

# **The effect of application of ERP system on the efficiency of resources use in Jordanian companies' case study (Arab potash company)**

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**Key words:** ERP system, turnover rate, inventory turnover rate, receivables turnover rate.

## **Abstract:**

The study results showed that there is a statistical significant impact of ERP implementation on the fixed assets turnover rate , so that the ERP application explains 96.2 % of the variance of the fixed assets turnover rate ,and a significant impact at the significance interval of .05 for the impact of ERP implementation on the inventory turnover rate , so that the ERP application explains 76.9 % of the variance the inventory turnover rate , the results also showed that there is a significant impact at the significance interval .05 for the impact of ERP implementation on the total assets turnover rate significance interval of .05, so that the ERP application explains 70.4 % of the variance the total assets turnover rate.

The study results showed that there is a statistical significant impact of ERP implementation on the receivables turnover rate significance interval of .05 , so that the ERP application explains 65.8 % of the variance of the receivables turnover rate. the results also showed that there is a significant impact at the significance interval .05 for the impact of ERP implementation on the liabilities turnover rate significance interval of .05, so that the ERP application explains 65.8 % of the variance the liabilities turnover rate. Where the t-calculated is 6.510 at the significance interval of 0.000, while the F value is 42.383 with the significance interval of 0.000. the ERP application results showed that it explains of 45.8% of the liabilities turnover rate.

Based upon the study results the researcher made the following recommendations :

the need for the industrial establishments to adopt ERP system (like the potash company) with all its applications in order to affect the financial resources of the company , like the fixed assets turnover rate, the inventory turnover rate ,the total assets turnover rate , the liabilities and receivables turnover rates , and to have the accountants and auditors trained and acknowledge the importance of such system.

## **Introduction:**

The world has witnessed during the past few years a tremendous advance in information technology and what resulted from it and known as globalization, which led to creating what was known after that as the global village, where many states have come into cooperation in many fields such as the social and economic fields, so that the global corporations and other firms were in great competition with the local corporations in order to support its competitive advantage through using the information technology specially with regard to resources planning system (Maguire et al. 2010, enterprise resources planning –ERP), the need for this system as one of the most modern applications for the accounting information systems was crucial because it was designed for the sake of coordinating the activities of all resources, information and communication according to the different business environments (nassar,2014).

During the past few decades, many enterprises have adopted the resources planning system because of its major importance in accounting processes (spathis & kanellou,2011).

Locally, some enterprises and companies have adopted resources planning system in order to keep up with its international rivals and saving or keeping its competitive status through increasing its efficiency in terms of using resources.

One of the best ways followed by the enterprise in order to judge its ability to manage its resources effectively is by using the financial analysis related to the financial activities percentages.

Based upon the role played by the resources planning systems in coordinating the entity's activities, the resources planning systems was adopted by many Jordanian entities currently. so that this study was made in order to shed the lights on the Jordanian corporations adoption of the resources planning systems in order to manage its resources efficiently.

## **Statement of the problem:**

Some of the studies indicators state that many enterprises use or try to adopt the resources planning systems in its work ,(zabjek Et al.,2009) showed that the increase regarding the use of the resources planning systems in work by the companies have soured to 11% in the west due to the major advantages the enterprise can get by adopting such system.

While many companies adopt this system, other studies point to the major threats regarding adopting the resources planning systems by the companies of the developing countries due to the inexperience in operating and using this system besides its high cost (sawah et al.2008).

Based upon the fact that Jordan as other developing countries counterparts, this study was made in order to shed the lights on the impact of using the resources planning systems (ERP) on the efficiency of using resources of the Jordanian companies by answering the following questions:

The statement of problem is reflected by answering the following question:

- is there any impact of using the ERP system on the efficiency of the Jordanian companies in using their resources? Based upon answering the past question ,the other following related questions are answered:
  1. is there any impact of using the ERP system on the current assets turnover rate at the Jordanian companies?
  2. is there any impact of using the ERP system on the inventory assets turnover rate at the Jordanian companies?
  3. is there any impact of using the ERP system on the inventory total assets turnover rate at the Jordanian companies?
  4. is there any impact of using the ERP system on the inventory total receivables turnover rate at the Jordanian companies?
  5. is there any impact of using the ERP system on the inventory total liabilities turnover rate at the Jordanian companies?

### **Significance of the study:**

Significance of the study is based upon the results the study will conclude with, and based upon these results , the Jordanian companies will determine its advantages of using the ERP system in terms of resources management efficiency , so that the researcher expects that the study will achieve the following:

- helping the administrations of the Jordanian companies in taking the rational decisions regarding the implementation of the ERP system.

### **The objectives of the study:**

This study aims to measure The effect of application of ERP system on the efficiency of resources use in Jordanian companies' case study (Arab potash company) through achieving the following:

- 1- measure The effect of application of ERP system on the efficiency of fixed assets turnover.
- 2- measure The effect of application of ERP system on the efficiency inventory turnover.
- 3- measure The effect of application of ERP system on the efficiency total assets turnover.

- 4- measure The effect of application of ERP system on the efficiency receivables turnover.
- 5- measure The effect of application of ERP system on the efficiency liabilities turnover.

**Hypothesis:**

Based upon the statement of the problem questions , the researcher had the following hypothesis:

H1: there is no statistical significant impact at significance interval ( $\alpha=.05$ ) for the implementation of ERP system on fixed assets turnover.

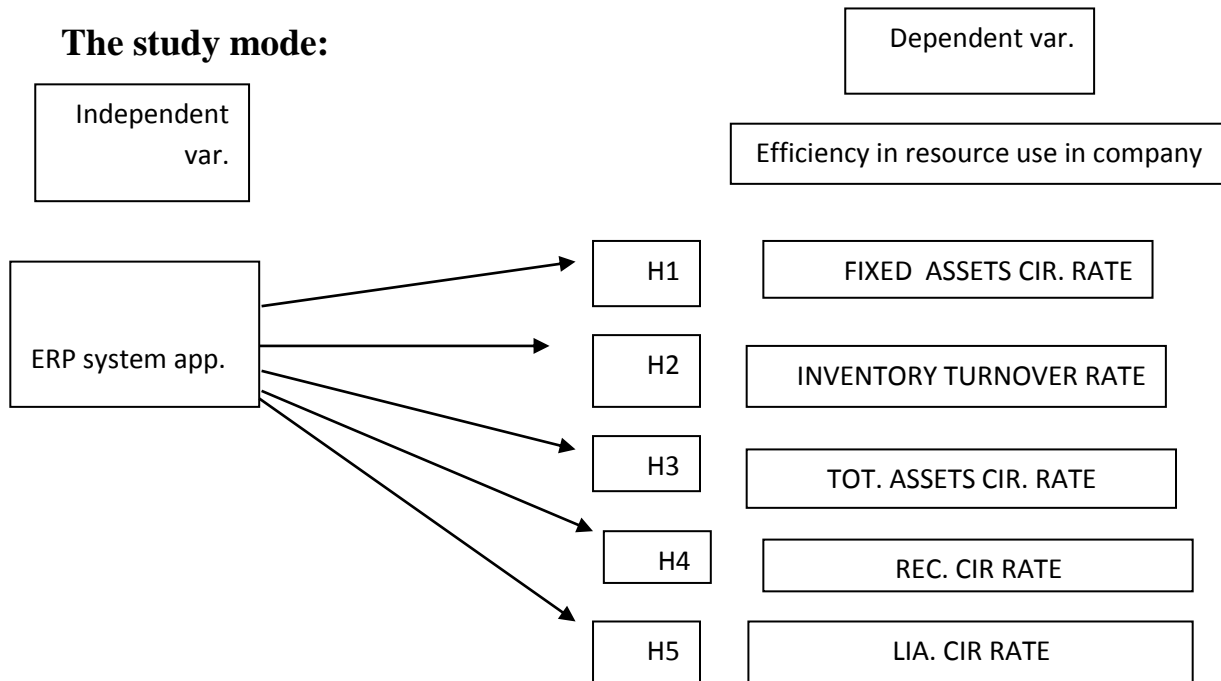
H2: there is no statistical significant impact at significance interval ( $\alpha=.05$ ) for the implementation of ERP system on inventory turnover.

H3: there is no statistical significant impact at significance interval ( $\alpha=.05$ ) for the implementation of ERP system on total assets turnover.

H4: there is no statistical significant impact at significance interval ( $\alpha=.05$ ) for the implementation of ERP system on receivables turnover.

H5: there is no statistical significant impact at significance interval ( $\alpha=.05$ ) for the implementation of ERP system on liabilities turnover.

**The study mode:**



## **A Literature Review:**

The researcher has reviewed All articles retrieved as a result of this search were subject to further analysis by reviewing the title, abstract and keywords to ascertain their applicability for inclusion in the literature review.

The full text of all articles retrieved from the detailed search of the accounting and information system journals reviewed by Harvey et al. (2010) and the accounting information systems journals were subject to examination in order to identify their appropriateness for inclusion.

To date, a number of empirical studies have investigated the relationship between ES and management accounting. Using methodological criteria, these studies can generally be grouped into three categories: those which have employed a positivist approach, an interpretivist approach, and a combination of both approaches. The differences between the two research paradigms (i.e. positivism and interpretive) lie in the selection of the research method (Weber, 2004). Positivist researchers usually carry out surveys or experiments, while interpretivist researchers typically conduct case studies. On the basis of the above three categories, a review of the literature is now conducted.

A review of these studies indicates that the survey method has been used extensively. At this point, it is useful to note that the majority of surveys have been designed to examine the impact of ERP systems on management accounting practice. In this context, some studies have focused on identifying changes only with regard to the transactional aspects of management accounting (e.g. changes in information processing), while other studies have also paid attention to the strategic aspect of management accounting by viewing ERP systems as enablers of sophisticated accounting techniques (e.g. activity based costing (ABC), benchmarking, balanced scorecard (BSC)).

However, since the authors wanted to compare ERP and non-ERP users, any company who had an ERP project under consideration or an ERP implementation in progress was excluded from the analysis. The final sample therefore consisted of 55 firms, representing 32 non-ERP and 23 ERP users. Booth et al.'s findings indicated that ERP systems are effective in supporting information processing but less so for reporting and decision-making support. Rather surprisingly, there was no noteworthy difference between ERP and non-ERP users regarding the level of information integration with a possible explanation being that most ERP implementations were at an early stage of development.

Since ERP systems often need years to 'bed in' (Adhikari et al., 2004), the majority of benefits are expected to be extracted from these systems when they are in their maturity phase. Booth et al. (2000) also indicated that ERP systems have a

minor impact on the adoption of sophisticated accounting techniques. In particular, no statistically significant difference in the utilisation of such techniques between ERP and non-ERP users was determined. For this reason, Booth et al. (2000) deduced that ERP systems do not constitute an incentive for the adoption of sophisticated accounting techniques. In a similar vein, Hyvonen (2003) conducted a comparison between ERP and best of breed (BoB) systems in respect of their impact on management accounting practice.

As illustrated by Rom and Rohde (2006), BoB systems are normally installed to assist practitioners in dealing with activities such as consolidation, budgeting, costing and performance measurement. A questionnaire was distributed to 300 large and medium-sized businesses in Finland with 99 responses received (response rate of 33%). Their findings indicate that ERP systems were used by 53% of the respondents, while the remainder used BoB systems. Based on 86 usable responses (13 enterprises which had not updated their information systems during the 1990s were excluded from the final sample).

Hyvonen (2003) argued that ERP and BoB systems exert almost the same influence on management accounting practice, as no statistically significant differences between these information systems were found. Explicitly, both had a small impact on the introduction of sophisticated accounting techniques. However, it is worth noting that in most cases where such techniques were adopted, companies had an ERP system.

Booth et al. (2000) that ERP systems are not sufficient in terms of reporting and do not motivate the utilization of sophisticated accounting techniques. Spathis and Constantinides (2003) also explore how ERP systems have influenced the management of accounting information. Using telephone contacts from a random sample of 98 large and medium-sized Greek companies, the researchers report on the practices of 45 organizations (response rate of 45.9%).

The most highly rated ERP perceived accounting benefits found by the researchers were increased flexibility in information generation, improved quality of reports and increased integration of applications. No significant improvements were experienced by the surveyed firms with regard to the time required for issuing reports and the decision-making process. The findings of Spathis and Constantinides (2003) are therefore much in line with those of Booth et al. (2000) which suggested that ERP systems are effective in supporting information processing, but not as effective in terms of reporting and decision-making support.

One year later, Doran and Walsh (2004) reported the results of a survey which was designed to examine the impact that ERP systems have upon both management accounting practice and the role of the management accountant. Using a survey, Doran and Walsh (2004) received 70 responses from Irish companies (representing a response rate of 45.8%).

In comparison with the findings of Booth et al. (2000) and Hyvonen (2003), Doran and Walsh (2004) found a stronger relationship between ERP systems and management accounting. In particular, while the former indicated that ERP implementations are not significantly associated with the adoption of sophisticated accounting techniques, the latter revealed that several companies utilized such techniques alongside ERP systems. The findings also suggest that ERP systems increase the use of numerous traditional management accounting practices, (e.g. variance analysis, standard costing, marginal costing, breakeven analysis). Finally, the findings suggest that ERP systems advance the role of the management accountant. For example, following the implementation of ERP systems, more comprehensive information is automatically provided to managers which consequently free the management accountant from manual tasks and facilitate more time for information analysis to support key decision makers.

In a similar fashion, Spathis and Constantinides (2004) attempted to identify what changes to management accounting practice have come about as a result of ERP implementations. Extending their earlier study which investigated the impact that ERP systems have on the management of accounting information, they examined whether ERP implementations in the Greek business context are associated with the adoption of sophisticated accounting techniques.

Again using a random sample of telephone contacts of 98 large and medium-sized companies, Spathis and Constantinides (2004) report on 26 companies which participated in the study (response rate of 26.5%). The findings of this study are in line with those of Doran and Walsh (2004) and suggest that after the implementation of ERP systems, sophisticated accounting techniques, such as ABC and target costing are implemented.

Furthermore, the evidence provided by Spathis and Constantinides (2004) adds support to the results of the studies of Booth et al. (2000) and Spathis and Constantinides (2003), indicating that ERP systems are more effective in terms of information processing (e.g. increased flexibility in information generation) and less effective in terms of reporting and decision-making.

Another study by Spathis and Ananiadis (2005) investigated how the implementation of an ERP system influenced the management of accounting

information, thereby replicating that of Spathis and Constantinides (2003). What differentiates these two studies is that Spathis and Constantinides (2003) conducted a survey of 45 firms, whereas Spathis and Ananiadis (2005) carried out a survey of ERP users in the context of a single case study, namely a large Greek public university.

The researchers used structured questionnaires in two phases to collect data, one month before and one year after the implementation of the ERP system. Questionnaires were sent to a random sample of 61 ERP users (University staff), of whom 43 participated in the survey, giving a 70.5% response rate. The most highly rated ERP perceived accounting benefits were improved follow-up of assets, increased flexibility in information provision, improved cash control, and less time required for end of year procedures. Improved quality of reports and less time for issuing reports were among the lowest rated benefits of the ERP system.

These findings suggest that ERP systems support tasks of information processing better than reporting activities, and, therefore, reinforce the findings of Booth et al. (2000) and Spathis and Constantinides (2003, 2004).

In the same year, research by Spraakman (2005) examined how ERP systems changed management accounting practice and in particular capital budgeting activities. The survey was administered to 71 large Canadian companies with 35 responses received (response rate of 43.7%). With respect to capital budgeting, the changes occurred were noted as follows: more rigorous use of detailed and accurate data (e.g. organisation of data by type and start date), more realistic process, on-line submissions, reviews and approvals of data used in capital budgeting, increased linkages to strategy, greater ability to track projects such as construction plan, monetary expenditures and fixed asset ledgers and decentralization of smaller projects. Furthermore, Spraakman (2005) indicates that ERP systems have a moderate impact on other management accounting practices, such as budgeting, operating statements, forecasting, performance measurement and costing.

Some of the most frequent changes regarding these practices, which were observed after the implementation of ERP systems, were:

- **Budgeting**: more automated, more detailed, more accurate, easier to use, easier for consolidations, and improved overview capacity.
- **Operating statements**: more automated, more detailed and quicker generation.
- **Forecasting**: longer term, more frequent, rolling and not merely fixed period, more accurate, more integrated, and more detailed.
- **Performance measurement**: expanded, more detailed, more focused on operations, more flexible reports, greater use of benchmarking.
- **Costing**: more detailed, more focused, more accurate, more flexible reports.



Overall, it can be concluded from Spraakman's (2005) findings that ERP implementations mainly improve the use of existing traditional management accounting practices rather than enabling the use of sophisticated accounting techniques.

The research of Spraakman (2005) was replicated by Jackling and Spraakman (2006) in an Australian context. Using a questionnaire which was distributed to 90 large companies, 35 responses were received (response rate of 38.9%).

The most significant changes in capital budgeting arising from the implementation of ERP systems were increased use of analytical or measurement tools, such as risk adjustments, return on investment, weighted average cost of capital, discounted cash flow, internal rate of return and payback; and increased formalization and rigor in the overall process, principally expressed through the development of an investment management committee. With respect to the impact of ERP systems on other management accounting practices, such as costing, performance measurement, forecasting, operating statements and budgeting, Spraakman (2005) find that ERP systems render these practices to be more detailed, accurate and flexible.

In later work, Rom and Rohde (2006) attempted to trace the differences between ERP systems and BI systems with respect to their impact on management accounting practice. A questionnaire was sent to 3,000 Danish large and medium-sized firms and 401 responses were received (response rate of 13.4%), of which 349 were suitable for analysis. The authors indicate that ERP systems are effective in terms of collecting data and organising management accounting tasks. These systems also support and improve the use of some traditional management accounting practices. These findings are largely consistent with those of Spraakman (2005) and Jackling and Spraakman (2006). Rom and Rhode (2006) also report that ERP systems are not significantly associated with improvements in information reporting and analysis, confirming earlier studies.

As for BI systems, the research findings show that they further improve data collection and facilitate and advance reporting, analysis and budgeting tasks. However, a limitation of this particular study is that the authors did not investigate whether any sophisticated accounting techniques were utilized post-BI implementation. Nevertheless, based on their findings, the researchers inferred that BI systems seem to be able to support such techniques.

Rom and Rohde (2006) also argued that there is an independent variable called “sophistication of management” which is likely to affect the extent of change in management accounting due to ES implementations. According to the authors, this variable is concerned with the extent to which management focuses on and applies appropriate management techniques and should influence both the comprehensiveness of ES and management accounting.

In the same year, research conducted by Spathis (2006) examined what accounting benefits were achieved via ERP implementations. Spathis’s (2006) study attempted to identify the independent variables which affect the number of perceived accounting benefits from using ERP systems. Drawing on the responses of 73 Greek large and medium-sized organizations,

Spathis (2006) reports the most highly rated accounting benefits, deriving from the implementation of ERP systems, as follows: increased flexibility in information generation, increased integration of applications, improved quality of reports, quicker issuing of reports, improved decisions based on timely and reliable accounting information, and speedier end of year accounting procedures.

In comparison with earlier studies, the study found a significant relationship between ERP systems, reporting and decision-making. Nevertheless, Spathis (2006) also indicates that ERP systems support tasks of information processing better than reporting and decision-making activities. Interestingly, Spathis (2006) also measured the correlation between the number of ERP perceived accounting benefits and a number of independent variables: number of implemented ERP modules, number of reasons for ERP implementation, cost of ERP implementation (as a percentage of sales) and company size (total assets).

He found that there is a positive correlation between the independent variables (with the exception of the cost of ERP implementation) and the number of accounting benefits. Conversely, a negative correlation was found between the cost of ERP implementation and the number of accounting benefits. The most influential independent variable found in the study was the number of implemented ERP modules.

In a more recent study, Jean-Baptiste (2009) evaluated the contribution of management accountants to the deployment of ERP systems. The research methodology adopted included the distribution of a questionnaire in 2005 to approximately 50,000 members of the Institute of Management Accountants (IMA).

Three years later, the same survey was also sent to 45 certified public accountants outside of the IMA group. The questionnaire was completed only by

management accountants with ERP experience. In total, 219 responses were received, of which 212 were suitable for analysis. The researcher reports the existence of a significant positive relationship between the participation of management accountants in an ERP implementation and its level of success. Jean-Baptiste (2009) also found that when management accountants are equipped with high IT skills, they are more likely to become members of ERP groups in both the implementation and maintenance phases of ERP systems.

The author also stresses that during the implementation of an ERP system, management accountants need enhanced financial, knowledge sharing and IT skills. These same skills are also required in the post implementation phase. Interestingly, report writing abilities were found to be an additional skill required by management accountants after the implementation of an ERP system.

This finding seems to corroborate evidence provided by earlier research that ERP systems are not sufficient in terms of information reporting and decision-making. As a consequence, management accountants are often forced to develop additional reports via the use of spreadsheets in order to present relevant information to decision makers.

In the most recent study to adopt a positive perspective, Sangster et al. (2009) examined the relationship between ERP systems and management accounting, paying particular attention to the impact these systems have upon the role of the management accountant. The ultimate objective of this study was to detect whether there is a relationship between the level of success of ERP implementations and the extent of change in the role of the management accountant.

Sangster et al.'s (2009) survey instrument was designed by drawing heavily on the research of Grabski et al. (2009) and other related literature. Grabski et al (2009) found that the more successful an ERP implementation is, the more significant the changes which take place in the role of the management accountant. Sangster et al.'s sample consisted of 668 members of the Chartered Institute of Management Accountants (CIMA) who were employed in large UK organizations. Ninety two questionnaires were completed, representing a 13.8% response rate. Of these, only 62 were used for analysis, representing management accountants who were employed for an ERP adopting organization.

The findings of Sangster et al.'s study suggest that the level of success of an ERP implementation is not significantly related to the extent of change in management accounting practice, as successfully implemented ERP systems merely automate data collection and improve information quality. This finding strengthens

the results of prior research which indicated that ERP systems are effective mainly in terms of information processing.

Sangster et al. (2009) also report that there is a significant correlation between the level of success of an ERP implementation and the extent of change in the role of the management accountant. Explicitly, they observed that successfully implemented ERP systems result in dramatic changes in the work of management accountants, as many of their previous tasks (e.g. information gathering and provision) are executed by the ERP system. As a consequence, management accountants can concentrate on value-adding activities such as information analysis.

Conversely, they indicate that poorly implemented ERP systems limit the role of management accountants, since the latter continue to carry out the same tasks but in a more complex work setting. The authors also considered the skills which are required by management accountants when they work in ERP adopting firms. Their findings suggest that the key skills which management accountants should possess in this context include IT competencies, cross functional working relationships and analytical and consulting abilities, which concur with the findings of Jean-Baptiste (2009).

### **Methodology:**

In order to answer the study questions the researcher has used the descriptive method in this study ,besides the analytical method in the experimental side of the study which is based upon analyzing the annual financial reports for these companies using percentages.

### **The population and study sample:**

This study adopted the survey method where the Arab potash company was chosen as a case study for this during the years 2001-2010.

### **Data collection:**

The researcher will use the primary and secondary data resources at this study as follows:

The secondary: is made up of the past literature in Arabic and English regarding the subject.

The primary sources : will include the Arab potash company annual reports as a case study for this during the years 2001-2010.

## **The variables:**

THE INDEPENDENT VARIABLES: ERP SYSTEM is both an art and science that consists of planning, implementation, and ongoing maintenance for the resources of the establishment or company. This methodology is designed to automate the drudgery of implementation and provide organized approaches to problem solving by listing, diagramming, and documenting all steps. Structured methodologies help to standardize and systemize ERP implementation and maintenance by approaching them as An instrument to support the company processes and activities which are part of its wok.

## **Fixed assets turnover rate:**

It equals the net sales divided by the total assets average ,this index reflects the assets ability to generate revenues in terms of monetary terms and the net sales( revenues).

**Assets:** is defined as all of what the company owns in order to be invested in the company or it means the sums ready to be invested to generate money.

## **The formula:**

the assets turnover rate=net sales (earning) ÷ average total assets.

## **Inventory turnover rate:**

Inventory turnover rate =sales cost/average inventory

Its defined as the times the inventory is sold during the year and its used as an indicator for the sales management efficiency in marketing the entity products annually so that the higher this rate the higher is the management efficacy in profitability. the inventory turnover can be computed as follows:

**Inventory turnover per day:  $\text{Inventory turnover}/360$**

**The total assets turnover rate:** its defined as the indicator that reflects the enterprise or projects ability to invest capitals in its uses, but the formulas adopted for this rate are three and as follows:

the current assets turnover rate= net sales/current assets.

the fixed assets turnover rate= net sales/fixed assets.

the total assets turnover rate= net sales/total assets.

**Receivables turnover rate:**

Net prepaid sales/average receivables

It's used to judge the credit management ability in the company in collecting its debts , so that the higher this rate the better is the management.

**Liabilities turnover rate:**

The Liabilities turnover rate = the net purchase /receivables +N. receivables.

It's used to judge the credit management ability in the company in settling its debts , so that the higher this rate the better is the management.

Liabilities turnover rate per day = Liabilities turnover rate/360.

**Statistical analysis:**

The statistical processing package (spss) was used in order to analyze the study data and relations of dependent and independent variables.

**Analysis**

Financial data for arab potash company

Table (1)

Y r	Cost of good sold	inv	Avv inv	sales	Reciev- ables	Avv Recieva- bles	lia	Avv Lia.	Fixed assets	Avv. Fixed assets	Total asset	Tot. assets avv.
2 0 0 1	79.11	7.015	7.015	143.9	30.9	30.9	6.585	6.585	293.8	293.8	414.54	414.54
2 0 0 2	85.623	6.63	6.823	141.96	31.425	31.166	7.066	6.825	281.525	426.597	426.597	420.572
2 0 0 3	91.913	3.826	5.644	154.58	22.475	28.26	11.73 4	8.462	196.185	257.196	342.994	394.713
2 0 0 4	100.007	2.412	4.836	26.34	27.789	9.518	8.726	178.1 22	237.428	237.428	368.831	388.242

**The dependent variable Table (2)**  
**After using ERP in resources efficiency as a system**

	Inv. Turnover rate	Receivables turn. rate	Liab. turn. Rate	Fixed assets turn. rate	Tot. assets turn. Rate
2001	11.82	4.66	12.01	0.49	0.35
2002	12.55	4.56	12.54	0.49	0.34
2003	16.29	5.47	12.54	0.60	0.39
2004	20.68	6.69	11.46	.78	.48
2005	23.1	6.58	11.74	0.99	.57
Avv.	16.04	5.59	11.68	.56	0.42
2006	17.32	3.39	7.23	1.00	.52
2007	15.88	3.66	6.96	1.24	0.62
2008	14.01	5.24	8.7	2.42	1.10
2009	7.57	3.04	5.95	1.09	.55
2010	15.44	4.5	9.89	1.44	.75
Avv	13.09	4.07	7.86	1.45	0.72

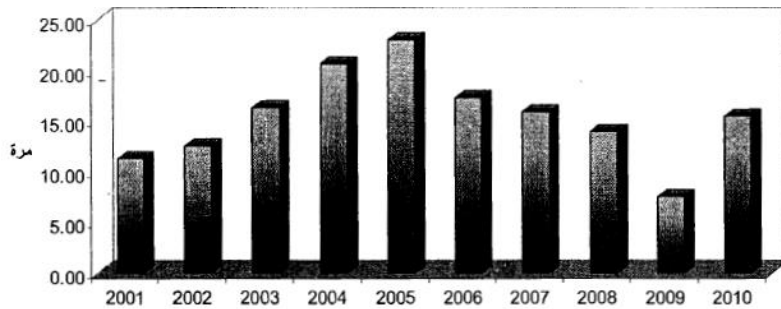
\*resources efficiency use of Arab potash company during (2001-2005) before using ERP and for (2006-2010) after using ERP:

#### Inventory turnover rate:

Inventory turnover rate for the period (2001-2005) was 16.04 where it was increasing respectively from 2001 onwards till 2005 with 23.1.

Inventory turnover rate for the period (2006-2010) was 13.09 where it was decreasing respectively from 2006 with 17.32 and 7.57 in 2009, while it was doubled in 2010 with 15.44.

The following graph indicates the inventory turnover rate for the study period:

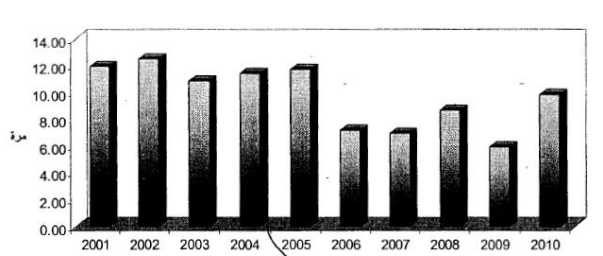


The inventory turnover rate

### The receivables turnover rate:

The receivables turnover rate average was 5.59 for the period (2001-2005) with fluctuating rates here with 4.66 for the year 2001 and 4.56 for 2002, and 6.69 for 2003 then decreased to 6.58.

The receivables turnover rate average was 4.07 for the period (2006-2010) with fluctuating rates here with 3.39 in 2006, then 3.66 in 2007, and increased to 5.24 in 2008 and decreased to 3.04 in 2009 and 4.50 in 2010. And the following graph shows the trend for this rate during the study period:

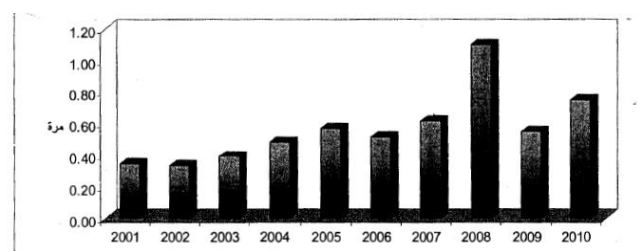


The receivables turnover rate

### The liabilities turnover rate:

The liabilities turnover rate average was 11.68 for the period (2001-2005) with major fluctuation in the liabilities turnover rate with 12.01 in 2001 and 12.54 In 2002 and decreased to 10.86 in 2003 but increased in 2004 with 11.64 and 11.74 in 2005.

The liabilities turnover rate average was 7.68 for the period (2006-2010) with major fluctuation in the liabilities turnover rate with 7.23 in 2006 and 6.69 In 2007 and increased to 8.7 in 2008 but decreased in 2009 with 5.95 and increased to 9.89 in 2010. And the following graph shows the trend for this rate during the study period:



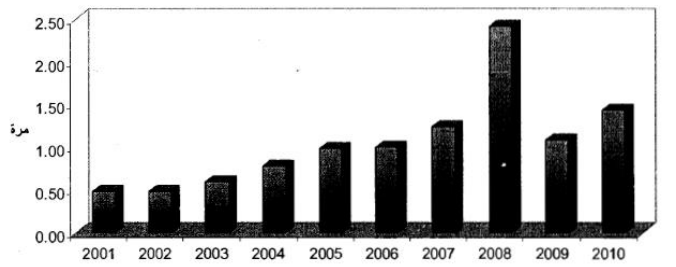
The liabilities turnover rate.

### Fixed assets turnover rate:

The Fixed assets turnover rate average was 0.65 for the period (2001-2005) with major stability in the liabilities turnover rate with 12.01 in 2001 and .49 In 2002 and increased to 0.60 in 2003 but increased in 2004 with 0.78 and 0.99 in 2005.



The **Fixed assets** turnover rate average was 1.45 for the period (2006-2010) with major fluctuation in the liabilities turnover rate with 1.00 in 2006 and 1.24 In 2007 and increased to 2.42 in 2008 but decreased in 2009 with 1.09 and increased to 1.44 in 2010. And the following graph shows the trend for Fixed assets turnover rate during the study period:

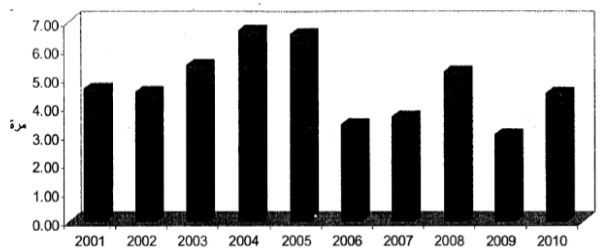


Fixed assets turnover rate.

#### **Total assets turnover rate:**

The total assets turnover rate average was 0.42 for the period (2001-2005) with major stability in the liabilities turnover rate with 0.42 in 2001 and .34 In 2002 and increased to 0.39 in 2003 but increased in 2004 with 0.48 and 0.57 in 2005.

The total assets turnover rate average was 0.72 for the period (2006-2010) with major fluctuation in the liabilities turnover rate with 0.52 in 2006 and .62 In 2007 and increased to 1.10 in 2008 but decreased in 2009 with 0.55 and increased to 0.75 in 2010. And the following graph shows the trend for total assets turnover rate during the study period:



Total assets turnover rate.

Comparing The pre and post effect of application of ERP system on the efficiency of resources use in Jordanian companies' case study (Arab potash company) regarding the study variables had shown the following:

**The variables averages                      Table (3)**

	Inventory turnover rate	Receivables turnover rate	Lia. Cir rate	Fixed assets cir.rate	Total assets circ. Rate
Avv. (2001-2005)	16.04	5.59	11.68	.65	0.42
Avv (2006-2010)	13.09	4.07	7.86	1.45	.72

**The inventory turnover rate:**

From table (3) we note that The inventory turnover rate has decreased from 16.04 to 13.09 after using ERP system which indicates that the company storage for the inventory was higher ,and from table (1) we note that the doubling of the inventory turnover rate from 5.8 million dinar before using the system to 14.5 million dinars after using the system, the sales volume for the company has doubled after using the ERP system with 170.1 million before using the system while it soared to 419.8 million dinars after using the system which reflects the system ability to increasing the company's productivity.

**The average receivables turnover rate:**

we note that the average receivables turnover rate has decreased from 5.59 to 4.07 after using ERP system which indicates that the company took longer time to collect its debts but doesn't mean that there is a major weakness here or a gap in the receivables but the higher values of the receivables had pushed the average receivables turnover rate to decrease ,and from table (1) we note that the doubling of the average receivables turnover rate from 34 million dinar before using the system to 124 million dinars after using the system, the sales volume for the company has doubled after using the ERP system and that was the reason for it.

**The average liabilities turnover rate:**

we note that the average liabilities turnover rate has decreased from 11.68 to 7.86 after using ERP system which indicates that the company took longer time to pay its debts but doesn't mean that there is a major weakness here or a gap in the liabilities but the higher values of the liabilities was due to the higher cost of sales for it .

**The average fixed assets turnover rate:**

we note that **the average fixed assets turnover rate** has increased from 0.65 to 1.47 after using ERP system which indicates that the company was doing good regarding its fixed assets management so that the average fixed assets turnover rate has soared from 393.5 million dinar to 742 million dinar after using the ERP system.

## The statistical test for the study data:

**Normal distribution:** The ( kolmogorov-sminov ) test was used for the normal distribution test for the variables as in the following table:

VAR	kolmogorov-sminov	
	Sig	Value
ERP sys application	2.762	0.000
Fixed assets turn. Rate	1.684	.07
Inventory turnover rate	1.718	.005
Total assets turn. Rate	1.565	.015
Receivables cir rate.	1.499	.022

### One sample kolmogorov-sminov test

	ERP sys applic- ation	Fixed assets turn. rate	Inventory turnover rate	Total assets turn. rate	Receivables turn. rate.	Liabilities turn. Rate
N	50	50	50	50	50	50
Normal mean	.60	.5678	.5022	.4930	.4930	.4260
Parameter sa,b std deviation	.495	.26082	.2828	.24224	.24227	.21801
Most extreme diff absolute	.391	.238	.243	.221	.221	.207
Positive	.287	.237	.243	.221	.221	.207
Negative	-.391	-.238	-.155	-.157	-.157	-.137
kolmogorov-sminov z	2.762	1.684	1.718	.1565	.1499	.1467
Asymp. Sig (2-tailed)	.000	.007	.005	.015	.022	.027

from table (1) we can realize that the three variables is not normally distributed if the kolmogorov-sminov test were high ,and the sig is more than 5% so that it indicates that the variables aren't normally distributed.

### Correlation matrix for the variables:

As its indicated in table (2), the Pearson correlation matrix for the study variables is provided , where there are high relations between the variables of the study, which indicates that there is no linear relation between them, and there is a strong relation between the independent variable (system application) and the other five dependent variables with a value of (.0685-0.981).

**Correlation matrix for the variables Table (2)**

	ERP sys application	Fixed assets circ. Rate	Inventory turnover rate	Total assets circ. Rate	Receivables cir rate.	Liabilities cir rate
ERP sys application		.981	.880	.843	.816	.685
Fixed assets turn. rate	.981		.883	.802	.769	.667
Inventory turnover rate	.880	.883		.667	.631	.491
Total assets turn. rate	.843	.802	.667		.842	.704
Receivables turn. rate.	.816	.769	.631	.842		.821
Liabilities turn. rate	.685	.667	.491	.704	.821	

	ERP sys application	Fixed assets turn. rate	Inventory turnover rate	Total assets turn. Rate	Receivables turn. rate	Liabilities turn. Rate
ERP sys application <b>pearson</b>	1	.983**	.880**	.843**	.816**	.685**
<b>N</b>		.000	.000	.000	.000	.000
	50	50	50	50	50	50
ERP sys application <b>pearson</b>	.981**	1	.883	.802	.769**	.677**
<b>N</b>	.00		.000	.000	.000	.000
	50	50	50	50	50	50
ERP sys application <b>pearson</b>	.880**	.883**	1	.677**	.631**	.491**
<b>N</b>	.000	.000		.000	.000	.000
	50	50	50	50	50	50
ERP sys application <b>pearson</b>	.843	.802**	.667**	1	.842**	.704**
<b>N</b>	.000		.000		.000	.000
	50		50	50	50	50
ERP sys application <b>pearson</b>	.816**	.769**	.631**	.842**	1	.821**
<b>N</b>	.000	.000	.000	.000		.000
	50	50	50	50	50	50
ERP sys application <b>pearson</b>	.685**	.667**	.491	.704**	.821**	1
<b>N</b>	.000	.000	.000	.000	.000	
	50	50	50	50	50	50

## Testing hypothesis results:

**the H1 results : there is no significant statistical impact at significance interval (.05) for ERP application on the fixed assets turnover rate.**

Table 3: the simple- regression results

model	unstandardized	Coefficients	Standardized	T	sig
			Coefficients		
constant	B	Std. error	Beta	22.682	0.000
ERP appl.	.258	.011			0.000
f-value	.517	.981			
Sig-f			1245.196		
Adj. R2			0.000		
			.962		

From the simple- regression results, its indicated that there is a significant impact at the significance interval (0.05) for implementing ERP system on the fixed assets turnover rate , with t-calculated 22.682 and sig. of (0.000) and the results show also that the implementing ERP system explains (96.2%) of the variance of the fixed assets turnover rate.

## Model summary

model	R	R2	Adjusted R2	Std. error of the estimate
	<b>.981a</b>	<b>.963</b>	<b>.962</b>	<b>.5077</b>

model	R	Df	Mean square	F	Sig.
Regression	.3.210	1	3.210	1,245.196	.000a
Residual	.124	48			
total	3.333	49			

1- predictors: constant, ERP application

2- dependent variable: the fixed assets turnover rate.

## coefficients

Model	Unstandrdized	Coefficients	Standardized coefficients	T	sig
	B	Std. error	beta		
1 (constant)	.257	.011		22.682	.000
ERP sys app.	.517	.015	.981	35.287	.000

**the H2 results : there is no significant statistical impact at significance interval (.05) for ERP application on the inventory turnover rate.**

**Table 3: the simple- regression results.**

model	unstandardized	Coefficients	Standardized coefficients	T	sig
constant	B	Std. error	Beta	6.595	0.000
ERP appl.	.201	.030			0.000
f-value	.503	.039	.880		
Sig-f			164.197		
Adj. R2			0.000		
			.769		

### Model summary

Model	R	R2	Adjusted R2	Std. error of the estimate
<b>1</b>	<b>.880a</b>	<b>.774</b>	<b>.769</b>	<b>.13594</b>

From the simple- regression results, its indicated that there is a significant impact at the significance interval (0.05) for implementing ERP system on the inventory turnover rate , with t-calculated 164.197 and sig. of (0.000) and the results show also that the implementing ERP system explains (76.9%) of the variance of the fixed assets turnover rate.

Model	R	Df	Mean square	F	Sig.
Regression	3.034	1	3.034	164.197	.000a
Residual	.887	48			
Total	3.921	49			

- a. predictors: constant, ERP application
- b. dependent variable: the inventory turnover rate.

### coefficients

Model	Unstandrdized	Coefficients	Standardized	T	Sig
	B	Std. error	beta		
1 (constant)	.201	.030		6.569	.000
ERP sys app.	.503	.039	.981	12.814	.000

**the H3 results : there is no significant statistical impact at significance interval (.05) for ERP application on the total assets rate.**

**Table 4: the simple- regression results**

Model	unstandardized	Coefficients	Standardized	T	sig
	B	Std. error	beta		
Constant				6.595	0.000
ERP appl.	.246	.030			0.000
f-value	.413	.038	.843		
Sig-f			117.606		
Adj. R2			0.000		
			.704		

From the simple- regression results, its indicated that there is a significant impact at the significance interval (0.05) for implementing ERP system on the total assets turnover rate , with t-calculated 10.845 and f value (11.606) and sig. of (0.000) and the results show also that the implementing ERP system explains (70.4%) of the variance of the total assets turnover rate.

**the H4 results : there is no significant statistical impact at significance interval (.05) for ERP application on the receivables turnover rate.**

**Table 4: the simple- regression results**

Model	unstandardized	cefficients	Standardized	T	sig
			coefficients		
constant	B	Std. error	beta	6.157	0.000
ERP appl.	.197	.032		9.765	0.000
f-value	.403	.041	.816		
Sig-f			95.350		
Adj. R2			0.000		
			.685		

From the simple- regression results, its indicated that there is a significant impact at the significance interval (0.05) for implementing ERP system on the receivables turnover rate , with t-calculated 9.765 and f value (95.530) and sig. of (0.000) and the results show also that the implementing ERP system explains (65.8%) of the variance of the receivables turnover rate.

### Model summary

Model	R	R2	Adjusted R2	Std. error of the estimate
1	.816a	.665	.769	.14308

Model	R	Df	Mean square	F	Sig.
Regression	1.952	1	1.952	95.530	.000a
Residual	.983	48	.020	.	
total	2.935	49			



model	Unstandrdized	Coefficients	Standardized	T	Sig
	B	Std. error	Beta		
1 (constant)	.197	.032		6.157	.000
ERP sys app.	.403	.041	.816	9.765	.000

### coefficients

a- dependent variable : the receivables turnover rate.

**the H4 results : there is no significant statistical impact at significance interval (.05) for ERP application on the liabilities turnover rate.**

**Table 4: (the simple- regression results.**

model	Unstandardized	Coefficients	Standardized	T	Sig
			Coefficients		
constant	B	Std. error	Beta	6.826	0.000
ERP appl.	.245	.036		6.510	0.000
f-value	.302	.046	.685		
Sig-f			42.383		
Adj. R2			0.000		
			.458		

From the simple- regression results, its indicated that there is a significant impact at the significance interval (0.05) for implementing ERP system on the liabilities turnover rate , with t-calculated 6.510 and f value (42.383) and sig. of (0.000) and the results show also that the implementing ERP system explains (45.8%) of the variance of the liabilities turnover rate.

### Model summary

Model	R	R2	Adjusted R2	Std. error of the estimate
1	.685a	.469	.458	.16052

Coefficients

Model	R	Df	Mean square	F	Sig.
Regression	1.092	1	1.092	42.383	.000a
Residual	1.273	48	.026		
Total	2.329	49			

model	Unstandrdized	Coefficients	Standardized	T	sig
	B	Std. error	beta		
1 (constant)	.245	.036		6.826	.000
ERP sys app.	.302	.046	.685	6.510	.000

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