

**Measuring Syria's exported tomato  
competitiveness in Iraqi and Russian markets  
by using Composite Competitiveness  
Indicator (CCI)**

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# Forward

This research aims at shedding light on the competitive position of Syrian tomato in Iraqi and Russian markets. The study assesses the current crisis and its implications including the unjust sanctions which barred Syrian exports to most Arab countries except some neighbor countries, namely Iraq. On the other hand, the research can be seen as a practical translation for the “heading easterly” policy, which was adopted by Syria at the beginning of the crisis. This policy supports and facilitates agricultural trade with Russia and other “friend countries”.

# **Abstract**

This study deals with the economic factors contributing to the promotion of Syria's tomato exports. These factors actually increase its competitiveness in international markets, particularly Iraqi and Russian. The research was conducted given the significant importance of tomato, compared to other agricultural exports, where tomato ranked first among Syrian agricultural exports in 2011 and 2012. In addition, the study focuses on the indicators of the international demand of Syrian tomato, as well as the main difficulties and challenges that face tomato exportation.

The study of Composite Competitiveness Indicator (CCI), enabled us to draw several important results, which have multiple policy implications.

# Executive summary

Tomato ranks third among vegetables in volume of international trade, preceded by potato and sweet potato. China, India, USA, Turkey, Egypt and Italy are among top countries that promoted tomato cultivation and production. Tomato is among most consumed vegetables in Syria. This is because it is very much available and affordable, and has considerable nutritional benefits. Furthermore, its consumption is considered a cultural value. Reviewing Syrian tomato trade balance for the period 2003-2012 showed a constant surplus, which allowed exporting quantities of tomato, particularly tomato grown in greenhouses.

Examining the CCI, enabled us to determine the competitiveness of Syrian tomato exports in international markets. The current CCI, developed in this paper, has been built upon several simple indicators, namely the Revealed Comparative Advantage (RCA), Price Competitiveness Index (PCI), Market Share (MS), Stability Index (S) and Market Penetration Rate (MPR). These indicators were weighted and composed in order to obtain the CCI and consequently compare it with other CCIs for other products or for the same product with different origins. The simple indicators were weighted according to their impact on tomato's competitiveness as follows:

- RCA: 30%
- PCI: 20%
- MS: 20%
- S: 15%
- MPR: 15%

Subsequently, calculating Syrian tomato CCI in the examined markets, the following results were drawn:

- Although Syrian fresh tomato enjoy high RCA; exports are poor. This can be attributed to the insufficient and inefficient marketing services offered to producer.
- Syrian tomato has higher RCA than the Turkish, which can be employed and utilized in enhancing exports. In addition, Syrian tomato enjoys higher PCI of Russian markets compared to Turkish tomato (Turkey is the largest tomato exporter to Russia), and it is quite reasonable to exploit this opportunity. Syrian tomato has also reasonable PCI in the

Iraqi markets, and it is advantaged compared to Jordanian tomato (Jordan is the first exporter of tomato to Iraq); thus, this opportunity should be exploited as well.

- Tomato production in Syria is somehow stable, even though less stable than other major exports; which is mainly due to the current crisis, which calls for more effort to tackle this problem.
- The penetration rate of Syrian tomato into Russian markets is less than 1 percent - (on average 0.19 percent), yet the high Syrian production allows for greater exports to Russia, as has been proved by the “Green Corridor” experience. Identically, MPR of Syrian tomato in Iraqi markets reached 19.3 percent in 2009- the highest rate before the crisis, which reflects the significant potentials of Syrian tomato production, as the penetration rate to Iraqi market can reach almost one fifth.
- Syrian tomato’s competitiveness in Iraqi markets is better than its competitiveness in Russian markets.
- On the long run, the RCA and PCI of Syrian tomato in the Russian and Iraqi markets are declining, with the latter in less degree. In fact, Syrian tomato PCI had been increasing on the long run in Iraqi markets before the crisis. Conversely, Syrian tomato MPR decreased in Russian markets before and after the crisis, while it has always increased in Iraqi markets. Lastly, the trend of Syrian tomato MS in Russian markets is descending notably, whereas it had been ascending in Iraqi market before the crisis and then it declined after it.
- The modest value of CCI of Syrian tomato compared to other countries is mainly due to impacts of the crisis; this was clear when some simple indicators contributing to the CCI were studied.
- Turkish and Moroccan exports to Russian market: The CCIs for Turkish and Moroccan tomato in this market are higher than the Syrian’ by 4.1 point and 3.6 points respectively. This is mainly due to the high Turkish MS, and to less degree to the high Turkish MPR, high RCA for Moroccan tomato, and the high Moroccan MS and MPR. However, Turkish tomato CCI in Russian markets is expected to fall in the near future, and Syrian tomato can take advantage of this opportunity. In addition, Moroccan tomato does not enjoy price competitiveness in Russian markets, thus Syrian producers can exploit this opportunity and increase their exports to the Russian markets, as PCI of Syrian tomato in

Russian markets reached 1.073 in 2012 in spite of the crises i.e. Syrian tomato is still enjoying its price competitive advantage even during the crisis.

- Jordanian exports to Iraqi market: Jordanian tomato CCI is significantly higher than the Syrian' by 12.7 point, which is caused by high RCA of Jordanian tomato and its high MS in Iraqi markets as well. Syrian tomato PCI and MPR, however, surpass the Jordanian', indicating that Syrian tomato can compete in price, and has relatively good presence in Iraqi markets. This, calls for enhancing its competitiveness and consequently maximize its CCI in Iraqi market.

# The theoretical part

## 1- Introduction

Agricultural competitiveness occupies a special importance in countries that depend on agricultural export as one of their national economies' pillars. "Measuring competitiveness" is considered as the proper tool to evaluate the competitiveness of commodities and thus identify the adequate plans to promote their competitiveness. In fact, simple competitiveness indicators cannot individually provide a comprehensive picture of the competitiveness of certain commodity, therefore, "Composite Competitiveness Indicator (CCI)" is used. The CCI is a set of simple indicators that should be chosen and weighted in accordance with the examined sector and commodity under study.

In 2008, the Organization for Economic Cooperation and Development (OECD) published a guidebook on modeling the composite indicators and how to use them as a tool for policy analysis, illustrating the way to develop the theoretical basis for the indicator and the useful tools to build it. Accordingly, Limón & Riesgo (2008) studied alternative approaches to build a composite indicator that can measure agricultural sustainability. In addition, Abdallah (2006) studied the possibility of promoting exports of some Syrian agricultural products depending on a proposed model of CCI; he found that Syrian exports of Cherries and anise enjoy higher CCIs than other commodities in international markets.

The current study sheds light on Syrian exports of tomato; the most exported vegetable during the crisis. Therefore, a special CCI has been developed in this paper to measure the competitiveness of exported tomato to the Iraqi and Russian markets. Iraq ranked the first Syrian tomato importer while Russia, a friend country, was the second. Furthermore, the Russian sanctions on Turkish agricultural exports imposed in 2015, particularly on tomato, opens the door for Syrian exports to replace at least a part of the Turkish exports to Russia.

Consequently, measuring Syrian tomato's competitiveness in Iraqi and Russian markets by using the CCI, as the study suggests, will determine the competitive position of Syrian tomato in these two markets and obstacles to be tackled as well as strengths that should be maximized.

The remainder of this study is a theoretical part that covers many points: the importance of tomato, its international production and trade, consumption, marketing, processing, and trade in Syria. In addition, it covers the trade balance and related policies; and an analytical part that includes the methodology and reviews the simple indicators comprising the CCI. It shows then how the CCI was built for each of the Iraqi and Russian markets, and accordingly provides conclusion and recommendations.

## **2- The importance of tomato**

Tomato is among the most important vegetable crops. It is a main ingredient in the diets of all nations with different cultures. This is due to its health and nutritional value, as it contains high level of Lycopene (an active antioxidant that protects from cancers). Tomato is also rich in vitamins A, B and C, and minerals such as potassium, iron and calcium. According to UNCTAD (2012), *“cultivated tomatoes vary in size, with the most widely grown commercial types producing red, globe-shaped fruit that tend to be in the 5–6 centimeters diameter range”* (UNCTAD, 2012).

Internationally, tomato ranks third in importance among vegetables preceded by potato and sweet potato. China, India, USA, Turkey, Egypt and Italy are the main producing countries. Tomato can be harvested at the green stage, semi-ripe or ripe stages, depending on the market requirements. Tomato is a perishable crop and is sensitive for internal and external factors; therefore, it requires consistent care especially during harvest activities and certain maturation stages. Tomato is boxed in the field in open wood or plastic boxes in two layers.

Tomato's international trade is constantly expanding, with major exporting countries try to export to neighboring markets aiming at saving freight costs and take advantage of customs facilitations. For example, Mexico exports more than 98 percent of its tomato exports to the USA markets according to bilateral agreement, namely the “Suspension Agreement on Fresh Tomatoes” of 2008, which binds Mexican exporters to sell their production in the American markets at or above the applicable reference price. Turkey, a major tomato exporter, ships most tomato exports to Russia and the EU states. Jordan which is the 6<sup>th</sup> international exporter of tomato, exports most its production to the Middle East, particularly Iraq. China exports tomato to Russia, Kazakhstan, Vietnam and Hong Kong.

The perishable nature of tomato, transportation costs and market preferences of fresh tomato, influence marketing arrangements entails that these arrangements are in line with cross-border trade. In this sense, the “food miles” is used to estimate the environmental impact of food, as this term indicates the transport distance of food item from producer to consumer.

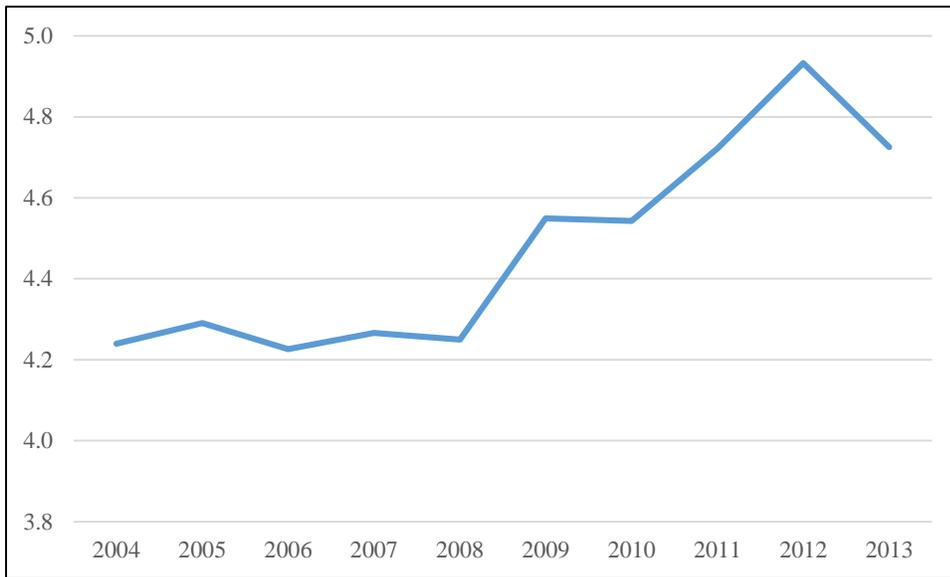
In Syria, tomato is planted in autumn, spring and summer, and it is mostly irrigated. It can be planted with protecting cover (greenhouses) or without. Uncovered tomato is planted from February until June, and harvested from mid-June to late October. Tomato varieties vary in their growing and maturity periods, processing ability, productivity, fruit characteristics, and pests’ resistance.

Most tomato grown in Syria are irrigated by grooves, while spray Irrigation is basically used for seed nursery, as high humidity increases the chances of certain diseases on mature plants such as early and late blight. It is worth mentioning that the government has been encouraging farmers to shift to drip irrigation by extending loans and providing networks and maintenance, which reflected in a remarkable increase in areas irrigated by drip irrigation.

### **3- International production of tomato**

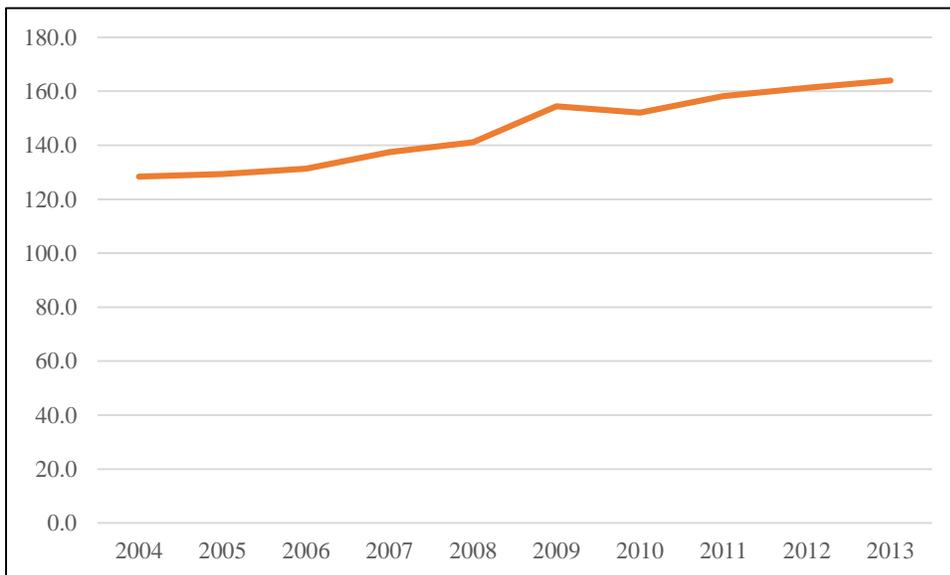
Worldwide tomato area increased moderately from 4.2 million hectares in 2004 to 4.7 million hectares in 2013, while for production between the two years increased substantially from 128 million tons to 164 million tons (Figure1).

**Figure 1** Global tomato areas , 2004-2013 (million hectares).



Source: FAOSTAT.

**Figure 2** International production of tomato, 2004-2013, (million ton).



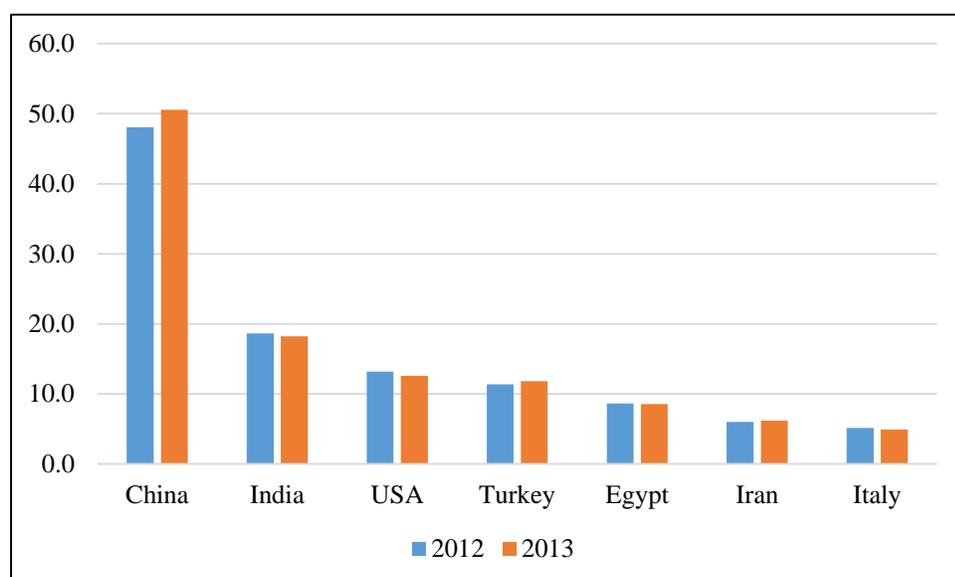
Source: FAOSTAT.

These figures show that global tomato areas for the period 2004-13 increased at a slow pace, conversely to the production which increased at a high rate. The average growth rate (AGR) for tomato areas during the examined decade was less than 1.6 percent, whereas the AGR of production during the same period was 3.6 percent, which can be obviously explained by the increased yields achieved by adopting modern techniques, integrated production management,

modern irrigation techniques, intensive farming and integrated pest management etc. These mentioned advances significantly raised worldwide tomato yield from 30.4 tons per hectare in 2004, to 34.7 tons per hectare in 2013.

**Main producers:** China ranked the first, with production that amounted 48.1 million tons in 2012, followed by India with a production of 18.7 million tons. However, in 2013, China's tomato production reached 50.6 million tons, while India's production fell to 18.2 million tons. Mexico; however, is a major greenhouse tomato producer. The following figure shows major producers of tomato in the world in 2012 and 2013.

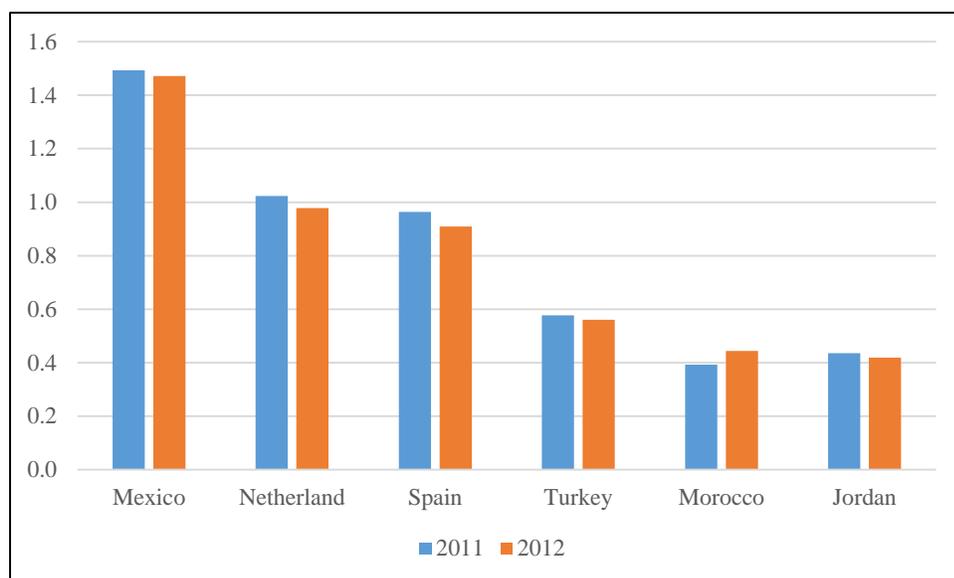
**Figure 3** Main producers of tomato in the world, 2012 and 2013 (million ton).



Source: FAOSTAT.

**Exporters:** Mexico ranked the first tomato international exporter, followed by Netherland and then Spain (Figure 3). Notably, Morocco ranked the fifth international tomato exporters in 2012, whereas Jordan was the 6<sup>th</sup>. Syria ranked eleventh in 2011, but fell to twelfth in 2012 due to the crisis.

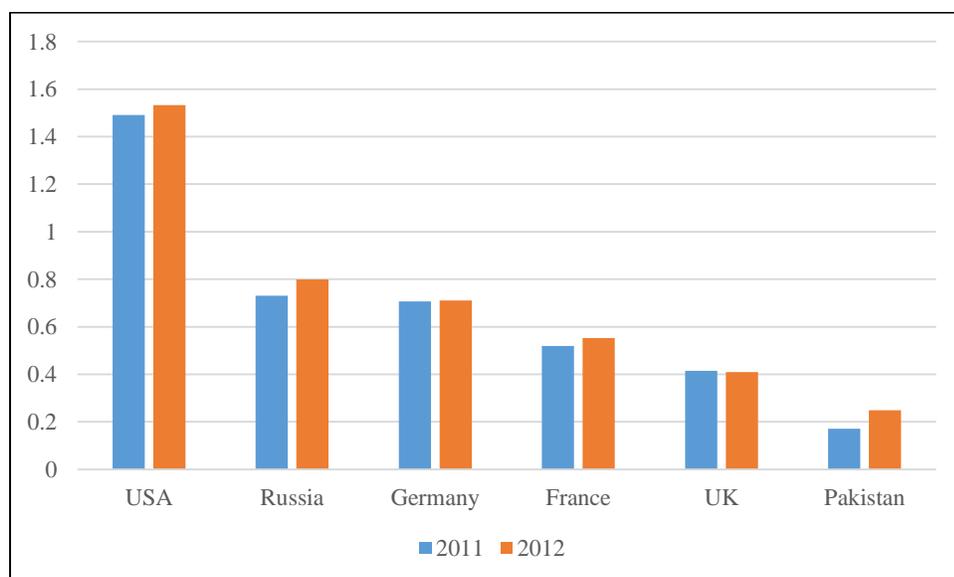
**Figure 4** Main global exporters of tomato, 2012 and 2013 (million ton).



Source: FAOSTAT.

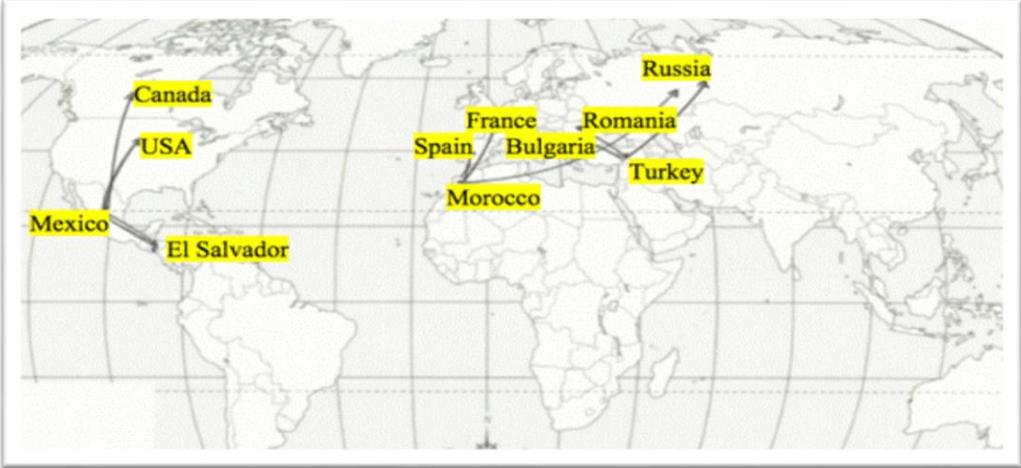
**Importers:** The USA is the largest importer in the world, followed by Russia (though with a big difference) and then the EU. Pakistan which ranked the ninth worldwide importer in 2011 jumped in 2012 to rank the sixth importer replacing Netherland which fell back to the seventh importer. The following figure demonstrates major international importers of tomato in 2011 and 2012.

**Figure 5** Main global importers of tomato, 2012 and 2013 (million ton).



Source: FAOSTAT.

The following picture shows world trade map of fresh tomato.



Source: UNCTAD, 2012.

#### **4- Tomato production in Syria**

Tomato is a vital export crop for the Syrian economy; however, it faces problems in production and marketing which negatively impacts exports, and need to be solved. Protected tomato seems to be the key for promoting the production of Syrian tomato.

FAO Statistics show that Syria ranked the nineteenth tomato producer in 2011, (the year the Syrian crisis erupted), with production that represented 0.73 percent of world production, and a value of US\$ 427 million, which formed an important returns for the country. In addition, it shows how important is this crop to the Syrian farmers and the comparative advantage it enjoys (due to its relatively low production cost and high yield). In fact, tomato farmer who suffer losses in one season continue on growing tomato the next seasons. The moderate temperature in Syria helps growing tomato in uncovered fields, and the moderate climate in the coastal area allows growing protected tomato with minimal heating and artificial ventilation in winter. Furthermore, the varieties planted in Syria are suitable for the exportation to foreign markets.

**Table 1 developments of domestic production of tomato, different farming (rainfed; irrigated; spring, summer and autumn seasons, protected).**

<b>Production (1000 tons)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>AGR%</b>
<b>Rainfed tomato</b>	13.2	11.0	14.4	10.8	12.0	6.8	7.8	8.8	-6%
<b>Autumn tomato</b>	103.4	110.5	89.4	81.8	59.8	77.2	67.7	21.1	-20%
<b>Spring tomato</b>	36.6	55.5	67.8	54.9	53.1	60.0	47.1	44.5	3%
<b>Summer tomato</b>	462.6	565.3	482.3	496.8	472.6	485.1	261.2	207.4	-11%
<b>Uncovered tomato</b>	602.6	731.3	639.5	633.5	585.5	622.3	376.0	273.0	-11%
<b>Protected tomato</b>	433.2	501.2	523.8	532.1	570.8	532.7	407.9	226.7	-9%
<b>Total production</b>	1035.8	1232.5	1163.3	1165.6	1156.3	1155.0	783.9	499.7	-10%

Source: NAPC database and bulletin of Central Bureau of Statistics (2013).

Table 1 shows that summer tomato has the highest productivity, followed by autumn then spring tomato. However, the share of autumn tomato in total production increased from 10 percent in 2010 to 18 percent in 2012, at the expense of summer tomato which fell from 81 percent in 2010 to 68 percent in 2012. In 2012; however, summer production suffered sharp fall when production fell to 261178 tons, down from 585549 tons in 2010, a fall of about 81 percent. In 2013, share of autumn tomato in total production shrank largely (by more than half) while summer tomato share increased again. These variations in production are attributed to climate conditions as well as the impacts of the war imposed on the country.

Generally speaking, the production of uncovered tomato was severely affected by the war, which also badly affected inputs provisions and crop marketing as well. Thus, production in 2012 of unprotected tomato declined sharply by 56 percent compared to 2010, while the production of protected tomato dramatically fell by 40 percent during the same period; these massive production cuts reflect the harsh impacts of crisis on this crop.

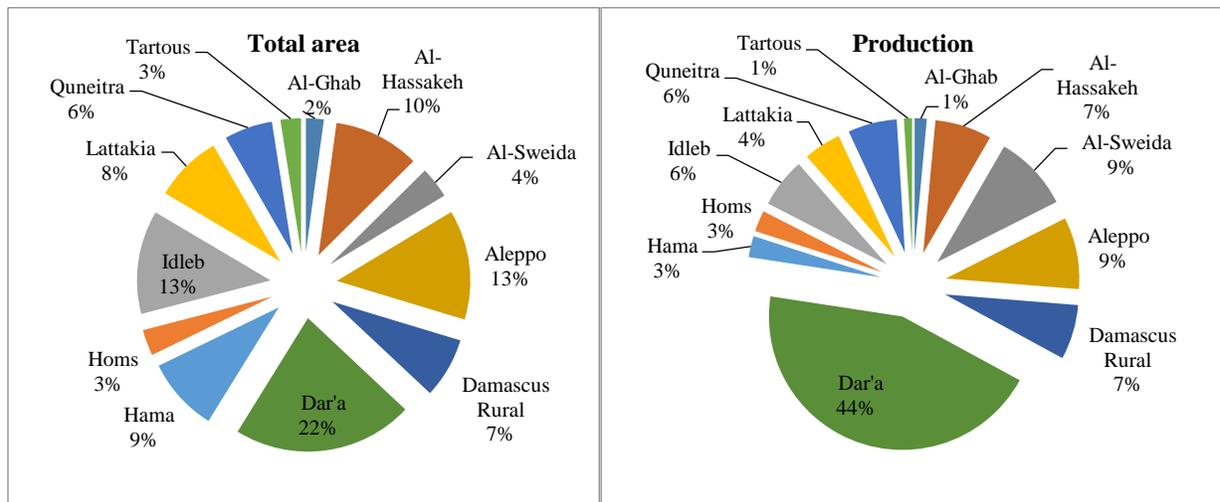
In 2010, uncovered tomato, and protected tomato comprised 51, 49 percent of total production, respectively. In 2011, the share of uncovered tomato increased to make up 54 of total production, and In 2012, however, uncovered tomato declined to make up 48 percent whereas the protected tomato contributed by 52 percent. Obviously, Rainfed tomato, is placed under field tomato, and its contribution in unprotected tomato production was about 2 percent in 2010-2012.

By all standards, 2013 was a very bad year for tomato farming. Compared to 2012, the overall tomato production declined sharply by 36 percent. The uncovered and protected tomato declined 44, 27 percent respectively. The fall of protected tomato farming is attributed to the decrease of the number of greenhouses in recent years. Total number of utilized greenhouses in 2010 was 95133 in a total area of 4281 ha; however, it shrank to 37789 in 2013, occupying an area of 1512 ha. These figures represent a fall of 60 percent in number of utilized greenhouses and 64 percent in the protected and cultivated area.

According to the CBS data, areas and production of protected tomato are distributed among four Governorates. Favorable climatic conditions in the coastal area made Tartous and Lattakia comprise 97 percent of the total tomato protected areas, with 68 percent in Tartous, and 29 percent in Lattakia. Homs and Hama made up a small fraction; only 2, 1 percent respectively of total protected tomato production and area.

Uncovered tomato was spread in all governorates, but concentrated in Dar'a, Aleppo, Al Hassakeh and Al Quneitra. Field tomato was cultivated in areas where water is available, and its distribution among governorates is shown in figure 5 (production and areas).

**Figure 6** uncovered tomato production and cultivated areas per governorate, 2013.

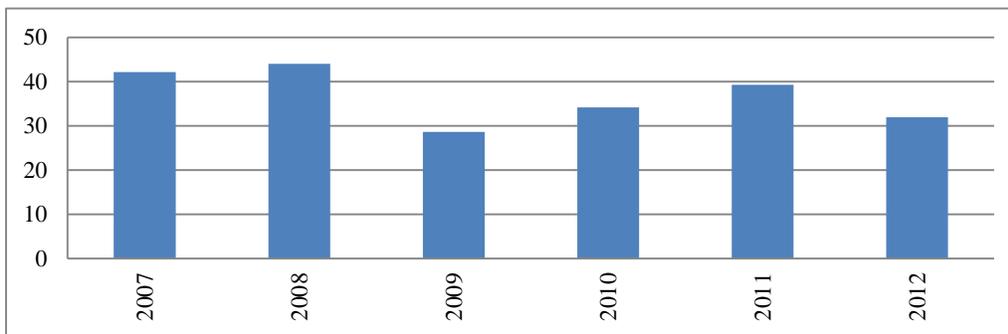


Source: bulletin of Central Bureau of Statistics (2013).

## 5- Tomato consumption in Syria

Tomato is an indispensable food stuff in Syria. It is one of the most consumed vegetables among Syrian people, due to its availability and reasonable prices mainly during its peak supply season. However, the crisis has badly affected tomato production and consumption, resulting in higher prices, which dramatically pushed down consumption from 42 kg per capita in 2007 to 32 kg per capita in 2012. Figure 2 shows tomato consumption per capita in 2007-12. The reason for the decrease in tomato domestic consumption in 2009 was the substantial increase in exports, which reduced the domestic supply, although imports to fulfill tomato local demand did not change. However, in 2011 and 2012 the fall in domestic per capita consumption was due to the decreased production and marketing difficulties.

**Figure 7** developments of tomato quantity per capita from 2007 to 2012, kg.



Source: NAPC database and bulletin of Central Bureau of Statistics (2013).

## 6- Tomato marketing in Syria

Tomato is marketed domestically by either the producers themselves or by small wholesalers who sell the produce to the local markets, Souk Al Hal, in each governorate. Uncovered tomato production is either consumed fresh locally or processed, canned and packaged in processing factories in the country. On the contrary, most protected tomato is exported to neighboring or friend countries, which have commercial relations or trade agreements with Syria. Prices (wholesales or retails) are mostly determined by demand and supply forces. Marketing difficulties due to current conditions negatively impact tomato causing higher prices for the final consumer. On the other hand, tomato's high perishability and difficulties encountered in storing

tomato (considering the unavailability of refrigerators or marketing facilitations) badly affects farmers who market tomato, incurring them huge losses in some seasons.

## **7- Tomato processing in Syria**

#Tomato processing factories are spread in main producing regions (mainly southern region), and they belong to public and private sectors. Processing is carried out only for uncovered tomato, and since Dar'a governorate is the first uncovered tomato producer, most processing factories are located in this governorate. According to Badro (2015), there are 40 tomato processing factories in Dar'a, spread in major producing sub-regions, with a total value of SP 960 million. The remaining factories are located in Rural Damascus, Al Hassake and Jableh. (Badro, 2015, P.6). The inputs (tomato) for these factories are obtained through direct contracts with farmers or wholesalers, whereas some factories have their own farms.

In fact, the capacity of tomato processing factories doesn't meet the quantity and quality of tomato produced in Syria. In addition, the current crisis increased the gap, as many public and private processing factories in Dar'a and Rural Damascus became idle due to the damage occurred to these firms.

Consequently, it is essential to arrange for a study (with participation of Chambers of Industry and Trade, as well as Ministries of Industry and Economy). The purpose of the proposed study is to examine international markets of tomato fresh or processed, and to define strengths and weaknesses of the Syrian tomato sector, then accordingly develop programs that boost tomato sector quantitatively and qualitatively on one hand, and induces exports of tomato mainly processed, on the other hand.

## **8- Tomato trade in Syria**

### **8-1 Tomato imports to Syria**

The laws governing tomato importation have been subject to a series of alterations in recent years. Firstly, tomato importation was banned then permitted though with high tariff to protect local production, but lastly imports have been permitted by eliminating all barriers. The reason behind this new import policy was to meet the growing demand resulted from increasing

populations, and to fill the supply gap resulted from the drastic fall in domestic tomato production and supply.

Syrian tomato imports have been fluctuating during the last decade. Imports increased sharply by 190 percent in 2006-08 compared to 2003-05, due to a new policy that facilitated tomato importation as well as the full implementation of GAFTA in 2006 which facilitated imports from neighboring Arab countries. However, if imports in 2012 were compared with 2009-2011, we see that the increase was 17 percent, with value of tomato imports in 2012 that amounted SP2 billion.

According to FAO statistics, Syria ranked 11<sup>th</sup> among tomato importers in the world, and it mostly imports fresh or chilled tomato from Jordan and Egypt, and processed tomato from Italy. FAO statistics indicate also that tomato is Syria's 8<sup>th</sup> imported agricultural commodity, preceded by maize, soybean, wheat, sugar (raw and refined), soybean oil and barley. Its import value was US\$ 70 million (FAO, 2016).

### **8-2 Tomato exports from Syria**

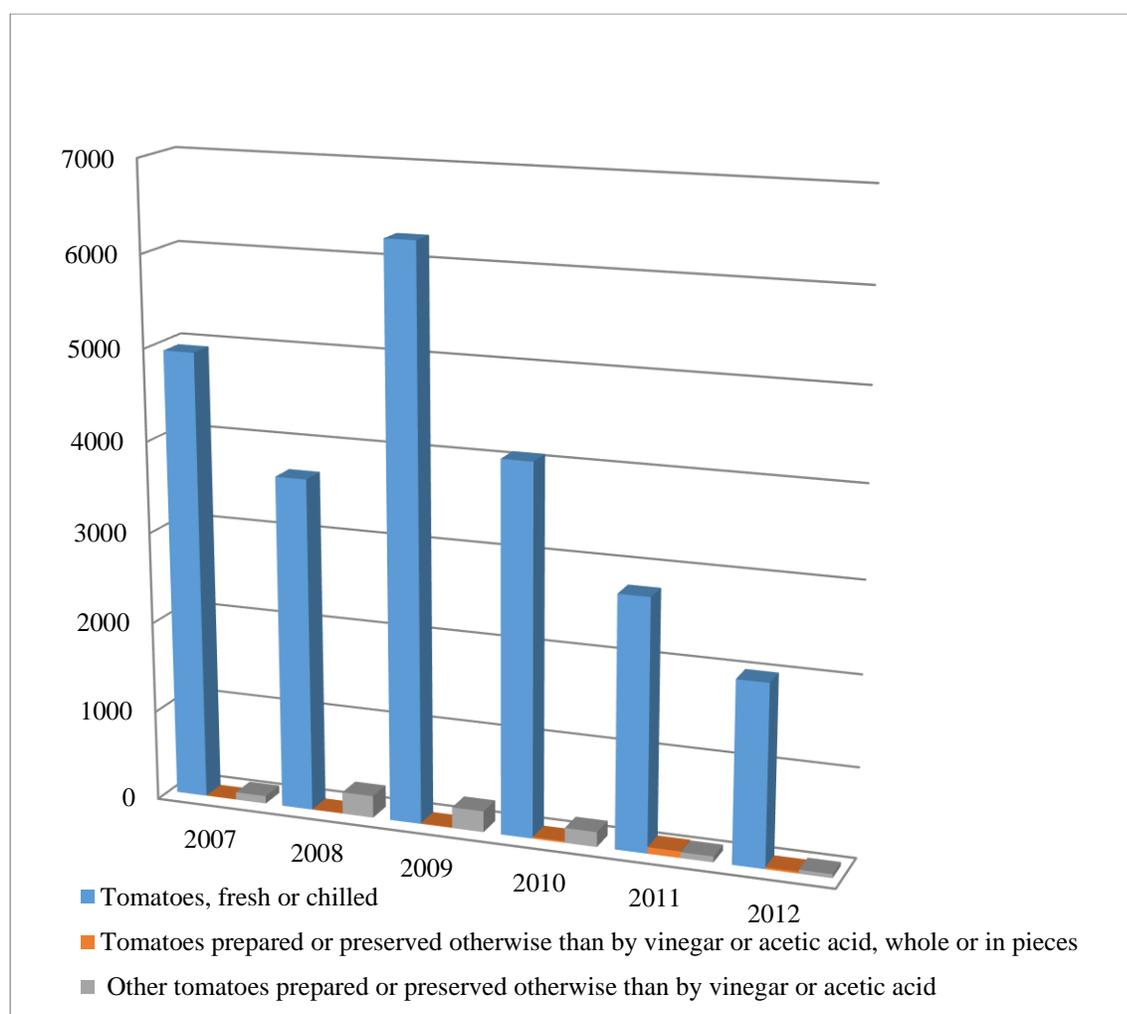
In recent years, Syria has been exporting three tariff lines of tomato, namely:

- I- Tomato, fresh or chilled
- II- tomatoes prepared or preserved in other than vinegar or acetic acid
- III- Tomatoes prepared or preserved in other than by vinegar or acetic acid, whole or in pieces

Main destination countries have been neighboring Arab countries (Iraq, Lebanon and Jordan) as well as Gulf States (Emirates, Bahrain, Kuwait and Saudi Arabia) and Yemen. On the global level, Eastern Europe countries (Moldavia, Serbia, Armenia, Albania and Ukraine) and Azerbaijan were regular buyers of Syrian tomato, while Germany and Italy imported Syrian processed tomato.

Figure 3 shows that most Syria's exports of tomato during the examined period were fresh tomato. Exports reached a peak in 2009, while 2011 and 2012 exports fall due to deterioration in production and difficulties in external marketing because of the unfair sanctions on Syria.

**Figure 3** Tomato exports (the three tariff lines) from Syria, 2006-2012, (tons).



Source: NAPC database

According to FAO statistics, in 2011, Syria ranked 11<sup>th</sup> among tomato global exporters, with export valued US\$ 58 million. Furthermore, tomato was the first Syrian exported vegetable in terms of quantity and the third in terms of value (FAO, 2016).

### **8-3 Tomato balance in Syria**

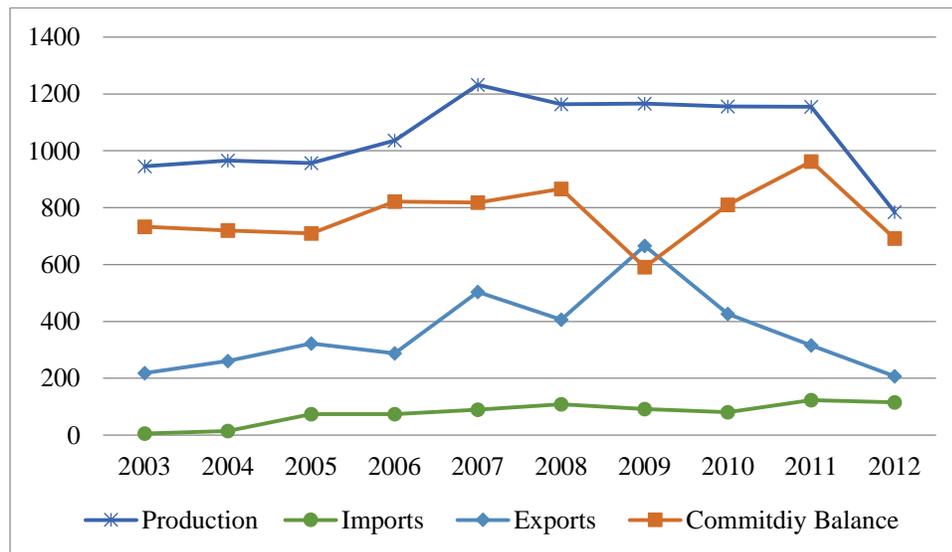
Tomato balance sheet in 2003- 12 shows us that there was constant surplus in tomato which allowed for exporting tomato, particularly protected tomato. Simultaneously, there has been a need for tomato imports (particularly field tomato) to meet the increasing domestic demand. Consequently, the last ten years witnessed a substantial expansion in tomato cultivation and production, which has been achieved through the integrated pests-management (IPM), in

addition to using high yielding varieties and applying modern irrigation networks and suitable fertilizers. Hence, tomato cultivation expanded, due to the increased number of processing factories that were capable of processing the surplus of exported and imported tomato.

Trend of tomato production shows that the production peaked in 2007, reaching about 1233 thousand tons. However, it decreased gradually during the period 2008-2011, and then fell during the crisis, when in 2012 it registered the lowest level during last decade, 783.9 thousand tons. The production continued to decline after 2012 due to the increasing cost of inputs; seeds, fertilizers, fuel and pesticides, in addition to the increase in labor wages, transport costs and speculations. Mediators also played negative role; they would bought the produce for a very low prices from farmers, exploiting the difficulties they encounter in marketing and selling the produce, taking into consideration tomato high perishability, and that farmers do not afford high costs of storage.

Concerning export, the trend graph demonstrates that its peak was in 2009, where it reached 665.7 thousand tons, and the lowest point was in 2012 (207.5 thousand tons). Imports, however, increased, starting in 2003 with small quantity, and then increased along with trade agreements and mutual markets with neighbor countries. Correspondingly, imported quantities of tomato reached 122.8 thousand tons in 2011, and 115.3 thousand tons in 2012 to fulfill the gap resulted from decreased production and increased demand.

**Figure 4** Tomato trade balance, 2006-2012, thousand tons.



Source: NAPC database.

## **9- Syrian policies regarding tomato**

Currently, there is no particular policy that regulate tomato marketing (either field or protected). The planning for tomato is indicative and not obligatory; however, some decisions could be taken exceptionally, such as in 2006 when tomato exports and imports were banned.

Identically, a policy for tomato cash support was established, based on the economic committee's recommendation; the cabinet established the Agricultural Production Support Fund in 2008, and tomato support was launched in 2009. According to Badro (2015), the support has been provided as follows:

- Field tomato is supported by an amount of SP 5000 for each hectare.
- Greenhouse (protected tomato) is supported by SP 1000 for each greenhouse

The total amount of cash support was determined according to field surveys of tomato areas. The total cash support value was SP 3.6 million in 2009, SP 9 million in 2010, 58.5 million S.P. in 2011 and SP 67.5 million in 2012.

Cash support was not provided in 2013 due to war circumstances and the adverse conditions that did not help conducting field surveys (Badro, 2015, P. 11).

Production, marketing, pricing, exporting and importing of Tomato are all determined by supply and demand forces; therefore, clear and strict rules must be enforced in order to prevent monopolizing tomato marketing and protect farmers from incurring losses, considering that tomato has a high competitive advantage should all production and marketing conditions were met adequately. Subsequently, suggestions and recommendations will be drawn later in this study.

# Analytical part

## 10- Methodology

This paper aims at defining the level of competitiveness of Syrian tomato in foreign markets, utilizing the CCI. The CCI consists of several secondary indicators, namely: RCA, PCI, MS, S and MPR. These indicators have been weighted separately and then added together in order to obtain the CCI. The later can be compared with other CCIs, either CCIs of other commodities or CCIs of the same commodity but from different origins. The indicators have been weighted in this study in accordance with their impact on tomato competitive capacity, as follows:

- RCA: 30%
- PCI: 20%
- MS: 20%
- S: 15%
- MPR: 15%

Here is a brief about each of them:

### - RCA

This indicator compares the share of exports of a given product to total exports in a given country, with the share of the world exports of the same product to the world total exports. The indicator takes positive values (more than zero), and the meant country is deemed to have revealed comparative advantage for the given product if the RCA value for this product is greater than 1. RCA formula is as follows:

$$RCA_{ik} = \frac{X_{ik}/X_{it}}{X_{wk}/X_{wt}}$$

Where:

X is export value, i denotes for the meant country, k denotes for the product, t denotes for total value, and w denotes for world.

This indicator is one of the most important indicators used to discover potential opportunities of trade; therefore, it has been weighted by 30 percent in the model developed in this study.

### **PCI**

This indicator measures the price advantage for a given commodity originated from a certain country in a certain destination country, and thus the existence of a higher competitive advantage. The index value revolves around 1, so if its value is greater than 1, then the commodity meant to be exported has a price advantage in the destination market, and vice versa. The index can be calculated as follows:

$$PCI = \frac{P_c}{P_i} = \frac{\text{Average prices of third countries in the destination market}}{\text{Average prices of exporting countries in the destination market}}$$

PCI is considered important indicator because it gives an idea about the competitive capacity of origin country's prices in targeted market. However, its importance is less than the RCA's; therefore, it has been weighted by 20 percent.

### **- MS**

This indicator gives a clear idea about the strength of competitiveness of a given commodity by measuring the level of its existence in the targeted market. The MS is calculated as follows:

$$MS_{ij} = X_{ij} / \sum_j M_{ij}^k$$

Where:

$X_{ij}$  is exports of commodity i from country j into the market k

$M_{ij}^k$  is imports of commodity i into market k from country j

$\sum_j M_{ij}^k$  is total imports of commodity i into market k

MS is perceived as important indicator, because it reflects the commodity's competitive capacity; nevertheless, it doesn't necessarily reflect the self-characteristics of the commodity, such as the quality, as it does in terms of other factors that have no direct relation with the commodity. Subsequently, it has been weighted by 20 percent.

## S

There are two versions of this indicator, the Exports Stability and the Production Stability which has been used in this study and weighted by 15 percent. The production instability reflects different natural, production and economic conditions that ultimately influence the competitive capacity of the commodity, whereas export instability reflects logistic, financial and political conditions, besides production instability. S values can be calculated as follows:

$$S_{xi} = (1 - \sum_y^i \frac{abs(X_{y+1} - X_y)}{X_y}) / n * 100$$

Where:

$S_{xi}$  is the index of commodity x stability in country i

$X_y$  is production of commodity x in year y

$X_{y+1}$  is production of commodity x in next year

$n$  is number of examined years

When the index value is 1, it means that the production is stable 100 percent, and when it is 0 it means that there is no production, while when it fluctuates around 1 it indicates a fluctuation in production. Yet, one of this indicator's shortcomings is that it considers the increase of production negative for stability, despite that it actually could increase competitive capacity of the commodity. Consequently, this indicator has been weighted less than other indicators.

### - MPR

This indicator is among common competitiveness indicators, and it can be defined as the import value of a given commodity from the country that its penetration rate value needs to be estimated, divided on the revealed consumption of the importing market of that commodity, as the following formula shows:

$$MPR_{ij} = \frac{E_{xij}}{Q_{ij} + M_{ij} + X_{ij}}$$

Where:

$MPR_{ij}$  is market penetration rate of commodity j in market i

$E_{xij}$  is the exporting country's export of commodity j to market i

$Q_{ij}$  is country i production of commodity j

$M_{ij}$  is country i imports of commodity j

$X_{ij}$  is country I exports of commodity j

If the index value is 1, this means that the importing country imports all its needs of the commodity from one origin country; i.e. it is a net importer of the commodity, and it doesn't produce or export any quantity of it. In this case, the exporting country completely dominates the commodity market in the destination country. MPR has been weighted by 15 percent in this study, considering that it is less important than the first two indicators, while it has the same importance of S indicator.

These above mentioned indicators (except the 1st and the 4<sup>th</sup>) will be examined on Syrian tomato exports to the Iraqi and Russian markets, taking into consideration that currently these two markets are the most important and promising markets for Syrian agricultural exports. Iraqi market has become the main market for Syrian exports after the Syrian crisis started, and Russian market is a prospective market for the Syrian agricultural exporters, in the context of the formal governmental policy called "heading easterly".

### **10-1 RCA**

As mentioned previously, the formula that calculates RCA value is as follows:

$$RCA_{ik} = \frac{X_{ik}/X_{it}}{X_{wk}/X_{wt}}$$

Here is a table that shows RCA calculations in recent years in which data is available.

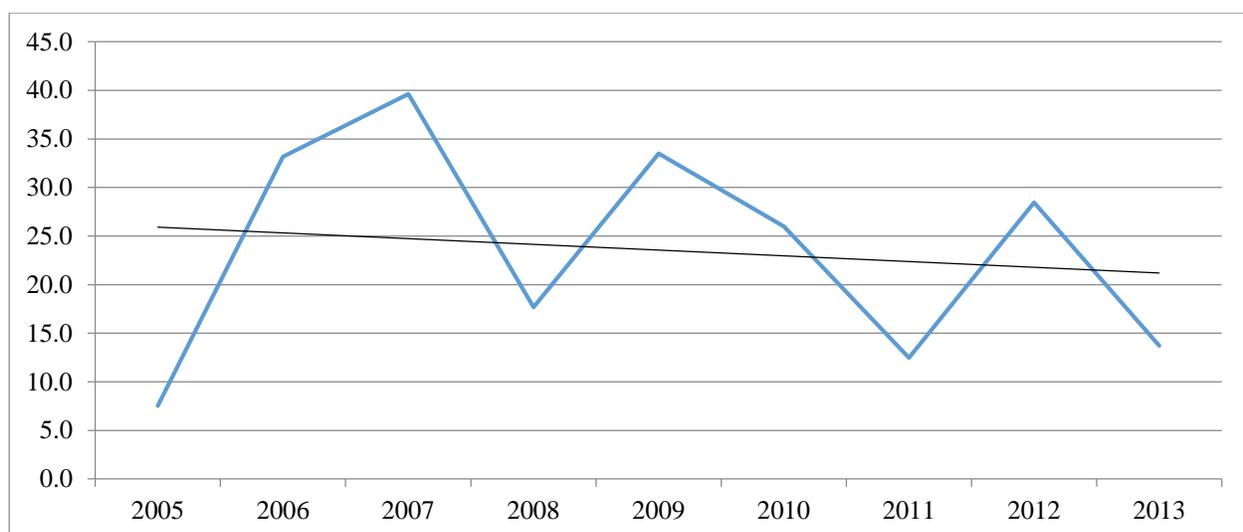
**Table 2 tomato RCA calculations during 2005-2013.**

<b>Years</b>	<b>Syrian exports of tomato/Syrian total exports</b>	<b>World exports of tomato/world total exports</b>	<b>RCA</b>
<b>2005</b>	0.00370	0.00049	7.5
<b>2006</b>	0.01510	0.00046	33.2
<b>2007</b>	0.01948	0.00049	39.6
<b>2008</b>	0.00808	0.00046	17.7
<b>2009</b>	0.01874	0.00056	33.5
<b>2010</b>	0.01404	0.00054	26.0
<b>2011</b>	0.00580	0.00046	12.5
<b>2012</b>	0.01265	0.00044	28.5
<b>2013</b>	0.00642	0.00047	13.7

Source: author calculations, based on FAOSTAT data.

The above table reveals that Syrian tomato has a high value of RCA, 23.6 on average during last nine years, which highlight an important primary opportunity for Syrian tomato exportation into international markets. The results mean that world produces tomato but exports it with lower percentage (comparing with its total exports), whereas Syria produces tomato and exports it with higher percentage (comparing with its total exports). Notably, this advantage was not clearly eroded during years of crisis; nevertheless, its trend has been continuously declining, as shown in next figure.

**Figure 7** trend of Syrian tomato's RCA, 2007-2012.



Source: author calculations, based on FAOSTAT data.

The fall of RCA trend is attributed to the descending tomato exports, compared with total Syrian exports. This, in turn, was due to the fall of Syrian tomato exports as mentioned previously, which represented a hindering factor that weakened tomato competitiveness, particularly its revealed comparative advantage. In fact, the declining tomato exports can be partially attributed to the poor marketing services offered to tomato exports, which puts other countries' exports in an advanced position compared with Syrian exports.

**Jordanian, Turkish and Moroccan tomatoes:** Considering that these countries are main exporters of tomato, their tomato RCAs can be described as follows: Jordanian tomato's RCA value was 59.5 on average during the examined period, while Moroccan tomato's RCA value was 32.1 on average during the same period — this makes them in a better position compared with Syrian ones; Identically, Turkish tomato's RCA value (Turkey is major exporter of tomato internationally and represents important competitor for Syrian tomato) was about 5.7, which gives Syria an advantage that needs to be utilized and exploited. The following table shows Jordanian, Moroccan and Turkish tomatoes' RCAs in recent years.

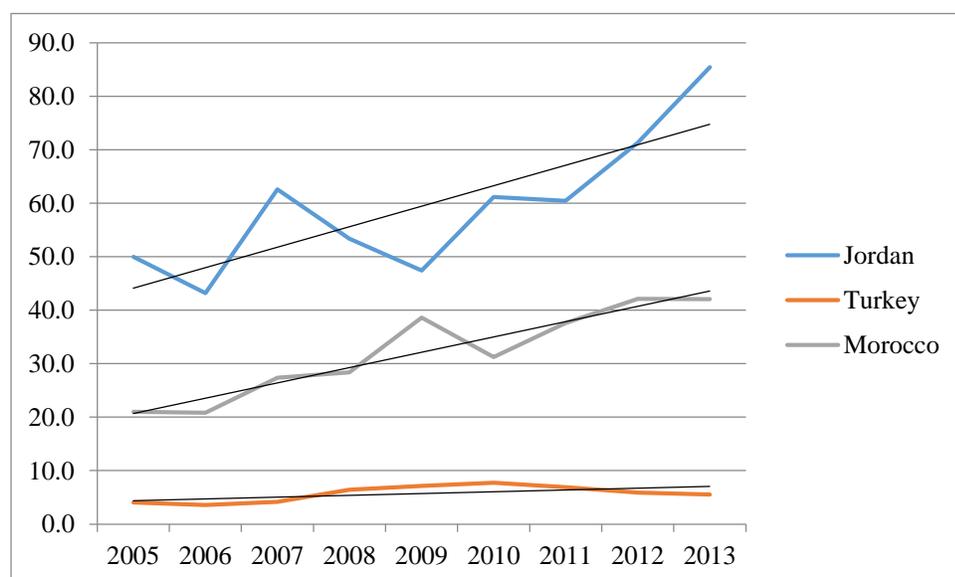
**Table 3 Jordanian, Moroccan and Turkish tomato's RCAs, 2005-2013.**

Year	Jordanian tomato's RCA	Turkish tomato's RCA	Moroccan tomato's RCA
2005	50.0	4.0	21.0
2006	43.2	3.6	20.8
2007	62.6	4.2	27.4
2008	53.4	6.4	28.4
2009	47.4	7.1	38.6
2010	61.2	7.7	31.3
2011	60.4	6.9	37.6
2012	71.4	5.9	42.1
2013	85.5	5.5	42.1

Source: author calculations, based on FAOSTAT data.

While Jordanian and Moroccan tomatoes' RCAs constantly increases, the Turkish one seems almost stable, with a slight increase in its trend (figure 7). This entails more efforts need to be made to promote Syrian tomato's RCA and its ability to compete.

**Figure 7** trends of Jordanian, Moroccan and Turkish tomato's RCAs, 2007-2013.



Source: author calculations, based on FAOSTAT data.

## 10-2 PCI

As mentioned earlier, this indicator measures the price advantage of a given commodity from a certain origin country in a certain destination country, and thus it measures whether a higher competitive advantage is existed. Its formula, as shown earlier, is as follows:

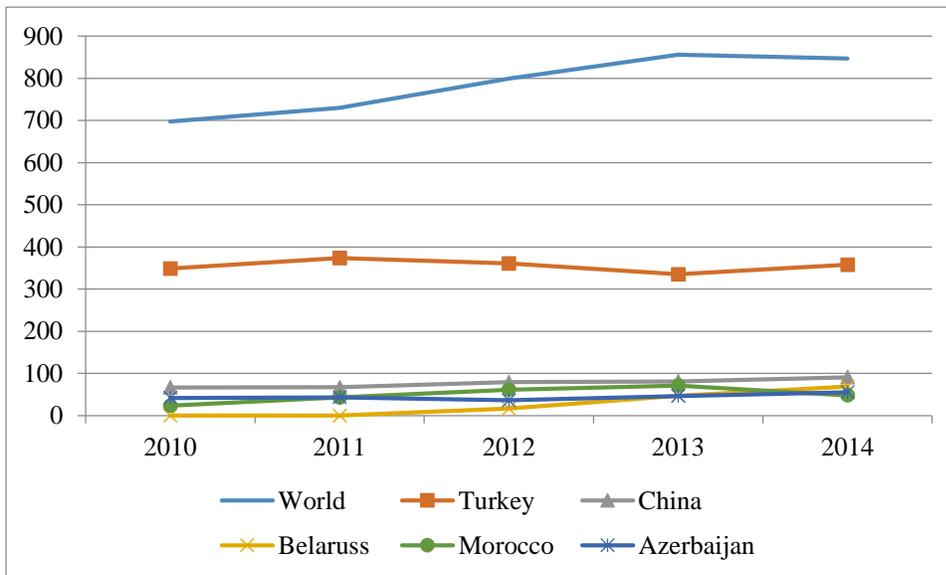
$$PCI = \frac{P_c}{P_i} = \frac{\text{Average prices of third countries in the destination market}}{\text{Average prices of exporting countries in the destination market}}$$

The indicator will be applied on Iraqi and Russian markets, as they are currently the main markets for Syrian agricultural exports (particularly tomato).

### 10-2-1 Russian market

Russia imports fresh tomato from a number of countries, mainly Turkey, China, Belaruss, Azerbaijan and Morocco. Figure 8 shows the countries that Russia import tomato from and the imported quantities during recent years.

**Figure 8** Tomato Russian imports and main countries of origin , 2010-14, 1000 tons.



Source: author calculations, based on ITC data.

The above figure demonstrates that Turkey largely dominates tomato exports in Russian market. The question arises here- is this because Turkish tomato has price advantage? And does Syrian tomato have stronger or weaker price advantage? The following table shows a comparison

among PCI values for Syrian, Turkish (first exporter) and Moroccan (Mediterranean country) tomato in Russian markets.

**Table 4 PCIs of Syrian, Turkish and Moroccan tomato in Russian markets, 2005-2014.**

<b>Year</b>	<b>Syrian tomato PCI</b>	<b>Turkish tomato PCI</b>	<b>Moroccan tomato PCI</b>
<b>2005</b>	1.154	1.154	1.147
<b>2006</b>	1.356	1.158	0.978
<b>2007</b>	0.978	1.039	0.944
<b>2008</b>	1.161	0.974	0.902
<b>2009</b>	0.857	0.952	0.827
<b>2010</b>	0.940	0.989	0.820
<b>2011</b>	0.900	1.013	0.785
<b>2012</b>	1.073	1.116	0.770
<b>2013</b>	0.938	0.959	0.905
<b>2014</b>	-	1.027	0.874
<b>Average</b>	1.040	1.038	0.895

Source: author calculations, based on ITC data.

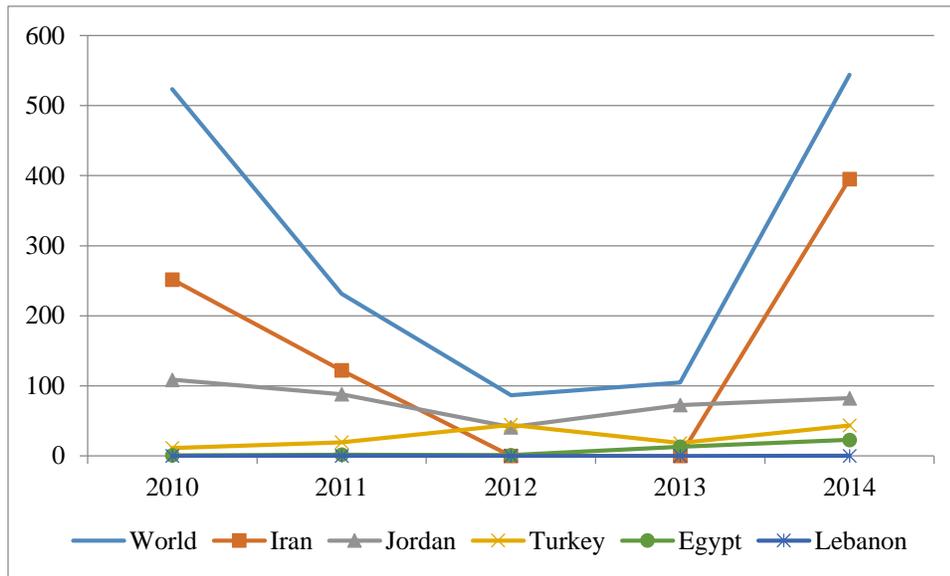
Table 4 shows that Turkish tomato has a price advantage in Russian markets, yet Syrian tomato has a slightly higher one; i.e. Syria has the higher PCA. Identically, Moroccan tomato doesn't have any price advantage in Russian markets (this is likely due to transportation costs, considering the long distance between the two countries). Nevertheless, Morocco is still a main tomato supplier country for Russia.

Consequently, it is clear that Syrian producers must take advantage of this opportunity and extend their tomato exports to Russian markets. It is also notable that despite the crisis, PCI value of Syrian tomato reached 1.073 in 2012, which means that Syrian tomato maintained its price advantage even during the crisis (no data available on Syria's exported tomato to Russia in 2014). On contrary, Moroccan tomato PCI was 0.77 in the same year.

### 10-2-2 Iraqi market

Concerning Iraq, it imports fresh tomato mainly from Iran, then Jordan followed by Egypt, as illustrated in the following figure.

**Figure 9** Tomato Iraqi imports and main countries of origin, 2010-2014, 1000 tons.



Source: author calculations, based on ITC data.

PCIs for Syrian tomato in Iraqi markets are calculated to reveal whether it has a price advantage. Also, Iranian and Jordanian tomatoes' PCIs are calculated for the purpose of comparison.

**Table 5 PCIs of Syrian, Iranian and Jordanian tomato in Iraqi markets, 2005-2014.**

<b>Year</b>	<b>Syrian tomato's PCI</b>	<b>Iranian tomato's PCI</b>	<b>Jordanian tomato's PCI</b>
<b>2005</b>	1.749	1.061	0.700
<b>2006</b>	1.320	0.910	0.725
<b>2007</b>	0.609	-	1.727
<b>2008</b>	1.450	-	0.822
<b>2009</b>	1.289	-	0.414
<b>2010</b>	1.083	0.932	1.021
<b>2011</b>	-	0.902	1.143
<b>2012</b>	-	-	0.768
<b>2013</b>	-	-	1.044
<b>2014</b>	-	1.250	0.620
<b>المتوسط</b>	501.2	1.011	0.898

Source: author calculations, based on ITC data.

The table shows that Jordanian tomato has no price advantage in Iraqi market, while the Iranian one has a small price advantage. Identically, Syrian tomato has a large price advantage - its index value reached 1.25 (though the value of this index beyond 2010 is unavailable), which again calls for taking advantage of this superiority and extend Syrian exports of tomato in Iraqi market.

### **10-3 MS**

As it has been clarified, MS value can be calculated as follows:

$$MS_{ij} = X_{ij} / \sum_j M_{ij}^k$$

Where:

$X_{ij}$  is country j exports of commodity i into market k

$\sum_j M_{ij}^k$  is total imports of commodity i into market k

Subsequently, Russian market will be studied firstly.

### 10-3-1 Russian market

As mentioned, Russia imports fresh tomato from a number of countries, mainly Turkey, China, Belarus, Azerbaijan and Morocco. It shows also that Turkey largely dominates tomato exports in Russian market. Syrian tomato MS in Russian market will be calculated here and then compared with Moroccan and Turkish MSs.

**Table 6 values of Syrian, Turkish and Moroccan tomato's MSs in Russian markets, 2005-2014.**

<b>Years</b>	<b>Syrian tomato's MSs</b>	<b>Turkish tomato's MSs</b>	<b>Moroccan tomato's MSs</b>
<b>2005</b>	2.9	29.3	5.2
<b>2006</b>	2.4	30.0	5.0
<b>2007</b>	1.9	41.9	5.9
<b>2008</b>	0.6	40.8	6.7
<b>2009</b>	0.6	46.8	4.5
<b>2010</b>	0.6	50.0	3.3
<b>2011</b>	0.3	51.1	5.9
<b>2012</b>	0.02	45.1	7.7
<b>2013</b>	0.001	39.1	8.3
<b>2014</b>	0.000	42.2	5.6

Source: author calculations, based on ITC data.

Table 6 demonstrates that Syrian tomato has small share in Russian markets - less than 1.5 percent before the Syrian crisis. Efforts must be made to boost this share, despite the destructive impact of the crisis which reduced this share to 0.3, 0 percent in 2011, 2014 respectively. Now, however, there is a new hope to increase tomato export share with the launched "Green Corridor", which links Lattakia and Novorossiysk ports. Identically, Turkish MS value was 41.6 on average during the same period, which - as mentioned - confirms the dominance of Turkish tomato in the Russian market. However, this trend has declined after Syrian crisis, and more fall of Turkish export is expected following the recent political tension<sup>1</sup> between Russia and Turkey. This can represent an opportunity for Syria to take the place of the tomato Turkish exports to Russia. Morocco had a market share of 5.8 percent during the examined period, and it has been increasing slightly, yet it couldn't meet the Russian demand after the Turkish-Russian crises, while Russia's still looking for alternative suppliers of tomato. This would pave the way for

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<sup>1</sup> The Russian aircraft which Turkey bombed it in late 2015 and the sequences of the Turkish action, particularly limiting Turkish agricultural exports to Russia, mainly tomato.

Syrian tomato to access the Russian market providing that reasonable quantities of tomato is secured, as well as facilities and support services is provided to ease export process.

### *10-3-2 Iraqi market*

As mentioned, Iraq imports fresh tomato from a number of countries, mainly Iran followed by Jordan. Unlike the Russian market, the shares of exporters here are more balanced. The market share of Syria, Iran and Jordan will be reviewed and compared.

**Table 7 Syrian, Iranian and Jordanian tomato MSs in Iraqi markets, 2005-2014.**

<b>Years</b>	<b>Syrian tomato MSs</b>	<b>Iranian tomato MSs</b>	<b>Jordanian tomato MSs</b>
<b>2005</b>	32.1	27.7	37.0
<b>2006</b>	39.2	48.7	11.7
<b>2007</b>	39.7	0.0	59.3
<b>2008</b>	37.2	0.0	57.4
<b>2009</b>	80.1	0.0	14.3
<b>2010</b>	28.9	48.1	20.8
<b>2011</b>	25.1	52.8	38.1
<b>2012</b>	24.1	0.0	47.4
<b>2013</b>	0.0	0.0	69.4
<b>2014</b>	0.0	72.7	15.1

Source: author calculations, based on ITC data<sup>2</sup>.

Apparently, Syrian tomato had the largest MS in Iraq, 42.9 percent on average, and it reached 80 percent in 2009. Identically, Iran's share was 25 percent of Iraqi tomato market on average (it was 20.7 percent before the Syrian crisis) and Jordan's share was 37 percent of this market on average (33.4 percent before the crisis starts). The average of Jordanian share is larger than the Iranian one as in some years no imports from Iran was recorded. Furthermore, it is reasonable

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<sup>2</sup> Concerning Syrian tomato MSs in 2001 and 2012, they were calculated based on NAPC database.

that Iran and Jordan have benefited from the absence of Syrian exports after the crisis and filled the gap resulted from such absence. On the other hand, the ITC database had no data on exportation of Syrian tomato to Iraqi market after the crisis; nevertheless, NAPC database indicates exporting quantities of tomato in 2011 and 2012. In general, Syrian tomato MS in Iraqi market would have been the largest without the impacts of the crisis. Until 2012, the Syrian MS was more than 38.3 percent on average, while the Iranian MS was 22.2 and the Jordanian was 35.7 percent; which means that Syria has had the largest MS until 2012.

#### 10-4 S

As clarified in a previous section, there are two versions of S index, namely S of production and S of exports. The index of production stability is the one which was used here, bearing in mind that instability reflects different natural, production and economic circumstances that ultimately influence competitive capacity of the commodity. The formula is as follows:

$$S_{xi} = (1 - \sum_y \frac{abs(X_{y+1} - X_y)}{X_y} / n) * 100$$

Where:  $X_y$  is production of commodity x in year y and  $X_{y+1}$  is production of commodity x in next year, and n is number of examined years.

S value has been calculated (utilizing NAPC database) and the results reveal that S value was 0.863 during 2005-2014; this reflects high level of stability in terms of tomato production, even during the crisis. Identically, the same value was 0.894 if the calculation was based on FAO database. This variance is due to some differences in data on the one hand, and the exemption of 2014 figures on the other hand, where FAO has no statistics for it. Equally important, Jordanian tomato's S value for the same period was 0.915 relying on FAO statistics, whereas it was 0.955 for Turkey and 0.945 for Morocco.

Based on the above, it is clear that Syrian tomato production is largely stable, yet it is less stability than other main exporting countries. This is mainly due to the current crisis, where S value for the period 2005-2011 (based on FAO statistics) equaled 0.971, i.e. it is higher than any other S value for other countries. Consequently, efforts should be made in various ways to mitigate the negative impacts of the crisis on the agricultural sector in general and tomato in particular; dedicated recommendations will be listed at the end of the study for this purpose.

### 10-5 MPR

As shown previously, MPR formula is as follows:

$$\text{MPR}_{ij} = \frac{E_{xij}}{Q_{ij} + M_{ij} + X_{ij}}$$

Where:

$E_{xij}$  is what exporter country exports of commodity j to market i

$Q_{ij}$  is country i production of commodity j

$M_{ij}$  is what country i imports of commodity j

$X_{ij}$  is what country i exports of commodity j

If the index value is 1, then the importing country imports all it needs of the meant commodity from a single country, and it doesn't produce or export any quantity of it. Here is a table that shows Syrian tomato's MPRs in Russian market.

**Table 8 Syrian tomato's MPRs in Russian market, 2005-2013.**

<b>Years</b>	<b>Syria's exports to Russia (tons)</b>	<b>Russia's imports (tons)</b>	<b>Russia's exports (tons)</b>	<b>Russia's production</b>	<b>MPR</b>
<b>2005</b>	10259	351832	5	2295900	0.39
<b>2006</b>	9987	413594	18	2414860	0.35
<b>2007</b>	10676	550528	49	1791007	0.46
<b>2008</b>	3725	673894	107	1938710	0.14
<b>2009</b>	4241	694386	230	2170390	0.15
<b>2010</b>	4161	699282	201	2049640	0.15
<b>2011</b>	2001	730007	7	2395399	0.06
<b>2012</b>	179	799484	48	2623823	0.01
<b>2013</b>	8	855953	306	2644220	0

Source: author calculations, based on ITC and FAO data.

As demonstrated by the table 8, Syrian tomato MPR in Russian market was very small 0.19 percent on average (it becomes 0.27 percent on average if the years of crisis were exempted from calculations). This reflects a very weak presence of Syrian tomato in Russian markets. Although this is partly due to the fact that Syria is very small country compared with Russia, it also underlines technical and trade barriers that hinder Syrian tomato from penetrating Russian markets more effectively. In fact, Syrian production of tomato has the potential to increase exported quantities of tomato, as the “green corridor” experiment, launched in 2014, indicates.

Regarding Iraqi market, the following table shows Syrian tomato's MPRs in that market.

**Table 9 Syrian tomato MPRs in Iraqi market, 2005-2012.**

<b>Years</b>	<b>Syria's exports to Iraq (tons)</b>	<b>Iraq's imports (tons)</b>	<b>Iraq's exports (tons)</b>	<b>Iraq's production</b>	<b>MPRs</b>
<b>2005</b>	28570	60100	11	939000	2.86
<b>2006</b>	99163	251892	11	1042000	7.66
<b>2007</b>	56909	655481	11	955000	3.53
<b>2008</b>	66474	178603	11	802386	6.78
<b>2009</b>	253644	401870	11	913493	19.3
<b>2010</b>	151179	522809	22	1013177	9.84
<b>2011</b>	58102	109310	22	1059537	4.97
<b>2012</b>	20899	85429	26	768375	2.45

Source: author calculations, based on ITC and FAO data<sup>3</sup>.

The table shows relatively good penetration of Syrian tomato into Iraqi market, 7.17 percent on average (8.33 before the crisis). Syrian tomato's MPR value reached 19.3 percent in 2009, which was the highest value reached before the crisis. This figure reflects the great potential of Syrian tomato production; it penetrated Iraqi market by almost one fifth. Accordingly, efforts should be doubled to regain the status and penetration of Syrian tomato in Iraqi markets, by boosting tomato production, enhancing its competitiveness and extending its market base.

## **11- CCI**

AS indicated in previous section, Syrian tomato's ICC will be calculated as follows:

$$ICC = RCA*0.3 + PCI*0.2 + MS*0.2 + S*0.15 + MPR*0.15$$

The following table demonstrates the calculation of Syrian tomato's ICC in Russian markets between 2005 and 2013.

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<sup>3</sup> NAPC database was utilized to obtain figures of Syrian tomato exported to Iraq, considering that ITC database has no data on this issue after 2010.

**Table 10 calculations of Syrian tomato's ICC in Russian markets, 2005-2013.**

<b>Years</b>	<b>RCA</b>	<b>PCI</b>	<b>MS</b>	<b>S</b>	<b>MPR</b>	<b>CCI</b>
<b>2005</b>	7.5	1.2	2.9	0.9	0.4	3.3
<b>2006</b>	33.2	1.4	2.4	0.9	0.4	10.9
<b>2007</b>	39.6	1.0	1.9	0.9	0.5	12.7
<b>2008</b>	17.7	1.2	0.6	0.9	0.1	5.8
<b>2009</b>	33.5	0.9	0.6	0.9	0.1	10.5
<b>2010</b>	26.0	0.9	0.6	0.9	0.2	8.3
<b>2011</b>	12.5	0.9	0.3	0.9	0.1	4.1
<b>2012</b>	28.5	1.1	0.0	0.9	0.0	8.9
<b>2013</b>	13.7	0.9	0.0	0.9	0.0	4.4
<b>المتوسط</b>	<b>23.6</b>	<b>1.0</b>	<b>1.0</b>	<b>0.9</b>	<b>0.2</b>	<b>7.7</b>

Source: author calculations, based on NAPC, FAO and ITC data.

CCI of Syrian tomato in Iraqi markets between 2005 and 2013 has also been calculated, as shown in this table.

**Table 11 calculations of Syrian tomato's ICC in Iraqi markets, 2005-2013<sup>4</sup>.**

<b>Years</b>	<b>RCA</b>	<b>PCI</b>	<b>MS</b>	<b>S</b>	<b>MPR</b>	<b>CCI</b>
<b>2005</b>	7.5	1.7	32.1	0.9	2.9	9.6
<b>2006</b>	33.2	1.3	39.2	0.9	7.7	19.3
<b>2007</b>	39.6	0.6	39.7	0.9	3.5	20.6
<b>2008</b>	17.7	1.4	37.2	0.9	6.8	14.2
<b>2009</b>	33.5	1.3	80.1	0.9	19.3	29.4
<b>2010</b>	26.0	1.1	28.9	0.9	9.8	15.4
<b>2011</b>	12.5	1.2	0.0	0.9	5.0	4.9
<b>2012</b>	28.5	1.2	0.0	0.9	2.4	9.3
<b>2013</b>	13.7	1.2	0.0	0.9	7.2	5.6
<b>Average</b>	<b>23.6</b>	<b>1.2</b>	<b>28.6</b>	<b>0.9</b>	<b>7.2</b>	<b>14.2</b>

Source: author calculations, based on NAPC, FAO and ITC data.

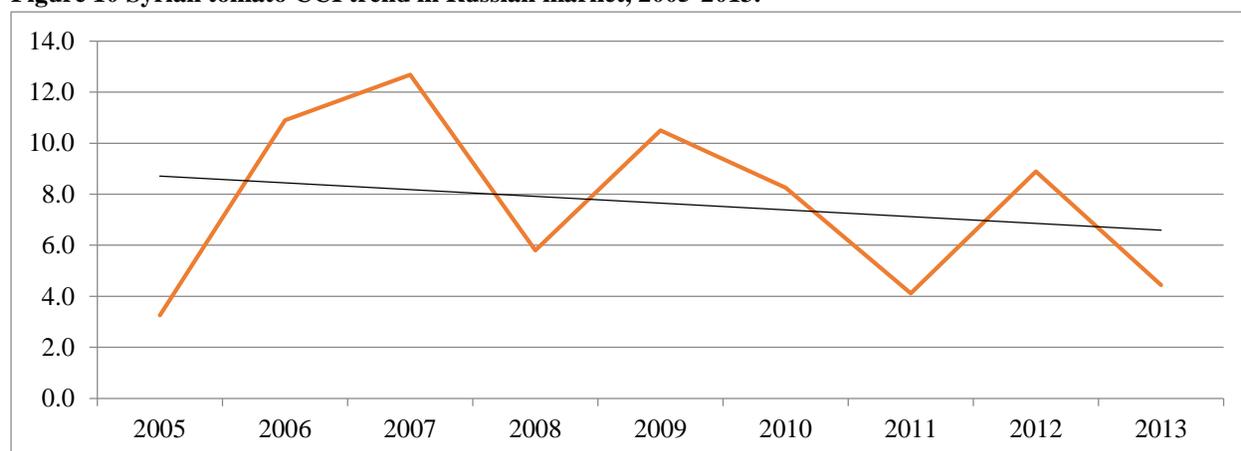
At first glance, we see that Syrian tomato competitiveness in Iraqi market is better than in Russian market; CCI in Iraqi markets is higher by 6.5 points than in Russian markets. In a more thorough look, it can be noted that PCI for Syrian tomato in Russian market is higher than in Iraqi market by 0.2 point. Yet, there is big disparity between the MS value of Syrian tomato in Russian market and its value in Iraqi market, with the latter is higher (the difference is 27.6 points), as well as in terms of MPR (the difference is 7 points in favor of the value in Iraq). On the other hand, CCI of Syria's tomato in the Russian markets reached its peak in 2006, with its RCA increased largely, whereas CCI in Iraqi market reached its peak in 2009, thanks to the higher MS in that year.

It is worth mentioning that in both cases, CCI trend is decreasing, as shown in figure 10 and figure 11.

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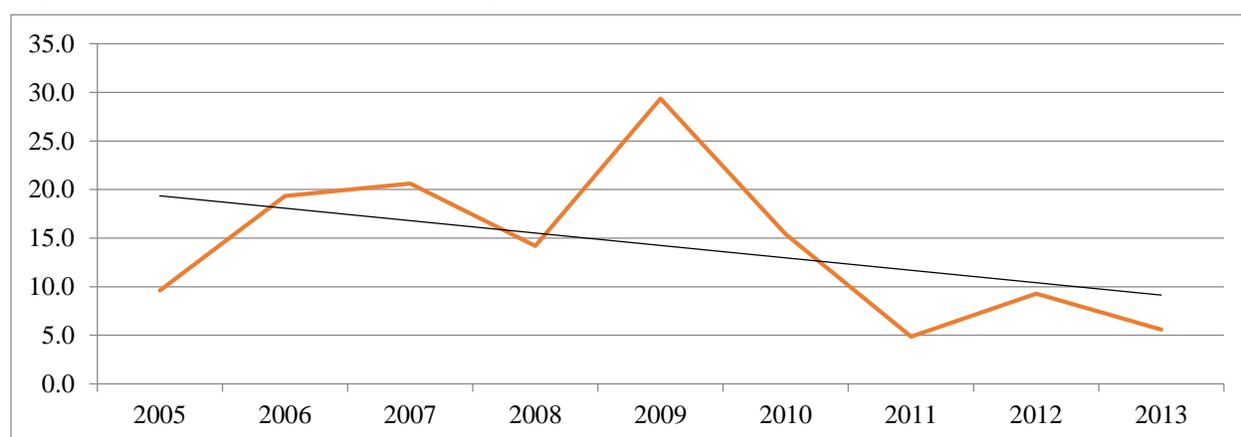
<sup>4</sup> Concerning PCI index, its values for 2011, 2012 and 2013 were replaced by the general average, in shed of data unavailability; the same applies for MPR in 2013.

**Figure 10 Syrian tomato CCI trend in Russian market, 2005-2013.**



Source: author calculations, based on NAPC, FAO and ITC data.

**Figure 11 Syrian tomato CCI trend in Iraqi market, 2005-2013.**



Source: author calculations, based on NAPC, FAO and ITC data.

In order to analyze this declining trend, we are going to focus on RCA for Syrian tomato, which has been declining for long period. This generates, up to a point, the decrease in both trends of CCI. Nonetheless, RCA trend had been increasing before the crisis. Similarly, PCI trend has increased in both markets in 2005-13, though more smoothly in the Iraqi market. However, this trend had been increasing in Iraqi market even before the crisis. MS trend, nevertheless, declined in Russian market, before and during the crisis as well, while its trend in Iraqi market had been increasing before the crisis while has decreased during the crisis. MPR of Syrian tomato trend in Russian markets had been declining before and during the crisis as well, whereas it has been increasing in Iraqi market before and during the crisis.

In order to evaluate the competitive position of Syrian tomato, we calculate the CCI values for the major regional producers and exporting countries (particularly those exporting to Russia and Iraq). **For the Russian market** we've chosen Turkey and Morocco, considering that Turkey has been the main exporter of fresh tomato to Russia, and the major competitor for Syria. Morocco - a Mediterranean Arab country - exports substantial quantities of tomato to Russia (5<sup>th</sup> important exporter of tomato to Russia). **For Iraqi market**, we chose Jordan, which has been the second exporter of tomato to Iraq, and a regional exporter that strongly competes with Syria in Iraqi market<sup>5</sup>. The following table shows Syrian, Turkish, Moroccan tomatoes' CCIs values in Russian markets, as well as Syrian and Jordanian tomatoes' CCIs in Iraqi markets.

**Table 12 Syrian, Turkish, Moroccan tomato CCIs in Russian markets, and Syrian and Jordanian tomato CCIs in Iraqi markets, 2005-2013.**

Importer	Russian market			Iraqi market	
	Syria	Turkey	Morocco	Syria	Jordan
Index	CCI	CCI	CCI	CCI	CCI
<b>2005</b>	3.3	8.0	7.8	9.6	23.2
<b>2006</b>	10.9	8.1	7.7	19.3	15.9
<b>2007</b>	12.7	11.4	9.9	20.6	31.9
<b>2008</b>	5.8	12.0	10.4	14.2	29.4
<b>2009</b>	10.5	13.5	13.0	29.4	17.8
<b>2010</b>	8.3	14.6	10.5	15.4	23.9
<b>2011</b>	4.1	14.4	13.0	4.9	27.2
<b>2012</b>	8.9	12.7	14.7	9.3	31.9
<b>2013</b>	4.4	11.3	14.9	5.6	41.0
<b>Average</b>	<b>7.7</b>	<b>11.8</b>	<b>11.3</b>	<b>14.2</b>	<b>26.9</b>

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<sup>5</sup> Concerning Iraqi market we chose Jordan only for the sake of comparison because there are big gaps in trade data, considering the circumstances which this country passed through in last decade.

Source: author calculations, based on NAPC, FAO and ITC data.

Considering Russian market, the table shows that CCIs for Turkish and Moroccan tomatoes are higher than the Syrian' by 4.1 and 3.6 points respectively. Concerning Turkey, this is mainly due to the high values of MS in the first place, and the high values of MPR in the second place; while for Morocco, this also due to its high MS and MPR values. Traditionally Turkey is a major agricultural exporter to Russian market, and is the first exporter of tomato to that market, as mentioned previously. Therefore, it is not surprising that it has a substantial market share and a good market penetration. Nevertheless, the recent political developments and the trade sanctions imposed by Russia on Turkey, particularly in terms of agricultural products, would pave the way for other competitors, including Syria, to replace the Turkish portion. Accordingly, CCI of Turkish tomato in Russian markets is expected to decline in the coming future. Morocco, in turn, is a large agricultural country; this interprets the high RCA of its tomato. Also, it has been exporting its tomato to Russia for decades; therefore, it has a good MS and MPR. Nevertheless, as mentioned previously, Moroccan tomato has no price competitive advantage in Russian markets (this is likely due to transportation costs, considering the long distance between the two countries). Subsequently, Syrian producers have to take advantage of this opportunity and extend their exports of tomato into Russian markets, bearing in mind particularly that Syrian tomato PCI value reached 1.073 in 2012 during the crisis; i.e. it maintained its advantage even during the crisis.

Regarding Iraqi market, CCI value of Jordanian tomato is above the Syrian by 12.7 points, which represents a large gap due to high RCA of Jordanian tomato as well as its high MS in Iraqi markets. However, Syrian tomato PCI value is higher than the Jordanian one, and its MPR is higher also. This means that Syrian tomato can compete in terms of prices, and it has relatively an influential presence in Iraqi markets. Accordingly, these advantages should be utilized in order to promote Syrian tomato competitiveness and thus increase its CCI value in that market.

## **12- Recommendations**

The study has shown that Syrian tomato's CCI trend is declining year after year, and it is lower by several points than CCIs of its regional counterpart competitors in Russian and Iraqi markets. In addition, the results reveal that the main problem in terms of Syrian tomato's competitiveness is its declining RCA on the long run, though it enjoys the revealed comparative advantage. This reflects the contraction of Syrian tomato markets despite its capability of horizontal expansion. The protected agriculture seems to be the key for promoting Syrian tomato production, but also the good preparation for cultivation and the adequate fertilizing as well as the integrated pest control (IPC) which increase the productivity are all of great importance. Furthermore, it is important to put every effort to mitigate the negative effects of the crisis on agricultural sector in general and tomato sub-sector in particular.

More specifically, the following points can be recommended in order to promote Syrian tomato competitiveness both in the Russian and Iraqi markets:

- Affording adequate inputs, particularly seeds that produce the preferred varieties in foreign markets, so as to be varieties of high productivity and relevant standards for exportation.
- Increasing the amounts of money offered by Agriculture Support Fund in order to encourage farmers and peasants to keep growing tomato, particularly considering that several annual losses in row would lead the farmer to seize cultivation, especially those who don't own the land.
- Focusing on protected tomato cultivation in the coast, considering its high productivity and the relevance of the produced tomato for exportation, as well as the relevant climatic conditions in that region.
- Utilizing the Green Corridor project, in terms of expanding Syrian tomato's MS in Russian markets, and taking advantage of the decline in Turkish exports to Russian markets, and fulfilling Russian demand on tomato resulted from that decline.
- Negotiating Russia in order to remove technical and trade barriers that prevent Syrian tomato from penetrating Russian market more effectively. In this context, efforts should

be put in place to conclude a bilateral free trade area with Russia, or to join the Eurasian Union or sign a free trade agreement with it.

- Focusing on biological pests control to enhance the quality and secure a safe and competitive production, and promote the response to food safety requirements.
- Encouraging organic farming in order to conserve environment and expand the opportunity to access foreign markets, besides utilizing the advantages offered to organic production in Russian markets particularly.
- Processing tomato, and using proper boxes, in accordance with international standards and criteria, in order to expand the opportunity to marketing tomato internally and externally; and promoting rural and traditional crafts and enhancing their quality, besides affording loans and required facilitations in order to establish food-industry firms and securing refrigerated vehicles needed for crop's transportation.
- It is essential to utilize the competitive advantage which Syrian tomato has been enjoying in Russian and Iraqi markets, even during the imposed war. This can be achieved by advertising Syrian products and introducing them to foreign consumers through exhibitions and brochure, among others.
- Re-establishing the penetration to Iraqi market and the commercial presence in it, which would contribute to the promotion of Syrian tomato production and the enhancement of its competitiveness as well as the expansion of its market base.

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