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IMPACT OF FINANCIALIZATION ON PRIMARY PRODUCTION, CONSUMPTION AND EXPORTS: THE CASE OF SYRIAN CITRUS MARKET[*]

The paper attempts to find a pattern between the financialization impact on commodity production as shown on the correlation between cycles of production, exports, consumption and imports and the volatilities of 3 capital market indices in the period of 2010–2013 for the case of Syrian citrus markets, with its highly cyclical value chains. The potential correlation between the metioned variables could shed some light on the relationship between the North-South economic relations which are deemed to affect the economic development of commodity-dependent low income developing countries and which is especially important in the present era of increased dangers of excessive financialization.

Keyword: *Syria; farmers; citrus market; financialization; fluctuation; cyclicity; value chain.*

Abbreviations: *AMIS – Agricultural Market Information System; CCDCs – Commodity Dependent Developing Countries; CRY – Thomson Reuters/Jefferies CRB Commodity Index; MXWO – MSCI World Index value; OECD – Organization for Economic Co–operation and Development; OLS – Ordinary Least Squares; PSH – Prebisch-Singer Hypothesis; UN – United Nations.*

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ВПЛИВ ФІНАНСІАЛІЗАЦІЇ НА ПЕРВИННЕ ВИРОБНИЦТВО, СПОЖИВАННЯ ТА ЕКСПОРТ: НА ПРИКЛАДІ СІРІЙСЬКОГО РИНКУ ЦИТРУСОВИХ

У статті зроблено спробу показати вплив фінансіалізації на товарне виробництво та виявити кореляції між циклами виробництва, споживання, експорту та імпорту, з одного боку, та волатильністю ринку капіталу – з іншого, для чого використано дані по сірійському ринку цитрусових у 2010–2013 роках. Кореляції між дослідженими змінними частково відображають тренди взаємозалежності в економічних відносинах Глобальної Півночі з Глобальним Півднем. Дані кореляції неминуче відбиваються на стані товарозалежних бідних країн, що розвиваються. І це стає особливо небезпечним в епоху надмірної фінансіалізації економіки.

Ключові слова: *Сірія; фермери; ринок цитрусових; фінансіалізація; коливання; циклічність; ланцюг формування вартості.*

Форм. 1. Рис. 2. Табл. 4. Літ. 18.

Томаш Хес, Хайян Сулейман, Александр Кандаков

ВЛИЯНИЕ ФИНАНСИАЛИЗАЦИИ НА ПЕРВИЧНОЕ ПРОИЗВОДСТВО, ПОТРЕБЛЕНИЕ И ЭКСПОРТ: НА ПРИМЕРЕ СИРИЙСКОГО РЫНКА ЦИТРУСОВЫХ

В статье сделана попытка показать влияние финансиализации на товарное производство и выявить корреляции между циклами производства, потребления, экспорта и импорта, с одной стороны, и волатильностью рынка капитала – с другой, для чего использованы данные по сирийскому рынку цитрусовых в 2010–2013 годах. Корреляции между исследуемыми переменными частично отображают тренды взаимозависимости в экономических отношениях Глобального Севера и Глобального Юга.

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Данные корреляции неизбежно отражаются на состоянии товарозависимых бедных развивающихся стран, что становится особенно опасным в эпоху чрезмерной финансиализации экономики.
Ключевые слова: *Сирия; фермеры; рынок цитрусовых; финансиализация; колебания; цикличность; цепочка формирования стоимости.*

Introduction.

1. Importance and structure of global citrus production. Citrus production belongs to most important agricultural sectors worldwide. Long-term succesfull international commercialization of citrus production is however extremely difficult due to an array of factors including complex export barriers, unbalanced conditions at international markets of oligopolic nature, competition in certain areas such as regional subsidies as well as expensive means of exportation and storage with high capital inputs. Between these, the cyclical nature of production plays the pivotal role as it hampers all year income of producers. In terms of value, citrus fruits are the first fruit crop in international commerce and thus belong to commodities of key importance.

Citrus fruit production at the global level has seen continuous and unprecedented growth in the last decades of the 20th century, mainly due to the increase in cultivation and changes in consumer preferences due to health-oriented food consumption and increased incomes (UNCTAD, 2011). There are two differentiated markets in the sector: fresh citrus fruits market and processed citrus products market, mainly orange juice. Improvements in price levels, quality, promotional capacity and technology in processing, storage and packaging have boosted citrus juice production and international juice trade (UNCTAD, 2011). Citrus fruits are produced globally as according to FAO data, in 2004, 140 countries produced citrus fruits (FAO, 2005). However, the greatest part of production is concentrated in only few areas. Most citrus fruits are produced in the Northern hemisphere, accounting for around 70% of the total citrus production, including the Mediterranean region, China and the United States, representing more than two thirds of the global citrus fruit production. Processing of citrus fruits accounts for almost one third of the total citrus fruit production, and more than 80% of that berlongs to orange juice production. With two key players, Florida in the United States and the Sao Paulo State in Brazil, the orange juice market is oligopolic by its nature, as the production of orange juice between the two players makes up 85% of the world market. The EU is the largest importer of orange juice, accounting for over 80% of the world orange juice import (FAO, 2005). According to FAO, fresh oranges consumption is declining in developed countries as it is being replaced by citrus juice consumption as well as transportation and storage improvement favor availability of substitute fruits. Exports of fresh citrus fruits represent roughly 10% of the total citrus fruit production. Another reason could the subsidies provided to growers in developed countries. In the Mediterranean countries, such as Syria, citrus fruits are produced primarily for fresh fruit consumption. The Mediterranean region plays a prominent role as fresh citrus exporter, providing nearly 2/3 of the global fresh citrus export, which makes this region attractive for studying the impact of financialization on primary products export. Major destinations of Mediterranean exports of fresh citrus fruits are the EU countries (UNCTAD, 2011).

2. Citrus production in Syria. Citrus is an important crop in the Syrian Arab Republic, it is consumed both as fresh fruit and juice. The production of citruses pro-

vides significant income for more than 35,000 Syrian farm families located in the coastal governorships of Lattakia and Tartous.

Citrus production accounts for some 5% of the national agricultural output and for 1.3% of GDP (Westlake, 2000). In 1997, 20% of national fruit and vegetable export earnings and 1.9% of the total national merchandise export earnings derived from citruses. In 1997/98, Syria accounted for about 0.8% of the 90 mln tons of citrus produced globally (Westlake, 2000). The bulk of citrus production is located in two governorates, Latakia and Tartous, where they grow on the coastal plain and on slopes of coastal hills up to 150 m accounting for approx. 77% and 23% of national citrus production output.

Output is currently almost 100 times that of 1970, as the rapid growth of citrus output over the past 30 years resulted from deliberate efforts of government to establish citrus as an important crop, which was achieved through the introduction of new varieties, through public programmes providing and subsidising land, seedlings, and through provision of interest-free long-term credits and the introduction of integrated pest management (FAO, 2000).

Except for 3 government farms, all commercial citrus production takes place on privately owned and operated 27,000 farms, of which roughly two-thirds are in Latakia and one-third in Tartous. 89% of all citrus farms in Syria have less than 600 trees. More than half of all citrus farms are between 61 and 300 trees (FAO, 2000). The bulk of Syria's citrus output thus comes from small farms which account for over 60% of all trees. This makes Syrian market ideal for studying the impact of prices on output, as they represent myriads of decisions taken by many different small-scale stakeholders.

In Syria, the citrus sector is an important branch of economy. It is a provider of jobs for thousands of employees and an income source for thousands of families. It reduces population exodus and immigration. Employment is provided directly by production at packinghouses, farms and nurseries or indirectly at services provided to production such as transportation, sales, pesticides and fertilizers manufacturing etc. (EuroMedCitrusNet, 2007).

The major destination of citrus fruits produced in the Mediterranean markets is fresh consumption. In fact, most fruits are either consumed domestically or exported to foreign coutries (EuroMedCitrusNet, 2007). Export sales occur from approximately mid-October to mid-June and represent a vital source of hard currency. Destination markets are United Kingdom, Germany, France, Ukraine and Russia for Turkey, France for Tunisia, the Gulf Arab States for Syria and Eastern Europe for Egypt, Russia, Holland, France, United Kingdom and Canada for Morocco (EuroMedCitrusNet, 2007).

Major problems citrus farmers in Syria are facing are insufficient access to information sources in rural areas, lack of promotion for Syrian citruses, lack of specialized companies able to export (Mouhamed, 2008), a lack of information about the situation at local markets and their trends, lack of suitable storages and sorting facilities, insufficient financial support as well as training also represent detrimental barriers for citrus small farmers. Efficient dissemination of information to producers, especially related to price volatility could lead to better decision-making. However, it is still difficult due to inexistent Agricultural Market Information System (AMIS)

that could enhance timeliness and reliability of information at food markets. The dissemination of information without such system is currently inefficient as most farmers cannot find the right markets at the right time and this results in frequent fluctuations in citrus supply and demand and significant differences in prices across local markets (Sulaiman, 2014).

3. Capital markets, financialization of commodity markets and citrus production. According to Prebish-Singer hypothesis (PSH) the relative terms of trade between primary production and manufactured production deteriorate in time as countries that export commodities import fewer manufactured goods relative to the level of exports, due greater income elasticity of demand of manufactured production (Singer, 1998). Eventhough the PSH is losing its expressive value, due to counterfactual evidence of the past decade, the antagonistic relationship between developing countries that are primary production exporters and developed countries with their capital based manufacturing production is subject to ongoing research. The "export pessimistic" supporters of PSH believe that low-value added exports, including unprocessed production of fresh fruits in Syria, do not generate enough foreign exchange currency in order to generate the means for needed imports. This phenomenon can be at present complemented with another symptom of contemporary global economics, through the so-called "financialization". Financialization, unfolding steadily since the second half of the past century, is considered to be one of the reasons for the current food crisis, permeating food provision along the value chain.

In this regard, the surprising appearance of strains at financial as well as commodity markets in 2007–2009 is not to be considered a mere coincidence (Nissanke et al., 2013). Instead, a conjectured relationship between commodity markets and capital markets where the bulk of financialisation takes place can be behind this phenomenon. The term "financialization" used for this phenomenon in recent decades, describes the process of financial leverage overriding equities with financial markets tending to dominate over traditional and agricultural economics, including citrus market economics, attempting to reduce values of exchanged goods into financial instruments – and thus lower its transaction costs (Cushen, 2013). Given the accelerated pace of financialisation of commodity markets through rapid expansion of financial innovations over the last decade, it is not surprising that the volatility of commodity prices and primary materials productions cycle can be linked. Speculative activities by financial investors at capital markets thus can be one of the reason behind commodity price volatility and thus behind commodity production output.

Trading activities at global markets with commodities are influenced by changes in the way how commodity markets are linked to financial markets, while these fireback to individual markets imprinting the pattern of demand on the local production facilities. As noted by UNCTAD in 2011 changes in more complex commodity linked financial instruments and products were responses to heterogeneous and changing demand by portfolio investors (Nissanke et al., 2013). Also, many investors opt for trading strategies focused on management of commodity linked funds rather than commodities themselves. Cushen (2013) as well as Haw et al. (2013) argue that finacialization transformed commodity markets, through creation of commodity futures, which became an asset class popular for portfolio investors and attracted unprecedented volumes of investment capital. The excess of financial assets thus created

imbalances in price signalling. Price volatility, on the other hand, impacted local producers, such as citrus producers in Syria, through highly volatile and thus unpredictable market demand, leading to shifts in production to producers with higher capital buffers.

It is well known that portfolio investors often act as noise traders as their decisions are less related to development in commodity fundamentals disregarding the fundamentals of portfolio and their speculative actions, thus make commodity prices more volatile and impact the price dynamics in the medium term (Nissanke et al., 2013), also in the places of their origin. In a similar way, fluctuations of commodity prices can be explained by frequent changes in the supply-demand relationship of commodities. As Maizels noted in 1994, low price elasticities of supply and demand in the short term that apply for majority of commodities including citruses, is the cause for greater than proportionate price sensitivity for disturbances in economic activities in developed countries or supply in commodities supply and thus export earnings.

Usually, exogenous shocks on the supply side ignite a price change if the shock impact cannot be amortized by inventory or storage adjustments. The amplitude and duration of price cycles on the other hand is determined by the way and the speed how the supply side responds to an initial price shock (Nissanke, 2013).

Volatility in commodity prices, also denominated as the "financialization of commodity markets" can thus also be viewed as the expression of intense linkages between activities at financial and commodity markets. Volatilities at commodities markets and capital markets can influence each other, institutionalizing complex bilateral relationships that may be vital for the world economy. According to the supporters of financialization, financial system is being destabilized by leverage funds seeking maximum returns in the environment of misevaluated risks and funds directed by professional managers, generating successive speculative bubbles, exemplifying typical participant-agent problem. Gradual elimination of regulations allowed money managers to use complex risk transfer innovations to deepen financialization. As Minsky says, the financial crisis in 2008 resulted from the step-by-step transformation of the financial system towards progressing financialization (Levy Economics Institute, 2012)[4].

In this paper, the authors attempted to find a correlation between 3 capital market indices (DWX, CRY and MXWO) at national as well as international levels (Figure 2) and Syrian citrus market of 5 citrus products (Lemon Autochton, Lemon Mayer, Lemon Americain, Grapefruit Rose and Grapefruit Normal) (Figure 1). The variables, such as Average Production, Average Exports, Average Imports and Average Consumption are dependent variables within the statistical model.

It is however important to mention that other negative externalities such as major weather elongations or conflicts can have devastating impact on citrus production, rendering the studied volatility obsolete. The ongoing civil war is having at present a devastating influence on citrus production in Syria as an important part of the local GDP is being lost, in a situation when in 2010 the estimated losses for the past 22 months accounted for 81.7% of the pre-war GDP of the country with only 43% out of the mentioned volume to be attributed to decrease in capital stock (SCPR, 2012).

[4] Financialization is a systemic risk increasing process, characterised by inflated significance of financial markets over the traditional industrial economy, in the intent of commodification of any product or service to an exchangeable financial instrument, and thus making it easier to trade, both at national and international levels (Epstein, 2001).

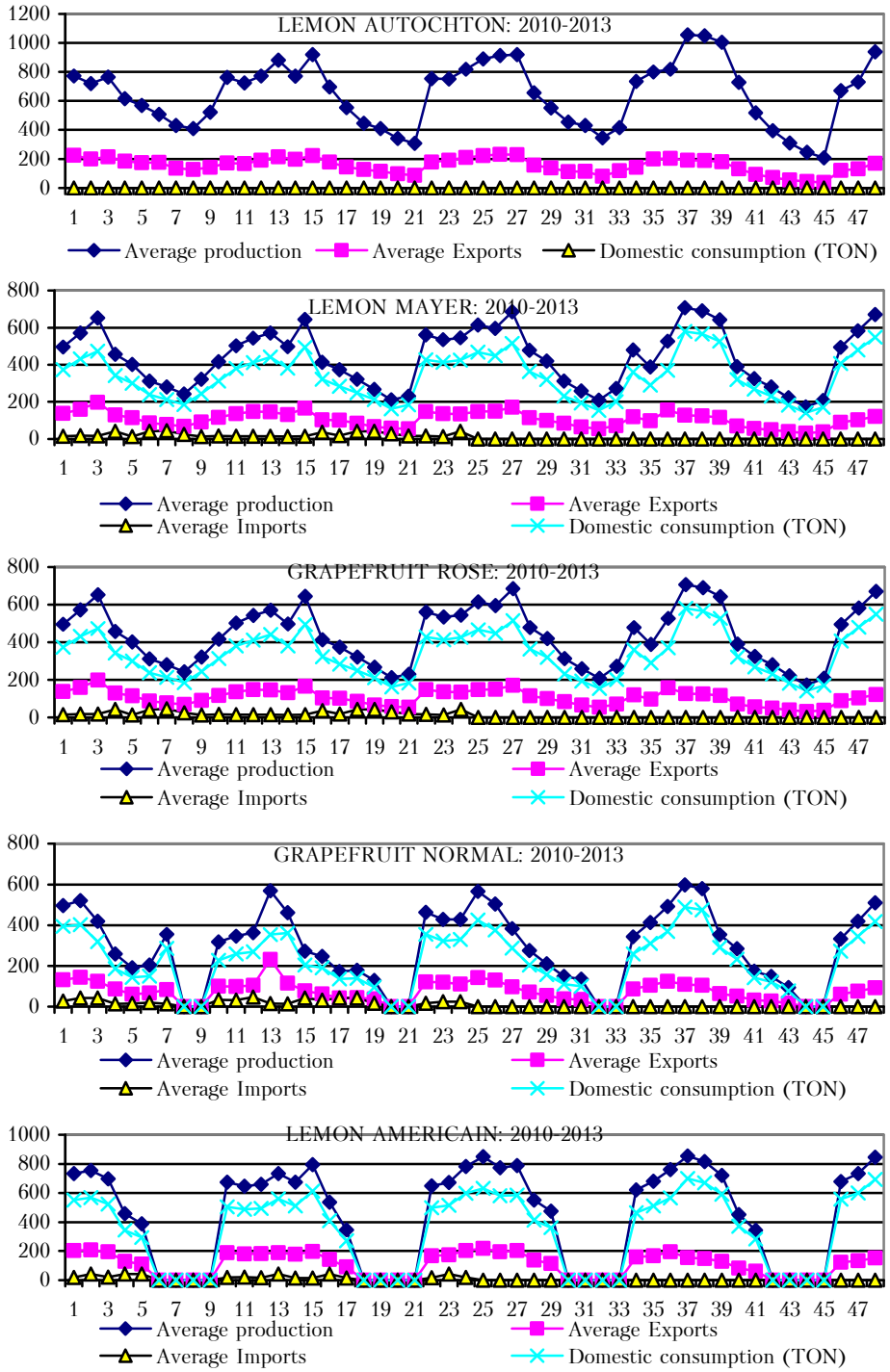

Figure 1. **Cycles of production, exports, imports and consumption of chosen citrus products in Syria, 2010–2013**

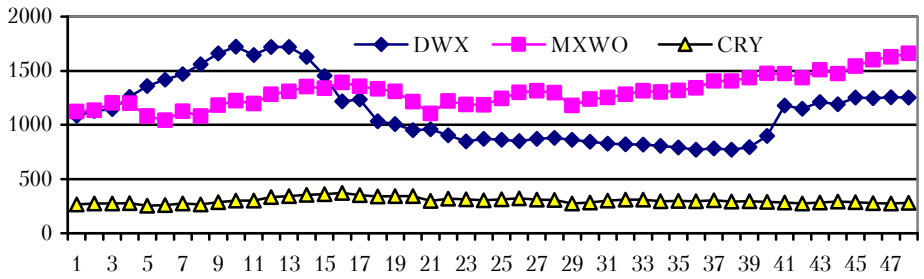

Figure 2. **Indices DWX, MXWO and CRY in the time span of 2010–2013**

4. External factors of food production in Syria. Syria has a unique position as a trade crossing point in the region, a port of access to Eastern Europe, Central Asia, Russia and Turkey for the countries of Middle East. Thus, Syria is a major trading partner for its neighbouring countries. Before the crisis, Iraq, for example, received one-third of local exports. Lebanon exported more than 20% of its agricultural production to Syria. Economic liberalisation starting in 1991 transformed Syrian state to a country of crony capitalism, induced a relatively healthy macroeconomic situation with low debt and reasonable foreign reserves and with a strong agricultural sector. This large sector has become increasingly inefficient, as the population grew.

The impact of the war crisis on Syrian society and its economy including agricultural production has been severe. Heavy fights destroyed public infrastructure and military activity have impeded access to income sources, disrupting distribution and supply networks and devastating purchasing power through currency depreciation, with heavy sanctions being imposed on Syrian state by superpowers including the Arab league which hampered imports and exports. These issues affected the purchasing power of consumers as well as the ability of farmers to market their production. Several external factors have therefore affected Syrian markets:

1. Devaluation of Syrian pound compared to USD.
2. Sanctions hampering financial transactions and commerce.
3. Loss of traditional trade partners due to sanctions.
4. Reduced income due to decimation of export industries.
5. Increase of imports due to decline of local production.

Some sources estimating cumulative falls in the currency estimate up to 75% loss since March 2011, which is why many farmers abandon citrus cultivation because of high input prices and low citrus prices.

International sanctions have severely hampered international trade and also manufacturing and agriculture in Syria with direct effects on markets and consumers leading to famine and poverty combined with the suspension of business activity and decrease in production, drop in exports from 7.2 bln USD in 2011 to 185 mln USD in 2012 (FAO, 2013).

The trade sector, on the other hand, including food commodity trade, was severely disrupted due to lowered demand because of reduced purchasing power, high prices, bottlenecks in supply chains caused by delays on roads bringing products to markets, and higher energy and import costs driven by the depreciation of Syrian currency and economic sanctions.

The WFP report found markets to be fully operating in May-June 2013, in the areas less affected by the crisis such as Al-Hasakeh, Damascus, Lattakia, Tartous, and As-Sweida. Although food commodities are available in all governorates, most traders reported reduced quantities of food for sale at local markets as compared to 2012 (WFB, 2013).

Informal trade including smuggling between Syria and neighbouring countries increased in 2011–2012, particularly for basic food and petroleum products. Traded food items included, among others, fruit, vegetables, bread and groceries. Livestock (including sheep and cattle) have been informally traded through the borders with Iraq, Jordan and Lebanon. Although Turkey has officially closed its land border with Syria to all trade, traders have found ingenious ways of bypassing border controls, including off-loading goods onto Syrian registered trucks for their onward journeys (FAO, 2013).

The Syrian Center for Policy Research (SCPR) estimates a more dramatic contraction of the economy. It estimated GDP declined by 4% in 2011, 31% in 2012, and 38% in 2013. Accordingly, Syria's GDP in 2013 dropped to 41% of the pre-crisis level in 2010. The contraction in GDP is concentrated in 4 key economic sectors: the wholesale and retail trade sector (including hotels and restaurants), transport, mining (primarily petroleum) and manufacturing. Together these sectors accounted for about two-thirds of the overall estimated decline in GDP until the end of 2013.

Available data suggests that Syrian economy is drifting towards hyperinflation. The latest data issued by the Central Bureau of Statistics (CBS) shows that the Consumer Price Index (CPI) in August 2013 had increased by about 210% as compared to the beginning of the conflict in March 2011, and by 121% year-on-year. Despite the sharp official increase, the actual figure may be substantially higher, and is likely to vary widely across the country, reflecting the fragmentation of Syria's economic space. Sharp increase in prices might reflect the substantial fiscal pressure potentially leading to monetization of fiscal deficit contributing to inflation acceleration in order to curb recurrent expenditures.

Methodology.

1. Estimation method used. We compare citrus production with 3 indices, searching for correlation, through stacked cross sections of longitudinal panel data analysis with fixed effects within the frameworkthe of ordinary least squares (OLS) method for time series.

$$y = \alpha + \beta_1 x_{it} + \varepsilon_{it}, \quad (1)$$

where Y – performance variable of local output (exports, imports, consumption, production); β – the coefficient of X; α – the intercept of the regression line and the Y axis; ε_{it} – the error term, residual value describing market i and time t.

2. Data collection and structure. Data was structured in 48 periods with 240 observations in 5 cross-sectional units. The panel data on 5 citrus products and 3 indices is classified on the monthly basis during 4 year long observations. The data were complemented with the sources from the General Commission for Agricultural Research (Lattakian Centre) on production quantities, on domestic consumption and prices at local markets (Al-Kurdaha, Al-Haffi, Jablih and Lattakia markets), from the Lattakian Chamber of Agriculture and sources on the quantities of export-

ed and imported citrus fruit from the Agricultural Directorate of Lattakia (Economics Directorate), the Agriculture Extension Services from the citrus pilot area. The index data were retrieved from Damascus Stock Exchange, MSCI and Thomson Reuters publicly available sources.

3. Indices. 3 indices were chosen to represent capital markets at the local, regional ans global levels. The DSE weighted index is provided by the Damascus Securities Exchange (DSE, 2014)[5] and is based on weighting with the market value of companies involved in the calculation of the equation, where each company is given weight as much as its market value represented in the market value of the sample as a whole.

As the second index was chosen Thomson Reuters/Jefferies CRB Index, which is commodity price index first calculated by Commodity Research Bureau, Inc. in 1957. The Thomson Reuters/Jefferies CRB Index (CRY) was originally designed to provide dynamic representation of broad trends in overall commodity prices. It is currently made up of 19 commodities as quoted at NYMEX, LME, CBOT, COMEX and CME exchanges (Thomson Reuters, 2014). These are structured into 4 groups, each with different weights. The index described comprises 19 commodities: aluminum, coffee, cocoa, copper, cotton, corn, crude oil, gold, heating oil, lean hogs, live cattle, natural gas, nickel, orange juice, silver, soybeans, sugar, unleaded gas and wheat (Thomson Reuters, 2014).

The MSCI World is a stock market index representing of 1,612 world stocks (MSCI, 2014). It is maintained by MSCI Inc., often applied as a benchmark for global stock funds. The MSCI World Index includes a collection of stocks of all developed markets in the world, as defined by MSCI (MSCI, 2014).

4. Synthesis of the results. Out of the 12 correlational analysis between 3 indices and 4 citrus market variables, statistically important nexus was found in 3 cases, at the confidence level of 95%. In all cases, the correlation was related to imported volume of citrus production (Annex C) to the 3 indices CRY, MSCI World Index and DWX, which means that fluctuations at rhe local level of capital markets as well as fluctuations of capital market at the global level have impact on the volume of imported citrus to Syria.

At the same time, the impact of capital markets volatilities at the local as well as global levels, is represented by the chosen indices and had not shown an important relationship to consumption, exportation and production at the national level.

Conclusion. The analysis of the relationship between capital market volatilities represented by 3 indices and outputs of Syrian citrus markets expressed by 4 variables had shown evidence that imports of citrus fruit, which was permitted by Syrian authorities in 2001 and gradually increased as a result of Great Arab Free Trade Agreement (Mouhamed, 2008), are impacted by volatilities at local as well as global capital markets. While this finding cannot confirm fully the large scale retroactive impact of financialization of global capital markets on the citrus sector in Syria, as exportation, production as well as consumption seem to be insulated enough from the capital market volatilities not to show such relation in a mid-term statistical model, it can be stated that situation at capital markets does have impact on the market through imports.

[5] DSE, founded in 2009, is the only stock exchange located in Damascus, Syria.

The reason why these 3 variables are not impacted can be the fact that Syria is largely self-sufficient in citrus production and that exports are hindered by severe obstacles such as the EU protectionist policies or high capital requirements on product price completion On the other hand, the robust insulation level can have advantages in its lower exposure to influences uncontrollable by Syrian authorities, such as volatilities of global capital markets. This advantage of the market is to be preserved and the volatilities of the income stemming from the local citrus market are thus to be off-set through the search of intraregional trade alliances with similar characteristics, such as neighbouring countries. The thread of volatilities of citrus production prices in case of intensifying financialization could futher suggest the implementation of robust national information systems such as AMIS, that would provide better food market information through more efficient collaboration between producing, importing and exporting countries as well as trading corporations and multilateral organizations. Increased transparency and timely information on price shocks could reduce uncertainty and provide higher margins for all agricultural producers (AMIS, 2013), mitigate effects described in PSH and thus protect national citrus markets in Syria. As mentioned earlier, the analyzed phenomenon can provide rather unimportant insights on the situation when major bulk of national production estimated at more than 50% of GDP is being lost due to exogenous market influences such as the ongoing civil war.

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Annex A. **Exports**

Model 2: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: AVERAGE_EXPORTS

		COEFFICIENT	std.error	t-ratio	p-value
	Const	906,794	953,03	0,9515	0,3423
	dwx_value	-0,409612	0,819716	-0,4997	0,6178
Mean dependent var		446,4868	S.D dependent var		3812,284
sum squared resid		3,35E+09	S.E OF REGRESSION		3785,735
R-squared		0,03451	Adjusted R-squared		0,01388
	F(5,234)	1,672791	p-value (F)		0,141953
Log-likelihood		-2314,866	Akaike criterion		4641,732
schwars criteiron		4662,616	Hannan-Quinn		4650,147
	rho	-0,049352	Durbin-Watson		2,096989

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 2.02856
with p -value = p (F(4.234)>2.02856)=0.0911886

Model 13 : Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: AVERAGE_EXPORTS

		COEFFICIENT	std.error	t-ratio	p-value
	Const	1645,35	2687,8	0,6122	0,541
	CRY	-3,98347	8,89382	-0,4479	0,6546
Mean dependent var		446,4868	S.D dependent var		3812,28
sum squared resid		3,35E+09	S.E OF REGRESSION		3786,13
R-squared		0,034308	Adjusted R-squared		0,01367
	F(5,234)	1,662632	p-value (F)		0,14447
Log-likelihood		-2314,091	Akaike criterion		4641,78
schwars criteiron		4662,666	Hannan-Quinn		4650,2
	rho	-0,045946	Durbin-Watson		2,08974

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 2.02814
with p-value = p (F(4,234) > 2.02814) = 0.0912400

Model 3: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: AVERAGE_EXPORTS

		COEFFICIENT	std.error	t-ratio	p-value
	Const	157,081	37,5154	4,187	4.00e-05***
	Msci_world_Index	-0,0458701	0,0286219	-1,603	0,1104
Mean dependent var		97,32737	S.D dependent var		64,20165
sum squared resid		9,69E+05	S.E OF REGRESSION		64,36277
R-squared		0,016	Adjusted R-squared		-0,005026
	F(5,234)	0,760977	p-value (F)		0,578793
Log-likelihood		-1336,996	Akaike criterion		2685,991
schwars criteiron		2706,875	Hannan-Quinn		2694,406
	rho	-0,272836	Durbin-Watson		2,467313

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 2.02856
with p-value = p(F(4, 234)> 0.309119 = 0.871724

Annex B. **Consumption**

Model 15: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Domestic_consumption_TON_

		COEFFICIENT	std.error	t-ratio	p-value
	Const	133,151	146,407	0,9095	0,364
	CRY	0,581062	0,484455	1,199	0,2316
Mean dependent var		308,0266	S.D dependent var		205,0958
sum squared resid		9,95E+06	S.E OF REGRESSION		206,2345
R-squared		0,010019	Adjusted R-squared		-0,01113
	F(5,234)	0,473641	p-value (F)		0,795732
Log-likelihood		-1616,47	Akaike criterion		3244,941
schwars criteiron		3265,825	Hannan-Quinn		3253,355
	rho	-0,294668	Durbin-Watson		2,534898

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 0.232403
with p-value = p (F(4, 234) >0.232403)= 0.919966

Model 1: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Domestic_consumption_TON_

		COEFFICIENT	std.error	t-ratio	p-value
	Const	368,442	51,9168	7,097	1.51e-011***
	dwx_value_	-0,0537612	0,044654	-1,204	0,2298
Mean dependent var		308,0266	S.D dependent var		205,0958
sum squared resid		9,95E+06	S.E OF regression		206,2297
R-squared		0,010065	Adjusted R-squared		-0,01109
	F(5,234)	0,475825	p-value (F)		0,794117
Log-likelihood		-1616,465	Akaike criterion		3244,93
schwars criteiron		3265,814	Hannan-Quinn		3253,344
	rho	-0,311754	Durbin-Watson		2,570743

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 0.232403
with p-value = p (F(4, 234) > 0.232414) = 0.91996

Model 1: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Domestic_consumption_TON_

		COEFFICIENT	std.error	t-ratio	p-value
	Const	33,8445	119,221	0,2839	0,7768
	Msci world index	0,210478	0,090958	2,314	0.0215**
Mean dependent var		308,0266	S.D dependent var		205,0958
sum squared resid		9,79E+06	S.E OF regression		204,5404
R-squared		0,026216	Adjusted R-squared		0,005409
	F(5,234)	1,259943	p-value (F)		0,282094
Log-likelihood		-1614,491	Akaike criterion		3240,982
schwars criteiron		3261,866	Hannan-Quinn		3249,396
	rho	-0,299596	Durbin-Watson		2,525363

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4,234)= 0.232403
with p-value = p (F(4, 234) > 0.236268) = 0.917695

Annex C. **Imports**

Model 9: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_imports

		COEFFICIENT	std.error	t-ratio	p-value
	Const	38743,7	9952,1	-2,434	0.0157**
Msci-world-index		-24,3237	32,931	3,156	0.0018***
Mean dependent var		7058,169	S.D dependent var		14231,58
sum squared resid		4,50E+10	S.E OF regression		14018,86
R-squared		0,071328	Adjusted R-squared		0,029671
	F(5,234)	3,594522	p-value (F)		0,033818
Log-likelihood		-2626,337	Akaike criterion		5270,131
schwars criteiron		5285,557	Hannan-Quinn		5278,545
	rho	0,08434	Durbin-Watson		1,687344

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4, 234) = 0.599816
with p-value = p (F(4, 234) > 0.599816) = 0.66313

Model 14: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_imports

		COEFFICIENT	std.error	t-ratio	p-value
	Const	-24224,4	9952,1	-2,434	0.0157**
	CRY	103,943	32,931	3,156	0.0018***
Mean dependent var		7058,169	S.D dependent var		14231,58
sum squared resid		4,60E+10	S.E OF regression		14018,86
R-squared		0,04997	Adjusted R-squared		0,029671
	F(5,234)	2,461625	p-value (F)		0,033818
Log-likelihood		-2629,065	Akaike criterion		5270,131
schwars criteiron		5291,014	Hannan-Quinn		5278,545
	rho	0,154408	Durbin-Watson		1,687344

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
test statistical: F(4, 234) = 0.586332
with p-value = p(F(4, 234) >0.586332) = 0.672843

Model 3: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_imports

		COEFFICIENT	std.error	t-ratio	p-value
	Const	-3653,72	3529,91	-1,035	0,3017
	dwx value	9,53214	3,03613	3,14	0,0019
Mean dependent var		7058,169	S.D dependent var		14231,58
sum squared resid		4,60E+10	S.E OF regression		14021,91
R-squared		0,049558	Adjusted R-squared		0,029249
	F(5,234)	2,440241	p-value (F)		0,035208
Log-likelihood		-2629,117	Akaike criterion		5270,235
schwars criteiron		5291,119	Hannan-Quinn		5278,649
	rho	0,109479	Durbin-Watson		1,76828

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4, 234) = 0.586078
with p-value = p(F(4.234) > 0.586078) = 0.673027

Annex D. **Production**

Model 5: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_production

		COEFFICIENT	std.error	t-ratio	p-value
	Const	166,156	154,766	1,074	0,2841
	Msci-world-index	0,180307	0,118077	1,527	0,1281
Mean dependent var		401,0351	S.D dependent var		264,6438
sum squared resid		1,65E+07	S.E OF regression		265,5225
R-squared		0,014408	Adjusted R-squared		-0,00665
	F(5,234)	0,684147	p-value (F)		0,635861
Log-likelihood		-1677,115	Akaike criterion		3366,23
schwars criteiron		3387,114	Hannan-Quinn		3374,645
	rho	-0,288347	Durbin-Watson		2,500284

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4, 234) = 0.272262
with p-value = p(F(4, 234) > 0.272262)= 0.895673

Model 11: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_production

		COEFFICIENT	std.error	t-ratio	p-value
	Const	146,356	188,694	0,7756	0,4388
	cry	0,846227	0,62438	1,355	0,1766
Mean dependent var		401,0351	S.D dependent var		264,6438
sum squared resid		1,65E+07	S.E OF regression		265,801
R-squared		0,01234	Adjusted R-squared		-0,00876
	F(5,234)	0,584725	p-value (F)		0,711691
Log-likelihood		-1677,367	Akaike criterion		3366,733
schwars criteiron		3387,617	Hannan-Quinn		3375,148
	rho	-0,285653	Durbin-Watson		2,506513

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4, 234) = 0.271692
with p-value = p(F(4, 234) > 0.271692) = 0.896033

Model 1: Fixed-effects, using 240 observations
Included 5 cross-sectional units
Time-series length = 48
Dependent variable: Average_production

		COEFFICIENT	std.error	t-ratio	p-value
	Const	466,415	67,0298	6,958	3.43e-011***
	dwx-value	-0,0581791	0,057653	-1,009	0,314
Mean dependent var		401,0351	S.D dependent var		264,6438
sum squared resid		1,66E+07	S.E OF regression		266,2634
R-squared		0,0089	Adjusted R-squared		-0,01228
	F(5,234)	0,420264	p-value (F)		0,834391
Log-likelihood		-1677,784	Akaike criterion		3367,568
schwars criteiron		3388,451	Hannan-Quinn		3375,982
	rho	-0,303083	Durbin-Watson		2,543968

Test for differing group intercepts -
Null hypothesis: The groupd have a common intercept
Test statistic: F(4, 234) = 0.270749
With p-value = p (F(4, 234) > 0.270749) = 0.896628

Стаття надійшла до редакції 30.10.2014.