

AGRICULTURAL STAGNATION IN THE 1920'S, A MACROECONOMIC PERSPECTIVE

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“Trade, exchange rate, fiscal, and monetary policies have a significant impact on agriculture in developing countries, and their effects often overshadow those of sector-specific policies. These policies are leading determinants of the movement of capital and labor between agriculture and the rest of the economy, the growth and composition of agricultural output, and the volume and composition of trade in agricultural products. They are often the principal sources of bias against agriculture, and as such they inhibit the growth of real incomes in rural areas, where the concentration of poverty is greatest.”

World Bank, *World Development Report 1986*, p. 62.

Introduction

It is customary to divide the entire process of Japan's agricultural development before World War II into two distinct phases. Broadly, the end of Meiji Era or World War I is the line of demarcation for the two phases. Such a phasing recognizes drastic changes in the role of agriculture in the Japanese economy in the 1920's and the pattern of major swings in input and output and therefore productivity trends. The productivity of labor in agriculture fell markedly from the annual rate of 2.0 percent in 1901-15 to insignificant 0.2 percent between 1916 and 1930, while in nonagriculture the labor productivity rose at the annual rate of 1.6 percent in 1901-1915, and at 1.3 percent in 1916-30. Having contributed materially in the growth of the overall economy until the first world war, agriculture stagnated, and its economic position rapidly declined relative to the other sectors of the economy.

Unresolved problems concerning the agricultural stagnation of the 1920's are controversy surrounding the relative importance of factors that distinguish this period from those preceding it, regarding, for example, the sources and rates of technological progress in agriculture, the progress of land infrastructure investment and the negative effects on rice prices from colonial competition together with the progress of the parasitic landlordism in the agrarian structure. Even during this period of stagnation, however, civil engineering works expanded in agriculture, the dependence on inorganic, chemical fertilizers increased, and commercialization of agriculture progressed along with the rise in the variety of farm products. On the other hand, those problems not directly of the agricultural origin came to greatly affect and interact with agriculture. The adversities of the 1920s made it clear that the agriculture of Japan was not to remain isolated from the macroeconomic impact of Japan's external relations nor from developments in the nonfarm sectors at home. Scholars including Bruce F. Johnston explained the agricultural stagnation of the decade in part by the deflationary

impact resulting from the policy of pursuing the goal of returning to the Gold Standard at prewar parity. He in particular emphasized the adverse impact of surplus labor dammed up in agriculture as well as in the "semi-modern" nonfarm sectors. According to Johnston, the slowing down of the growth rate of nonfarm employment during the 1920's and early 1930's was the result of inappropriate policies which encouraged capital-intensive investment by the large-scale, modern sector as well as the circumstances that discouraged the expansion of smaller firms in the semi-modern sector.¹

Despite the violent upheavals of the first world war, and its aftermath, major economies of the world became ever more closely bound together by movements of goods, services, and capital. While other major powers were consuming wealth and piling up colossal debts, not only did Japan emerge from a light-industry based economy to an economy with a rising share of heavy industry, but metamorphose herself from a debtor to creditor country owing to the successive favorable trade balances and a virtual monopoly of the carrying trade on many routes. From 1920 to 1931, however, real Gross National Product grew by only 21 percent over the twelve years. With the real growth rate of GNP at 1.6 percent per annum and the growth rate of population of 1.4 percent, it appears that the period could be characterized by a virtual lack of growth except for the "natural" expansion resulting from the population growth.

What did happen after the first world war that produced this result? In this paper I propose to look at this question from a macroeconomic frame of reference. In confronting the question of the "deflationary impact of returning to the Gold Standard at the prewar parity," I propose to deal with it in reference to the impact on agriculture of changes in the real exchange rate of an economy. The concept provides us with a valuable insight into this problem.

The Real Exchange Rate and Agriculture

It is most convenient to think of the real exchange rate as the ratio of the prices of traded goods to the prices of nontraded goods. The concept measures the real terms of

¹ Bruce F. Johnston was among the first writers in English who focused attention on the adverse effects of the post-WWI economic policies on the agricultural sector of Japan. C.f., Bruce F. Johnston, "Agriculture and Economic Development: The Relevance of the Japanese Experience," *Food Research Institute Studies*, VI, No. 3 (1966), pp. 251-312, and his "Agricultural Development and Economic Transformation: A Comparative Study of the Japanese Experience," *Food Research Institute Studies*, III, No. 3 (1962), esp. pp. 241-247.

Yujiro Hayami and V.W. Ruttan ascribes the emergence of the interwar stagnation in part to an unfavorable shift in the demand for agricultural products, especially such staple foods as rice. They argue that the demand for food as well as for other consumer goods declined as a result of the decline in consumer income, which in turn resulted from the deflation policy Japan adopted in order to return to the gold standard at the prewar parity. They cite my earlier study and argue that the income elasticity of demand for rice and staple foods declined as a result of urbanization and of changes in the occupational distribution of the labor force. They explain the stagnation, however, by analyzing "events of greater magnitude, such as the exhaustion of technological potential or the importation of colonial rice." Yujiro Hayami and V.W. Ruttan, "Korean Rice, Taiwan Rice and Japanese Agricultural Stagnation: An Economic Consequence of Colonialism," *Quarterly Journal of Economics* (Nov. 1970), pp. 562-589. See also Hiromitsu Kaneda, "Long-term Changes in Food Consumption Patterns in Japan, 1878-1964," *Food Research Institute Studies in Agricultural Economics, Trade, and Development* (1968), VIII-1, pp. 1-32.

trade between traded and nontraded goods. The real exchange rate p is defined variously as follows:

$$p = eP^*/P,$$

where e is nominal exchange rate (measured in, say, ¥ per \$), P^* is an index of foreign prices, and P is an index of domestic prices. This is the nominal exchange rate multiplied by a foreign price index and divided by an internal price index. Alternatively, p can be defined

$$p = P_T/P_{NT},$$

where P_T is the home price level of tradable goods and P_{NT} stands for that of nontradable goods. Since the nominal exchange rate determines the domestic prices of tradables, whereas the wage rate is the predominant determinant of the price level of nontradable services, a third measure would define p as

$$p = e/w,$$

where e is again nominal exchange rate and w is the wage rate at home. In both the first and third measures, the nominal exchange rate is the predominant internal variable in determining the domestic prices of tradables, whereas the wage rate is the primary input into services, which constitute the bulk of nontradables.²

A fall in the real exchange rate implies that the prices of tradables are falling relative to the prices of nontradables. On the other hand, an increase means that the price ratio improves in favor of tradable goods. If the reasonable assumption is made that intersectoral resource flows are sensitive to relative price changes, it is clear that changes in the real exchange rate would tend to affect intersectoral profitability, which would induce movement of resources between different sectors of the economy. More specifically, a reduction in the real exchange rate would tend to divert resources away from tradables to nontradables, while an increase would accomplish the opposite.

In a basic Dutch Disease model that derives from analysis of real exchange rate, a booming resource (export) sector affects the rest of the economy through the spending and resource-movement mechanisms.³ An export boom generates a balance-of-payments surplus,

² The conceptual framework is based on the standard assumptions of a small, open economy producing three kinds of goods: importables, exportables, and nontradables (domestic goods). The world prices of the importables and exportables are exogenously given. The domestic nominal prices of the tradable goods are determined by their foreign prices, the nominal exchange rate, import duties, and export taxes or subsidies. The domestic nominal prices of nontraded goods are determined by domestic demand and supply factors, which are, in turn, influenced by trade and exchange rate policies through the tradable goods market. Given the overriding importance of raw silk and silk fabrics in Japan's exports, and given the typical pattern of her fabrication trade where raw cotton was imported and cotton textiles were exported (where large negative trade balances resulted), the assumptions needed for the conceptual framework of real exchange rate may do no violence to the Japanese economy of the interwar period. References are: Rudiger Dornbusch, "Tariffs and Nontraded Goods," *Journal of International Economics* 4 (1974), pp. 177-185; Larry A. Sjaastad, "Commercial Policy, True Tariffs, and Relative Prices," in J. Black and B. Hindley, eds., *Current Issues in Commercial Policy and Diplomacy* (New York: St. Martin's Press, 1980).

³ References are: R.G. Gregory, "Some Implications of the Growth of the Mineral Sector," *Australian Journal of Agricultural Economics* 20 (1976): 71-91; William M. Corden and P. Neary, "Booming Sector and De-Industrialization in a Small Open Economy," *Economic Journal* 92 (1982): 825-848; A.C. Harberger, "Dutch Disease: How Much Sickness, How Much Boom," *Resources and Energy* 5 (No. 1, 1983); H. Siebert, ed., *The Resource Sector in an Open Economy* (Berlin: Springer-Verlag, 1984); and T. Ademola Oyejide, *Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria*, IFPRI Research Report, #55, October 1986.

as indeed happened in Japan during the WWI years. Under the gold standard, or when the central bank monetizes this surplus, money supply increases. An increase in the general price level that is not matched by an equivalent devaluation would generate a real appreciation of the domestic currency. This appreciation would, in turn, squeeze profitability out of the tradable goods (both importables and exportables) sectors of the economy. From this analytical standpoint one sees also how trade and exchange rate policies impinge on agriculture. Changes in the real exchange rate play a critical role in the profitability of both export-oriented and import-competing agriculture. The approach enables one to focus on the real exchange rate as a strategic variable that could be used to analyze policy issues.

In general, a decline of the real exchange rate is a signal that the terms of trade have worsened against the tradable goods sector and that resources are being diverted to the non-tradable goods sector. An increase in the real rate gives an opposite signal. The export crops (raw silk, tea, etc.) and import-competing products of agriculture are tradables.⁴ For this sector, a decline in the real exchange rate indicates a reduction in the prices of agricultural exports and import-competing products of agriculture relative to nontradable goods. For example, industrial protection (however provided) makes the real exchange rate lower than it would be otherwise. Agriculture, then, suffers for two reasons: increased profitability of protected industrial outputs and increased profitability of nontradable goods. Resources move from the agricultural tradables sector to these other sectors.

Moreover, such a model permits explicit consideration of the way domestic prices of exportables and importables move relative to domestic goods with the real exchange rate over time. Regardless of the exchange rate policy followed, for example, a country subjected to an exogenous worsening of its international terms of trade should witness a decline in the price of non-traded goods and services (or the wage rate) relative to the domestic price of importable goods. Such a change would encourage a movement of labor and capital, including fresh investment, toward import-competing industry. Furthermore, these trends correspond to a decline in the real exchange rate implying also that the prices of tradables are falling relative to the prices of nontradables. Resources are induced to move from tradables to nontradables, being affected by intersectoral profitability. Thus, such a reduction in the real exchange rate tends to encourage domestic construction industry and services, including the government sector, as well as import-competing industry. It follows, therefore, that components of real exchange rate can be empirically examined in order to study the macroeconomic effects of a wartime export boom on agriculture and the import-competing goods sector (manufacturing). Such an analysis would indicate changes in competitiveness of both exportable and importable goods sectors.

⁴ Primary products (raw silk, tea, marine products, coal and copper) occupied more than four fifths of total exports at the beginning of Japan's modern growth, but the share of manufactured export increased steadily afterward. However, manufactures included such products as foodstuff, ceramics, wood products, and straw products which were based on domestic natural resources. Textiles and other light manufacture exports expanded rapidly to be the leading exports for the forty years before World War II. It was only after 1920s when exports of heavy industry started to grow and well after World War II when it led Japanese exports.

Exports of silk fabrics started in the 1880s and increased up to a quarter share in the 1900s. Raw silk, however, continued to be the main form of silk exports throughout the whole period. Partly due to the tariff structure of the major market for Japanese silk in the United States, exports of silk fabrics remained small relative to that of raw silk. In the Tariff Act of 1883, the general ad valorem rate on silk fabrics was 50%, that on silk yarn 30%, whereas raw silk was imported free of duty.

TABLE 1. RELATIVE PRICES OF TRADED GOODS AND EXCHANGE RATES, JAPAN, 1917-1939

Year	Relative Price Index for Exports (P_x/P_d)	Relative Price Index for Imports (P_m/P_d)	Exchange Rate*	Real Wage**
1917	132.5	105.9	50.5	50.8
1918	125.9	112.0	51.4	52.7
1919	138.6	101.2	50.6	65.1
1920	187.4	99.2	49.6	60.6
1921	136.6	83.8	48.0	88.7
1922	145.1	81.1	47.9	84.3
1923	148.4	83.2	48.9	82.0
1924	142.1	88.2	42.0	81.6
1925	150.4	103.7	40.8	84.0
1926	147.3	97.0	47.9	74.4
1927	136.5	92.0	47.4	100.7
1928	131.5	92.1	46.5	99.9
1929	133.7	90.0	46.1	100.9
1930	123.1	83.2	49.4	113.0
1931	116.8	84.2	48.9	121.5
1932	106.7	88.9	28.1	110.5
1933	109.1	94.2	25.2	98.9
1934	104.4	98.6	29.5	102.3
1935	98.1	101.5	28.6	100.5
1936	96.6	88.8	29.0	96.8
1937	91.7	91.7	29.9	96.7
1938	89.7	83.9	28.5	88.5
1939	101.2	80.8	26.0	86.2

* U.S. Dollars per ¥100, annual average, New York.

** Laborer's annual wage rate index for rodosha (manual workers) and shokuin (office workers) deflated by the wholesale price index.

Notes: P_x stands for the price index of merchandise exports (total), P_m for the price index of merchandise imports (total), and P_d for the index of the wholesale prices (all commodities).

Source: Wage rate index: Long-term Economic Statistics, Vol. 1.

Export and import price index: Long-term Economic Statistics, Vol. 14.

Wholesale price index: Bank of Japan, 100 Year Statistics of Japanese Economy.

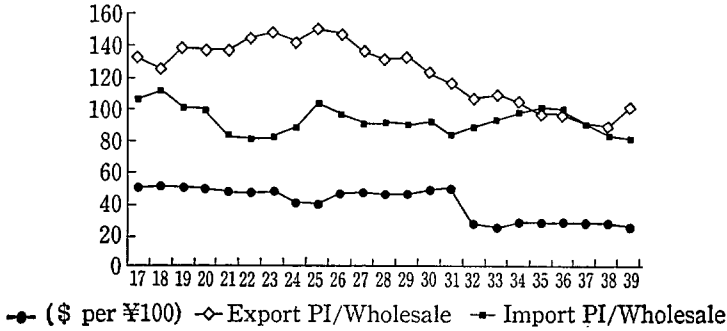
Exchange rate: Long-term Economic Statistics, Vol. 14.

Fig. 1 reveals (1) that the relative prices of exports show slight gains in the early twenties then fall through the thirties, and (2) that relative prices of imports show a gentle wave-like pattern, if anything, declining a little in the immediate postwar years, rising somewhat in the early twenties, falling through 1931, and rising subsequently once again for a few years to be followed by a gentle fall in the remainder of the thirties.⁵ The figure indicates also (3) that the yen-dollar exchange rate remains stable (except for a dip in the mid-twenties) and then starts to fall from the early thirties. Fig. 2 shows (4) that the real wage rate rises throughout until early in the thirties and has a sharp fall during 1931 to 1933, which is followed by a gentle decline throughout until the very end of the decade.⁶

⁵ Charts are drawn from the data in Table 1.

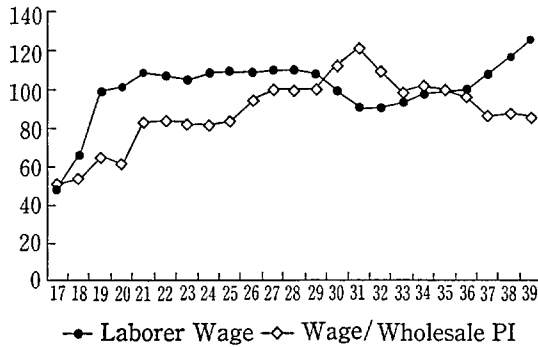
⁶ Related to this is the controversy in the literature concerning the dating of the turning point in Japanese development. Minami, for example, found unskilled industrial real wages rising after 1920 but falling again in the 1930s, exhibiting a sustained rise only in the 1960s. The interpretation given by Kazushi Ohkawa, Gustav Ranis and John Fei is that the decline in the 1930s was caused by the impact of the Great Depression, which had a similar effect in other mature economies. They believe the turning point in 1920 has the distinguishing characteristic that, before then, the real wage was determined independently of the rapidity of labor absorption by nonagriculture. See, Ryoshin Minami, *The Turning Point in Economic Development: Japan's Experience* (Tokyo: Kinokuniya, 1973); and John C. Fei, Kazushi Ohkawa and Gustav Ranis, "Economic Development in Historical Perspective: Japan, Korea, and Taiwan," in K. Ohkawa and G. Ranis, eds., *Japan and the Developing Countries, A Comparative Analysis* (Basil Blackwell, 1985), pp. 35-64.

FIG. 1. REAL EXCHANGE RATE and NOMINAL EXCHANGE RATE, 1917-1933, JAPAN



Source: Table 1. Trade price indexes: LTES, Vol. 14. Wholesale price index: BOJ, 100 Year Stat.

FIG. 2. NOMINAL AND REAL WAGE RATE, 1917-1939, JAPAN



Source: Table 1. Annual wage index of rodosha(manual workers) and shokuin (office workers), LTES, Vol. 1.

I propose next to look at important developments in macroeconomic variables that help explain the movement of the real exchange rate. In doing so I intend to study (1) if, given the external environment of the 1920s and some catastrophic events, such as the great earthquake of 1923, was Japan able to lessen the deflationary impact of the decade, and (2) if the policy of pursuing the goal of returning to the Gold Standard at prewar parity was indeed responsible for the deflationary impact on the economy of the 1920's.

External Trade, Specie Holdings, and Money Supply

During the war years, the growth of exports exceeded that of imports and the visible trade yielded a net balance of ¥1.4 billion between 1915 and 1918. Moreover, Japan's maritime shipping industry experienced an unprecedented boom when a large increase in shipping

needs enhanced the demand for bottoms and the freight charges rose markedly. Benefiting greatly from the rapid growth in her shipping revenues, Japan's net balance of the invisibles in the current account reached ¥1.4 billion during the same four years. In total, therefore, the net current-account earnings amounted to some ¥2.8 billion in foreign exchange. Thus, in the aftermath of the war Japan emerged as a net creditor with the specie reserves abroad of ¥1.5 billion and the loans outstanding abroad of ¥1.9 billion while owing the external debt of ¥1.6 billion.⁷

The real growth rate of the Japanese economy exceeded 8 percent per annum for the three years from 1916 to 1918. More spectacular, however, was the growth in the nominal rates. Gross National Product in nominal terms rose from ¥4.7 billion in 1914 to ¥11.8 billion in 1918, registering a nominal rate of growth in the excess of 25 percent per annum during these years. Although the magnitudes of real growth rates were unprecedented, it is vitally important to note that the war boom of 1914–1918 was fundamentally a price boom in which prices rose spectacularly.⁸

The reaction came swiftly in 1920. The stock market crash on March 15 precipitated the crisis. The prices of stocks and commodities collapsed, and stock markets all over Japan had to be closed for about a month. The financial crisis of 1920 was the harbinger of a series of adversities to fall on the Japanese economy in the 1920's, including another crisis in 1922, the great earthquake of 1923, the 1925 recession, the financial panic of 1927, and the *nogyo-kyoko*, agricultural depression, of 1929–1932, which coincided with the Great Depression of 1930–31.

During the 1920's Japanese exports stagnated. Having declined drastically after 1920, Japan's merchandise exports was to recover to the level of 1920 only in the second half of the decade. Consequently, Japan's balance of visible foreign trade turned heavily adverse in each year from 1919. The annual negative trade balances were indeed substantial, amounting to about a quarter to a third of the export earnings in the first half of the twenties. Obviously, these deficits had to be financed somehow.

In order to finance the annual trade deficits Japan used her specie holdings abroad. As these holdings were drawn down, despite fresh foreign loans floated abroad by Japan, their value fell from its maximum of some ¥1,500 million to ¥230 million in 1925 and lower still toward the end of the 1920's. As could be expected under the circumstances, the exchange rate of the yen fluctuated violently in early 1925 and early 1926. In 1925 strenuous efforts were

⁷ The expansion of exports owed to: (1) growth in demand from belligerents for munitions, supplies and agricultural commodities, (2) concentration of substitution demand on Japan by China and Southeast Asia to which European supplies were interrupted, and (3) increase in consumer goods exports (raw silk, etc.) to the U.S., whose economy was booming on account of European demand for its output. Imports increased as the domestic economy prospered. Financial data in the text are from Sumitomo Bank, *Sumitomo Ginko 80-nenshi* [The 80-Year History of the Sumitomo Bank] (Osaka, 1979), pp. 184–185.

⁸ Finance Minister Inouye saw causal relation between the expansion of money supply during the war years, when Japan's reserves accumulated abroad, and price inflation at home. He also was aware that the strong wartime demand abroad causing rising prices of exportables. By the mid-1919, he became convinced that rising prices then were being caused mainly by expanding credit at home (i.e., "kara-keiki," vacuous prosperity and speculation) while Japan's imports began exceeding her exports. He was thinking seriously about contracting the money supply by removing the gold embargo and accumulating reserves abroad. See, Shogo Kasahara, "Inouye Zosho no Keizai Ronri," [The Economics of Finance Minister Inouye], Ch. 2 in *Nihon Shihonshugi no Rekishi to Genjyo* [The History and Present Status of Japanese Capitalism] (Chuo Univ. Press, 1987), pp. 33–76.

made to keep the yen rate from depreciating still further. The government declared to make use of the reserves of specie at home in order to stabilize the yen, and to export specie for this purpose in spite of the formal embargo on gold export. In the early 1926, when the yen rate recovered, equally vigorous attempts were made to keep the yen from rising too rapidly. The actual shipment of gold abroad amounted to less than ¥100 million. Draw-down of the reserves abroad remained the most important source of financing the trade deficits in the early 1920's.

It is to be noted that the availability and the use of specie reserves enabled Japan to avoid much of the deflationary impact on consumption and investment which would have resulted otherwise. The steady diminution of Japan's specie holdings abroad, despite the flotation of considerable public and private foreign loans, represented the price paid in order to avoid other disagreeable options, such as reducing her foreign purchases, or further contracting her domestic economic activity—unless, of course, she could rapidly expand her export trade. It is to be noted that the specie holdings abroad were rebuilt as much as possible by a part of the borrowings floated abroad during the 1920's. Had there been no foreign borrowings there would have been a more rapid loss of the specie holdings abroad. It can be stated, therefore, that the specie drawdowns and loan flotation abroad offset the shortage of Japan's foreign exchange earnings and the relatively shallow domestic capital market. Studies comparing the macroeconomic trends across nations during the decade of the 1920's reveal that Japanese consumption in real terms rose quite satisfactorily and that her investment ratio was high relative to the U.S., Germany and the U.K.⁹

It is important to note in this connection that the specie reserve abroad was distinct from that maintained as a reserve against the note issue at home.¹⁰ The note issue in Japan, therefore, was virtually unaffected by the trade deficits. Despite the loss of reserves abroad the Japanese currency remained well backed by specie and the money supply, narrowly defined, remained rather stable in the domestic economy. Indeed, it is accurate to state that the drawing down of the reserves abroad was the cushion used to isolate the Japanese currency and the money supply from the annual payment deficits. The monetary data by Kokichi Asakura and Chiaki Nishiyama reveal that during the years 1920–1935 currency in circulation (C) and money supply (M_1) stagnated with notable declines in 1930 and 1931 only, while the broadly defined money supply (M_2) showed a steadily rising trend except once again for the two years affected by the great depression.¹¹

This divergent movements of the monetary variables represents of course the steady rise

⁹ Tuvia Blumenthal, "Senkanki no Nihon Keizai: Sono Kokusai Hikaku," [The Japanese Economy in the Interwar Period, Its International Comparison] in Takafusa Nakamura, ed., *Senkanki no Nihon Keizai Bunseki* [Analysis of the Japanese Economy in the Interwar Period], (Yamakawa Shuppan-Sha, 1981), pp. 32–51, p. 36 in particular.

¹⁰ The specie reserve abroad had been earmarked primarily for the servicing of foreign debt, the expenses of Japanese missions in foreign countries, and payment for government purchases abroad as well as for financing ordinary trade. Sales of the reserve was made also to the Yokohama Specie Bank, and through that bank to other exchange banks, for the purpose of financing Japanese trade. Periodical shipments of gold from the government's reserve held in Japan were made (to the U.S.) in 1926, despite the gold export embargo, to replenish reserve, but was quickly terminated in 1927 because of the financial crisis. This gold sent abroad too had been taken from a fund entirely distinct from that maintained as a reserve against the note issue.

¹¹ Kokichi Asakura and Chiaki Nishiyama, *Nihon Keizai no Kaheiteki Bunseki* [Monetary Analysis of the Japanese Economy], (Sobunsha, 1976), p. 36. Also, see Masanao Ito, "Zaisei, Kinyu" in *Senkyuhyakunijunendai no Nihon Shihonshugi* [The Japanese Capitalism of the 1920's], (Univ. of Tokyo Press, 1983), pp. 85–121.

in time deposits while currency and demand deposits remained more or less constant. This divergence, perhaps characteristic of a period of economic stagnation, coincided with the difficulties that large city banks faced in making commercial loans and underscores the point made often in the second half of the 1920's that the large excess reserves of the leading banks, at no interest, with the Bank of Japan made it difficult for the central bank to control the money supply by its loan policy.¹² Financial injections in the form of crisis relief credits and special loans provided by the Bank of Japan and the Deposit Bureau of the Ministry of Finance (by mobilizing various special banks) remained largely unabsorbed and idle. Although banks wanted to hold more excess reserves because many bank failures (particularly local and small banks) had made them afraid of further runs on them, the banks held them primarily because they had too few customers for loans, and had little incentive to buy securities at the prevailing low interest rates. Under these circumstances, what both merchants and manufacturers needed was effective demand, and not more or better credit facilities, although the latter may have had a slight palliative effect to small enterprises.

It is appropriate to state that the gold embargo in the 1920's, given these circumstances, made it possible for Japan to cushion the domestic economy from the adverse impact of the balance of payments. It enabled her to maintain an inflation bias rather than a deflationary bias that would have resulted otherwise. What is important, however, is not that the gold export embargo continued during the decade, nor that returning to the Gold Standard was a major policy objective of the government, but that under the formal embargo that foreign loans were successfully floated (due in part to the "discretionary" policy of supporting the yen rate) and that the specie holdings were maintained abroad that could be slowly drawn down.

The Removal of the Gold Embargo: The Return to Gold

As Tuvia Blumenthal points out, there were two outstanding characteristics for the decade of 1920's for Japan and other countries.¹³ The first was the mood of uncertainty. The world war's brutal destruction and the post-war crisis of 1920 contributed, of course,

¹² Large banks faced with difficulties in expanding commercial loans increased their holding of securities and bonds, as well as deposits in the BOJ. Corporate bonds increased its weight in banks' holding of securities and matched the level of the bank-held government bonds. Indeed, it was appreciated at the time that, until the control was restored over the excess liquidity of the banking system and the danger of likely outflow of capital (for investment) abroad removed, it would not be safe to remove the gold embargo. At the end of March 1928, Mitsubishi, Mitsui, Dai-Ichi, Sumitomo and Yasuda Banks had on deposit 2,826 million yen, which was 59 percent of the total deposits in all commercial banks. The financial crises probably accelerated the "rationalisation" process in Japanese banking as well as in industry, as the funds withdrawn from financially weak institutions were redeposited in the banks and other financial intermediaries perceived to be financially strong and more viable. See Sumitomo Bank, *Op. cit.*

¹³ This paragraph owes much to Tuvia Blumenthal, "Senkanki no Nihon Keizai: Sono Kokusai Hikaku," *Op. cit.*, pp. 34-36 and p. 42.

When the Federal Reserve System was inaugurated in 1913 one of its major goals, perhaps *the* major goal, was the maintenance of the gold standard, which at the time was generally considered the foundation of sound money. This gold standard was to some extent written into the 1913 Federal Reserve Act by requiring the Fed to maintain a gold reserve of 40 percent against Federal Reserve notes (that is, against its currency) and 35 percent against its deposits. C.f., Thomas Mayer, James S. Duesenberry, and Robert Aliber, *Money, Banking and the Economy* (W.W. Norton, 1981), pp. 603-04.

to fundamentally shaking up the confidence in, and popular expectations of, unbroken growth and prosperity. This was reflected in recurrent financial crises everywhere around the world.¹⁴ The second was to idealize the “normalcy” of the prewar period. The desire to return to the “good old days” was reflected in various attempts of the time. Returning to the Gold Standard, which was considered to have anchored the stability of the age, was a goal sought after everywhere. Japan was no exception in desiring to go back to the normalcy of the prewar period. It was one of the major objectives of Japan’s economic policy then to return to the Gold Standard at the prewar party. It was perhaps unfortunate that she missed the most opportune time right after the armistice to accomplish it, when she had accumulated a huge specie holdings abroad and still enjoyed the domestic prosperity. As time passed, it became increasingly difficult to achieve the goal. Nonetheless, the Japanese government pursued this objective in due compliance with the international expectations and the examples of major powers.

Toward the end of the 1920’s there was no real recovery from the financial crisis of 1927. The economy stagnated, while the money supply was eased, industrial activities were in slump, payments deficits continued annually and the price level in Japan remained still high relative to the world. The yen exchange rate fluctuated violently doubling the difficulties of the industries engaged in external trade. Stabilization of the exchange rate became the most urgent wish of business and financial circles. The cry for removal of the gold embargo gained momentum. In June 1928 France returned to the Gold Standard and left Japan, among the major economic powers, alone outside the system. In July 1929 the Seiyukai Party Cabinet fell and new Hamaguchi Cabinet of the Minseito Party came to power with Finance Minister Inouye.

Inouye pushed a deflationary policy in preparation for returning to the Gold Standard by tightening fiscal expenditures, redeeming government bonds, and calling for reduced consumption by the public. The government announced in November that the gold embargo would be lifted as of January 11, 1930. The timing was most unfortunate. Indeed, it was exactly the wrong time. The U.S. boom was to collapse with the crash of the New York

¹⁴ In the United States, too, with wartime financing policy continuing after the war, the inflation kept up. Then in January 1920 the Federal Reserve raised the discount rate by the sharpest margin that had ever occurred. This discount rate was raised and the Fed maintained this highly restrictive policy despite the recession until May 1921. January 1920 was also the month of the upper turning point of the business cycle in the U.S. The ensuing recession started mildly, but then turned into one of the deepest recessions in American history, though it was short-lived. Real GNP declined by 12 percent and, due to a sharp price decline, nominal GNP fell by 31 percent. C.f., Thomas Mayer, James S. Duesenberry, and Robert Aliber, *Op. cit.* pp., 605–606.

Agrarian distress in the United States took various forms, notably farm foreclosures which, after averaging 3.2 per thousand farms between 1913 and 1920, rose to 10.7 per thousand in 1921–25 and 17.0 per thousand in 1926–29. The foreclosure problem reflected not just the declining relative price of agricultural products but overall price level trends; since much agricultural land had turned over between 1917 and 1920 when prices were high, the subsequent deflation greatly augmented the burden of mortgage debt. C.f., Barry Eichengreen, “The Political Economy of the Smoot-Hawley Tariff,” *NBER, Working Paper* No. 2001 (August, 1986), p. 10–11.

¹⁵ Derek Davies quotes a courageous, if untimely, statement by President Herbert Hoover, in response to requests for a public works program to stimulate a recovery, on 30 June 1930: “Gentlemen, you have come 60 days too late. The depression is over.” *Far Eastern Economic Review* (October 29, 1987). See also, Shogo Kasahara, “Inouye Zosho no Keizai Ronri,” [The Economics of Finance Minister Inouye], *Op. cit.*, particularly p. 63.

Stock Exchange on the Black Thursday, October 24, 1929. Nonetheless, Inouye shared the optimism of President Hoover; there was to be a long time-lag before the gravity of the situation was realized.¹⁵ As soon as the embargo was removed there emerged a tremendous demand for foreign exchange, which coincided with another negative trade balance. The government and the Bank of Japan tried to limit the sale of specie abroad. Then, of course, the exchange rate dropped to near the gold export point. In late January already foreign banks began to ship gold abroad, followed immediately by Japanese banks. By the end of May ¥250 million worth of gold had been exported.¹⁶

The fact that the return was executed at the prewar parity was quite unfortunate, also. At the time, however, it was generally regarded as natural for Japan to return to the Gold Standard at the prewar parity, as did the U.K. and the U.S. Only a minority of economists and industrialists had warned about the likely deflationary impact and recommended returning to gold at a lower yen rate than the prewar rate. It is reported, however, that, when a ¥100 million credit was being negotiated in preparation for the removal of the gold embargo, the U.S. and U.K. delegations recommended to their Japanese counterparts a new parity reflecting a more realistic exchange rate of the Japanese currency.¹⁷

Thus, in the wake of both the great worldwide depression and the removal of the gold embargo at the prewar parity, the Japanese economy was to suffer from the severe deflationary impact. Viewed in the framework of the real exchange rate concept, the breakdown of the international economic order in the early 1930's was transmitted first of all by sharp changes in relative prices; dollar export prices collapsed more steeply than dollar import prices. The collapse of the prices of cocoons and rice precipitated a steep drop in farm incomes, in spite of good and plentiful supplies of rice and silk in 1930.¹⁸ The cumulative debt of farm households rose. Under-consumption resulting from reduced urban wages and unemployment together with rural poverty resulted in a rapid reduction of consumption expenditures. The Japanese economy got itself trapped in a low-level macro-equilibrium.

¹⁶ As soon as the embargo was lifted in January 1930, there emerged a tremendous demand for foreign exchange. Banks that had anticipated the move and bought the yen earlier wanted now to cash in and withdraw their funds in foreign exchange. Japan's exchange banks were short in foreign exchange generally, having sold their foreign exchange reserves to the Yokohama Specie Bank when the government had wanted to build up foreign exchange reserves in preparation for the embargo removal, and yet they now wished to redeem the foreign currency denominated debts they had had to incur in the meantime. These demands coincided with another negative trade balance to increase the demand for foreign exchange tremendously.

¹⁷ Sumitomo Bank, *Op. cit.*, p. 272.

¹⁸ Both rice and raw silk prices declined steeply after June, 1930, as follows:

Rice			Raw Silk		
(Average price per <i>koku</i>)			(Average price per bale)		
Jan-Jun.	1930	27.25	Jan.	1930	1,150
Jul-Dec.	1930	23.92	June	1930	797
Jan-Jun.	1931	18.01	Jul-Dec.	1930	639
Jul-Dec.	1931	19.00	June	1931	527
			Dec.	1931	567

Data are from Department of Overseas Trade, *Economic Conditions in Japan to December 31st, 1932, Report*, by G.B. Sansom and D.W. Kermod (HMSO, 1933), p. 6.

Developments in Agriculture

During the war years of the rising agricultural prices worldwide the agriculture of Japan enjoyed boom conditions. These conditions, however, came to pose new problems of transition for Japan's agriculture. Firstly, the August, 1918, shortage of farm products in the face of rising prices, in particular a drastic rise in the rice price, precipitated the so-called rice riots across the nation. Their political impact was to lead the government to adopt a policy of maintaining low food prices and securing sufficient supply in order to appease the urban population. One basic component of the agricultural policy in the 1920s was then to expand and improve cultivated area at home and to promote rice production in colonies, Korea and Taiwan.

Although the rice price movements indicated that excess supply conditions emerged already in the early 1920's (and the price movements reflected the deflationary trends and excessive supply conditions across nations), the government was not to reverse its policy. The rapid decline in agricultural prices in the latter half of the 1920's and the emergence of the serious "farm problem" came to attract public attention at the time. However, they were not regarded sufficient to discard the policy of rice output expansion nor to restrain rice shipments from the colonies. The Rice Law of 1921 was designed to aim primarily at regulating the supply of rice by the government purchase, sale, exchange, processing and storage of the grain. Subsequently, the 1925 amendment added adjustment of the price of rice as an explicit objective of the law. This direction was strengthened further by the 1931 amendment that determined the standard procedures for purchase and sale of rice in accordance with the predetermined minimum and maximum prices. The government was not as much concerned about what was regarded to be the short-run excess supply and low price problem as about securing sufficient supplies in the long-term perspective. Moreover, Takafusa Nakamura argues that it was not easy nor advisable, from the colonial administration's point of view, to reverse the policy of expanded rice production once decided for the colonies.¹⁹

The colonial rice policy was a success, based on the transfer of Japan's production technology. On the other hand, in metropolitan Japan the expansion of cultivated area clearly stagnated from the early 1920's, as cultivated area hit the peak of 6,097,000 *cho* in 1921 and started to decline thereafter. Similarly, rice yields per *tan* hit the (pre-WWII) maximum of 2.22 *koku* in 1920, as Japan's total rice output reached the maximum with 63 million *koku*, and began the process of decline thereafter.²⁰ The easily cultivable area had already been put into cultivation, thereby exhausting the potential for inexpensive expansion of cultivated area. At the same time, the potential for further technological improvements based on the veteran farmers' knowledge and experience, which had been effective in the Meiji agricultural

¹⁹ Takafusa Nakamura, "Takahashi Zaisei' to Kokyo Toshi Seisaku [The Takahashi Fiscal Policy and Public Investment]" in Takafusa Nakamura, ed., *Senkanki no Nihon Keizai Bunseki* [Analysis of the Japanese Economy in the Interwar Period], (Yamakawa Shuppan-Sha, 1981), pp. 112-133. See p. 115 in particular.

²⁰ One *koku* is a common unit of measuring volume in Japan. It is equivalent to 6.37 cubic ft. and equals 150 kilograms in weight in the case of rice. See N. Kayo, *Nihon Nogyo Kiso Tokei* [Basic Agricultural Statistics of Japan], p. 654. One *tan* is one-tenth of a *cho*, i.e., 0.1008 hectare.

growth, had been exhausted and the law of diminishing returns had begun to constrain any further development of intensive cultivation. Moreover, colonial rice imports depressed the price and the incomes of rice farmers at home. As the price of rice declined relative to those of other farm products, the incentives for raising rice yields deteriorated and the relatively more vigorous development of sericulture, commercial crops, livestock and poultry was induced.

Because raw silk normally occupied one-third of the total export earnings of Japan, rice about a half the total value of Japan's farm output, and because about a half of the population was engaged in rice cultivation, or sericulture, or both, the two commodities together affected directly and powerfully not only her purchasing power at home and abroad, but social and political conditions of Japan. While the very success of promoting rice cultivation in Korea and Taiwan tended to depress the market in Japan, the recurring silk market slumps abroad (in the United States) deprived many Japanese farms of satisfactory levels of subsidiary income. Rice and silk were so paramount in Japanese farming that there was no other crop which could restore the balance in bad times that periodically plagued Japan in the 1920's.²¹ In the end, the coming of the great depression took the bottom out of the U.S. silk market. The great depression and the bumper crop of rice in 1930 coincided to produce an unprecedented 40 percent decline in farm prices. The next few years were to witness a serious impoverishment of farming communities with their reported debt amounting to 5,000 million yen to 8,000 million yen. Even a limited survey in 1932 by the Ministry of Agriculture and Forestry estimated the total debt to be 4,700 million yen. The *Nogyo Kyoko* (agricultural depression) of 1929-32 had already begun.²²

It is important to note also that agriculture was not immune to the so-called rationalization process. Wage rate had been the fastest rising of all factor prices during the boom years of the war. The labor-land ratio had declined continually. Entrepreneurial response by farmers to the situation at hand was those measures adopted for increasing the efficiency of labor and reducing the costs of production. As nascent as it was, the new emphasis on labor productivity growth began to emerge as contrasted to the former focus on the land productivity growth. The agriculture of the 1920's saw the introduction and diffusion of labor-saving implements and machines, mostly in post-harvest operations, among which especially important were internal combustion engines, electric motors, and pedaled-powered threshers. Major implements for field operations were rotary weeders operated manually. Yuken Kashiwa emphasizes that during this period the traditional practice of cooperation and labor-exchange among farmers in some field and post-harvest operations was strength-

²¹ In 1920 the postwar crisis came when two important banks failed, several large firms had to suspend business, share and produce exchange were closed for weeks, and the Government had to advance a sum of 246 million yen in relief. In 1922 there were serious failures of stock and produce brokers, and several small banks failed. In 1923 the aftermath of the great earthquake, supervening upon already weak conditions, forced the Japanese government to declare a moratorium. It is essential to remember that at the time this great natural catastrophe overtook Japan she was still suffering from the effects of the post-war slump of 1920. In 1925 an important firm failed and showed a loss of 30 million yen. In 1927 there occurred a financial crisis of the first magnitude. The Showa Crisis (1929) exerted a devastating impact not only on trade and industry but on the commercialized agriculture of the sericulture type.

²² The Ministry of Agriculture and Forestry survey is quoted in Yuken Kashiwa, *Nihon Nogyo Gairon* [An Introduction to Japanese Agriculture] (Yoken-do, 1961), p. 62.

²³ Yuken Kashiwa, *Nihon Nogyo Gairon*, Op. cit., pp. 70-74.

ened to raise the productivity of labor.²³ Indeed, hidden (necessarily) under the stagnant yields per hectare and the stagnant growth in farm output was the success of rationalization measures on the farm. It appears appropriate, moreover, to regard the rise in irrigation investment in the 1920's as an effort to facilitate the use of commercial inorganic fertilizer in the face of a marked fall in self-supplied fertilizer use. As labor, the one almost exclusive input in producing self-supplied organic fertilizer, grew more expensive, it was natural for purchased fertilizer to substitute for it.

The stagnation of agriculture reflected no doubt the weak market conditions and lower prices for farm products. Such a situation was by no means limited to Japan, however. The excess supply of farm products and the "agricultural crisis" had become chronic worldwide by the late 1920's. According to the estimates of the Long-Term Economic Statistics, there was a gradual increase in the current value of agricultural production up to 1925, when the total value was assessed at ¥4.5 billion. The current value of production declined to about ¥2.1 billion in 1931 only to improve gradually to the level of about ¥2.7 billion in 1934. Even in years of good and plentiful supplies of rice and silk, the incomes of the farm households diminished due to price declines, and their debt increased, so that by the end of 1931 it was estimated that the total debts of the farming communities stood at some ¥5.0 billion, or ¥1,000 per household.²⁴ The below-average rice crop of 1931 was attributed partly to the situation where many farmers could not afford sufficient quantities of fertilizer. It was reported that in poor northern regions crops had almost failed and many farming communities were near famine level.²⁵

As bankruptcies increased in the countryside, changes in land ownership became rather common. For the second time since the early Meiji marked changes were taking place in land ownership. Having lost their land, some landlords had a simple alternative of either becoming tenants or leaving farming altogether. It was rather natural under the circumstances then that landlords, especially small and medium size ones, attempted to reestablish themselves as cultivating landlords by demanding the return of the land that they had leased out for their own self-cultivation. Therefore, a new dimension was added to the already serious tenant strikes. Whereas tenant strikes had formerly been concerned primarily about reduction of high land rents and directed almost exclusively against large landlords, tenant strikes from around 1928-29 assumed a new characteristic of being directed against small and medium scale landlords who were attempting to resume self-cultivation of leased-out land.²⁶ It is significant in this connection that medium-size farmers (self-cultivating, with leased-in land) were the major source of strength for tenant strikes against the impact of the crises of the 1920's. It may be noted also that the areas most affected by the tenant strikes during the 1920's were Osaka, Hyogo, Kyoto, Nara, Aichi, Gifu and Kagawa, whose farms

²⁴ This was not surprising, according to the British commercial attache, since the rice and cocoon crops for 1930 were 800 million yen less in value. In other words farmers raising rice and cocoons started the year 1931 with 800 million yen less purchasing power. See Department of Overseas Trade, *Economic Conditions in Japan to December 31st, 1932, Report*, by G.B. Sansom and D.W. Kermod (HMSO, 1933), p. 9.

²⁵ DOT, *Economic Conditions, Ibid.*

²⁶ The data, quoted by Yuken Kashiwa, indicate that the tenant strikes toward the end of the decade involved, on average, only several *cho* to less than 20 *cho* of farm area and affected 10 to 20 persons per case, while formerly a tenant strike had affected on average about 50 *cho* of area and entangled about 100 or so persons per case. Accordingly, the number of tenant strikes increased dramatically, from 1,600 cases in 1921 to some 54,500 cases in 1935 across Japan, Yuken Kashiwa, *Nihon Nogyo Gairon*, Op. cit., pp. 65-66.

were characterized by high rice yields and advanced farm management practices relative to their counterparts elsewhere in Japan.

The government had to come to confront the problems of the deflationary impact on farmers and tenancy; and it was inevitable that the agricultural policy came to be more fiscally expensive as well as more "social policy" oriented.²⁶ It should be pointed out, however, that the major thrust of policy measures was toward supporting (and improving) the economic viability of *jisakuno*, self-cultivating farmers. The policy emphasis was not so much on protection of tenancy rights nor on promotion of tenants' welfare as on promotion and encouragement of self-cultivation.

Finally, reflecting the rapid urbanization ensuing the remarkably rapid industrialization during the first world war, the rising demand for vegetables, fruits, livestock and dairy products (reflected in their relative prices) stimulated the rapid growth of commercial farming in the neighborhood of urban centers, in conjunction with already commercialized sericulture. Commercial crops such as vegetables and fruits as well as sericulture, livestock and poultry characterized the most advanced commercial farming of the Kinki region which developed rapidly since World War I. Rice paddies and upland fields occupied almost 90 percent of the farm land in Tohoku region, however, characterizing its traditional crop based farming. In contrast, in the sericultural prefectures of Nagano, Yamanashi, and Gumma, in particular, mulberry trees came to occupy 40 to 50 percent of the cultivated area. No doubt, relative prices of farm products as well as geographic factors influenced the regional patterns of commercialization. Although the price of silk cocoons stagnated as did that of rice during the 1920's, it was better, relative to rice, in the first half of 1920's before deteriorating in the second half. The relative prices of fruits, vegetables, livestock and poultry remained high throughout. Commercial sericulture was devastated by the agricultural depression and the collapse of the silk market. The value of sericulture output peaked in 1930 and gradually decreased, with marked fluctuations around the trend, during the next ten years.

In a recent paper I studied the sources and rates of productivity growth in Japan's agriculture in early modern economic growth, focusing primarily on the decades before the World War I.²⁷ Lacking cross-section data on value-added in agriculture per worker for each year of the early phases of Japan's modern economic growth, I had to focus on rice, rather than agricultural output or value-added as a whole, and use prefectural data on farm households and yields of rice per acre in Japan. However, for the period of my present interest, there exist annual cross-section data on input and output variables arising from the sampled farm households' own agricultural operations.²⁸ Their source is the Farm Household Economy Surveys, carried out annually by the Ministry of Agriculture and Forestry from 1922 through 1940, which covered over 100 farm households in the sample earlier and

²⁷ The paper was presented at the eighth World Congress of the International Economic Association in December, 1986, in New Delhi. Hiromitsu Kaneda, "Rural Resource Mobility and Intersectoral Balance in Early Modern Growth," in J. Williamson, ed., *The Balance between Industry and Agriculture in Economic Development, Vol. 2, Sector Proportions* (Macmillan, 1988).

²⁸ Hiromitsu Kaneda, "Microeconomic Study of Agricultural Stagnation in the 1920's, Performance of Farm Households," processed (Sept. 1987).

over 200 later.²⁹ I use this source in order to explore further the stagnation of the Japanese agriculture in the interwar years.

The Farm Household Economy in the Interwar Years

In the Farm Household Economy Surveys we have farm accounting records of annual input and output data arising from farm households' own agricultural operations. The sample size in the interwar years was rather small relative to the similar surveys conducted after the second world war. Nonetheless, more than one hundred farm households were chosen in the early 1920's and more than two hundred were sampled later in the decade. During the 1960's the original farm household records, which had been classified in terms of land ownership and tenancy categories, were reclassified in terms of farm sizes across four operating scales of 0.5 to 1.0 *cho*, 1.0 to 1.5 *cho*, 1.5 to 2.0 *cho*, and over 2.0 *cho*.³⁰

This set of data reveal that the total hours of labor devoted to own farm operations per unit of cultivated area declined for farm households of all operating scales at the annual rate of nearly one percent during 1922/24 to 1937/39. It is noted in Table 2, however, that the input of labor per acre broke the declining trend and increased clearly during 1928-30 to 1931-33 only to resume the downward trend once again in subsequent years. The impact of the deep recession highlighted by the *Nogyo-Kyoko* (agricultural depression) of 1929-1932 stands out and is clearly reflected by the temporary rise in the total labor hours per unit cultivated area, coincident with the return flows of labor from the nonagricultural sector. It is also discernible that across the operating scales generally the rate of fall of labor input accelerated after the early 1930's.

It is well known and widely observed empirically that the input of labor per acre tends to be greater the smaller is the farm's operating acreage, and also that yield per acre tends to be greater the smaller is the operating scale. This is indeed confirmed by what we observe in Table 2 in terms of labor input (by both family members and hired hands) in hours per acre and in terms of real agricultural income per acre. The latter variable is the difference between, on the one hand, gross revenue from all farm enterprises, including crops, sericul-

²⁹ The Farm Household Economy Surveys (FHES) data are based on the accounting records kept by farm households over the course of a year. The data are not always consistent year by year due to occasional changes in the survey's sampling methods. The FHES adopted random sampling in principle in 1949 for the first time. Until then the surveys had not used random sampling methods. Generally speaking, the FHES data prior to the second world war have an upward bias with regard to the size of the sampled farms, as proportionally more of the larger farms are represented in the sample than in the population. The average annual sample size including Hokkaido was as follows:

1922/24	1925/27	1928/30	1931/33	1934/36	1937/39
138	178	215	293	294	284

Norin Tokei Kenkyukai, *Nogyo Keizai Ruinen Tokei, Vol. 1, Noka Keizai Chosa* [Annual Statistics of the Agricultural Economy, Vol. 1, Farm Household Economy Surveys] (Tokyo, 1974), pp. 56-127.

³⁰ The FHES data for 1921 to 1931 were originally tabulated in terms of three classes of farm households, namely, self-cultivating farmers, self-cultivating farmers with leased-in land, and tenant-farmers. In the source publication the data were retabulated in terms of operating scales by using original records of individual farms. The statistical source warns its users of the recently reclassified data for the bias and inconsistency resulting from a rather small number of records available for the retabulation work. We shall focus only on basic, aggregate variables only.

TABLE 2. LABOR INTENSITY AND LAND PRODUCTIVITY BY SCALE OF OPERATION, JAPAN, 1922/24-1937/39

Year	0.5-1.0	1.0-1.5	1.5-2.0	Over 2.0
<i>Labor Intensity</i> (Hours of total labor/se)*				
1922-24	70.80	59.10	40.25	39.27
1925-27	62.99	56.04	44.72	36.45
1928-30	65.60	53.52	43.82	36.00
1931-33	67.87	58.16	47.19	37.92
1934-36	62.64	47.21	45.31	37.17
1937-39	60.14	48.87	44.27	33.54
Growth Rate (% per annum)				
1922-24 to 1928-30	-1.3	-1.6	1.4	-1.4
1928-30 to 1931-33	1.1	-0.2	2.5	1.7
1931-33 to 1937-39	-2.0	-1.4	-1.1	-2.0
<i>Land Productivity</i> (Real agricultural income/se)**				
1922-24	5.72	5.60	4.17	4.06
1925-27	6.85	6.39	5.07	4.58
1928-30	7.02	6.28	5.72	4.71
1931-33	6.11	6.06	5.08	4.07
1934-36	6.16	5.80	4.88	4.84
1937-39	6.50	6.44	6.19	5.46
Growth Rate (% per annum)				
1922-24 to 1928-30	3.5	1.9	5.4	2.5
1928-30 to 1931-33	-4.5	-1.2	-3.3	-4.8
1931-33 to 1937-39	1.0	1.0	3.3	5.0
<i>Weights</i> (Percent of total number of farms)**				
1923	36.6	14.3	7.1	10.0
1926	34.0	14.4	7.2	9.5
1929	34.2	14.7	7.3	9.4
1932	34.3	14.8	7.4	9.5
1935	34.3	15.0	7.5	9.5
1938	32.8	16.2	8.1	9.3

Source: Norin Tokei Kenkyukai, *Nogyo Keizai Ruinen Tokei, Vol. 1, Noka Keizai Chosa* [Annual Statistics of the Agricultural Economy, Vol. 1, Farm Household Economy Surveys] (Tokyo, 1974), pp. 56-127.

All data are for "Tafuken," All Japan except Hokkaido.

* Total hours of labor devoted own farm operations, including hired labor, per 58 se is 1/100 of a cho. One cho is 0.99 hectare.

** "Nogyo Shotoku," agricultural income in 1934-36 yeens, per 58 se. The two component elements, Gross Agricultural Revenue and Total Operating Expenses were deflated separately by indices for agricultural output prices and farm input prices in LTES, Vol. 9.

*** Based on the number of farms in each scale, N. Kayo, p. 134. The shares do not sum up to 1 because of the omitted scale class below 0.5 cho.

ture, fruits and nuts, livestock and poultry, and other miscellaneous farm activities and, on the other, total current expenses related to such enterprises. Indeed, a closer examination of the related data reveal that for the farm households sampled both gross farm revenues and operating expenses (in real terms) are larger per unit cultivated area the smaller is the farm's operating scale. On the other hand, as is often observed, the productivity of labor (real agricultural income per hour of labor) tends to be greater the larger is the operating acreage. Small farmers did not hesitate to expend greater current costs and their own labor in order to maximize revenues out of their holdings.

On the whole, during the period between 1922/24 and 1937/39, real agricultural income per acre grew at about the average annual rate of one percent for two lower scales and at

about two percent for the two higher scales. Annual variations in the growth rates turned out to be much more important, however, within each operating scale. The rapid growth of land productivity in the early twenties was taken over by a marked deceleration in the latter half of the twenties, which was then followed by a substantial negative growth in the early thirties. It is to be noted that the smallest and the largest size classes suffered the greatest rates of decline in these years. The recovery was underway toward the middle of the middle of the thirties, although it was conspicuously slow for the lowest scale under examination here. It is to be noted that in the second half of the thirties the real farm income per cultivated area began to grow at the substantial rate of more than 3 percent per annum for farms in the scale class 1.5–2.0 *cho* and at the spectacular rate of some 5 percent per year for those in the largest size class of over 2.0 *cho*.

Finally, the relative weight of medium size farms (in Japan's context) increased at the expense of the smallest and the largest during the two decades under examination. Reversing the trend from the early Meiji era (say, the 1870's onward) for the bi-polarization of farms in terms of operating size, the medium-size farms (with cultivating area of 1.0–2.0 *cho*) had come to gain their relative share from around the turn of the century. The so-called *chunohyojunka*, the standardization of medium-size farms, progressed in particular during the two decades under investigation here.

The weighted national average output per hour of labor in real terms increased by 28 percent between 1922–24 and 1928–30. This implies that the labor productivity grew at about 4 percent per year. From 1928/30 to 1931/33 there was a clear decline in the weighted national average productivity of agricultural labor at the annual rate of fall of 4.6 percent. Labor intensity (input of labor hours per acre) went up for all operating scales, except for the 1.0–1.5 *cho* group for which there was virtually no change. A greater increase in the input of labor than that of operating acreage contributed to the rise in labor intensity for the two largest scales. The productivity of land, on the other hand, fell across the board for all operating scales, although the loss was the smallest for the medium size class of 1.0–1.5 *cho* and the greatest for the smallest size class of 0.5–1.0 *cho* as well as for the largest size class of over 2.0 *cho*. During the period between 1931–33 and 1937–39, however, the national average productivity of labor in agriculture resumed a satisfactory growth once again. The productivity index rose by 23 percent, implying the annual growth of labor productivity at 3.6 percent. The environment surrounding Japan's agriculture had changed significantly after the early 1930's to affect its patterns of productivity growth.

The recovery of the Japanese economy from the depression of 1930–31 began in earnest under the combination of fiscal, monetary and exchange rate policies implemented by Finance Minister Takahashi toward the end of 1931. Takahashi's "Keynesian" policy propelled Japan out of the depression in front of other countries.³¹ Japan's exports more than

³¹ The Takahashi policies were in direct contrast to the government policies in the 1920's, and can be summarized as follows:

1. Reimposition of the gold embargo on December 13, 1931, and letting the yen rate fall. The yen rate fell rapidly from 49 3/8 cents prior to reimposition of the embargo to 20.7 cents in December, 1932. The rate rose subsequently and remained at about 30 cents per dollar to 1935.

2. Reduction in the rate of interest at home. The Bank of Japan official discount rate was reduced from the peak of 5.84 percent in 1931 to 3.65 percent in 1933. This very operation was, of course, facilitated by depressed conditions and the fall of prices and interest rates in the United States.

doubled during the four years between 1931 and 1935 while those of other countries were shrinking and, together with enlarged ordnance production under deficit fiscal financing, led the recovery of economic activities in Japan. From the early thirties on, the renewed growth of nonfarm employment enabled a resurgence of the rural-to-urban migration of labor. Despite the on-going transition from light to heavy industries of the Japanese economy and the consequent rise in the capital-intensity of manufacturing, the modern manufacturing sector recorded a net gain of 1.4 million workers between 1932 and 1937.

Wage rate was again rising faster than other factor prices. The labor-land ratio began declining once again. Labor was increasingly becoming scarce relative to land in Japan during this period. Labor-saving machinery and implements such as internal combustion engines and electric motors appeared and pedal-operated threshers spread among rice farms, particularly for post-harvest operations. Moreover, these years saw a clear decrease in the use of (labor intensive) self-supplied fertilizer. Technological progress in Japanese agriculture became as much labor-saving as land-augmenting.

It is to be remembered, however, that having suffered the greatest rate of decline in the depression years, the smallest size class (with 0.5–1.0 *cho*) continued to languish in the slowest growth even when the recovery was underway toward the middle of the thirties. Despite the apparent progress of the *chuno-hyojunka*, presumption is strong that rural income inequality increased during the thirties, after having decreased up to the onset of the agricultural depression.

Concluding Remarks, Macroeconomic Interpretation

The sluggish growth of output in the 1920's owed to the world-wide disequilibria between production and consumption (resulting in part from inappropriate policies across the nations). It is clear that Japanese exports stagnated during the 1920's. It is also true that successive cabinets tended to adopt policies of administrative and financial readjustment and retrenchment. Indeed, the government considered removal of the embargo placed upon gold exports a number of times, but action was postponed only because some catastrophic event, such as the crises of 1920, 1925 and 1927, and the great earthquake of 1923, made it difficult or inadvisable. The pressure of circumstances nevertheless forced the authorities to replace gold standard rules with "emergency discretionary tinkering." It appears appropriate to view such policies as attempts to avoid the costs of the deflation called for by the orthodox mechanism of adjustment.

When the boom resulting from the first world war ended, the price level in Japan was excessive relative to the international level due to the wartime inflation. International com-

3. Expansion of fiscal expenditures, with particular emphasis on military expenditures and "Crisis Relief" (agricultural relief, *noson shinko hi*) expenditures. Resulting fiscal deficits were financed by the central bank acceptance of government bonds.

Predictions that budget deficits met by loans and easy money by the central bank would combine to produce malignant inflation did not materialize. Indeed, the stimulation of demand by fiscal deficits and the promotion of exports by the lower exchange rate of the yen propelled Japan out of the depression in front of other countries. In fact, Japan's export expanded while the others' were shrieking and she became subject to the criticism abroad of "social dumping." Exports rose 2.2 times during the four years between 1931 and 1935 and, together with enlarged ordnance production, led the recovery of economic activities in Japan.

parison of price movements suggests that the exchange value of the yen did not represent its true value in purchasing power. Although the Japanese government did not formally and consistently support the exchange rate, it may be said that the yen was artificially maintained at a high rate by discretionary operations, the maintenance of the gold embargo, high tariffs, and underdeveloped distribution channels. Despite the apparent general stability of the yen rate until the lifting and reimposition of the gold embargo in 1930–31, one wonders about changes in the real exchange rate of the yen during the 1920's. Also, what about changes in the real rate during the 1930's?

Regardless of the exchange rate policy followed, it is correct to state that a country subjected to an exogenous worsening of its international terms of trade should witness a decline in the price of non-traded goods and services (or the wage rate) relative to the domestic price of importable goods, Figs. 1 and 2 reveal these trends for the second half of the 1920's and through the decade of the 1930's, which encouraged a movement of labor and capital, including fresh investment, toward import-competing industry. The rapid growth in production of consumer durables and intermediate and capital goods, and in particular metal products and chemicals, reflected a clear trend toward a structure of production with a higher degree of diversification and capitalization. Furthermore, these trends correspond also to a decline in the real exchange rate implying that the prices of tradables are falling relative to the prices of nontradables. Resources were induced to move from tradables to nontradables, being affected by intersectoral profitability. Specifically, a reduction in the real exchange rate tended to divert resources away from tradables to nontradables, encouraging domestic construction industry and services, including the government sector.

The rationalization measures that favored large manufacturing establishments and capital intensive production was consistent with these changes. It seems that they were more or less indispensable, given the excess capacity at the end of the war when both domestic and overseas demand fell drastically. Moreover, the outstanding fact at the time of the 1920 post-war crisis was that Japan's costs of production remained too high relative to her competitors abroad. Her principal article of export was raw silk destined almost exclusively to the U.S. market, while many of her other exports were of indifferent (inferior and uneven) quality, which were "only bought because they were cheap." As Japanese goods became relatively dearer and as other sources of supply became once again available, what competitive advantage they had enjoyed was being lost. Especially when the yen exchange rate remained high, Japanese goods were difficult to sell abroad. The restructuring and rationalization of Japanese industries was inevitable. New patterns of aggregate demand that emerged in consumption and investment at home stimulated this shift in the structure of Japanese industries.

The spectacular growth of Japanese exports from 1932 onwards was based as much on the advance in industrial efficiency as on the depreciated yen that came in the wake of the brief but disastrous return to gold in 1930–31. From then on the renewed growth of non-farm employment enabled a resurgence of the rural-to-urban migration of labor. Despite the on-going transition from light to heavy industries of the Japanese economy, the modern manufacturing sector recorded a net gain of 1.4 million workers between 1932 and 1937. The resurgence came, however, along with great changes in the economy of Japan. The structure of her industries changed remarkably in correspondence with the shift in the composition of aggregate demand. Reflecting the expanded military demand after the so-called

Manchurian Incident of September, 1931, through the fateful Sino-Japanese war which began in July 1937, 35 percent of the net addition in the manufacturing employment was absorbed by machinery, 18 percent by metals, 16 percent by chemicals, and only 13 percent by textiles.³² Japan led the world in terms of the economic growth rate. Investment demand remained high throughout, relative to other countries, centered in residential and public investment expenditures. The continuing urbanization and the strong electrification drive stimulated a synergistic development of heavy industries and chemical industries.

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³² Ministry of International Trade and Industry, [*History of the Census of Manufactures for 1909-1958, Explanatory Volume*], Op. cit., pp. 77-106.