inflation rate of the country instead of that. Inflation rates in different years are shown in Table 1. Capital University is also the sum of its current and fixed assets. Current and fixed assets of Islamic Azad University of OMIDIYEH have been extracted from balances of third type for 2002-2010. And through its sum, asset of beginning of period is obtained and is shown in Table 1.

Table 1 - EVA of Islamic Azad University of OMIDIYEH during 2002-2010

Year	Total revenue	Total Cost	Gross Profit	Interest	Net Profit	Inflation rate	Beginning capital	Economic Value Added	EVA growth rate
2002	12150/4	-	- 620/9	20289/6	15/8	2584/9	344/8	2979/7	9170/7
2003	17937/3	2/07	662/0	30015/8	15/6	5344/5	290/3	5634/8	12302/5
2004	39171/3	26/51	18208/3	47462/2	15/2	25422/6	245/0	25667/6	13503/7
2005	44601/7	-0/43	10299/4	74493/8	10/4	18046/7	195/1	18241/8	26359/9
2006	71358/5	0/87	19236/0	118919/9	11/9	33387/5	148/4	33535/9	37822/6
2007	77819/4	-1/75	-14477/7	155252/5	18/4	24956/4	84/8	25041/2	52778/2
2008	105020/8	2/97	28516/4	206280/4	25/4	50794/6	30/4	50825	54195/8
2009	100447/1	-0/92	2229/6	242524/1	10/8	28422/2	3/2	28425/4	72021/7
2010	111689/0	-6/10	-11376/5	285710/5	12/4	24051/6	0/04	24051/6	87637/4

Thus, the EVA of Islamic Azad University of OMIDIYEH has been calculated for different years through subtraction net income and capital multiplied by the inflation rate and is shown in table 1. Therefore, EVA of Islamic Azad University of OMIDIYEH has been calculated for 2002-2010 and is shown in table 1.

The EVA of Islamic Azad University of OMIDIYEH during 2002-2010 as seen in Table 1 was fluctuating of 1477.7 million Riyals to 28516.4 million Riyals that has increased from 620.9 million Riyals in 2002 to -11376.5 million Riyals in 2010. In other words, for the years 2002, 2007 and 2010 have been negative. In other words, it been negative has for the years 2002, 2007 and 2010. This means that the university during the three mentioned years lost part of its capital and has not been considered a substitute for it.

Thus, during the three years, the performance of university has not been successful in creating wealth and capital. But in other years, the performance has been successful and the university has created wealth quite a lot. Highest economic value added during the mentioned period has been 28516.4 million Riyals in 2008 which indicates the status related to successful performance in this year. As Figure 1 illustrates, the economic value added of 2002-2010 has been relatively bullish which suggest that university had successive successes in these years, which is influenced by many factors, including management. Thus, the overall trend of economic value added and its growth rate during the period from 2002 to 2010 as shown in Figures 1 and 2 was an upward trend and in general, shows the successful functioning of the University.

Figure 1 - EVA of Islamic Azad University of OMIDIYEH during 2002-2010

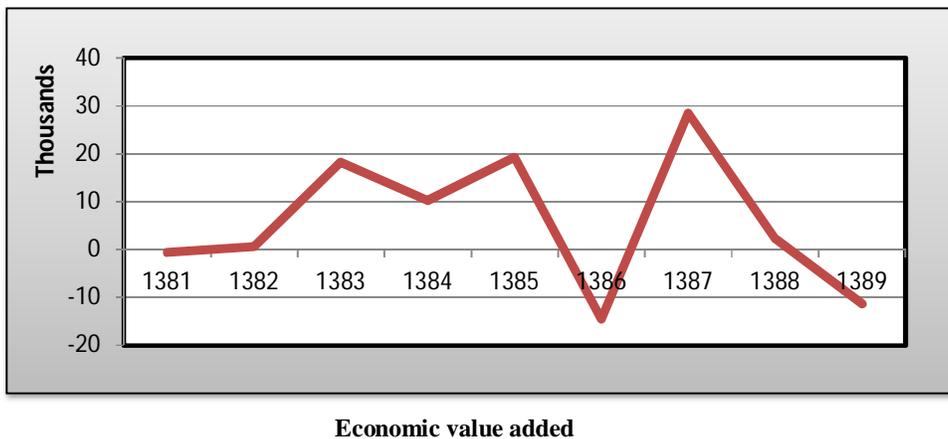
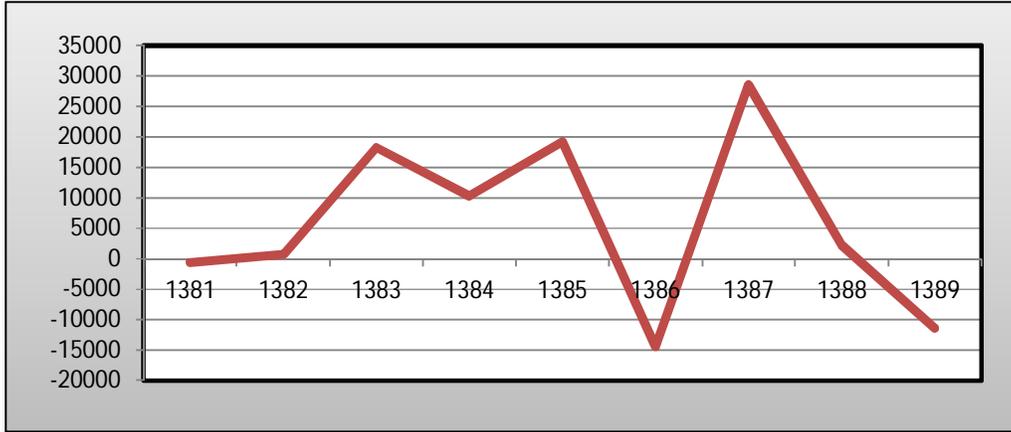


Figure2 - Growth rate of Economic value added of Islamic Azad University of OMIDIYEH during 2002-2010



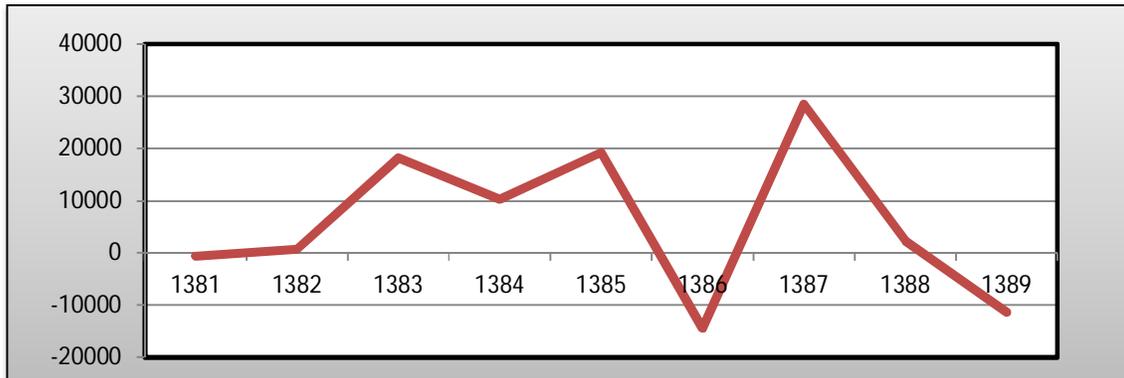
Growth rate of Economic value added

Since in the partial productivity models value added or output is linked to each of the factors of production, precision is not require, and the other hand, firms have slightly different productivity, so it is necessary that calculate the total productivity be used. Kendrick has defined the total productivity as the ratio of value added to sum of labor elasticity multiplied by the amount of labor and capital elasticity multiplied by the amount of capital. FOURACITEH has defined the total productivity as the physical size of the product to the total of direct and indirect labor, materials, energy and overhead costs. However, total productivity can be considered as the ratio of sum of the add value created to the sum value of the total of the inputs or ratio of total outputs (total revenues) to the total inputs (total costs). In general, if the total productivity is larger than 1, indicates that revenues are greater than costs. If the total productivity is equal to 1, indicates that total productivity is equal to revenues and costs. If the total productivity is less than 1, indicates that organizations are not provided suitable management in the field of obtaining more income or reduce costs (KHAKI, 1998). In different ways can be calculated that in the study of income from fees (after deduction of discount fees) is measured. In the second phase, all inputs must be measured. The total input of university that includes labor, capital, etc is measured by total costs of administrative, research, training, etc and is shown for 2002-2010 in table 2.

Table 2–Total productivity of Islamic Azad University of OMIDIYEH during 2002-2010

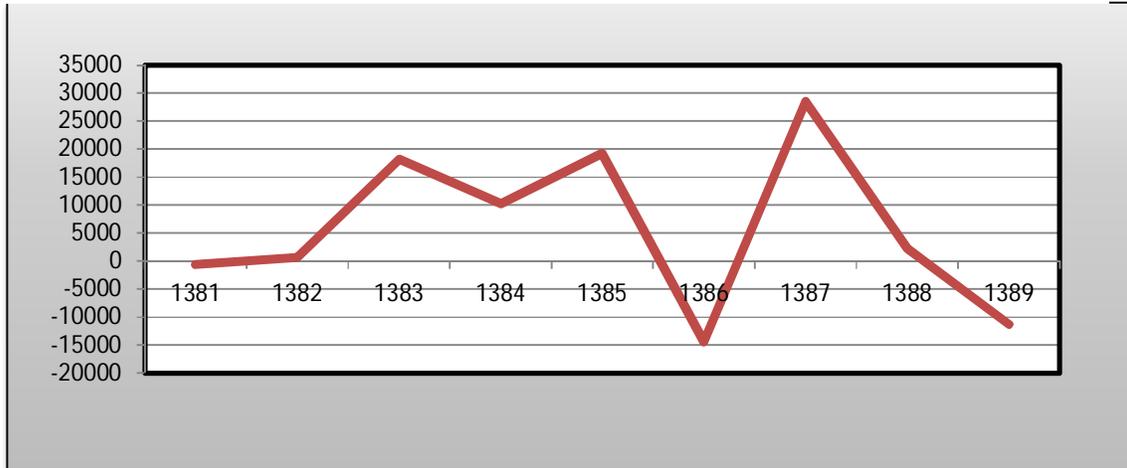
Year	Growth rate of total productivity	Total productivity	Total Cost (million Riyals)	Total revenue (million Riyals)
2002	-	1/325	9170/7	12150/4
2003	0/1	1/458	12302/5	17937/3
2004	0/99	2/901	13503/7	39171/3
2005	- 0/42	1/692	26359/9	44601/7
2006	0/12	1/887	37822/6	71358/5
2007	- 0/22	1/475	52778/2	77819/4
2008	0/31	1/938	54195/8	105020/8
2009	- 0/28	1/395	72021/7	100447/1
2010	- 0/09	1/275	87637/4	111689/0

Figure 3 – Total productivity of Islamic Azad University of OMIDIYEH during 2002-2010



Total productivity

Figure 4 – Growth rate of Total productivity of Islamic Azad University of OMIDIYEH during 2002-2010



Growth rate of Total productivity

Total revenue of the university which is considered as total output to calculate total productivity has been listed in Table 2. Total revenue is increased of 12150.4 million Riyals in 2002 to 111689 million Riyals in 2010 that has a jump of almost 900 percent over the 9 year period of 2002-2010. On the one hand, the income earned is because establishing popular BS and MS degrees and successful management in creasing capacity to attract students and on the other hand is because of appropriate educational environment. Its uptrend is because of suitable capital management and its application in the required cases and successful operation of university management. Also, Total cost of university which is listed in table 2, is increased of 9170.7 million Riyals in 2002 to 87637.4 million Riyals in 2010 that has a very large jump during 2002-2010. Of course, with progress and growth of university in various fields, costs are the natural and obvious issues. But it is necessary to consider in this regard better management. In general, in one hand most of this increase is due to the creation of an educational environment and the other hand is due to teachers employed in different groups at different times. Total productivity shows income derived from the use of all inputs such as labor, capital and so on. Total productivity of Islamic Azad University of OMIDIYEH through the ratio of total revenue to total cost has been calculated for the years 2002-2010. Although the total productivity of the 1.325 in 2002 to 3.275 in 2010 is decreased, but in some years such as 2008, the total productivity is increased to 2.901 or in 2008 is increased to 1.938 which shows a large jump. As mentioned previously, the total productivity greater than 1 indicates higher revenues than costs. Total productivity of university during the period 2002-2010 was greater than 1 in all years. Minimum of them is 1.275 which is related to 2010, and maximum of them is 2.901 which related to 2004. Thus, in all the years studied, revenues were higher than costs which show a successful operation and suitable management of the university. Table 2 shows the total productivity for the period of 2002-2010 and the trend is shown in Figure 3. As is known, the total productivity of university during mentioned period has experienced an upward trend. This indicates that the performance of university by using production factors such as labor and capital has been improved. In other words, these agents are used efficiently and accurately. The general trend in Figure 3 shows that the total productivity during 2002-2010 has positive and upward trend which on the one hand shows providing suitable management in the field of an additional income and reduction in costs and other hand shows providing successful performance with accelerate the increasing revenues and retard increasing costs.

Also, the rate of total productivity growth of Islamic Azad University of OMIDIYEH is also calculated and listed in Table 2. As can be seen, the total productivity of university is decreased in some years in comparison with the previous year. The negative growth rate of total productivity in the years 2005, 2007, 2009 and 2010 are seen. But in the other years have been positive that shows overall upward trend. Figure 4 shows that the rate of productivity growth is almost ascending. However, in some mentioned years, the trend has been downward, but the overall behavior is ascending.

Gold Model

Gold criteria have focused on the rate of return of the capital and links profit with five identified factors (price of product, unit costs, use of facilities, productivity of facilities and allocation of capital sources between fixed capital and working capital) and combines these five elements in the following equation:

$$(\text{Profit} / \text{Capital}) = \text{rate of return of capital}$$

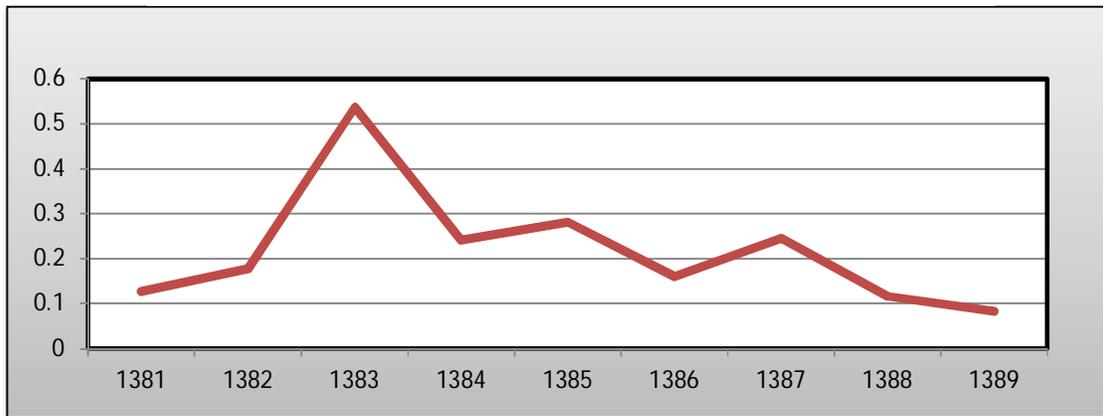
$$(\text{Profit} / \text{Capital}) = [(\text{Revenue} / \text{Product}) - (\text{Total cost} / \text{Product})] \times (\text{Product} / \text{Capacity}) \times (\text{Capacity} / \text{Product}) \times (\text{Fixed investment} / \text{Total investment})$$

The first three ratios after the equal sign are related to short-term and other two ratios are related to long-term changes. Above equation shows that how profitability changes from one period to another period depend on the interaction between the share of production, the optimum use of capacity and share of the total investment allocated capacity of production. Therefore based on Gold model, the return of capital ratio is obtained through net profit to capital. Capital turnover ratio and return of capital which is obtained by dividing the net profit to capital shows institution's ability to use all the resources available to it. This ratio is a good indicator for measuring the profitability and evaluation of success of the organization's managers. This ratio evaluates performance of the organization in implementing investment and earning profit. A higher ratio means that a firm with existing assets in obtaining income has been successful and was able to earn a good profit. However, this ratio is the final index for the detection efficiency of the management in the management. It should be noted that on the one hand to facilitate discussion and the absence or weakness of the data related to relevant in the Gold model on the other hand, only the ratio of profit to capital to calculate the return of capital of Islamic Azad University of OMIDIYEH over the period 2002-2010 is presented in Table 3. During 2002-2010 as net profit of university is increased of the 2584.9 in 2002 to 24051.6 in 2010 and also the capital of university is increased of the 20289.6 in 2002 to 285710.5 in 2010, it should be expected that rate of return of capital also be increased during this period. Over the mentioned years, the rate of return of the capital which is shown in Table 3 is increased of the 12.7% in 2002 to 17.8% in 2003 and 53.6% in 2004, but in 2005 is decreased to 24.2%, of course is increased to 28.1% after year that after years is decreased to 8.4% in 2010. Figure 5 shows the rate of return of capital of university during 2002-2010 that shows the upside and the downside trend. But the upside tend is greater than the downside trend. Growth rate of capital return during the period mentioned in Table 3 and its trend is shown in Figure 6. During the years 2005, 2007, 2009 and 2010 unfortunately growth rate of capital has been negative which suggests that the return of capital over the mentioned years is decreased from the previous year. Maximum of capital growth rate during the period from 2002 to 2010 is 200 percent which is related to the 2004. But in the other years is decreased so that the minimum of capital growth rate is related to the year 2009 and it is negative.

Table 2 – The rate of capital growth of Islamic Azad University of OMIDIYEH during 2002-2010

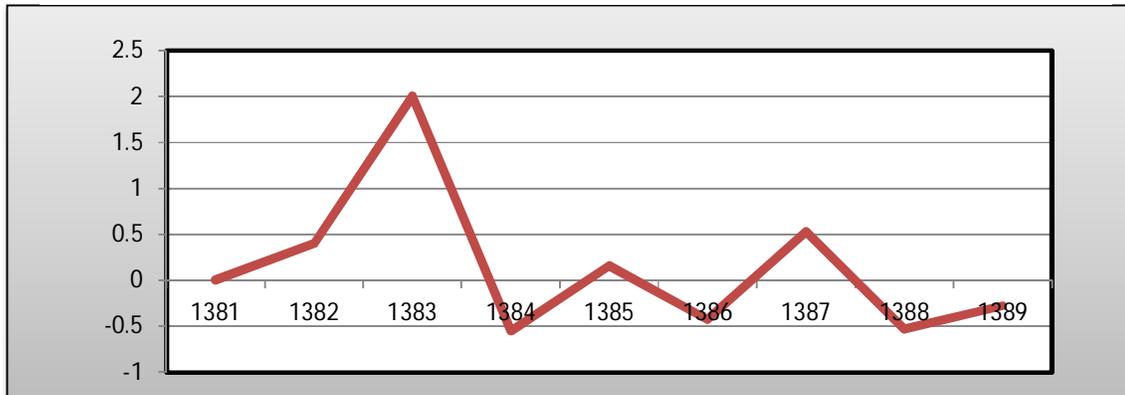
Year	Growth rate of return of capital	Rate of return of capital	Capital (million Riyals)	Net profit (million Riyals)
2002	-	0/127	20289/6	2584/9
2003	0/4	0/178	30015/8	5344/5
2004	2/01	0/536	47462/2	25422/6
2005	- 0/55	0/242	74493/8	18046/7
2006	0/16	0/281	118919/9	33387/5
2007	- 0/43	0/161	155252/5	24956/4
2008	0/53	0/246	206280/4	50794/6
2009	- 0/53	0/117	242524/1	28422/2
2010	- 0/28	0/084	285710/5	24051/6

Figure 5 –rate of capital return of Islamic Azad University of OMIDIYEH during 2002-2010



Rate of capital return

Figure 6 –Growth rate of capital return of Islamic Azad University of OMIDIYEH during 2002-2010



The growth rate of capital return

RESEARCH METHODOLOGY

Research is based on data extracted from the financial statements of university in the period 2002-2010. The type of study mainly is analytical-statistical. How to conduct research is analyze and evaluate information obtained during mentioned period and evaluation of relevant elements. Tools used in data collection mainly have become used books and resources about productivity in relation to mentioned methods. The present study is library type. Statistical population is Islamic Azad University of OMIDIYEH that will be discussed during 2002-2010.

Conclusions and recommendations

In this study, we tried to determine productivity of Islamic Azad University of OMIDIYEH during 2002-2010 based on three models of value-added model, total productivity and gold model. However, with information obtained, So that we can meet the research goals, we have ventured to calculate some required ratios and determine their trends.

Based on the value-added method: Performance of university has been weak over the three years of 2002, 2007 and 2010 (because of the negative economic value), but in other years for period 2002-2010, Performance of university has been successful. Also the growth rate of value added in 4 years 1995, 1997, 1999 and 2010 has been negative that means reduce of economic value added over these years. But in other years, economic value added has increased. Therefore, university management should special focus on the years 2002, 2007 and 2009 due to the negative economic value added and should special focus on the years over the years 2005, 2007, 2009 and 2010 due to reducing economic value. University management should identify the factors which reduce economic value added or make them negative and seek to resolve them. University management should also identify the factors that increase their economic value and strengths them in order to plan better performance in the coming years.

Based on the total productivity method: The University performance in the years 2005, 2007, 2009 and 2010, is weaker than the previous year. Because total productivity of university in these years is weaker than the previous year and its growth rate has been negative. During 2002-2010, the number of total productivity is good and indicates a successful operation and suitable management in various fields of education, administrative - financial, research and development. Therefore, it is necessary to identify factors which increase the total productivity during 2003, 2004, 2006 and 2008 and University management should strengthen them and he should distinguish between mentioned factors and factors which reduce total productivity and make negative total productivity growth. In general, he should provide properly management in order to strengthen and improve the productivity in order to be successful in various fields.

Based on Gold method: Poor performance of the university in four years 2005, 2007, 2009, 2010 due to reduce capital return and negative growth rates, can be seen. But in other years, the successful performance about using capital is visible. Therefore, the University management should identify, analyze reducing factors of capital return and resolve them. Therefore, the University management should identify, analyze increasing factors of capital return and strengthen them.

Generally based on three mentioned methods: value added method, total productivity method, gold method are closely related with each other in terms of key variables such as total revenue, total cost, net profit and capital in all of them. The result of the investigation of university performance during 2002-2010 indicates that in the years 2005, 2007, 2009 and 2010, performance of university in different fields of education, administrative - financial, research and development was not appropriate that lead to a decline in economic

value added, total productivity and capital return. But hopefully in other 5 years, the management of university was successful in increasing revenues more than costs, increase profits, increase capital and applying capital for achieving benefits better than other years.

It is recommended that the University adopt science management more than before in income and expenditure and tries to increase revenues and save costs to increase a net profit over the coming years. On the other hand, it is recommended that the University has greater attention to create assets as capital to increase economic value added, total productivity and capital return.

It is hoped that the university can adopt suitable management through resolving weaknesses in the years that has relatively poorly performance and through reinforce of Strengths in years that has successful performance and it is hoped that using academic planning we have better future and more successful performance in the coming years.

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