2

Changes in Income Distribution in Thailand

Study on income distribution in Thailand began in the 1970s. Even though people began to pay attention to income inequality in the latter half of the 1960s, research on it lagged for several years because of the lack of data available. The first reliable data for income distribution is the *1968/69 Socio-Economic Survey* (SES 1968/69). Since its results became available several scholars began to study income distribution. But these studies are different in many aspects. For example, a different period is covered or a different income concept, such as, household income or per capita household income, is used. All these differences make it impossible to compare their results and so show the trend of income inequality. Therefore, in this chapter we will attempt to indicate the trend of income inequality for the longest period possible at present, that is, from 1962 to 1986. The only income concept that is available for this whole period is that of household income, thus we have used this concept in this chapter even though per capita household income is generally considered to be a better concept because it takes into account the household size and so indicates the welfare level of the household more accurately than household income.[1]

We conclude that income inequality increased from 1962 to 1986 except for the period of equalization between 1969 and 1975, which is a very peculiar period in Thai history. This result is generally consistent with the early phase of the Kuznets inverted U-shaped curve hypothesis which asserts that in the early phase of economic development income inequality increases but in the latter phase it decreases. In the latter half of this chapter we will examine this hypothesis by comparing the case of Thailand with that of other Asian countries.

Past Studies on Income Distribution

Compared with other regions, study on income distribution in Thailand as well as in other Southeast Asian countries started only recently. " In the 1960s, studies on the distribution of income in East and Southeast Asia lagged far behind those for any other region including South America and South Asia. But the situation during the 1970s changed drastically " (Mizoguchi [39], p. 308).

In his paper of 1970 Dr. Oshima analyzed the income distribution of Thailand as well as that of other East and Southeast Asian countries (Oshima [43]). He showed that the Gini coefficient of Thailand in 1962 was around 0.5, and that income inequality in Thailand was higher than in East Asian countries and slightly lower than other Southeast Asian countries. This rather high Gini coefficient contradicts our results, but his conclusion that income inequality in Thailand is between that of East Asia and that of other Southeast Asian countries is consistent with our conclusions. He then attributed this high income inequality to the larger differential in the average family income between the rural and urban sector, the larger share of the rural population, and the wider dispersion in the size of the family incomes in the larger cities.[2]

In 1972 Kerdpibule [27] analyzed the change of income inequality in Thailand between 1962 and 1970 based on the 1962/63 and 1970 *Household Expenditure Survey* (HES 1962/63 and 1970). His results were given only for the rural and urban sectors separately and not for the whole kingdom (see Table 2–1). He showed that in the rural sector income inequality increased slightly between the two periods while in the urban sector it decreased sharply. Since the levels of income inequality in both sectors were about the same in 1962/63 in terms of the Gini coefficient, this change in income inequality made income distribution in the rural sector more unequal than in the urban sector. However, this higher level of inequality in the rural sector seems to be improbable considering the experiences in other countries and the results of later studies on Thailand.

Chantaworn [8] and Meesook [35] [36] are the studies which presented detailed and consistent results on income distribution in Thailand for the first time. Chantaworn [8] deals with HES 1962/63 and *1968/69 Socio-Economic Survey* (SES 1968/69). An important contribution of his paper is the estimation of the distribution of the total income for 1962/63 because HES 1962/63 collected data only on money income. His estimation made a comparison between HES 1962/63 and the one for 1968/69 possible. His result shows that the Gini coefficient increased from 0.414 in 1962/63 to 0.466 in 1968/69. The figure for 1968/69 seems to be rather high com-

Table 2-1
Review of Gini Coefficients of Past Studies

Source	1962	1969	1970	1971	1975	1981	1986
Oshima [43]							
Whole kingdom	0.5						
Kerdpibule [27]							
Rural areas	0.436		0.443				
Urban areas	0.448		0.366				
Chantaworn [8]							
Whole kingdom	0.414	0.466					
Rural areas	0.361	0.379					
Urban areas	0.405	0.434					
Meesook [36]							
Whole kingdom		0.429					
Rural areas		0.381					
Urban areas		0.429					
Wattanavitukul [68]							
Whole kingdom	0.414	0.429		0.499			
Rural areas	0.361	0.381		0.466			
Urban areas	0.405	0.429		0.433			
Krongkaew [29]							
Whole kingdom	0.414	0.429			0.451	0.473	
Rural areas	0.361	0.381			0.395	0.437	
Urban areas	0.405	0.429			0.435	0.447	
Hutaserani and Jitsuchon [15]							
Whole kingdom					0.426	0.453	0.500
Ikemoto and Limskul [21] and author's study							
Whole kingdom	0.413	0.426			0.417	0.441	0.471
Rural areas		0.384			0.392	0.413	0.439
Urban areas		0.439			0.403	0.428	0.466

pared with that of Meesook. On the other hand Meesook [35] [36] deals only with SES 1968/69. After adjusting the income distribution data, she showed that the Gini coefficients in SES 1968/69 were 0.428 for the whole kingdom, 0.429 for the urban sector, and 0.381 for the rural sector.

Wattanavitukul [68] added her conclusions concerning the *Socio-Economic Survey of 1971–73* (SES 1971/73) to the results of Meesook [36] and Chantaworn [8] for 1962 and 1969 to determine the change in income inequality over time in Thailand. Her results showed that the Gini coefficient of total income increased rapidly, from 0.429 in 1969 to 0.499 in 1971–73. Her result is in accord with the Kuznets hypothesis that at the early stage of economic development income inequality increases (Kuznets [32]). However, the estimation for 1971–73 seems to be very problematic. As Mizoguchi [39] pointed out, the SES 1971/73 employed a regional rotation sys-

tem in which different regions were surveyed in different years. Therefore, the survey must be adjusted to estimate the distribution of income of the whole kingdom at a specific point of time. Wattanavitukul did this by deflating the household income by the regional price indices. Her result is that the Gini coefficient in 1971–73 was 0.499, 0.466, and 0.433 for the whole kingdom, the rural areas, and the urban areas, respectively.[3] But as mentioned in Kerdpibule's case, it seems improbable that income inequality in the rural areas could have been higher than that in the urban ones, and this implies that the adjustment is still not sufficient to draw any reliable conclusions. For this reason, we will not use the SES 1971/73 in the following analysis.

Meesook [37] analyzed HES 1962/63 and SES 1968/69 and SES 1975/76 and concluded " that economic growth has been accompanied by a reduction in regional and urban-rural disparities in household incomes and in the proportion of the poor population in the total. Moreover, to the extent that the reduction in disparities originates from direct improvement in the agricultural sector, then we have not witnessed any trade-off between economic growth and equity " (Meesook [37], p. 70). This conclusion is drawn by comparing the mean income between regions and areas without showing the level of income inequality for the whole kingdom and within regions and areas by such inequality indices as the Gini coefficient. Thus the question as to whether income inequality for the whole kingdom increased or decreased was left unanswered.

Krongkaew [29] tried to answer this question by estimating the total inequality, both between and within regions. He used the SES 1975/76 and SES 1981 and estimated the Gini coefficients as being 0.451 and 0.473 in 1975 and 1981, respectively. These values are higher than the 0.414 for 1962 and 0.429 for 1969, which are cited from Meesook [36] and Wattanavitukul [68], and he concludes that " income distribution in Thailand had become more unequal as the country continued on its economic growth path " (Krongkaew [29], p. 331). The problem of his methodology is that while he uses the distribution of total *individual* income to calculate the Gini coefficients for 1975 and 1981, the Gini coefficients for 1962 and 1969, which he cites for comparison, are calculated from the distribution of total *household* income, not individual income. It seems, therefore, that the comparison between these two groups of estimates is incorrect and that his conclusion needs further elaboration.

Ikemoto and Limskul [21] focused on income distribution and regional income disparities in Thailand. They used the distribution of household, not of individual, income. Their results showed that from HES 1962/63 to

1981 income inequality increased except for the period between 1969 and 1975 when it decreased slightly. Though it is widely believed that income inequality has been increasing steadily since the 1960s, their conclusions show that at least in the first half of the 1970s income inequality decreased. We will investigate some of the factors of this equalization of income distribution later in this and the next chapters.

Hutaserani and Jitsuchon [15] examined income distribution from 1976 to 1986. They used a different concept of income, that is, the distribution of population by per capita household income. Perhaps this may be the reason they did not take up the period before 1975 for which only the data of household income is available. The Gini coefficient of the distribution of the population by per capita household income tends to be bigger than that of the distribution of households by household income in the Thai case.[4] Their estimate of the Gini coefficient is always higher than that of Ikemoto and Limskul [21] (see Table 2–1). Therefore, if their results were compared with those of before 1975 mistakenly, it would exaggerate the worsening of income distribution. The very high Gini coefficient of 0.5 in 1986 gives the impression that income inequality in Thailand is as high as that of Malaysia and the Philippines, which belong to the group of countries which have the highest income inequality in the world. But this comparison is not correct because of the different concept of income. The Gini coefficient of the distribution of household by household income in that year is 0.47 as shown in Table 2–1 for Ikemoto and Limskul [21] which is still lower than that of the group of highest income inequality. In spite of these differences, the increasing tendency of income inequality between 1975 and 1986 is shown in both the two studies.

Changes in Income Distribution for the Whole Kingdom

Now we will examine the past changes in the distribution of income in Thailand as a whole. Income inequality at the rural-urban and regional levels will be dealt with in later chapters.

There are many indices that can be used to measure income inequality, such as the Gini coefficient, the Theil index, variance of income logarithm, Atkinson's measure, etc.[5] As is well known, the ordering of income distribution by these indices may differ from each other. For example, it sometimes happens that the Gini coefficient indicates a decrease in income inequality while the Theil index indicates an increase in income inequality for a change in income distribution. This is due to the characteristics of the welfare function behind these indices. Some measures may give a

larger weight to the lower income class while others may give a larger weight to the higher income class. We cannot determine which index is the best a priori. Therefore, it is desirable to compare some of these indices.

Among these indices the most popular one is the Gini coefficient because it is easily understood and calculated by utilizing the Lorenz curve. But even for this single index there are many ways to estimate which will cause differences to the coefficient. Usually the data of income distribution is given by a fixed interval of income; we can estimate the Gini coefficient directly from this data, which will be called the direct method. But it has a weak point in that the interval can be chosen arbitrarily, which will bring about a different value of inequality. An illustration of this point is the case in which there is an increase in income for all households at the same rate as inflation, which means that no real change has occurred in income distribution. Even in this case, if the income interval is fixed in nominal terms, some households will move to a higher bracket and the resultant Gini coefficient would differ from that before inflation. To eliminate this possibility we will use the decile data and Kakwani's continuous method.[6] Unfortunately, the data which is necessary for Kakwani's method is not available for 1962; therefore, we will mainly use the decile method first and then use Kakwani's method only for comparison. The Theil index and variance of income logarithm are also calculated by the decile data and are presented for comparison.

Table 2-2 is a summury of these indices for the whole kingdom. The Gini coefficient of the decile method increased from 0.412 in 1962 to 0.426 in 1969 but decreased to 0.417 in 1976 and again increased more rapidly to 0.441 in 1981 and then to 0.471 in 1986. This means that the distribution of income became slightly more unequal from 1962 to 1969 and then equalized a little in 1975. But this equalization was short lived, and the distribution of income becomes steadily more unequal until 1986 (the last year

Table 2-2
Income Inequality for the Whole Kingdom

	1962	1969	1975	1981	1986
Gini coefficient					
1. Decile method	0.4128	0.4263	0.4174	0.4410	0.4712
2. Kakwani's method	—	0.4342	0.4306	0.4516	0.4880
Theil index	0.3082	0.3110	0.2976	0.3345	0.3970
Varlog	0.4801	0.6454	0.6639	0.7445	0.8053

Source: From 1962 to 1981 Ikemoto and Limskul [21], and for 1986 the author's estimate from NSO [65].

of our data). The Gini coefficient estimated by Kakwani's method is consistently higher than that of the decile method. This may be due to a downward bias of the decile method because the decile method ignores the inequality within each decile. Though the values of these two methods may differ, the trend is the same, that is, income inequality increases each year except for that of 1975.

Now we compare these results with the Theil index and varlog. The Theil index in Table 2–2 shows the same trend as the Gini coefficient, but the varlog changes in a somewhat different manner. The difference is that the varlog does not indicate a decrease in income inequality in 1975 contrary to all other indices. The verlog increased between 1969 and 1975 only slightly by 0.02 points. According to the varlog there was no decrease in income inequality for the whole period between 1962 and 1986. Even though the varlog has the convenient characteristic of decomposability into between- and within-group components, it also has a shortcoming. The shortcoming is that it does not satisfy Pigou-Dalton's transfer principle,[7] and it would be better to draw conclusions relying more on other indices. Thus it can be concluded that income inequality increased from 1962 to 1986 except for the year 1975.

Now we will briefly touch on the macroeconomic situation of the Thai economy relating to the changes in income inequality. The period between 1962 and 1969 was one of an easy phase of import-substitution industrialization. The industrialization of this period was carried out by the private sector, and the government protected this sector by providing investement incentives and tariff protection. The result of this protection was high capital intensity. Under the government's protection the capital stock increased at a much higher rate than GDP (Figure 2–1), and as a result the capital output ratio increased rapidly in the 1960s (Figure 2–2). This type of industrialization has been often accused of making the income distribution of developing countries more unequal because of low employment creation and high profitability of capital. This accusation seems to be true for Thailand too.

But in the first half of the 1970s the situation was reversed as the inequality indices decreased. In this period various events happened which were favorable to both the agricultural sector and labor and unfavorable to capital. The commodity boom in the early 1970s increased the income level of the agricultural sector, and during the democratic period between 1973 and 1976 various policies were adopted to develop the rural areas and raise the living standard of rural people. The minimum wage rate was also adopted in this period to increase labor income. In these circumstances, investment was stagnant and the share of property income de-

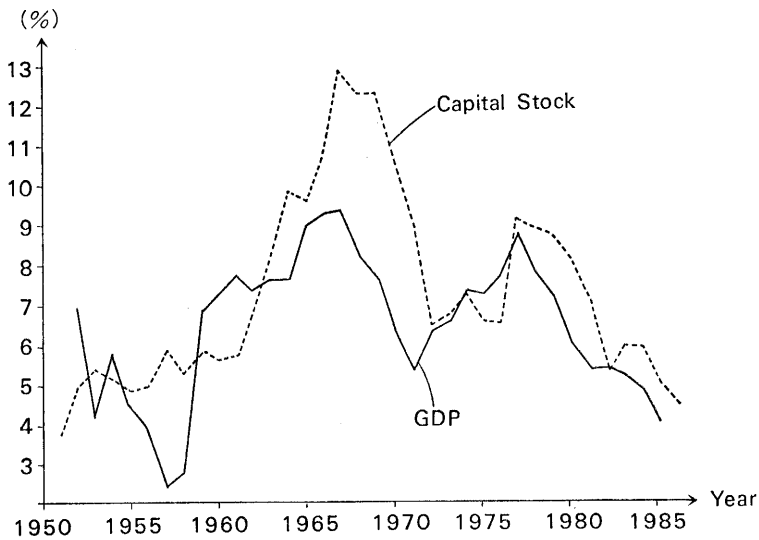

Figure 2–1
Growth Rates of GDP and Capital Stock
Source: Ikemoto [20], Figure 15.
Notes: Growth rate of GDP is calculated from a three-year moving average, and that of capital stock is calculated from original data.

creased.[8] All these factors affected income distribution so as to reduce the rural-urban gap.

After 1976, however, income distribution became worse, especially after 1981. As the analysis of trade cycle in the previous chapter showed, this period corresponds to a downward phase of the medium-term trade cycle. In this period, commodity prices went down relatively to the overall price level, and this affected the rural sector negatively and increased the rural-urban gap. This period is also characterized by a conservative economic policy introduced to remedy those structural imbalances caused by the government expenditure policy in the latter half of the 1970s. Under the structural adjustment policy or conservative economic policy, government expenditure was reduced, including expenditure for the Rural Job Creation Projects, which affected the lower income class in the rural area. In some developing countries it is often argued that this kind of conservative policy, or the structural adjustment policy proposed by the IMF and the World Bank, makes the problem of income distribution and poverty more serious, and therefore adjustment suffers a setback. But in Thailand the relatively equitable distribution of income as an initial condition made the adjustment endurable even in the middle of the 1980s, when Thailand

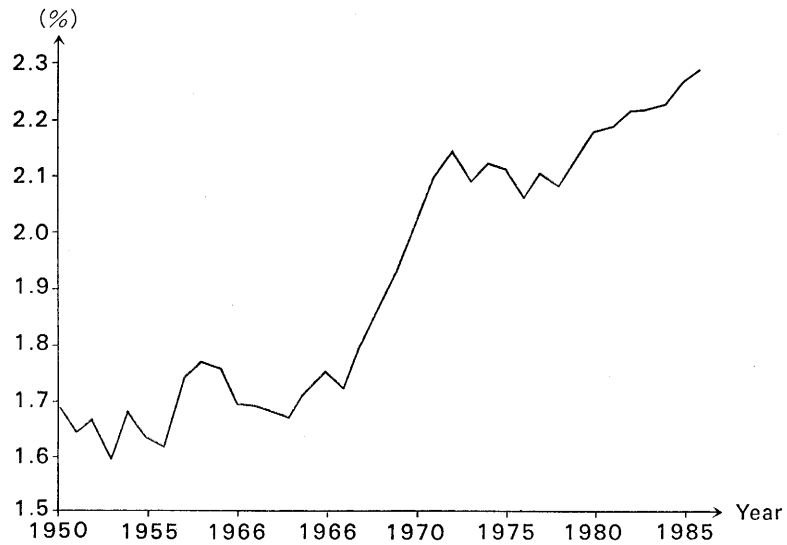

Figure 2–2
Capital-Output Ratio
Source: Ikemoto [20], Figure 16.

Table 2–3
Income Share by Household Group for the Whole Kingdom (%)

Household Group	1962	1969	1975	1981	1986
Lowest 40 per cent	16.6	15.2	15.0	13.8	13.0
40–60 per cent	12.1	14.3	14.8	14.2	13.2
60–80 per cent	21.5	20.4	21.8	21.5	20.0
80–90 per cent	15.5	15.3	16.1	16.3	15.4
Top 10 per cent	34.3	34.8	32.2	34.1	38.4

Source: From 1962 to 1981 Ikemoto and Limskul [21], and for 1986 the author's estimate from NSO [65].

went into a new era of booming exports and investments due to the global adjustment that occurred after 1985.

Inequality indices are convenient to indicate the level of inequality but do not show what kind of changes happened to the income share of each income group. The income share by household group gives us some explanation of the change in income inequality. Table 2–3 shows the income share by household group classified by household income level. This is also depicted in Figure 2–3. In 1962 the lowest (or poorest) 40 per cent of households received only 16.6 per cent of the total income. And their income share gradually decreased further to 13.0 per cent in

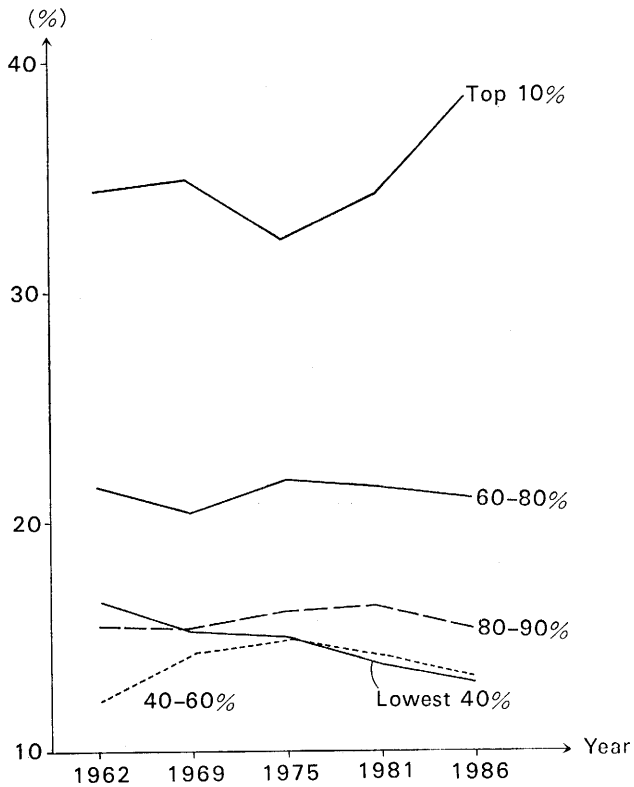

Figure 2–3
Income Share by Household for the Whole Kingdom
Source: Table 2–3.

1986. Even in 1975, when income inequality was mitigated, their income share decreased by 0.2 per cent. On the other hand, the income share of the top (or richest) 10 per cent of households reflects the changes in income inequality very well, which decreased in 1975 and then increased rapidly until 1986. In 1986, when income inequality was the highest, the income share of the top 10 per cent was 38.4 per cent, which is three times as high as that of the lowest 40 per cent. In terms of average household income, the top 10 per cent receives twelve times as much as that of the lowest 40 per cent. This ratio is much larger if compared with the lowest 10 per cent: the average household income of the top 10 per cent is more than thirty times of that of the lowest 10 per cent.

As mentioned above, the change in the income share of the top 10 per cent (or top decile) is consistent with the change in income inequality. When income inequality increases the income share of the top 10 per cent

also increases, and when income inequality decreases their income share decreases. On the other hand, the income share of the 60–80 per cent level changes in the opposite direction to that of the top 10 per cent. Even the remaining household groups' income shares change in the opposite direction to that of the top 10 per cent, except for a few cases such as that of the lowest 40 per cent in 1975. This means that the trend of income inequality is mainly determined by the change in the income share of the top 10 per cent.

Kuznets Hypothesis

Studies on the relationship between income distribution and economic development began in the 1940s with the work of Colin Clark [10], which was then followed by Simon Kuznets [32] in the 1950s. They showed that income inequality increases up to a certain level in economic development but thereafter decreases as the economy develops. This relationship is well known as the Kuznets hypothesis. If we draw this relationship on a graph with an indicator of economic development (for example, GNP per capita) on the horizontal axis and an index of income inequality (for example, the Gini coefficient) on the vertical axis, then the curve looks like an inverted U-shape. Figure 2–4, which is borrowed from Paukert [46],

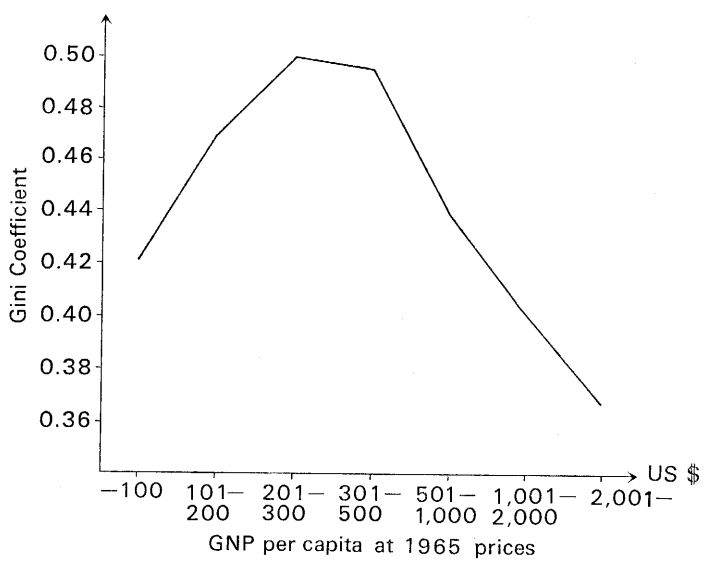

Figure 2–4
Kuznets Inverted U-shaped Curve
Source: Paukert [46], Diagram 1.

shows this relationship. This figure shows that the average of the Gini coefficient is around 0.42 for those countries whose GNP per capita is less than US$100 at 1965 constant prices and increases to around 0.50 for those whose GNP per capita is between US$201 and 300 and then decreases to around 0.36 for those whose GNP per capita is more than US$2001. Thus the curve shows an inverted U-shape. Due to this shape, the Kuznets hypothesis is called Kuznets inverted U-shaped curve. And the inverted U-shaped curve is often called Kuznets curve.

But it took more than ten years since Kuznets published his paper in 1955 before this hypothesis drew much attention. In the latter half of the 1960s the problem of income distribution became very serious in developing countries because of the industrialization policies in the 1960s. In the 1960s, which was defined as the first Development Decade by the United Nations, many developing countries adopted import-substituting industrialization policies. But within the decade the problems of this policy became clear. Those industries established in this period were highly capital intensive and did not create job opportunities sufficiently for the people. The benefits of the industrialization were limited to a small group of people, and the majority were left completely untouched by development. The high growth rate of population made this situation worse by deteriorating their living conditions. Toward the end of the 1960s it was often argued that income distribution in developing countries became worse. And, in these circumstances, studies on income distribution in developing countries started. Many studies were conducted in order to examine the relationship between income inequality and economic development and people began to pay attention to the Kuznets inverted U-shaped curve hypothesis. Most of these studies such as Paukert [46] confirmed the relationship.[9]

These results lead to the next question, which concerns the implication of this hypothesis. The hypothesis seems to imply that income inequalization is inevitable in the early stage of economic development but that after a certain level of development it will decrease automatically. Based on this interpretation, its policy implication is to raise the economic growth rate as high as the economy can sustain so that the economy goes through the phase of income inequalization as quickly as possible to reach the stage of income equalization. But this interpretation seems to be too simple. That is, this interpretation assumes that every country follows the unique path of the Kuznets curve. But, as shown below, this path differs even within the small group of Asian countries, and this assumption seems to be unrealistic.

Counterevidence to this hypothesis was given by case studies of Taiwan

and Korea.[10] These countries adopted industrialization policies that reflected their comparative advantages, and promoted labor-intensive industries. These industries grew fast and absorbed a large number of laborers. Because of the labor-intensive nature of these industries, high economic growth could be achieved without making income distribution worse. Based on this finding some scholars argue that labor-intensive industrialization is the policy needed to avoid the phase of income inequalization of the Kuznets curve. But a different interpretation is possible, that is, that these economies were already in the latter phase of the Kuznets curve. In the Japanese case the turning point of income inequality on the Kuznets curve corresponds to the turning point of the labor market. When surplus labor disappeared in 1962, income inequality began to decrease.[11] In Taiwan the turning point of the labor market was 1968, and from that year income inequality began to decrease.[12] These findings suggest that the situation of the labor market is one of the key factors which determines income inequality. If this is true, the Taiwanese case is not a case which avoided the Kuznets hypothesis but a case which reached the turning point of the Kuznets curve at an earlier stage of economic development due to labor-intensive industrialization. The results of international comparison below suggest that the shape of the Kuznets curve differs according to the economic and social conditions of the economy.

Comparison of Income Inequality between Asian Countries

Though studies on income distribution in East and Southeast Asia at one stage started to lag far behind those in other regions, enough data for income distribution has now been accumulated to make an international comparison between the Asian countries. For this comparison we will use the data of eight countries in East and Southeast Asia: Japan, Korea, Taiwan, Thailand, Malaysia, the Philippines, Singapore, and Indonesia. Gini coefficients and GDP per capita are shown in Table 2–4. These data are also shown in Figure 2–5 where the horizontal axis is the logarithm of GDP per capita converted into US dollars by the exchange rate.

Here it would be worthwhile to remind ourselves of the difficulties of any international comparison. Even within a country, comparison of income inequality over time is very difficult because two different surveys of income distribution may not be comparable due to differences in a survey method, the definition of concepts, etc. International comparison is also subject to these difficulties. Furthermore, in order to draw the Kuznets curve for several countries it is necessary to convert the domestic currencies to a common currency. The problem is what kind of rate we

Table 2-4
Gini Coefficient and GDP Per Capita

	Japan		Korea		Taiwan		Thailand	
	Gini	PCY	Gini	PCY	Gini	PCY	Gini	PCY
1956	0.313	307						
1957								
1958								
1959	0.357	405						
1960								
1961								
1962	0.382	551					0.413	4,331
1963	0.357	618						
1964	0.358	677			0.360	17.9		
1965	0.348	706	0.343	115				
1966					0.358	20.1		
1967	0.351	878	0.396	132				
1968	0.349	953	0.425	145	0.362	23.0		
1969	0.357	1,096	0.425	163			0.426	6,133
1970	0.355	1,185	0.355	174	0.321	26.1		
1971	0.369	1,182	0.365	187				
1972	0.334	1,271			0.318	31.7		
1973	0.325	1,334						
1974					0.319	34.4		
1975							0.417	7,214
1976					0.307	40.2		
1977								
1978					0.306	48.5		
1979								
1980					0.303	54.3		
1981							0.437	9,530
1986							0.471	11,080

Source: Mizoguchi [39], Ikemoto [17], Terasaki [54], Rao and Ramakrishnan [48], Sigit [51].
Note: PCY stands for GDP per capita at 1975 constant prices.
Unit of PCY is as follows:

should use for the conversion. The exchange rate is often used as the conversion factor. But the exchange rate is often distorted by governments as a part of industrialization policy and does not necessarily reflect the real level of output. Nevertheless, we used the exchange rate below because there is no other conversion factor which covers all the eight countries. For an international comparison, purchasing power parity (PPP)

Malaysia		Philippines		Singapore		Indonesia	
Gini	PCY	Gini	PCY	Gini	PCY	Gini	PCY
0.449	1,130	0.48					
		0.49	1,775				
		0.49	1,908				
				0.498	2,672		
0.498	1,348						
0.505	1,477						
		0.43	2,183				
				0.443	5,038		
0.498	1,736			0.457	5,515		
				0.434	5,789		
				0.448	5,944		
0.509	1,955					0.4919	103
						0.5211	110
						0.5039	115
0.493	2,242						

Japan .....1,000 yen
Korea .....1,000 won
Taiwan .....1,000 NT dollar
Thailand.....Baht

Malaysia .....Malaysian dollar
Philippines .....Peso
Singapore .....Singapore dollar
Indonesia .....1,000 rupiah

is superior to the exchange rate. Therefore, we also use it though its coverage is smaller.

At a first glance, Figure 2–5 does not seem to show any single Kuznets U-shaped curve covering all the countries. For example, Indonesia and the Philippines both indicate high income inequality though their income level is low, and Taiwan's curve is far below Malaysia. Figure 2–5 rather

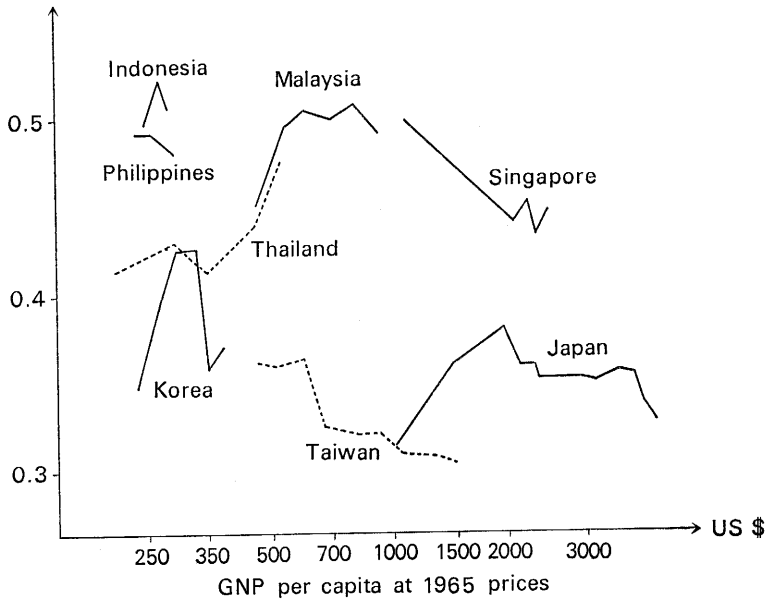

Figure 2–5
Kuznets Curve for Selected Asian Countries
Source: Table 2–4.

shows that these countries can be divided into two groups according to the level of income inequality. A group of low-income inequality consists of Japan, Taiwan, and Korea, which are all East Asian countries. Another group of high-income inequality consists of Indonesia, the Philippines, Malaysia, Singapore, and Thailand, which are all ASEAN countries. Among the ASEAN countries, Thailand shows a relatively lower inequality until 1981. In their 1987 paper Ikemoto and Limskul [21] state that " the comparative study of the 1970s done by Oshima still holds true. The level of income inequality in Thailand was higher than in East Asian countries where Gini coefficients range from 0.3 to 0.4. But Thailand showed lower income inequality compared to other Southeast Asian countries where Gini coefficients were about 0.5 " (Ikemoto and Limskul [21], p. 259). But in 1986 the level of inequality in Thailand increased and was higher than that of Malaysia in 1957 and that of Singapore after 1972. Figure 2–5 suggests that the curve for Thailand will follow the path of Malaysia which will also follow that of Singapore. If we can make the assumption that these three neighboring countries are all following the same Kuznets curve, then the income inequality of Thailand will increase to the level of 0.5. But this assumption seems to be unrealistic because these three coun-

tries have different economic and social characteristics. We have to wait for the turning point of the Kuznets curve of Thailand to draw any conclusions concerning a common Kuznets path for the three countries. Until then the hypothesis that income inequality in Thailand is lower than that of other ASEAN countries can not be rejected.

In Figure 2–5 there are two other case that suggest the existence of a common Kuznets curve shared by some countries. These countries are Korea and Taiwan. It seems that Korea is following the Taiwanese path. But we must refrain from deriving too much from such figures because the socio-economic conditions of these economies are different. What we can do at this stage is only to indicate the possibility of the existence of a common Kuznets path for each group of countries.

A more realistic way to convert the currency is to use PPP. Kravis, Heston, and Summers [28] estimated the PPP for some of the East and Southeast Asian countries. The converted unit is called an ICP dollar. ICP is the acronym for the United Nations' International Comparison Project. The horizontal axis of Figure 2–6 is expressed in terms of this ICP dollar. The difference between Figure 2–5 and 2–6 is that the curves

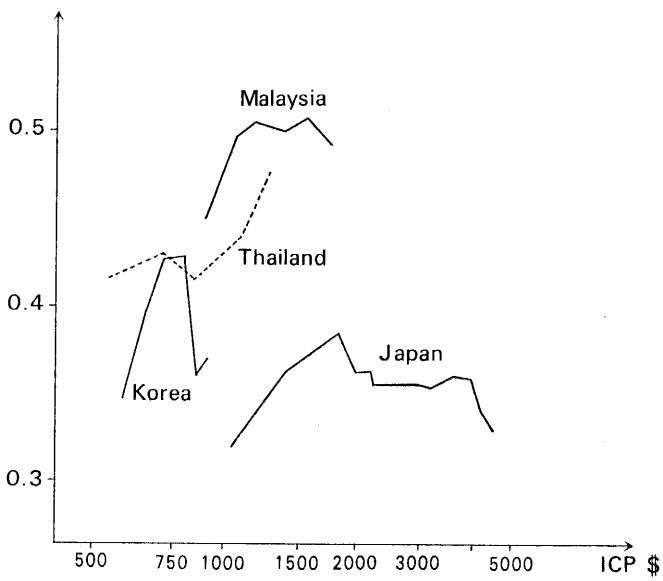

Figure 2–6
The Kuznets Curve for Purchasing Power Parity of Selected Asian Countries
Source: Table 2–4 and Kravis, Heston, and Summers [28] for PPP.

of Korea, Thailand, and Malaysia shift to the right if PPP is used. This is because the exchange rate undervalues the GDP of developing countries and therefore exaggerates the gap in per capita GDP between Japan and other Asian countries. In Figure 2–6 this means that the curves lie in a narrower range of GDP per capita. In this case, the Kuznets curve is not discernible either. The curve of Malaysia lies above that of Japan. This implies that the level of income inequality is determined not only by the level of real output per capita but also by other factors.

The Kuznets Hypothesis in Asia

Since the 1970s many econometric studies have been conducted to locate the Kuznets inverted U-shaped curve. Most of these used cross-section data, that is, one sample from a single country. But there are some problems connected with this methodology. As Mizoguchi and Terasaki [40] pointed out, even though the Kuznets curve really exists, we may not delineate the curve clearly because of the socio-economic and statistical differences between the various countries. To overcome this difficulty, they proposed the use of pooled sample data, that is, several samples from each country. Following them we will examine the Kuznets hypothesis using pooled data presented in Table 2–4.

Before estimating the Kuznets curve with pooled samples we will estimate the curve for each country even though the sample size is very small. The equation for regression is as follows:

$$\text{Gini} = c + a\,\text{PCY} + b\,(\text{PCY})^2$$

where Gini is the Gini coefficient, PCY is GDP per capita, a and b are coefficients to be estimated, and c is a constant. The Kuznets inverted U-shaped curve is established when a is positive and b is negative. We chose this equation according to Ahluwaria [3] even though there are many other forms which approximate the inverted U-shaped curve.[13] Ahluwaria used the logarithm of GNP per capita as an independent variable. We also tried the logarithm of GDP per capita but the results were not very good. Ahluwaria also used other independent variables such as the share of agriculture in GDP and employment, literacy rate, the share of urban population, the population growth rate, etc. We also tried these variables in the regression, but the agricultural share in GDP proved to be the only significant one.

The result is shown in Table 2–5.[14] Thailand is excluded from this table because the sign of coefficients does not satisfy the condition of the inverted U-shape. For Japan, Korea, and Malaysia the coefficients, a and

Table 2-5
Estimates of the Kuznets Curve by Country

	Independent Variable				R^2 (F-value)	Turning Point (US$)
	c	a	b	Agr		
Japan	0.2817***	0.0586**	−0.0105**	—	0.2640	2,790.5
	(9.095)	(2.428)	(−2.499)		(3.153)*	
Korea	−0.8313	7.9925*	−12.785*	—	0.5210	312.5
	(−1.854)	(2.726)	(−2.725)		(3.719)	
Malaysia	0.1264	1.0198**	−0.6747*	—	0.7051	755.7
	(1.155)	(3.164)	(−2.957)		(6.977)	
Taiwan	−0.1629	0.3175	−0.0660	0.0159**	0.8872	2,405.3
	(−0.506)	(0.754)	(−0.384)	(2.702)	(29.854)***	

Source: Ikemoto [19] Table 2, p. 59.
Note: Figures in parentheses indicate the t-value.
*, **, and *** indicate significant levels at 10 per cent, 5 per cent, and 1 per cent, respectively.
Agr stands for the share of agriculture in GDP.

b, are significant at the 5 or 10 per cent level. For Taiwan the coefficients are not significant. Turning Point in Table 2–5 shows the amount of GDP per capita at which income inequality reaches the highest point calculated from the estimated coefficients. For Japan, Korea, and Malaysia the turning points roughly correspond to the highest points of the curves in Figure 2–5. But for Taiwan, the turning point in Table 2–5 is far higher than that indicated in Figure 2–5. This is because the regression equation for Taiwan includes the share of agriculture in GDP as an independent variable. The effect of the decreasing agricultural share is to reduce income inequality. From the results of Table 2–5, we can say that one percentage point decrease in the agricultural share will reduce the Gini coefficient by 0.015. Therefore, the decrease in the agricultural share brought about a decrease in the Gini coefficient even before the Turning Point. Even though the decrease in the agricultural share "explains" the decrease in income inequality, this does not necessarily mean that the agricultural share should be decreased in order to reduce income inequality. For example, in Thailand the agricultural share decreased rapidly in these few decades but income inequality did not decrease. The difference between these two economies is the structure of employment. In Thailand more than 60 per cent of the labor force still remains in the agricultural sector, while in Taiwan the labor surplus was absorbed by the non-agricultural sector. Labor shortage was a factor in the reduction of income inequality in Taiwan, and the agricultural share in GDP reflects this change.

The next step is to estimate the inverted U-shaped curve with the pooled

Table 2–6
Estimates of the Kuznets Curve by Pooled Data: Exchange Rate

	Independent Variable					R^2 (F-value)	Turning Point (US$)
	c	a	b	Agr	Dummy		
1.	0.0789	0.1173***	−0.0173**	0.0100***	—	0.5319	3,390.2
	(1.160)	(2.828)	(−2.303)	(5.479)		(16.152)***	
2.	0.1890***	0.0945**	−0.0136**	0.0078***	−0.0610***	0.6546	3,474.3
	(2.892)	(2.616)	(−2.082)	(4.681)	(−3.761)	(19.955)***	

Source: Ikemoto [19] Table 3, p. 60.
Note: Figures in parentheses indicate the t-value, *, **, and *** indicate significant levels at 10 per cent, 5 per cent, and 1 per cent, respectively.
Dummy indicates a dummy variable for East Asian countries. For Japan, Korea, and Taiwan it is one and for other countries it is zero.

sample data. Though the exchange rate may be distorted as a part of development policy, and the GDP per capita converted by exchange rates may not represent the real level of income, we used it as a first step. As can be seen from Figure 2–5, this case does not show the inverted U-shaped curve. Therefore, we added the share of agriculture in GDP as an independent variable. Furthermore, we use a dummy variable for East Asian countries, namely, Japan, Korea, and Taiwan. The result is shown in Table 2–6. The coefficients, a and b, are significant at the 1 or 5 per cent level, and their signs are consistent with the Kuznets hypothesis in the limited sense that the effect of agricultural share is excluded. The coefficient of the agricultural share is significant at the 1 per cent level and positive, which means that as the share of agriculture decreases income inequality also decreases. The dummy for East Asian countries is also significant at the 1 per cent level. The negative coefficient for this dummy means that income inequality in East Asian countries is lower than in Southeast Asian countries, other conditions being equal. The turning point is about US$3,400, higher than the Japanese case in Table 2–5. As mentioned earlier regarding Taiwan, this is because the share of agriculture in GDP is included as an independent variable. If the effect of the decreasing share of agriculture is taken into account, the actual turning point would be at a much lower level of per capita GDP.

Now we turn to the case where the currency is converted into PPP. The results of this regression analysis are shown in Table 2–7. When the independent variable is GDP per capita, the result does not improve so much. But when the independent variable is the logarithm of GDP per capita, the result improves very much in terms of the t-value and the adjusted R-squared. But the implication is the same. After eliminating

Table 2-7
The Estimates of Kuznets Curve by Pooled Data: Purchasing Power Parity

	Independent Variable					R^2 (F-value)	Turning Point (ICP$)
	c	a	b	Agr	Dummy		
Independent Variable=PCY							
1.	0.0379	0.1847***	−0.0260***	0.0102***		0.5275	3,551.9
	(−0.361)	(3.777)	(−3.675)	(4.466)		(11.418)***	
2.	0.2584**	0.0892**	−0.0134)**	0.0042*	−0.0765***	0.7331	3,328.4
	(2.517)	(2.102)	(−2.220)	(1.902)	(4.501)	(20.227)***	
Independent Variable=logarithm of PCY							
3.	0.0998*	0.2107***	−0.0704***	0.0115***	—	0.7061	4,465.8
	(1.969)	(6.123)	(−4.349)	(6.414)		(23.428)***	
4.	0.2661***	0.1288***	−0.0478***	0.0065***	−0.0558***	0.7855	3,846.9
	(3.935)	(3.306)	(−3.085)	(2.980)	(3.202)	(26.639)***	

Source: Ikemoto [19] Table 4, p. 61.
Note: Figures in parentheses indicate the t-value, *, **, and *** indicate significant levels at 10 per cent, 5 per cent, and 1 per cent, respectively.

the effect of the agricultural share in GDP we find the inverted U-shaped curve. The effect of a decreasing agricultural share is to decrease income inequality. The actual path of income inequality in the course of economic growth is affected by both the income level and the agricultural share. If the effect of the agricultural share dominates all other effects, then the inverted U-shaped will disappear, that is, there will be no increase in income inequality even at the early stage of economic development, contrary to the Kuznets hypothesis. Therefore, our results support the Kuznets U-shaped curve hypothesis only in a limited sense.