THE IMPACT OF INNOVATION IN JORDANIAN CHEMICAL AND PHARMACEUTICAL INDUSTRIES ON EXPORT PERFORMANCE

Hani H. Al-Dmour
The University of Jordan
dmourh@ju.edu.jo

Ibrahim Mohammad Issa
The University of Jordan
Iissa@Hikma.com

Majed K Alshami
The University of Jordan
majed-shami@hotmail.com

ABSTRACT

Innovation has long been considered an important factor for creating and maintaining the competitiveness of the firms. Common knowledge stands that innovation is the cause of the increase of exports. However, contradicting empirical evidences are reported in the literature on the relationship between innovation and export performance. In this research we examine whether innovation performed by Jordanian chemical and pharmaceutical industries enhances their export performance. Based on research objectives, a structured questionnaire was developed to collect the needed data to test the developed hypotheses. Data were collected from twenty two companies, representing a sixty-five percent response rate. Data were analyzed and hypotheses were tested using various analytical methods. Research findings indicate that there is a statistical significant relationship between innovation and export performance for the sample under study; mainly for research and development, marketing data base, management (atmosphere conductive to innovation), promotion and product (quality). Based on the results, several recommendations are suggested.

Keywords : export performance, innovation, marketing, quality

I. INTRODUCTION

This research examines the process of innovation within chemical and pharmaceutical industries and its effects on export performance, focusing, in particular, on a sample of firms in Jordan. The trend of the last several decades towards increased integration of global markets, or globalization, has meant that many firms are experiencing continuously increasing pressure to remain viable as their markets expand, and they begin competing with a larger number of firms. Jordan has made great steps in development at all levels and in different domains, including industrialization. Investment promotion and attraction policy in force as well as the investment climate and security stability in Jordan have contributed to establishment

of different industries, including chemical and pharmaceutical industries. The spread of those industries was accompanied by an active movement for importing raw chemicals and exporting processed products of such materials.

Problem Statement and Research Questions:

Over the past two decades, the growing liberalization and integration of global trading systems, the elimination of political and economic boundaries, the pervasive developments of communications technology, and the rapid globalization of products and services are rapidly transforming the global business arena (Lee and Habte-Giorgis, 2004). All of that have put pressure on Jordanian chemical industry to find some new markets and it was leaded by pharmaceutical industry since Jordanian pharmaceutical exports have grown from 193 JD million to 291 JD million as noted in Jordan Statistical Yearbook 2012, making Jordan now the leading Arab drug exporter. So we will try to explore the relationship between innovation with all of its elements and export performance. However, this connection has not been deeply addressed, and this relationship constitutes the ground for our main research question:

Is there any relationship between innovation and export performance of the firm?

So the questions that we shall focus on include the following:

1. Does the practice of innovation improve the firm's export performance?
2. How strong is the relationship between the firm's export performance and the practice of innovation?
3. What are the most important factors of innovation that highly affect the firm's export performance?

The Research Objective:

The main objective of this research is to identify the strength and the direction of the relationship between the practice of innovation and the export performance of Jordanian chemical and pharmaceutical firms. Precisely, the main research objective of this investigation is to evaluate the Jordanian chemical and pharmaceutical firms in terms of patterns of innovation and export performance, in particular, to find out the relationship which exists between these two processes and the factors that influence this relationship.

And this investigation will contribute to the scientific literature but it will also be very useful to managers, as it can be taken as a guide in order to improve their export performance by innovating, depending on the results of this study.

Research Importance

The importance of this study stems from the following features:
1- This study is concerned about studying basically the effect of innovations on export performance.
2- The tendency nowadays is to explore the relationships between the components of innovation (either taken together and separately) and export performance rather than previous studies which focus on one or two aspects of innovations .
3- The theoretical contribution through combining all components of innovation together and its effect on export performance in chemical and pharmaceutical companies in Jordan.

II. LITERATURE REVIEW:

Innovation is anything which might be an idea, practice , activity ,or object that is perceived as new to an individual , organization , or any other unit of adoption (Fruhling and siau, 2007; Hsu, 2006). Weerawardena (2003) recognized that innovation is the adjustment of product, service, process, organizational systems, and marketing systems so as creating and enhancing customer relationships through upgrading customer value. Green et al. (1995) also considered innovation as a multi-dimensional concept where producers concentrating their efforts on product, process, and service to apply gradual adjustment, minor modifications and product lines expansions

The word ìinnovateî is derived from Latin, in+novare, that is to ìmake newî, to renew or to alter. Put simply, innovation is about having and applying a new idea, or sometimes applying other peopleís ideas in new and novel ways. As aptly noted by Michael Vance:

"Innovation is the creation of the new or the re-arranging of the old in a new way." Many of the products that we consider to be innovative are often based on ideas of others or a rework of existing products in a way that turns out to be a hit with consumers. In a mundane sense at many points in our lives, we are all innovators. The challenge arises when innovation is about an idea that is implemented successfully resulting in a positive outcome.

For a firm this connected to the launching new products or improving on an existing product. Sometimes it involves organizational

innovation that enhances firm efficiency. At a macro level, innovation is intimately connected to economic growth and welfare. Although innovation may be intimately linked to technology, it doesnít necessarily have to have technology at the core. If the market accepts a new idea, and a firm is successful in transforming this new idea into a product that sells in the market place, then that is innovative. However technology by making a product difficult to being imitated provides the stickiness as well as potential for much higher growth that in turn provides sustainability to innovation. Innovation has a broad canvas, including involving social change that need not involve technology. For instance the micro-credit model (pioneered by Muhammad Yunus who was honored with the 2006 Nobel Peace Prize) which is an instrument in the fight against poverty, is also innovation. So what again is innovation? Succinctly, innovation is the exploitation of new ideas which find market acceptance, often incorporating new technologies, processes, design and best practices. The innovation process generally involves the following phases:

- having a new idea or rethinking an old one
- recognizing opportunities that exist or can be promoted
- choosing the best alternatives
- Application of the idea and the process.

For a historical definition of innovation, one must turn to Joseph Schumpeter (1939) who held technological change to be one of the major determinants of industrial transformation, and consisted of the introduction of new products (product innovation), new production processes (process innovation) and new management

methods (organizational innovation). Interestingly Schumpeterís perspective of who is an entrepreneur is exactly the same as that of an innovator. He argued that the entrepreneur is the innovator who implements change within markets through the carrying out of new combinations. The new combinations could manifest itself as the one or a combination of the following:

• The introduction of a new good or quality thereof
• The introduction of a new method of production
• The opening of a new market
• The conquest of a new source of supply of new materials or parts
• The carrying out of the new organization of any industry

Management guru Peter Drucker, (1985) explicitly calls for the entrepreneur to equip himself with the tool of innovation, when he declared that: ìInnovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to search purposefully for the sources of innovation, the changes and their symptoms that indicate opportunities for successful innovation. And they need to know and to apply the principles of successful innovation. In a similar vein, Freeman C. and Soete, L. (1997) The economics of Industrial Innovation, 3 edition, printer. couples entrepreneurship with innovation, declaring the latter to be: ìThe first commercial application or production of a new process or product, it follows that the crucial contribution of the entrepreneur is to link the novel ideas and the market.

The concepts of change, creativity and innovation "have never been more topical, especially given the commercial context of fierce business competition, shorter product life cycle and more demanding customers. Increasingly, long-term commercial success is based on the ability to manage change, to nurture creativity and to promote innovation" Andriopoulos and Dawson, 2009). Innovation has long been considered an important factor for creating and maintaining the competitiveness of nations and firms. Common knowledge stands that innovation is the cause of the increase of exports. However, contradicting empirical evidences are reported in the literature on the causality between innovation and export performance.

The relationship between innovation and export performance is often regarded to be of paramount importance to an economy and has long been investigated by many researchers around the world (e.g. Narula and Wakelin, 1998; Greenhalgh, 1990; Verspagen and Wakelin, 1997; Montobbio and Rampa, 2005 and DiPietro and Anoruo, 2006). However, in Jordan, virtually, there is no research on the relation between innovation and export in general and for Chemical and Pharmaceutical industries in particular. So it's important to investigate how innovation can affect the export performance and what are the most important factors of innovation that has the most significant effect? Previous studies can be divided into three categories: studies on innovation, studies on export performance and internationalization and finally studies on the innovation and the export performance relationship. Innovation issues have been addressed through case studies and econometric studies. The change and innovation research has been

carried out by psychologists (King and Anderson, 2002), management scientists and organizational sociologists (Weick and Quinn, 1999), (Paton and McCalman, 2001), (Henry and Mayle, 2002), (Senior 2002), (Graetz et al. 2006), organization behavior specialists (Mowday and Sutton, 1993) in addition to scholars from other disciplines (Clarke 1994).

Innovation is not simply developing new ideas, but rather is "the generation, acceptance and implementation of new ideas, processes, products or services" (West and Altink, 1996). 'Creativity' is commonly used as a synonym of 'innovation'. Although the two terms are greatly connected to each other, they refer to two different but related concepts. "At its simplest, creativity is the thinking process that drives employees to generate new and useful ideas. Without the development of new ideas, the ability to respond to dynamic market pressures, or to imagine alternative ways of doing things, organizations may lose their competitive position and become unresponsive to the shifting demands of their customers"(Andriopoulos and Dawson, 2009).

Many studies have been carried out on innovation: In a study done by Haded S. & Al-Ghadeer H. (2003) Marketing Innovation in pharmaceutical Industry, Jordanian Journal for Applied Science, 16 101-30 investigating the marketing innovation and creativity in pharmaceutical and medicinal industry with the objective to explore the importance of innovation in marketing pharmaceutical products, they found a positive relationship with R & D , financing, marketing data base, management, and firm size. In another study investigating the same

topic but on banks, Al-Sarhan (2005) found that there are strong and medium statistical relation between marketing innovation & creativity in the banking services and product and between achieving competitive advantage, distribution, management acknowledgement for marketing innovation, clients' recognition/acknowledgement for marketing innovation, and the availability of marketing. Geroski (1995) examined the effects of major innovations and patents on various measures of corporate performance, including accounting profitability, stock market rates of return and corporate growth. While Olsen *et al* (2006), in their paper "Innovation in Small and Medium-Sized Enterprises: A Study of Businesses in New South Wales, Australia", they have accomplished 3 objectives: first to examine other firm characteristics, in addition to firm size, in the innovation process; second to formulate a more sophisticated model of the innovation process, which recognizes it as being more complex than the traditional linear process involving R&D investment; and third to examine the nature of this process in Australian Small and Medium Enterprises (SMEs), using a sample of firms in New South Wales. Cao. *et al* (2006) tried to investigate Innovation in China's furniture industry, they have explored the industry's recent development and measured its innovativeness via a combination of qualitative and quantitative approaches. Correlations among four key variables of interest--innovation, competitiveness, company size, and export intensity--are assessed. Results suggest that Chinese furniture firms are pursuing innovation with three equal focuses on product, process, and business systems. Studying innovation has received increased attention. A preview of the trend is obvious from Figure 1 below of

searched articles for the word 'Innovation' in their title from (1970-2009) as per 23,000 social sciences articles. This increased

no relationship, or a negative relationship, between size and exports (Calof, 1993). Evidence from Australia, Denmark, Italy,
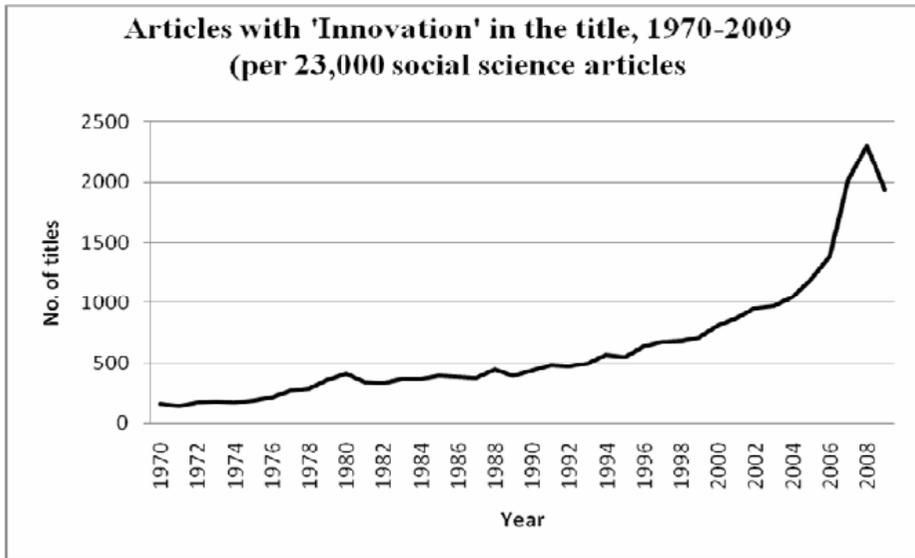
Figure 1

Source: ISI Web of Knowledge, Social science Citation Index, cited with permission in Feb 2010

interest in 'Innovation' is mainly triggered by the pressure to present new products for customers.

A firm's internationalization is driven by the existence of hard to trade proprietary resources that the firm leverages and exploits in international markets (Markusen, 1995). The literature on firm-level determinants of export performance and behavior is extremely rich (Chetty and Hamilton, 1993) and covers a wide spectrum of issues, such as the relative importance of firms' demographics (Bonaccorsi, 1992; Wagner, 1995) or the relative impact of the beliefs, attitudes and perceptions of top management (Bijmolt and Smart, 1994). Although the traditional assumption that in order "to compete globally you have to be big" (Chandler, 1990) holds in several studies, a significant number of researchers have found

Japan and Spain supports this observation that size is of considerable importance during the first stages of internationalization but does not seem to be a significant factor afterwards (OECD, 1997).

The relationship between age and exports may also produce conflicting results. On one hand, more mature firms may have accumulated considerable knowledge stocks (Baldwin and Rafiquzzaman, 1998) and built strong core capabilities that allow them to better penetrate foreign markets. On the other hand, core capabilities can become core rigidities or competence traps (Leonard-Barton, 1992) and younger firms may be more proactive, flexible and aggressive. Technological capabilities refer to "the firm's current ability and its future potential to apply firm-specific technology

to solve technical problems and/or enhance the technical functioning of its production process and/or its finished products" (Nicholls-Nixon, 1995, p.7). While Khon (1997) strongly suggests that small exporters are able to compete on foreign markets because of their technological capabilities, Sriram et al. (1989) observed a negative relationship between technology and exports, and Reid (1986) found no relationship.

Carlos (2004) in his "Export Performance Measurement: An Evaluation of the Empirical Research in the Literature" have revealed that export performance assessment is often idiosyncratic to the type of firm and its setting. This suggests the need for the adoption of a contingency approach in the selection of individual export performance measures to address the idiosyncrasies of the situation at hand, instead of taking a dogmatic view. While Myers (1999) has suggested using a measure like ROI to assess export performance ignoring the difference between firm's overall performance and the firm export performance. Exports are measured as ratio of exports to total sales (Gruber et al., 1967), as excess of exports over imports to total sales (Gruber et al., 1967), as ratio of exports to imports (Soete, 1981) or as share of exports in total exports (Soete, 1981). In recent years the effects of innovation on economic growth and trade have been the subject of theoretical and empirical studies. The effects of innovation have been analyzed by two perspectives: 1. Innovation as a key element for economic development. 2. Innovation as an essential element to improve competitiveness in increasingly global markets. These global markets began to impose, as a prerequisite, a systematic, permanent and a sustained innovation (Huergo, 2006).

Innovation thus has a central role in the process of long-term economic growth. We can consider two types of innovation: product innovation or process innovation. The first is defined by the development or introduction of a new product and / or service successfully in the market, the second refers to the process and organizational innovations that lead to increased productivity and to revitalize their own organizational structure and secure a position in the market. According to Cassiman and Martinez-Ros (2007) results, product innovation rather than process innovation affects the productivity of the company, considering an innate ability of the companies. Therefore, studies have focused on decisions that affect individual productivity and the dynamics of corporate survival. In the theory of product life cycle as originally presented by Raymond Vernon (1966) countries export innovative products, which are later imitated by developing countries. In this context, the time factor is a key element between the adoption of new ideas and market responsiveness (Tidd et al 1997).

Export decisions have also been related businesses to better performance or productivity. Exporting companies have a higher productivity compared to other companies. Bernard and Jensen (1999) find that firms with larger export activities have higher levels of productivity, with high technology usage and pay higher salaries. According to the study by Chadha (2009) the ability to generate an export company is often seen as a key indicator of competitiveness and ability to generate wealth. According to him, innovation is positively related to export. According

to Lachenmaier and Woessman (2004) innovation is essentially an endogenous process (does not depend on causes external to the company itself, but rather a process is created within the company itself), but in the process of economic growth there is a relationship between innovation and export. The authors tested this hypothesis using data at the firm level in Germany. The results confirmed the hypothesis, it is more evident in technology-intensive sectors. In the theoretical literature on the relationship between innovation and exports, we can find two main models. On one hand, there are models of international trade (for example; model of product life cycle) who tend to view innovation as endogenous (Lachenmaier and Woessman, 2004; Roper and Love, 2002), with a positive relationship between innovation and export activities. On the other hand, there are models that consider innovation an exogenous (Olszewki, 2008).

In an era of technological change, the return of the innovations is increasingly rapid. Companies must accelerate the process of internationalization by exports, in order to remain competitive not only with domestic competitors but also with foreign competitors. Without continuous innovation, innovative activity is quickly imitated in other parts of the world. In addition, this year's innovations can replace last year innovations. Özçelik and Taymaz (2004) concluded that innovation is an important factor to explain not only the performance of exports, but also to firm size, measured by the number of employees. This is the Schumpeterian hypothesis of positive relationship between company size and innovation. In a literature on endogenous economic growth (Romer, 1986, and especially Grossman and Helpman, 1991) it

is argued the causality may run from trade to technical change, i.e. from export to innovation activities, as well as vice versa. Wakelin (1998) stated that, in addition to relative prices, differences in terms of innovation can significantly influence the performance of export activities. According to economic theory it is expected that the propensity to be innovative is an increasing function of firm size, human capital, investment and exports.

However, companies that are highly dependent on bank loans are less likely to be involved in innovation activities in relation to companies which finance their R & D through self-financing (Wakelin, 1998). Chadha (2009) indicates that technology, R & D activities, intellectual skills and creativity are key factors in explaining international trade flows. Also Loof (2009) considers that investment in R & D has direct effect in winning market share (just in exports) and indirect effects on the improvement of innovation, know-how management, productivity, and competitiveness. Various measures for firm innovation activities have been used. Earlier studies use quite narrow input measures of innovation processes like R&D expenditures in relation to total sales or ratio of R&D employees to total employment (Gruber et al., 1967; and Wolter, 1977). Since export performance is more likely to be affected by the output of innovation processes, attempts have been made to find appropriate output measures. Soete, L. (1987) The impact of technological on international trade patterns, the evidence reconsidered research policy, 16, 101-30 uses the share of patent applications in total patents. Most of these studies find a positive correlation between the chosen measure of innovation and export activities.

Damijan and Kostevc (2006) in a study of companies in Slovenia in the period between 1994 and 2002 assess the heterogeneity of firms, foreign trade and firm performance. They also consider the effects of learning (learning by doing) in exports. The capital structure is an important strategic decision for most companies and plays an important role in the export strategy of multinational firms (Aggarwal *et al*., 2008). In a research paper "Innovation and Internationalization. A focus on the Spanish exporting firm." Diana-Andreea Filipescu (2007) try to analyze the existence of a relationship between the innovation and the internationalization processes of the firm, since it is assumed that there is a cyclic one, having as a theoretical background the internationalization theory of the firm, the resource-based view of the firm, and also the literature on the innovation phenomenon of the firm.

And here are further studies that relate innovation and export performance, Phapruke (2007) in his research "Innovation capability and export performance: an empirical study of textile businesses in Thailand" aims at empirically examining and investigating the relationships between innovation capability and export performance of textile businesses in Thailand. In this study, three dimensions of innovation capability (innovativeness, capacity to innovate, and willingness to change) were chosen as independent variables. The results demonstrate that innovativeness, capacity to innovate, and willingness to change have a significant positive impact and influence on exporting firms' performance.

While Radu Chiru (2003) in his paper "Innovativeness and Export Orientation Among Establishments in Knowledge-Intensive Business Services (KIBS)" he tried to examine the link between establishment innovativeness and export orientation among KIBS (knowledge-intensive business services) operating within Canada. Controlling for foreign or domestic control, size of establishment, training level of workforce, usage of intellectual property protection and industry type, he founds that innovation is positively linked to export orientation. He also founds that different factors are important for explaining export orientation for innovators than for non-innovators as well as for establishments of different sizes. And a third research Anh *et al*, (2007) in their paper "Innovation and Export of Vietnam's SME Sector", they tried to examine whether innovation performed by Vietnam's small and medium enterprises (SMEs) enhances their exporting likelihood. Using the recently released Vietnam Small and Medium Enterprise Survey 2005, they found that innovation as measured directly by 'new products', 'new production process' and 'improvement of existing products' are important determinants of exports by Vietnamese SMEs.

Namiki (1989) in his article "The impact of competitive strategy on export sales performance: an exploratory study" he attempted to investigate the role of strategy a firm selects in its export sales performance. Competitive strategy, or business-level strategy, has emerged as an important topic in the strategic management field for one national (U.S.) market. The results clearly revealed the presence of significant impacts of competitive strategy on a firm's export activities and performance. Three strategies, i.e., prospectors, analyzers and defenders, outperformed reactors in terms of export performance. Defenders which compete

mainly on the basis of low cost positions relative to competitors in a narrow range of products, tended to be less export oriented than did both prospectors and analyzers. The study also found that, while the firm's export marketing activities had significant effects on their export intensity measure of performance, the firms' adopted competitive strategies had more significant impacts on export growth. And the technological advantages of firms were often found to be a major determinant of export performance.

III. THE THEORETICAL FRAMEWORK:

According to the previously presented literature review, the researchers developed a comprehensive theoretical framework, presented below. Figure 2, presents the research model developed for the purposes of this research, it consists of two variables, a dependent variable and independent variables.   The dependent variable is the export performance (which is measured by: export intensity and export growth rate), which is affected by the independent variables; the antecedents or the factors affecting company's export performance.

Fig. (2): Research model:

Independent variables

Dependent variable

INNOVATION

- Research and development
- Financing and taking risks
- Marketing data base
- Management (atmosphere conductive to innovation)
- Pricing
- Promotion
- Distribution
- Product (Quality)

Export performance:

a. Export intensity
b. Export growth rate
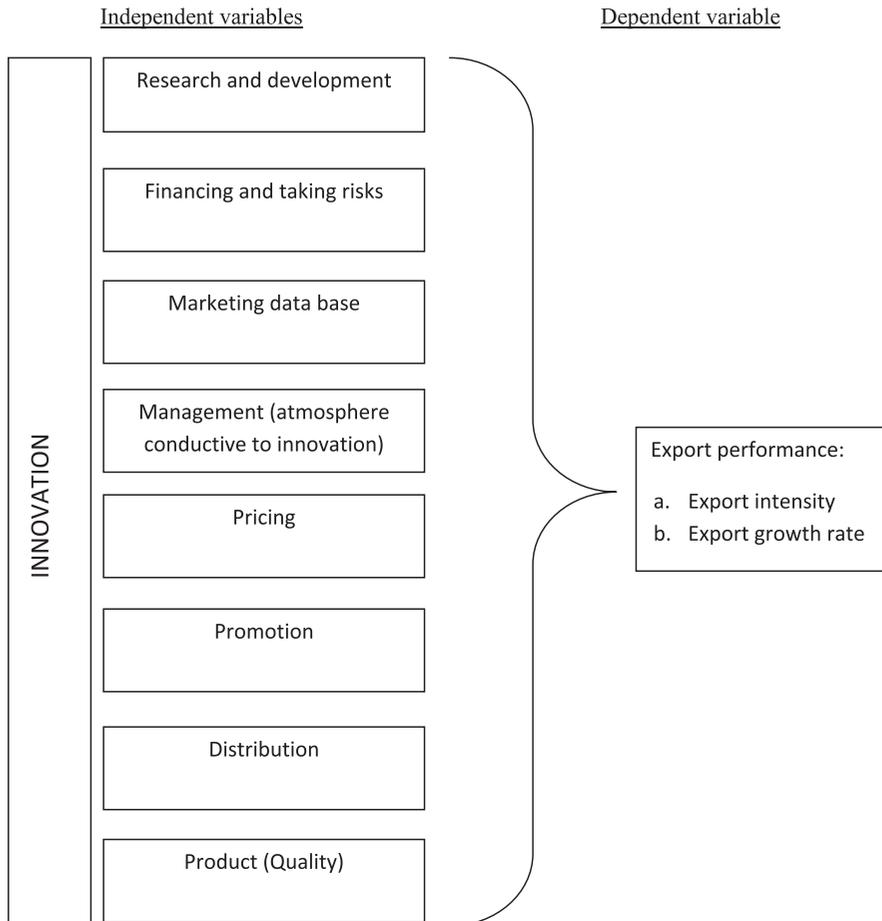
These factors were derived from previous research, where all were independently found to be related to increased levels of export performance. However, they had not been combined and tested in the previous studies. The research proposes eight independent variables; Research and development, financing and taking risks, marketing data base, management (atmosphere conductive to innovation), pricing, promotion, distribution and product (Quality). Table 1 shows the list of depentent and independent variables.

Research Hypotheses: The study hypotheses are formulated **as follows**

The main hypothesis of this research is: "**There is a statistical significant relationship between innovation and the export performance".** This main hypothesis can be divided into the following **sub -Hypotheses:**

(Ho1): Research and development   is positively related to and the export performance.

(Ho2): Financing and taking risks are positively related to the export performance.

Table 1 :
Measures of Dependent and Independent Variables

Variable	How to Measure the Variable	Reference
Dependent Variable Export Performance	Export Growth Rate	Gruber et al (1967)
	Export Intensity	Cao et al (2006), Myers (1999), Gruber et al (1967)
Independent variables Innovation	Research and Development (R&D)	Haddad and Al-Ghadeer (2004), Olsen et al (2006), Chadha (2009)
	Financing and Taking Risks	Haddad and Al-Ghadeer (2004), Wakelin (1998), Loof (2009)
	Marketing Data Base	Haddad and Al-Ghadeer (2004), Al-Sarhan (2005)
	Management (Atmosphere Conductive to Innovation)	Haddad and Al-Ghadeer (2004), Al-Sarhan (2005), Bijmolt and Zmart (1994),
	Pricing	Wakelin (1998), Oslo Manual of the OECD (2005)
	Promotion	Oslo Manual of the OECD (2005)
	Distribution	Al-Sarhan (2005), Oslo Manual of the OECD (2005)
	Product (Quality)	Cassiman and Martinez-Ros (2007), Schumpeter (1939)
	Promotion	Oslo Manual of the OECD (2005)
	Distribution	Al-Sarhan (2005), Oslo Manual of the OECD (2005)
	Product (Quality)	Cassiman and Martinez-Ros (2007), Schumpeter (1939)

(Ho3): The marketing data base is positively related to the export performance.

(Ho4): The management is positively related to the export performance.

(Ho5): The pricing is positively related to the export performance.

(Ho6): The promotion is positively related to the export performance.

(Ho7): The distribution is positively related to the export performance.

(Ho8): The quality of the product is positively related to the export performance.

IV. RESEARCH METHODOLOGY:

This section demonstrates the research design and clarifies data collection and analysis methods

Research Type: This research uses two research scientific approaches, the descriptive analysis is undertaken to describe the characteristics of the variables, and also to get a general idea on innovation and export performance. Empirical investigation is used to test the research hypotheses, and to explain the nature of variables relationships.

Research Population: The study population consists of all pharmaceutical and chemical industry companies which perform export activities. So the population size consists of 34 companies (9 pharmaceutical companies and 25 chemical companies, see table 2),

Data Collection Methods: Two data

collection methods are used to support this research. Secondary data are obtained from various books, periodicals, theses, and the internet. Primary data needed for this study are gathered by a structured questionnaire measuring the proposed variables developed by the researchers themselves, generated through the examination of available literature. The questionnaire consists of three parts; the first part relates to questions concerning the employee who answered the questionnaire, the second part of the questionnaire relates to questions concerning companies' characteristics (export activities, R&D, Company's background) along with the question measuring the export intensity and export growth rate. And the third part of the questionnaire relates to questions measuring each of the proposed antecedents on a five point Likert scale.

After the questionnaire was developed, it was assessed and evaluated prior distribution to respondents, by a number of key specialists and professionals in business research and marketing from the University of Jordan. Next, the questionnaire was pre-tested on a randomly selected panel of seven companies from which the sample would be drawn, in order to obtain an understanding of how respondents viewed and interpreted the questionnaire statements. After the interviews were conducted, the questionnaire was modified and adjusted to reflect needed simplification and instruction clarity. Afterward the questionnaires were administered to the remaining population

Table (2): Study population by sector

Sector	No. of companies	Percentage
Pharmaceutical companies	9	26%
Chemical companies	25	74%
Total	34	100%

Source: Jordan Chamber of Commerce and Industry, 2011

Table (3) Number of Actual and Respondent Companies by Sector

Sector	Actual Number of Companies	Respondent Number of Companies	Percentage of Questionnaires Returned Within Each Sector
Pharmaceutical companies	9	7	78%
Chemical companies	25	15	60%
Total	34	22	65%

by personal visits to the companies or sent by Email; where geographic distance made it impossible to deliver the questionnaires personally. Marketing managers were asked to fill the questionnaire. In companies where no marketing manager existed, the questionnaire was asked to be filled by the General Manager, or Production Manager. All selected respondents were key informants who had access to privileged information about their company's activities. A copy of the questionnaire is attached in the appendix. Afterwards, the researchers followed up the questionnaire completion through phone calls and sites visits. After a one month period, twenty two questionnaires were collected, presenting a sixty five-percent response rate.

Data Analysis Methods: After data were collected, completed questionnaires were checked, edited and coded before the data were keyed in. The Statistical Package for Social Science (SPSS) software was utilized for statistical analysis. Different methods of analysis were employed; descriptive analysis was used to calculate frequencies, Cronbach's alpha coefficient to test the reliability of the data measured, multiple regression test was used to test the main research hypotheses in addition to stepwise regression analysis and Pearson Correlation tests were used to test the sub-hypotheses. Tables were generated to develop a better understanding of the findings.

Validity and Reliability: The questionnaires were assessed and evaluated prior distribution to respondents by a number of key specialists and professionals in this business research field from the University of Jordan. However, the reliability of the study constructs was assessed by examining the Cronbach's alpha coefficient. Cronbach's alpha was calculated and it was found to be (0. 81) more than 0.6 (Sekaran, 1992). Thus, it indicates the stability and consistency of the scale.

V. DATA ANALYSIS:

Descriptive Analysis: This section presents the descriptive analysis for the collected data. Table (3) above, demonstrates the actual and the respondent number of companies for each sector and Table (4) demonstrates the main characteristics of the respondent companies.

From the table above, it can be noticed, that twenty two companies responded to the questionnaire. The response rate is thereof sixty five percent. Also, it can be noticed that the largest percentage of respondent companies are within the Pharmaceutical sector (78%), followed by chemical companies sector (60%).

Reliability Test:
According to table (5) below, there is high internal consistency or reliability between the items measure a single independent

Table 4: The Respondents' Characteristics

Companies Characteristics	Frequency	Percentage
1.Export intensity		
Less than 5%	6	27.2%
5% - 10%	10	45.5%
11% - 50 %	4	18.2%
More than 50%	2	9.1%
Total	22	100%
2. Export growth rate		
Less than 1%	5	22.7%
1% - 5%	12	54.5%
5% - 10 %	1	4.5%
More than 10%	4	18.3%
Total	22	100.0%
3. Percentage of expenditure allocated to R&D		
Less than 1%	5	22.7%
1% - 5%	17	77.3%
6% - 10 %	0	0%
More than 10%	0	0%
Total	22	100.0%
Number of years working in the Business .4		
Less than 1 year	0	0.0%
1 – 5 years	2	9.1%
6 - 10 years	13	59.1%
More than 10 years	7	31.8%
Total	22	100.0%
5.Number of years with export activity		
Less than 1 year	0	0.0%
1 – 5 years	6	27.3%
6 - 10 years	12	54.5%
More than 10 years	4	18.2%
Total	22	100.0%
6.Total number of employees		
Less than 100	3	13.6%
100 – 500	11	50.0%
501 - 1000	6	27.3%
More than 1000	2	9.1%
Total	22	100.0%

variable, except for distribution (.197). While for innovation (in total) we have a very strong internal consistency between the eight independent variables (.949).

Hypotheses Testing:

This section tests and discusses the main result of the null research hypotheses.

Multiple regression analysis is used to test the above hypothesis and the result can be shown in table (6).

The decision rule here is to accept the null hypothesis Ho if the calculated value is less than the tabulated value and to reject the null hypothesis Ho if the calculated value is

Table (5): Cronbach's Alpha reliability test for the independent variables

Variable	Cronbach's Alpha	Number of items
R&D	.873	5
Financing and taking risks	.815	4
Marketing data base	.889	9
Management atmosphere conductive to innovation)	.902	8
Pricing	.703	5
Promotion	.920	6
Distribution	.197	4
Product (Quality)	.820	5
Innovation (in total)	.949	46

Table (6): The Result of Multiple Regression Analysis for the Main Hypothesis

F (calculated)	F (tabulated)	R	R Square	Adjusted R Square	Beta	F Sig.	Hypothesis Testing Result
3.483	2.49	.763	.582	.415	.565	.023	Rejected

greater than the tabulated value. Hence this hypothesis Ho is rejected. R square value exhibits the capability of the independent variable in predicting the dependent variable; indicating that 58.2% of the variation in export performance is explained by the innovation factors within the organization. Beta Coefficient is .565 indicating a positive relationship between innovation and export performance.

Table (7) below exhibits the results of the sub-hypotheses by using the Stepwise Regression Analysis for each component of innovations: taken separately.

From the table above, it can be noticed that according to Stepwise Regression Analysis, Management factor (atmosphere conductive to innovation) is found to be the most significant one within the components, followed by Promotion and Product factors respectively. After that, Marketing data base and Research and Development factors follow. Beta Coefficient is positive for the above five components indicating a positive relationships between these components and the export performance.

Table (7) Stepwise Regression Analysis for the Variables

Sub-hypotheses	Component of Innovation	R	R²	F	Beta	Sig.
1-1	Research & Development	.721	.519	.741	.503	.000
1-2	Marketing data base	757	.573	.912	.559	.000
1-3	Product (Quality)	.790	.625	.972	.592	.000
1-4	Promotion	.824	.679	.317	.627	.000
1-5	Management (atmosphere conductive to innovation)	.843	.710	.098	.658	.000

Independent Variables

| Management (atmosphere conductive to innovation) R^2 .710 |

| Promotion R^2 .679 |

INNOVATION

| Product (Quality) R^2 .625 |

| Marketing data base R^2 .573 |

| Research and development R^2 .519 |

R^2 .582

Dependent Variable

| Export performance: c. Export intensity d. Export growth rate |
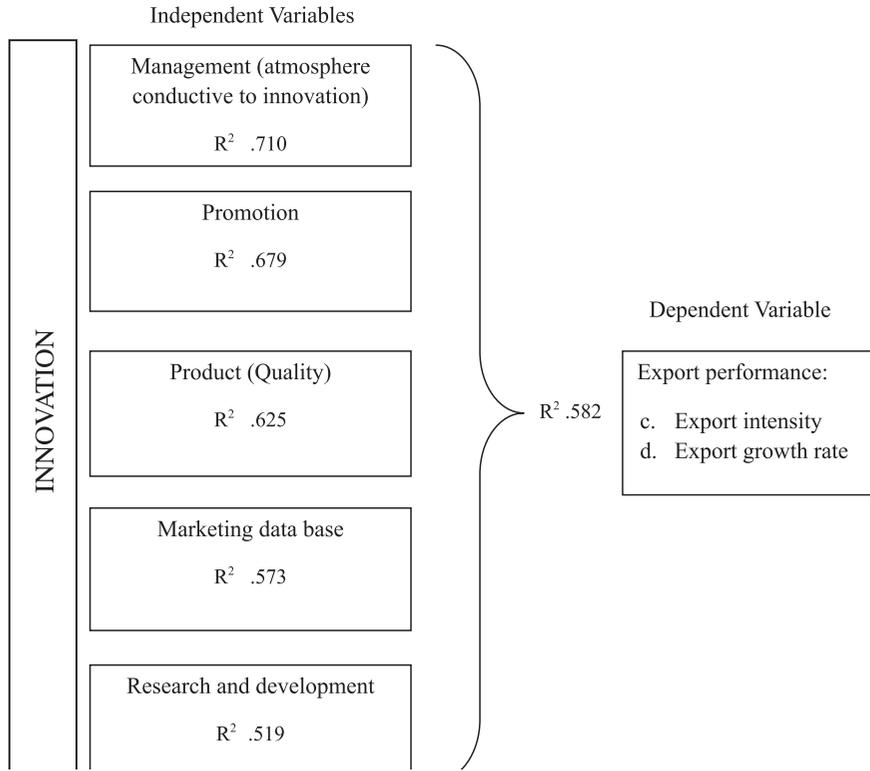
Fig 3 : The research model adjusted according to independent variables' R square value (By the researchers according to step-wise regression)

Figure (3) below, illustrates the research model adjusted according to independent variables' R square value. In addition, R square values are presented for the independent variables separately, and for all the independent variables taken together.

VI. RESULTS OF SUB-HYPOTHESES:

Table 8 reports the results of pearson correlation tests for sub-hypotheses (Ho1-Ho8).

Null hypothesis no. 1 (Ho1): There is no statistical significant relationship between the research and development and the export performance.

To investigate the relationship between two quantitative dependent and independent variables, Pearson's correlation is used, which measures the strength of the association between the two variables.

To test this hypothesis using Pearson

Table (8):
Analysis for sub-Hypotheses 1-8
(using Pearson Correlation test)

	Pearson Correlation	Sig. (2-tailed)
H1	.626*	.002
H2	.664*	.001
H3	.531**	.011
H4	.429**	.046
H5	.096	.670
H6	.331	.133
H7	.111	.621
H8	.514**	.014

Correlation is significant at the 0.01 level (2-tailed)
**Correlation is significant at the 0.05 level (2-tailed)

Correlation test, according to the SPSS analysis, null hypothesis will be rejected, (see Table 8) meaning; there is a significant positive relationship between Research and Development and export performance (taken together).

Null hypothesis no. 2 (Ho2): There is no statistical significant relationship between the financing and taking risks and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is rejected, meaning; there is a significant positive relationship between Research and Development and export performance (taken together).

Null hypothesis no. 3 (Ho3): There is no statistical significant relationship between the marketing data base and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is rejected, meaning; there is a significant positive relationship between marketing data base and export performance (taken together).

Null hypothesis no. 4 (Ho4): There is no statistical significant relationship between the management and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is rejected, meaning; there is a significant positive relationship between management and export performance (taken together).

Null hypothesis no. 5 (Ho5): There is no statistical significant relationship between the pricing and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is accepted, meaning; there is no statistical significant relationship between pricing and export performance (taken together). (Since P value is more than .05).

Null hypothesis no. 6 (Ho6): There is no statistical significant relationship between the promotion and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is accepted, meaning; there is no statistical significant relationship between the promotion and export performance (taken together). (Since P value is more than .05).

Null hypothesis no. 7 (Ho7): There is no statistical significant relationship between the distribution and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is accepted, meaning; there is no statistical significant relationship between the distribution and export performance (taken together). (Since P value is more than 05).

Null hypothesis no. 8 (Ho8): There is no statistical significant relationship between the quality of the product and the export performance.

To test this hypothesis using Pearson Correlation test, according to the SPSS analysis, null hypothesis is rejected,

meaning; there is a significant positive relationship between the product (quality) and export performance (taken together).

In addition to the previous tests which were used to test the main and the sub-hypotheses, the researchers used Paired sample T test to compare the means of two variables (one independent and dependent variables) and to calculate the correlation between these two variables.

According to Table 9, there are strong positive correlations between all independent variables and the dependent variable. P value

VII. RESEARCH FINDINGS AND RESULTS:

A summary of the main research results and findings are discussed below: Research findings indicate that there is a statistical significant relationship between innovation and export performance for the sample under study which is consistent with Lachenmaier and Woessman (2004). Findings indicate that there is a relationship between research and development and export performance, which is supported by literature (Helfat, 1994), so R&D is therefore viewed as one

Table (9): Paired Samples Correlations

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	R&D – Export performance	22	.626	.002
Pair 2	Financing & taking risks - Export performance	22	.664	.001
Pair 3	Product (Quality) - Export performance	22	.514	.014
Pair 4	Management - Export performance	22	.608	.003
Pair 5	Marketing data base - Export performance	22	.531	.011
Pair 6	Pricing - Export performance	22	.457	.033
Pair 7	Promotion - Export performance	22	.519	.013
Pair 8	Distribution - Export performance	22	.608	.003
Pair 9	Innovation - Export performance	22	.656	.001

is less than .05 for all correlations (significant differences). Finally the researchers mentioned the inferential statistics:

Since the P value (Sig. (2-tailed)) is less than. 05 for all pairs (see Table 10), so all null hypotheses are rejected and there are significant relationships between all independent variables and the dependent variable. Table (11) below, summarizes the results of the hypotheses testing.

of the prime factors influencing export performance. The positive relationship between R&D and exports in small firms has been demonstrated by Ong and Pearson (1984). Moreover, SME exporters conduct more R&D Baldwin, et al.1985) and produce more patents (Moini, 1995).

Table (10): Paired Samples T test:

		Paired Differences			t	df	Sig. (2-tailed)
Paired Samples Test							
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	R&D – Export performance	1.75455	.58613	.12496	14.040	21	.000
Pair 2	Financing & taking risks - Export performance	1.12500	.54962	.11718	9.601	21	.000
Pair 3	Product (Quality) - Export performance	2.10000	.64291	.13707	15.321	21	.000
Pair 4	Management - Export performance	1.45455	.55171	.11762	12.366	21	.000
Pair 5	Marketing data base - Export performance	1.59596	.59371	.12658	12.608	21	.000
Pair 6	Pricing - Export performance	2.11818	.62916	.13414	15.791	21	.000
Pair 7	Promotion - Export performance	2.12879	.64433	.13737	15.497	21	.000
Pair 8	Distribution - Export performance	1.56818	.55195	.11768	13.326	21	.000
Pair 9	Innovation - Export performance	1.73065	.52342	.11159	15.509	21	.000

Table (11) Hypotheses Testing Summary

Hypotheses (Ho)	Results taken separately	Results taken together
Main hypotheses: Null hypothesis (Ho): There is no statistical significant relationship between innovation and the export performance.	Rejected	N.A.
Sub-hypotheses: Null hypothesis no. 1 (Ho1): There is no statistical significant relationship between the research and development and the export performance.	Rejected	Rejected
Sub-hypotheses: Null hypothesis no. 2 (Ho2): There is no statistical significant relationship between the financing and taking risks and the export performance.	Rejected	Accepted
Sub-hypotheses: Null hypothesis no. 3 (Ho3): There is no statistical significant relationship between the marketing data base and the export performance.	Rejected	Rejected
Sub-hypotheses: Null hypothesis no. 4 (Ho4): There is no statistical significant relationship between the management and the export performance.	Rejected	Rejected
Sub-hypotheses: Null hypothesis no. 5 (Ho5): There is no statistical significant relationship between the pricing and the export performance.	Accepted	Accepted
Sub-hypotheses: Null hypothesis no. 6 (Ho6): There is no statistical significant relationship between the promotion and the export performance.	Accepted	Rejected
Sub-hypotheses: Null hypothesis no. 7 (Ho7): There is no statistical significant relationship between the distribution and the export performance.	Accepted	Accepted
Sub-hypotheses: Null hypothesis no. 8 (Ho8): There is no statistical significant relationship between the quality of the product and the export performance	Rejected	Rejected

Findings indicate that there is a relationship between the financing and taking risks and the export performance. This was supported in the literature (Wakelin, 1998) and Al-Sarhan (2005). Findings indicate that there is a relationship between the marketing data base and the export performance, since marketing intelligence and marketing research plays an essential role in the performance of the companies, and this is supported in the previous studies (Olsen *et al,* 2006).

Findings indicate that there is a relationship between the management and the export performance. Atmosphere conductive to innovation is essential part of the innovation creation. The literature on firm-level determinants of export performance and behavior is extremely rich (Chetty and Hamilton, 1993) and covers a wide spectrum of issues, such as the relative importance of firms' demographics (Bonaccorsi, 1992; Wagner, 1995) or the relative impact of the beliefs, attitudes and perceptions of top management (Bijmolt and Zwart, 1994).

Findings indicate that there is no statistical significant relationship between the pricing and the export performance. This result is not consistent with the opinion of Wakelin (1998) who states that, in addition to relative prices, differences in terms of innovation can significantly influence the performance of exports, either by direct impact of being an innovative company, or through knowledge spillovers. According to economic theory it is expected that the propensity to be innovative is increasing function of firm size, human capital, investment (including prices) and exports.

Findings indicate that there is no statistical significant relationship between the promotion and the export performance. This result is not consistent with the opinion of Wilkinson et al (2006) who related export promotion to the export activities. This result is not consistent with the opinion of Al-Sarhan (2005) and Bernard et al. (2007) who attempted to formulate theories consistent with the empirical facts connecting export behavior to the productivity of firms.

Findings indicate that there is a statistical significant relationship between the quality of the product and the export performance. Anderton (1998, 1999) considered the impact of R&D and patenting activity on trade volumes and prices arguing that both technology indicators act as proxies for the quality and/or variety of goods being produced. However, not all evidence points in the same direction. Ito and Pucik (1993) have an opposite opinion.

Recommendations

The companies should collaborate with scientific research institutes and universities to develop new ideas, since the results of this research show weak collaboration. Universities are a rich source for new ideas, and this is a missed opportunity for most of Jordanian chemical and pharmaceutical industries.

The above collaboration should include funds for the scientific research which is relevant to the companies' field. An area for improvement for most of Jordanian chemical and pharmaceutical companies is to invest in certain markets or fields where competitors failed.

Innovative products play a major role in the export activity for the company, so it is highly recommended that companies should have innovative products in their portfolio, either from its own or by licensing agreement.

Education of employees is essential. Give them resources so that they clearly understand expectations and can perform their job with personal and professional satisfaction.

Over recent years internal marketing has increasingly been integrated with employer branding, and employer brand management, which strives to build stronger links between the employee brand experience and customer brand experience. According to Burkitt and Zealley, "the challenge for internal marketing is not only to get the right messages across, but to embed them in such a way that they both change and reinforce employee behavior". So companies should focus on internal marketing and start to implement it.

VIII. CONCLUSION:

In this research, we examine the relationship between innovation and export activities at the firm level. We use eight measures of innovation, namely research and development, financing and taking risks, management (atmosphere conductive to innovation), marketing data base, pricing, promotion, distribution and the quality of the product. Our findings highlight that there is a positive link between innovation and export performance, positive links between research and development, financing and taking risks, management (atmosphere conductive to innovation), marketing data

base and the quality of the product are found. No statistical significant relationships between pricing, promotion, and distribution with the export performance.

Our results have important implication in the context of Jordan. That is, on top of the comparative advantages that push Jordanian's export, a policy to encourage innovation activities by companies should be in place. This research confirms that boosting firm's competitiveness through fostering innovation cause export growth.

Recommendations for Future Research:

To the best knowledge of the researchers, few researches are available in Jordan regarding innovation and export performance; hence numerous recommendations for future research exist, mainly based on the limitation of this research study.

First of all, as noted earlier this research study aimed on getting a general idea of the relation of innovation and export performance, hence focused on a limited number of innovation variables. Clearly, innovation includes a wide array of variables; undoubtedly a study with a wider range of variables would provide greater understanding and more generalization that found in the present investigation.

Likewise, this research studied innovation antecedents in general; future studies could identify more antecedents of innovation that were uncovered in this study. In addition research is needed to focus more specifically on analyzing the driving factors of innovation realization or the characteristics of innovative companies.

Moreover it will be beneficial to examine the consequences of innovative strategies on companies' performance (export, profitability, market share, sales, etc.). Also future studies could explore the obstacles, problems and difficulties that hinder companies from implanting innovative strategies.

It is advised to replicate the present study on a larger sample of companies and apply this framework to more sectors to provide more generalization that found in this study, and to see if the results obtained here are confirmed on all sectors. In addition the current study could be replicated on the entire population of a specific manufacturing sector setting, for example on food and beverage sector or on textile sector Finally, future replications and longitudinal study would be particularly useful, to provide supporting evidence for substantive relationships, also they would permit examination of the evolution of the relations, as well as dynamic comparisons.

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Short Bio of Hani al-Dmour & Ibrahim issa & Majed alshami

Professor Al-Dmour's background is in international marketing and his particular research interests surround the export marketing behavior and services marketing. He completed university education and received bachelorís degree Business Management from the University of Jordan in 1983 and MBA degree from the University of Edinburgh in 1986. In 1985, he gained his Ph.D. degree from the University of Sheffield in export marketing behaviour in 1993. In addition of being author of more than 80 scientific articles and 8 books, he is known as an expert in the fields of marketing and quality management of higher education institutions. He served for 4 years as a member of the editorial board of Jordan Journal of Business administration and for two years as a member of the editorial board of DIRSAT in the University of Jordan and as a member of Accreditation Council of Higher Education Institutions for six years. Before he becomes as the Vice-President for the Faculties of Humanities Affairs in 2012, he was the Dean of Faculty of Graduate Studies (2005-2008) and Dean of Faculty of Business in the University of Jordan for two years, consultant to several international organizations and national institutions, and author for four books in marketing.

Ibrahim Issa is a brand manager works for Hikma Pharmaceuticals responsible for the Cardiovascular and Diabetes line for MENA region, Ibrahim received his Bachelor of Science in Pharmacy from University of Jordan in 2006 and MBA degree in Business Administration / Marketing from University of Jordan in 2011.

Dr. Majed K. Shami is a holder of a Doctorate degree in business administration from the USIU, San Diego, California, 1991. Specialization: Marketing. The master degree was obtained from USIU, England, 1985. Specialization: Marketing. The Bachelor of Business Administration, with major emphasis in Marketing and minor emphasis in Finance, was obtained from The American College of Greece, Athens, in 1984. Since 2001 until present working at the University of Jordan, prior to that worked at Applied Science University in Jordan. Also, lectured in several places such as German-Jordanian University, Institute of banking studies, Strategic Telesis in California; AON Corporation in California. Furthermore, providing consultancy works and Research Studies for Dar al-Mashura and Kenary Shirts Factory in Jordan. Participated in several seminars and granted a number of achievement awards.