

ECONOMIC EFFECTS OF RICE CONTROL POLICY IN POSTWAR TAIWAN

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I. LONG-TERM TRENDS IN RELATIVE PRICES OF AGRICULTURAL PRODUCTS

AGRICULTURAL PRICE policies in Taiwan in the postwar years have been the very reverse of the price support policies currently adopted by advanced countries, that is to say, price control. In addition to the original aim of stabilizing agricultural production through the stabilization of prices, these policies were designed to keep the prices of agricultural products at a low level, working as a lever to check the severe inflationary trends witnessed in the immediate postwar years. Low relative prices of agricultural products reduced the share of consumption of agricultural products relative to total household expenditure, and this reduction in household expenditure will result in the increase of either purchases of manufactured products or services, or savings. On the other hand, farmers' agricultural incomes are kept low through low agricultural prices with the result that the low living standards of farmers are maintained. Needless to say, the low living standards of farmers have played an important role in keeping wages in urban areas at a low level.

Agricultural products are supplied by a great many farmers scattered all over the country, and their prices are determined in a condition of near perfect competition. However, an entirely different situation prevails in the case of products manufactured by large-scale industries. That is, the number of enterprises engaged in manufacturing is relatively small, and prices are determined under conditions of imperfect competition. Thus, prices are more or less similar to monopoly ones. In other words, manufacturers can realize prices a little higher than the average production cost. Also, in view of the possibly larger regressive rate of production costs in manufacturing than in agriculture due to technological innovation, prices of products manufactured by large-scale industries may show a long-term downward tendency.

Bearing in mind the above premises, the following will survey and examine the long-term trends in the prices of agricultural products in Taiwan.

Indices of complete accuracy showing relative changes in the prices of agricultural products in Taiwan over a long period have not yet been developed, but price indices of agricultural products relative to the general wholesale price index have been made available by the Joint Commission on Rural Reconstruction, which calculated the long-term trends (1914-59) in relative prices of agricultural

products with the base period from 1935 to 1937 equaling 100. In addition, price indices with the first half of 1937 as the base period, i.e., 100, are available in the form of "The Wholesale Price Index in Taipei" published by the Bureau of Accounting and Statistics, Provincial Government of Taiwan and "The Retail Rice Price Index in Five Major Cities" published by the Food Bureau.

According to "The Ratio of Relative Prices of Agricultural Products in Taiwan" (Table I) computed by the Joint Commission on Rural Reconstruction, relative prices showed sharp fluctuations in the period from 1914 to 1959, but continued at a low level in the postwar years. (See Figure 1.) As shown in the above figure, one can observe three periods of low relative prices and two periods of high prices in the period from 1914 to 1964 (i.e., 1914-24, 1938-45, and 1950-64 are periods of low relative prices, while 1925-37 and 1946-49 are periods of high prices). The first period of low prices (1914-24) was the first stage of development of agricultural production in Taiwan. During those years agricultural production expanded through the introduction of new agricultural techniques, but owing partly to the underdevelopment of export markets for the country's agricultural products, and partly to low population growth relative to the increased rate of production, prices of agricultural products were below the general level of prices. After 1924 Taiwan started to export large quantities of agricultural products to Japan, with the result that the value of exports amounted to nearly 60 per cent of total production. Although agricultural production continued to increase during these years, it was not large enough to meet the briskly expanding demand from abroad, and accordingly, prices of agricultural products kept on rising, approaching close to the general price level. As a matter of fact, both agricultural production and farm incomes increased at an average annual rate of 4.5 per cent in this period. Lee Têng-hui called this period the golden age of the Taiwan agriculture.¹

The second period of low relative prices is the period when, with the outbreak of World War II in 1938, wartime economic control measures were enforced in Taiwan. In these years prices for agricultural products were fixed and the "foodstuff rationing system" was adopted. Naturally there were black market prices, but as the war became more severe from 1942 to 1945, the rationing system was enforced with greater stringency and the price level of agricultural products was maintained at a very low level. Following the end of the war, there was a second period of higher relative prices from 1945 to 1949. In these five years, agricultural production fell greatly as a result of the economic collapse immediately following the end of the war and the great influx of people from Mainland China which, together with the loss of control over food products in the immediate postwar years, caused prices of agricultural products to rise very much higher than the general price level.

In 1950, the Provincial Government took strict measures to increase rice delivery. For nearly ten years from 1950 to 1959, relative prices of agricultural products, including rice, were kept at a level of 70 per cent of the general price

¹ [9].

TABLE I
PRICE INDEX OF AGRICULTURAL PRODUCTS AND RICE

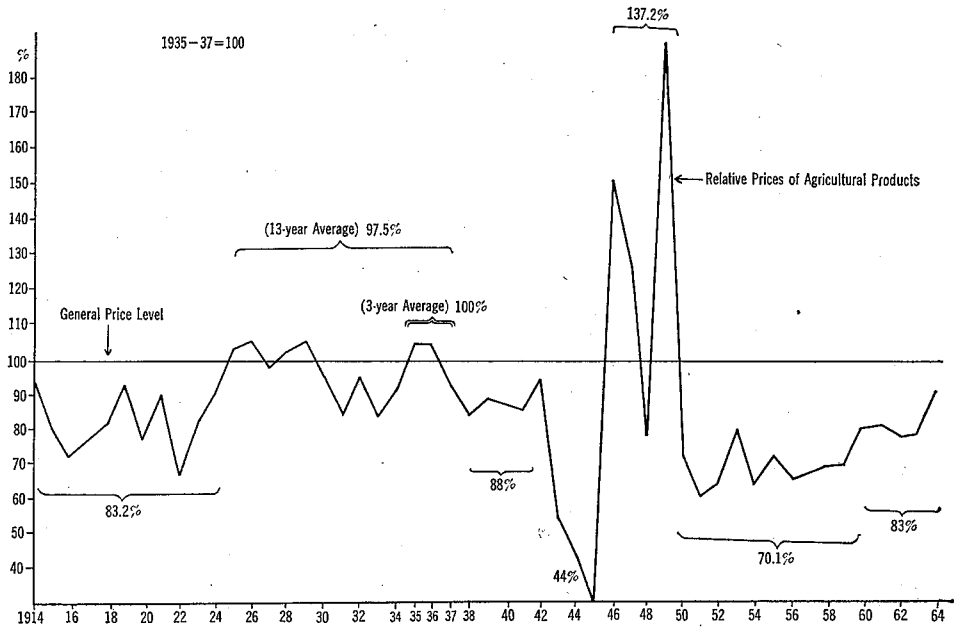
(1935-37=100)

Year	General Price Index (A)	Price Index of Agricultural Products (B)	Relative Prices (B/A)	Rice Price Index (C)	Ratio of Rice Price Index to General Price Index (C/A)
1938	132.58	112.54	84.9	109.12	82.3
1939	152.25	134.08	88.1	118.92	78.1
1940	172.03	150.90	87.7	121.64	70.7
1941	187.15	161.45	86.3	132.27	70.7
1942	184.99	175.63	94.9	136.27	73.7
1943	315.97	176.41	55.8	146.71	46.4
1944	529.96	248.66	46.9	192.30	36.3
1945	2,721.21	512.95	18.9	539.52	19.8
1946	10,813.91	16,279.51	150.5	20,176.85	53.6
1947	52,062.42	65,523.19	125.9	41,808.59	80.3
1948	433,251.05	380,904.77	77.4	331,839.06	76.6
1949	248.90	467.68	187.9	331.57	133.2
1950	1,009.39	738.75	73.19	568.01	56.2
1951	1,675.43	1,039.91	62.07	658.23	39.2
1952	2,062.89	1,378.63	66.83	1,201.68	58.2
1953	2,243.66	1,822.97	81.25	1,795.70	80.0
1954	2,296.77	1,501.03	65.35	1,340.19	58.3
1955	2,260.33	1,942.30	74.13	1,735.68	76.7
1956	2,953.25	1,997.10	67.63	1,720.20	58.2
1957	3,166.55	2,194.44	69.30	1,905.46	60.1
1958	3,210.62	2,260.45	70.37	1,929.03	60.0
1959	3,633.97	2,579.15	70.93	2,086.75	57.4
1960	4,148.13	3,386.42	81.69	3,160.70	78.1
1961	4,280.88	3,523.43	82.30	3,279.52	76.6
1962	4,411.35	3,518.11	79.75	3,039.95	68.9
1963	4,696.25	3,769.72	80.27	3,160.75	67.3
1964	4,812.31	4,443.58	92.33	3,225.61	67.0

1914-1924 Average			82.2%		69.9%
1925-1937			97.5%		87.5%
1938-1942			88.0%		75.1%
1943-1945			44.0%		34.2%
1946-1949			137.2%		85.9%
1950-1959			70.1%		60.4%
1960-1964			83.0%		71.5%

Sources: [8]. Rice price indices after 1960 have been calculated from [4, 1967 edition, p. 54].

Fig. 1. Long-term Trends in Relative Prices of Agricultural Products



Source: [8].

level, due to controlled price placed on other export foodstuffs, as well as to the low world sugar price. Since 1960 relative prices of agricultural products have been increasing gradually, but they are still relatively low, with the average of 1960-64 standing at 83 per cent. As mentioned above, there are three periods of low relative prices in the long-term price trends for the past fifty years, but these three periods are different in nature. In the period from 1914 to 1924, although the average was only 82 per cent, price levels fluctuated greatly and during four of the eleven years in this period reached 90 per cent. From 1922, the agricultural price level gradually started to move upward during the next fourteen years and approached close to the general price level. For eight years, in the second period of low prices (from 1938 to 1945), prices of agricultural products were restrained by wartime food control measures. This was the period when official prices and food rationing were enforced through military as well as civilian police forces. When the war ended in late 1945, the Government lost the power to enforce controls, and prices of agricultural products soared. Subsequent sections will describe the movement during the third period of low relative prices of agricultural products (from 1950 to 1965), which is the focus of the present survey.

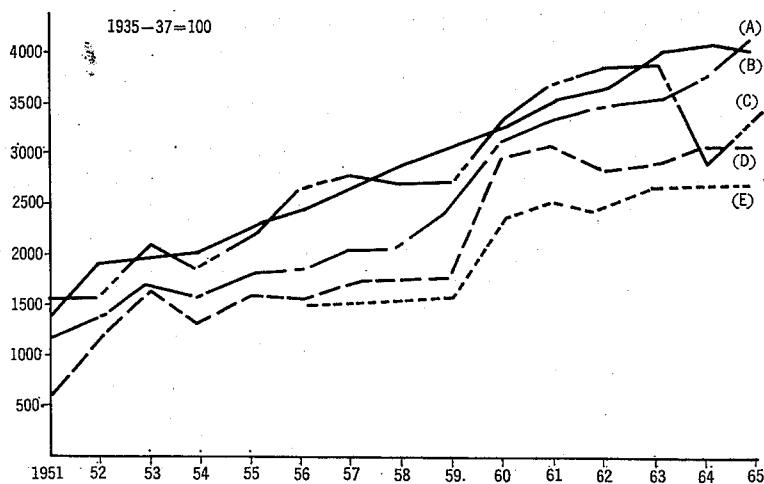
Figure 2 contains graphs based on other basic statistics to indicate long-term trends in prices ("The Taipei City Wholesale Price Index" published officially by the Bureau of Accounting and Statistics, Taiwan Provincial Government; "The Price Index of Agricultural Products" prepared on the basis of the Taiwan Agricultural Yearbook published by the Department of Agriculture and Forestry; "Fertilizer Prices," and "Rice Prices.") In these graphs, it will be

TABLE II
COMPARISON OF PRICE INDICES OF PRINCIPAL COMMODITIES

Base Year	Wholesale Price Index in Taipei (A)	Farm Price Index of Agricultural Products (B)	Farm Price Index of Unhulled Rice (C)	Retail Price Index of Polished Rice (D)	Selling Price Index of Fertilizer (E)
First Year 1937	1935-37	1935-37	1935-37	1937	1935-37
1949	218.91	467.68	331.57		772.22
1950	887.76	738.75	568.01		982.44
1951	1,473.54	1,039.91	653.23		1,515.88
1952	1,814.31	1,378.63	1,201.68		1,531.68
1953	1,973.30	1,822.97	1,795.70		2,144.98
1954	2,020.01	1,501.03	1,340.19		1,781.40
1955	2,304.58	1,942.30	1,735.68		2,272.71
1956	2,597.38	1,997.10	1,720.20	1,636.36	2,679.66
1957	2,784.98	2,194.44	1,905.46	1,768.60	2,782.81
1958	2,823.74	2,260.45	1,929.03	1,826.45	2,668.32
1959	3,129.27	2,579.15	2,086.75	1,925.62	2,686.16
1960	3,571.74	3,386.42	3,160.70	2,752.07	3,640.90
1961	3,687.24	3,523.43	3,279.52	2,942.15	3,891.05
1962	3,799.62	3,518.11	3,039.95	2,834.71	3,956.28
1963	4,045.01	3,769.72	3,160.70	2,892.56	3,929.93
1964	4,144.97	4,443.58	3,225.61	2,942.15	3,080.94
1965				3,479.39	3,903.81

Sources: (A): [1, various editions].
(B), (C), (E): [4, 1960 and 1967 editions].
(D): [12, 1967 edition].

Fig. 2. Comparison between the General Price Index and Price Indices of Agricultural Products, Rice, and Fertilizer

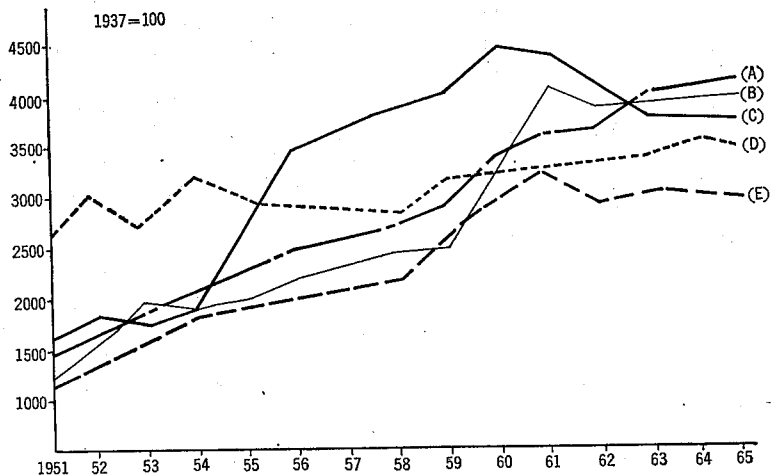


(A) Farm Price Indices of Agricultural Products
(B) General Indices of Wholesale Prices
(C) Selling Price Indices of Fertilizer
(D) Farm Price Indices of Unhulled Rice
(E) Retail Rice Price Indices in Six Major Cities

evident that during the period from 1950 to 1965, general price indices (Taipei City Wholesale Price Indices) were persistently above the farm price indices of agricultural products, and that the farm price indices of rice were at a very low level, compared with the selling price indices of fertilizer. It will also be observed that the rice price indices were below the price indices of agricultural products.

Secondly, with regards to the components of the Taipei City Wholesale Price Index, until 1960, staple food price indices were below the over-all indices, while wearing apparel price indices were above the over-all indices. Up to 1964, price indices of electricity and metals were continuously above the over-all indices by a wide margin. (See Figure 3.) All the above indices indicating long-term trends in prices use the average of the period from 1935 to 1937 as the base period. If we observe the variations in the purchasing power of agricultural and livestock products, using 1952, one of the postwar years, as the base year (see Table III), we notice that since 1960, farmers' selling price indices of agricultural products have been above the price indices of materials purchased by farmers for agricultural production. The purchasing power of agricultural products prior to 1960 was a little below that in the base year of 1952. The rise in prices of agricultural products in 1960 and 1961 can be attributed to the fact that typhoons caused severe damage to agricultural production in both 1959 and 1960. Favorable movements in the world sugar price influenced the price indices of agricultural products in 1963 and 1964. It will also be seen from Table III that since 1960 price indices of agricultural products have been a little above those of farm supplies, while price indices of manufactured goods have been far above those of industrial raw materials. In comparing the two ratios

Fig. 3. Comparison of Wholesale Price Index in Taipei



(A) General Price Indices (D) Clothing
 (B) Staple Food (E) Other Foodstuffs
 (C) Electricity and Metals

Source: Drawn up on the basis of [13].

of price indices of inputs and outputs in the agricultural and industrial sectors (Columns B and C in Table III), one can see that the ratio in the agricultural sector exceeded that of the industrial sector only during the three year period from 1959 to 1961 within the fifteen year period from 1952 to 1966 with the reverse being true for the remaining twelve years. (See Table IV.) Thus, by looking only at the movements of the relative ratios of price indices of inputs and outputs, it can be seen that industry has been more favorably positioned than agriculture.

It could be said that relative low price levels of agricultural products since 1950 were brought about by the following measures designed to restrain farm prices of agricultural products: rice control measures adopted by the Government, export controls placed on pork and cereals, imports of large quantities of wheat by the Government, the monopoly of sugar exports, high excise taxes on domestic consumption of sugar,² controls on the slaughter of pigs for food, and high taxes on slaughtering itself. Out of the above factors, controls on rice which is by far the major item of agricultural production, were the most important policy measures respecting prices of agricultural products.

TABLE III
PRICE INDICES OF INPUTS AND OUTPUTS OF THE AGRICULTURAL SECTOR
(Wholesale Prices in Taipei)

Year	General	Agri- cultural Products (A)	Agri- cultural Producers' Goods (A')	A/A' × 100 (B)	Manufac- tured Goods (I)	Indus- trial Raw Materials (I')	I/I' × 100 (C)	B/C
1952	100	100	100	100	100	100	100	100
1953	108.8	134.7	137.1	98.2	109.2	105.6	103.4	95.0
1954	111.3	124.1	128.1	96.8	113.2	105.2	107.6	90.0
1955	127.0	137.2	144.9	94.6	130.2	122.4	106.4	88.9
1956	143.2	148.1	155.5	95.2	155.5	145.5	106.9	89.0
1957	153.5	164.1	165.5	99.8	176.3	171.7	102.7	97.0
1958	155.6	164.9	170.9	96.4	173.5	172.1	100.8	95.6
1959	172.5	183.0	186.2	98.2	184.2	201.9	91.2	107.6
1960	196.9	254.9	241.2	105.6	198.1	208.1	95.2	110.9
1961	203.2	262.8	258.9	101.5	194.3	207.5	93.6	108.4
1962	209.4	249.4	260.2	95.8	208.6	196.8	106.0	90.4
1963	223.0	271.8	262.3	103.6	228.8	199.9	114.4	90.5
1964	228.5	282.2	266.5	105.8	247.9	200.0	124.0	85.3
1965	217.9	280.6	262.9	106.7	245.7	203.8	120.6	88.4
1966	221.1	280.6	266.4	105.3	258.2	215.3	119.9	87.8

Source: Calculated from [4, 1967].

² The ratio of various taxes and public charges imposed on sugar to the official sugar purchase price which the Taiwan Sugar Corporation paid to farmers amounted to as much as 84 per cent on an average for the years from 1950 to 1966. Out of the above figure, 60 per cent was for commodity taxes, disclosed officially, but the remaining 24 per cent varied from year to year and its details or components were not known.

TABLE IV
RICE PRICE INDEX IN RELATION TO PRICE INDICES OF
AGRICULTURAL PRODUCTS

Year	Rice	Rice
	All Agricultural Products	Sweet Potatoes
1949	70.89	75.32
1950	76.88	86.74
1951	62.82	65.34
1952	87.16	76.62
1953	98.50	103.01
1954	89.28	83.11
1955	89.36	81.94
1956	86.13	72.39
1957	86.83	77.49
1958	85.33	71.70
1959	80.90	72.84
1960	93.33	80.80
1961	93.07	83.04
1962	86.40	74.02
1963	83.84	67.88
1964	73.59	68.26
1949-59	76.17	72.20
1960-64	85.84	74.80

Sources: Calculated from Table I. Price indices of sweet potatoes were calculated from [4].

Focusing on the rice price, changes in the three relative price ratios—the ratio of the rice price to the general prices; the ratio of the rice price to the general prices of agricultural products; and the ratio of the rice price to the price of sweet potatoes (the substitute food for rice and the principal agricultural commodity which is not subject to price controls by the Government) are examined below. As Table I indicates, the ratio of the rice price to the general prices was 60.4 per cent in the period from 1950 to 1959, and 71.5 per cent in the years 1960 to 1964, with the years 1935 to 1937 as the base period. The rice price level in the base period (1935 to 1937) was not particularly high, since the rice price index in the years 1935 to 1937 was almost at the same level, 102.8 per cent, when a different period (1925 to 1926) was used as the base years. In this base period there were no rice controls and production, marketing, exports, and imports of rice were entirely free from control. In these years Taiwan experienced no wars, natural disasters, or economic depressions.

Next, when we follow the changes in the relative price of rice to general prices of agricultural products in Figure 2, it could be observed that rice price indices were below the price indices of all agricultural products combined. The ratio of the rice price index to the price index of combined agricultural products was 76.17 per cent in the years 1949 to 1959, and 85.84 per cent in the years 1960 to 1964, respectively. Since sweet potatoes are used as the substitute for rice

in Taiwan when the rice price is high, the price of sweet potatoes is influenced by the fluctuations in the price of rice. However, sales and prices of sweet potatoes are not subject to any controls, hence their prices are relatively flexible. Calculations of the ratio of rice price to the price of sweet potatoes in past years (with the years 1935 to 1937 equaling as 100) reveal that the ratio was below 80 per cent in the majority of the years, with the sole exception being 103 per cent in 1953. The ratio was 72.2 per cent on the average from 1949 to 1959, and 74.8 per cent in the years from 1960 to 1964 respectively. (See Table IV.) I believe the above substantiates the conclusion that Government food policies have been one of the important causes of low price levels of agricultural products, especially rice.

II. PRODUCTION AND CONTROLS OF FOODSTUFFS

1. *Food Policies in the Prewar Days*

Food policies in prewar Taiwan could be broken down broadly into two major periods. The first period was from 1896 to 1938 when agricultural production was encouraged. Policies which tended to encourage and promote the development of agriculture in Taiwan were adopted in order to turn the island into the supply center of foodstuffs and other raw materials for Japan with the aim of relieving the food shortage in Japan proper and accelerating industrialization. Thus, various vigorous measures to increase food production were taken, such as the improvement of varieties, the building up of facilities for irrigation and water utilization and land development programs to clear and reclaim waste land. As a result, rice production in 1938 surpassed 1.4 million tons, which was twice as much as in 1921 and a five-fold increase over 1900. The area of both cultivated land and paddy fields showed an increase of about two and a half times over 1900. In 1932, "The Agricultural Land Control Ordinance" was promulgated to promote the production of sugar and the development of the sugar industry in Taiwan, and farmers were encouraged to grow sugarcane. In spite of these efforts, rice production continued to expand and registered a 17.3 per cent increase in the five-year period up to 1938. (The rate of increase in ten years from 1921 to 1932 was 65.3 per cent.) During this period the Government took a non-interference attitude towards food price and placed no restrictions whatsoever. Thus, the demand and supply were left to the free play of economic forces. Rice prices, too, were determined by the forces of the market during this period.

The second period after 1939 was a period when food controls were imposed. After 1939 the war situation was aggravated and prices in Japan proper began to rise. As a result the Government started to enforce the control of rice in Taiwan and Korea for the purpose of securing necessary foodstuffs including rice for military use. On May 10, 1939, the Government promulgated "The Taiwan Rice Shipment Control Ordinance" and purchased rice for shipment to Japan proper at an official price fixed on the basis of rice production costs. In the same year rice production in Taiwan began to decrease (1,402,000 tons in

1938, 1,307,000 tons in 1939, 1,129,000 tons in 1940). Because of the low official purchase price, rice was left in the fields, creating difficulties in transportation and the mass rice shipment program and causing food shortages in major cities on the island. Beginning with the first crop of 1940, the Government enforced strict all-out controls, under the name of "the total requisition and the total rationing" movement, which covered all phases from production to storage, processing, transport, distribution and selling. Under this program, the Government determined the delivery quotas on the basis of past production figures and purchased rice compulsorily at the official price. Out of the rice thus collected, a certain amount was distributed to each household through the "Taiwan Food Corporation" (8.4 kilograms per person per month, the remaining requirements were filled with miscellaneous cereals), and the rest was shipped to Japan proper or consigned for military use. Such all-out controls were successful only with the help of both military and civilian policy forces. On the other hand, farmers were obliged to deliver almost all of the rice they produced. Since the official purchase price was lower than the production costs, they had to live on miscellaneous cereals and rice was given only to invalids. Thus, farmers lost their interest in growing rice, and this, together with the growing difficulties in the supply of fertilizers and the shortage of labor as a result of military conscription, caused rice production in Taiwan to decrease rapidly. As a result, rice production in 1945, immediately after the end of the war amounted to only 640,000 tons. This compares with the rice production of over 1,400,000 tons in 1938.

2. Food Controls in the Postwar Years and Their Effects

For about half a year immediately after the end of the war, "the total requisition and the total rationing" system of prewar days was extended and all surplus rice stored in private warehouses was requisitioned and rationed. At that time, the consumer population numbered about 6.5 million. Consequently if the wartime ration level of 8.4 kilograms per person per month (compare the consumption survey result of about 12 kilograms in 1960) had been distributed, 783,000 tons (of brown rice equivalent) would have been required annually. The actual production of brown rice in that year, however, amounted to only 640,000 tons, which was not enough to solve the food shortage. In January of the following year, the system was abolished to make way for free dealings (selling and buying) in rice. Requisitioning of unhulled rice was also discontinued, and in its place, the Government set up "the Food Procurement Committee" to control the storage of rice and made every effort to prevent the price of rice from rising. In spite of such efforts by the Government, rice prices soared day after day, because of the absolute shortage of rice and the absence of government stocks. These rocketing rice prices, together with the effects of the disturbances on the continent, caused vicious inflation. Later, the Government took measures not only to increase rice production but also to acquire its own stocks. For instance, the Government adopted the following measures. Starting with the first crop of 1946, the systems of "agricultural land taxes to be payable in kind" and "rent on public lands to be paid in kind" were initiated. Starting with the first crop of

1947, the systems of requisitioning rice to be distributed among officials within the country, as a part of land taxes, and purchasing of surplus rice at the official price from large- and medium-sized farmers were adopted (the latter system, however, was abolished later, since large- and medium-sized farmers disappeared as a result of the land reform in 1953). In 1948 a system to exchange soy bean cakes and fertilizers for unhulled rice was started, and in 1950 land taxes were increased by 30 per cent to provide revenue for military expenses. This 30 per cent increase in the land tax was to be paid in kind. In 1950 the system of loaning threshing machines and clothes, with both the interest and the principal to be repayable in rice was also adopted. In 1951 a plan to loan necessary funds for agricultural production, with both the interest and the principal to be repayable in rice, and in 1953 a similar scheme to loan mechanical water pumps and other equipment for water utilization and irrigation to be repayable in rice were adopted. In this way, the Government adopted every possible measure to fill up Government rice stocks, and though the measures adopted were not compulsory in name they were compulsory in substance. On the other hand, the Government, through the Food Bureau and the Department of Agriculture and Forestry, took various effective measures for the increase of yield per unit area, the expansion of paddy fields through irrigation works, and the encouragement of intercropping and occasional wage labor in order to increase farm incomes. The most important agricultural policy measure adopted in the postwar years was the land reform scheme undertaken in three stages, i.e., "the 37.5 per cent farm rent reduction program," "the sale of public farm lands program," and "the land-to-the-tiller program." Though this land reform scheme will be appraised later, here I will briefly point out its relationship to food control measures discussed in this section. Prior to the initiation of the land reform scheme, land owners collected unhulled rice as farm rents and could store it for a certain length of time. They could even influence the selling price of rice on the market, through tacit agreement among large landowners. Since the start of the reform scheme, however, they could secure only a far smaller amount of unhulled rice, due to the reduction or discontinuance of farm rents, and could not influence the market price. On the other hand, the Food Bureau procured about one third of the rice production, through various means such as payment in kind by farmers for the purchase of agricultural land, exchange of fertilizers and other materials for unhulled rice, and repayment in rice of loans for agricultural production, and thus came to hold a position from which it could influence the market price of rice.

Next, let us see what effects the Government's food controls had on the market price of rice.

As described previously, in postwar Taiwan after the complete failures of "the total requisition and the total rationing system" and the subsequent system of laissez-faire, a plan was finally adopted under which the Food Bureau would hold large stocks of rice and make releases of these stocks, according to the fluctuations of rice prices. Under this system, prices are not left to the market mechanism, but are influenced by the intentions of the Food Bureau. The Food Bureau manipulates prices arbitrarily to attain its specified objectives. Though

a Government agency, the Food Bureau does not determine and enforce nationally-controlled prices in complete disregard to the market mechanism, it was nevertheless quite clear that the Government was fully determined to check price increases through the control of food prices, since the Government had once had a hard time trying to combat vicious inflation. Therefore, officially-controlled prices tended to be realized at a level close to average production costs, while average production costs are liable to be influenced greatly by farmers' own labor wages as well as the assessment of land and land capital. The wages of farmers are influenced by their living standards, which in turn can be calculated by the traditional standards which prevailed prior to the expansion of agricultural production. With regard to the assessment of land capital, the assessed value of agricultural lands has been virtually fixed from 1937 up to the present according to the calculation of rice production costs by the Food Bureau.³ The fact is, however, with the growth of the economy and population, agricultural lands are utilized as factory sites or building locations, and land values are on the increase year after year.

Thus, the official price of the Food Bureau (the purchasing price of unhulled rice) has been calculated on the basis of low assessment, and the Bureau has been making efforts to manipulate the market price close to this official price and stabilize it there. For this purpose, the Food Bureau must keep stocks large enough to influence the market price. And the Food Bureau takes part in the rice market as a semi-monopolistic supplier. The share of the quantity of rice the Food Bureau collected from farmers for Government stocks amounted to about 30 per cent of total rice production as a twelve-year average from 1952 to 1964. (See Table V.) The share of Government stocks in terms of the supply available to the rice market, with farmers' own consumption deducted, is a little over 50 per cent. Thus, the Food Bureau has established itself in the market as a monopolistic supplier. (See Figure 4.) These Government stocks are to be released, as necessary, according to the fluctuations of the general market price, in addition to the rations which are used as partial payment in kind, to personnel in both the military and the government services. The selling price of Government stocks is maintained at a low level, or 70 to 80 per cent of the average market price. (See Table VII.) Though Government stocks are thus released at a price lower than the market level, it is not necessary for the Government to cover deficits by transfers to the Foodstuff Control Special Account, as in the case of the Government of Japan. Because the Government's purchase price from

³ According to the reference materials on rice production costs of the Food Bureau (provided by Dr. Lee of the Joint Commission on Rural Reconstruction), the interest rate of borrowed capital per *chia* (a unit of land) used as paddy fields for the second crop of 1937 was NT\$137.6, or equivalent to 1,060 kilograms of unhulled rice, converted by the rice price prevailing at that time, while in 1949 immediately after the war the rate was NT\$207.8, or equivalent to only 307 kilograms worth of unhulled rice. (Since the rice price ratio in that year was 1.52, the rate would be 476 kilograms worth, if calculated by the general price index. Owing to the lower productivity of land after the war, the price of agricultural lands decreased.) In the above reference materials, it was stated to the effect that the interest rate of land capital was fixed at or near the level of 900 kilograms worth of unhulled rice during the years from 1950 to 1964.

TABLE
GOVERNMENT RICE

	1952	1953	1954	1955	1956	1957
Land tax	(16.2) 69,558	(13.5) 67,216	(12) 66,674	(12.7) 64,375	(13.7) 66,012	(13.0) 73,234
Purchased as a part of land tax	(13.8) 58,992	(11.4) 65,722	(14.2) 56,157	(10.4) 54,174	(10.7) 55,469	(11.4) 61,222
Public farm land rents	(3.) 15,472	(3.5) 17,298	(3.1) 17,198	(-1.8) -9,462	(2.1) 10,938	(1.6) 8,784
Payment for the purchase of farm land	—	(5.3) 26,148	(2.2) 12,301	(12.6) 65,324	(5.4) 28,283	(4.1) 21,902
In exchange for fertilizers	(60.7) 260,026	(56.2) 278,900	(51.8) 286,991	(59.8) 309,982	(62.1) 322,524	(65.2) 348,944
Repayment of a loan of funds for agri- cultural production	(4.6) 19,851	(5.2) 25,602	(5.0) 27,491	(4.3) 22,155	(4.3) 22,502	(3.3) 17,672
Other	(1.1) 4,889	(4.9) 24,438	(15.7) 87,127	(2.3) 12,191	(2.7) 14,037	(10.7) 3,589
Total	(100.0) 428,788	(100.0) 496,324	(100.0) 553,939	(100.0) 518,739	(100.0) 519,785	(100.0) 535,347
Stocks at the year-end	76,586	188,282	420,939	325,393	379,455	397,757
Production of the year	1,570,115	1,641,557	1,695,107	1,614,953	1,789,829	1,839,009
The share of govern- ment stocks	27.3%	30.2%	32.7%	32.1%	29.0%	29.1%

Source: Calculated from [10].

farmers is at a level lower than the average market price, being at 60 to 70 per cent of the latter price. (See Table VIII.) If the Government authorities want to realize ideal market price (controlled price, in effect), they will continue to make releases (of Government stocks) gradually until supply and demand are stabilized at an ideal level. For these operations, it is not necessary for the officials in charge to have precise knowledge of higher mathematics, the supply and demand functions, elasticity of demand, etc. Instead, they could maintain prices by the trial and error method. Data in the past thirteen years reveal that the quantities of rice ("rice to stabilize the market price") released to the market from Government stocks fluctuated widely from 24,000 tons to 244,000 tons annually. (See Table VI.) Not only does the "rice to stabilize the market price" influence the market price, but also almost all other Government rice supplies, such as rice for the military, the militia or the citizen army (for the training of national guards and officers in the reserve army), national defence, rationing of public officials and teachers, and relief of disasters, also influence price formation in the rice market. If there is not a big change in the demand, the market price of rice relate directly to the quantity of rice harvested as well as to the size of Government stocks. As a concrete measure to estimate Government stocks, let us observe the trends in Government stocks at the end of each year and the ratio of the quantity the Government collected to the total production in Table

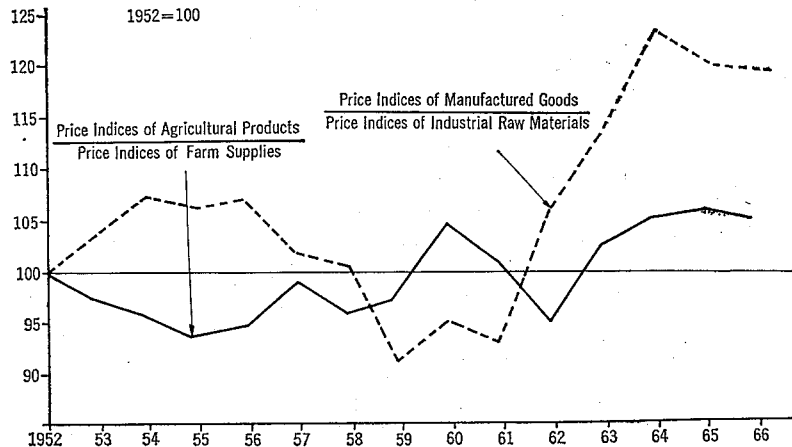
V

PROCUREMENT BY SOURCE

(Unit: Unhulled Rice m/t & %)

1958	1959	1960	1961	1962	1963	1964	Average (1952-64)
(13.0)	(11.4)	(16.1)	(11.7)	(14.2)	(14.0)	(13.17)	(13.3)
70,615	58,564	75,270	67,248	84,428	79,117	88,173	71,575
(10.8)	(8.7)	(12.2)	(9.8)	(9.7)	(9.9)	(8.5)	(10.4)
59,140	44,518	56,766	56,029	57,761	51,142	56,898	55,768
(2.8)	(2.0)	(0.4)	(0.7)	(0.2)	()	(5.63)	(1.8)
15,486	10,120	2,025	3,949	1,402	256	37,681	10,089
(7.6)	(9.9)	(3.5)	(5.6)	(5.0)	(2.4)	(1.71)	(5.4)
41,254	50,780	16,458	32,076	29,642	13,568	11,435	29,097
(62.3)	(63.5)	(62.9)	(63.7)	(64.0)	(66.6)	(65.42)	(62.1)
339,269	325,792	293,102	364,925	381,975	376,385	438,111	333,609
(2.4)	(2.9)	(2.0)	(1.8)	(1.5)	(1.9)	(1.37)	(3.0)
13,238	14,961	9,280	10,510	9,030	10,653	9,184	16,317
(1.1)	(1.6)	(2.9)	(6.7)	(5.4)	()	(4.2)	(4.4)
5,839	8,429	13,346	38,150	32,180	34,380	28,166	23,597
(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
544,841	513,164	466,247	572,887	596,418	565,501	669,648	537,048
322,009	199,704	140,058	296,021	435,815	393,047	496,836	313,223
1,894,127	1,856,316	1,912,018	2,016,276	2,112,874	2,109,037	2,246,639	1,868,987
28.8%		24.4%	28.4%	28.2%	26.8%	29.8%	28.8%

Fig. 4. Movements of the Relative Ratios of Price Indices of Inputs and Outputs—Comparison of Agriculture and Industry



Source: Drawn up on the basis of Table III.

TABLE
DISTRIBUTION OF

	1952	1953	1954	1955	1956	1957
For military use	(35.4) 182,805	(44.7) 199,113	(44.6) 148,557	(30.9) 159,351	(34.9) 167,715	(29.1) 157,898
For militia	(0.4) 2,315	(0.4) 1,962	(0.5) 1,762	(0.3) 1,341	(0.1) 694	(0.6) 3,485
For national defense	(3.0) 15,307	(6.0) 26,740	(7.4) 24,740	(5.6) 28,755	(7.0) 33,640	(6.1) 32,947
For public officials and teachers	(14.7) 75,912	(18.7) 83,498	(24.7) 82,560	(17.1) 87,789	(19.4) 93,162	(17.8) 96,852
For stabilization of the market price	(17.0) 87,454	(20.2) 90,000	(7.2) 24,018	(8.4) 43,143	(13.1) 63,040	(11.4) 62,055
Export	(22.1) 113,760	(9.2) 41,216	(10.8) 36,062	(32.9) 169,834	(19.5) 93,587	(29.8) 161,648
Other	(7.4) 37,919	(0.8) 3,320	(4.8) 15,999	(4.8) 24,643	(6.0) 28,763	(5.2) 28,009
Total	(100.0) 515,472	(100.0) 445,859	(100.0) 333,998	(100.0) 514,856	(100.0) 480,591	(100.0) 542,894

Source: Calculated from [10].

V. Let us examine the changes in the rice price index ratio in Table I, utilizing the tables and figures already mentioned.

The average ratio of the rice price index to the general price index during the years from 1950 to 1959 (with 1935 to 1937 = 100) was 60.4 per cent and in every one of these years, the ratio was close to the average, except in 1953 when the ratio rose to 80.0 per cent. The reason why the rice price rose in 1953 is to be found in the fact that stocks at the end of the previous year were extremely low. These stocks were less than 90,000 tons, the amount of rice released to stabilize the market price in that year. Consequently, the Government cut exports to 40,000 tons in 1953, down from the annual average of about 110,000, and increased stocks at the end of that year. In the following year, the Government collected much more rice than in a normal year. Through such operations, the ratio of the rice price index in 1954 fell on the average to 58.3 per cent. In the following five years, the Government maintained its stocks between 330,000–400,000 tons, and was ready to release sufficient quantities of rice at any time during the five-year period. However, the stocks at the end of 1959 showed a sharp decrease from the level a year before to 199,000 tons. The stocks were not enough to cover the 244,000 tons of rice released in 1960. In addition, the quantity of rice collected by the Government in 1960 decreased, and the share of the rice collected relative to the total production was 24.3 per cent, lower than the average. At the same time, the ratio of rice price index in 1960 rose again to 78.1 per cent from the average of 61.8 per cent in the preceding six years. To check the increase in rice price, the Government released as much as 244,000 tons, equivalent to 41 per cent of the rice collected, with a result that the stocks at the end of the year decreased to 140,000 tons (compare the stocks in a normal year of about 300,000 tons). Thus, the Government's

VI

GOVERNMENT RICE STOCKS

(Unit: m/t & %)

1958	1959	1960	1961	1962	1963	1964	Average (1952-64)
(24.7)	(23.0)	(20.9)	(22.9)	(25.7)	(20.7)	(21.3)	(28.1)
155,508	140,905	124,420	123,040	120,519	129,151	125,436	148,824
(0.8)	(0.3)	(0.7)	(0.6)	(1.1)	(0.5)	(0.8)	(0.5)
4,887	1,939	4,240	3,385	5,305	2,874	4,800	2,999
(5.8)	(6.2)	(7.2)	(7.7)	(8.0)	(6.4)	(7.4)	(6.4)
36,267	37,635	42,587	41,444	37,625	39,885	43,411	33,922
(16.4)	(18.3)	(17.3)	(19.5)	(23.3)	(18.1)	(20.0)	(18.3)
103,590	112,024	103,045	104,825	109,638	112,486	118,048	98,654
(12.8)	(17.4)	(41.0)	(28.2)	(21.4)	(20.8)	(19.6)	(18.9)
80,768	106,845	243,879	151,806	100,331	129,413	115,290	99,849
(34.5)	(29.0)	(6.6)	(13.4)	(12.1)	(27.8)	(21.5)	(21.4)
217,491	177,849	38,895	72,222	56,944	173,289	126,829	113,817
(5.0)	(5.8)	(6.3)	(7.7)	(8.4)	(5.7)	(9.4)	(6.0)
331,688	35,618	37,593	41,248	39,330	35,757	55,726	31,970
(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
630,199	612,815	594,658	537,970	469,692	622,855	589,540	530,107

TABLE VII
COMPARISON OF THE GOVERNMENT RICE SELLING
PRICE AND THE MARKET PRICE

(Unit: NT\$ per Kilogram)

	Market Price in Taipei (A)	Government Rice Selling Price (B)	B/A (%)
1950	1.230	0.935	76.0
1951	1.305	1.215	93.0
1952	2.040	1.575	77.0
1953	3.260	2.290	70.0
1954	2.860	2.290	80.0
1955	3.085	2.310	74.8
1956	3.305	2.405	72.7
1957	3.520	2.545	72.3
1958	3.645	2.715	74.4
1959	3.875	2.900	74.8
1960	5.475	3.880	70.8
1961	5.925	4.205	72.3
1962	5.780	4.425	76.5
1963	5.825	4.515	77.5
1964	5.895	4.615	78.2
1965	5.930	4.735	79.8
1966	5.990	4.895	81.7

Source: Calculated from [11, 1967].

Note: The market price of polished rice in Taipei City is the annual average of the retail prices of both the Ponlai rice and Chailai rice. The Government rice (polished rice) selling price is the average of the first and second periods.

TABLE VIII
COMPARISON OF THE GOVERNMENT UNHULLED RICE PURCHASE
PRICE AND THE FARM PRICE

(Unit: NT\$ per 100 Kilogram)

	Farm Wholesale Price of Unhulled Rice (A)	Official Purchase Price of the Government (B)	B/A (%)
1947	7,993	3,100	38.7
1948	163,882	21,435	13.1
1949	68.05	24	35.2
1950	80.71	56	69.1
1951	97.76	75	76.7
1952	170.40	98.5	57.8
1953	218.90	146	66.6
1954	187.56	146	77.8
1955	210.64	153	72.6
1956	223.41	159.5	71.3
1957	243.32	168.5	69.2
1958	247.18	180	72.8
1959	293.81	192	65.3
1960	408.03	256.5	62.8
1961	401.58	283	70.4
1962	380.93	290.5	74.6
1963	398.28	296.5	74.4
1964	409.63	304	74.2
1965	412.16	310.5	75.3
1966	422.55	322	76.2

Source: [11].

Note: Farm price is calculated by the averaging of three data, i.e., average price in forty-five villages in Taiwan [12], wholesale price in Changhua City, and wholesale prices in seventeen cities [11]. The Government purchase price is the average of the first and second periods [11].

power to check the increase in the rice price through the release of stocks in 1961 was weakened and the ratio of the rice price index to the general price index still remained at a high level at 76.6 per cent.

The rice price is influenced by such factors as the stocks at the end of the previous year, the production of that year, the release of Government stocks during the year, psychological effects of natural disasters such as drought, floods, and many other factors. Table IX shows the changes in Government stocks at the end of the previous year (to be regarded as a part of the Government's power to check the increase in rice price) and the actual amount of rice released from Government stocks each year (to be regarded as a force to push upward the market price of rice) as well as the actual shifts in the ratio of the rice price index to the general price index. It will be seen from the table that the ratio rose particularly in a year when the difference between the Government stocks at the end of the year before and the actual amount of rice released shows a minus sign. This is not to say that the factors responsible for the change of the rice price index ratio were only concerned with the relationship between the

Government stocks at the end of a year before and the actual amount of rice released, but rather that large stocks owned by the Government were helpful to check increases in the rice price. In the fifteen years from 1950, rice price controls were successful in keeping the price at a low level of less than 70 per cent of the prewar level (1935 to 1937 = 100), with the exception of only four years, i.e., 1935, 1955, 1960, and 1961 when the rice price index ratio rose higher.

TABLE IX
DIFFERENCE BETWEEN GOVERNMENT PROCUREMENT AND RELEASES AS WELL AS
THE RATIO OF RICE PRICE INDEX TO GENERAL PRICE INDEX

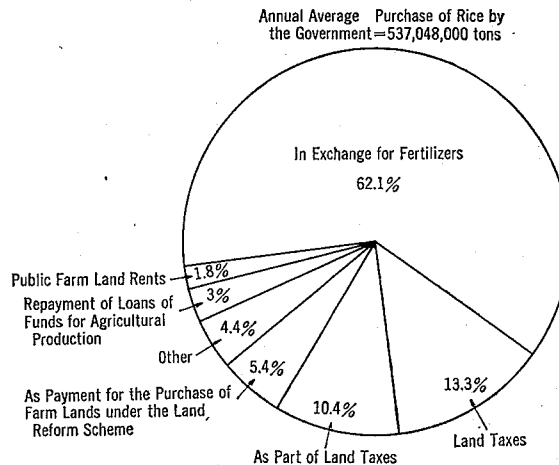
Year	Government Stocks at the End of the Previous Year (ton) (A)	Amount of Rice Released for the Stabilization of the Rice Price during the Year (ton) (B)	A-B (ton)	Ratio of Rice Price Index to General Price Index	Output for the Year (1,000 tons)
1952	163,260	87,454	75,806	58.2	1,570
1953	76,586	90,000	(-) 13,414	80.0	1,641
1954	188,282	24,018	164,264	58.3	1,696
1955 ¹⁾	420,939	43,143	377,796	76.7	1,614
1956	379,455	62,055	317,400	60.1	1,832
1958	397,737	80,768	316,989	60.0	1,894
1959	322,009	106,845	216,164	57.4	1,856
1960 ²⁾	199,704	243,879	(-) 44,175	78.1	1,912
1961	140,058	151,806	(-) 11,748	76.6	2,016
1962	296,021	100,331	195,690	68.9	2,112
1963	435,815	129,413	306,402	67.3	2,109
1964	393,047	115,290	277,757	67.0	2,246

Source: Calculated from Tables I, V and VI.

¹⁾ A year of drought.

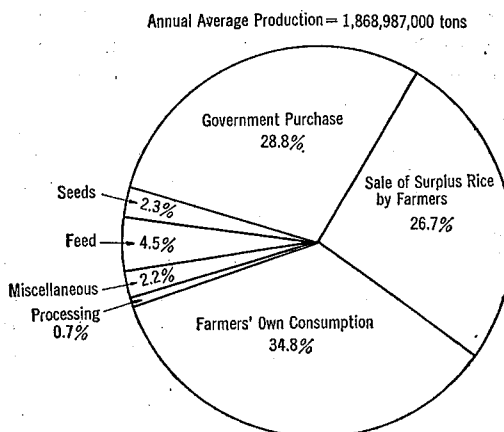
²⁾ A year of floods.

Fig. 5. Government Rice Procurement by Source on the Annual Average between 1952 and 1964



When we take into consideration that Taiwan suffered from severe drought in 1955 and that smooth enforcement of price controls was impossible in 1960 because of the worst flood damages in sixty years, it could be safely said that quantitative control policies have been generally successful.

Fig. 6. The Share of Government Procurement to the Total Production in the Years from 1952 to 1964 (Average Figures)



Sources: Drawn up on the basis of Tables V and VI. Data on farmers' surplus rice sold, rice used as seeds and feed, and processing are obtained from [9, p. 182].

III. SUPPLIES OF RICE AND CHANGES IN THE RATIO OF RICE PRICE INDEX TO GENERAL PRICE INDEX

Many scholars have stressed the important role which agricultural production will play in the economic development in developing countries. Agriculture has held such a predominantly important position in the national economy of Taiwan that Taiwan's economy might be called an agriculturally based economy. In the prewar days, Taiwan's agriculture supplied not only foodstuffs to the people on the island but also a part of the food requirements of Japan proper. Even after the war, the great bulk of foreign exchange needed to pay for importing industrial raw materials and capital equipment was earned by the export of agricultural commodities and processed products. It is very interesting to examine the relationship between long-term growth rate of agricultural production and the rate of population expansion in Taiwan in view of the Malthusian theory that population increases by a geometric progression, while the supply of food can only increase arithmetically. The growth rate of agricultural production is not exactly in direct proportion to the rate of population expansion, but both rates follow similar trends of increase and decrease. From Table X, it can be seen that the growth rate of agricultural production has always been in excess of the rate of

population growth in the last fifty-five years, except for the period of World War II. In the thirty years before the war, the growth rate of agricultural production averaged 3.32 per cent, while population increased at an annual average rate of 2.02 per cent. This resulted in surpluses accumulated in the agricultural sector in Taiwan. The productive power to produce a surplus (in the agricultural sector) was partly destroyed in the seven years during the war (from 1939 to 1945), but has recovered completely as shown in an extremely high growth rate of agricultural production of 12.94 per cent in the postwar recovery period (1945-52). In the following years from 1952 to 1965, agricultural production increased at the rate of 4.26 per cent, while the rate of population growth was 3.45 per cent. This brought about surpluses of agricultural commodities, and enabled export of farm products to be resumed. Figure 7 shows the comparison between the over-all population index and the rice production index, with the years 1935-37 as the base period. Owing to the rapid fall in the production indices of both agricultural commodities and rice during the war years, the growth rate of rice production exceeded the rate of population expansion in the postwar years and the rice production index has tended to catch up. However, the rice production index is still lower than the population index by about 40 per cent. It should be noted in this connection that rice exports averaged 670,000 tons annually in the base period of 1935-37, while the average rice exports in the postwar years of 1952-64 amounted only to 110,000 tons, with the difference of 560,000 tons reflected in an increase in the supplies within the island. This difference is equivalent to 42 per cent of the rice production of 1,320,000 tons in the base period. The per capita supply of brown rice in Taiwan (including seeds for rice planting, feed-stuffs for livestock, and wastage), was 157.6 kilograms in the years from 1951 to 1960 and 154.6 kilograms in the years 1961 to 1964, respectively, and represents an increase of about 30 per cent as compared with 120.4 kilograms in the base period. (See Table XI.) Figure 8 shows the relationship between rice supplies and the ratio of rice price index to the general price index. As indicated in the figure, the per capita rice supply was at a low level at 132.9 kilograms

TABLE X
THE GROWTH RATE OF AGRICULTURAL PRODUCTION AND THE
RATE OF POPULATION EXPANSION IN TAIWAN

	Annual Average Growth Rate	Rate of Population Expansion
1909-20	1.65%	1.31%
1920-39	4.20	2.40
1939-45	-12.30	0.46
1945-52	12.94	4.94
1952-60	4.26	3.45

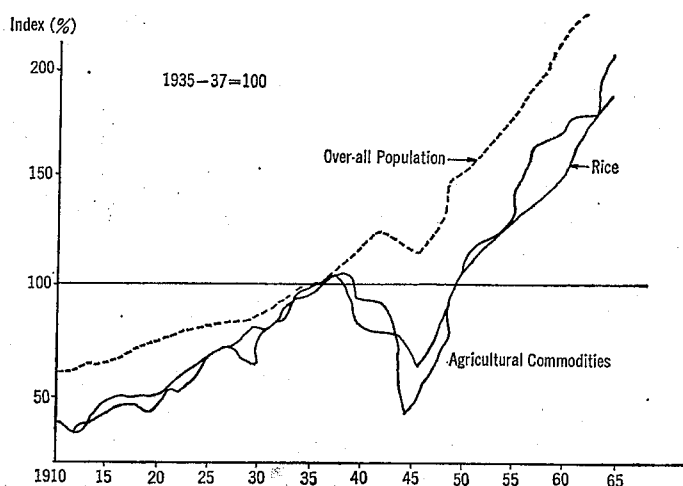
Prewar years (1909-1939)	3.32	2.02

War years (1939-1945)	-12.30	0.46

Postwar years (1945-1965)	7.21	3.91

Source: Calculated from [4] and [2].

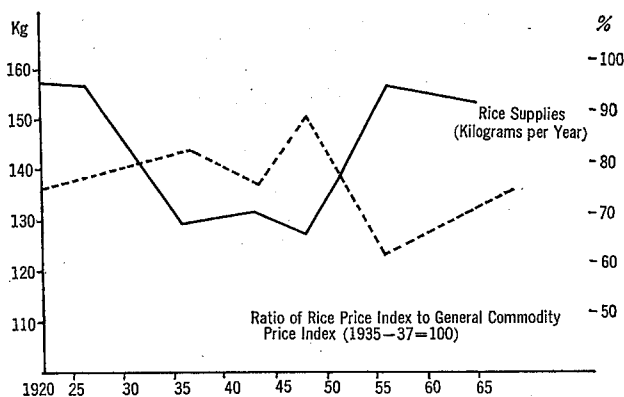
Fig. 7. Production Indices of Agricultural Commodities and Rice, and Population Index



Sources: [4] and [11].

during the war years. However, under strict controls and rationing at the official price, rice prices did not rise and the ratio of the rice price index to the general index remained at 77 per cent. The figure also shows that, except for these war years, rice supplies and the ratio of the rice price index were reversely related on the whole. However, the above statement needs some modifications. In the years 1920 to 1929, the per capita rice supply averaged 157.8 kilograms, while the ratio of the rice price index was 79.4 per cent, comparing to the per capita rice supply of 157.6 kilograms and the rice price index ratio of 62.6 per cent in the years 1951 to 1960. Though the per capita rice supply was more or less

Fig. 8. Relationship between Per Capita Rice Supply and the Rice Price Index Ratio (Average Value over 10 Years)



Source: Drawn up on the basis of Table XI.

TABLE XI
PER CAPITA SUPPLY OF RICE AND WHEAT, AND RICE PRICE INDEX RATIO

	Per Capita Annual Supply of Unhulled Rice (kg)	Per Capita Annual Supply of Wheat (kg)	Rice Price Index Ratio (%)		
			1935-37=100	1914=100	1925-26=100
1920-29	157.8	0.3	79.4	95.1	
1930-39	129.8	0.2	84.9	99.3	
1935-37	120.4	0.2	100		102.8
1939-44	132.9	0.7	77		
1945-50	127.9	0.8	92		
1951-60	157.6	18.5	62.6		
1961-64	154.6	28.0	70.0		

Source: Rice price index ratios are taken from Table I. Consumption of rice and wheat has been compiled from [11], [6], [5] and Table VI.

Note:
$$\text{Supply} = \frac{\left(\text{Production} + \frac{\text{Stocks at the end of the year}}{\text{previous year}} \right) - \left(\text{Exports} + \frac{\text{Stocks at the end of the year}}{\text{year}} + \text{Rice for military use} \right)}{\text{Over-all population (excluding military servicemen)}}$$

equal, the rice price index ratio was lower in the latter period. This is accounted for by the following two factors. First, in the latter period, the Government was the monopolistic supplier of rice, as already described. Secondly, a per capita wheat supply of 18.5 kilograms was used to make up for the unfilled demand for rice in the latter period. As a matter of fact, on the average about 180,000 tons of wheat were supplied annually in these years, mainly from the United States of America under its surplus agricultural commodities disposal program (149,000 tons under the U.S. assistance program and 27,000 tons domestically produced). It is evident that these supplies of surplus wheat under the U.S. assistance program helped the Food Bureau to maintain the rice price at a low level over a considerably long period.

IV. THE EFFECT OF RICE CONTROLS UPON TAIWAN'S ECONOMY

The previous sections have examined the observation that relative prices of agricultural commodities have been maintained at a low level in the postwar years and that especially the rice price has been kept low owing to the rice control measures.

It is difficult, in view of the limited data, to give a full explanation of what effect the forced maintenance of the low rice price index ratio has had upon Taiwan's economy in the postwar years. However, certain points should be mentioned briefly.

In respect to the structure of agriculture, it has encouraged the diversification of production in the agricultural sector and the intensification of land utilization. It is conceivable that producers would switch to agricultural commodities less strictly controlled. However, no profitable crops other than rice have been widely

cultivated in fertile paddy fields. It is only natural that farmers, conservative by nature, would feel anxiety about converting to new crops from rice, which they have been cultivating for several hundred years. Thus farmers continued to cultivate rice, though its price was somewhat low, and made efforts to increase unit area rice yields. At the same time, their efforts were directed toward the intensification of land utilization.⁴ For example, in the case of rice, there was little change in the planted area during the years 1952 to 1966, but production increased by almost 60 per cent during the period. We cannot observe any real trend toward expansion in cultivated area in 1965, when compared with 1938, the highest in the prewar years, or the postwar year of 1952. Nevertheless, the expansion of agricultural production in these years is very remarkable. For instance, the production of brown rice, sweet potatoes, and pineapples increased by nearly 80 per cent over the highest volume of production in the prewar years. The production of wheat was about three and a half times greater than the prewar level, soybeans about ten times, peanuts more than four times, bananas more than double, and citrus fruits three-fold. Except for the production of sugarcane which decreased by 20 per cent, agricultural production generally showed a marked increase. This increase in land productivity is attributable mainly to increases in such inputs as chemical fertilizers, insecticides and pesticides as a result of technological advances as well as to labor. The average input of chemical fertilizers increased to 660 kilograms per hectare in paddy fields in 1960, to 775 kilograms in 1965, as compared with 623 kilograms in 1938, the highest recorded before the war. The input of labor in terms of labor days per hectare of cultivated land increased markedly: 168.2 days in 1946, 264.7 days in 1952, 297.3 days in 1960, and 324.4 days in 1965. The labor input in terms of labor days per hectare of planted area also showed an increase: 143.2 days in 1946, 154.0 days in 1952, 162.4 days in 1960, and 172.7 days in 1965.⁵ This is due not only to the increase in the farming population, but also to the increase in the annual number of working days per agricultural worker. Annual working days per capita was 90.2 days in 1946, but increased to 133.7 days in 1952, 147.2 days in 1960 and 156 days in 1965.⁶ If the relative prices of agricultural products, particularly the rice price, become unfavorable for farmers and if farmers find it impossible to maintain their living standards with the present volume of agricultural production, they will in-

⁴ Per hectare yields of brown rice were 1,882 kilograms in 1952, 2,284 kilograms in 1956, 2,242 kilograms in 1938—the highest level in the prewar years—2,495 kilograms in 1960, and 3,038 kilograms in 1965, respectively. The rate of land utilization was improved from 172 per cent in 1952 to 189 per cent in 1966. The following is a concrete example of intensive land utilization by multiple cropping centering around rice cultivation. After rice has been planted in paddy fields, fast-growing small fish are bred in the fields, making use of the full-water period. Before the rice plants bloom, the fish are caught. When the rice plants begin to bear ears, vegetables and sweet potatoes are planted. Thus, there is presently a trend in the direction of multiple cropping, from raising two crops in paddy fields in the past to five crops a year. In addition, vegetables for personal consumption, such as beans, are grown along foot-paths between rice fields.

⁵ These figures are arrived at by dividing working days by the sum of cultivated acreage and planted area. Refer to [3, Vol. 1, p. 46].

⁶ Refer to [7, p. 323].

crease capital inputs such as fertilizers, insecticides and pesticides so as to expand future production, even at the sacrifice of their present consumption level. They also will work twenty or thirty added days to prevent lowering of their living standards and will even make positive efforts to raise the standards. In fact, they generally acted that way. As it was difficult for laborers to leave the agricultural sector for other sectors in Taiwan's economy in the immediate postwar years, checks on prices of agricultural products were effective in achieving the objective of increasing agricultural production.

Secondly, as to the effect upon the non-agricultural sectors, it can be said that inflation was checked through curbs on the wage level, and that low food prices resulted in a relative expansion of purchases of manufactured goods and services in a given household income. The severity of inflation caused by the rise in food prices and the resultant increase in wages will depend upon the inter-relationship of prices of various goods. There are a great many theories on wage levels, but in terms of supply Malthus has said that prices of daily necessities exert a great influence on the value of labor.

Since it is difficult to analyze the relationship among food prices, the wage level, and the general price level, I shall not venture to discuss it now, but rather I will examine only the relationship between food prices, real wages in the manufacturing sector, and industrial labor productivity. It can be assumed that of the four curves of indices shown in Figure 9, the rapid increasing rate of labor productivity tends to move up real wages, while retail prices of polished rice and food prices work as a force to move down the wage level. Among the reasons why the wage level can not catch up with the labor productivity level are the existence of production factors other than labor, the demand and supply of labor,

TABLE XII
INDICES OF RICE PRICE, WAGES, AND LABOR PRODUCTIVITY

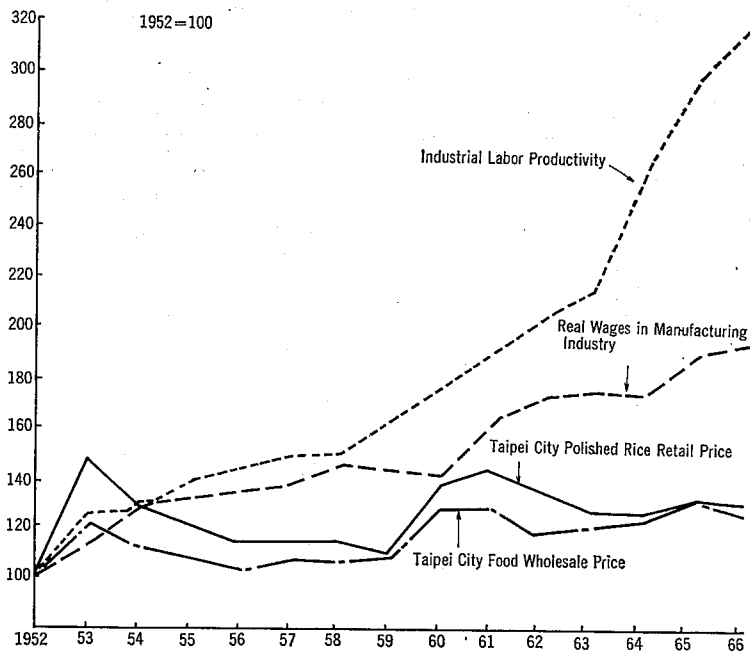
	Taipei City Wholesale Price Index	Taipei City Retail Rice Price Index	Industrial Labor		Taipei City Wholesale Food Price Index
			Real Wages	Productivity	
1952	100.0	100.0	100.0	100.0	100.0
1953	108.7	147.0	110.3	124.6	123.8
1954	11.3	125.9	128.5	125.2	111.5
1955	127.0	119.8	131.5	135.8	103.4
1956	143.1	113.3	134.6	141.8	103.4
1957	153.5	112.4	138.5	148.7	106.8
1958	155.6	114.8	144.7	149.8	106.0
1959	172.5	110.0	142.4	161.5	106.8
1960	196.9	136.2	140.0	176.5	129.4
1961	203.2	142.9	163.2	189.9	129.3
1962	209.4	135.3	174.5	205.3	119.1
1963	222.9	128.0	176.8	215.3	121.8
1964	228.4	126.4	176.8	215.3	121.8
1965	217.8	133.4	189.1	301.0	133.3
1966	221.8	132.8	196.9	322.2	127.8

Source: Rice Price: [11, 1967, p. 144]. Others: [13, 1967].

and many other factors. Low prices of agricultural products are one of the factors which cause laborers to leave the agricultural sector for other sectors. It thus increases the supply of labor in the industrial sector.

The share of expenditures for rice in the total household consumption expenditures of a working family in the industrial sector in 1954-55 accounted for more than 20 per cent, while the share of expenditures for foodstuffs was more than 60 per cent. In 1952 the expenditure for foodstuffs accounted for 69.9 per cent of household consumption expenditures. There might have been some difference in the two household surveys cited above in terms of method, coverage, etc. However, both surveys were conducted in a year when both the rice price index ratio and the relative agricultural prices were low. Since similar data is not available for a period when both the rice price index ratio and the relative agricultural prices were high, we could not examine the changes in Engel's coefficient as a result of price movements. But it is evident that foodstuffs are a daily necessity in a worker's household in Taiwan. In the early postwar years, Taiwan's economy suffered from severe food shortage and serious inflation. If the Government had let farm prices rise in accordance with supply and demand, it would have had to issue an enormous amount of paper notes in order to purchase and distribute foodstuffs for well over a million people, including seven hundred thousand military personnel and Government officials who along with their families fled from the continent. If this had happened, the rise in food prices would have brought about not only the rise in the general level of prices but also the issuance of a

Fig. 9. Changes in Indices of Food Prices, Wages, and Labor Productivity



Source: Drawn up on the basis of Table XII.

huge amount of paper notes in order to supply foodstuffs to military personnel and immigrants. This would have put a heavy burden on an already exhausted treasury, and it would have been extremely difficult to curb this far more vicious inflation. The rise in the general level of prices would have brought about increases in prices of agricultural inputs and, in turn, the eventual rise in farm prices. As a lever to cut off this vicious cycle, the price of rice, staple food, was kept low through controls. The fact that such a low rice price level has been maintained in this way for more than a decade, in spite of the stabilization of prices and the growth of industrial production, means that the natural purchasing power of farmers selling surplus rice has been transferred to the Government or consumers who buy rice from farmers. The Government, by selling rice at a price higher than the purchase price, makes a profit to increase the revenue and turns this into Government saving. If the Government keeps the market price of rice at a low level through controls, it will be able to purchase rice from farmers at a cheaper price. Such a cycle results in the reduction of Government expenditure (a part of salaries of the military personnel and the Government employees) and contributes indirectly to Government saving. The rise in prices for staple foodstuffs would mean that for the general public, including small farmers who purchase rice and especially for workers in urban areas, the relative reduction of either the purchase of other goods and services or saving. In any case, it could be concluded that the maintenance of the relative prices of farm products at a low level in favor of the urban household which has a high ratio of consumption expenditure for agricultural commodities is conducive to capital formation in the non-agricultural enterprise.

At this point one might ask the following question. When the purchasing power of farmers, accounting for more than half of the people, decreases, the effective demand for manufactured goods reduces. Then, is this not a factor which will retard the development of industrial production? The reply would go as follows. The purchasing power of farmers was lowered by the reduction of relative prices for agricultural commodities. On the other hand, it is possible to make up for the lowered portion or even to increase purchasing power by improvement in unit area yields through the increased input of technological innovations, capital and labor, the adoption of multiple cropping, and the increase in earnings from part-time employment.

There is not space here to make clear the relation between such farm prices and industrialization in Taiwan, but I will say in conclusion that the Taiwan Government has adopted this policy, first, in order to make the prices of its manufactured goods competitive in the world market by maintaining low wage levels through low food prices, secondly, to expand production and increase employment opportunities, by increasing exports, and, finally, to increase the effective demand in the country.

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