

## **The Extent of the Efficiency Strategy in Selection of the Factory Site (An Empirical Study on the Pharmaceutical Industry in Jordan)**

**Moayyad Al-Fawaer**

Business Faculty

The World Islamic Sciences & Education University

Jordan.

**Feras Al-Gagbeer**

Business Faculty

The World Islamic Sciences & Education University

Jordan.

### **Abstract**

*The purpose of this study was to identify the extent of senior management efficiency in the selection of the factory site in the Jordanian pharmaceutical companies at the long-term strategic level.*

*In order to quantify the importance given to site factors defined as economics, infrastructure, law and environmental factors, the practical implications of modeling approach were designed to elicit location preferences based on decision makers' opinions, parameterize the effects of location drivers in a pharmaceutical industry and which assessment method using in analysis firms location, and raw recommendations for policy aimed at fostering industry development in Jordan. The empirical study was developed based on questionnaire filled by (90) senior managers of pharmaceutical firms located in Jordan. As main findings the study identify; infrastructure, economics, law and environmental factors as main drivers of location selection in those firms. Also, the study indicates that, managers must exercise considerable judgment in the choice of alternative locations; by using quantitative techniques which can help decision process which compatible and consistent with the long-term strategic objectives of pharmaceutical firms.*

**Key words:** Efficiency strategy; Factory site; Site factors; Pharmaceutical industry; Jordan.

### **1. Introduction**

As the Pharmacological manufacturing in Jordan contributes in the amount of 20% of the industry's contribution to GDP, where the pace of Pharmacological industrialization grew to reach 17.5% in 2012. The volume of exports contribution to the pharmaceutical industry and medical supplies from Jordan's total exports 10.63% during 2010. The value of these exports reached 234.7 million JD at the end of August 2012. The Jordanian pharmaceutical industry sector exports 70% of its annual production to 60 countries around the world. The most important export markets are Saudi Arabia, Algeria, and Iraq. In contrast, we find that Jordan imported medicines that are not available locally from foreign markets, where the value of Jordan's imports of pharmaceutical products and pharmaceutical approximately 376.2 million JD in 2011 while these imports amounted at the end of August 2012 was 246.45 million Jordanian dinars (Central Bank of Jordan, 2012), and Jordan's non-oil state, seeking to develop their manufacturing and attract foreign investment in all productive sectors, especially the pharmaceutical industry.

Decision of the location is one of the most important decisions that result in supply chain efficiency of the factory. The increasing importance of this decision when the strategic directions of the organization around the world, and in this case, the senior management has two options in the cycling process or re-cycling, the first option is centralizing strategy by choosing a site for the factory and production in large quantities which allow exports to the world market. The second option is decentralizing goal by choosing different sites to spread their manufacturing process, choosing a site for the manufacturing process either to its closeness to the markets which the organization markets its products inside them or to provide employee with low salaries, or the existence of incentives for investment, few taxes on production inputs or outputs manufacturing (Bogataj et al., 2011).

In both options, the decision maker must be based on a realistic and scientific basis in determining the location of the factory for either manufacturing or recycling. The decision to locate the factory plays an important role in estimating the total cost of production and marketing of commodity and often cannot move or choose a new site for the factory in the medium term (Tactical level), so irrational decision to locate the factory consequent increase the costs of production and distribution. As the choice of site is not suitable for factory sites affects the efficiency and effectiveness costs of direct transport and production costs, as well as increasing the time needed to recover capital, regardless of the policies of storage and transportation plans and policies of the exchange of information administration's (Grubbstrom et al., 2007; Bogataj et al., 2011).

## **2. General Background to the Problem**

The pharmaceutical industry sector in Jordan considers to be one of the most promising industries and attracting for national and foreign investment. The pharmaceutical industry is growing upward, where this sector is the second largest export industry in terms of exports pharmaceutical factories in Jordan for more than 70% of its production to 60 countries around the world.

The decision of choosing the industrial location also consider decisions that exceed the importance dimension tactical level (medium and short-term ) to extend the impact of that decision on the overall strategic for the factory in the long term, as this affects the decision on the competitiveness of the factory in the market in the future. The location factory plays a vital role in the report of the total cost of production and marketing products. Due to the difference of the relative importance of site selection factors from one industry to another and from one country to another, and different methods of evaluation of selection factors, this study was to answer the following two questions:

1. What are the most important factors in choosing the factory site from the perspective of senior management in the Jordanian pharmaceutical industry sector, and what are the methods used in the evaluation of these factors?
2. What is the efficient management of the pharmaceutical sector factories in Jordan in determining the location of the factory on a long-term strategic level, according to the used method of assessing factors?

### **2.1. Study Importance**

Identifying the most important site selection factors from the perspective of senior management in a dynamic and important sector contributes to a high level of GDP. The study also shed light on one of the most important success factors for strategic Pharmaceutical Industries existing and future. The study will contribute to the knowledge of the most important problems resulting from the current selection of sites for factories, especially in light of the lack of interest of researchers and scholars factors in Jordan and thus reduce the risk caused by poor industrial site selection. Contribution in providing the necessary information for current and potential investors about the most important factors of industrial site selection and style appropriate to assess the factors to be taken into account in determining the sites or factories in the creation of other branches of existing factories. As well as it applied study on the productive sector, a major pharmaceutical industry, which is one of the important areas of productivity in the industrial sector in general and the business environment in particular.

### **2.2. Study Objectives**

Determine the efficiency of the management of factories in the pharmaceutical industry in the factory locate at the strategic level. Make the decision to choose the site more easily by selecting the most important factors in the site selection and industrial elements of effective assessment of the site in the pharmaceutical industry in Jordan. Statement of strategic importance in the long term for the site selection decision, and enable management of existing factories re-evaluate the appropriateness of existing sites in the light of the future strategic orientation. Coming up with recommendations that serve the industrial sector in the study area and will enhance the competitiveness of this vital productive sector, and encouraging foreign investment in it. As well as to provide decision makers with the determinants of site selection factors from the perspective of senior management in the Jordanian pharmaceutical factories to be taken into account when building plans for the development of the Jordanian industrial sector in general and the Jordanian pharmaceutical industry in particular.

### **2.3. Study Hypotheses**

Based on the study model and problem of the study and its variables and questions that have been developed, it has been formed hypotheses in order to achieve the objectives of this study, as the following:

#### ***The First Main Hypothesis:***

No statistically significant effect to the factors of selecting the location of the factory (economic, infrastructure, legal and environmental) in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of qualitative assessment.

#### ***This Hypothesis Is Divided Into Sub- Hypothesis:***

H0a1: No statistically significant effect of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of qualitative assessment.

H0a2: No statistically significant effect of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of qualitative assessment.

H0a3: No statistically significant effect of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of qualitative assessment.

#### ***The Second Main Hypothesis:***

No statistically significant effect to the factors of selecting the location of the factory (economic, infrastructure, legal and environmental) in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of quantitative assessment.

***H0b1:*** No statistically significant effect of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of quantitative assessment.

***H0b2:*** No statistically significant effect of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of quantitative assessment.

***H0b3:*** No statistically significant effect of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of quantitative assessment.

### **3. Literature Review**

#### ***3.1. The Importance of Determining factors of the Site Selection:***

Location of any factory considers to be an important factor in any organization success and determining its ability to face the competitors. Thus, the position of any factory and the accompaniment industrial facilities like places of storage of materials processed or semi-processed or raw materials, affect the extent of the organization's ability to serve its customers regularly and in suitable time and place and this reflects the importance of the site not only to the place of the operations, but extends its influence to include the organization as a whole, and direction of future strategy, so must make the decision carefully (Krajewski et al., 2010; Heizer & Render, 2009).

So, selecting the location consider to be one of the most difficult decisions which face the senior management in the industrial sector, especially in the large volume of industrial investments. That are employed in the location, since we can't go back about the decision of the location easily, and its influence extends to the long term which increases the importance of the location, also it isn't easy to move the location of the investment from one place to another. Alternatives of selecting the location and its relative importance and technique of defining this importance to the factors of selecting of the location, also kinds of the selecting factors differ from industrial sector to another according to the senior management orientation. That happens because of making the decision of selecting the location in different times; another thing is under some different considerations and determinants in its importance degree from one side to another.

On the other hand, senior management may evaluate the suitability of the proposed site without making a comparison of the elements of evaluation with other alternative sites (Ulgado & Lee, 2004). The importance of evaluating factors of selecting location of the factory appears in the strategic design to the supply chain which includes decisions determine previously upon to location of the factory such as, the production capacity and the used technology, and distribution. Because access to the integration of the supply chain requires efficient in selecting suppliers, and designing models of distribution and transport and planning quantities of production and installed, and other decisions which have influence on the strategic situation to the organization in the future. That the efficiency of senior management in selection of the factory location plays a vital role in all of them, so selecting the best location to the factory embodies the ideal choice for a production site, consequently determine costs of factors of the production and transportation cost (Lee & Wilhelm, 2010).

In addition, selecting the best location is important in attracting foreign investment at the level of the overall assessment of the state (Somelv & Hoshino, 2005). Attracting direct Capital requires available studies interested in the most important factors for selecting the location inside the state itself, even the foreign company which is interested in foreign investment; take those factors into consideration because of its effect on the stability of its operations in the future. As well as the selection factors for a particular industrial sector has an impact on corporate profitability level of industrial activity which they practiced it (Delois & Henisz, 2000; Beamish et al , 1997; Chen & Hu, 2002). And that requires determining the attracting factors for selecting the location for each industrial sector and work to raise the level of attractiveness of each factor in the site selection within the elements of evaluation to enable the State to attract these investments, whether local or foreign.

Therefore, some studies have come to focus on the restrictions imposed by states on the incomes of foreign investments and the availability of on-site attractions for those investments ( Somlev & Hoshino, 2005; Oman, 2000; Oum & Park, 2004).The appearance that show how important the efficiency of senior management in determining the choice of location factors through that some studies have linked the efficiency of the supply chain design for sites spread of the organization and its competitive position force ( Lee & Wilhelm, 2010 ). Some studies also specialized to look for the factors of political and institutional environment in the advanced countries (Delios & Henisz, 2000; Padmanabhan & Cho, 1996). So, governments should be aware of, especially in developing countries that the decision of choosing the location of factories and industrial facilities depends not only on what these countries offer the facilities and tax breaks for the flow of foreign capital, but also depends on the amount of availability of attracting the factors of industrial sites within the state itself. While foreign investment and international companies do not stand of the market incomes of any State, unless that serve their interests and enhance their competitiveness in the international business environment (Dunning, 1988; Lee & Wilhelm, 2010).Therefore, studies have recently begun looking toward more privacy to determine the appropriate choice of location within a single country and is not part of a group of countries in order to identify the most attractive site from other sites which serve the growth of the industrial sector, especially for multinational companies.

### ***3.2. Location Theories and World Trade***

There have been several theories discussed the choice of location from different approaches adopted by each theory to choose the best location (Jones et al., 2005): the Neo-classical theories have focused on the factor of costs and revenues to determine the best location to achieve higher profitability possible for the factory. This approach was based on consideration that the demand is limited only to the area where there is the factory, and the raw materials and parts which are used in meant industry are concentrated in stable areas, consequently the site that achieves less transportation cost is the optimal location (Parr, 1993; Smith, 1987). On the other hand, behavioral approach focused on the manufacturing processes themselves and strategies for the organization and administration policies, but they did not focus their research on site itself ( Wood, 1987 ), but the structural approach studied the productive sectors and geographical sites and the focus was on the quality and type of the work to locate industries( Massey, 1995). There were some studies tied between the behavioral approach and the structural approach. The three approaches with their differences only was trying to choose the factory site of several sites within the same region or in the country or a single state or even between different countries ( Jones et al., 2005 ).

In general, regardless of the intellectual approach, the sites that have been selected for various industries have been trade-offs among them based on several factors, most notably the sector, which the factory belongs to, the characteristics of the labor market, the desire to invest, the rate of return on investment in the domestic industry, the interrelationship between the factory and the rest of the factories in the area, economies of scale, domestic legislation, and compatibility with the requirements of environmental protection. It should be noted that studies on industrial sites are not limited only on administrators' researchers; other researchers were interested in the regional and urban economy in identifying sites for industrial purposes.

### **3.3. Techniques Used in Selecting the Location:**

Generally, the site analysis of industrial location has become increasingly important in recent years as new statistical tools have allowed empirical analysis of location choices in a wide variety of industries. Also, the technological development which showed modern technological methods help in analysis of suitability current sites or new industrial sites (Aguilar, 2009). Managers must exercise considerable judgment in the choice of alternative locations, there are some systemic and quantitative techniques which can help decision process (Slack et al., 2010). For example, weighted scoring models are quite clear and weighted scoring models can be simulated because both the scores and the weights are usually estimated. When decision maker using qualitative approach really on his intuition, emotions, and personal experiences. On the other hand, in order to successfully using any quantitative model, even computer models such as heuristics, simulation, and optimization, a data base must be created and maintained to furnish data for the model. To reach the best location, the decision making process must be taking place in a reasonably rational organizational environment. Therefore, these decisions must be carefully evaluated by specialists and experts like organizations accounting and finance departments (Krajewski et al., 2010).

### **4. Related Studies**

According to the importance of the factory site and associated facilities, has conducted several studies in order to determine factors of the site selecting. In the United States, for example, the Study ( Ajami & Ricks, 1981) and study ( Calzonetti & Walker, 1991), also, study ( Ulgado, 1996) the main objective was for these studies to determine the relative importance for the firm factors of the site selection in the united states. Somlev & Hoshino ( 2005), Studied particularly, factors of the site selection for Japanese factories in Europe.

The study included a sample of 751 Japanese factories were located in Europe. The study found that the competitive advantage of the host country and the prevailing culture and industrial growth in these countries was the most important factors of site selecting at the level of the host country, as well as political stability in those countries. The study came to the recommendation included the importance of taking into account factors for choosing the factory site because of its impact on the future expansion strategy for those factories.

Oum & Park (2004) studied the most important factors that multinationals take on consideration when selecting and locating its distribution centers. The study proceeded to explore the views of some European companies and companies from North America to see how their assessment of the Korean cities to adopt as sites for potential distribution centers for those international companies, compared with other cities in East Asia. The main objective was to study proposals can process based upon the official views attract international companies to Korea. The study included 83 international companies from Europe and North America. The study found that the size of the market and the expected economic growth in the region, and proximity to transportation and services such as ports, airports and roads size, availability of skilled labor, as well as the political stability were the most attractive factors for the selection of these companies operating sites. (Al-Baz, 2004) This study was done to look for the determinants of establishment of cities and industrial zones in the province of Nablus, causing a delay of the Palestinian economy, and slow its growth, and resulted in economic and social problems of the inhabitants of the city of Nablus. The study concluded that the main reasons that limit the expansion of the establishment of industries in the city of Nablus, the difficulty of obtaining raw materials by 88.6%, and the problems related to the difficulty of marketing by 88.6%, as a result of restrictions on industrial activity in that city. The study found some recommendations, the most important need that is proper positioning for the establishment of industrial clusters, taking into account that does not lead to damage to society and the environment, and securing these areas, basic services and infrastructure necessary for the continuity and sustainability of the industry in those areas, as well as to promote and support industrial education to provide the labor required for the industrial sector.

In the study for (Ulgado, M., Lee, M., 2004) the researchers conducted a comparative study between the Americans and foreign investors. In terms of giving them a degree of the relative importance of site selection factors in the United States of America, the study has proceeded to develop (18) sites proposed for the establishment of the factory and put to each site elements of differentiation based on seven factors is proximity to markets, the cost of labor, the standard of living in the region, the level of support and direction of community, services and government support, proximity to transportation, the cost of facilities and transportation. The study analyzed (83) questionnaires, and concluded that when foreign investors choose the factory site, give more important than local Americans investors to the factors of proximity to governmental markets, services and facilities, and easy transport.

**5. Methodology of the Study**

The study adopted the descriptive analytical method, and a comprehensive survey has been used, where the sample included all pharmaceutical companies in Jordan which were (18) companies, and (108) questionnaires were distributed, retrieved (94) questionnaires with rate (87%), (4) questionnaires were excluded due to incomplete data, and thus (90) questionnaires were adopted for analysis, represent (83%) of the total questionnaires administrated. The distribution process included the general managers and their assistants and directors of departments in pharmaceutical factories in Jordan. The process of distribution of questionnaires and re-collected were during the months of September and October 2012. A five-point Likert scale has been used as a measure to reflect the views of respondents regarding the paragraphs contained in the questionnaire, which was allocated a weight (5) for strongly agree, until (1) for strongly disagree. To increase the content validity of the research instrument, the questionnaire was introduced to a group of experts and professors for the purpose of arbitration; they can modify it based on their observation. A previous test was conducted on it, and the amount of Cronbach’s alpha was reached (0.731), which is indicated on the consistency and steadfastness. The study population was consisted of all Jordanian companies operating in the pharmaceutical sector and registered with the Ministry of Industry and Trade of Jordan until the year 2012 which were (18) companies.

**5.1. Analytical Procedures**

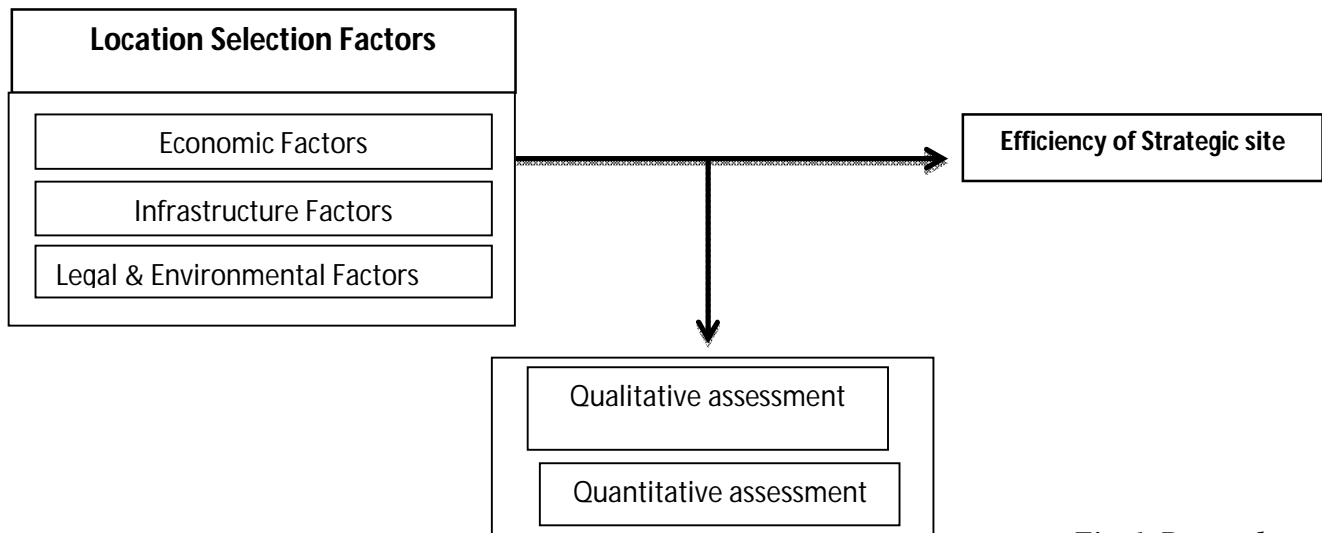
To achieve the objectives of the study was the use of statistical software packages for the Social Sciences (SPSS 22) to analysis the questionnaire of the study.

**5.2. Unit of Analysis**

The unit of analysis for this study was the administrator of the category level of senior management: General Managers of factories, Assistant Director General, Directors of Departments in the Jordanian companies working in the pharmaceutical industry.

**5.3. Research Design**

The model of the study ( Fig. 1 . ) has been made to fit the objectives of the study and its hypothesis.



**Fig. 1. Research model**

The model of the study has adopted three variables:

1. Independent variables: which represents factors of selecting the factory sites? The study has adopted dividing these factors into three elements: economic, infrastructure, legal and environmental, and that according to several studies which examined the factors of selecting the factory location like (Aguilar, 2009; Queiruga et al., 2008; Ghoneim, 2006).
2. Moderating variables: represent qualitative and quantitative techniques used by senior management in the evaluation factors of site selection.
3. Dependent variables: represents the efficiency of senior management in the selection of the best location on the strategic level.

The Fig ( 1 ) explains the conceptual model to the study variables and it has been utilized in designing the instrument from the following studies: (Aguilar, 2009; Queiruga et al., 2008; Guneim, 2006 )

## 6. Test Hypotheses

To test the hypotheses simple linear regression analyses have been used to determine the effect of the independent variable on the efficiency of the senior management in determining the strategic location of the factory. The first major hypothesis: There are no statistically significant effect of the factory site selection factors (economic, infrastructure, legal and environmental) in determining the efficiency of senior management in the selection of the strategic location of the factory when using the technique of qualitative assessment. Emerge from this hypothesis the following sub-hypotheses.

**Ho1:** No statistically significant effect of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment.

This targeted hypothesis test for the presence of the impact of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment technique and the following is a breakdown of hypothesis testing:

**Table (1) the results of testing the impact of economic factors in determining the efficiency of the strategy of the site when using the qualitative assessment.**

Hypothesis related	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
Economic Factors	0.068	0.005	0.245	0.623	0.073	0.148	0.495	0.623	Rejected

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results in Table (1) shows that the simple regression model of the variable's efficiency strategy in determining the site using the qualitative technique as independent variable, economic factors not significant in terms of statistical 0.05, where the value of (F) calculated equal to (0.245) and the level of significance (Sig = 0.623), and the value of correlation coefficient (0.068), is evidence of the weakness of the relationship between the two variables, and the coefficient of determination has reached (0.005), which means that the independent variable explains what rate (0.5%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached (0.073), representing the overall impact of a changing economic factors on efficiency strategy in determining the site using the qualitative technique which is not statistically significant, where the value of (T) calculated (0.495) is not significant at the level of statistical significance 0.05, and this leads to that there is no effect statistically significant economic factors in the strategic efficiency of the site, when using the technique of qualitative assessment in determining the factory site.

**Ho2:** No statistically significant effect of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment. This targeted hypothesis test for the presence of the impact of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment and the following is a breakdown of hypothesis testing.

**Table (2) the results of the impact test infrastructure factors in determining the efficiency of the strategy of the site when using the qualitative assessment**

Hypothesis	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
<b>Infrastructure Factors</b>	<b>0.135</b>	<b>0.018</b>	<b>0.984</b>	<b>0.326</b>	<b>0.107</b>	<b>0.108</b>	<b>0.992</b>	<b>0.326</b>	<b>Rejected</b>

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results in Table (2) shows that the simple regression model of the variable's efficiency strategy in determining the site using the qualitative technique, independent variable infrastructure not significant in terms of statistical 0.05, where the value of (F) calculated equal to (0.984) and the level of significance (Sig = 0.326), and the value of correlation coefficient (0.135) is evidence of the weakness of the relationship between the two variables, and the coefficient of determination has reached (0.018), that explains what the independent variable (1.80%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached (0.107), representing the overall impact of the environment variable infrastructure efficiency strategy in determining the site using the qualitative technique which is not statistically significant, where the value of (T) calculated (0.992) is not significant at the level of statistical significance 0.05, and this leads to that there is no effect statistically significant infrastructure in the strategic competence of the site, when using the qualitative method to locate the factory.

**H0a3:** No statistically significant effect of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment. This targeted hypothesis test for the presence of trace of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a qualitative assessment technique and the following is a breakdown of hypothesis testing:

**Table (3) the results of testing the effect of legal and environmental factors in determining the efficiency of the strategy of the site when using the qualitative assessment**

Hypothesis	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
<b>Legal &amp; Environmental Factors</b>	<b>0.108</b>	<b>0.012</b>	<b>0.431</b>	<b>0.431</b>	<b>0.110</b>	<b>0.139</b>	<b>0.794</b>	<b>0.431</b>	<b>Rejected</b>

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results in Table (3) shows that the simple regression model of the variable's efficiency strategy in determining the site using the qualitative technique, independent variable legal and environmental not significant in terms of statistical 0.05, where the value of (F) calculated equal to (0.431) and the level of significance (Sig = 0.431), and the value of the correlation coefficient (0.108) is evidence of the weakness of the relationship between the two variables, and the coefficient of determination has reached (0.012), which means that the independent variable explains what (1.20%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached(0.110), representing the overall impact of variable factors, legal and environmental efficiency of the administration in determining the site using the qualitative technique which is not statistically significant, where the value of (T) calculated (0.794) is not significant at the level of statistical significance 0.05, and this leads to that there is no effect with statistical significance of the legal and environmental factors in the strategic competence of the site, when using the qualitative technique in determining the factory site.

The second major hypothesis: There are no statistically significant effect of the factory site selection factors (economic, infrastructure, legal and environmental) in determining the efficiency of senior management in the selection of the strategic location of the factory, when using the quantitative assessment technique of the selection factors. Emerge from this hypothesis the following sub-hypotheses:



**H0b1:** No statistically significant effect of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative assessment technique.

This targeted hypothesis test for the presence of the impact of economic factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative assessment technique and the following is a breakdown of hypothesis testing:

**Table (4) the results of testing the impact of economic factors in determining the efficiency of the strategy for the site when using the quantitative assessment**

Hypothesis	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
<b>Economic Factors</b>	<b>0.683</b>	<b>0.466</b>	<b>28.845</b>	<b>0.000</b>	<b>0.574</b>	<b>0.107</b>	<b>5.371</b>	<b>0.000</b>	<b>Accepted</b>

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results in Table (4) shows that the simple regression model of the variable's efficiency strategy in determining the site using the quantitative technique, independent variable economic factors significant in terms of statistical 0.05, where the value of (F) calculated equal to (28.845) and the level of significance (Sig = 0.000), and the value of coefficient correlation (0.683), a testament to the strength of the relationship between the two variables, and the coefficient of determination has reached (0.466), which means that the independent variable explains what rate (68.3%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached (0.574), which represents the total effect of a variable economic factors on efficiency strategy in determining the site using the quantitative technique is statistically significant, where the value of (T) calculated (5.371) significant at the level of statistical significance 0.05, and this leads to that there is statistically significant impact of economic factors in efficiency strategic location, when using the quantitative technique to locate the factory.

**H0b2:** No statistically significant effect of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative technique.

This targeted hypothesis test for the presence of the impact of infrastructure factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative assessment and the following is a breakdown of hypothesis testing:

**Table (5) the results of the impact test infrastructure factors in determining the efficiency of the strategy for the site when using the quantitative assessment**

Hypothesis	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
<b>Infrastructure Factors</b>	<b>0.809</b>	<b>0.655</b>	<b>62.566</b>	<b>0.000</b>	<b>0.711</b>	<b>0.090</b>	<b>7.910</b>	<b>0.000</b>	<b>Accepted</b>

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results of Table (5) shows that the simple regression model of the variable's efficiency strategy in determining the site using the quantitative technique, independent variable infrastructure significantly in terms of statistical 0.05, where the value of (F) calculated equal to (62.566) and the level of significance (Sig = 0.000), and the value of coefficient correlation (0.809), a testament to the strength of the relationship between the two variables, and the coefficient of determination has reached (0.655), which means that the independent variable explains what rate (65.5%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached (0.711), which represents the overall impact of variable infrastructure efficiency strategy in determining the site using the quantitative technique is statistically significant, where the value of (T) calculated (7.910) significant at the level of statistical significance 0.05, and this leads to that there is statistically significant impact of infrastructure in efficiency strategic location, when using the quantitative technique to locate the factory .

**H0b3:** No statistically significant effect of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative technique.

This targeted hypothesis test for the presence of trace of legal and environmental factors in determining the efficiency of senior management in the selection of the strategic location of the factory when using a quantitative assessment technique and the following is a breakdown of hypothesis testing:

**Table (6) the results of testing the effect of legal and environmental factors in determining the efficiency of the strategy for the site when using the quantitative assessment**

Hypothesis	R	R Square	F Calculated	Sig**	Regression Coefficient				
					$\beta$	Standard error	T Test	Sig.*	Result
<b>Legal &amp; Environmental Factors</b>	<b>0.520</b>	<b>0.270</b>	<b>12.203</b>	<b>0.001</b>	<b>0.465</b>	<b>0.133</b>	<b>3.493</b>	<b>0.001</b>	<b>Accepted</b>

*\*The effect is statistically significant at the level ( $\alpha \leq 0.05$ )*

The results of Table (6) shows that the simple regression model of the variable's efficiency strategy in determining the site using the quantitative technique, independent variable legal and environmental factors significant in terms of statistical 0.05, where the value of (F) calculated equal to (12.203) and the level of significance (Sig = 0.001), and the value of correlation coefficient (0.520), a testament to the strength of the relationship between the two variables, and the coefficient of determination has reached (0.270), which means that the independent variable explains what rate (27.0%) of the changes in the dependent variable, in addition to the value of the degree of ( $\beta$ ) has reached ( 0.465), representing the overall impact of variable factors, legal and environmental efficiency strategy in determining the site using the quantitative technique is statistically significant, where the value of (T) calculated (3,493) significant at the level of statistical significance 0.05, and this leads to that there is statistically significant impact of legal and environmental factors in efficiency strategic location for the factory site, when using the quantitative technique to locate the factory.

### **7. Conclusion and Discussion**

In order to identify which were the decisive factors for the location of pharmaceutical firms in Jordan, three major variables were designated, to quantify the importance given to location factors defined as, economic factors, infrastructure factors, and legal and environmental factors. To achieve the objectives of the study, hypothesis proposed that there are appositve and significant relationship between the location selection factors (economic, infrastructural, legal and environmental) and the efficient of decision regarding strategic location selection taken by top management.

The study found that the infrastructure was at the forefront of these important factors in determining the factory site, followed by economic factors, legal and environmental factors. The study has also found a relationship between factors of selecting the site which was adopted in forming the model and the strategic efficiency to the decision of selecting the site which is taken by the senior management. The regression analysis provides support for the main hypothesis of this research for the selected sample. Thus, as expected, findings show a statistically positive and significant influence of location selection factors on efficiency of strategic site when using the technique of qualitative assessment in determining the factory site.

The study found that the style of qualitative or quantitative evaluation used in the assessment of location selection factors affect the efficiency of senior management decision in the location selection. The study reveals that the top management in the Jordanian pharmaceutical factories that used quantitative evaluation techniques for location selection factors were the most efficient in the factory locate on the strategic level. While top management which completely reliance on qualitative techniques to assess the site selection factors, the efficiency of their decision to choose the location was at the tactical level (short-term) only.

The results indicate that amore representative and timely approach such as quantitative analysis of selection factors may yield significantly different results regarding the efficient decision ( Slack et al., 2010). Based on the analysis, it can be concluded that 70% of the companies that have been implementing quantitative analysis were success in determining firm location at the strategic level, while 30% of the companies that have been using qualitative analysis were just success at the tactical level in determining firm location, on other words, it's failed at the strategic level.

The decision maker using qualitative approach rely on his intuition, emotions, and personal experience which vary from one to another (Slack et al., 2010), and that may give a negative impact on location decision. This is base on the perception that when a company applies quantitative techniques in measuring the importance of location factors and sub factors, it will have more transparency, accountability, and accuracy concerning the company's strategic objectives (Krajewski et al., 2010). This tendency shows that the companies wanted to minimize failure in selecting firm location must take in consideration using quantitative methods in order to reach optimal decision (Ulgado & Lee, 2004). On other words, the main contribution of the empirical findings of this research is precisely providing evidence that supports that the quantitative methods help management to reach location decision compatible and consistent with the long-term strategic objectives. In spite of contributions of this study, it is necessary to point out its main limitation, which advice taking this finding with care. This implies that, this finding may not be generalized in industrial or geographically without caution.

### **8. Future Research**

It has equally been possible to empirically validate the conceptual model presented, despite the fact that it has undergone changes regarding the location factors of pharmaceutical firms in Jordan. This fact suggest that future research, applied to different industrial sectors, is required, so as to ascertain factors carry more weight in the decision on location selection.

### **References**

- Aguilar, F., (2009). Spatial econometric analysis of location drivers in a renewable resource-based industry: The U.S. South Lumber Industry, *Journal of Forest Policy and Economics*, 11(3): 184-193.
- Ajami, R. A., & Ricks, D. A. (1981). Motives of non-American firms investing in the United States. *Journal of International Business Studies*, 12 (3), Winter, 25–34.
- Al-Baz, Wael, (2004). Determinants of the establishment of cities and industrial zones in the province of Naples and their impact on the environment, society and industrial education, unpublished Master, Najah University, Palestine.
- Beamish, P., Delios, A., & Lecraw, D. J. (1997). *Japanese multinationals in the global economy*. Cheltenham, UK: Edward Elgar.
- Bogataj, M., Grubbstrom, W, Bogataj, L.,(2011), Efficient location of industrial activity cells in a global supply chain, *International journal of production Economics* , 133
- Calzonetti, F. J., & Walker, R. T. (1991). Factors affecting industrial location decisions: a survey approach. In H. W. Herzog, & A. M. Schlottman (Eds.), *Industry location and public policy*. Knoxville, TN: University of Tennessee Press.
- Central Bank of Jordan. (2012), the report of third quarter, Amman, Jordan.
- Chen, H., & Hu, M. Y. (2002). An analysis of determinants of entry mode and its impact on performance. *International Business Review*, 11(2), 193–210.
- Delios, A., & Henisz, W. J. (2000). Japanese firms' investment strategies in emerging economies. *Academy of Management Journal*, 43(3), 305–323.
- Dunning, J. (1988). *Explaining international production*. London: Unwin Hyman.
- Ghoneim, Ahmed,( 2006), *Production and Operations Management: Research and Scientific Studies*, Modern library, Mansoura, Egypt.
- Grubbstrom, R.W.,Bogataj,M.,Bogataj,L.,(2007). Acompact representation of distribution and reverse logistics in the value chain. *Mathematical economics, Operational Research and Logistics*, No. 5, Faculty of Economics, KMOR, WP, Ljubljana.
- Heizer, j., Render, B., (2009). *Operations Management*, 10e, Prentice Hall. New Jersey.
- Jones, C., Dunse, N., & Martin, D., (2005). The nature and structure of spatial industrial property markets, *Journal of Land Use Policy*, 22(4): 281-290.

- Krajewski, L., Ritzman, L., Malhotra, M., (2010). *Operations Management: Process and Supply Chains*, 9e, Pearson Prentice Hall, New Jersey.
- Lee, C., and Wilhelm, W., (2010). On integrating theories of international economics in the strategic planning of global supply chains and facility location, *International journal of production Economics*, 124 (1): 225-240.
- Massey, D., (1995). *Spatial Divisions of Labor: Social Structures and the Geography of Production*. 2e, Macmillan, London.
- Oman, C. (2000). Policy competition for FDI: A study of competition among countries to attract FDI. OECD.
- Oum, T., & Park, J., (2004). Multinational firms location preference for regional distribution centers: focus on the Northeast Asian region, *Transportation Research Part E*, 40 (5): 385-399.
- Padmanabhan, P., & Cho, K. R. (1996). Ownership strategy for a foreign affiliate: An empirical investigation of Japanese firms. *Management International Review*, 36(1).
- Parr, J.B., (1993). Competition, supply areas and industrial location: an equilibrium approach. *Annals of Regional Science* 27, 191–210.
- Queiruga, D., Walthe, G., Benito, J., & Spengler, T., (2008). Evaluation of sites for the location of WEEE recycling plants in Spain, *Journal of Waste Management*, 28 (1): 181-190.
- Slack, N., Chambers, S., & Johnston, R., (2010). *Operations Management*, 6e, Prentice Hall, London.
- Smith, D., (1987). Neo-classical location theory. In: Lever, W.F. (Ed.), *Industrial Change in the UK*. Longman Scientific and Technical, Harlow.
- Somely, P., and Hoshino, Y., (2005). Influence of location factors on establishment and ownership of foreign investments: The case of the Japanese manufacturing firms in Europe, *International of Business Review*, 14(5): 577-598.
- Ulgado, F. M. (1996). Location characteristics of manufacturing investment in the US: a comparison of American and foreign-based firms. *Management International Review*, 36(1), 7–26.
- Ulgado, M., Lee, M., (2004). The effects of nationality differences on manufacturing location in the US: a conjoint analysis approach, *International Business Review*, 13 (4), 503-523.
- Wood, P., (1987). Behavioral approaches to industrial location. In: Lever, W.F. (Ed.), *Industrial Change in the UK*. Longman Scientific and Technical, Harlow.