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IMPORT PENETRATION RATIO AND JORDANIAN INDUSTRIAL IMPORT COMPETITIVENESS

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Abstract: This study aims at constructing an import penetration ratio (IPR) indicator that measures import market share in apparent consumption of Jordanian manufacturing industries during 1994-2010, in order to investigate their import competitiveness position. Statistical tests of the significance of changes in IPRs are conducted using the Ordinary Lease Square method. The results suggest that total IPR coefficient has actually increased, reaching 52 per cent in 2010 and the change was statistically significant. At the sectoral level, import penetration in nearly half of the industries has declined, indicating an improvement in their import competitiveness. On the other hand, some industries faced severe competition from imports and a drop in their market share of domestic production. Import penetration in Jordan from China rose in most industries. In contrast, that from USA and from Saudi Arabia was up in specific industries only. In comparison with Egypt and Morocco, the highest number of industries that witnessed an improvement in their import competitiveness was in Egypt, followed by Jordan and then comes Morocco.

Keywords: Import Penetration; Industrial Import Competitiveness; Jordan; Egypt and Morocco.

JEL Classification: F1, F14, F15

1. INTRODUCTION

International competitiveness (IC) at its different levels has become increasingly important for both developed and developing countries. National competitiveness of a multitude of countries in the world, including Jordan, is regularly assessed and evaluated by several international institutions such as the World Economic Forum, which publishes "The Global Competitiveness Report" and the International Institute for Management and Development, which issues "the World Competitiveness Yearbook".

At the micro-level, studies that focus on the competitiveness of sectors or even enterprises are being carried out as well. In Jordan, certain domestic institutions and scholars have conducted such studies covering most economic activities, including the industrial sector.

The concern about the competitiveness of Jordan's manufacturing industry has recently intensified owing to the growing importance of this sector to the Jordanian economy, in terms of value added, employment, exports and satisfaction of domestic demand.

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Also, the interest in the competitiveness of this sector has arisen from the large expansion of both manufactured exports and imports following Jordan's rapid international integration of its economy during the last two decades. In particular, imported manufactures from all over the world recorded spectacular increase, which influenced the Jordanian producers' share in their home market. Indeed, some industries have been exposed to severe import competition, which may threaten their existence.

Therefore, the key question which the paper should set out to answer is whether the inflow of imported manufactured goods to Jordan's market has significantly influenced the import market share in apparent consumption of Jordanian industries, and hence, whether it has an impact on their import competitiveness.

This specific side of competitiveness did not attract the same attention from officials and scholars as that of exports or overall competitiveness, and studies on this specific issue are limited.

Accordingly, the aim of this study is to fill the gap in the field of competitiveness of manufacturing industries, by assessing and analyzing their import competitiveness, utilizing the usually used indicator in this area; the import penetration ratio. This ratio will be computed at the most appropriate and available detailed level. The trend and direction of this ratio will be assessed and analyzed for total manufacturing and also sub- sectors during 1994-2010 period. The scope of the study will cover Jordan's imports from the World and also those from main trading partners (China, USA and Saudi Arabia). Also import penetration of two benchmarking countries will be calculated and analyzed (Egypt and Morocco) and then compared with Jordan's position.

The rest of the study is in six sections. The subsequent section, reviews the related literature. The theoretical framework is set out in section 3. Section 4 provides preliminary analysis of the structure and geographic composition of Jordan's trade. Section 5 discusses the methodology considering the choice of main trading partners, the data set and method of estimation. The results are presented in section 6, and finally section 7 concludes this study.

2. RELATED LITERATURE

Many scholars and organizations have discussed the issue of IC and explored its significance, scope, definition and nature, in addition to its measurement. Since we are specifically concerned in this study with import competitiveness, and the import penetration ratio as a major indicator to assess it, we will review the most important literature that tackles these concepts.

On the theoretical grounds, James Hughes and A.P. Thirlwall (1977) were the first to use the term "import penetration". Also, they estimated its trend in the United Kingdom's industry. Johns in his book "International Trade Theories and the Evolving International Economy" (1985), and Durand and Giorno (1987) in

their article "Indicators of International Competitiveness": Conceptual Aspects and Evaluation" have illustrated the different concepts of IC and presented the main indicators for assessing it, including the import penetration ratio. The second study has also applied IC indicators on the OECD countries.

Balassa (1988) in his study on Japan's economy discussed in details the advantages and shortcomings of IC indicators, and used the import penetration ratio to measure import competitiveness of Japan's industry. Another application on a detailed level is found in the study carried out by the New York Stock Exchange (1984), which investigated import competitiveness of US industrial sectors. It found that this ratio was increasing during the 1972-1982 period in 30 out of 42 industries, indicating a loss of competitiveness. The study of James and movshuk (2004) covered more than one country (Japan, Korea, Taiwan and the USA) investigating the presence and trend of import penetration ratio for 28 industries. The results, however, vary from country to country. A recent US Business and Industry Council Import Penetration Survey (2012) by Alan Tonelson showed that imports of advanced manufactures in 2012 seized record levels from US based industries in their own home market and had slowed America's weak growth that year.

Studies on Jordan's import competitiveness are rare[1]. Nassif and Walkenhorst (2006) in their research pertinent to investigating Jordan's trade and competitiveness calculated the import penetration ratio in the year 2005 for 22 industrial sectors, and analyzed their level in the context of Jordan's trade agreements, particularly with the US and the EU countries.

3. THEORETICAL CONSIDERATION

International Competitiveness

Defining international competitiveness is a highly controversially issue, but generally speaking, it refers to the ability of a country (industry) to compete successfully in world markets (export competitiveness) and with imports in its own domestic market (import competitiveness). Hence, import competitiveness is based on the notion that: "a national industry endeavors to win or at least keep its shares in its own market"[2].

Both price and cost criteria are considered as measures designed to assess international competitiveness (the process itself), and market shares as being designed to assess the results of this process[3].

Regarding market shares, two main market-shares have to be considered for a particular economy: the country's share in markets abroad (export market share) and the shares of imported products in the country's home market (import penetration ratio, IPR)[4]. However, market shares such as IPR (and also export market share) are criticized for capturing factors other than competitiveness. Therefore, changes in IPR of a particular country's industry cannot be merely ascribed to

changes in competitive factors. Other factors might include: the economic growth and the increase in internationalization of world trade, the shift in the composition of demand in favor of certain goods which have high import content, the arbitrary manipulation of import flows by governments in some countries which reflect balance of payments adjustments policies rather than changes in competitiveness[5].

In spite of these shortcomings, this indicator may be used in investigating the competitive position of a country, provided that it is applied and also interpreted carefully. Also, the efficacy of this indicator will be improved by further breakdown of manufacturing into individual industries. It is argued that a researcher should analyze the trend of a representative cross-section of product group for a reasonable period[6].

Therefore, in this study we will focus on assessing import competitiveness of Jordan's manufacturing at the sectoral level, through measuring and analyzing import penetration ratio for sub-sectors. It is worthy to note that this ratio is preferable to price measures in the case of sub-sectors. Price competitiveness is usually measured for total manufacturing only, because producers' prices may not be available for different partner countries in a detailed manner and according to the same classification.

Import Penetration Ratio and Import Competitiveness

Import Penetration Ratio (IPR) is defined by the OECD[7] as the percentage of domestic demand fulfilled by imports. It may also be defined as the share of imported products in the country's home market[8]. It is calculated as the ratio of imports to home demand where,

Home demand = manufacture sales + imports – exports.

Other measures consider apparent consumption instead of domestic demand, and calculate IPR as the ratio of imports to apparent consumption[9], where:

Apparent consumption = production + imports – exports.

Mathematically, IPR for a particular sector (i) in year (t) is calculated as follows:

$$IPR_{it}^{c} = \frac{M_{it}^{c}}{Q_{it} - X_{it} + M_{it}}$$

Where:

M_{it}^{c} = imports of sector (i) in year (t) from country (c) or the world

Apparent Consumption = $Q_{it} - X_{it} + M_{it}$

Where:

Q_{it} = Output of sector (i) in year (t).

X_{it} = Exports of sector (i) in year (t).

M_{it} = Imports of sector (i) in year (t).

As a measure of import competitiveness, a rise in a country's IPR for a manufacturing sector may be interpreted as a lack of competitiveness. Furthermore, IPR, which is considered an important concept that provides information on the significance of international trade relative to the overall economy, can be useful in understanding many aspects of the economy in addition to the assessment of import competitiveness. This appears in many studies which discussed the effect of IPR on employment, or profitability of domestic firms, productivity, capital structure, market power, domestic efficiency and other variables.

4. PRELIMINARY ANALYSIS

Jordan's commodity structure of external trade displays that the most important exported goods arranged in descending order according to their value in 2011 were: clothes, potash, phosphates, vegetables, "medical and pharmaceutical products" and fertilizers, in addition to other four less significant goods, namely; paper and paperboards, fruits and nuts, livestock, phosphoric acid and plastic products. The combined relative importance of these goods reached two thirds of total domestic exports, ranging between 14.8 per cent and 5.6 per cent for the first group, while the total share of the second group reached 9.5 per cent.

With respect to imports, crude oil and petroleum products accounted for one fourth of total imports. The remarkable rise of energy prices in the international markets had its impact on this high ratio[10]. Transport equipment and spare parts followed with 6.1 per cent, and then came "iron and steel" (3.8 per cent) and textiles (3.5 per cent). Other five less important goods had collectively a share of 13.5 per cent. These are: plastics, medical products, telecommunication equipment, "other machinery and equipment" and "meat, fish and preparations".

As for trade in manufacturing goods alone, Figure 1 depicts the values of major exported and imported goods in 2011, comprising in each case about two thirds of the equivalent total.

It is obvious from the figure that Jordanian manufactured exports are concentrated in three goods, with a share of 40 per cent in total domestic exports. These goods are: clothes, "medical and pharmacy products" and fertilizers. Other three less significant items were: paper and cardboard, phosphoric acid and plastic products, with shares ranging between 4.9 per cent – 2.5 per cent. The rest of the lists of main exports were some chemical products with a relative importance in the total of less than 2 per cent each.

On the other hand, imports of petroleum products occupied the first place in total manufactured imports, followed by transport equipment, then "iron and steel" and textiles, comprising together about 40 per cent of the total, with the following shares: 18 per cent, 10 per cent, 6 per cent and 5.5 per cent, respectively. Although

Figure 1: Jordan Major Manufactured Exports and Imports in 2011, US$ Thousands

Source: Based on data presented in WITS database

medical and pharmaceuticals are one of the major Jordanian exports, they are considered important imports also, reaching 4.5 per cent of the total. As Jordan's production of machinery and equipment is limited, its domestic demand is mainly satisfied through importing different kinds of such goods (see Figure 1)

With respect to the **geographic distribution** of Jordanian external trade, United States and Iraq, in addition to India and Saudi Arabia, which accounted together for about 50 per cent of total domestic exports, were Jordan's major destinations.

Regarding imports, the markets of Saudi Arabia, China, United States, Italy, Germany and Egypt were the major sources of Jordanian imports, comprising collectively about 52 per cent of the total. In general, Saudi Arabia, USA and China are Jordan's major partners of trade in (exports plus imports).

As for manufactured exports and imports, Figure 2 displays the shares of Jordan's major destinations and sources of trade. The United Sates had the lion's share in domestic exports, followed by Iraq, Saudi Arabia and India, constituting 55 per cent of the total. But Lebanon, China and Indonesia were less significant.

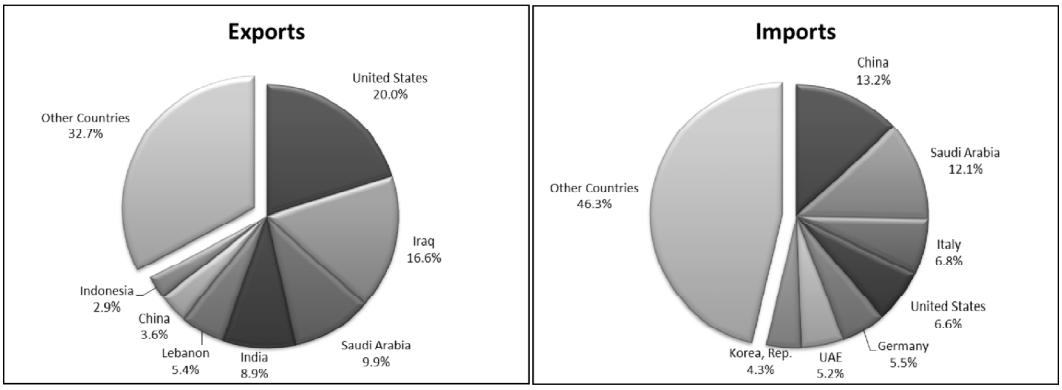
On the side of manufactured imports, China topped the list of total imports, and Saudi Arabia had almost the same share; comprising together one fourth of the total. Another one fourth was shared among Italy, USA, Germany and United Arab Emirates (UAE). Each of South Korea, Turkey, Russia and India had a share of less than 5 per cent.

5. METHODOLOGY

Choice of Countries

Computation of Jordan's IPR and analysis of its trend over time on both the total manufacturing and sub-sectors levels will be based on imports from the world, as

Figure 2: Geographic Distribution of Jordan's Manufactured Exports and Imports in 2011



Source: Based on data presented in WITS database.

well as from some major trading partners. The choice of the relevant set of most representative trading partners will be based on the data presented in WITS database and the descriptive analysis in section 4.

Consequently, Jordan's top trading partners during 2011 (on the basis of total domestic exports plus imports) were: Saudi Arabia, United States of America (USA) and China. Each of India and Iraq had also a noticeable contribution in Jordan's trade.

Further, since this study is concerned with trade in manufacturing goods, the choice of countries based on trade in these goods reveals that Jordan's three top partners in 2011 are the same as the above mentioned countries, but their order has changed to Saudi Arabia, China and the USA[11].

Even if emphasis is inserted on the import side of manufactured trade, as the focus of this study is on import penetration and import competitiveness, the most important source of Jordan's manufactured imports would still be China and Saudi Arabia. However, the relative position of the USA would become the fourth after Italy and followed by Germany. But choosing USA in addition to China and Saudi Arabia as major sources for Jordan's manufactured imports is preferable, because this choice serves the aim of the study of analyzing the import competitiveness of manufactured goods. The goods imported from the USA are more diversified in comparison to those from Italy (Mainly petroleum products and machinery) and Germany (mostly motor vehicles and spare parts, which have very limited domestic substitute products to compete with).

Data and Sources

Data on exports and imports for total manufacturing and industrial sub-sectors, all expressed in US Dollars, are obtained from WITS database. While data pertinent to

manufacturing production are obtained from Jordanian Industrial Surveys which are issued by Jordan's Department of Statistics (DoS). The ISIC 4-digit level (revision 3) data are grouped into 3-digit level in order to shorten the long list of industries (according to the 4 digit classification) in the text tables, and hence facilitating the presentation of their results and analyses. Production data are expressed in U.S Dollars using end-period exchange rate of Jordanian Dinar, issued in Central Bank of Jordan (CBJ), Monthly Statistical Bulletins. 41 industries of 3-digit manufacturing sectors were examined. Further, other 7 sub-sectors at the 4-digit level were added, as these industries are increasingly important in the trade and production of Jordan and its partners.

Real import penetration ratio has been calculated for total manufacturing only, owing to lack of appropriate detailed price indices. Nominal exports, imports and output were converted to real ones utilizing manufacturing export price index, import price index and producers' price index, respectively.

As producers' price index has been available only since 1999, real IPR has been computed since then. Export and import price indices for total manufacturing are computed on the basis of unpublished data from CBJ.

The period examined in this study is (1994-2010) covering Jordan's IPR with partners including the World as a whole, the USA, China and Saudi Arabia. Year 2010 being the last year for which production data, required for the construction of IPR indicator, is available.

In order to give a clearer picture of Jordan's situation, its position has been compared with two benchmarking countries; Egypt and Morocco. Data for these countries are available for a relatively suitable period of time in the UNIDO "Industrial Demand-Supply Balance Database"[12]. In addition to data availability, these two countries have common characteristics with Jordan as they belong to the same region, and are classified as diversified economies.

Method of Estimation

In order to investigate whether trends or changes are continuous or are reversed over the study period, import shares of apparent consumption (IPR) for each year of the period has been calculated, and not only for the earlier and the latest years.

An Ordinary Least Squares (OLS) regression of the original data Y_t on the linear time trend t has been run to examine the presence and direction of changes in IPR. Then the presence of trend and its statistical significance have been evaluated by testing the null hypothesis that parameter value for (t) is zero. This commonly used method proved to be valid in Jordan's case, as the regression disturbances of the OLS fit are normally distributed.

But the strong assumption on the distribution of the error term does not hold in small samples such as those of Egypt and Morocco cases. Therefore, non-parametric

tests for trend have been adopted (Daniels, 1950)[13]. This test does not require a normal distribution under the null hypothesis, but only requires that the observations follow an identical distribution, which does not have to be specified. This test is based on the Spearman rank correlation in which the original observations Y_t are replaced by their ranks, and the test statistics is computed as the Spearman correlation coefficient ρ between ranks of Y_t and t. The null hypothesis of the test is that no trend is found in Y_t. The alternative hypothesis is the presence of upward trend or downward trend.

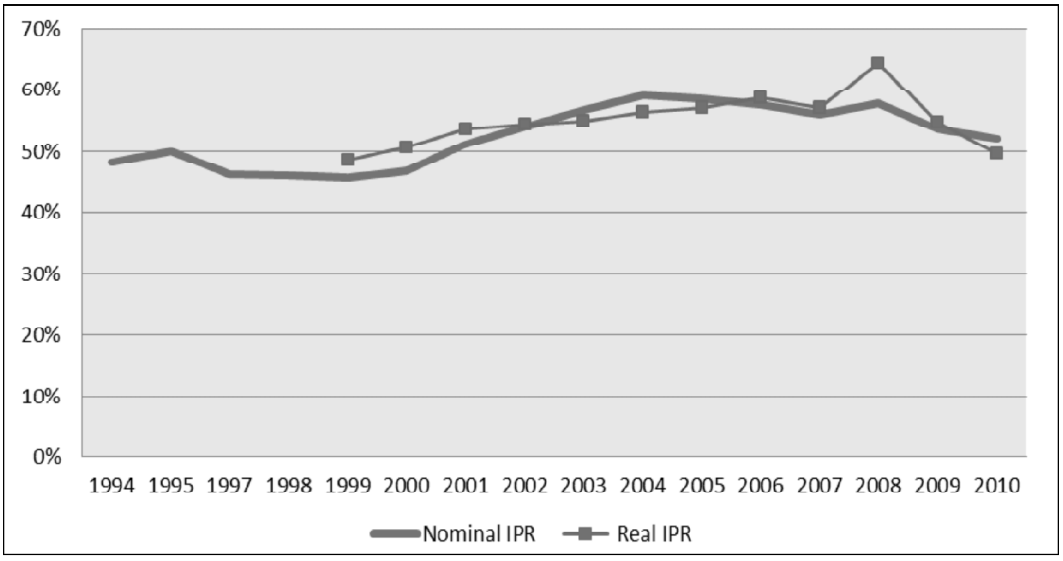
6. RESULTS

The results of this study are presented in three sub-sections; the first is IPR of total manufacturing, the second covers sub-sectors' import penetration and the third analyzes import penetration of Egypt and Morocco, comparing them with that of Jordan.

6.1. Import Penetration of Jordan's Total Manufacturing

Figure 3 depicts the trend for IPR of total Jordanian manufacturing during 1994-2010. It reveals that the general trend for this ratio was slowly increasing. As reported in Table 1, Appendix B, before 2001 IPR was slightly less than 50 per cent, and then it was up to about 60 per cent in 2004 and decelerated to 52 per cent in 2010, with an average of 52.4 per cent during the study period.

Figure 3: Import Penetration Ratio (IPR) of Jordan's Total Manufacturing Industry, 1994-2010 (%)



Source: IPR is computed from WITS database, Jordan's Industrial Surveys issued by Department of Statistics, Central Bank of Jordan, Monthly Statistical Bulliten. See the subsection on data and sources of the present study.

Real IPR, on the other hand, registered an average of 55 per cent which is slightly higher than the nominal one. It rose from 48.6 per cent in 1999 to 64 per cent before declining to about 50 per cent in 2010. The general trend was – to some extent – similar to that of nominal IPR, except in 2008. The reason of the higher ratio of real IPR in this year is due to the slowdown in real domestic production and exports, combined with a high rise in imports, owing to several factors as will be explained later.

It is noteworthy that steady declines in both nominal and real IPR during the last few years have been recorded. This may be interpreted as an improvement in import competitiveness, particularly, in light of the continuous expansion in gross output, associated with some negative changes in the other components of IPR.

But, generally speaking, changes in total IPR do not necessarily reflect an improvement or deterioration in import competitiveness. As mentioned earlier, other causes may be the decisive factors behind these changes. Explanations for the sudden increases in IPR in 2001, 2004, and 2008 are given below:

1. Internationalization of world trade. This appears in the year 2001. During this year, the performance of Jordanian external trade sector has been influenced by a bundle of measures and policies carried out by the government in 2000 and 2001 to increase the economic and trade openness and integration in the world economy. These measures included joining the WTO in addition to the conclusion of some bilateral and regional free trade agreements and enforcement of others.
2. Economic Growth: The year 2004 is a good example. The most spectacular growth in real GDP has been registered in this year since 1992, reaching 8.6 per cent. Real Gross National Disposable Income has also risen, stimulating imports to satisfy the increasing demand for both consumer and "intermediate and capital goods".
3. Year 2008 is an exceptional year. It witnessed multiple external shocks, namely; the surge in the prices of energy, food and other basic commodities in international markets[14], in addition to the repercussions of the global financial crises. These factors have increased production costs and resulted in slowdown of Jordan's industrial production.

6.2. Analysis of Jordan's Import Penetration Trend of Manufacturing Sub-sectors

Table 1 presents the OLS results for trend of import penetration ratios at the total and sub- sectors levels, considering imports from the whole world as well as imports from Jordan's three major trading partners: the USA, China and Saudi Arabia. Also, it shows the significance of changes in each case.

Table 1
OLS Test for Trend of Import Penetration Ratios in Jordan

ISIC Code	*Economic Activity*	*Imports from the World*		*Imports from the USA*		*Imports from China*		*Imports from Saudi Arabia*	
		ρ	*ρ-value*	*ρ*	*ρ-VALUE*	*ρ*	*ρ-VALUE*	*ρ*	*ρ-VALUE*
151	Production, processing and preservation of meat, fats	-0.8175***	0.0001	-0.1476	0.5995	0.7038***	0.0034	0.8186***	0.0002
1511	Production, processing and preserving of meat and meat products	-0.71381***	0.0019	-0.57866**	0.0189	0.655957***	0.0058	0.702669***	0.0024
1514	Manufacture of vegetable and animal oils and fats	-0.56528**	0.0225	-0.09191	0.735	-0.3023	0.2551	0.757059***	0.0007
152	Manufacture of dairy products	0.4449*	0.0842	0.6526***	0.0083	0.3664	0.1792	0.9458***	0.0000
153	Manufacture of grain mill products, starches	0.2672	0.3170	0.4290	0.1105	-0.3507	0.1936	0.7042***	0.0034
154	Manufacture of other food products	0.8362***	0.001	-0.1414	0.6153	0.6765***	0.0056	0.8834***	0.0000
155	Manufacture of beverages	0.8074***	0.0002	-0.2805	0.3113	NA	NA	0.8967***	0.0000
160	Manufacture of tobacco products	0.3103	0.2422	-0.6628***	0.0071	0.0640	0.8199	NA	NA
171	Spinning, weaving and finishing of textiles	0.5009**	0.0481	-0.7283***	0.0021	0.8959***	0.0000	0.6706***	0.0062
172	Manufacture of other textiles	-0.0447	0.8694	-0.5397**	0.0378	0.7089***	0.0031	0.4985*	0.0585
173	Manufacture of knitted, crocheted fabrics and articles	0.8852***	0.0000	0.1780	0.5254	0.8872***	0.0000	NA	NA
181	Manufacture of wearing apparel, except fur apparel	-0.1506	0.5777	-0.3034	0.2716	0.0583	0.8375	0.2563	0.3563
191	Tanning and dressing of leather; manufacture of luggage	0.4274*	0.0987	0.5324**	0.0410	0.5950**	0.0193	0.5972**	0.0187
192	Manufacture of footwear	0.7473***	0.0009	-0.5839**	0.0223	0.4252	0.1141	0.6059**	0.0166
201	Sawmilling and planning of wood	-0.3484	0.1860	-0.1161	0.6802	0.8219***	0.0002	0.3052	0.2684

table 1 contd.

ISIC Code	Economic Activity	Imports from the World		Imports from the USA		Imports from China		Imports from Saudi Arabia	
		ρ	ρ-value	ρ	ρ-VALUE	ρ	ρ-VALUE	ρ	ρ-VALUE
202	Manufacture of products of wood, cork, straw and plaiting	0.0424	0.8758	-0.0774	0.7847	0.3246	0.2377	-0.4282	0.1112
210	Manufacture of paper and paper products	0.9011***	0.0000	-0.4636*	0.0817	0.7628***	0.0009	0.9877***	0.0000
221	Publishing	-0.6627***	0.0051	-0.2370	0.3949	NA	NA	NA	NA
222	Printing and service activities related to printing	-0.4875*	0.0554	-0.2776	0.3164	-0.4875*	0.0554	-0.1378	0.6246
232	Manufacture of refined petroleum products	0.3719	0.1560	0.1997	0.4756	NA	NA	0.4236	0.1156
241	Manufacture of basic chemicals	-0.0964	0.7226	-0.1503	0.5926	-0.0877	0.7564	-0.0556	0.8431
242	Manufacture of other chemical products	0.0741	0.7847	0.4819*	0.0689	0.9274***	0.0000	0.9168***	0.0000
2422	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	-0.17881	0.5076	-0.50227**	0.0474	0.607544**	0.0126	0.569733**	0.0212
2423	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	0.078013	0.774	0.581024**	0.0183	0.850981***	0.0000	0.747563***	0.0009
2424	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparation	0.675931***	0.004	-0.15891	0.5566	0.779563***	0.0004	0.96682***	0.0000
251	Manufacture of rubber products	-0.4872*	0.0556	-0.4263	0.1130	0.8348***	0.0001	0.7448***	0.0014
252	Manufacture of plastics products	0.7240***	0.0015	-0.2009	0.4728	0.9210***	0.0000	0.9559***	0.0000
261	Manufacture of glass and glass products	-0.5712**	0.0208	-0.3524	0.1976	0.9409***	0.0000	-0.1224	0.6634
269	Manufacture of non-metallic mineral products n.e.c	0.9069***	0.0000	-0.7592***	0.0010	0.9455***	0.0000	0.6179**	0.0141

table 1 contd.

ISIC Code	Economic Activity	Imports from the World		Imports from the USA		Imports from China		Imports from Saudi Arabia	
		ρ	ρ-value	ρ	ρ-VALUE	ρ	ρ-VALUE	ρ	ρ-VALUE
2693	Manufacture of structural non-refractory clay and ceramic products	0.98431***	0.0000	-0.40942	0.1153	0.934971***	0.0000	0.862288***	0.0000
271	Manufacture of basic iron and steel	0.02	0.9420	0.0948	0.7372	0.8104***	0.0002	0.6319**	0.0115
272	Manufacture of basic precious and non-ferrous meta	0.2664	0.3185	0.3802	0.1620	0.6509***	0.0086	0.09	0.7495
281	Manufacture of structural metal products, tanks, containers of metals.	-0.2024	0.4465	-0.5186**	0.0476	0.6420***	0.0099	0.1907	0.4959
289	Manufacture of other fabricated metal products	0.29511	0.2671	-0.6275**	0.0123	0.7433***	0.0015	0.7104***	0.0030
291	Manufacture of general purpose machinery	0.0519	0.8487	-0.537**	0.0389	0.9524***	0.0000	-0.8959***	0.0000
2915	Manufacture of lifting and handling equipment	-0.2012	0.4549	0.06868	0.8005	0.889647***	0.0000	0.129379	0.633
292	Manufacture of special purpose machinery	-0.5472**	0.0282	-0.4433*	0.0978	0.7921***	0.0004	-0.1539	0.5838
293	Manufacture of domestic appliances n.e.c.	0.3871	0.1384	-0.9008***	0.0000	0.8212***	0.0002	0.5985**	0.0184
311	Manufacture of electric motors, generators and transformers	0.6345***	0.0083	0.2511	0.3664	0.7433***	0.0015	0.4411**	0.0404
312	Manufacture of electricity distribution and control apparatus	-0.2019	0.4530	-0.2313	0.4070	0.5314**	0.0415	-0.2958	0.3028
313	Manufacture of insulated wire and cable	-0.3768	0.1503	0.0264	0.9263	0.7487***	0.0013	-0.5309**	0.0417
315	Manufacture of electric lamps and lighting equipment	-0.7343***	0.0012	-0.4710*	0.0763	0.8408***	0.0001	0.3395	0.2156

table 1 contd.

ISIC Code	Economic Activity	Imports from the World		Imports from the USA		Imports from China		Imports from Saudi Arabia	
		ρ	ρ-value	ρ	ρ-VALUE	ρ	ρ-VALUE	ρ	ρ-VALUE
331	Manufacture of medical appliances and instruments	-0.0734	0.7859	0.3714	0.1292	0.9264***	0.0000	0.4993*	0.0581
341	Manufacture of motor vehicles	-0.0245	0.9255	0.6403**	0.0101	0.7072***	0.0032	0.1539	0.5842
343	Manufacture of parts and accessories for motor vehicles	-0.2236	0.4053	-0.2880	0.2977	-0.0509	0.8563	-0.1941	0.4878
351	Building and repairing of ships and boats	-0.7644***	0.0006	-0.5257**	0.0441	NA	NA	NA	NA
361	Manufacture of furniture	0.84***	0.0000	0	0.9954	0.9214***	0.0000	0.3737	0.1700
369	Manufacturing n.e.c.	-0.2765	0.2996	-0.2807	0.3109	-0.2645	0.3408	-0.2765	0.2996
	Total	0.7110***	0.0020	0.0361	0.8927	0.9060***	0.0000	0.8544***	0.0000

Source: Import Penetration Ratios are computed from WITS database and Jordan's Industrial Surveys issued by DoS

Notes: *** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

As reported in Table 1, the total import penetration coefficient during the study period was positive and statistically significant. However, coefficients of import penetration ratio for sub-sectors were positive in some industries (25 industries) and negative in others (23 industries).

The positive and significant changes in import penetration were registered in 12 three-digit and two-four digit industries, while positive but not significant changes took place in 6 industries. The positive and significant changes were in: ISIC 152 (dairy products), 155 (beverages), 171 (textiles), 192 (footwear), 210 (paper).2424 (soap and detergents), 252 (plastic products), 2693 (ceramic products) and 361 (furniture). Almost all these sectors are light and labor-intensive industries. It seems that Jordanian industrialists in these branches are facing increased competition from imports and the market shares of their products have declined. Hence, we can conclude that import competitiveness of these industries has deteriorated during 1994-2010.

On the other hand, the coefficient of import penetration ratio was negative and statistically significant in 10 industries and negative but not significant in 13 industries. The significant declines took place in 8 three-digit and two four-digit sectors. These industries include: ISIC 151 (preservation and processing of meat and fats), 1514 (vegetable oil), 221 (publishing), 251 (rubber products), 261 (glass products), 292 (special purpose machinery), 315 (electric lamps and lightning equipment). Based on these results, we can say that Jordan's competitiveness has improved not only in resource-based industries (ISIC 151, 1511, 261) but also in relatively high technology and knowledge-based industries (ISIC 292, 315).

It is worth mentioning that Jordan is trying to improve its competitiveness position in industries that are capital-intensive or of high technology. This appears in the decline in import penetration of such goods but the change was not statistically significant. Examples are: ISIC 2422 (paints), 2915 (lifting and handling equipment), 313 (insulated wire and cable), 343 (parts and accessories for motor vehicles).

Furthermore, the import share of some industries remained virtually unchanged such as ISIC 341 (motor vehicles), 291 (general purpose machinery) and ISIC 2423 (pharmaceuticals). In these industries IPR was high from the beginning and the change in its magnitude over time was minimal, because, as in the first two industries Jordan was not and still is not capable of producing these goods. However, in the case of pharmaceuticals, Jordan's production is large but a significant proportion of this production is exported. Also, specific high quality products that depend on recent innovations and sophisticated technology are not produced domestically.

Import Penetration in Jordan's Manufacturing from the USA

Total manufacturing imports from the USA supplied a small proportion of apparent consumption in Jordan, reaching 3.2 per cent in 2010, up from 2.7 per cent in 1994.

However, although the coefficient of total IPR was positive, but still it was not significant at all.

As it appears in Table 1, the increases in import penetration were statistically significant in four three-digit sectors, as well as one four-digit sector. These are: dairy products, leather and luggage, pharmaceuticals, other chemical products and motor vehicles. Hence, the American producers could gain market share in capital-intensive or high technology products (the last three industries), in addition to some light industries (the first two industries) which may reflect exporting high quality products.

In 12 three-digit and three four-digit industries import penetration have actually declined and the changes were statistically significant. These industries include: metal products, general machinery, electric lamps, and domestic appliances. This decline in the US share in Jordan's market may be explained by the fact that Jordan's competitiveness has improved (electric lamps), or the share of other countries such as China is increasing (domestic appliances). See Table 1; the cases of USA and China.

Import Penetration from China

A strong performance for Chinese exports in the Jordanian market for manufactured goods has been registered during the study period. The Jordanian imports from China are becoming of increasing importance both in terms of value and composition of the consumers and producers baskets of goods. The share of imports from China in Jordanian apparent consumption has risen from just 1.5 per cent in 1994 to 7.7 per cent in 2006 and 6.2 per cent in 2010 (doubled four times). This huge inflow of Chinese goods to Jordan's market, and the spectacular rise in IPR, may be caused by two factors: the first is a technical one, as IPR has started from a very low level. This share has started to rise since 2000, owing to several factors, including the measures undertaken in both countries to liberalize their economies and trade. The second factor is due to low prices of Chinese imports, owing to their low costs and low quality, particularly, those exported to low and middle-income countries in the world as Jordan. Indeed, according to a recent study, Jordanian demand function for imports from China is determined to be high price elastic, but low income elastic[15].

Table 1 shows that in the case of total manufactured imports from China, the coefficient of IPR is positive and statistically significant. As for sub-sectors, 27 ISIC three – digit and six four – digit sectors (more than two thirds of the number of industries) witnessed positive and statistically significant changes. The Chinese increased share was not confined to light and labor-intensive industries but was also in chemicals, machinery, motor vehicles. It appears that changes in comparative advantage may have taken place in China during this period.

Import Penetration from Saudi Arabia

Saudi Arabia, another major trading partner of Jordan, witnessed also a considerable rise in its import penetration in Jordan's market. IPR has risen from 1.7 per cent, 3.6 per cent, 6.2 per cent and 6.3 per cent during 1994, 2003, 2006 and 2010, in the same order.

As reported in Table 1, total IPR from Saudi Arabia was positive and the change was statistically significant. Saudi Arabia, which enjoys a comparative advantage in exporting goods based on its oil endowments, has gained market share in resource-based industries as petrochemical, and also in energy-intensive industries such as: food and beverages, paper, iron & steel, fabricated metals and ceramic.

Indeed, import penetration from Saudi Arabia, took place in 25 industries (including the above-mentioned sectors), and the changes were statistically significant.

6.3. Analysis of Import Penetration Trend in Egypt and Morocco

Import penetration in each of Egypt and Morocco is computed and its trend is estimated, and analyzed and compared with that in Jordan.

Table 2
Daniels Test for Trend of Import Penetration Ratios in Morocco and Egypt

ISIC Code	*Economic Activity*	*Imports from the World in Morocco*		*Imports from the World in Egypt*	
		ρ	ρ *-Value*	ρ	ρ *-Value*
151	Production, processing and preservation of meat,	0.367	0.332	0.886**	0.019
1511	Production, processing and preserving of meat and meat products	-.333	0.347	0.250	0.589
1514	Manufacture of vegetable and animal oils and fats	0.006	0.987	0.143	0.760
152	Manufacture of dairy products	0.567	0.112	-0.886**	0.019
153	Manufacture of grain mill products, starches	0.929***	0.000	-0.486	0.329
154	Manufacture of other food products	0.750**	0.020	-0.714	0.111
155	Manufacture of beverages	NA	NA	-0.395	0.439
160	Manufacture of tobacco products	0.567	0.112	-0.543	0.266
171	Spinning, weaving and finishing of textiles	0.650*	0.058	-0.429	0.397
172	Manufacture of other textiles	0.733**	0.025	0.143	0.787
173	Manufacture of knitted and crocheted fabrics and a	NA	NA	-0.899**	0.015
181	Manufacture of wearing apparel, except fur apparel	NA	NA	0.486	0.329
191	Tanning and dressing of leather; manufacture of luggage	0.717**	0.030	-0.086	0.872
192	Manufacture of footwear	NA	NA	0.657	0.156
201	Sawmilling and planning of wood	0.867***	0.002	0.029	0.957
202	Manufacture of products of wood, cork, straw and p	0.917***	0.001	0.143	0.787

table 2 contd.

ISIC Code	Economic Activity	Imports from the World in Morocco		Imports from the World in Egypt	
		ρ	ρ -Value	ρ	ρ -Value
210	Manufacture of paper and paper products	0.950***	0.000	-0.886**	0.019
221	Publishing	0.950***	0.000	-0.393	0.441
222	Printing and service activities related to printing	0.883***	0.002	0.943***	0.005
232	Manufacture of refined petroleum products	0.667**	0.050	0.771*	0.072
241	Manufacture of basic chemicals	0.317	0.406	0.371	0.468
242	Manufacture of other chemical products	0.500	0.170	-0.143	0.787
2422	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	0.321	0.365	-0.857**	0.014
2423	Manufacture of pharmaceuticals, medicinal chemicals and botanical products	-0.091	0.802	-0.393	0.383
2424	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparation	-0.164	0.651	-0.214	0.645
251	Manufacture of rubber products	0.750**	0.020	-0.600	0.208
252	Manufacture of plastics products	0.367	0.332	-0.714	0.111
261	Manufacture of glass and glass products	0.933***	0.000	-0.771*	0.072
269	Manufacture of non-metallic mineral products n.e.c	0.567	0.112	-0.943***	0.005
2693	Manufacture of structural non-refractory clay and ceramic products	-0.042	0.907	-0.857**	0.014
271	Manufacture of basic iron and steel	0.583*	0.099	-0.943***	0.005
272	Manufacture of basic precious and non-ferrous meta	NA	NA	-0.486	0.329
281	Manufacture of structural metal products, tanks, r	0.467	0.205	-0.543	0.266
289	Manufacture of other fabricated metal products; me	0.283	0.460	0.429	0.397
291	Manufacture of general purpose machinery	0.683**	0.042	-0.771*	0.072
2915	Manufacture of lifting and handling equipment	0.170	0.638	0.107	0.819
292	Manufacture of special purpose machinery	-0.500	0.170	-0.029	0.957
293	Manufacture of domestic appliances n.e.c.	0.933***	0.000	0.200	0.704
311	Manufacture of electric motors, generators and transformers	0.367	0.332	-0.829**	0.042
312	Manufacture of electricity distribution and control	-0.782**	0.013	-0.771*	0.072
313	Manufacture of insulated wire and cable	NA	NA	-0.829**	0.042
315	Manufacture of electric lamps and lighting equipment	0.850***	0.004	-0.314	0.544
331	Manufacture of medical appliances and instruments	0.731**	0.025	-0.600	0.208
341	Manufacture of motor vehicles	0.933***	0.000	0.600	0.208
343	Manufacture of parts and accessories for motor vehicles	-0.801***	0.010	0.638	0.173
351	Building and repairing of ships and boats	0.683**	0.042	-0.143	0.787
361	Manufacture of furniture	0.367	0.332	0.943***	0.005
369	Manufacturing n.e.c.	-0.583*	0.099	0.203	0.700
	Total	0.950***	0.000	0.371	0.468

Source: IPR for each of Egypt and Morocco was calculated by the researcher on the basis of data presented in: UNIDO, (Industrial Demand-Supply Balance Database) 2011.

Notes: *** Significant at the 1% level.
** Significant at the 5% level.
* Significant at the 10% level.

Import Penetration in Egypt

World's import penetration in Egyptian total manufacturing apparent consumption is relatively small, but it increased slowly reaching 37 per cent in 2006. The coefficient of this ratio was positive but not statistically significant.

IPR for 18 sub-sectors recorded also increases in their coefficients, and their changes were significant only in four industries; processing of meat, printing, refined petroleum and furniture. Also, textiles, wearing apparel, footwear, basic chemicals, fabricated metal products and domestic appliances have registered positive changes in their IPRs, but these changes were not significant. The rise in Egyptian IPRs of basic consumer goods such as: furniture, textiles, wearing apparel and footwear is influenced -to a large extent- by the increasing market share of imported low price Chinese goods[16].

In contrast, 30 industries registered negative changes in IPR coefficient; of which 12 recorded significant changes. These industries are: dairy products, knitted fabrics, paper products, paints, glass, non-metallic mineral products, basic iron and steel, general purpose machinery, electricity equipments, insulated wire and cables. Also 18 industries recorded declines in their import penetration, but these changes were not significant. This group includes pharmaceuticals, chemical products, rubber products, electric lamps and medical appliances.

Accordingly, we may conclude that although Egyptian manufacturers have lost market share in some traditional consumer and intermediate industries, but they could offset this loss and improved the import competitiveness of a lot of industries that are not confined to high labor-intensive industries but included also capital-intensive and relatively high technology industries.

Import Penetration in Morocco

As presented in Table 2 the total import penetration in Morocco's manufacturing actually increased, and the change was statistically significant. This ratio rose from 47.7 per cent in 2000 up to 56.1 per cent in 2008.

In 34 industries there were positive coefficients for import penetration, of which 19 were statistically significant. Hence, more than two thirds of the total has experienced deterioration in their import competitiveness.

In contrast, 8 industries recorded negative changes in their IPRs, of which only three were statistically significant manufacture of electricity distribution of control apparatus, (electricity parts and accessories for motor vehicles and manufacturing n.e.c.). These three industries have witnessed significant improvement in import competitiveness, while the improvement in that of soap and detergents, general purpose machinery, ceramic products, and pharmaceuticals was not significant.

7. SUMMARY AND CONCLUSION

The world's share of imports in apparent consumption (IPR) of Jordanian total manufacturing registered an average of 52.0 per cent during 1994-2010. In comparison with two benchmarking countries, IPR in the latest available year was 35.2 per cent for Egypt, 54.3 per cent for Morocco and 52.1 per cent for Jordan. The results of examining the existence of IPR trend and its direction show that it has increased in the three countries, and was statistically significant in both of Morocco and Jordan, but was not in the case of Egypt.

As emphasis in such a study should be put on sub-sectors, examining of the trend in 48 industries revealed that the highest number of industries that registered a significant decline in IPR, and hence improvement in import competitiveness was in Egypt, followed by Jordan and then Morocco.

In each of the three countries, particularly in Egypt and to a lesser extent Jordan, the improvement in competitiveness of some light and labor-intensive industries was limited, but there was more improvement in capital-intensive and knowledge-based industries.

Jordan's market was mostly penetrated from China in almost all industries, including capital-intensive ones. US and Saudi Arabia gained market shares in Jordan in specific industries; sophisticated products, high quality goods and products based on high R&D expenditure as in the case of USA, and oil-based and energy-intensive industries in the case of Saudi Arabia.

In order to improve Jordanian competitiveness position, and in light of Jordan's commitments to liberalize foreign trade, it is recommended to focus on the production side of the import penetration ratio.

Industries where Jordan enjoys a comparative advantage, but face strong import competition need a governmental support to enhance their labor and capital productivity; through training, developing technological capabilities and increasing R&D expenditure. Also, serious governmental measures to produce relatively cheap domestic energy (in the medium and long term) are required to reduce the costs of production and hence prices of domestic goods. Furthermore, Jordan has to create a competitive advantage in industries with high potential, and move to a higher stage of industrial development. In the current transitional stage, Jordan should start to focus on efficient production processes and improvement in the quality of products.

Construction of IPR for Jordan's industries for a relatively long period of time may stimulate researchers to carry out future studies utilizing the already available IPRs, focusing on the relation of IPRs with other variables such as employment, profitability, productivity in the industrial sector.

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Notes

1. One of the first studies on Jordan's import competiveness using import penetration ratios for Jordan's manufacturing subsectors is that of: Buthaina Muhtaseb, International Competitiveness of Jordan's Manufacturing Industry, 1995, unpublished Ph.D. thesis. See pp. 256-264 and 284-292.
2. See Hatzichronoglou, p. 32.
3. See Francis, p. 8 and Bank of England, pp. 396 and 371.
4. See for example, Ray, p. 3 and Balassa, "Japan in the World Economy", p. 62.
5. For more detailed discussion of these points see: NEDC, p. 29 and Francis, p. 10.
6. See Commission of the European Communities, p. 8.
7. OECD 2003, p. 112.
8. See Balassa, p. 62.
9. See Johns, p. 239.
10. The value of imported crude oil and petroleum products increased by 60.6 percent in 2011 over that of 2010, owing mainly to the high increase in oil prices. Indeed, the rise in the price index of imports of these goods was 43 percentage points, while the increase in the quantity index was only 8 percentage points.
11. If the volume of external trade of the average of the last three years is considered instead of the last year alone, the same three countries are still the main partners, but their order has changed.
12. Data on the concerned variables are presented in this database for some and not all countries of the world. Data for both Egypt and Morocco were available only for some years. Therefore, their IPRs were calculated for the available years only. But for Jordan, the researcher could gather the required continuous data from domestic sources as mentioned before.
13. This test has been recently applied in a similar study. See James and Movshuck, 2004.
14. Prices of energy have also increased owing to the liberalization of fuel prices in the domestic market. The inflation rate in this year step at 14.0% compared to 4.7% in 2007.
15. See: Al-Nasser, 2009.
16. See: *www.elaph.com/web/economics/2010/9/596867.html*

References

Balassa, Bela and Noland, Marcus. (1988). Japan in the World Economy, Institute for International Economics, Washington, D.C.

Commission of the European Communities. (1982), The Competitiveness of the Community Industry, Office for Official Publications of the European Communities, Luxemburg.

Francis, Arthur. (1989), The Concept of Competitiveness, in Arthur Francis and P.K. Tharakan, eds. The Competitiveness of European Industry, Routledge, London, New York.

Fröhlich, Hans-Peter, (1989), International Competitiveness: Alternative Macroeconomic Strategies and Changing Perceptions in Recent Years, in Arthur Francis and P.K. Tharakan, eds. Routledge, The Competitiveness of European Industry. London; New York.

Johns, Richard A. (1985), International Trade Theories and the Evolving International Economy, St. Martin's Press, New York.

Lenz, Allen J. (1991), Beyond Blue Economic Horizons: US Trade Performance and International Competitiveness in the 1990s, Praeger, New York.

National Economic Development Council (NEDC), (1965), Imported Manufactures: An Inquiry into Competitiveness, HMSO, London.

New York Stock Exchange (NYSE), (1984), US International Competitiveness Perception and Reality, New York Stock Exchange.

Scott, Bruce R. (1985), "US Competitiveness: Concepts, Performance and Implications", in Bruce R. Scott and George C. lodge, eds. US Competitiveness in the world Economy. Harvard Business School Press, Boston.

William E. James and Oleksandr Movshuck. (2004), "Shifting International Competitiveness: An Analysis of Market Share in Manufacturing Industries in Japan, Korea, Taiwan and the USA". *Asian Economic Journal*, Vol. 18, No. 2.

Bank of England. (1982), "Measures of Competitiveness", *Quarterly Bulletin*, vol. 22, pp. 369-375.

Durand, Martine and Giorno, Cloude. (Autumn 1987), "Indicators of International Competitiveness: Conceptual Aspects and Evaluation", *OECD, Economic Study*, No. 7, pp. 148-181.

Hashemite Kingdom of Jordan, Central Bank of Jordan. Annual Report. Issues of 1994- 2011.

Hashemite Kingdom of Jordan, Central Bank of Jordan. Monthly Statistical Bulletin. Different Issues.

Hashemite Kingdom of Jordan. Development of Statistics. Industrial Survey. Issues 1993- 2010.

Hughes, James J. and A. P. Thirlwall, (1977), "Trends and Cycles in Import Penetration in the UK". *Oxford Bulletin of Economics and Statistics* 39: pp. 301-317.

Tonelson, Alan. (2012), "Soaring Import Penetration Further slows Weak US Growth and Job Rebound", US Business and Industry Council.

UNCTAD, (2005), "Training Material on Competitiveness and Development".

World Economic Forum, "The Global Competitiveness Report", selected issues.

Mayy Issam Al-Nasser, (2009), "An Analytical Study of the Jordanian-Chinese Economic Relations during 1992-2006", MSc thesis in International Business, University of Jordan.

Nassif, Claudia and Walkenhorst, Peter. Trade, "Competitiveness and Employment in Jordan", World Bank, MPRA Paper No. 23979.

Hatzichronoglou, T., (1996), "Globalization and Competitiveness: Relevant Indicators", OECD Science, Technology and Industry Working Papers, 1996 /05, OECD Publishing, *http://dx.doi.org/10.1787/885511061376.*

Organization for Economic Cooperation and Development (OECD). Science, Technology and Industry Scoreboard 2003: Towards a knowledge-based Economy. *http://www.oecd.org/publications/e-book/92-2003-04-1-7294/,* 2003.

WITS database, World Bank. Website: *http://wits.worldbank.org/wits/index.html*

www.elaph.com/web/economics/2010/9/596867.html