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Motivations and Future of the Economic Reform in Egyptian Agriculture

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Abstract. This study includes three parts, the **first** of which presents the most important components and objectives of the Agrarian Economic Reform Program.

The **second part** is concerned with studying and detecting the economic impact of the liberalization of agricultural pricing policies in the agricultural sector and the national economy which began in 1987. The study points at some positive effects which result in an increase in the area planted with strategic crops (wheat, rice and maize), while that covered by cotton remained unchanged. Together with the increase in productivity per feddan, this led to an increase in self-sufficiency rates for most of the agricultural crops dealt with as well as to a noticeable increase in farm prices which, in turn, resulted in the increase of the economic efficiency of most crops in terms of the increase of the net return of the feddan, the value added and the return per L.E.

The **third part** includes fundamentals and criteria that could be relied upon and taken as a guide in identifying the credit prices through which the state can enter commodity markets as a buyer in an optimal way. This ensures a minimum limit of farm prices and stock reserves to be supplied for purchase when needed in order to achieve the balance in prices and markets. These fundamentals include the identification of credit prices on the basis of production costs, equivalent international rates, equal prices, and price trends. The study considers the variation of farm prices estimated by using these bases, where prices of some crops were higher than real prices (whereas they were lower than their actual equivalents for other crops.

Keywords. Structural adjustment/Agricutlural sector/Economic regions – Self-sufficiency – Rate of protection – Costs of production

Résumé. *Ce chapitre est composé de trois parties :*

*• La **première partie** présente les composantes et les objectifs du programme de réforme économique dans le secteur agricole.*
*• La **seconde partie** analyse les effets de la libéralisation des prix agricoles sur le secteur agricole et l'économie nationale.*
L'étude met l'accent sur l'augmentation de la surface cultivée par les produits dont les prix ont été libérés (blé, riz, maïs) tandis que la surface cultivée en coton n'a pas évolué. L'augmentation des prix d'achat aux producteurs agricoles et l'augmentation de la productivité par feddan ont donné comme résultat une amélioration de l'efficacité économique pour la majorité des cultures en terme de revenus nets par feddan, de la valeur ajoutée et du rendement par livre égyptienne (L.E.) dépensée.
*• La **troisième partie** expose les critères pris en compte pour identifier les prix de crédit en se basant sur les coûts de production, l'équivalent du taux international, les prix de parité et les prix de tendance.*
L'étude analyse les variations des prix à la ferme estimés selon ces différentes méthodes.

I – Introduction

During the sixties and seventies the agricultural policy in Egypt in general and the pricing policy in particular were biased in favour of consumers and other sectors of the national economy at the expense of the agricultural sector itself. At that time the state policy favoured the industrial sector. This policy largely favoured an increasing contribution of agriculture, as the prevalent sector, in financing the industry and supporting the other sectors of national economy.

That period was characterized by state intervention in the marketing and pricing of agricultural crops, with the aim of mobilizing surpluses into other sectors of the national economy.

Since the beginning of the sixties, the state applied a system of obligatory delivery for a number of agricultural crops. According to this system, farmers delivered their production to the government at low prices fixed by the state, the delivery rate differing from one crop to another.

Cotton, sugarcane, and soybean were among the crops under the obligatory delivery system, with a rate of supply of about 1.5 tons/feddan. For wheat, the rate of supply reached 1–3 ardabs/feddan. However its obligatory supply was abolished from 1976 until 1984—during which wheat delivery was left optional—but reappeared since 1985 when the rate was 2 ardabs/feddan for areas exceeding one feddan.

The rate of supply for onion amounted to approximately 6–8 tons/feddan. As regards peanuts and sesame, farmers had to deliver all their production leaving only the amount necessary for seeds, i.e., 2 ardabs for peanuts and 4 kg for sesame. The delivery rate for faba beans amounted to 2 ardabs/feddan and approximately one ardab for lentils. There was no obligatory delivery for maize, except in 1985 when it was decided that 2 ardabs/feddan should be delivered for areas exceeding one feddan.

To ensure due commitment to supply, a fine—that differed from one crop to another—was imposed on those who abstained from the obligatory delivery. In addition, transportation of such crops between provinces was prohibited. The procurement prices were lower than their equivalents in the free market.

These differences in prices posed a big burden in the agricultural sector but benefited to other sectors of the national economy. They also accounted for the fact that farmers frequently attempted to avoid planting these strategic crops and planted other crops instead (not subjected to the obligatory delivery and characterized by a relative superiority as regards prices and profitability). Moreover, farmers escaped from supplying some of the determined amounts preferring to pay the fine imposed upon them. This did affect the crops productivity and the portion of self-sufficiency realized in it.

The system continued to be applied until 1986–87. Since 1987–88, the Ministry of Agriculture and Land Reclamation, as a leading ministry in the economic reform program, started implementing an agricultural economic reform program. This program included a wide number of criteria, some of which involved pricing and marketing policies. Other criteria are related to external agricultural trade. Furthermore, the program includes different criteria concerning the institutional reform in the agricultural sector as well as the implementation of some national economic reform standards in the agricultural sector. The most important components of the agricultural economic reform program in Egypt are:

i) the abolition of the system of obligatory delivery, of governmental pricing and of the determination of planted areas for all crops—except for cotton and sugarcane which are now subjected to on-going studies aiming at excluding them from that system;
ii) the increase in the prices of crops subjected to the obligatory delivery and to state pricing bringing them closer to international prices;
iii) phasing out the subsidies on the agricultural production inputs;
iv) suspension of governmental restrictions imposed over the private sector in the exportation and importation of agricultural crops;
v) abolition of governmental restrictions on the private sector in importation and distribution of the agricultural inputs;
vi) gradual transformation of the Principal Bank for Development and Agricultural Credit (PBDAC) from an importer and distributor of agricultural inputs to a funder of agricultural development projects;
vii) restricted role of the state in the ownership of the newly reclaimed lands and in encouraging the private sector and youths to own, reclaim and cultivate these lands;
viii) limiting the role of the Ministry of Agriculture to research, extension, technical aid, policy-making, agricultural economics and statistics, without any intervention in the field of production or distribution;
ix) reviewing the law that regulates the relationship between owners and tenants of the cultivated lands to achieve justice and efficiency;
x) changing the interest rate on agricultural loans to reflect the commercial interest rate; and
xi) altering the rate of exchange to reflect the real value of the local currency.

The program aims at the gradual liberalization of the agricultural sector from all the imposed restrictions and distortions. It aims, as well, to encourage the private sector, improve the rates of exchange in agriculture and alleviate the burden put on it for long years. The program is also designed to: stimulate and encourage farmers to use modern technology in agriculture thus increasing the cultivated areas, productivity and farm incomes; improve the standard of living; make food available to citizens at reasonable

prices; increase exports; maximize the contribution of the agricultural sector to the economic and social development of the country.

II – Effects of the Economic Reform Program on Egyptian Agriculture

Applying any particular program would probably have a number of positive implications that will affect, in turn, the various sectors of the national economy. It is very important to evaluate these effects with sufficient accuracy to measure the extent of appropriateness of this program and to introduce the required amendments.

In spite of the fact that agricultural economic reform policies are still in a primary stage (since restrictions imposed on this sector were loosened starting from 1987), it is difficult to reasonably assess or quantitatively measure their effects on the agricultural sector and national economy. Such an assessment has to be done after some time, which allows the follow-up and measurement of these effects. Yet, it is possible to note and analyze some of the results that have been built on the application of these policies up to now.

Hereafter, the effect of the policy of liberalizing agricultural prices is discussed, as it is considered the most important ingredient in the program of economic reform in Egyptian agriculture and trace its influence on some of the economic variables in the agricultural sector (namely the cropping pattern, total production, productivity per feddan, net revenue per feddan, farm price, the added value, the actual rate of exchange, the supplied quantities, the outcome per expended pound, and the rate of self-sufficiency). A comparison of these variables between 1985 and 1989 is made to reach a stand *vis-à-vis* the extent of change that occurred as a result of the liberalization policy that started in 1987.

1. Cropping Pattern

The cropping pattern expresses the percentage of land occupied by the various crops in crop rotation. This is determined by specifying the area cultivated with each crop and the system of crop succession. The optimal crop pattern is that which achieves the greatest possible income, and it is reliant on the prices of both inputs and outputs and on the productivity per feddan.

It is worth mentioning that the optimal cropping pattern is a dynamic process that differs from one year to another according to the extent of the farmer's commitment to the implementation of the crop rotation and to the farmer's requirements for food (for his household) and feed (for his animals). It is equally true that the cropping pattern is affected by the amount of profits that crops achieved in the previous year. In addition, the optimal cropping pattern, considered from the individual point of view, is different from the economic, social or national point of view.

A competitive relation on the limited cultivated area exists between the crops planted in one season as is the case with wheat, beans, clover, flax, winter onion and cotton in the winter season; and between maize, sorghum, rice, and cotton planted in the summer. Therefore, increasing the area covered by one of these crops means decreasing the area for others.

Table 1 shows the cropping pattern of Egyptian agriculture in 1985 and 1989. In comparison with 1985, there was obviously an increase in the areas planted with wheat, beans, and flax in 1989. The rate of increase amounted to 27.99%, 10.69% and 5.13% respectively.

On the other hand, a decrease is observed for areas cultivated with long season berseem, barley, lentils, and onion. The rate of the corresponding decrease reached approximately 17.26%, 26.61%, 15% and 19.23% respectively.

As for summer crops, it is clear that areas cultivated with rice, maize, peanuts and sesame have increased by 5.62% , 4.49%, 14.29% and 13.64% respectively.

The areas for growing sorghum, soybean and cotton have decreased by 10.59%, 22.69%, and 6.94% respectively. Those cultivated with fruits and vegetables have also increased. This could probably be a

reflection of the currently applied policies which led to the liberalization of the marketing of wheat, beans and peanuts which resulted in the increase of the relative profitability of these crops and hence to the extension of the areas they occupied.

2. Productivity

Productivity is the outcome of the interaction of various factors among which we can mention: the quality of the soil, its degree of fertility and the extent of available nutrients essential for plants; climatic conditions, such as temperature, humidity and the speed of wind. Other factors concern the technical treatments of each crop in addition to economic factors such as its price and the profitability per feddan.

Table 2 shows the increase in productivity per feddan for all crops under study, except for barley, cotton, and soybean. The rate of increase varied from one crop to another, and reached its maximum for wheat (nearly 31.53%) and its minimum for flax (nearly 3.47%). This may reflect the level of various agricultural practices for growing these crops, including the preparation of seedbeds up to the harvest, the use of technological innovations, such as improved seeds, and the results of scientific research.

3. Total Production

The total production of a given crop depends on the cultivated area and the productivity per feddan. Production increases with the extension of the cultivated area, or productivity, or both. Production may also increase with the decrease of one of these and the increase of the other, especially if the increase in the one exceeds and redress the decrease in the other.

Table 2 shows the total production estimates for some winter crops (e.g., wheat, barley, beans, lentils and onion) and for some summer crops (e.g. cotton, rice, maize, sorghum, peanuts, sesame, soybean and sugarcane). The table shows an increase in the total production in 1989 compared to 1985. This is true for all the crops (except barley, onion, cotton, and soybean) whose total production decreased due to both the reduction in the planted area and productivity for cotton, barley and soybean. For onion, this was due to the reduction in the cultivated area in spite of the increase in productivity.

4. Farm-Gate Price

It is noted that there were high increases in farm-gate prices between 1985 and 1989. The price of wheat increased by 39.7 L.E/ardab, that of cotton increased by 104.8 L.E/quintar and that of rice by 150.5 L.E/ton. Maize increased by 29.4 pounds/ardab and soybean from 285 to 800 pounds/ton.

In addition, the rate of increase reached its maximum in soybean culminating to 181% and its minimum in winter onion, down to 32.7% *(Table 2)*.

5. Net Return of Income

The net return is referred to as the difference between the value of production, evaluated by local prices, and the costs of production. *Table 3* demonstrates the net return per feddan for the previously mentioned crops in 1985 and 1989. Accordingly, it is clear that there are major increases in the net return of income/feddans for all crops, except barley. In addition, the rate of increase reached its maximum for soybean (1715%) and its minimum for onion (17.22%). The rate of increase more than doubled for certain crops (e.g., wheat, broad beans, lentils, cotton, rice, maize, sorghum and sugarcane).

6. The Added Value

The criterion of the “added value” is considered as one of the economic efficiency indicators used for measuring the profits which the land unit can accomplish. It expresses the total revenue after deduction of the value of production inputs purchased from outside the farm which include organic manure, chemical fertilizers, pesticides and seeds.

If we consider the added value for the crops studied for 1985 and 1989 (see *Table 3*), it obviously increased in 1989 compared to 1985—almost by 153.3% which is the maximum for soybean—; the average increase estimation for all the crops is 80.6%.

7. Return per expended pound

Table 3 illustrates that the return per expended pound for one feddan for the crops under study varied from 0.06 to 1.16 pounds in 1985. On the other hand, it varied from 0.26 to 1.87 pounds in 1989. The table indicates that all products, except for barley and onion, accomplished an increase in the return per pound in 1989 compared to what was achieved in 1985. For example, the rate of increase reached 1,033% for soybean, nearly 139.7% for wheat, and about 195.24% for maize.

8. Rate of Self-Sufficiency

Self-sufficiency may mean to eat what we produce, or to produce what we eat, regardless of the convenient quantitative and qualitative nutrition standard. Economists tend to evaluate the percentage of self-sufficiency by measuring the percentage of production according to available or actual consumption and not to convenient consumption. This is applied in the case of loss or excess in the consumption of the crops above. In other cases there might be a shortage in the amount available for consumption or actual consumption as regards the convenient consumption quantatively and qualitatively. The available quantity for consumption is estimated to include: *Production – Export + Import + Changes in storage – Loss – Non-human consumption*. When the export or import of a specific commodity is prohibited, then the quantity available for consumption may be equal to production. This means that the percentage of self-sufficiency in this case may be 100% although the nutrition standard may not be quantitatively or qualitatively convenient.

Table 4 shows the rates of self-sufficiency for different crops during two years, 1985 and 1989. It is clear that rates of self-sufficiency increased as follows: for wheat from 23.7% to nearly 36%; broad beans from nearly 90% to 100%; lentils from 37.5% to 49%, flax from 104.5% to 110%, onion from 111% to 113%; maize from 74.2% to 81.2%, and sugar from 51.8% to 64.5%. Whereas the rates of self-sufficiency have decreased for cotton, rice and soybean from nearly 136.5%, 107%, 96.6% to nearly 92.2%, 101%, and 66% respectively.

On the other hand, rates of self-sufficiency in peanuts and sesame remained nearly unchanged. In addition, the rate of self-sufficiency for cotton did not take into consideration that Egyptian cotton is exported at high prices, averaged to 240 cents per pound in 1989. Whereas the price of imported American cotton did not exceed 112 cents per pound. On this basis, if we take into consideration the value of exports and of imports, the rate of self-sufficiency in cotton would exceed 100%.

9. Supplied Quantities

A study of the delivered quantities of some crops in 1985 and 1989, especially those which have been left for marketing optional supplying—or according to specific announced prices such as cotton, broad beans, lentils, maize and rice—showed an increase of the delivered quantities of wheat from 737 thousand to 1,190 thousand ardabs. As for broad beans, the delivered quantity increased from 637 thousand to 750 thousand ardabs. Concerning rice, the delivered quantity increased from 933 thousand to 987 thousand tons. The delivered quantity decreased for lentils but increased for maize *(Table 4)*.

10. Effective Exchange Rate

The effective exchange rate is defined as the number of units of the local currency that are paid or collected against the obtention of one unit from foreign currency. This value is obtained by dividing the local price of a commodity by the international price of the same commodity in foreign currency whether the commodity is exported or imported.

This criterion shows the degree of protection which the producer enjoys, or the burden laid on him, as a result of state intervention in the pricing of agricultural crops. If the effective exchange rate is greater

than the shadow exchange rate, this indicates that the commodity is protected. Subsidizing for this commodity is evaluated by the equivalent difference between the effective exchange rate and the real shadow exchange rate of the commodity.

Yet, if the effective exchange rate is less than the shadow exchange rate, this indicates that the commodity is not protected or taxed. The imposed tax upon the commodity is equal to the difference between both the actual exchange rate and the shadow exchange rate for each unit of the commodity.

Table 5 illustrates the effective exchange rate for agricultural crops included in Egypt's foreign trade taking into account crops exported either for 1985 or 1989. The data indicate that the effective exchange rates for crops such as broad beans, raw flax, winter onion, and cotton, are less than their equivalent exchange rates shadow. This means that these are unprotected or taxed commodities whereas products, such as lentils, rice, maize, peanuts, sesame, soybean, and sugarcane, are protected to increase their effective exchange rates greater than their equivalent shadow exchange rate. This rate is estimated to be nearly 0.83 L.E./dollar during 1985, whereas in 1989, it was 2.38 L.E./dollar. The data showed that all crops were unprotected or taxed as a result of the decrease in their effective exchange rate below the estimated shadow exchange rate.

11. Effective Rate of Protection

The effective rate of protection is considered a more comprehensive criterion to measure the effect of state intervention in the marketing and pricing of agricultural crops. It takes into account all kinds of price incentives, input subsidizing and different taxes imposed on the product or the producer. This criterion measures the overall effects of all forms of protection and commodities. This estimation is done by dividing the value added in local currency by the value added in international prices through the use of the shadow exchange rate.

N.B. Value added in international prices = Value of production evaluated at international prices – Value of production factors

The real protection that each activity enjoys varies according to the variation of the above criterion. For instance, if the value of the effective rate of protection is greater than one, this means that the product or the producer enjoys positive protection. This situation entails the allocation productive resources to the production of this commodity which is subsidized by the state. But if the value of the effective rate of protection is less than one, it means that the commodity suffers from negative protection (taxed) since the value added in local currency is lower than its equivalent in international prices. Thus, the productive resources will be diverted from the production of this commodity.

Table 5 estimates the effective rate of protection for exported crops, such as cotton, lentils, rice, maize, peanuts, sesame, soybean, and sugarcane which enjoy positive protection. The value added for these crops at international prices exceeds its equivalent in local prices. Whereas crops like broad beans, raw flax and onion were subjected to negative protection in 1985. As for the situation in 1989, all crops were subjected to negative protection when the effective rate of protection was lower than one. This means that, for these crops, the value added in international prices was higher than the equivalent in local prices.

III – Future of Economic Reform in Egyptian Agriculture

The program of Agricultural Economic Reform implies liberalizing agricultural pricing policy. This necessarily requires liberating the marketing of agricultural crops and leaving prices to be determined by the interaction of market forces. It might lead to some violent fluctuations in farm prices with the consequent undesired effects on farm incomes, agricultural production, consumers and some industrial sectors that use agricultural raw materials.

This means that the state's role should continue in order to:

i) minimize monopoly and other forms of organization which disrupt market efficiency and the proper provision of marketing information;

ii) ensure the free interaction of market forces;

iii) encourage competition;
iv) prohibit the various forms of cheating and manipulation; and v) ensure quality control.

State intervention will also be needed to ensure the relative stability of prices and markets. This can be done through indirect methods and ways. For example, the state enters the free market of crops as a buyer in an unobligatory manner so as to ensure a minimum limit of prices for agricultural crops and the availability of reserve stocks that could be released whenever it is needed to balance prices and markets. Thus, the indirect role of the state is more difficult and important than its direct role that mainly relies on administrative orders and price stabilization.

The following are the different bases upon which credit prices for agricultural crops are identified.

1. Production Costs-Based Pricing

This is the most applicable way known in identifying farm prices. It depends on the total production costs so that farm price can cover production costs and allow a satisfactory income for the farmer. This income can be estimated according to a specific percentage of the production costs, which may differ from one year to another and from one crop to another depending on to the state of production, production costs, and the importance of the given crop within the national economy.

It is worth mentioning that in spite of our belief that price should cover production costs and allow a reasonable net return to the farmer, the dependency on production expenses only as a basis for estimating agricultural prices does not reflect the optimal efficiency in resource allocation and production. This method concentrates on the supply side only and ignores other factors such as demand and international prices. Although it is important in identifying prices, it is limited to income distribution and ignores the allocation of agricultural production. In addition, pricing based on production expenses only implies that the price will decrease if productivity increases through the use of modern technological means in agriculture (e.g., fertilizers and improved seeds or improving agricultural practices).

In addition, farm prices are estimated for cotton, broad beans, lentils, winter onion, barley, raw flax (as winter crops) and for cotton, maize, rice, sorghum, peanuts, sesame and soybean (as summer crops) in addition to sugarcane for the 1981–89 period.

Thus, the farm price is estimated by using production costs plus a net return for the farmer which is evaluated as being nearly 50% of the total costs.

$$\text{Farm price} = \frac{\text{Total costs/feddan} + 50\% \text{ of the total costs} - \text{Value of by-product}}{\text{Average of production}}$$

Table 6 presents farm prices thus estimated for the above crops. They indicate that the estimated averages of farm prices are higher than the actual equivalents for crops such as barley, flax, cotton, peanuts, and soybean. Meanwhile, the estimated averages of prices were lower than their actual equivalents. For instance, the estimated prices were nearly 18.65, 45.89, 89.80, 92.79, 27.92, 194.8, 29.96, 96.10 and 28.17 pounds per unit for wheat, broad beans, lentils, onion, maize, rice, sorghum, sesame and sugarcane, respectively. However, the actual prices were 28.32, 59.54, 124.85, 112.03, 30.40, 196.54, 31.77, 122.87 and 28.96 pounds per unit of production, respectively.

In addition, it is worth noting that the fixed costs are expressed as the value of official rent, estimated to be seven times the tax value. This value does not reflect the real value of land which far exceeds the value of the official rent. The same principle is applied for the average costs that, however, do not cover all the farmer's expenses. Thus, the suggested 50% which was taken as a net return is considered an accepted percentage.

Therefore, there is a necessity for developing a proper system for summing the costs of production of agricultural crops in a continuous and accurate manner; so that production costs will be derived from farmer prices, will represent the actual situation, and will include the direct and indirect costs.

2. Identifying Guaranteed Prices on the Basis of Equivalent International Prices

This method is one of the important means in identifying guaranteed prices. While developing the pricing policies for agricultural products, especially for exported and imported products, the international prices of these products should be taken into consideration. Otherwise, efficient allocation of the local agricultural resources will not be achieved and no benefit will be obtained from the changes in international markets in directing agricultural production (increase of export production as prices of exports increases and *vice versa*). Still, this does not mean leaving the farm prices of crops to automatically follow international prices; because, if such is the case, there would be violent fluctuations in farm prices. It is observed that the agricultural products from developing countries entering the international market suffer from violent price fluctuations which lead to a relative unstability of the producers' income and make it difficult to adjust production to the demand structure.

It is believed, however, that price fluctuations balance crop fluctuations which consequently leads to relative stability in producers' incomes. Such belief holds true only when production for a given crop, in a certain country, represents the major part of its international production, or when the production of a competing country is affected in a similar way by such change.

Hence, a relative stability can be achieved in producers' incomes. Yet, it depends upon price flexibility of demand for a given crop. But if the production of competing countries is not affected, the decrease in the production of a given country will result in a decrease in the producers' income; the prices will not increase and will not compensate the decrease in production.

Therefore, when farm prices are defined on the basis of international prices, two main factors should be considered:

a) Farm prices of crops should continue to be parallel, as much as possible, to the international rate of these crops, for directing local agricultural production towards benefitting from the international market rates and allocating national resources efficiently to achieve optimal return.
b) Minimizing the effect of the severe fluctuations in the international prices of these crops on their farm prices in order to maintain relative stability of production to the demand structure so that producers can be able to implement a rational economic order. In this regard, some countries tend to reserve in the so-called "price balancing fund" a large part of the increases resulting from the changes in international rates certain years in order to cover the deficit that might occur due to their decline some other years. In addition, credit prices can be identified on the basis of the absolute equivalent international rates either by using absolute equivalent of international rates, or by maintaining the ratio between farm prices (guaranteed prices) and the equivalent international rates as they were in the initial phase.

A. Identifying Guaranteed Prices on the Basis of Absolute Equivalent International Rates

Table 7 refers to the equivalent international rates of the crops under study during the 1981–89 period.

The average international prices are estimated at nearly 23.8, 72.14, 92.53, 272.64, 570.1, 107.3, 23.65, 198.68, 69.26, 91.46, 246.87 and 26.53 L.E. per unit of production for wheat, broad beans, lentils, winter onion, raw flax, cotton, maize, rice, peanuts, sesame, soybean and sugarcane, respectively. This makes it clear that equivalent international rates of broad beans, winter onion, raw flax, cotton, rice and peanuts are higher than their farm prices, whereas the latter were higher than the equivalent international rates for other crops under study.

It is worth mentioning that the equivalent international rates were estimated according to the official exchange rate during the period of the study.

Yet, this does not reflect the real value of the U.S. $ since its price in the free market was greater than its official value during the period studied. Thus, while figuring out the equivalent international rates, foreign currency should be transformed into local currency in real value. Furthermore, it is worth mentioning that under the Economic Reform Policies that have been adopted recently, the rate of exchange was liberated and identified according to supply and demand.

Therefore “official” prices, “encouraging” prices and “free” prices are no longer applied. Thus, the current rate of exchange reflects the real value of foreign currency.

B. Guaranteed Prices on the Basis of the Maintenance of the Rate Between Farm Prices and Equivalent International Prices During the Base Period

This method depends on the identification of farm prices in a way that keeps the ratio between the farm price and the equivalent export (f.o.b.) or import price (c.i.f.) of the crop during the base period.

Farm price in a specific year = Export or import price of the crop in the same year x Average farm price in the base period

In other words, it equals the average farm price during the initial phase divided by the average international rate during the same period multiplied by the international rate in the year under consideration.

Table 8 presents farm prices evaluated according to this method during the period 1981–89, assuming the 1976–80 period as a base period. It is obvious that the averages of the evaluated rates reached nearly 18.82, 124.67, 245.47, 91.86, 39.83, 61.41, 26.39, 106, 44.81, 88.03, 171.52 and 16.79 L.E. per unit of production of wheat, broad beans, lentils, winter onion, raw flax, cotton, maize, rice, peanuts, sesame, soybean and sugarcane, respectively.

It is worth mentioning that only the average prices of broad beans and lentils were higher than their real equivalents, whereas the prices of the other crops were lower that their real equivalents.

3. Identifying Guaranteed Prices on the Basis of Equality Rates

This involves prices that give the farmer the same purchasing power for his products in a specific base period, i.e., to preserve the ratio between the prices received and paid by the farmers in that phase.

A. Equal Prices by Using the Standard of Living Index in Rural Areas

In this case the price is evaluated as follows:

Farm price for a specific year = Standard of living index in rural areas in that year x Average farm prices during the base period

Table 9 shows the estimated farm prices by using the standard of living index in rural areas during the 1981–89 period, assuming years 1976–81 as the base period. Estimates of the study, using this method, indicate prices to be 62.65, 22.78, 68.07, 81.01, 115.86, 32.78, 56.68, 129.77, 598.14 and 31.95 L.E/unit for broad bean, barley, flax seeds, raw flax, cotton, maize, peanuts, sesame, soybean and sugarcane, respectively. These prices were higher than their actual equivalents. Whereas the prices of wheat, winter onion, rice and sorghum were lower than their actual equivalents, which were approximately 28.03, 106.84, 189.51 and 31.03 pounds per unit, respectively.

B. Equal Prices Based on the Wholesale Price Index

In this case the farm price is estimated as follows :

Farm price for a specific year = Wholesale price index forf the same year x Average farm price for the base period

In addition, the study has estimated the farm prices of the concerned crops according to this method. At the same time, the period 1970–80 was assumed as the base period *(Table 10)*.

Estimates indicate that the average prices of flax seed and soybean were higher than their equivalents and were approximately 59.47 and 517.84 L.E. per unit. Whereas the average prices of the crops were lower than their real equivalents that were estimated at nearly 24.27 L.E/ardab for wheat, 54.24 L.E/ardab for broad beans, 93.81 L.E/ardab for lentils, 92.5 L.E/ton for winter onion, 19.72 L.E/ardab for barley, 67.13 L.E/ton for raw flax, 100.31 L.E/quintar for cotton, 28.38 L.E/ardab for maize, 164.07 L.E/ton for rice, 26.86 L.E/ardab for sorghum, 49.07 L.E/ardab for peanut, 112.35 L.E/ardab for sesame, 27.66 L.E/ton for sugarcane.

4. Identifying Guaranteed Prices Based on Price Trends

According to this method, credit prices are linked to the moving average of prices in the previous years.

A. Identifying guaranteed prices by using the moving average of agricultural crops prices and the standard of living index: the farm price goes in line with the variations in the paid and received prices in previous years when it is derived from these prices. The farm price is estimated as follows:

$$\text{Farm price for a specific year} = \frac{\text{Average farm price for the previous five years}}{\text{Prices of agricultural crops for the previous five years} \times \text{Standard of living index in rural areas for the year under consideration}}$$

Agricultural prices were estimated by using this method during the period 1986–89 assuming 1976–80 as the base period for the index prices of agricultural crops and the standard of living index in rural areas.

Table 11 shows the prices estimated by this method for the studied crops. Accordingly, average prices rates were estimated at nearly 39.91, 90.84, 193.06, 182.31, 34.35, 90.88, 140.22, 146.49, 45.33, 299.07, 49.95, 83.18, 197.9, 534.74, and 44.82 L.E. per unit for the following crops: wheat, broad beans, lentils, winter onion, barley, flaxseed, raw flax, cotton, maize, rice, sorghum, peanuts, sesame, soybean and sugarcane, respectively.

The study refers to the fact that these prices were higher than their real equivalents during the same period for all crops except wheat.

B. Identifying Guaranteed Prices by Using the Moving Average of Farm and International Prices

According to this method, farm price is parallel to the variations in farm prices and international rates in the years preceding the target year for which the price is to be estimated. Farm price is estimated as follows:

$$\text{Farm price for a specific year} = \frac{\text{Average farm price for the previous five year}}{\text{Average international rate for the last five years} \times \text{International price for the target year}}$$

Table 12 illustrates farm prices estimated by this method during the 1986–89 period. The average prices of the studied crops were estimated at 25.33, 84.75, 193.55, 160.34, 133.76, 118.9, 42.96, 184.7, 90.22, 178.73, 331.13, and 50.28 L.E. per unit for the following crops: wheat, broad beans, lentils, onions, raw flax, maize, rice, peanuts, sesame, soybean and sugarcane, respectively.

It is worth mentioning that the prices of wheat, cotton, and rice were less than their actual equivalent whereas the prices of the other products were higher than their actual equivalent.

5. Identifying Guaranteed Prices on the Basis of the Equivalent Crop Incomes

The identification of farm prices in such a way leads to the accomplishment of net and equal incomes for crops or alternative crop compositions. When prices are determined through this method, careful consideration should be given to crop requirements of the different agricultural resources (e.g., water, irrigation, employment, fertilizers, etc.) on account of the scarcity of these and the competitive relationship between crops or crop pattern on these resources.

It is possible in this regard to apply linear programming to identify the equivalent net incomes between crops or crop pattern at regional or national levels.

Conclusion

The agricultural pricing policy is one of the important components of the Agricultural Economic Reform in the Arab Republic of Egypt. It plays a major role in allocating agricultural resources to the economically and socially desired production. Moreover, it contributes to orienting consumption and distributing incomes among individuals and social groups.

Economic Reform Policies in the agricultural sector imply providing liberty to farmers in growing and marketing their crops and in leaving farm prices to be automatically determined by the interaction of market forces. Such policies equally implies liberalizing the trade of agricultural production and inputs. It should be considered that liberating the prices requires the continuation of the state's role in controlling monopoly and other forms of organization that may disturb the market efficiency. It also involves the provision of market information, ensuring the free interaction of supply and demand forces, encouraging competition, and prohibiting of cheating and manipulation, and quality control, ensuring prices and market stability.

In this regard, it is worth mentioning that the state's intervention in this case will be achieved through indirect ways and methods; as it is the case with the entrance of the state in the free market as a buyer, in an optional way, to ensure minimum prices for agricultural commodities and that the stock be purchased in the market whenever needed in order to balance prices and markets.

Trade liberalization does not mean chaos. Moreover, the indirect role of the state is more difficult and more important than its direct role which mainly depends on administrative orders and price fixing.

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Table 1. Crop Pattern in 1985 and 1989

(0,000 Fed.)

Crop	1985		1989		Rate of change (%)
	Area	% cropping area	Area	% cropping area	
Clover (permanent)	1 923	17.12	1 591	14.03	-17.26
Wheat	1 186	10.61	1 518	13.39	27.99
Barley	124	1.11	91	0.8	-26.61
Broad bean	329	2.94	364	3.21	10.64
Lentil	20	0.18	17	0.15	-15
Flax	39	0.35	41	0.36	5.13
Onion	26	0.23	21	0.19	-19.23
Vegetables	377	3.37	459	4.05	25.07
Other crops	167	1.49	166	1.46	-0.6
Total winter crops	**4 191**	**37.5**	**4 268**	**37.64**	
Rice	925	8.28	977	8.62	5.62
Maize	1 914	17.13	2 000	17.64	4.49
Sorghum	340	3.04	304	2.68	-10.59
Peanut	28	0.25	32	0.28	14.29
Sesame	22	0.2	25	0.22	13.64
Soybean	119	1.06	92	0.81	-22.69
Vegetables	712	6.37	723	6.38	1.54
Other crops	218	1.95	264	2.33	21.1
Total summer and nili crops	**4 278**	**38.28**	**4417**	**38.95**	
Cotton	1 081	9.67	1 006	8.87	-6.94
Sugarcane	250	2.24	274	2.42	9.6
Orchards	457	4.09	572	5.04	25.16
Cropping area	**11 175**	**100**	**11 339**	**100**	

Source: MOALR, Central Dep. of Agrarian Economics & Statistics, Records of Statistics Sect., unpublished dat

Table 2. Productivity, Total Production, and Farm Prices for Field Crops in 1985–1989

Crop	Unit	Productivity			Total Production			Farm Price		
		1985	1989	Rate of Change	1985	1989	Rate of Change	1985	1989	Rate of Change
Wheat	Ardab	10.53	13.85	32.53	12 488	21 020	68.32	25.76	65.47	154.15
Barley	Ardab	9.72	8.86	-8.85	1211	808	33.28	23.66	32.4	36.94
Broad bean	Ardab	6.84	7.97	16.52	2 248	2 904	29.18	49.30	89.5	81.54
Lentil	Ardab	4.23	4.99	17.97	84	84	___	116.98	210	79.52
Flax	Ton	4.32	4.47	3.47	170	182	7.06	56.90	80.8	-42
Onion	Ton	8.70	9.42	8.28	228	200	-12.28	125.00	165.9	32.72
Cotton	Quintar	6.79	5.03	-25.92	7340	5 058	-31.09	96.86	201.67	108.21
Rice	Ton	2.50	2.73	8.96	2 312	2661	15.1	211.50	362	71.16
Maize	Ardab	14.92	17.45	16.96	28 563	34 902	22.19	27.21	56.65	108.2
Sorghum	Ardab	11.56	13.80	19.38	3 929	4 199	6.87	32.30	53.74	66.38
Peanut	Ardab	10.89	11.87	9.00	307	379	23.45	53.20	75.64	42.18
Sesame	Ardab	3.54	3.96	11.86	77	98	27.27	120.14	176.6	47.00
Soybean	Ton	1.174	0.99	-15.67	140	91	-35	285.00	800.00	180.7
Sugarcane	Ton	38.74	40.61	4.83	9 685	11 145	15.07	30.00	50.00	66.67

Source: MOALR.

Table 3. Net Return, Added Value, Return on Exeanded L.E. during 1985–1989

Crop	Net return		L.E./fed.	Added value		L.E./fed.	Return on L.E.		L.E.
	1985	1989	Rate of change	1985	1989	Rate of change	1985	1989	Rate of change
Wheat	228.93	760.99	232.41	473.69	1 080.77	128.16	0.78	1.87	139.74
Barley	131.09	84.49	-35.55	342.34	364.08	6.35	0.54	0.26	-51.85
Broad bean	164.17	421.36	156.66	379.48	710.3	87.18	0.65	1.13	73.85
Lentil	266.88	673.66	152.42	478.89	989.81	106.69	0.96	1.59	65.63
Flax	134.47	246.02	82.96	391.49	584.07	49.19	0.41	0.55	34.15
Onion	582.3	682.58	17.22	891.27	1 186.20	33.09	1.16	0.78	-32.76
Cotton	194.82	413.11	112.05	617.13	967.53	56.78	0.39	0.63	61.54
Rice	220.22	552.43	150.85	519.09	948.20	82.67	0.64	1.16	81.25
Maize	134.9	582.21	331.59	388.24	940.90	142.35	0.42	1.24	195.24
Sorghum	147.74	452.73	206.44	403.44	758.42	87.99	0.52	1.30	150.00
Peanuts	271.84	464.97	71.05	536.61	845.12	57.49	0.83	1.01	21.69
Sesame	204.69	339.01	65.62	421.3	676.32	60.53	0.84	0.88	2.38
Soybean	17.71	321.45	1 715.08	269.21	679.31	153.33	0.06	0.68	1 033.30
Sugarcane	429.98	943.44	119.42	1 028.64	1 812.93	76.25	0.62	0.87	40.32

Source: MOALR, Central Dep. of Agricultural Economics & Statistics, unpublished data.

Table 4. Rate of Self-Sufficiency & Supplied Quantities of Some Agricultural Crops, 1985 & 1989

Crop	Rate of self-sufficiency (1)		Supplied quantities (2)*	
	1985 %	1989 %	1985	1989
Wheat	23.7	36.0	737	1 190
Barley	100.0	100.0	0	0
Broad bean	90.0	100.0	637	750
Lentil	37.5	49.0	23	9
Flax	104.5	110.5	Contract	Contract
Onion	110.7	113.0	59	
Cotton	136.5	2.2		
			Total Production	Total Production
Rice	107.0	101.1	933	987
Maize	74.2	81.2	1 154	442
Sorghum	100.0	100.0		
Peanuts	115.0	111.0	102	
Sesame	42.7	44.0	35	
Soybean	96.6	66.4	Contract	Contract
Sugarcane	51.8	64.5	Contract	Contract

* Supplied quantities in thousand tons.
(1) Sources: MOALR, Institute of Agricultural Economic Research, Production Economics Dep., unpublished data.
Central Bank of Egypt, Annual Report, 1990.
(2) Source: Principal Bank for Development and Agricultural Credit Marketing, Department Records, unpublished data.

Table 5. Effective Exchange Rate & Effective Protection Rate for Agricultural Crops in 1985 and 1989

Crop	Effective Exchange Rate		Effective Protection Rate	
	1985	1989	1985	1989
Wheat	0.82	1.73	1.1	0.76
Barley	—	—	—	—
Broad bean	0.65	0.63	0.86	0.27
Lentil	0.96	0.88	1.23	0.36
Raw flax	0.16	0.08	0.32	0.01
Onion	0.36	0.4	0.4	0.13
Cotton	0.65	0.79	0.91	0.34
Rice	0.97	0.99	1.26	0.43
Maize	1.28	0.86	1.91	0.36
Sorghum	—	—	—	—
Peanuts	0.85	0.42	1.1	0.17
Sesame	1.03	0.99	1.37	0.42
Soybean	0.89	1.9	1.38	0.83
Sugarcane	1.43	0.59	2.72	0.23

Table 6. Farm Prices Estimated by the Use of Production Costs during the Period 1981-1989

(L.E.)

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	8.99	11.39	17.4	18.64	17.91	21.28	21.68	25.32	25.24
Broad bean	Ardab	31.33	36.35	39.52	40.88	43.68	48.76	49.51	-63	60.02
Lentil	Ardab	56.38	69.82	80.22	87.74	86.69	100.74	104.96	104.17	117.46
Onion	Ton	60.76	65.10	82.06	90.00	86.48	93.90	103.47	113.28	140.03
Barley	Ardab	7.16	10.47	21.51	22.48	22.57	22.71	26.08	30.93	41.41
Flax	Ardab	38.66	53.16	66.85	63.31	63.53	73.53	78.78	54.62	76.01
Cotton	Qintar	60.5	76.56	91.58	98.88	104.95	117.75	138.57	162.35	184.36
Maize	Ardab	17.88	21.34	24.59	26.12	-29	31.92	31.03	32.63	36.77
Rice	Ton	118.56	142.74	151.43	199.13	192.47	217.29	241.11	243.8	246.7
Sorghum	Ardab	21.12	24.43	28.18	32.5	31.75	32.08	32.65	33.32	33.59
Peanuts	Ardab	21.85	29.16	37.89	37.95	43.54	47.53	51.41	50.16	55.79
Sesame	Ardab	66.96	69.09	75.59	95.03	96.66	102.25	106.13	113.48	139.70
Soybean	Ton	271.43	323.02	379.87	382.41	404.87	418.40	415.57	559.12	712.95
Sugarcane	Ardab	18.5	22.23	27.86	26.70	26.99	27.94	31.47	31.69	40.15

$$\text{Farm price for a given year} = \frac{\text{Total costs + 50\% of total costs as profit - Value of the by-product}}{\text{Average production}}$$

Source: MOALR, Central Dep. of Agricultural Economics & Statistics, Records of Statistics Section, unpublished data.

Table 7. Equivalent International Prices of Crops during the Period 1981–1989

(L.E.)

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	25.77	25.29	20.25	20.69	22.04	20.40	27.45	25.05	27.3
Broad bean	Ardab	15.57	35.66	73.20	67.27	52.85	107.60	106.10	91.30	99.7
Lentil	Ardab	36.19	54.94	62.49	43.36	85.00	133.70	136.20	113.90	167.0
Onion	Ton	240.04	290.31	232.44	230.00	243.3	220.70	378.6	327.60	290.8
Barley	Ardab	—	—	—	—	—	—	—	—	—
Flax	Ardab	418.96	272.37	377.68	341.89	322.50	490.00	779.50	1 063.00	1 065.0
Cotton	Qintar	90.10	71.46	73.91	97.50	104.30	105.90	104.70	139.30	178.5
Maize	Ardab	23.87	22.68	14.29	20.17	14.90	17.00	20.90	33.00	46.0
Rice	Ton	221.44	255.62	173.81	154.8	152.10	187.60	211.92	183.80	247
Sorghum	Ardab	—	—	—	—	—	—	—	—	—
Peanuts	Ardab	56.23	43.62	42.30	44.60	43.70	42.20	106.7	118.50	125.5
Sesame	Ardab	79.39	58.35	84.76	84.27	81.75	107.20	99.50	102.60	125.2
Soybean	Ton	272.80	266.90	254.60	254.60	224.2	168.50	233.50	260.90	294.8
Sugarcane	Ardab	30.32	15.04	14.40	17.90	14.70	22.10	22.30	42.50	59.5

Source: CAPMAS, Foreign Trade Bulletin, various issues.

Table 8. Farm Prices Estimated on the Basis of Maintaining the Ratio between Farm Prices & Equivalent International Prices as in the Intitial Phase (1981–1989)

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	20.38	20.00	16.01	16.36	17.43	16.13	21.71	19.81	21.58
Broad bean	Ardab	27.99	64.10	131.57	120.91	95.00	193.40	190.71	164.11	179.20
Lentil	Ardab	96.01	145.75	165.78	115.03	225.49	354.69	361.32	302.16	443.03
Onion	Ton	68.45	82.79	66.29	65.59	69.38	62.94	160.01	133.46	117.80
Barley	Ardab	—	—	—	—	—	—	—	—	—
Raw Flax	Ton	29.27	19.03	26.39	23.88	22.53	34.23	54.46	74.26	74.4
Cotton	Quintar	51.58	40.91	42.31	55.82	59.54	60.63	59.94	79.7	102.19
Maize	Ardab	26.64	25.31	15.95	22.51	16.63	18.98	23.33	36.83	51.34
Rice	Ton	118.81	137.15	93.25	83.05	81.61	100.65	113.70	93.25	132.52
Sorghum	Ardab	—	—	—	—	—	—	—	—	—
Peanuts	Ardab	36.38	28.22	27.36	28.85	28.27	27.30	69.03	76.66	81.19
Sesame	Ardab	65.40	48.07	69.82	69.42	67.34	88.31	117.14	122.49	144.32
Soybean	Ton	188.78	184.70	176.18	176.18	155.15	116.60	161.58	180.54	204.00
Sugarcane	Ardab	19.19	9.52	9.11	11.33	9.30	13.98	14.11	26.89	37.65

$$\text{Farm price for a given year} = \frac{\text{Average farm price in the initial phase}}{\text{Average international price in the initial phase}} \times \text{International price in the year to be estimated}$$

Source : MOALR; CAPMAS.

Table 9. Farm Prices Estimated on the Basis of Equal Prices Using the Cost of Living in Rural Areas during the Period 1981–1989

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	14.05	18.00	19.87	21.69	24.22	29.73	33.72	40.68	50.31
Broad bean	Ardab	31.41	40.23	44.42	48.47	54.13	66.44	75.36	90.92	112.44
Lentil	Ardab	54.32	69.59	76.82	83.84	93.63	114.92	130.34	157.26	194.49
Onion	Ton	53.56	68.62	75.75	82.67	92.32	113.32	128.52	155.07	191.77
Barley	Ardab	11.42	14.63	16.15	17.63	19.68	24.16	27.40	33.06	40.89
Seed Flax	Ton	34.44	44.12	48.71	53.15	59.36	72.86	82.63	99.70	123.30
Raw Flax	Ton	40.61	52.03	57.4	62.68	70.00	85.92	97.44	117.57	145.40
Cotton	Quintar	58.08	74.41	82.14	89.64	100.11	122.88	139.37	168.15	207.96
Maize	Ardab	16.43	21.05	23.24	25.36	28.32	34.76	39.43	47.57	58.83
Rice	Ton	95.00	121.71	134.36	146.63	163.75	201.00	227.96	275.05	340.15
Sorghum	Ardab	15.55	19.93	22.00	24.01	26.81	32.91	37.32	45.03	55.69
Peanut	Ardab	28.42	36.40	40.19	43.86	48.98	60.12	68.18	82.27	101.74
Sesame	Ardab	65.06	83.34	92.01	100.41	112.13	137.64	156.10	188.34	232.93
Soybean	Ton	299.85	384.14	424.07	462.79	516.83	634.39	719.49	868.1	1073.58
Sugarcane	Ardab	16.01	20.52	22.65	24.32	27.60	33.88	38.43	46.36	57.34

Initial phase: 1976–1980.
Farm price for a given year = Average farm price of the initial phase x The cost of living in the year to be estimated.
Source: MOALR.

Table 10. Farm Prices Estimated on the Basis of Equal Prices Using WholeSale Index Price during the Period 1981–1989

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	13.37	14.62	16.93	18.65	21.12	24.77	28.15	35.54	45.25
Broad bean	Ardab	29.88	32.67	37.85	41.69	47.20	55.36	62.92	79.43	101.12
Lentil	Ardab	51.69	56.51	65.46	72.11	81.64	95.75	108.82	137.39	174.91
Onion	Ton	50.97	55.72	64.55	71.10	80.50	94.41	107.30	135.47	172.46
Barley	Ardab	10.87	11.88	13.76	15.16	17.16	20.13	22.88	28.88	36.77
Seed Flax	Ton	32.77	35.83	41.5	45.72	51.76	60.7	68.99	87.10	110.89
Raw Flax	Ton	38.64	42.25	48.94	53.91	61.04	71.58	81.36	102.71	103.76
Cotton	Quintar	55.27	60.43	70.00	77.10	87.30	102.38	116.36	146.90	187.02
Maize	Ardab	15.64	17.09	19.80	21.81	24.70	28.96	32.92	41.56	52.91
Rice	Ton	90.40	98.84	114.49	126.12	142.79	167.46	190.33	240.29	305.91
Sorghum	Ardab	14.70	16.18	18.74	20.65	23.38	27.42	31.16	39.34	50.08
Peanut	Ardab	27.04	29.56	34.25	37.72	42.71	50.09	56.93	71.87	91.50
Sesame	Ardab	61.91	67.68	78.40	86.36	97.78	114.67	130.33	164.54	209.48
Soybean	Ton	285.33	311.95	361.36	389.06	450.69	528.52	600.72	758.41	965.50
Sugarcane	Ardab	15.24	16.66	19.30	21.26	24.07	28.23	32.08	40.51	51.57

Initial Phase: 1976–1980.
Farm price for a given year = Average farm price in the initial period x Wholesale index price in the year to be estimated.
Source: MOALR.

Table 11. Farm Prices Estimated on the Basis of Price Trends of Farm Price and Index of Living Costs in Rural Areas during the Period 1986–1989

Crop	Unit	1986	1987	1988	1989
Wheat	Ardab	29.30	34.53	42.90	52.90
Broad bean	Ardab	69.03	77.36	96.53	120.43
Lentil	Ardab	148.82	171.42	206.10	245.89
Onion	Ton	143.04	165.39	191.88	228.94
Barley	Ardab	26.74	29.89	36.38	44.39
Seed Flax	Ton	77.90	82.62	93.97	109.01
Raw Flax	Ton	104.04	119.46	147.08	190.31
Cotton	Qintar	119.33	126.99	150.24	189.39
Maize	Ardab	35.55	39.73	47.41	58.64
Rice	Ton	234.91	273.10	309.41	378.86
Sorghum	Ardab	38.38	44.54	53.74	63.14
Peanut	Ardab	68.28	73.92	85.93	104.57
Sesame	Ardab	159.67	175.70	209.71	246.50
Soybean	Ton	444.84	473.20	547.35	673.57
Sugarcane	Ton	36.45	39.76	46.64	56.44

Initial phase : 1976–1980.

$$\text{Farm price} = \frac{\text{Average farm price for the last five years}}{\text{Average of index price for the last five years}} \times \text{Index of living costs in the year to be estimated}$$

Source: Calculated from data in Tables 1 & 2 in the appendix.

Table 12. Farm Prices Estimated on the Basis of Price Trends Using the Moving Average of Farm Price and the International Price during the Period 1986–1989

Crop	1986	1987	1988	1989
Wheat	15.50	22.34	28.81	34.67
Broad bean	90.13	88.88	76.48	83.51
Lentil	209.91	190.68	151.49	222.11
Onion	75.04	235.66	177.84	152.80
Barley	—	—	—	—
Raw Flax	68.01	163.49	157.07	146.46
Cotton	85.76	90.86	128.16	170.82
Maize	18.70	28.84	53.46	70.84
Rice	136.54	118.05	192.40	291.80
Sorghum	—	—	—	—
Peanut	37.10	112.84	108.49	102.43
Sesame	130.78	186.28	185.88	211.99
Soybean	175.24	291.88	374.52	482.86
Sugarcane	25.88	32.62	64.59	78.02

$$\text{Farm price for a given year} = \frac{\text{Average farm price in the last 5 years}}{\text{Average int. price in the last 5 years}} \times \text{Int. price in the year to be estimated}$$

Source: Calculated from data of Table 7 & Table 1 of the Appendix.

APPENDIX

Table 1. Effective Prices of Agricultural Crops, 1981–1989

Crop	Unit	1981	1982	1983	1984	1985	1986	1987	1988	1989
Wheat	Ardab	13,77	12,26	16,49	18,65	25,76	33,74	33,09	35,61	65,47
Broad bean	Ardab	36,38	37,22	38,95	43,01	49,3	71,03	85,18	85,81	89,5
Lentil	Ardab	67,37	77	86,6	93,63	116,98	156,49	160,05	155,48	210
Onion	Ton	47,23	83,19	76,3	92,75	125	134,83	142,5	140,54	165,9
Barley	Ardab	13,29	12,28	13,74	16,37	23,66	26,49	28,09	28,64	32,4
Seed Flax	Ton	38,44	42,21	46,8	46,78	56,9	63,09	66,3	69,58	80,8
Raw Flax	Ton	31,65	34,61	38,18	60,62	75,53	79,51	87,72	108,78	119,6
Cotton	Quintar	58,09	59,96	65,13	74,04	96,86	97,14	114,2	143,5	201,67
Maize	Ardab	13,13	17,48	23,47	24,19	27,21	30,66	36,65	45,1	56,65
Rice	Ton	98,8	130,12	126,08	130,56	211,5	247,25	206	256,5	362
Sorghum	Ardab	12,11	17,72	27,06	24,73	32,3	36,07	39,9	42,3	53,74
Peanut	Ardab	30,31	39,64	63,4	43,03	53,2	56,6	66,67	70,8	75,64
Sesame	Ardab	74,29	74,15	96,47	108,74	120,14	144,44	154,73	156,3	176,6
Soybean	Ton	230	260	260	285	285	375	425	500	800
Sugarcane	Ton	15,53	18,2	20,2	24,2	30	30,5	34	38	50

Source: MOALR, Central Department for Agricultural Economics & Statistics, Records of the Statistics Section, unpublished data.

Table 2. Index Prices in the Arab Republic of Egypt, 1965/66–1989

Years	Cost of living in rural areas	Wholesale prices	Agricultural crops prices
1965/1966	—	100	100
1966/1967	100	—	—
1976	187,8	170,7	205
1977	206,7	186,6	240,6
1978	234,2	214,1	254,2
1979	248,7	234,6	292,7
1980	311	285,2	342,4
1981	353,4	308,9	372,3
1982	452,8	337,7	402,9
1983	499,8	391,1	498,7
1984	545,4	430,9	561,1
1985	609,2	487,8	657,7
1986	747,8	572,1	829,4
1987	848,1	650,2	876,1
1988	1023,3	820,9	1023,3
1989	1265,3	1044,9	1421,9

Source: CAPMAS, Annual Statistics Book, various issues.