

An Emerging Agricultural Problem in High-Performing Asian Economies

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August 2007



Abstract

Policies to tax farmers in low-income countries and policies to subsidize them in high-income countries have been identified as a major source of the disequilibrium of world agriculture. Recently, as many high-performing economies in Asia advanced from the low-income to the middle-income stage through successful industrialization, they have been confronted with the problem of a widening income gap between farm and non-farm workers corresponding to rapid shifts in comparative advantage from agriculture to manufacturing. In order to prevent this disparity from culminating in serious social and political instability, policies have been reoriented

toward supporting the income of farmers. At the same time, governments in middle-income countries must continue to secure low-cost food for the urban poor who are still large in number. The need to achieve the two conflicting goals under the still weak fiscal capacity of governments tends to make agricultural policies in the middle-income stage tinkering and ineffective. Greater research inputs in this area are called for in order to prevent the growth momentum of high-performing economies in Asia from being disrupted by political crises.

This paper—a product of the Trade Team, Development Research Group—is part of a larger effort in the department to understand the changing extent, underlying causes and the economic effects of distortions to agricultural incentives faced by farmers and poor consumers in developing countries. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted via the leader of that research project, wmartin1@worldbank.org.

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Paper submitted to the World Bank project on “Distortions to Agricultural Incentives”

An Emerging Agricultural Problem in High-Performing Asian Economies*

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* The original version of this paper was presented at the 5th conference of The Asian Society of Agricultural Economists held in Zahedan, Iran in 29-31 August 2005.

1. Introduction

This paper aims to identify the nature of a new agricultural problem emerging in high-performing economies in Asia, as they have advanced from the low-income to a middle-income stage. The “agricultural problem” is here defined as a problem of overriding concern to policymakers with respect to designing and implementing policies for agriculture as part of policies to promote national economic development in their country. As such, it may well be called the “basic problem in determining agricultural policies”.

For the past half century East Asia has been the growth pole of world economy. Japan’s jump from a middle-income to a high-income economy associated with very rapid industrialization in two decades from the 1950s was followed by a more compressed growth of so-called Asian NIES – Korea, Taiwan, Hong Kong and Singapore – from the 1960s. Equally remarkable in this period was the advancement of low-income agrarian economies in Southeast Asia, such as Indonesia and Thailand, to the middle income stage. Within three decades from the 1960s they were able to achieve significant industrialization with the major share of their export shifted from primary to manufactured commodities. Shortly after the take-off of these high-performing economies in the Association of South-East Asia (ASEAN), China began to rise to “the workshop of the world” with its successful market-oriented reforms. This experience has been followed by another transitional economy in East Asia, Vietnam. Furthermore, it appears that this ‘East Asian Miracle’ (World Bank, 1993) is now being transmitted to South Asia, where India and Bangladesh have been accelerating economic growth rates since the 1990s, though they have not yet escaped from the low-income status.

As high-performing developing economies in Asia have advanced or will advance to a middle-income stage, they are bound to face a new agricultural problem. What is the nature of this problem? What is its root? What policies might be appropriate and effective in solving the problem? These are the questions addressed in this paper.

Following this introduction, Section 2 defines three agricultural problems, each corresponding to a major development stage. Section 3 elaborates the political economy mechanism giving rise to a unique problem in the middle-income stage, on which Section 4 gives a historical perspective in terms of the experiences of Thailand and Japan. Section 5 discusses on the relevance of East Asian experience to economies in

other regions. Finally, Section 6 concludes with a plea for more serious research on this problem for sustaining development of high-performing economies in Asia.

2. Three Agricultural Problems

First, the nature of the agricultural problem in the middle-income stage shall be specified in comparison with the problems confronted by the low-income and high-income countries.

In his classic treatise, Theodore Schultz (1953) specified the two different agricultural problems confronted by low-income and high-income economies. The ‘food problem’ in his term is the problem faced by low-income economies; these economies characterized by rapid population growth and high food demand elasticity are under the constant risk to be beset by shortage in the supply of food relative to the demand; the resulting high food prices pull up the costs of living and the wage rates of workers in non-farm sectors and thereby suppress industrialization and overall economic growth; therefore, the prime policy concern in low-income economies is to prevent the food shortage from occurring. Schultz argued that the ‘farm problem’ faced by high-income economies is diametrically different from the food problem; population growth slow down and food consumption is saturated in the high-income stage, while the food production capacity is strengthened due to their ability to advance technology; therefore, high-income economies have a chronic tendency for food demand to be exceeded by supply with the result that food prices and farm incomes decline; under the powerful lobbying by farmers, agricultural policies in high-income economies is mainly geared toward preventing farm incomes from falling; their demand for agricultural protection policies tends to be easily accepted because high-income consumers are lenient to high food prices and farm subsidies.

Later, Schultz (1978) identified these two agricultural problems as underlying the policies to exploit or tax agriculture commonly adopted in low-income countries in contrast to the policies to protect or subsidize agriculture in high-income countries. His hypothesis has been established as a paradigm among agricultural economists as it found supports from several empirical studies (Anderson and Hayami, 1986; Hayami, 1988; Krueger, et al., 1991). Under the serious constraint of foreign exchange common among low-income economies, it is generally not feasible for them to counteract food

shortage and rising food prices by increasing commercial imports. Instead, lowering domestic food prices by such means as taxation on food exports, government compulsory procurement of farm products from producers at lower-than-market prices and accepting foreign food aid for damping in domestic market is commonly practiced in low-income countries for securing the supply of cheap food to non-farm workers at the expense of farmers. In contrast, policies to raise agricultural product prices by such means as border protection and domestic production control are commonly used in high-income countries for supporting farmers' incomes at the expense of consumers and taxpayers. In this paper, the agricultural problem underlying policies to depress food prices and farm incomes in low-income countries is called the "food problem" following Schultz's terminology, but the agricultural problem underlying policies to support farm incomes in high-income countries is called the 'protection problem', instead of Schultz's 'farm problem' or Hayami's (1988) 'agricultural adjustment problem'.

Despite the change in terminology, I adopt as the basic framework the Schultz theory on the two agricultural problems. In addition, I would propose it useful to identify another agricultural problem specifically faced by middle-income countries. This problem is brought about by a lag in productivity growth in agriculture behind non-agriculture as a result of the successful industrialization that raised these economies to a middle-income stage. At this stage as compared with the previous low-income stage, the food supply capacity rises and factors causing demand growth are weakened, but people's per-capita incomes do not yet reach a level at which food consumption is completely saturated as in the high-income economies. As a result, the terms of trade between agriculture and non-agriculture remain largely stable, despite significant decreases in agriculture's productivity relative to non-agriculture due to rapid progress in industrialization. Therefore, farmers' income level tends to decline relative to non-farmers' corresponding to the widening inter-sectoral productivity gap. By observing non-farm workers' rapid escape from poverty, farmers who are left behind begin to realize how poor they are, even if their income level did not decrease or even slightly increased from the previous stage. Dissatisfaction of farm population on their remaining to be poor despite visible improvements in other sectors often becomes a significant source of social instability. Thus, at the middle-income stage, it becomes a prime concern of policymakers to prevent rural-urban income disparity from widening. This agricultural problem is here called the 'disparity problem'. It is by nature the problem of income disparity between the farm and the non-farm sectors.

This problem is looming large and will continue to become more serious among high-performing economies in Asia as they advance to the middle-income stage upon their success in industrialization.

3. The Political Equilibrium of the Disparity Problem

The disparity problem is considered a political equilibrium in which the political influences of farm and non-farm interests are more or less balanced. Figure 1 illustrates how the objective of politicians in designing agricultural policies changes in the process of economic development. The food-problem becomes dominant where politicians' major concern for the sake of their staying in office is how to secure low-price food to urban dwellers; and the protection-problem becomes dominant where their major concern is how to keep farmers' income level balanced with non-farm workers. In contrast, the disparity-problem emerges where these two concerns are more or less equally important.

At the stage in which the disparity problem is dominant, the prime concern of politicians is to relieve farmers from poverty. However, 'poverty' here means not absolute poverty but relative poverty. Absolute poverty among farm population is less severe in middle-income countries than in low-income countries. In the middle-income stage, with the progress of industrialization by means of borrowing technology from developed countries, newly-risen well-to-do families, including workers employed in large-scale modern enterprises, form a new social class in urban areas enjoying a modern comfortable life. Observing the income difference from the newly-risen urban families, farmers become envious and eventually develop grudge against the social system to keep them in poverty, which may culminate in social disruptions.

This relative poverty problem is closely related with the so-called 'dual structure' that emerged in the process of industrialization. The dual structure refers to the situation characterized by the coexistence between a formal sector consisted of large-scale, capital-intensive enterprises paying high wages to their employees and an informal sector consisted of small-scale, labor-intensive enterprises based on cheap labor. The formal sector is largely closed to laborers in the informal sector including employees in small-scale enterprises, casual laborers working on a daily contract basis, and self-employed manufactures and traders. With labor codes and unions exclusively applicable to large-scale enterprises their labor costs are high despite the abundant

availability of low-wage laborers in the informal sector. Therefore, strong incentives are at work among entrepreneurs in the formal sector to increase capital intensity by adopting labor-saving technologies. As a result, employment increases much slower than increases in output. The income gap tends to widen cumulatively between employees in the formal and the informal sectors.

Typically the informal sector functions as a buffer in the labor market. Many small-scale enterprises engage in production as subcontractors of large-scale enterprises. Since employment in the formal sector is largely permanent, large-scale enterprises prefer to reduce order to subcontractors during the economic slump rather than to lay off their own employees. Correspondingly, many laborers in the informal sector who came from farm households lose work opportunities in cities and are forced to return to parents or brothers in home villages. In addition to the economic burden of feeding these returnees, farmers face sharp drops in farm product prices during recessions because of the low price elasticities characteristic of food demand and supply. In this way, during economic recessions, farmers suffer from dire poverty, intensifying their grudge against urban people.

Supported by the sympathy of the intelligentsia, farmers' dissatisfaction may elevate to serious anti-governmental movements. So, the government is forced to adopt agricultural protection measures. However, this protection cannot be strong enough to fill up the income gap between farmers and urban workers unlike in the high-income stage. Since the shares of agriculture in both national income and labor force still remain large, it is impossible for the government in the middle-income stage to secure sufficient finance for closing the growing income gap. In addition, increases in food prices result in a major damage to a large number of small-scale enterprises in urban area, which heavily rely on cheap labor. Developing countries can advance from the low-income to the middle-income stage by technology borrowing from developed countries. However, the successful industrialization by means of technology borrowing tends to result in the formation of the dual structure in the economy and the widening of income disparity between farmers and newly-risen urban families. Under the dictate of this disparity problem, policymakers in middle-income countries are forced to muddle around in search of ways and means to protect farmers within the constraint of the food problem that is still binding because a large number of workers in urban informal sectors are still absolutely poor. As their Engel coefficients are high, high food prices could well raise the cost of living above their meager incomes.

The tendency of relative poverty to rise in the middle-income stage can be confirmed in Table 1. In Table 1, farmers' relative income is measured by dividing agriculture's share in GDP by agriculture's share in employment. In low-income countries, farmer's relative incomes were in the order of 40-60 percent in 2000, which were not so low compared with those of middle-income countries. In particular, three African economies, Ghana, Nigeria and Kenya, which recorded virtually no economic growth for 1965-2000, experienced no significant decrease in farmer's relative income. In contrast, in India and Pakistan, which recorded moderate economic growth, farmer's relative income dropped slightly. In Indonesia and Thailand, which recorded high growth having been able to advance from the low-income to the middle-income stage during this period, farmer's relative income declined sharply. It is interesting to observe that, in the Philippines that lagged behind East Asian Miracle growth, farmer's relative income did not significantly decrease. Notably, farmer's relative income increased rather than decreased in high-income economies on the average, where the government could afford to spend sufficient budgets for supporting farmers' incomes.

Underlying this widening income gap between farm and non-farm sectors in the middle-income stage is the rapid shift in comparative advantage away from agriculture to industry, as illustrated in Table 2. In this table, changes in comparative advantages are compared among selected countries in terms of labor productivity growth in agriculture relative to that of manufacturing. In developed countries, a tendency is observed that labor productivity increased faster in the agricultural sector than in the manufacturing sector, whereas in developing economies labor productivity in manufacturing tended to increase faster than in agriculture. These observations are consistent with the hypothesis that comparative advantage in agriculture declined in developing countries and increased in developed countries.

Likely underlying this increase in comparative advantage in manufacturing among developing countries is the greater difficulty of technology transfer from developed to developing countries in agriculture than in manufacturing. Because agricultural production is a biological process, it is critically influenced by natural environments which are difficult to control artificially. Therefore, superior farming methods and plant varieties developed in advanced countries located in the temperate zone can not readily be applied in developing countries under tropical environments. In contrast, manufacturing production is largely a mechanical process operated in the controlled

environments of factories, so that its technology is much easier to transfer from developed countries to developing countries. In this way, agriculture's comparative advantage tends to decline in developing countries, especially in middle-income countries achieving rapid industrialization by technological borrowing from developed countries.

The speed of decline in agriculture's comparative advantage is likely to exceed the speed of labor transfer from agriculture to manufacturing under the regime of emerging dual structure characterized by the low rate of labor absorption in the formal sector. To that extent the income disparity between farmers and the employees of formal manufacturing and service enterprises could well rise to becoming a source of major social instability or even disruption.

4. Historical Perspectives

A more concrete grasp of the process by which the disparity problem dominates agricultural policy formulation as economies advance from the low-income to the middle-income stage may be obtained by examining histories of the nations that underwent such a transformation. For this purpose the histories of Thailand during the period after the Second World War and of Japan between the First and Second World Wars shall be reviewed in this section.

The experience of Thailand

First, the experience of Thailand is examined as a typical example of high-performing economies in Asia currently experiencing the disparity problem.

Indeed, the growth performance of Thai economy in the past half century was dramatic. Before the 1960s, Thailand was a low-income economy dependent on the production and export of primary commodities, rice above all. Before 1960, average GDP per capita remained largely stagnant at the level of about 500 US dollars (in 1990 prices) with the share of industrial products in total export being only about 10 percent (Douangngeune, et al., 2005). However, within only two decades from 1960, Thailand suddenly jumped up to a middle-income status based on the success of labor-intensive industrialization; by the end of the 1970s the export share of industrial products rose to about 40 percent

and GDP per capita more than doubled to the level of about 1200 dollars. Thereafter, the industrial sector in Thailand was further strengthened, beginning to develop high-tech industries such as automobile and electronics. Correspondingly, within only a decade and half before the 1997 Asian Financial Crisis, per-capita GDP again more than doubled and the export share of industrial products exceeded 70 percent. Even though Thai economy suffered severely from the 1997 Crisis, it was able to return to the track of high growth in about three years.

It was inevitable that the rise of Thailand from a low-income to a middle-income country based on dramatic industrial development was associated with the widening of income disparity between agriculture and the rest of economy, as already observed in Table 1. Increasing income disparity between rural and urban sectors should have been parallel with the widening income gap between workers in urban formal and informal sectors. The disparity increased as the development of capital- and knowledge-intensive industries created a dual structure. Altogether, inequality in income distribution in Thailand, as measured by the Gini coefficient in Figure 2, increased significantly as the economy advanced to the middle-income stage.

In this process both farmers and workers in the urban informal sector were not absolutely worse off. Instead, they should have improved their absolute income levels, as reflected in continued reduction in the share of population below the poverty line (the head-count index) despite increases in the Gini coefficient. Nevertheless, they must have developed frustration on their being poor or becoming poorer in comparison with the rising standard of living of formal-sector employees. Thus, upon successful reduction of absolute poverty, Thailand began to be confronted with the problem of relative poverty.

Since the majority of the poor were staking out subsistence in agriculture, policies to support farmers' incomes became important agenda for politicians to prevent income inequality from rising to a socially disastrous level. Also, the spread of primary education and the improvements of communication and transportation infrastructure in rural areas increased both farmers' awareness of their being 'unfairly' treated relative to urban dwellers as well as their ability of organizing political lobbies for demanding a 'fair deal'. Thus, in the process of advancing from a low-income to a middle-income stage, Thai politicians were pressed to change their policy objective from taxing agriculture for solving the food problem to supporting farmers for solving the disparity problem.

This change in policy orientation in Thailand is most clearly observable in changes in taxation on rice exports. As a major exporter of rice, taxation on rice exports represented a convenient and effective instrument for taxing agriculture for the purpose of income transfer from farm producers to consumers and taxpayers. Several instruments were used for taxing rice exports in Thailand, including quantitative restriction (export quota) and imposition of obligations on exporters to submit a certain share of rice export to the government at lower-than-market prices (so-called 'rice reserve requirement'), all of which had the effect of lowering domestic prices below international prices. However, by far the most important instrument used by Thai government was the 'rice premium', a kind of specific duty levied proportional to export quantities. At the low-income stage, the rice premium was a critically important source of government revenue and, at the same time, acted as a mechanism of supplying rice to domestic consumers at lower-than-world market prices. Further, it had the power to protect consumers from the vagary of world market by increasing (reducing) the premium when world market prices rose (dropped) so as to stabilize domestic prices. Thus, the rice premium was a highly effective policy instrument to serve for the dual purpose of raising government revenue and securing supply of cheap food to urban consumers by means of taxing agriculture at the stage when the food problem was dominant in the formulation of agricultural policies (Siwamwalla, 1987; Siwamwalla and Sethboonsarny, 1989).

Figure 3 draws changes in rice premium in comparison with changes in the nominal rate of protection (NRP). NRP aims to measure the divergence of the domestic price from the border price. Here it is calculated as the rate of difference of the domestic wholesale price from the export price, fob, Bangkok, for the grade of rice 5-percent broken. To the extent that rice exports are taxed, domestic prices diverge below border export prices, resulting in the negative values of NRP. NRP includes the effects of not only the rice premium but also other taxation instruments, but the dominant role of the premium is evident from high negative correlation between movements in the premium rate and NRP. Data in Figure 3 show that, before the mid 1970s when Thailand stayed in a low-income stage, the rice premium rate remained high at the level of about 30 percent of the border price, and NRP was as high as about 50 percent; this implies that nearly half the values of farmers' rice sales were transferred to non-farm sectors including the government through the export taxation. For a decade since then, however, as Thailand had advanced to the middle-income stage, the rice premium had been

reduced till its abolishment in 1986. This change should have reflected the rise of the disparity problem.

Beside the reduction of export taxation, the emerging need to prevent rural-urban disparity from further widening pressed politicians to install more visible measures for the support of farmers. Under the political instability in the mid1970s involving student riots and military coups, this pressure culminated in the establishment of the Farmers' Aid Fund in 1974. Based on large rice premium revenue corresponding to sharp increases in world rice prices in the so-called 'World Food Crisis' of 1973-75, the Fund tried to undertake several programs to support farmers, such as farmer credit, fertilizer subsidy, and public work using rural labor for the construction of rural infrastructure. Among them a program organized in a significant scale attempted to support rice prices through the purchase of rice by government agencies. However, the program totally failed to achieve its intended goal, partly because the poor design and inefficient implementation due to lack of experience and skill in government procurement agencies but more critically because the budget that the Fund could allocate was too small to significantly influence market prices (Siwamwalla, 1987). This program was soon terminated as the rice premium revenue decreased corresponding to declines in world rice prices after the Food Crisis period.

This failure of the price support program organized by the Farmers' Aid Fund epitomizes the difficulty in formulating appropriate policies to cope with the disparity problem. First of all, the program was contradictory as it tried to support farmers based on the revenue from taxation on them; this contradiction arose from the fact that the government tax base outside agriculture was still insufficient to support farmers adequately in the middle-income stage. Second, if the program were really successful in raising domestic rice prices, it should have met strong opposition and protest from the urban poor outside the formal sector. Here is the dilemma of the disparity problem under which supplying cheap food to the urban poor and preventing farmers from becoming poorer relative to non-farm workers are more or less important for politicians.

It must be very difficult for middle-income countries to escape from this dilemma. Thailand, for example, tried to introduce export subsidy on rice for further increasing support on farmers after the abolishment of rice premium. As yet, however, the export subsidy has been negligibly small. The large application of export subsidy would not have been possible as it is against the WTO rule. However, even before the GATT

Uruguay Round Agreement in 1993, Thai government indicated no sign to greatly expand the export subsidy scheme. This was presumably because of both the budgetary constraint and the danger to raise food prices for the urban poor.

Since the mid 1980s, the Thai government has introduced a commodity credit program akin to a program operated by the Commodity Credit Corporation in the United States in the past. By this program farmers can receive low-interest loans from the government for the pledge of their rice until the rice price will go up to a target level and, in the event that the price will not sufficiently rise, they can relinquish their debt by submitting the pledged rice to the government. This is a high-cost program unsustainable even in the United States. It is doubtful if this program can be expanded to such a scale as to render sufficient income supports for farmers in a middle-income country.

As industrialization in Thailand will continue to progress, comparative advantage in agriculture will decline further. For closing the rural-urban income gap, the government will continue to increase supports on farmers in various fronts, including subsidies on inputs and credits as well as price supports. Yet, it is unlikely that Thailand will be able to expand the support programs to such a scale as to fully close the income gap before its economy will advance to a high-income stage.

The experience of Japan

The current problem in Thailand at the middle-income stage, as reviewed in the previous section, may be better understood by comparing it with the economic transformation of Japan from the low-income to the high-income stage. Table 3 presents a synopsis of modern economic development in Japan from 1885 to 1995. Japan and Thailand opened to international trade at about the same time under the pressure of West; both were forced to sign unequal treaties – Thailand with the United Kingdom in 1855 and Japan with the United States in 1858. Despite this similarity, industrialization progressed much faster in Japan than in Thailand, probably owing to much scarcer endowments of natural resources, especially land for cultivation, making it more urgent in Japan to industrialize than in Thailand for surviving under open international trade (Bounlouane, et al., 2005). At any rate, in terms of per-capita GDP data in Table 3 (Column 1), it appears that Japan was able to approach the middle-income stage by the first decade of the 20 century. Until the First World War,

Japan's industrialization had been predominantly based on the expansion of labor-intensive manufacturing. Later, heavy industries were promoted during the First World War and continued to be strengthened thereafter in the inter-war period. At that time a dual structure emerged and the rural-urban disparity became serious.

Correspondingly, the focus of agricultural policies changed. Before the First World War, agricultural policies were mainly geared for increasing food production so as to counteract the food problem in the low-income stage. The adequate supply of cheap food, especially rice, was considered a critical support for the development of labor-intensive industries. For this end Japanese government invested heavily in agricultural research and extension as well as irrigation infrastructure for the development and diffusion of high-yielding varieties, initially within Japan and later to overseas territories, Korea and Taiwan. Such efforts were successful to overcome the food problem before the Second World War (Hayami, 1975; Hayami and Ruttan, 1985, Hayami and Yamada, 1991).

Ironically, this success greatly aggravated the disparity problem during the inter-war period. As Column 5 of Table 3 shows, declines in labor productivity in agriculture relative to industry were very fast in Japan from the beginning of modern economic growth, reflecting very rapid progress in industrialization. Nevertheless, the terms of trade did not improve for agriculture (Column 6), so that income per capita in farmers' households declined sharply relative to that in non-farm workers' households (Column 7). These trends contrast sharply with those after the Second World War, when despite continued declines in relative productivity for agriculture, the per-capita income of farmers improved relative to non-farmers to the point of exceeding parity after the 1970s: this was resulted from very rapid improvements in the terms of trade based on farm price support programs at a large scale unthinkable in the prewar days. Such a scale of farm supports became possible as Japan advanced to the high-income stage in the late 1960s.

As the disparity problem loomed large, the farm bloc demanded for increased government supports. Already in 1913, politically powerful landlords were successful in lobbying for the institution of a specific duty on rice imports, but it was not applied to rice produced in overseas territories within the Japanese Empire. When the price of rice began to fall after the First World War, the farm bloc pressed the government to support rice prices by means of procurement and storage of rice. In addition, the government

developed various programs to assist farmers, including government spending on construction of physical infrastructure in rural areas in order to provide wage-earning opportunities and the release of low-interest loans from government to farmers heavily in debt from private money lenders.

Tax burden on farmers was also reduced. In the early stage of modernization in Japan, land tax levied from farmers was the major source of government revenue. During the 1880s the ratio of direct tax shouldered by farmers to their income was about 15 percent compared with only about 2 percent for non-farmers; this disparity largely remained even in the 1910s with the tax rates of about 11 percent for farmers and 5 percent for non-farmers, but by the late 1930s farmers' tax rate was reduced to about 6 percent not so different from non-farmers (Hayami, 1988, p.40).

These policies designed in Japan during the inter-war period in response to the emerging disparity problem were also very similar to those adopted Thailand since 1970s. Their consequences were similar. In spite of all these efforts, the level of income and the living standard of farm people did not appreciably improve. Unlike after the Second World War, Japanese economy during the inter-war period did not reach the stage at which the government could afford to undertake farm support programs at such a scale as to close the rural-urban income gap. Although heavy industries developed rapidly, light industries based on small- and medium-scale enterprises were still the backbone of Japanese economy, especially with respect to foreign exchange earnings. Their international competitive power was still dependent on cheap labor, so that a major increase in the wage rate resulting from large increases food prices could not be tolerated. In such circumstances, with whatever powerful lobbying the landlords were able to organize, it was not politically possible to raise the level of agricultural protection sufficiently to solve the rising disparity problem.

Very unfortunately, by the time when the disparity problem became serious, Japan was plunged into the storm of the Great Depression that began in 1929. In Japan as well as throughout the world, farm product prices declined faster than the prices of manufactures and farmers' incomes dropped more than non-farm workers'. Growing dissatisfaction and frustration of farmers, who became poorer both absolutely and relatively, culminated in social disruptions including terrorism; this rendered a major support for militarism to gain power, ending in the tragedy of the Pacific War.

5. On the Relevance of the East Asian Experience

So far, the process of the disparity problem to emerge in developing economies as they advance from the low-income to the middle-income stage as the result of successful industrialization has been illustrated with respect to the experience of high-performing economies in East Asia. One may wonder how relevant is the model based on the East Asian experience to economies in other regions with different economic and social conditions. Is it not possible that the disparity problem in other regions might not become quite as severe as in East Asia, even if they might be able to achieve rapid industrialization comparable to that of East Asia? This possibility depends on their capability of inter-industry adjustment to the loss in comparative advantage in agriculture owing to rapid industrial development.

First, even if the productivity of manufacturing in an economy might rise very rapidly owing to the success in the borrowing of advanced industrial technology from abroad in association with increases in capital intensity, as has been the case in the East Asian Miracle, the loss in agriculture's comparative advantage might not be so large if it can achieve agricultural technology borrowing at a comparable speed. For example, if the agriculture sector were able to achieve its productivity growth by means of farm mechanization parallel with increases in the capital intensity in the manufacturing sector, inter-sectoral productivity difference could have not been widened so much. However, even if investment in farm mechanization may become profitable in terms of increased wage rates resulting from successful industrialization, the farm mechanization might not proceed smoothly because of the difficulty to establish a sufficiently large-sized farms to exploit the advantage of using modern large-scale machinery under the high transaction costs involved in consolidating a large number of peasants' holdings into large commercial farms.. In East Asia, such as Japan, Korea and Taiwan in particular, in which agriculture has traditionally been manned by small homogeneous peasants who had been attached to the same lands over generations, it is very costly to alienate them from their ancestral lands. These economies are also characterized by high population density where frontiers have long been closed for opening new lands for cultivation. In such economies, it should be extremely difficult to counteract against loss in agriculture's comparative advantage by promoting an agrarian structure dominated by large-scale commercial farms. Such agrarian restructuring could be relatively easier in land-abundant newly settled regions such as Latin America where land and labor markets are more fluid and the aggregate supply of

arable lands is more elastic through new land opening. To that extent, the disparity problem could be less severe to emerge in such economies than in Japan, Korea and Taiwan even at the same speed of industrialization.

Such a difference could well be significant, but it is unlikely that even newly-settled land-abundant economies where land markets are usually more active can totally escape from the trap of the disparity problem in the process of industrialization. Unlike the manufacturing sector where adjustments in factor combination necessary for the borrowing of foreign technology can easily be done based on the efficient supply of capital from both domestic and foreign sources through generally well-functioning capital markets, adjustments in land input needed for introducing foreign agricultural technology is much more difficult and costly, given the typical absence in developing economies of institutions to support land markets such as cadastral surveys and land registry, not to speak of the total absence of “international markets for lands” unlike the case for capital. Furthermore, as emphasized in section 4, the importation of foreign technology is usually much more difficult for agriculture than for manufacturing because of the location-specific nature of agricultural technology that is constrained by natural environments (Hayami and Ruttan 1985). For these reasons it is just unlikely that even the economies most favourably endowed with agricultural resources can be immune from the trap of the disparity problem when they are able to achieve rapid industrialization based on the success in industrial technology borrowing,

In fact, Thailand represents a good example in this regard. Within East Asia, Thailand has been characterized by relative abundance in the endowment of land where land frontiers had been open until very recently, especially in its North East. Nevertheless, Thailand could not escape from the disparity problem when it joined the East Asian Miracle of rapid industrialization and economic growth, as explained in the previous section. The policy response of Thailand to the disparity problem is also representative of land abundant economies. As a means to support farmers, Thailand relied heavily on the reduction of rice export tax, unlike the cases of Japan, Korea and Taiwan which relied on border protection measures such as tariffs and quotas. As a major exporter of agricultural commodities, it was not a viable option for Thailand to support farmers by raising domestic prices by the combination of border protection and domestic price support programs. If domestic prices may be raised above the international market prices, Thailand’s exports of agricultural commodities should have stopped, resulting in the accumulation of surplus agricultural products in domestic markets to the point that

the cost needed to reduce the surplus by such means as the government's stock holding and acreage control will exceed the nation's fiscal capacity. For this reason, it was only natural for Thailand to adopt reduction on agricultural export taxation as a major means to support farmers in a way similar to many land-abundant agricultural exporters in Latin America.

Needless to say that the basic cause of the disparity problem is the lag in the transfer of labor from agriculture to non-agriculture relative to the speed of loss in agriculture's comparative advantage in the process of industrialization. Therefore, the problem can be less severe where the access of farmers to non-farm employment is easier, which depends to a large extent on the geographic distribution of industrial and commercial activities. This effect can be clearly observed from the comparison between Korea and Taiwan within East Asia. Taiwan is known for the success of rural-based industrialization characterized by the wide diffusion of small- and medium-scale enterprises over rural areas, while Korea's industrialization has centered on urban-based large enterprises. The access of farmers and their family members to nonfarm employment has been much easier in Taiwan than in Korea, as reflected in the data that more than a half of farm-household income in Taiwan came from non-farm sources in 1970 whereas it was only about one quarter in Korea (Honma and Hayami 2006).

Correspondingly, government responses to the disparity problem were different. Both Korea and Taiwan entered the middle-income stage from the 1960s, when border protection measures on the import of agricultural commodities were strengthened in both economies reflecting governments' responses to the emergence of the severe disparity problem. This aspect of agricultural protection growth was shared common by Korea and Taiwan, which recorded similar successes in industrial growth under similar resource endowments and agrarian structures. Nevertheless, agricultural protection in Korea, as measured by the average nominal rate of protection for agricultural commodities, rose faster to much higher levels than in Taiwan for the same levels of per-capita incomes throughout their middle-income stage and further after they advanced to the high-income stage in the 1990s (Honma and Hayami 2006). This difference seems to reflect the difference in the cost of inter-sectoral adjustments in labor allocation corresponding to changes in comparative advantage, which farmers had to shoulder. In Korea the shift of labor from agriculture to non-agriculture necessarily involved the migration of workers from rural to urban areas, whereas in Taiwan much

of the shift was done by farmers' increases in non-farm activities while continued living in their home villages. Correspondingly, both the pecuniary and psychological costs of inter-sectoral labor reallocation should have been much higher for farmers in Korea.

The experience of Korea relative to Taiwan suggests the great difficulty that China will have to face. The miraculous growth of China in recent years has been characterized by concentration of industrial activities in the coastal areas whereas western hinterlands have largely been bypassed. As the result, the disparity problem has been especially serious and is expected to become more so in China since the rural-urban income gap is augmented by the large inter-regional inequality in the process of rapid industrialization. It is feared if the disparity problem in China might escalate to the social and political crisis of the nature similar to that experienced by Japan between the two world wars if the present course of its development continues.

6. Conclusion

The growing imbalance in world agriculture today is epitomized in the increasing food deficits in low-income economies in contrast with increasing surpluses in high-income economies. This has not simply been the result of different demand and supply structures corresponding to different income levels. The problem has been aggravated by policies under the dictate of the three agricultural problems in different stages of economic development -- the food problem in the low-income stage, the disparity problem in the middle-income stage, and the protection problem in the high-income stage.

Under the regime of the food problem, policymakers in low-income countries have been inclined to adopt policies geared for securing low-priced food to urban consumers at the expense of farm producers. In contrast, under the regime of the protection problem, politicians in high-income countries have not been able to resist pressures from the farm lobby for instituting policies to raise farmers' incomes to the level of non-farm workers. Great inefficiency and inequity resulting from these contrasting policy distortions have already been amply documented (Johnson, 1973; Schultz, 1978, Anderson and Hayami, 1986), and the need to reduce these distortions has been widely recognized. In fact, major international collaborative efforts have progressed in that direction for the past two decades, through GATT/WTO multilateral trade negotiations.

In contrast, the disparity problem has received relatively little attention. Yet, the growing income disparity between the farm and non-farm population could be a major source of social and political instability for economies attempting to achieve catching up with high-income economies through industrialization by means of rapid technology borrowing. This problem is now spreading over Asia from ASEAN nations to China and Vietnam and will eventually reach South Asia, especially India.

While the right approaches to the food and protection problems have already been established among economists, though actual implementation is often politically difficult, the right design to cope with the disparity problem has not yet been identified. The difficulty is how to compromise the conflicting goals to support farmers' incomes on the one hand and to secure the supply of low-cost food to a large number of workers in urban informal sectors on the other hand under the still weak capacity of the government to raise sufficient revenue from non-agricultural sectors. Almost inevitably, agricultural policies tend to become tinkering exercises combining various, often mutually conflicting policy instruments in ad hoc manners, as the experiences of Thailand and Japan illustrate.

Greater research inputs in this area are called for in order to prevent the growth momentum of high-performing Asian economies from being disrupted, as experienced by Japan between the two World Wars. Given the weak fiscal capacity of developing economies at the middle-income stage, it is unrealistic to expect that they can solve the problem by means of increasing subsidies to farmers as attempted by high-income economies. Policy must be designed to strengthen their capacity to adjust to changes in comparative advantage resulting from the lag in the growth of agricultural productivity behind the industrial productivity growth. Greater investments in public research and development of agricultural technology shall be needed, especially in the direction to adapt advanced agricultural technology in developed economies to the environments of developing economies as well as in the development of institutional infrastructure such as land registry systems for operating land market more efficiently. The education and training of rural people will be critically important for shifting rural labor smoothly from farm to non-farm economic activities. Industrial development policy should consider the need to support rural-based industries for facilitating access of farmers to non-farm income sources.

These policies must be supported by the accurate grasp of the nature and scope of

disparity problem, for which the further accumulation of farm household income data based on micro household surveys is badly needed. Unless comparisons between farm and non-farm households are made in terms of aggregates of farm and non-farm incomes across regions and over time, the effective allocation of public resources to cope with the disparity problem by region can not appropriately be designed. The sectoral value added data from social accounts used for broad comparisons in Tables 1 of this paper are grossly insufficient for the purpose of such concrete policy design. Social engineering to cope with the disparity problem, which is by nature very complex and sensitive, must be based on careful field-level research for different socio-economic and ecological environments, such as those presented in the set of papers compiled in the November 2006 special issue on “the role of nonfarm income in poverty reduction: evidence from Asia and East Asia” of *Agricultural Economics* 35:393-478.

References

Anderson, K, and Hayami, Y., 1986. *The Political Economy of Agricultural Protection*. Sydney: Allen and Unwin.

Churchart, C., 1957. *Rice Marketing in Thailand*. Ph. D Dissertation, Louisiana State University, Louisiana.

Douangneune, B., Godo, Y., and Hayami, Y., 2005 forthcoming. "Education and Natural Resources in Economic Development: Thailand Compared with Japan and Korea", *Journal of Asian Economics*.

Hayami, Y., 1975. *A Century of Agricultural Growth In Japan: Its Relevance to Asian Development*, Tokyo: University of Tokyo Press.

Hayami, Y., 1988. *Japanese Agriculture under Siege: The Political Economy of Agricultural Policies*, London: Macmillan.

Hayami, Y., and Godo, Y., 2002. *Nogyo Keizairon* (Agricultural Economics), New edition, Tokyo: Iwanami Shoten.

Hayami, Y., and Godo, Y., 2004. "The Three Agricultural Problems in the Disequilibrium of World Agriculture", *Journal of Agriculture and Development* 1(June):3-16.

Hayami, Y., and Godo, Y., 2005. *Development Economics: From the Poverty to the Wealth of Nations*, Oxford: Oxford University Press.

Hayami, Y. and Ruttan, V. W., 1985, *Agricultural Development: An International Perspective*, Baltimore, 2nd edition, Johns Hopkins University Press.

Hayami, Y., and Yamada, S., 1991. *The Agricultural Development of Japan: A Century's Perspective*, Tokyo: University of Tokyo Press.

Honma, M. and Hayami, Y. 2006. "Distortions to Agricultural Incentives in Korea and Taiwan", Paper submitted to the World Bank project *Distortions to Agricultural*

Incentives.

Johnson, D. G., 1973. *World Agriculture in Disarray*, London: Fontana.

International Rice Research Institute (IRRI), 2003. *World Rice Statistics 2003*, Los Banos, Philippines.

Kruger, A. O., Schiff, M. and Valdes, A., eds., 1991. *Political Economy of Agricultural Pricing Policies*, 3 volumes, Baltimore: Johns Hopkins University Press.

Pookkachatikul, J., and Welsch, D., 1976. *Thai Rice Premium Data, 1954- 1976*. Staff Paper No. 12, Department of Agricultural Economics, Kasetsart University, Bangkok.

Schultz, T. W., 1953. *The Economic Organization of Agriculture*, New York: McGraw-Hill.

Schultz, T. W., ed., 1978. *Distortion of Agricultural Incentives*, Bloomington: Indiana University Press.

Siamwalla, A., 1987. *The Farmers' Aid Fund Act of 1974: Its Genesis and Aftermath*. Bangkok: Thailand Development Research Institute.

Siamwalla, A. and Setboonsarng, S., 1989. *Trade, Exchange Rate, and Agricultural Pricing Policies in Thailand.*, Washington, D.C: World Bank.

Warr, P., 2004. "Boom, Bust and Beyond", in P. Warr, ed., *Thailand Beyond the Crisis*, London: Routledge.

World Bank, 1993. *The East Asian Miracle: Economic Growth and Public Policy*, Oxford: Oxford University Press.

Table 1 International comparisons of relative incomes of agricultural workers across different stages of economic development

	(1)		(2)		(3)		(4) = (3)/(2)	
	Per-capita GDP (constant 2000 US\$)		Agriculture's share in economic active population (%) (Na/N)		Agriculture's share in GDP (%) (Ya/Y)		Agriculture's per-capita income/whole economy's per-capita income ^a (%) (Ya/Na)/(Y/N),	
	2000	1965-2000 average annual growth rate (%)	1965	2000	1965	2000	1965	2000
Developing countries								
Low-income countries								
Ghana	251	-0.2	62	57	44	36	70	63
Nigeria	358	0.3	72	33	55	29	76	86
Kenya	414	1.3	87	75	35	32	41	43
India	450	2.5	74	60	45	25	61	41
Pakistan	531	2.4	65	47	40	26	62	55
Average ^a	401	1.3	72	54	44	30	62	58
Middle-income countries								
Indonesia	800	4.1	71	48	56	16	79	32
China	949	6.6	80	67	38	15	47	22
Philippines	1,002	1.1	61	40	26	16	43	40
Thailand	1,998	4.7	82	56	32	9	39	16
Turkey	2,956	2.0 ^b	72 ^c	46	42 ^c	15	59 ^c	33
South Africa Rep.	3,020	0.3	34	10	9	3	27	34
Chile	4,917	2.7	27	16	9	5	32	30
Mexico	5,935	1.9	49	21	14	4	28	20
Average ^d	2,660	3.1	58	37	26	10	42	28
Developed countries								
Korea	10,884	6.3	55	10	39	5	71	49
Spain	14,338	2.8	28 ^e	7	14 ^e	4	50 ^e	60
France	22,548	2.5	13 ^e	3	7 ^e	3	55 ^e	85
Canada	23,220	2.1	8 ^e	2	4 ^e	2	59 ^e	98
UK	24,075	2.1	3 ^e	1	3 ^e	2	95 ^e	168
US	34,599	2.2	4 ^e	1	4 ^e	2	120 ^e	169
Japan	37,409	3.7	19 ^e	4	5 ^e	1	28 ^e	34
Average ^f	26,032	2.6	12 ^e	3	6 ^e	2	68 ^e	102

Notes (1) GDP is converted by the average official exchange rate reported by the International Monetary Fund.

(2) Economically active population in agriculture (agricultural labour force) is that part of the economically active population engaged in or seeking work in agriculture, hunting, fishing or forestry.

(3) Agriculture corresponds to divisions 1-5 of the International Standard Industrial Classification and includes forestry and fishing.

a. Simple average of Ghana, Nigeria, Kenya, India and Pakistan.

b. 1968-2000 growth rate.

c. 1968 value.

d. Simple average of Indonesia, China, Philippines, Thailand, South Africa Republic, Chile and Mexico.

e. 1971 value.

f. Simple average of Spain, France, Canada, UK, US and Japan.

Sources FAO, *FAOSTAT 2005*.

World Bank, *World Development Indicators CD-ROM*, 2006.

Table 2 The average annual growth rates of real labor productivities in agriculture and manufacturing in selected countries, 1980–95

	(1)	(2)	(3)	(4) = (2) – (3)
	Per-capita GDP (US\$)	Average growth rate per year of labor productivity (%)		Rate of change in comparative productivity (%)
		Agriculture	Manufacturing	
Developing countries				
Kenya	414	–0.1	0.4	–0.5
India	450	2.3	4.3	–2.0
Pakistan	531	3.1	3.3	–0.2
China	949	3.7	5.1	–1.4
Philippines	1,002	0.4	10.7	–10.3
Turkey	2,956	0.8	4.8	–4.0
South Africa Rep.	3,020	0.9	0.6	0.3
Mexico	5,935	1.5	3.5	–2.0
Average ^a	1,907	1.6	4.1	–2.5
Developed countries				
Korea	10,884	6.6	6.7	–0.2
Spain	14,338	4.5	3.5	1.1
France	22,548	4.5	2.3	2.1
Canada	23,220	5.8	2.6	3.2
UK	24,075	2.0	3.9	–1.9
US	34,599	2.2	3.5	–1.3
Japan	37,409	3.9	1.9	2.0
Average ^b	23,868	4.2	3.5	0.7

Notes (1) GDP in 2000 converted by the average official exchange rate reported by the International Monetary Fund.

(2) Productivity in the agricultural sector is measured by FAO's index of agricultural production divided by the economically active population (or labour force) in agriculture.

(3) Productivity in the manufacturing sector is measured by UNIDO's industrial production index divided by employment in the manufacturing sector. For China, for which UNIDO's industrial production index is not available, value added of the manufacturing sector (in 1990 US dollars) is used.

a. Simple average of Kenya, India, Pakistan, China, Philippines, Turkey, South Africa Republic and Mexico.

b. Simple average of Korea, Spain, France, Canada, UK, US and Japan.

Sources United Nations Industrial Development Organization (1997), *Industrial Development Global Report*, 1997 Edition. FAO, *FAOSTAT Database*, 2005.

Table 3 Farm-nonfarm income disparity agriculture in Japan's economic development, 1885-2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per capita (ppp at 2000)	Share of agriculture in GDP	Agriculture/ Industry labour productivity ratio	Tariff rate of rice	Average tariff rate of all products	Agriculture/ Manufacturing Terms of Trade	Farm / Non- farm house- hold income ratio
	(US\$)	(%)	(%)	(%)	(%)	(1885=100)	(%)
1885	1,092	45	75	-	-	100	76
1890	1,285	48	67	-	-	115	87
1900	1,498	39	49	-	3.7	102	52
1910	1,656	32	37	13.7	16.2	98	47
1920	2,154	30	50	9.9	10.0	99	48
1930	2,350	18	31	14.0	22.6	104	32
1935	2,693	18	24	41.2	23.8	136	38
1955	3,519	21	55	-	3.5	163	77
1960	5,063	13	39	-	6.5	169	70
1970	12,337	6	25	-	6.9	303	94
1980	17,056	4	25	-	2.5	342	116
1990	23,580	2	26	-	2.7	379	115
2000	26,220	1	22	778	2.1	347	101

GDP per capita in PPP at 2000 from World Bank, *World Development Indicators 2006*, linked with the series in OECD Development Centre, *The World Economy : Historical Statistics*, 2003.

The share of agriculture in nominal GDP. 1885-1955 from Ohkawa and Shinohara, pp.273-81(share in NNP for 1885-1935). 1960-2000 from *World Development Indicators 2006*.

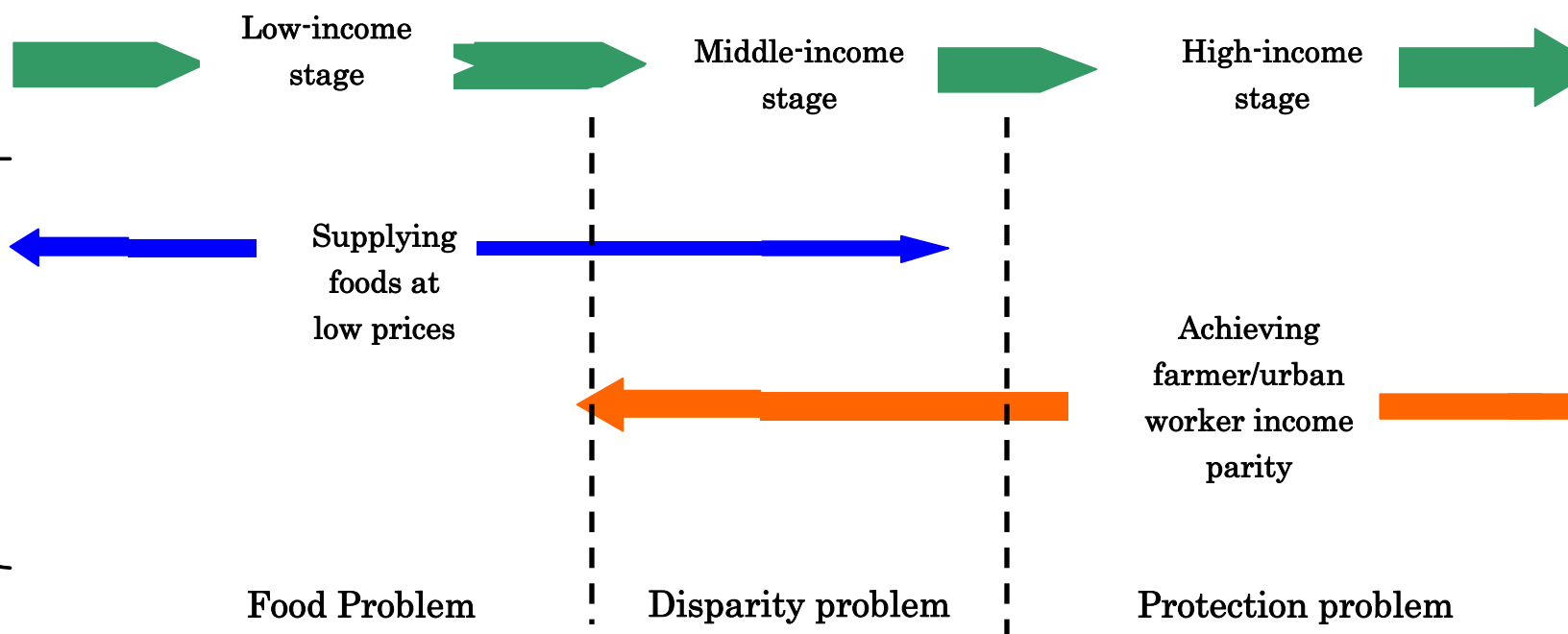
The ratio of real GDP per worker in agriculture (including forestry and fishery) to real GDP per worker in industry (including mining). 1885-1970 from Y. Hayami, *Nogo Keizairon* (Agricultural Economics), Iwanami, 1986, p.120. 1980-2000: extended from 1970 using real GDPs from *Annual Reports of National Accounts*.

Tariffs for 1910, 1920, 1930 and 1935 are tariffs in 1908. 1918, 1928 and 1933, respectively, from K. Ohkawa, et al. eds., *Long-Term Economic Statistics in Japan since 1868*, Toyo Keizai, Shimpsha, 1967. Tariffs rate for 2000 is ad valorem tariff equivalent of specific duty, 341 yen/kg, which was reported to WTO by the government.

Tariffs for 1900, 1910, 1920, 1930 and 1935 are tariffs in 1898, 1908. 1918, 1928 and 1933, respectively, from K. Ohkawa, et al. eds., *Long-Term Economic Statistics in Japan since 1868*, Toyo Keizai, Shimpsha, 1967. Tariffs for 1955-2000 are average tariffs calculated by total tariff revenue as percentage of total import cif value in the Monthly Report of Financial Statistics, Ministry of Finance, various issues.

1985-1960: the ratio between the price index of agricultural products and the price index of manufacturing products in K. Ohkawa, et al. eds., *Long-Term Economic Statistics in Japan since 1868*, Toyo Keizai Shimpsha, 1967, pp.165 and 192-3. 1970-80: extended from 1960 using the Ministry of Agriculture, Forestry and Fishery's price index of agricultural products and the Bank of Japan's domestic corporate goods price index for manufacturing industry products.

1885-1935: the ratio in household income per household member between farm and non-farm households in T. Otsuki and N. Takamatsu, *On the measurement of Income Inequality in Prewar Japan*, International Development Center of Japan, 1982. 1955-2000: the ratio in per-capita income between farm households and employees' households based on the Ministry of Agriculture's *Farm Household Economy Survey* and the Ministry of Internal Affairs' *National Survey of Family Income and Expenditure*. Farm households in 1990-2000 exclude non-commercial farm households.



1 The agricultural problems at different stages of economic development

Source: Hayami and Godo(2004, p.12)

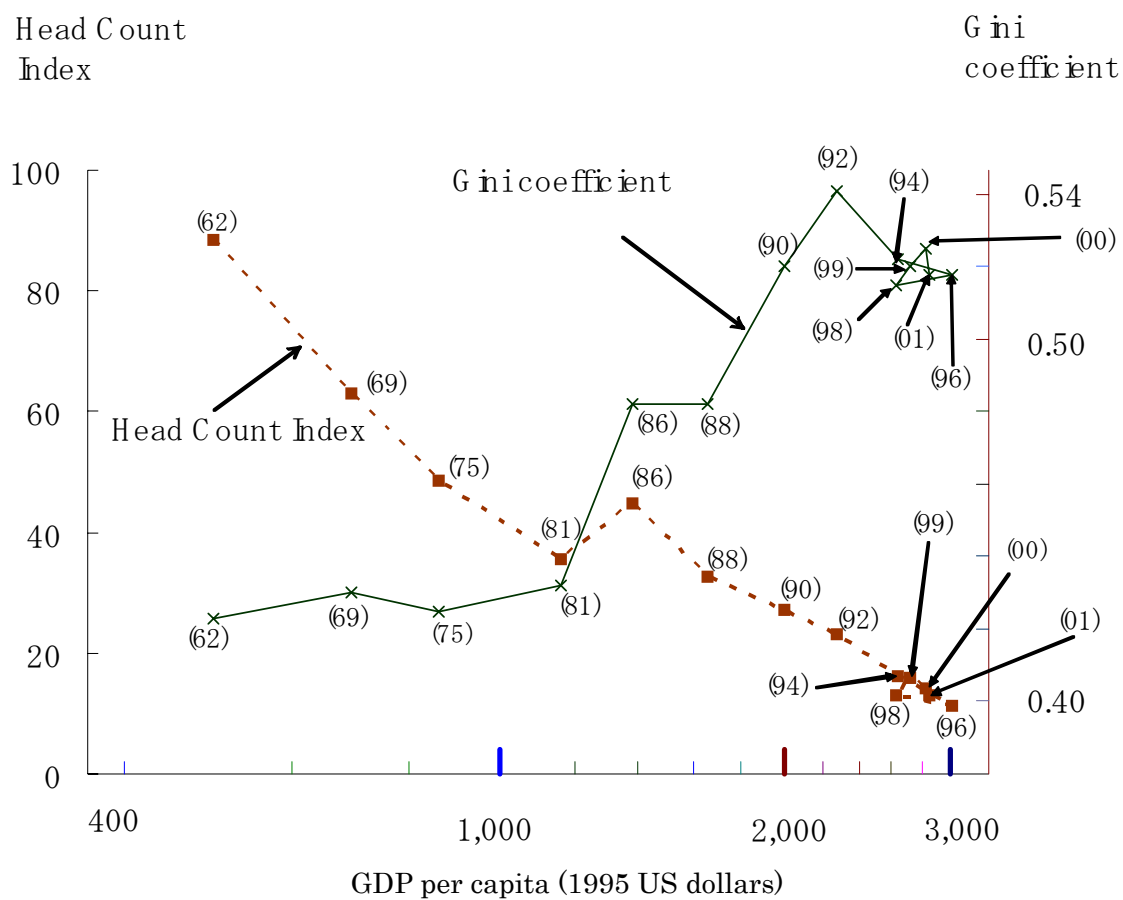


Fig. 2 GDP growth and poverty indexes in Thailand, 1962-2001

Note: Within parenthesis is the year of observation.

Sources: Reproduced from Hayami and Godo(2005.p.208):

GDP per capita from World Bank, World Development Indicators CD-ROM, 2003.

Head Count Index and Gini coefficient from Warr (2004).

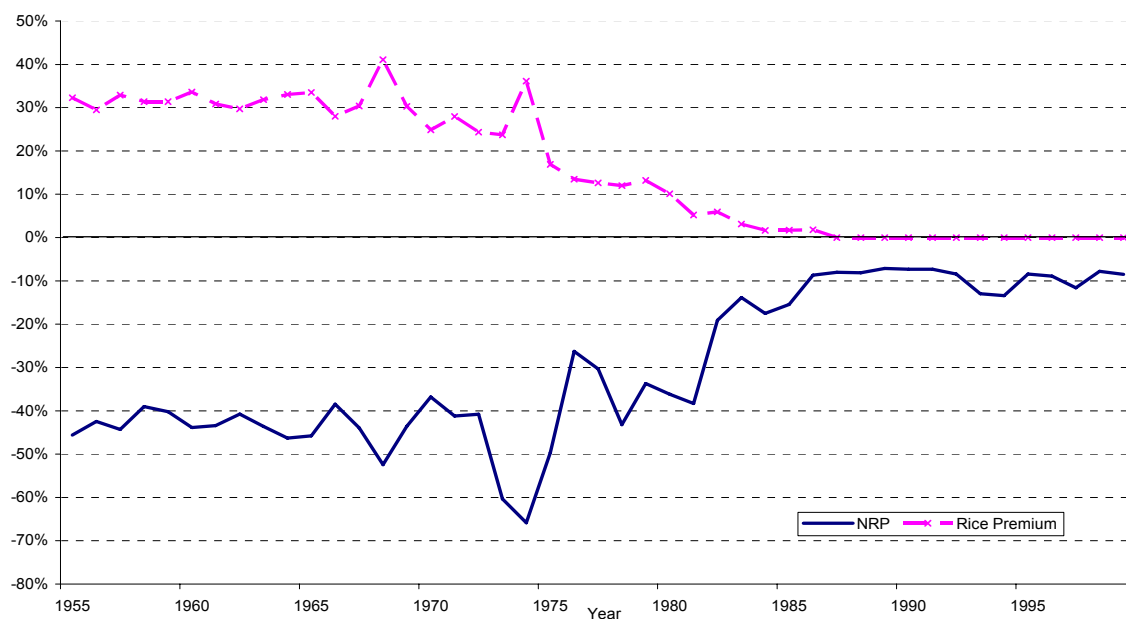


Fig 3. Rice premium and nominal rate of protection (NRP) for rice 5% broken in Thailand, 1950-2002

Note: $NRP = (\text{domestic wholesale price} - \text{export price fob Bangkok}) / \text{export price fob Bangkok}$

Source:

Export price: IRRI World Rice Statistics (2003)

Domestic price: Churchart (1957) for 1950-54, IRRI World Rice Statistics (2003) for 1955-97, and The Bank of Thailand Monthly Bulletin for 1998-2002

Rice premium: Churchart (1957), Pookkachatikul and Welsch (1976), and Siamwalla and Sethboonsarng (1989)