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THE ECONOMIC IMPLICATIONS OF ENFORCING THE COMMON AGRICULTURAL POLICY (CAP) IN THE ARAB REGION

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Abstract

The Arab countries do not consider implementation of the joint agreements and policies a priority, which hinders economic development and blocks the way to resolve the political, economic, and social problems taking place in the Arab world today. Integration between the Arabs in at least one specific sector may pave the way for a greater unity in the years to come. This paper discusses the implications of enforcing the Common Agricultural Policy (CAP) in the Arab world. The paper also shows how agricultural integration will lead to an increase in the value of the Arab's agricultural productivity. The Ordinary Least Squares (OLS) method was used for this purpose. This paper utilized a model with two dependent variables viz. dependent variables are Labor and Technology, along with the independent variable i.e. Value of Agricultural Productivity. Findings indicate that the value of agricultural productivity will increase in the long run. Furthermore, the model utilized in analysis proved to be accurate and the results were significant. Therefore, enforcing the Common Agricultural Policy (CAP) in the Arab world will be the first step to achieving full economic integration.

Keywords:The Arab region,Common Agricultural policy, Agricultural productivity, labor, technology

INTRODUCTION

The agricultural sector has many important roles and its major role is for the well-being of humanity. Through agricultural sectors, farmers are expected to produce all the basic necessities of life for the world. The agricultural products are expected to be reliable, safe, nutritious, and in good condition. Moreover, the agricultural sector is needed for the survival of all people especially the poor. The agricultural sector highly contributes to the sustainability, growth, and development of the economy. To keep the function of these roles, agricultural productivity has to grow in a supportable manner.

The goal of this Paper is to provide an understanding to the reader regarding the Arab region's current agricultural situation. The main issue has to do with the fact that the Arab region does not apply a well sound agricultural policy. The Arab Economic Community (AEC), the Greater Arab Free Trade Area (GAFTA), the meaning of agriculture and agricultural trade.

Overview

The Economic and Social Council (ESC) is one of the Institutions of the Arab League, and the ESC's role is to coordinate the Arab League's economic integration. According to the Business Dictionary, economic integration is "an agreement among countries (unification of economic policies between different countries) in a geographic region to reduce and ultimately remove tariff and non-tariff barriers to the free flow of goods or services" (BD, 2017).Therefore, the ESC's job is to encourage Free Trade, and coordinate the Fiscal and Monetary policies in the Arab world. The ESC created the Council of Arab Economic Unity (CAEU) in 1957, and in February 1997 the ESC created an agreement to advance trade among Arab countries hoping to achieve the Greater Arab Free Trade Area (GAFTA).

The Council of Arab Economic Unity (CAEU)

The Council of Arab Economic Unity (CAEU) was founded by 14 countries within the Arab League on May 30, 1964. These countries are Egypt, Jordan, Libya, Iraq, Kuwait, Mauritania, Palestine, Saudi Arabia, Sudan, Tunisia, Syria, Yemen, and the United Arab Emirates. The goal of the CAEU is to unite and organize the economic relations in the Arab league and to set up the best conditions possible to both develop and grow their economies. The United Nations University Institute on Comparative Regional Integration Studies (UNU-CRIS)highlights the bases of economic agreements between the countries in the Council of Arab Economic Unity. The following articles are solicited from the UNU-CRIS document:

- Article 1: Article 1 describes that each member state has the right to:

i) Personal and Capital Mobility

ii) Free exchange of goods and product

iii) Exercise of residence and economic endeavors (work employment, etc.)

iv) Transit and use of ports and airports

v) Possession and inheritance

• Article 2: Article 2 indicates that the countries will work toward the objectives mentioned in Article 1 by:

i) Merging into a unified customs area

ii) Unifying their import and export policies

iii) Unifying their regulations with regard to transit

iv) Jointly negotiating agreements with other states

v) Unifying and coordinating legislation to achieve equal conditions of agriculture, industry and trade among member states

vi) Coordinating legislation with regard to labor and social security

vii) A) Coordinating "government and municipal taxes and duties and all taxes pertaining to agriculture, industry, trade, real estate, and capital investments" to achieve equivalent business climates among member states; B) Avoiding double taxing nationals of member states

viii) Coordinating monetary and fiscal policies

ix) Unifying "statistical methods of classification and tabulations"

x) Adopting any other measures consistent with the stated objectives of Articles 1 and 2.

Greater Arab Free Trade Area (GAFTA)

The GAFTA is a program that was created by the ESC that allows the Arab League to engage in free trade. There are 17 country members in the GAFTA program i.e., Jordan, Morocco, Kuwait, Syria, Tunisia, Bahrain, Lebanon, Libya, Saudi Arabia, Iraq, Sudan, Oman, Egypt, Yemen, Qatar, Palestine, and the United Arab Emirates. The Lebanese Ministry of Economy and Trade stated the main provisions and developments of the GAFTA agreement. However, two of the five main provisions were highlighted due to their relevance to this paper.

Main Provisions

Removal of all non-trade barriers (administrative, quotas, and monetary)

Application of the "Agricultural Calendar" given the following conditions:

- Maximum of ten products to be included on the list per country

- The maximum time allowed for a listed product to remain on the calendar is 7 months (per year) with a maximum of 45 months in total for all listed products.

- The Agricultural Calendar does not authorize prohibitions. Products included in the calendar are allowed to enter, however they do not benefit from the gradual reductions in tariff rates during specific time periods. Moreover, in other periods, the same listed products would be subjected to the lower rates. (The Lebanese Ministry of Economy and Trade, 2016)

There are two main issues with the GAFTA program. The first issue is that the Arab countries are not fully united and there are five Arab countries that are not members. These five countries are: Algeria, the Comoro Islands, Djibouti, Mauritania, and Somalia.The second issue is that the Arab League is not applying the program and the Arab countries are not benefiting from GAFTA.

Agricultural Trade

Agricultural Trade deals with the trading of all final agricultural goods and services between two or more parties. Agricultural trade plays an important role in every country's overall economic development, especially, when it comes to the domestic labor market and agricultural production.

Problem Definition

Fourteen countries founded the Council of Arab Economic Unity (CAEU) so eight Arab countries are not members. The Arab region lacks unity in both the CAEU and the GAFTA. The problem is that the Arab countries are not honoring the ratified agreements regarding free trade. Therefore, unifying the Arab region will fill the weaknesses that each individual country faces. The agriculture sector of the Arab region as a whole will become much more effective and efficient.

Under a proper free trade policy, there will be easier access to agricultural goods and services for both consumers and producers which will increase the social welfare level of the Arab region.

LITERATURE REVIEW

Agriculture in the Arab Region

The Arab Organization for Agricultural Development: The First Strategy

In 2005, the Arab Organization for Agricultural Development (AOAD) posed the first strategy for Arab agricultural development. The report was named "Strategy for Sustainable Agricultural Development for the Upcoming Two Decades" (SSADUTD) and it was approved by the League of Arab States. The main purpose of this strategy was to enhance competition of Arab

agricultural goods and services globally, attain agricultural integration in the Arab world, and ensure food security and demand.

Several consecutive meetings were held for two whole years and the strategy was finally approved on the 29th of March 2007 by the Riyadh Arab Summit (RAS). The RAS called on the AOAD to implement the strategy jointly with all the concerned members. The AOAD was asked to submit annual reports on their progress to the Arab Economic and Social Council (AESC). (SSADUTD, 2007)

The report also highlights important lessons learnt from past experience such as lack and scarcity of water resources, limited improvement in technology, shortages of agricultural products and services, imbalances between improving production and marketing services, and inequalities in food security and self-sufficiency. (Ibid, 2007)

The Arab Region's agriculture sector faces many challenges that require long term solutions. These challenges become clear when comparing Arab agriculture with the developed countries. Advanced countries such as the USA and the UK invest in their agriculture sector to ensure growth in agricultural development. Thus, the challenges are not only based on the country's resources but it is also based on investment. Therefore, progress cannot be achieved without a price that should be paid. (Ibid, 2007). The strategy emphasizes on improving the limited water resources, coping with both international and regional changes, investing in new agricultural technology, implementing a unified economic and agriculture policy, increasing the efficiency of farmers through training, encouraging Arab investments to Arab agriculture, attaining stability in rural areas, ensuring food security, and increasing competition of Arab agricultural products globally. (Ibid, 2007)

The AOAD strategy laid out their future vision and objectives through several detailed developmental programs. Each developmental program includes a sub-program and additional components to the sub-program. The project also linked every developmental program with other strategies either directly or indirectly. Furthermore, the AOAD project created seven developmental programs, thirty-four sub programs, and one hundred and fourteen developmental components (SSADUTD, 2007).

Current Situation

Although several strategies were created and approved by the Arab countries, none of these strategies were fully implemented. It is true that the Arab region did show some improvement when it comes to free trade within each other, but this was just a minor and halted improvement. The reality is that many Arab politicians are not interested in developing the Arab region but are only interested in their own interests. Moreover, achieving Arab integration today is tougher than

it was before due to the region's mass ideological differences. Sectarianism in the Arab world has flourished and the problem with sectarianism is that it shapes the current life of the Arab people. For example, if a political leader from a certain sect takes power, most of the followers of that sect follow this leader's decisions blindly. Therefore, the Arab region's first step is to acknowledge this issue and seek a solution.

RESEARCH METHODOLOGY

Regression Analysis

Regression analysis is a statistical and predictable process to forecast the changes in specific variables. Variables can be dependent (returns, gains...) and independent (income...). The regression analysis model measures the changes in the dependent variables based on the change of one or more independent variable. Regression analysis introduces the quantitative effect of variables caused by other variables. In addition, it includes the 'statistical significance 'that is the degree of confidence of the true relationship and its closeness and connectedness to the predicted relationship.(Sykes, 1983)

Regression analysis could be used to start a business or any endeavor, by which it helps to create the perfect image and shows how to focus and manage the changes. Moreover, it helps to figure out the closeness of the dependent and independent variables and how the circumstances are taking their place. Also it is commonly used to forecast events that didn't happened yet. Suppliers and sellers depend heavily on regression analysis to predict the quantity demanded on specific purchases. Many insurance companies focus on this model to estimate car accidents or victims holding their company's insurance cards (Ozyasar, 2006).

In order to use the regression analysis model, there should be a strong theoretical foundation between the two variables. Moreover, valid data is required, and the best data used for regression is the data that is numerical.

The Equation of the Regression Analysis

$Yi = \alpha + \beta Xi + \varepsilon i$

i: number of observations

α: intercept of the true line

β: slope

εi random errors of ith observations

Xi: observed score on the independent variable

Yi: observed score on the dependent variable

Regression Analysis on Arab Agriculture

This section provides varied agricultural data for all 22 Arab countries. The parameters used are: The size of skilled agricultural Labor, the Level of Technology (number of machines), and agricultural productivity in US Dollar (Table 1). This paper will use an agricultural productivity model based on two parameters i.e., labor and technology. The productivity model I as follows:

- $Y= \beta 0 + \beta 1X1 + \beta 2X2$

X1: The size of skilled Labor.

X2: The Level of Technology.

Table.1. Dependent and Independent Variables

Country	Size of Skilled Agricultural Labor (independent variable)	Agricultural machinery: refers to the number of wheel and crawler tractors	Agricultural Productivity (Million) ($) (Dependent Variable)
Iraq	1,922,400	192,480	8,362
Sudan	9,600,000	30,330	30,525
Oman	48,440	752	1,132
Yemen	5,566,240	26,484	3,580
Qatar	23,016	343	263,0
The Palestinian territories	42,306	98,166	1,031
Algeria	3,686,370	203,698	19,230
Comoros	196,160	13	190,1
Mauritania	659,000	920	362,1
Djibouti	29,460	34	10,685
Somalia	2,207,390	3,233	55,934
Jordan	41,100	23,944	1,380
Egypt	909,288	201,085	37,431
Morocco	4,707,640	198,623	12,871
Kuwait	29,676	371	787,6
Syria	608,090	407,950	15,320
Tunisia	594,072	168,919	4,167
Bahrain	7861	63	98,1
Libya	202,810	165,975	2,213
Saudi Arabia	781,890	49,494	14,626
United Arab Emirates	356,090	1,588	2,866
Lebanon	102,564	37,936	2,109

Sources: CIA Fact Book and the World Bank.

Data and the productivity Model

The basic hypothesis that this paper will test is the effect of imposing the Common Agricultural Policy (CAP) on the Arab World. The impact is expected to be positive in relation to the value of

agricultural productivity i.e. adding more Labor and Technology will lead to a positive increase in the value of agricultural productivity. The question that remains is: By how much the value of agricultural productivity will increase? The following equation will explain the relationship between the three variables utilized by the productivity model:

$AP = \beta_0 + \beta_1 LAB + \beta_2 TECH + \varepsilon$

All of the variables in the above equation i.e., definition, unit of measurement, and data sources are presented in the following table 2.

Table 2. Variables and Data Sources

Label	Variable	Definition	Unit of Measurement
AP	Dependent	Agricultural Productivity	US Dollars
LAB	Independent	Number of Skilled Laborers	Per Person
TECH	Independent	Technology	Level of Technology

The data for the variables was collected from two sources, the World Bank (2016), and the CIA World Fact Book (2016). Information on the value of agricultural productivity for each country was calculated by using the Gross Domestic Product (GDP) of each country .The GDP of the specific country was then multiplied by the percentage of the contribution of the agriculture sector to GDP.

Moreover, information on the size of skilled labor was derived by considering the percentage of Labor in agriculture for each country and then multiplying the percentage of Labor by the Labor Force of the specific country. The latest data for technology in the Arab world was solicited from the Food and Agriculture Organization (FAO) (2015).

The results of the model were obtained using the Ordinary Least Squares technique (OLS). The results were generated using SPSS software V.24.

ANALYSIS AND FINDINGS

The results of the OLS method for the Agricultural Productivity (AP) model is shown in table 3. It is worth noting that table 3, is a combination of three tables in (SPSS). The three tables are the coefficient table, the ANOVA table, and the model summary table. This section will discuss the AP regression equation, the T-test, the F-test, Autocorrelation, Multicollinearity, and Heteroscedasticity.

Table 3. Ordinary Least Squares Estimation for the AP Model

Dependent Variable is AP				
Parameters		Coefficient	Standard Error	T-Ratio [Prob.]
Constant (CON)	β_0	1.7**	646956499.100	2.563[.019] *
Labor	β_1	232.444	25.135	9.248[.000] *
Technology	β_2	8893.733	4669.667	1.905[.072] *
R-squared		.82	R-Bar Squared	.801
S.E of Regression		2313620680	F-stat. F (2,19)	5.926
Mean of AP		3638177636	Residual Sum of Squares	1.017E+20
Durbin-Watson Statistic		2.030	Regression Sum of Squares	4.643E+20
Variance Inflation Factors(VIF)				
1.008		Tolerance	.992	
* Refers to 5% significance level.		**Billions	Note: E+20 means: (*10^20)	

According to the table above, the regression equation has the following form:

AP= 1.7 + 232LAB+8894TECH

This equation shows that if:

a) The size of skilled labor increases by one unit, the value of agricultural productivity increases by 232 units. This means that bringing one extra labor into Arab agriculture will lead to an extra $232 in the value of agricultural productivity.
b) The level of technology increases by one unit, the value of agricultural productivity increases by 8894 units. This means that bringing one extra unit of technology into Arab agriculture will lead to an extra $8894 in the value of agricultural productivity.
c) LAB and TECH= 0, then AP=1.7 billion USD (this coefficient at a zero value of the independent variables will show a mathematical significance only).

It is worthy to mention that high correlations may lead to an inaccurate estimate of the model. The problem is usually associated with Multicollinearity. Multicollinearity means that the independent variables heavily rely on each other. Furthermore, two measures were used to detect Multicollinearity. The first measure shown in the table is the Variance Inflation Factors (VIF) and this measures the level of correlation between the independent variables in a regression model. The maximum level the VIF should have is 10 (Kutner, 2004). The second measure shown in the table is Tolerance and it is estimated by [1-R^2]. The minimum level of tolerance has a value of 0.1 (Ibid, 1989). This model has no problem of Multicollinearity because the VIF is less than 10 (VIF<10) and the Tolerance is greater than 0.1 (Tolerance>0.1).

The next concern is whether or not each individual variable is statistically significant. This relies on the t-test in the table above.

1. H_0: ***$f\beta_1=0; \beta_2=0$***
   H_1: ***$\beta_1\neq0; \beta_2\neq0$***
2. $\alpha = 0.05$
3. t_1= 9.25 (for the LAB parameter); t_2= 1.905(for the TECH parameter); Tabular-t (one-tailed, d f 20) = 1.729

According to the above results, the null hypothesis (H_0: ***$f\beta_1=0; \beta_2=0$***) is rejected. Therefore, each independent variable is statistically significant.

Furthermore, the results showed that the two independent variables (Labor and Technology) explain 82 percent of the variation of the dependent variable (Agricultural Production). Since R^2 is greater than 80 percent, this means that agricultural productivity was greatly explained by the independent variables (the size of skilled Labor and the Level of Technology). This confirms the ANOVA results where the sum of squares regression is higher than the sum of squares residuals (shown in the table above).

Moreover, another hypothesis is proposed to further test the quality of the AP model. The new hypothesis is: at least one independent variable (Labor or Technology) explains the dependent variable (Agricultural Productivity).

1. H_0: $f\beta_1=\beta_2=0$
   $H_{1:}$ At least one independent variable explains the dependent variable.
2. $\alpha = 0.05$
3. F (regression) = 43.368; F boundary for the regression and the residual is 2 and 19 such that: F (2,19) = 5.926

The value of the calculated Fisher's Statistics (F) is greater than the value of the Fisher's statistics derived from the F-table. Thus, the null hypothesis (H_0: ***$f\beta_1=\beta_2=0$***) is rejected and at least one of the independent variables explains the dependent variable.

Moreover, the results of the correlations coefficient showed that there is a significant positive correlation between the dependent variable (Agricultural Productivity) and the independent variable, the size of skilled labor. Furthermore, there is a significant positive correlation between agricultural productivity and the level of technology. However, there is a significant negative correlation between the two independent variables labor and level of technology such that the more labor is brought into agricultural production, the less technology is utilized which indicates that there is a light degree of substitution between labor and technology taken together. The Correlations results are shown in table 4, As follows:

Table 4. Correlations

		AP	Labor	Technology
Pearson Correlation	AP	1.000	.887	.107
	Labor	.887	1.000	-0.87
	Technology	.107	-.087	1.000
Sig. (1-Tailed)	AP	.	.000	.318
	Labor	.000	.	.350
	Technology	.318	.350	.
Note: N=22 (Represents All Arab Countries)				

Reliability of Results

This section discusses four diagnostic tests for the AP model. The diagnostic tests are: The Durbin-Watson Test for Autocorrelation, The Normality Test, and the Beursh-Pagan and Koenker Tests.

The Durbin-Watson test is used to examine whether or not Autocorrelation exists. The Durbin-Watson (DW) statistic always has a value between 0 and 4 and if DW is between 0 and 2, then there is no need to test for positive Autocorrelation. However, if the DW is between 2 and 4, then it is necessary to test for negative Autocorrelation.

For the AP model, the DW is 2.030 (shown in table 3), and although the number is very close to 2, it is necessary to test for negative Autocorrelation. The sample consisted of 22 observations (all Arab countries) and 2 independent variables. Therefore, for n=22, k=2, and 5% significant level, the lower and upper critical values are: d_L=1.147 and d_U= 1.541. Since the DW value of 2.030 is less than "4-d_U", it can be safely concluded that there is no Autocorrelation in the residuals.

The normality test characterizes data further through skewness and kurtosis. The test will determine whether or not the model will satisfy the conditions of normality of residuals Kurtosis measures whether or not there are outliers and Skewness measures the lack of symmetry (Hamdar & Nouayhid, 2017). The descriptive statistics are shown in table 5, below.

Table 5. Skewness and Kurtosis

	Statistic	Standard Error
Skewness	1.197	0.491
Kurtosis	0.981	0.953

One way to measure whether or not skewness exists is by multiplying the Standard Error of the Skewness by 3 and if the statistical value of the skewness is less than the number, then the errors are normally distributed. It is worthy to mention that the same applies for Kurtosis. The

values after multiplying by 3 are: 1.473 for skewness and 2.859 for Kurtosis. Since the statistical value of skewness and kurtosis are less than the numbers mentioned above, the errors are normally distributed.

The final test is to measure whether or not Heteroscedasticity exists. Heteroscedasticity "refers to the circumstance in which the variability of a variable is unequal across the range of values of a second variable that predicts it. If Heteroscedasticity exists, the variables in the scatterplot will "create a cone-like shape as the variability of the dependent variable widens or narrows as the value of the independent variable increases." It is worthy to mention that Homoscedasticity is the exact opposite, or the inverse of Heteroscedasticity. Thus, Homoscedasticity shows that a specific dependent variable's variability is equal across the values of the independent variable. The results are shown in table 6 below.

Table 6. Breush-Pagan and Koenker Tests

	Breush-Pagan	Koenker
Chi square (df=P)	0.961	0.766
Sig. Level of Chi Square (df=P)	0.6184	0.6819
Regression SS	1.9227	
Residual SS	53.3161	
R-Square	0.0348	
** Significance Level: 5%	** N=22 (which represents all Arab Countries)	

The results above show two methods that test for the existence of Heteroscedasticity. The first method is known as the Breush-Pagan (BP) test and the second method is known as the Koenker test. The BP and Koenker test shows Chi-Square values, thus, both follow the Chi-Square distribution. The probability values for both are greater than the 5% level of significance, therefore, the null hypothesis of Homoscedasticity is not rejected which implies that the residuals are Homoscedastic.

The four diagnostic tests (Normality, Durbin-Watson, Koenker, and Breush-Pagan) verify that the model is accurate because (1) the relationship between the conditional mean of the dependent variable (Agricultural Productivity) and its independent variables is linear, (2) no Autocorrelation is present, and (3) the residuals are Homoscedastic. Therefore, the results of the AP model are reliable.

CONCLUSION

The Common Agricultural Policy (CAP) would be a very efficient policy once implemented in the Arab world. Arguably, the CAP will cause dramatic changes and significant improvements in general and on the economic level in particular. One of the greatest advantages concerning this

policy is that it unifies all the Arab countries .Furthermore, the results of the model reveals that once imposing the CAP in the Arab world, labor and technology will influence the value of agricultural productivity significantly. Moreover, it is worthy to mention that imposing the CAP is the first step to achieving economic integration in the Arab region. Arab countries vary in crop production due to the different environmental conditions. For example, fruits and vegetables production is usually better in the Arab countries outside the Gulf region due to better water resources and lager areas of arable land. These environmental differences generate different food demand in each country. Therefore, free trade in agricultural products within the Arab region will benefit the Arab world.

The results also showed that an increase in the value of agricultural productivity will occur once the Arab countries achieve a common policy for agricultural integration. The integration in Arab agricultural will also contribute greatly to the macro-economy and lead to a higher standard of living. Moreover, the findings of the analysis indicated that the two independent variables in the model (Labor and Technology), are significantly correlated with the dependent variable (Agricultural Productivity). This means that as labor and technology increase, the value of agricultural productivity increases. Therefore, agricultural integration in the Arab world is both effective and efficient. Thus; the CAP will lead to an increase in investment in the countries with large areas of arable lands, which in turn will create many job opportunities for farmers.

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