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The relationship between the Number of Students and Academic Ranks to Develop the Quality Higher Education in Jordan Using Statistics

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Abstract: The purpose of this paper is to develop the quality higher education in Jordan by studying the number of students and academic ranks in the Jordanian universities, public and private during the period 2000 – 2011. Number of degrees and academic ranks in the Jordanian universities, public and private, increased during the same period so that the total number of academic ranks during the period 2010 – 2011 was (5566) in public universities with (2599) academic ranks in private ones. Whereas the total number of students during the period 2010 – 2011 was (38707) in public universities with (13445) students in private ones.

Finally, time series has been used, by which the results were so different from the general trend. The forecasting of academic ranks and different simple correlation coefficients in public and private universities has been estimated.

Keywords: *Quality, Human Capital, General Trend Equation.*

Introduction

Higher education is no longer a prestige in the Arab countries for the elite people in the society, but it has become crucial for each Arab country in the framework of its efforts to achieve its goals in the development, especially in Jordan and some Arab countries. Moreover, education and not the financial capital has become the main source of wealth of nations, at present and future.

Therefore, the development of human capital in the Arab community is one of the priorities of its objectives. Thus the Arab countries encounter severe pressures to meet the growing demand for higher education in terms of quantity and quality, in particular, the institutions that rely mainly on the government funding, in addition to their income from tuition fees in some Arab countries. The statistics indicate that the number of Arab students enrolled in universities increased from four million students, male and female, to six million during the period 2000 to 2011, out of about 100 million male and female students in the world. So, it is important to pay attention of the quality of higher education in Jordan through many factors and indicators, such the number of the degrees and academic ranks in the Jordanian universities, public and private. The number of students in the public and private universities.

There are many reasons for the growth of university education demand in Jordan which serve the formulation and development of the human capital,

Therefore, more attention should be paid to the quality of education in Jordan in order to supply the society with appropriate outputs commensurate with its formulation and the development of the human capital.

The paper focused on the quality of higher education in Jordan, in terms of basic concepts, including the concept of quality, time series analysis, and human capital. Also the forecasting of the academic ranks for the period 2015 - 2016 and different simple correlation coefficients in the public and private universities has been estimated.

Literature Review

The most important relevant previous studies relevant linked with this paper are the study of (Batikhi, 2001) in which he pointed out to the Jordanian universities scientific research. (Badran, 2002) indicated to the rules and horizons of a distinguished higher education in Jordan. (Al-Qasem, 1999), he pointed out the rules and horizons of higher education in Jordan. (Al-Hajj, 2008) discussed the guidelines of quality assurance and accreditation of Arab League. (Haddaw, 2011) discussed the evaluation of higher education by using the comprehensive quality management and statistics.

Methodology

Quality

Quality is an old concept. The first man who was interested in quality was Babylon's In Iraq, including Hammurabi, who was interested and emphasized proficiency through what had been displayed in his famous obelisk which contained many laws. The main objective of quality is to detect deviations and defects of production or services of certain organization. Such situation requires finding out the solutions to correct these defects. Moreover, quality plays a prominent role in detection of the strengths and weaknesses (internal environment) as well as the opportunities and threats (external environment) of the organization.

There are many definitions of quality, for example; the quality is the degree of preference, which means the preference for certain product or service, also the quality is identical for use, which means that the specifications conform to the requirements of certain goods or services. Al-Waseet Dictionary defined quality as "it is derived from (do something well), i.e. the well done something or saying, doing something well means making it well. The American Institute of Standards defined quality as (the whole features and characteristics of a product or service which make it to be able to meet specified needs). Currently, it is well known that the scientific developments and technology, as well as the development of the university performance and the interest of university graduates need continuous efforts of the Arab universities and the provision of basic fundamentals of achieved development and continuous higher education. Therefore, quality is deemed a distinct and important functions sought by the managers of different organizations. It has many benefits, especially at the level of competition among the organizations. The prime objective of quality is to detect the deviations and defects in production process or services of certain organization. This requires the appropriate solutions to correct those errors and deviations. Moreover, quality plays a prominent role in detecting the weaknesses and strengths (internal environment) in addition to the opportunities and threats (external environment) of certain organization.

Time series analysis

Statistically, it is well known that time-series analysis is one of important topics in statistical methods. It is a set of observations of certain (PHENOMENON) variable takes different period of time regularly. Therefore, this analysis requires three stages, namely: stage of identification through the design of the examined series to identify its behavior, so that we can be able to determine whether it represents the general trend, seasonal variations, or periodical variations due to regular variations. The second stage is assessment stage, for example the general trend variation represents the changes occur by time and can be defined by increasing or decreasing time series in three ways; namely the method of mid-term arithmetic means, least squares method and moving averages method which will be used in this paper. The benefit of the estimated general trend equation is the forecast of the studied phenomenon values. The third stage is the stage of diagnosis of validity of the model used by examining random errors variable by using one of the methods related to this test.

Human Capital

The quality of the Arab higher education has important role in the development of human capital. Also that human capital represents a group of capabilities and capacities and innovations that characterize individuals, and its ability to achieve leadership and innovation in various fields. This brings us to a globalized world, where the development of human capital is deemed an essential condition to transform to a society and economics of knowledge, which leads to a balanced economic and sustainable development. So that the world is divided into two advanced and developing countries.

Results

Two types of data have been adopted in this paper, namely; secondary data, represented in the published literature in books, journals, previous studies and periodical journal related to the paper. The primary data, which is the data published by the Ministry of Higher Education and Scientific Research of Jordan.

The use of a descriptive statistics, including mean, average rate of change, the percentage of development, numbers and percents to describe paper data. Also, the use of inferential statistics, including simple correlation coefficients, and time series analysis to analyze paper data as mentioned before in the theoretical framework.

Table 1: The Development of the Academic Ranks and Students Numbers Enrolled in Jordanian Universities for the Academic Year 2000/2001 - 2010/2011

Years	Academic Ranks			Students/Public			Students /Private		
	Public	Private	Total	Males	Females	Total	Males	Females	Total
2000/2001	3062	1498	4560	10012	12514	22526	8099	2953	11052
2001-2002	3142	1619	4761	9584	11070	20654	7887	2850	10737
2002/2003	3523	1879	5402	10510	12069	22579	8188	3055	11243
2003/2004	3815	1881	5696	11585	13689	25274	7711	3662	11373

2004/2005	3958	1984	5942	17874	21901	39775	8827	3833	12660
2005/2006	4355	2187	6542	19066	24939	44005	8295	3759	12054
2006/2007	4506	2326	6832	19315	25664	44979	7945	4152	12097
2007/2008	4772	2511	7283	17809	24495	42304	7705	3552	11257
2008/2009	4951	2662	7613	18688	22509	41197	9763	3778	13541
2009/2010	5308	2730	8038	20108	24690	44798	9080	4515	13595
2010/2011	5566	2599	8165	15396	23311	38707	9843	3602	13445
The percentage development% 2010/2011 2000/2001	182	174	179	154	186	172	122	122	122

Table 2: The distribution of Academic Ranks in Jordanian Universities, Academic Year 2010 – 2011

Universities	Professor	Asso. Professor	Assistant Professor	Lecturer	Lecturer	Researcher	R & T Assistant	Total
<u>First: public universities</u>	967	1223	1675	424	870	38	369	5566
The University of Jordan	335	323	325	61	289	27	179	1539
Yarmouk University	227	205	175	105	119	-	28	859
Mouta University	119	160	114	22	77	-	6	498
University of Science and Technology	157	202	279	6	138	-	38	820
Al-Hashemite University	40	116	216	13	85	-	29	499
Al Al-Bait University	30	71	113	41	42	-	16	313
Balqa Applied University	27	83	182	116	5	-	19	432
The Al-Hussein Bin	13	35	151	45	-	-	3	247

Talal University								
Technical University of At- Tafilah	6	18	72	6	59	-	17	178
German Jordanian university	13	10	48	9	56	11	34	181
Secondly: private universities.	255	360	1449	412	117	-	6	2599
Jordan University College	1	-	3	-	20	-	6	30
Arab University of Amman.	34	28	27	-	-	-	-	89
Middle East University	31	22	61	5	-	-	-	119
Jadara University	12	15	54	10	-	-	-	91
Amman Private University	17	39	155	59	-	-	-	270
The University of Applied Sciences	19	42	147	21	56	-	-	285
Philadelphia University	20	40	135	59	-	-	-	254
Isra University	18	24	143	46	-	-	-	231
Petra University	22	34	128	57	-	-	-	241
Jordanian Zeitouna University	24	44	163	23	38	-	-	292
Zarqa University	13	31	158	50	-	-	-	252
University of Irbid	6	3	77	24	-	-	-	110
University of Jerash	17	21	114	32	-	-	-	184
Princess Sumaya University of Technology	19	13	28	3	3	-	-	66

Jordanian Academy of Music	1	1	7	14	-	-	-	23
University of Educational Sciences	-	-	13	5	-	-	-	18
National University of Ajlun.	1	3	36	4	-	-	-	44
Total Number	1222	1583	3124	836	987	38	375	8165
The percentage(%)	15.0	19.4	38.2	10.2	12.1	0.5	4.6	100

Table 3: Members of Academic Ranks in Jordanian Universities, According to Scientific Degree University Year (2010-2011)

Universities	Phd	Master Degree	Diploma high	Bachelor	Total
First: Public Universities	4272	1073	8	213	5566
The University of Jordan	1193	226	3	117	1539
Yarmouk University	652	195	1	11	859
Mouta University	431	66	1	-	498
University of Science and Technology	665	150	-	5	820
Al-Hashmite University	416	83	-	-	499
University of Al Al-Biat	253	57	-	3	313
Balqa Applied sciences University	296	115	2	19	432
The Al-Husseain Bin Talal	187	59	1	-	247
Technical University of At Tafilah	108	53	-	17	178
German Jordanian university	71	69	-	41	181
Secondly: Private Universities.	2061	518	4	16	2599
Jordan University College	6	17	-	7	30
Arab University of Amman.	83	2	4	-	89
University of the Middle East	114	5	-	-	119
University of Jadara	82	9	-	-	91
Amman Private University	211	59	-	-	270
The University of Applied Sciences	208	77	-	-	285
Philadelphia University	196	58	-	-	254
Isra University	185	46	-	-	231
Petra University	184	57	-	-	241
Jordanian Zeitouna University	232	60	-	-	292
University of Zarqa	202	50	-	-	252
University of Irbid	86	24	-	-	110
University of Jerash	151	33	-	-	184
Princess Sumaya University of Technology	60	6	-	-	66

Jordanian Academy of Music	8	6	-	9	23
University faculty of Educational Sciences	13	5	-	-	18
National University of Ajlun.	40	4	-	-	44
Total number	6333	1591	12	229	8165

Tables 1, 2 and 3 indicate that the total number of academic ranks in the academic year 2010-2011 in public universities were (5566) and (2599) in private universities respectively, totaling (8165). The total number of Professors were (1222), Associate Professor (2583), Assistant Professor (3124), lecturer (987) and Researcher (38), Assistant Researcher and Teaching (375) and their percentages were (15.0, 19.4, 38.2, 12.10, 0.5, and 4.6) respectively. Therefore, the highest percent was (38.2) for the Assistant Professor rank and the lowest was (0.5) for the Researcher. The total number for a Doctorate was (6333), Master Degree (1591), Higher Diploma (12) and Bachelor Degree (229). The total number of students in 2010 - 2011 in Jordanian public universities and private were (38707, 13445) respectively. Average rates of change of academic ranks for example for the period (2000-2001), is $(5566 - 3062) / 5566 = 0.45$ in the public universities and (0.42) in the private universities, and with a grand total to both (0.44). Rate of change of grand total of the students in the public universities was (0.42) and (0.18) in the private ones. It can be seen that average rate of change of the academic ranks and students in the public universities is greater than the private one. The percentage of development for the number of academic year 2010-2011 divided by the number of 2000-2001, according to calculation of the Ministry of Higher Education and Scientific Research of Jordan for academic ranks in public universities was (182) and 174 in private universities, with total (179). The total of development percents of the students in public universities were (172) and in private universities (122). So, the percentage of development of the academic ranks and students in the public universities is greater than the development percent of academic ranks and students in the private ones.

In order to estimate the relationship between academic ranks and students in public universities and private universities, simple correlation coefficient has been used based on Table 1 for the period (2000-2011). The simple correlation coefficients between the total number of academic ranks in public and private universities was (0.97), and between the total number of academic ranks and the total number of students in public universities (0.82) and between the total number of academic ranks and the total number of students in private universities (0.80) and between the total number of students in public universities and private universities (0.70). It was found that they are positive and strong relationships. The strongest was the correlations of academic ranks in public and private universities and the lowest was between the students in both public and private universities.

In analyzing a time series, there are three major stages of model building: identification, estimation, and diagnostic checking. So the first step (identification) is plotting it. A plot gives a general idea of how the series behaves. Does it have an overall trend (increase or decrease over time)? Does it show seasonality? Does it show no trend or no seasonality?

The figures for academic ranks and students in public and private universities. Indicate that the behavior of time series. It was clear that there was a general trend toward increasing. Therefore, the general trend will be adopted in the estimate and diagnostic stages are shown in table 4.

For the estimate values of β_1 , it means any increase in one year will increase (254, 126, 2478, & 268) in both the number of academic ranks and students in public and private universities. The t-values of the number of academic ranks and students in public and private universities were all significant (0.00) since which are less than the significance level (0.05). The means of random errors were equal to zero, with standard deviations all equal to (0.95), which is close to one. Therefore, the conditions of random errors in terms of mean equal to zero, and the standard deviation was equal to one. This means that the random errors follow normal distribution, which requires to be done in the diagnostic stage. Also predictive values (Forecasting) are shown in Table 4, the first predicted value represents the period 2015- 2016, while second predicted value represents the period 2019-2020. It was found that increasing with time, where the increase will be to academic ranks and students in public universities compared to academic ranks and students in private universities.

Table 4: Results of the General trend Equation in the Period 2000-2011

Results Dependent Variable	Estimated β_0	Estimated β_1	T-Significance Of β_1	Forecasting	Means of Standard Error
Academic Ranks (Public Universities)	2745.46	253.91	0.00	5793, 7823	0.00
Academic Ranks (Private Universities)	1412.36	126.36	0.00	2929 3590	0.00
Students (Public Universities)	20294.42	2478.17	0.00	59945 69858	0.00
Students (Private Universities)	10486.95	268.15	0.00	14777 15850	0.00

Conclusion

From literature review, there are a few researchers considered that the Quality of Higher Education. Because academic ranks and students in public and private universities are increasing, the Ministre of Higher Education and Scientific Research are requested, to take care of the humane capital. The percentage of development of the academic ranks and students in the public universities is greater than the development percent of academic ranks and students in the private ones. The strongest was the correlations of academic ranks in public and private universities and the lowest was between the students in both public and private universities. Take the benefit, as possible, of the conclusions of this paper, in particular the means and forecasting of the total number of academic ranks in universities and the number of students in both, public and private universities, in order to make a comparison between the actual and estimated number of them for several years.

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