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The Developmental Role of the Pharmaceutical Industries in Jordan during the Period (1994-2014)

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Abstract *The study dealt with the developmental role of the pharmaceutical industries in Jordan through showing their impact extent on Gross Domestic Product (GDP).The study used the descriptive analytical method, a measurement model was designed by the researchers and data analysis was performed through the use of an appropriate statistical method for this study. The results showed the existence of a positive and strong relationship between the study variables (independent variables) and GDP (dependent variables). The study came up with a set of recommendations, giving the pharmaceutical sector much more significance, being among the most prominent and pioneering sectors in Jordan due to the role it plays in increasing the export bill of Jordan in addition to alleviate the two major problems in Jordan, poverty and unemployment.*

Key words GDP, Added Value, Pharmaceutical Industries, Jordan

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1. Introduction

The development of the industrial sector is considered a major criterion for measuring the level of economic, social and cultural development for any country, the thing that consequently led to the rapid progress in productivity in the industrial field. Due to such progress, most countries have changed from economically-retarded countries into advanced ones, being capable to compete among the most capital and industrial countries, especially after they got much expertise about commercial and agricultural capitalism Qoraishy (2005). Due to the significance of this sector and its prominent role that affects the entire economic variables in economics (e.g., Gross Domestic product GDP, employment, foreign trade) this sector constitutes the economic system of any country through connectedness with almost all variables. That's why most countries, including Jordan, have thoroughly sought to pay much attention to this sector by providing generous support for this sector.

1.1. Industrial Sector in Jordan

The Jordanian industrial sector mainly consists of the sectors of transfer and extractive industries along with the sector of electricity and water. These sectors are considered the major pillars of Jordan economy industry due to what they contribute to achieving economic and social development. The industrial sector has contributed to about 25% of Jordan's GDP, in a direct way. Because the industrial sector is strongly connected to the other sectors, such as transport, insurance and commence, it played a great role that it contributed to around 40% of the GDP, whether directly or indirectly. Furthermore the industrial exports form the major pillar for the external commerce of Jordan as its industrial exports achieved more than 7 billion Jordanian Dinars during 1914, then in 2015 it increased to become 7.4 billion Jordanian Dinars, with a growth percentage of 6.8%. Additionally, the industrial sector in Jordan employs around 25,000 male and female workers, forming 18% of the workforce in Jordan who work for more than 18,000 industrial firms distributed all over the country *Amman Industrial Chamber. (2015)*.

1.2. Pharmaceutical Industries in Jordan

The Hashemite Kingdom of Jordan is considered one of the most advanced countries in the Arab world in the sector of Pharmaceutical industries, when this sector has started to grow very enormously since 1962. The Pharmaceutical industrial sector in Jordan occupies the second place of the total exports; the exported pharmaceutical products represented 8% decreasing of Jordan's total exports during 2008-2009. Therefore it played a positive role in decreasing the deficiency in the Jordanian balance of trade. The sector has been based on exporting its products to more than (60) countries worldwide including the United States of America and the European Union, due to the high quality of such products.

Approximately 80% of the pharmaceutical products in Jordan were exported to KSA, Algeria, and Iraq. Due to the competitive advantage which characterizes these industries, they started to geographically extend to Eastern Europe and the former Soviet Union (Joranian Kuwaiti Bank, 2012). The reason for the development of pharmaceutical industries in Jordan is mainly attributed to the governmental privileges which the sector has had, in regard to encouragement to hold agreements (Rights of licensing and manufacturing) with multinational pharmaceutical companies, thus achieving high rates of commercial and financial benefits. The Jordanian pharmaceutical exports in 2015 achieved 870 Million dollars. That's why pharmaceutical industries are considered pioneering industries in the Arab world due to what they have accomplished, especially in supporting balance of payments represented by the bulk of rise in the pharmaceutical industries abroad. This is mainly attributed to the fact that the pharmaceutical sector in Jordan mainly depends on Jordanian qualified work force of all administrative and artistic sectors , where the workforce number working in pharmaceutical industries amounts to 12,000 employees, one third of whom hold a B.A degree whereas female contribution in this regard reaches 37% (*Al Ghad*, 2016).

1.3. Significance of the Study

The significance of the current study lies in its shedding light on pharmaceutical industries and their developmental role in the national economy, showing their contribution to GDP and how they support balance of payments in addition to identifying the factors that contribute to the development of the quality of such pharmaceutical industries and their spread in non-conventional markets such as those of Europe, America and East Asian countries due to the grand reputations they have regarding their high quality products which compete with a lot of foreign industries.

2. Literature review

Al Shahwan's study (2007) titled "Development of a model clarifying the effect of the internal and external environmental limits on the exporting performance of Jordanian pharmaceutical industries. The results of this study revealed that the exporting performance level of Jordanian firms working in the field of pharmaceutical industry and which followed the strategy of modeling achieved an estimated performance level of the firm which followed the strategy of adaptation. Al-shahwan's study recommended the necessity for attracting international firms to co-operate with for the sake of promoting this sector.

Al Nsoor (2009) also conducted a study titled "the competitive performance of the corporations of pharmaceutical industry in Jordan in light of the economic openness". The Results of this study indicated the existence of a positive relationship between the marketing policies adopted by the Jordanian pharmaceutical corporations and their competitive performance. Also, the results showed the important role played by the governments in supporting competitiveness in a way which conforms to the world trade agreements. The study recommended the necessity for applying all comprehensive quality aspects, considering them as components of competitiveness, as well as following policies of market spread.

Al Zreigat *et al*. (2009) conducted a study titled "the impact of the elements of knowledge network on the technological strategy in the organizations of pharmaceutical industries in Jordan". The study revealed the existence of a positive relationship between the processes of research, development, the capability to innovate new products as well as entering new foreign markets. Furthermore it revealed that the continuous improvement in pharmaceutical productive processes contributes to increasing the competitive distinguishing feature of these companies. The study recommended the necessity for the co-operation of

Jordanian pharmaceutical corporations regarding the processes of research and development in the field of pharmaceutical industries.

Al Otoom (2009) discussed the mission of the pharmaceutical organization and its impact in achieving competitive feature on the sector of pharmaceutical industries in Jordan. The study, through the results of statistical analysis, revealed that the most important dimensions used by Jordanian companies in preparing their mission are excellence, research, development, and care about human resources, meeting customers' needs and achieving competitive feature.

The study also recommended conducting a comprehensive review for their mission to include all influential elements of excellence, research and development to promote their competitive qualities.

Abu Zneid and Algnimat (2016) conducted a study titled "the Palestinian pharmaceutical marketing: problems and recommendations". The results of the study showed that the Palestinian pharmaceutical companies achieved great success and a remarkable progress in terms of marketing through reaching international markets in accordance with international standards followed in the importing countries. The study recommended promoting the level of performance and enhancing marketing process in Palestinian pharmaceutical industries.

3. Methodology of research

The present study used the descriptive analytical approach that described and analyzed the pharmaceutical industries sector in Jordan through gathering data from the companies of pharmaceutical industries in Jordan, reviewing the reports, publications, websites, which dealt with the sector of pharmaceutical industry in Jordan, in an attempt to obtain results.

3.1. Problem of the study

The pharmaceutical industry in Jordan is considered one of the significant industries due to the role it plays in providing the pharmaceutical security for the Jordanian citizen as it supplies the local market with more than 60% of its needs. Therefore the sector of pharmaceutical industries is considered as one of the most significant permanent streams of national economy due to the pharmaceutical security it provides. Therefore, the problem of the study lies in investigating the capability extent of pharmaceutical industries to increase their developmental role and reinforce the competitive ability of the Jordanian pharmaceutical companies to increase the export chances and provide the necessary materials for this sector in order to achieves what can support national economy and reach appropriate benefits for investors in this sector.

3.2. Study Hypothesis

There is statistically a significant relationship between the sector of pharmaceutical industries and the role it plays in each of: workforce, exports and national product.

3.3. Objectives of the study

This study aims at identifying the role of pharmaceutical industries in the Jordanian economy through the following:

- Showing the significance of pharmaceutical industries in Jordan.
- Identifying the sector of pharmaceutical industries in Jordan.
- Identifying the major difficulties and problems that face the development of the sector of pharmaceutical industries in Jordan.
- Presenting a set of recommendations and suggestions to enhance the contribution role of the sector of pharmaceutical industries in Jordan to the GDP.
- Enhancing the competitive role of the sector of pharmaceutical industries in Jordan at both levels of local and foreign markets.

4. Analytical Framework

When reviewing the status and development of the Jordanian pharmaceutical industries in Jordan, during the period of the study, we notice that the Jordanian pharmaceutical exports remarkably grew from

91293704 in 1994 to 423676029 in 2014. As shown in Table 1, it is noticed that there is noticeable progress regarding the growth of this sector. To show the impact of the Jordanian pharmaceutical industries on GDP, the researchers designed a model as follows:

$$NGDP = C(1)\ FE\ X\ P + C(2)\ FREX + C(3)\ FVA + C(4) \quad (1)$$

Where,
NGDP =Nominal Gross Domestic Product;
FE X P = Pharmaceutical Export;
FREX = Re-Export;
FVA= Added Value.

Table 1. National Exports and Re-exports of the Jordanian pharmaceutical industries during the period 1994-2014

Year	National Exports: JDs	Re-Exports	GDP	Added value
1994	**91293704.0**	5391214.0	**4357.4**	**36750.3**
1995	**87298304.0**	13756864.0	**4714.7**	**33675.8**
1996	**103850596.0**	25838834.0	**4911.3**	**32679.6**
1997	**132465777.0**	11932939.0	**5127.4**	**47046.2**
1998	**100978885.0**	6047924.0	**5609.9**	**55162.8**
1999	**100653231.0**	4802757.0	**5778.1**	**54032.5**
2000	**110135789.0**	6590796.0	**5998.6**	**59506.7**
2001	**129703739.0**	7080374.0	**6363.7**	**67484.4**
2002	**14286464.0**	11213062.0	**6794.0**	**71262.5**
2003	**130848488.0**	18671485.0	**7228.8**	**75667.8**
2004	**158136495.0**	15387436.0	**8090.7**	**92309.2**
2005	**19783427.0**	14476814.0	**8925.4**	**112940.1**
2006	**210183680.0**	11869769.0	**10675.4**	**119162.0**
2007	**298738451.0**	17581210.0	**12131.4**	**172449.1**
2008	**352823055.0**	25444001.0	**15593.4**	**185163.4**
2009	**333963745.0**	36153298.0	**16912.2**	**225855.0**
2010	**421749270.0**	64303549.0	**18762.6**	**301172.0**
2011	**353988819.0**	60310360.0	**20476.6**	**371882.0**
2012	**381909428.0**	65565703.0	**21965.5**	**410927.0**
2013	**437814651.0**	740140096.0	**23851.6**	**439093.0**
2014	**423676029.0**	43751120.0	**25437.1**	**568143.0**

Source: *General Department of Statistics – Statistical Brochure—Different issues.*

We further conducted the normal distribution test and found that it was statistically accepted as test results indicated that errors were normally distributed as shown in Figure 1.

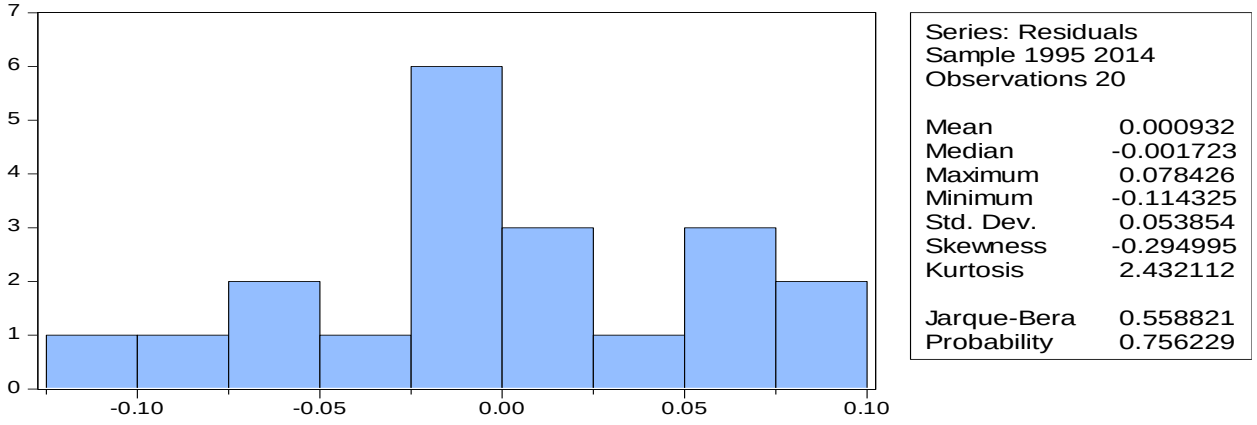

Figure 1. Normal Distribution

We later conducted another test for joint integration where we found a long term integrated relationship. Then we conducted the unit root test for each variable independently, as shown in the statistical analysis. It is shown that all tests had a positive relationship between the independent variables (National exports and re-exported pharmaceutical industries), (added value) and the dependent variable (GDP with current prices), as shown in the following equation:

NGDP= -2.26+0.29 FEXP+0.053 FREX +0.44 FVA

T-test shows that all T values of the independent variables had a positive and statistical relationship in light of the dependant variables. That's why it could be said that there is a positive impact on the dependant variable. Based on this, it can be said that there is a positive impact on the pharmaceutical exports and the re-exported industries. Also, there is a positive impact on the added value on GDP in Jordan, in addition, this sector is attracting large numbers of Jordanian employees whose number reached 7882 in 2014, the Jordanian workforce forms around 99% of the entire work force in this sector (*Amman Industrial Chamber 2015)*.

Intermediate Results:	
Rho - 1	-1.237466
Rho S.E.	0.221838
Residual variance	0.002679
Long-run residual variance	0.002679
Number of lags	0
Number of observations	20
Number of stochastic trends**	4

**Number of stochastic trends in asymptotic distribution.

Engle-Granger Test Equation:
Dependent Variable: D(RESID)
Method: Least Squares
Date: 03/09/17 Time: 09:40
Sample (adjusted): 1995 2014
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-1.237466	0.221838	-5.578248	0.0000

R-squared	0.620864	Mean dependent var	0.000629
Adjusted R-squared	0.620864	S.D. dependent var	0.084064
S.E. of regression	0.051761	Akaike info criterion	-3.035635
Sum squared resid	0.050906	Schwarz criterion	-2.985849
Log likelihood	31.35635	Hannan-Quinn criter.	-3.025917
Durbin-Watson stat	2.049896		

Null Hypothesis: FEXP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.438055	0.8843
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FEXP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.092120	0.0007
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Null Hypothesis: FREX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.361885	0.5796
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(FREX) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.152599	0.0395
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Null Hypothesis: FVA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.228108	0.9971
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(FVA) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.700891	0.0016
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Null Hypothesis: NGDP has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.478189	0.8744
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 18

Null Hypothesis: D(NGDP) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.425019	0.5470
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 18
Null Hypothesis: D(NGDP,2) has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.487920	0.0000
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 18

5. Conclusions and Limitations

Based on the statistical results it could be concluded that:

There is a positive statistically significant relationship between the increase in the Jordanian exports of pharmaceutical industries and GDP; there is a positive statistically significant relationship between the re-exported pharmaceutical industries and GDP; there is a positive statistically significant relationship between the added value of pharmaceutical industries and GDP; Pharmaceutical industries in Jordan are considered significant and pioneering industries that need to take care of due to the many job opportunities they provide in a way that pharmaceutical industries in Jordan have become internationally recognized all over the world.

However, as limitation of the study current researchers have found that no previous studies dealt with the variable currently used. Therefore, the current study recommends the following:

- Pharmaceutical companies in Jordan need to be aware of how to increase the level of productivity based on international standards.
- Merchandising Jordanian pharmaceutical industries abroad in order to open more markets for this industry which will eventually lead to appositive effect on the domestic product.
- The Government should provide all kinds of support and help to these companies as they encounter international competitiveness.
- The necessity for co-operation between the Jordanian companies of pharmaceutical industry and people concerned in the Jordanian government, especially in the field of offering consultations, research, development and marketing.
- Pharmaceutical industries in Jordan should dedicate a ratio of their sales for research and development purposes in order to cope with innovations in this sector in order to maintain their markets and excellence.

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