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Case Study

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Using Accounting Information in Evaluating Spending Efficiency on Academic Activities in Jordanian State Universities: A Case Study of Yarmouk University

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ARTICLE INFO

ABSTRACT

This paper aimed at using the accounting information in the accounting statements and reports of Jordanian state universities and the Jordanian ministry of Higher Education to determine the spending efficiency of these universities according to a number of unconventional accounting indicators as primary inputs for the development of a model to judge the educational productivity of these universities.

The researcher examined the expenditure on various academic activities at Yarmouk universities as a case study. The data was collected from the periodic reports of Jordanian Ministry of Higher Education for the period between 1999 and 2003 and analyzed using simple regression analysis.

The finding revealed differences in the strength and direction of the correlation coefficients between the volume of estimated and actual expenditure on one hand and student services, number of enrolled students, and number of faculty members on the other hand. The finding further revealed a weakness in state universities' dependence on accounting indicators in planning and evaluating funding resources for their academic and research programs.

The researcher drew a number of recommendations the most significant of which pertains to the need to depend on a set of indicators on adequate accounting information about state universities when planning funding for the various programs and activities in these universities as well as when evaluating the efficiency of these funding. Another recommendation pertains to adopting a sat of modern mechanisms to enhance the efficiency of planning and evaluation decisions from accounting perspective.

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KEYWORDS: ***Expenditure; Jordanian State Universities; Accounting Indicators; Performance Efficiency.***

1. INTRODECUTION

The State Universities in Jordan that ten universities to carry out educational and research activities and community service, aimed at the development of human resources for economic development and higher rates of economic growth. These universities rely on funding its activities and programs on the own

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resources of the university and other fees, in addition to government financial support through the state budget allocations from general funds.

Jordanian universities have been spent in 2003 (339,611,550) $ from which (289,365,667) $ on recurring expenditures and by 85% of the total expenditure, while capital expenditures (50245883) $ and is approximately 15%. These universities depend on the financing of expenditure on the different sources of funding a significant proportion of Government support, which contributed to the tuition amount (185,637,119) $ and 54.7% of total actual expenditures for 2003, while contributing to Government support of $(105, 224280) or (31%) of the total actual expenditures for the same year (Adwan, Albudoor, 2004).

Despite the magnitude of the expenditure on University activities, it does not judge their efficiency due to the difficulty of accurately measuring real inputs, as well as the uncertain outcome of difficulties as a result of the expected returns of the projects included as non-quantities and non-economic (Nasser, 1992). In addition to the lack of accurate accounting indicators to judge the efficiency of spending on these projects (Peter & Rossi, 1980), which are currently limited evaluation of the efficiency of expenditure in the education sector in Jordan at a group of ineffective traditional financial indicators, without interest using a set of indicators based on accounting information.

One study in the higher education sector has revealed(Shattov,1995) the enormity of the problem was found, for example, that there is great difficulty in conducting objective judgment on the efficiency of spending on investment in higher education because of poor efficiency outputs, and mismatch between the output and the needs of economic and social development in developing countries, as well as the high cost of university education in these countries and high rates of unemployment among its graduates.

In fact, there are many studies (Schult, 1961, Ward, 1969, Mood 1970, Nasear & Hashim, 1992, Link, 1993, Beattie, 1995, and Fergali 1997) were indicated the need to search for objective tools to measure the cost and return on university education as an entry point for judging the productivity of its expenses and rationalize because this education is a social and economic returns a real investment in exchange for use of a large amount of financial resources.

As accounting indicators were considered the most important objective tools, which won a growing interest on the part of accountants, economists and administrators due to its ability to perform accounting analysis required for the size and the results of spending in the higher education sector, as well as the ability to build appropriate models to judge the productivity and efficiency of this spending.

From the insight of the above discussion, The aim of this study is to seek to hire the accounting information contained in the accounting reports published from public universities and other agencies responsible for university education through case Yarmouk University study, in order to judge the efficiency and effectiveness of this spending, depending on a range of effective indicators as inputs essential to build a model suitable for the size of the productivity.

To achieve this goal has been the study is divided into four sections, the first section will be devoted to view the importance of the study and its objectives and the problem of the study and hypotheses, while the second section deals with the methodology of the study, while Section III deals previous studies and its results of studies devoted Section IV to analyze the results, and finished fifth section to display the study summary and recommendations.

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Importance of the study:

This study derives its importance from the following indicators:

1. to provide higher education institutions a range of appropriate accounting indicators to judge the efficiency and effectiveness of spending in this sector and are able to rationalize their investment decisions in the future.
2. great challenges facing public universities in Jordan, foremost of which is a severe financial crisis faced by these universities and of a severe shortage of funds available to it and the limited resources (meanings, 2002), which makes the provision of accurate accounting indicators to guide the planning and control operations and decision-making of the urgent necessities.
3. . This research is useful in testing the benefit of accounting information presented in charge of higher education sector, and public universities reports.
4. . The small size of the studies and research in the field of the role of accounting information in judging the efficiency expenditures on activities in public universities.

Questions and hypotheses of the study:

Questions of the study:

This study seeks to answer the following questions:

- Is there a relationship between spending finance official Jordanian universities and the effectiveness of educational plans, as measured by the number of graduates and the number of published research?
- Is there a relationship between the actual and estimated spending of university and among the various services provided such as education, scientific research and student activities?
- Is there a discrepancy between the approved expenditures and actual expenditures in these universities?

Hypotheses of the study:

This study aims to test the following hypotheses:

- **$H0_1$:** There is no relationship between finance spending on public universities size (case of Yarmouk University) and the effectiveness of educational plans, as measured by the number of graduates, the proportion of spending on scientific research, and the number of published research.
- **$H0_2$:** There is no relationship between the actual and estimated spending of university and among the various services provided services such as education, scientific research, and various student activities at Yarmouk University.
- **$H0_3$:** There is no relationship between the actual efficiency of the university and the estimated spending and the services provided to students measured by spending on health insurance services, housing services, student loans and pensions, running students, and grants in aid and the number of beneficiaries students of these services at Yarmouk University.

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RESEARCH METHODOLGY:

Data collection

Data has been collected for this study from two sources: Secondary sources have been represented in the literature available in books and references, articles and research related. Primary Sources: represented in the collection of data and information directly from the budgets of Yarmouk University and its annual financial reports, as well as various statistical releases and financial reports issued by the Ministry of Higher Education.

The Sample

This research has been done by taking sample of state universities in Jordan which are ten universities.

MODELS AND TECHNIQUES

For the conduct of the study various models have been developed and used.

The Models:

To test the hypotheses of the study, the statistical model used will depend on the clarification of the relationship between the dependent and independent variables used in this study, according to the main regression models and subsidiary models which are as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e \text{ …….. ……...(1)}$$

$$Y1 = \alpha + \beta_{10} X_{10} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} \text{ ……...(2)}$$

$$Y2 = \alpha + \beta_{20} X_{20} + \beta_{21} X_{21} + \beta_{23} X_{23} + \beta_{24} X_{24} \text{……(3)}$$

$$Y3 = \alpha + \beta_{30} X_{30} + \beta_{31} X_{31} + \beta_{32} X_{32} + \beta_{34} X_{34} \text{……..(4)}$$

Where,

Y= is the main dependent variable which is measured the efficiency of the services that have been measured how students benefit and faculty members at public universities from all dinars were spent on these services. This main variable was included on the set of 8 sub variables (Y1 ....Y8) to express 8 types of services offered by the university for students and faculty members.

X= is the main independent variable which represents the ratios of spending in public universities, whether approved or actual and also financing sources of these spending, whether self or from loans. This variable was included on the set of sub-variables (X1 ..... X4) to express a range of accounting indicators that can explain the variation in the efficiency of student services and faculty members' services.

b= is the regression coefficient to be valued to test the relationship between the dependent and independent variables.

α= Constant

Statistical techniques used in the analysis:

To test the validity of hypotheses of the study were used the following statistical tools:

Descriptive statistics: used for the purpose of calculating averages and standard deviation of the study.

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Correlation: used in order to identify the type and strength of the relationship between the dependent and independent variables for the study.

Simple and multiple regression analysis: used in order to recognize the value of identification required to measure the relative contribution of more independent variables in an explanation of the variables as input to judge the efficiency of spending university education sector coefficient.

T.Test: used In order to determine the degree of the effect of each independent variable on the dependent variables.

F. Test: used In order to determine the extent of the impact of substantial independent variables together on the dependent variables.

REVIEW OF THE LITERATURE

There are many field studies that are of direct and indirect relationship to the subject of study. These studies have confirmed the importance of assessing university education activities from multiple angles in order to improve productivity and raise efficient use of available resources and assess the extent of the contribution of investment projects to strengthen the economic and social dimensions. In order to shed light on the results of previous studies in this area we will summarize below the most important results to determine the area and the location of this research from these studies.

1. (Schultz, 1960), This study aimed to investigate the relationship between education spending and an increase in physical capital The study found the following findings that the increase in resources for education increases the human investment attractiveness more than physical investment, including at least 3.5 times, as well as to increase spending on this leads to increased education graduates income by between 36% -70%, which increases the yield on the human investment.
2. (Hartley, 1968) study which aimed to measure the efficiency of spending on higher education in America in which the researcher has been reached to the following findings that the cost of this education is growing at a faster rate than revenues, and then the list of institutions to carry out its activities suffer from an annual fiscal deficit that is not helping them to complete their projects investment in efficient and rational manner.
3. (Mood, 1970) study in order to learn how to plan and monitor investment spending in institutions of higher education in America. The study pointed out that most of these institutions are planning and monitoring spending on university education through the budget to be prepared in accordance with the approach of programming and planning, which represents the essence of the right economic and financial entrance to judge the productivity of expenditure contained in this budget.
4. (Cameron, 1978) study Aimed to investigate the reasons for the ineffectiveness of some US colleges activities in achieving educational objectives , and characterization of potential and projected curricula in image-target activities that are measured in light of the appropriate accounting information, and through the use of survey forms to collect and analyze the necessary data. The study concluded that a set of indicators that will enable to judge the effectiveness of educational institutions in the implementation of their projects and activities.
5. (Pasacharopoulos, 1988) ended up in his study on the efficiency of investment spending on higher education to the following findings need to rely on cost-effective approach which is based on the comparison of different levels of cost to evaluate the specific outputs of the number and quality of graduates.

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6. Another study conducted by (Farghali, 1997) aimed to prepare a set of accounting indicators appropriate for measuring the efficiency of the education programs of the Egyptian universities and higher institutions from economic and social perspectives. The study concluded the following findings that higher education is an activity that involves the flow of a given volume of inputs in order to achieve the views of the outputs of the number and quality of graduates in different disciplines, in addition to the need to determine the appropriate units to measure the productivity of the educational process.
7. Miles & Zimmerman, 1997 also conducted a study on reducing the cost and improving efficiency in the education which showed that there are several ways to reduce the cost of university education from the most important to reduce expenses and administrative costs, as well as raising university fees and increased assistance for student.
8. Ibrahim & Abdel Fattah, 2003 also conducted a study that aimed to make the accounting assessment required for the size and the results of government-university investment spending in Egypt during the period from 92/93 to 94/95 using capital spending data during the period from 92-95, the researchers concluded that a set of recommendations including the need to diversify the financing structure of the university investment project.
9. In a study Al-Hamoud and Taani's,2005 aimed to identify how realistic planning in preparing the budget of Yarmouk University and the development of estimates in both revenues and expenditures for fiscal years 1987 -2002, also aimed to test the extent of the variation between the estimated and actual budget during that period. The study showed substantial imbalances in the distribution of financial allocations process. The study also indicated expansion in recurrent expenditures on the account of capital expenditures and spending at the scientific research, where the average rate of spending on scientific research did not exceed 1% of the total expenditures.
10. Another study conducted by Al-Taani and Al-Kasharma, 2005 aimed at measuring the cost and determining the efficiency in the use of human and financial resources available in the state Jordanian universities and to identify the major components of this cost and the impact of the parallel program on each of the Yarmouk University revenue and the cost of the student during the period from 1997 to 2003. The results of the study showed weakness in the internal efficiency in a number of aspects, including expansion of the current spending, and the expansion of employment in the administrative staff.

Through the presentation of the previous studies it is clear that there is an agreement on the importance of using accounting information through a variety of non-traditional indicators in measuring the efficiency of university education activities and the judgment on the efficiency of productivity of these activities. And despite the importance of the results of previous studies, but most of them have had to assess the efficiency of spending from the subsequent perspective of the implementation, and hence the previous studies did not bother to judge the efficiency and effectiveness of this spending at the level of public universities, and according to the knowledge of the researcher there is no any study that had been conducted in this area, so the current study was came to fill this gap.

RESULTS AND DISCUSSION

Descriptive statistics in (Table 1, 2) including the sources of funding for the expenditures of Yarmouk University for the period 1999-2003,as well as the rates of self – financing, government support, and loans to actual spending.

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Table1. Sources of funding for the expenditures of Yarmouk University for the period 1999-2003

Year	Self-financing	Government Support	Donations	Loans	Total
1999	11,692,626	8,813,064	337,000	1,837,980	22,680,670
2000	14,228,191	8,637,847	303,000	1,242,898	24,412,436
2001	16,052,380	8,822,463	124,626	3,070,327	28,069,796
2002	17,300,188	8,846,337	15,000	1,123.120	27,284,645
2003	19,804,939	8,987,584	10,000	5,907,187	34,709,710

Source: Yarmouk University's Annual Financial Reports: Numbers in JD.

Table2. % of loans, self-financing, and government support to the actual spending at Yu during the study period 1999-2003

Year	% self-financing to spending	%Government Support to Spending	%Loans to Spending
1999	52%	39%	9%
2000	58%	35%	7%
2001	57%	31%	12%
2002	63%	32%	5%
2003	57%	26%	17%

Calculated by the researcher

Data in table 1 and 2 indicates that the sources of self-financing continues to increase because of the increasing numbers of undergraduate and graduate students, while the government support has become a decreasing percentage of actual spending, which shows the government's inability to increase support due to increasing in the number of public universities in Jordan. Also shows that the amount of donations is decreasing due to the weakness of the relationship and communication between the university and the individuals and institutions of the community. It is also notable that the funding loans increased significantly during the period between 1999- 2003 which indicates that the university administration has become obliged to obtain loans to bridge the shortfall in other sources of funding.

Table3. Distribution of the actual expenditure on education, scientific research and student services and activities for the period 199-2003

Year	Educational expenses	Research expenses	Student Services	*Other expenses	Total
1999	7,014,418	109,718	340,830	14,711,849	22,176,815
2000	8,247,360	133,482	358,880	15,800,362	24,540,084
2001	9,137,050	119,450	357,000	23,249,873	32,863,373
2002	9,890,835	78,138	416,693	21,945,576	32,331,242
2003	11,107,081	96,260	423,646	22,357,571	33,984,558

***Represent the current expenditures including salaries and wages and other administrative expenses in JD.**

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Table 3. Shows the distribution of actual expenditure on education services, scientific research, student activities and other services for Yarmouk University during the period 1999-2003. Evidenced by the distribution of the actual expenses of the University that there is a marked increase in spending on educational services and other expenses, while actual spending on scientific research is decreasing, also notes that the increase in spending on student activities not commensurate with the large increase in the number of students enrolled at the university. It is clear from the distribution of the actual expenditure of the University that there is a marked increase in spending on educational and other services, while spending on scientific research is decreasing, also notes that the increase in expenditures on student activities did not suit with the large increase in the number of students enrolled at the university.

Table 4. the student share from actual expenditure during the study period from 1999 to 2003

Year	Total Expenditures	Number of students	Student's share from spending
1999	22,176,815	17,206	1289
2000	24,540,084	19,455	1261
2001	32,863,373	21,205	1550
2002	32,331,242	20,195	1601
2003	33,984,558	20639	1647

Source: annual statistical reports of Yarmouk University for the period 1999-2003

Table 5. Number of undergraduate and postgraduate students during the study period 1999-2003

Year	Number of undergraduate	Number of postgraduate	Total number of students
1999	15535	1671	17206
2000	17478	1977	19455
2001	18797	2408	21205
2002	17450	2745	20195
2003	17628	3011	20639

Source: annual statistical reports of Yarmouk University for the period 1999-2003

It can be seen from tables 4 and 5 that in spite of the significant increase in the number of students, but the student's share of actual spending has not increased to reflect actual spending on services and student activities.

Test hypotheses:

To test the validity of hypotheses of the study correlation and regression models was used to determine the degree of influence and significance relationships between variables. the researcher has relied on statistical programs package SPSS.

- **$H0_1$:** There is no relationship between finance spending on public universities size (case of Yarmouk University) and the effectiveness of educational plans, as measured by the number of graduates, the proportion of spending on scientific research, and the number of published research.

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Table 6 below shows the results of correlation analysis and testing of the degree of significance between finance spending as independent variable, which includes two sets of self-financing and loans, and educational plans as dependent variable which includes number of graduates in the stages of bachelor's, master's and doctoral degrees and the proportion of spending on scientific research, the number of published papers at Yarmouk University during the study period.

Table 6. results of the analysis of the degree of influence and significance of financing size spending on the effectiveness of educational plans at Yarmouk University during the study period 1999-2003

Variables	Self-financing		Loans		Self-financing + Loans	
	Significance	correlation	Significance	correlation	Significance	correlation
number of graduates from the Bachelor stage	0.033	*0.852	0.009	*0.938	0.009	*0.938
number of graduates from master's and doctoral stage	0.003	*0.0974	0.12	*0.925	0.009	*0.940
Number of published research	0.136	-0.613	0.030	*-0.864	0.036	*-0.845

*** Statistically significant at the level of 5%**

It has seen from the table above that there is a strong correlation and a positive and statistically significant at ($\alpha \leq 0.05$) level between the size of self-financing and the number of graduates from bachelor's stage, which indicates that there is a percentage of the cost borne by the graduates of this stage. Also it can be seen from the table that there is a strong correlation and a positive and statistically significant relationship at (($\alpha \leq 0.05$) level between each of the size of self-financing and number of the graduates of postgraduate master's and doctoral program, which also indicates that there is a percentage of the cost borne by these graduates. And confirms the fact that the average number of graduates from this stage has increased from 382 students in 1999 to 1188 students in 2003.

Table (7) below indicates the results of the correlation analysis between the size of the estimated and actual spending and the number of students enrolled in each of the undergraduate and postgraduate phase.

Table 7. Results of the correlation analysis between the estimated and actual expenditure and number of students

Variables	Actual expenditure		Estimated expenditure	
	Significance	correlation	Significance	correlation
number of students enrolled in undergraduate stage	0. 320	0.287	0.099	**0.689
number of students enrolled in postgraduate stage	0.013	*0.922	0.74	0.074

*** Statistically significant at the level of 5%**

**** Statistically significant at the level of 10%**

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It is noticed from the analysis of the data presented in Table (7) that there is a strong correlation and a positive and statistically significant at ($\alpha \leq 0.05$) level between actual spending and the number of students enrolled in the two phases of Graduate Studies (Master's and PhD). This relationship can be explained because the university administration more interested in the expansion of postgraduate programs. While there is no statistically significant correlation between actual spending and the number of students enrolled in the under graduate phase. At the same there is a correlation statistically significant at ($\alpha \leq 0.10$) level between the number of students enrolled in undergraduate stage and the estimated spending. Therefore the first hypothesis was rejected.

- **$H0_2$**: There is no relationship between the actual and estimated spending of university and among the various services provided services such as education, scientific research, and various student activities at Yarmouk University.

Table (8) shows the results of the analysis of the degree of the effect of each the total estimated and actual spending on the efficiency of the educational, research activities, and student services. Evidence from the analysis of the data contained in Table (8) lack of correlation and statistically significance between each of the actual spending and educational services and research. while there is a strong and correlation statistically significant at ($\alpha \leq 0.05$) level between actual as well as the estimated expenditure and other services. It is clear from this analysis, the presence of significant financial structural imbalances in the allocation of resources process.

It is clear from this analysis that the public universities do not direct this spending consistent with achieving the objectives of the university in the educational process and support scientific research. For this reason second hypothesis was rejected.

Table 8. results of the correlation analysis between the estimated and actual expenditure and number of students

Dependent Variables	Total Actual expenditure		Total Estimated expenditure	
independent Variable	Significance	correlation	Significance	correlation
Educational services expenses	0. 228	-0.4415	0.488	-0.0189
Expenses of Scientific Research	0.124	-0.6010	0.023	*0.8865
expenses of Services and activities student	0.040	*0.8327	0.249	0.4058

*** Statistically significant at the level of 5%**

- **$H0_3$:** There is no relationship between the actual efficiency of the university and the estimated spending and the services provided to students measured by spending on health insurance services, housing services, student loans and pensions, running students, and grants in aid and the number of beneficiaries students of these services at Yarmouk University. Table (9,10) indicate the results of correlation analysis between the estimated and actual expending in one hand and number of students benefit from student services and the number of academic staff during the study period in the other hand.

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Table 9. results of the correlation analysis between the estimated and actual expenditure and number of students benefit from student services

Dependent Variables	Total Actual expenditure		Total Estimated expenditure	
independent Variable	**Significance**	**correlation**	**Significance**	**correlation**
Number of students benefit from loans	0. 102	0.6822	0.084	**0.7229
Number of students benefit from awarded top	0.195	0.5015	0.281	03521
Number of students benefit from work	0.132	0.6205	0.111	0.6645
Number o student benefit from Medical insurance	0.031	*0.8589	0.009	*0.9398
Number of students who have Jrayat	0.071	**0.7531	0.123	0.6392
Number of student benefit from aid	0.287	0.3418	0.436	0.1012
Number of student benefit from housing services	0.020	-0.8957	0.060	-**0.7792
The amount spent on student loans	0.049	*0.8074	0.089	**0.7104
The amount spent on student grant	0.031	*0.8607	0.041	*0.8294
The amount spent on student aid	0.277	0.3580	0.421	0.1250
The amount spent on student work	0.009	*0.9397	0.013	0.9199
The amount spent on student Jrayat	0.215	-0.4659	0.333	-0.2649
The amount spent on medical insurance	0.039	0.8344	0.021	*0.8911
The amount spent on housing services	0.195	0.6511	0.148	-0.5893

*** Statistically significant at the level of 5%**

**** Statistically significant at the level of 10%**

By analyzing the data presented in the table (9)we conclude the following: there is a positive correlation and statistically significant at ($\alpha \leq 0.05$) level between actual spending and the amount spent on medical services, student grants, student works and student loans.

This is due to the orientation of the university administration to give priority for expansion in the provision of social support for poor students excelling at the university, and through the provision of loans, grants and aid.

Also there is a positive correlation and statistically significant at ($\alpha \leq 0.05$) level between actual spending and the amount spent on medical services, student grants, student works and student loans.

As well as there is a positive relationship between the actual spending on Jrayat item paid for graduate students and the number of students benefit from these Jrayat. This is due to the orientation of the university administration for expansion in post graduate programs, and for encouraging the talented students.

Conclusion and Recommendations

This study aimed to make an assessment of the size of spending and the results of this spending on various university activities during the period between 1999-2003, by using the accounting information presented in the financial reports issued by the relevant authorities and by setting accounting indicators as inputs for the construction of a suitable model for judging the efficiency and productivity of this spending.

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To accomplish this objective, the researcher analyzed the data contained in financial reports issued during the period 1999 - 2003, using the statistical package of SPSS.

The results indicated a disparity and difference in the strength and direction of the correlation coefficients, both between the size of the finance spending in public universities and educational plans, measured by the number of graduates from the stages of undergraduate and graduate studies, number of papers published in Scientifically refereed journals, student services and the number of students enrolled at the university. It shows a lack of consensus among both the number of students enrolled for bachelor stage and size of the spending, while there is a strong and statistically significant correlation at ($\alpha \leq 0.05$) level and the number of students enrolled for post-graduate studies and between the size of the actual spending.

Results of the study also showed that there was no consensus among the scientific research service and the amount of funding spent on this activity, which demonstrated by the very low funding ratio, where this ratio did not exceed 0.4% of the total spending in the Yarmouk University. This confirms the weakness of attention directed spending for scientific research, which is one of the main objectives that the university found for it, while the university expansion in the volume of spending on other current expenses which will reflect negatively on the development of the educational process.

The study also showed the weakness of public universities in adoption of the accounting indicators and modern techniques for planning and evaluating the various sources of funding to finance their activities and programs, such as the use of programs and budget performance.

In light of the above findings the researcher recommends that there is a need to achieve balance in the distribution of financial allocations to the various activities and university services, and the adoption of sophisticated models of budgets in public universities, in order to improve the efficiency of spending and allocation of available resources for these universities, in addition to the development of accounting information systems because of their closely related to the provision of data and information that are based on planning , evaluating and decision- making process.

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