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Economic Development and Income Inequality: The Taiwan Case

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ABSTRACT

An abstract of the thesis of Ju-kuang Chang for the Master of Arts in Sociology presented August 2, 1995.

Title: Economic Development and Income Inequality: The Taiwan Case

This thesis examines income inequality in Taiwan from three perspectives: economic development, political democracy, and world-system/dependence. Education, population growth, population structure, unemployment, savings, and export growth are treated as variables. Below are the important conclusions.

Economic development has an effect on income inequality. The level of development is crucial. In the 1950s and 1960s, the relationship was significant, but in the next two decades economic development did not further decrease income inequality. Sector dualism was not a good predictor.

Democratization did not have an obvious relation with income inequality. But the stable political environment and the endeavors of government to keep the society stable were crucial to economic development and improvement in income inequality.

Foreign capital and export dependence did not retard economic development and worsen income inequality. But the influence of foreign capital did not contradict the world-system/dependence argument.

Expansion of education had a negative relation with income inequality. The most important thing was the expansion of primary school education and junior high school education.

The predicted relation between population growth and population structure and income inequality was not totally supported.

Export expansion and savings expansion had an important influence on economic development and, like the relation between the economic development and income inequality, the relation between the expansion of exports and savings and income inequality was stronger in the 1960s than in the 1950s.

Unemployment had almost the same change pattern as income inequality. This implies that employment had a negative relation with income inequality and, after 1970, the low unemployment helped keep inequality at a low level in the 1970s and 1980s.

In the late 1980s and early 1990s income inequality increased slightly as radical changes in economic structure, political environment, and other social factors transformed Taiwan. Other developed countries also show an increase in income inequality associated with similar changes. Thus income inequality in Taiwan is predicted to increase further.

ECONOMIC DEVELOPMENT AND INCOME INEQUALITY:

THE TAIWAN CASE

by

JU-KUANG CHANG

A thesis submitted in partial fulfillment of the requirement
for the degree of

MASTER OF ARTS
in
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CHAPTER I

RELEVANT STUDIES AND RESEARCH PURPOSE

Despite years of speculation and research, scholars still disagree on the causes of variation in income inequality in a society. In this study three theoretical perspectives (economic, political-democratic, and world-system) used to explain income inequality and the influence of some other social factors on income inequality are examined.

Economic Development Perspective

Economists argue that a nation's income inequality stems from the dynamics of distribution. In the economic model, inequality increases in the early stages of economic growth, reaches a peak, and then declines (Kuznets, 1963). During the first stage of economic growth, wealthier classes accumulate savings faster than poorer classes and display a greater marginal propensity to save, and urbanization produces spatial inequality. In the second stage, income inequality declines because (1) of the expanding demand for industrial labor force; (2) the wealthier classes tend toward fiscal conservatism and invest less in new high-risk investments while the less wealthy, often with more liquid capital, invest in new and expanding "boom" industries with greater rewards; and (3) given that the marginal utility of income is the inverse of income level, the poor have a greater incentive to work, save, and invest (Simpson, 1990; Isaacs, 1981; Kuznets, 1963, 1976; Paukert t, 1973). The size of the agricultural sector of the economy may have a direct

impact on income inequality. The more agrarian the nation, the greater the gulf between rural and urban incomes (Bollen and Jackman, 1985).

Cutright (1967), using data for 44 non-communist nations and eight communist states, found that the transition of the labor force from the agricultural sector to the nonagricultural sector has an effect on income inequality. Kuznets (1955) argued that (1) high inequality was associated with low income per capita, (2) savings had an effect on income inequality, and (3) sector shift had an effect on inequality. Bollen and Jackman (1985), using data for 60 countries, found that economic development had a significant, negative effect on income inequality. Lindert and Williamson (1985) presented comparable longitudinal data over several decades for a set of European countries that showed the strikingly parallel decline of income inequality in these countries over the course of their continued development. Simpson (1990), using data for 62 countries, found that economic development did not have an effect on income inequality. Nielsen (1994), using data for 56 countries, found the labor force shift from agriculture to nonagriculture and the shift in economic activity from agriculture to industry had an negative effect on income inequality.

Political Democracy Perspective

Lenski (1966) stressed the impact of the nation's political system on income inequality. He argued that while a society's technological base influenced economic inequality through its impact on the political system and the balance of power within a

society, the economic system had no direct effect on income inequality. Historically, property inequality was greatest in advanced agrarian societies and the appearance of mature industrial societies had marked the first significant reversal in the age-old evolutionary trend toward ever increasing inequality. But it is neither the technology nor the wealth of industrial nations that reduces inequality. In industrial societies a high portion of the adults vote and may organize politically to advance their interests or beliefs, even when these are in opposition to the interests or beliefs of those in power. When advanced industrial societies elevate the middle class and working class politically and educationally, the many can combine against the few. Even though individually the many are weaker, in combination, they may be as strong or stronger. With further expansion of the political base, government is no longer for the benefit of the few and radical changes in the distribution of services and goods are possible.

Most studies of this question have examined the fit of a linear relationship between political democracy and income inequality and have found contradictory results. Muller (1988), using data for 55 countries, found that democratization reduced income inequality in a society. Cutright (1967), using data for 52 countries (forty-four non-communist nations and eight communist states), found a negative relationship between democratization and inequality. Simpson (1990) using two sets of data, sixty-two nations of Muller's data set and sixty-one nations of Hoover's data set, found that political democracy had a significant direct impact on income inequality. Nielsen (1994), using data of fifty-six countries, found that political democracy had a negative effect on income inequality. Some other studies report a negative relationship between democratization and

inequality (Hewitt, 1977; Muller, 1985; Rubinson and Quinlan, 1977; Stack, 1979). Bollen and Jackman (1985), using data of sixty countries, found no evidence of direct effects of political democracy on income inequality. Some other studies also found no relationship between political democracy and inequality (Bollen and Grandjean, 1981, Jackman, 1974).

World-system/Dependence Perspective

World-system and dependence theorists link a nation's level of income inequality to its position in the world economic order (Bornschier, 1983; Chase-Dunn, 1975; Evans and Timberlake, 1980; Nolan, 1983; Snyder and Kick, 1979; Wallerstein, 1974, 1979). According to this view, nation states are embedded in a wider system of economic relationships consisting of the core, the periphery, and (in an intermediate position) the semi-periphery. Relationships between these three blocks of countries are asymmetrical and fundamentally exploitative, with the core benefiting at the expense of the other two blocks. Paralleling this is the emergence of new patterns of intranational stratification that increase distributional inequality in noncore countries. A nation on the economic periphery, being dependent on exports of commodities and with a high level of penetration of foreign capital by multinational corporations (MNCs), is divided into traditional and modern economic sectors. A small, relatively wealthy "modern" sector coexists with and exploits a large, poor, "traditional" sector. Foreign MNCs and a small group of indigenous elites exploit the power distribution within the nation and retard the

development of its infrastructure, except where it supports the MNC's interests. This, in turn, exacerbates social inequality within noncore countries. This dependency-inequality linkage has received a good deal of study. Most effort has centered on the dependency variant of the argument, employing continuous measures of trade dependence, the penetration of foreign capital, and the like. Some have claimed that the dependency-inequality relationship is relatively robust (Evans and Timberlake, 1980). Nolan (1983) found evidence for the world-system model after controlling for energy consumption. However, neither Weeds and Kummer (1985) nor Bollen and Jackman (1985) found a significant world-system effect in their analyses.

Other Relevant Studies

Sociologists stress the role of social factors, for example, education and population composition, that affect income inequality. Education may affect income inequality because it prepares students for the role of citizen and provides job skill. It also allocates individuals to social ranks, the elite or nonelite, and students tend to adopt the social qualities appropriate to the position their schools assign to them. Providing education to a select few and leaving the remainder of society unschooled divides a society into an elite that can function successfully in a modern society and those who are locked in a traditional mode. Early educational expansion thus increases income inequality, but further expansion of the educational system dilutes the value of education for the elite. John Stuart Mill (1848) predicted that the diffusion of education would lead to a decrease

in inequality. Nielsen (1994) and Simpson (1990) found that the spread of education had a negative effect on income inequality. On the other hand, demographic structure may amplify income inequality (Bollen and Jackman, 1985). In nations with high rates of population growth, different income groups grow at different rates. The poorest sectors have higher birth rates and grow quickly, resulting in a high proportion of the young concentrated in the lowest income groups (Ahluwalia, 1976). That is, high population growth generates inequality by expanding the proportion of the population in low-income groups. The problem is compounded by the fact that high growth typically involves high levels of fertility and decreases in mortality, resulting in a very young population age structure, especially among low-income groups. Younger populations located disproportionately within lower-income groups exacerbate inequality by lowering per capita productivity. The longer-term results may be even more severe, since the larger family size associated with younger populations further reduces the already small intergenerational transfer of income (Boulier, 1977). Thus, the relevance of population growth rates for inequality seems to depend primarily on the way population growth influencing the age structure of the population (Hargens and Felmlee, 1984). Bollen and Jackman (1985) found that the percentage of population under age 15 had a positive relation with income inequality. Nielsen (1994) found the demographic transition and natural rate of population increase had a positive effect on income inequality. Simpson (1990) found the percentage of population under age 15 had a significant effect on income inequality.

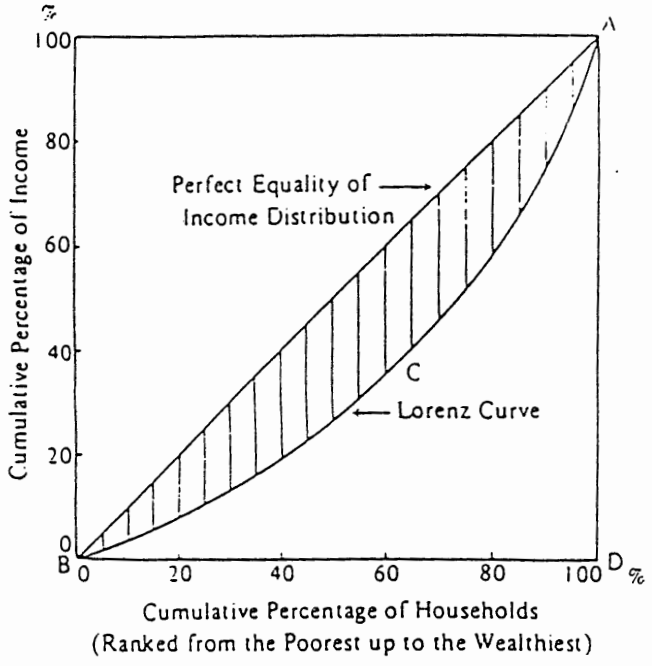
Research Purpose

Most of the analyses of income inequality in a society have followed a conventional strategy of relying on a cross section of a single calendar year, but such a cross section neglects longitudinal information. It assumes that the factors would affect inequality in 1990 in the same way as 1950. Therefore, it makes sense to pool, in the same data set, all available observations on income inequality (and corresponding independent variables), allowing multiple observations (in different years) for the same country (Nielsen, 1994). The necessity of the study of longitudinal data is also advocated by Gagliani (1987). Such a design allows the comparison of cross-sectional and longitudinal patterns of relationships (Firebaugh, 1980).

The research here has followed that advice. The data used in this study is for Taiwan from 1950 to 1990. The research purpose is to test the three perspectives used to explain income inequality in a society. The study also examines the factors thought by sociologists to affect income inequality, including education and demographic factors. In addition, the study examines three factors that are put forward as factors that reduce income inequality in Taiwan (Myers, 1990; Scitovsky, 1990). The three factors are employment, export-led growth, and savings. Myers (1990) cited a number of factors that contributed to reducing income inequality in Taiwan. The high rate of employment between 1965 and 1981 increased labor's share of income and narrowed the gap between the wages of skilled and unskilled labor. As incomes rise, both consumption and savings increase. These stimulate further economic growth and at the same time enhance

productivity and create job opportunities. Scitovsky (1990) argued that the high labor intensity of Taiwan's rapidly expanding exports accounted for the very low and continuously declining unemployment rates (a unique accomplishment among developing counties). It increases the earnings of labor and so improves the distribution of income. In Taiwan the statistics showed a shift of income from capital to labor among nonfarm households and a consequent reduction of inequalities in the overall distribution of income between 1964 and 1987. Taiwan's high interest rate policy is a standard remedy for inflation, but, totally unexpected, is another effect that follows the policy: the acceleration of capital accumulation and growth. Savings deposits accumulate very fast following the substantial raising of the interest paid on deposits. They may have increased people's proportion of income, and make more profitable the use of labor-intensive methods of production. Equitable income distribution favors the expansion of effective demand and tends to concentrate it on domestically produced goods. The increase in domestic demand for domestic goods in turn calls for domestic investment, which not only creates additional productive capacity and employment opportunities but also enhances the standard of living. In sum, monetary policy influences savings and the savings helps capital accumulation and at the same time increases employment and income. Export growth leads to economic development and enhances productivity. It also increases employment, income, and the standard of living.

FIGURE 2.1 GINI COEFFICIENT AND LORENZ CURVE.



Diagrammatically, a Lorenz Curve is derived by plotting the cumulative percentage of the households (ranked from the poorest up to the wealthiest), shown on the horizontal axis, against the cumulative percentage share of the total income they receive, shown on the vertical axis. The diagonal line (where Gini coefficient equals zero) represents the perfect equality of income distribution.
Source: Kuo, Shirley W. Y. et al.(1981), The Taiwan Success Story. (p. 86) Boulder, Co. Westview Press.

CHAPTER II

VARIABLES, HYPOTHESES, AND DATA

Variables and Definition

The study uses the income shared by the highest quintile and the Gini coefficient to measure income inequality, the dependent variable. These two are the variables most frequently used to measure inequality of the income distribution (Muller, 1988; Nielsen, 1994; Simpson, 1990). The larger the percentage of income that goes to the highest quintile, the greater the income inequality in a society. The Gini coefficient is also used as an indicator of income equality. The greater the coefficient, the less even the income distribution. As is shown in Figure 2.1 the Gini coefficient is the ratio of the area enclosed by the diagonal line and the Lorenz Curve to the area of the triangle, namely the shaded area ABC to the area of triangle ABD. Kolm (1976) argued that given any reasonable looking index of inequality it was always possible to find another one providing the opposite answer to the question that is normally addressed. Braun (1991) argued that the Gini ratio did have a few weaknesses as a measure of income inequality.

> This seemed inevitable with any figure that tried to show a complex process with one number. The Dow-Jones Industrial Average, although widely used and almost religiously followed, is only a composite of a few selected stocks among the many traded on the New York Stock Exchange. At times it has also been criticized for not being representative of activity on the exchange because of its makeup. Yet it continues to provide a useful function for analysts. So too, does the Gini ratio. This technique is the oldest and most reliable of income inequality measurements. It has now been in use for three quarters of a century. Its utility also depends greatly on how we wish to use the Gini ratio. In an

> analysis comparing Gini with seven different income inequality measurements, the choice of measure did not really matter in looking at the factors that we wish to pursue. Other studies show that the Gini ratio is an ideal way to measure income change within the middle class (Braun, 1991 :79).

Gagliani (1987) also supported the argument that the Gini coefficient is a preferable index of income inequality. In sum, the Gini coefficient is a good indicator of income inequality and is widely used.

In cross-national study, Hoover (1989) pointed to three problems in measurement of income inequality. The first is the inconsistency in calculating the Gini coefficient. For example, some countries use data of decile income distribution to calculate the Gini coefficients and some use data of quintile income distribution to calculate the Gini coefficients. The inconsistency will introduce unnecessary error into one's analysis. Secondly, the measurement of income is inconsistent in pre-tax income or post-tax income, and is inconsistent in individual's income and household's income. That is, some countries use data of pre-tax income to measure the inequality in income distribution, and some use data of post-tax income. Generally speaking, the post-tax income distribution is more equal than pre-tax income distribution. The other inconsistency is that some countries use individual income to measure the inequality in income distribution, and some countries use household income. The third problem is that researchers generally do not "time match" their independent variables to the inequality data. For example, the variables of GNP per capita, political democracy index, and foreign investment are measured in 1970 and the Gini coefficient is measured in 1975. The study here will try to avoid these problems or to specify clearly each indicator.

Independent variables measure economic development, political democracy, and world-system/dependence. This study uses the energy consumption per capita (Nielsen, 1994; Muller, 1988; Bollen, 1983, 1979; Simpson, 1990) and GNP per capita to measure economic development (Nielsen, 1994; Bollen and Jackman, 1985). To measure the labor force shift from the agricultural sector to the modern sectors of economy (the heterogeneous development that might generate income inequality) the percent labor force in agriculture (Nielsen, 1994) is used in this study. Following Lecaillon et al. (1984) and Nielsen (1994), this study uses the expression, "sector dualism," to denote the process by which shift between sectors generates income inequality and the amount of inequality between the traditional and modern sectors of a developing economy. The sector dualism is calculated empirically (within the simplified two-sector framework) using widely available data on the proportion of the labor force in agriculture minus agriculture's share of the gross domestic product (Lecaillon et al., 1984; Nielsen, 1994). Due to the fact that the gross domestic product is only available for some years, this study uses the net domestic product as a substitute. According to available data, this substitution did not affect the patterns of change in sector dualism coefficients. Table 2.1 displays patterns of change in sector dualism coefficients when using gross domestic product (GDP) and net domestic product (NDP). Democracy is thought to be a noble condition and is evoked by politicians, publicists, preachers, and demagogues to prove their unsullied intentions and present a just claim to popular support (de Schweinitz, 1964). Democracy is a political system which supplies regular constitutional opportunities for changing governing officials, and a social mechanism which permits the largest possible part of the population

TABLE 2.1 PATTERNS OF CHANGE IN SECTOR DUALISM COEFFICIENTS FOR TAIWAN.

Year	Sector Dualism Coefficient: Percent of labor force in agriculture minus agriculture share of GDP	Sector Dualism Coefficient: Percent of labor force in agriculture minus agriculture share of NDP
1962	23.5	19.5
1963	24.7	21.2
1964	22.6	18.8
1965	22.5	18.7
1966	21.7	17.9
1967	21.4	18.1
1968	21.0	17.9
1969	22.1	19.1
1970	20.3	17.8
1971	21.7	19.9

Source: (see Appendix data source 3, 4, 5)

to influence major decisions by choosing among contenders for political office (Lipset, 1963). Among other things, a democracy should have elections in which each vote is weighted equally, each individual possesses identical information about the alternatives presented for decisions and the order of elected officials are executed (Dahl, 1956). A democratic society must have periodic elections, decided by majority rule, in which each voter casts only one vote. In addition, there must be two or more parties competing for control, and a single party (or coalitions of parties) chosen to run the government (Downs, 1957). Lenski (1966) identified democratic political systems not only by the extent of the electoral franchise but also by the extent of the existence of political liberties, which preserve the right of organized political opposition. In light of these definitions of political democracy, this study uses Gastil's political rights index and civil rights index (published by Freedom House), Bollen's political democracy index, as well as deaths from political violence, political demonstrations, numbers of newspapers, and indicators of electoral competition for the Provincial Assembly to measure political democracy in Taiwan. Bollen's political democracy index is available for two years (1960, 1965), and Taiwan's score (22.8) is only calculated for 1965 (Bollen, 1980:388). The Bollen's political democracy index consists of six elements, press freedom, freedom of group opposition, government sanctions, fairness of elections, executive selection, and legislative selection. The details of Bollen's political democracy index are described in Appendix data source 15. The Gastil political rights index and civil rights index has been published by year since 1973. Political rights involve the right to play a part in determining who will govern one's country and what the laws will be. Countries are coded with scores ranging from 1

(highest degree of liberty) to 7 (lowest degree of liberty). Civil rights are those rights the individual has vis a vis a vis a vis a vis a vis a vis a vis a vis the state. Particularly important are the freedom of the press and the other media and the independence of the judiciary. Countries are coded with scores ranging from 1 (greatest civil liberty) to 7 (least civil liberty). The details of the political rights index and civil rights index are described in Appendix data source 10. To measure world-system/dependence, this study uses foreign investment, export dependence, and foreign aid dependence. Foreign investment has been used by Firebaugh and Beck (1994). Export dependence has been used by Cutright (1967), Bollen and Jackman (1985), Firebaugh and Beck (1994), and Lenski (1984). Foreign aid dependence has been used by Bornchier (1978). The position of Taiwan in the world economic system is listed in Table 2.2. Taiwan is among the countries of the periphery. The core countries in this study were selected by the amount of Taiwan's export that went to the countries. Taiwan's export to the us and Japan almost exceeds fifty percent in every year from 1952 to 1988 (Taiwan Statistical Data Book, 1989). That is, Taiwan depended heavily on exports to the us and Japan during the study period. In addition to the discussion of the effect of foreign capital and export dependence, one other focus in dependency theory has been the analysis of the consequences of foreign aid for economic development, economic structure, the structure of the state, and income inequality. According to Ho (1978), the U. S. aid program to Taiwan was initiated in the early 1950s largely in connection with the communist takeover on the mainland of China and was stepped up considerably in the wake of the Korean War. In the postwar period

TABLE 2.2 POSITION OF COUNTRIES INTO CORE, SEMI-PERIPHERY, AND PERIPHERY WITHIN MODERN SYSTEMS THEORY: 1965.

Core	Semi-Periphery	Periphery	
Australia	Argentina	Afghanistan	Laos
Austria	Bulgaria	Albania	Liberia
Belgium	Burma	Algeria	Libya
Canada	Cuba	Benin	Madagascar
Denmark	Cyprus	Bolivia	Mali
France	East Germany	Brazil	Malta
Greece	Finland	Burkina Faso	Mauritania
Italy	Hungary	Burundi	Mexico
Japan	India	Cameroon	Mongolia
Luxembourg	Iran	Central African Rep.	Morocco
Netherlands	Ireland	Chad	Nepal
Norway	Israel	Chile	New Zealand
Sweden	Jordan	China	Nicaragua
Switzerland	Kenya	Colombia	Niger
United Kingdom	Lebanon	Congo	Nigeria
United States	Malaysia	Costa Rica	Panama
West Germany	Pakistan	Czechoslovakia	Paraguay
Yugoslavia	Peru	Dominican Rep.	Poland
	Philippines	Ecuador	Rwanda
	Portugal	Egypt	Saudi Arabia
	Rumania	El Salvador	Senegal
	South Africa	Ethiopia	Sierra Leone
	South Korea	Gabon	Somalia
	Spain	Ghana	Sudan
	Sri Lanka	Guatemala	Syria
	Turkey	Guinea	Taiwan
	Uruguay	Haiti	Thailand
	USSR	Honduras	Togo
	Venezuela	Iceland	Trinidad and Tobago
		Indonesia	
		Iraq	Tunisia
		Ivory Coast	Uganda
		Jamaica	Vietnam
		Kampuchea	Yemen
		Kuwait	Zaire

Source: Braun (1991) The Rich Get Richer. (p.37) Chicago: Nelson-Hall Publishers

United States economic aid and private us and Japanese investments not only augmented domestic savings but also served as important conduits for advanced technology.

Other factors in this study include the following: population with secondary education (Nielsen, 1994; Simpson, 1990; Firebaugh and Beck, 1994), the percent of population under age 15 (Cutright, 1967; Nielsen, 1994; Bollen and Jackman, 1985), the natural increase rate of population (Nielsen, 1994; Lenski, 1984), unemployment, export as a share of GNP, and savings as a share of GNP. Population with at least a secondary education is used as an indicator of changes in education level. The percent of population under age 15 and the natural increase rate of population are used as indicators of changes in population structure. Unemployment is used as an indicator of changes in labor force employment. Export as a percent of GNP is used as an indicator of changes in export growth, and savings as a share of GNP is used as an indicator of changes in savings accumulation. All these variables are selected by theoretical argument or were used in some other studies that have been discussed in the previous chapter.

Hypotheses

According to the arguments described in the previous chapter, this study examines six hypotheses.

H1: Economic development has a negative relation with income inequality.

H2: Democratization has a negative relation with income inequality.

H3: The peripheral position and dependence on core countries has a positive relation with income inequality.

H4: The expansion of education has a negative relation with income inequality.

H5: The natural increase of population and the proportion of population under age 15 have a positive relation with income inequality.

H6: Employment, exports, and savings have a negative relation with income inequality.

Data and Problems

The data gathered in this study are from 1951 to 1992, but data for some years are not available. There are some problems with the quality of data of income inequality collected on Taiwan that must be specified. Barrett and Whyte (1982) made the following argument.

> In general Taiwan has a much better developed statistical reporting system than other countries at a comparable stage of development, so we generally accept figures from Taiwan as relatively reliable. However, the 1953 Gini coefficient was computed from a household survey whose sample was not very representative. Since urban areas, where incomes were more unequal, were oversampled, the figure of .576 probably overstates the degree of inequality to some degree, perhaps by as much 20 percent. However, more recent data derived from island-wide representative samples reveal a clear decline in inequality from the 1950s to the low level indicated in 1972. To some degree these relatively recent family income survey data may still underestimate nonwage (e.g., profit and dividend) income and thus the true extent of inequality. However, since such underestimation is likely to be a more serious problem in other developing societies with poorer statistical systems, and since there is no reason to assume that the extent of this underestimation has increased, the two conclusions reached here still seem warranted: inequality in Taiwan is relatively low and has declined over time (p.1066).

In sum, the lack of reliability of the 1953 figure does not negate the trend of changes in income inequality, and data for Taiwan are better than data for most of other developing countries.

In another study, Kuo et al. (1979) made the following argument.

> For Taiwan in the 1950s, only two surveys gathered data on the overall distribution of income: one was conducted in 1953; the other in 1959-60. In addition, surveys by the Joint Commission on Rural Reconstruction (JCRR) for 1952, 1957, 1962, and 1967 contain information only on farm family incomes. In 1964, the Directorate-General of Budget, Accounting, and Statistics (DGBAS) began to conduct household surveys which included information on factor components, as well as total family incomes (p. 10). Even when good household surveys became available after 1964, there are problems associated with the randomness of sampling and the biased nonresponses among sample returns. There are problems associated with differences between primary and published data, problems which cause the appearance of a "consolidation error (p. 11). " Because of this consolidation, trends in the Gini coefficients over time once again become more meaningful than absolute magnitudes (p. 13). There is no question in our minds that the DGBAS surveys were based on competently drawn and stratified random samples. Even when samples are random, however, a frequent problem is the underresponse of certain groups, such as wealthier families. The conscientiousness of DGBAS personnel and the good attitude of respondents to questionnaire surveys nevertheless give us a high degree of confidence. In addition, we know of no reason to suspect differences in the quality of the data over time. We are, moreover, mainly concerned with the change rather than the precise levels of, say, the Gini coefficients (p. 12). On the whole, we feel that the quality of data in Taiwan favorably compares with that in other LDCs (p. 13).

In sum, again, the study also points out some problems in the data, but compared to data for other developing countries, data for Taiwan are relatively reliable.

In this study the Gini coefficients of 1953 and 1959 refer to Shirley W. Y. Kuo (1975). In the year of 1961, the Gini coefficient is not available, but the income shared by

quintile is available The 1961 Gini coefficient in this study is calculated using the data of quintile income distribution. Other things that must be specified about the Gini coefficients are the following. First, according to DGBAS, the time series before 1976 were based on ten equal divisions of disposable income and those for 1976 and thereafter, on un-grouped disposable income. Secondly, the formula for calculating Gini coefficient is the following. The example is described in Table 2.3.

Gini = I/n times sum of (Yj - Yi), where Yj > or = Yi,
Yj = Yi / sum of Yi, and Yi is the disposable income of the ith household.

Method

Hunt (1985) argues that the cross-sectional study is a frozen frame of reality showing what existed at one moment in time. Since it does not show motion or change, it cannot directly reveal how things came to be as they are or what consequences are likely to follow. He suggests that when researchers need to study social changes or on going social processes, a longitudinal design is better than cross-sectional design.

Following the line of analyzing historical changes in income distribution in one particular country, this study uses period data comparison to show the changes in different periods of time. In Taiwan, income inequality declined rapidly during 1950 to 1970, leveled off during 1971 to 1985, and increased slightly after 1985. The major concern of this study concentrates on the period from 1950 to 1970. But the analysis of the period after 1970 is also important and interesting. By analyzing the period of 1970 to 1990, this

TABLE 2.3 EXAMPLE OF THE CALCULATION OF GINI COEFFICIENT

Year: 1961
Data Type: Five equal divisions of disposable income.

	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth
Yi	.045	.097	.14	.198	.52
Sum of Yi	.045	.142	.282	.48	1
Yj	1	.683	.4965	.4125	.52
Yj-Yi	.955	.586	.3565	.2145	0

Sum of (Yj -Yi) = 2.112

Gini = (2.112)/5
= .4242

Source: (see Appendix data source 1)

study discovers the changes in these factors, when income inequality almost leveled off, and offers some possible explanations. In addition, some results drawn from cross-sectional study are compared in this study. Finally, this study offers prediction of changes in income inequality in the near future in Taiwan.

CHAPTER III

ANALYSES AND FINDINGS

Economic Development and Income Inequality

Kuo et al. (1979; 1981) and Ho (1978) have studied the relationship between economic development and income inequality in Taiwan. During 1950 to 1970 the real GNP grew around 9 percent each year and at the same time the Gini coefficient (indicator of income inequality) declined from .58 to .29. In this study, the purpose is to examine the variables used in cross-national study by using longitudinal data. That is, to study the question, "Can these variables used to explain income inequality in a society be used to explain the changes of income inequality over a long period?" The variables most often used in cross-national studies are GNT per capita, energy consumption per capita, labor force in agriculture, and sector dualism. The changes in GNP per capita and energy consumption per capita are the most efficient indicators of economic development. The percent of labor force in agriculture is used to measure the labor force shifting from the traditional agricultural sector to modern sectors (industrial and service sectors). In most developing countries, the more a country develops, the less the labor force will stay in agricultural sector. At the beginning of development, most of the labor force is in the agricultural sector, and then gradually it shifts from that sector to modern sectors. During this transition, income inequality will at first increase, and due to the shift of labor force to modern sectors, income inequality will decline. Sector dualism measures the productivity

of the labor force in agriculture. If the productivity of the labor force in agriculture is equal to the productivity of labor force in other modern sectors, the sector dualism will be zero. The larger the sector dualism coefficient, the less productivity of the labor force in agriculture, and theoretically the more inequality in the society.

According to available data, in Taiwan income inequality declined gradually from 1950 to 1970, leveled off from 1971 to 1985, and increased slightly after 1985. Table 3.1 displays the changes in income inequality indicators and economic development indicators from 1953 to 1970. In the first decade, the 1950s, the Gini coefficient declined from .58 to .42, and income shared by the highest quintile declined from 61.4 percent to 52 percent. The decrease in the Gini coefficient was 27 percent, and the decrease in the income shared by the highest quintile was 15.3 percent. At the same time, GNP per capita increased from 17,155 new Taiwan (NT) dollars (at 1981 prices) to 24,356 NT dollars (at 1981 prices). The change in GNP per capita was 42 percent. Labor force in agriculture declined from 56 percent to 49.2 percent and sector dualism coefficient increased slightly from 17.1 percent to 17.6 percent. The decrease of labor force in agriculture was 12.1 percent. The increase of GNP per capita and the decrease of the labor force in agriculture indicated the economic growth and labor force transition in this decade. The increase in sector dualism coefficient indicated that associated with the economic development there was a slight decrease of productivity of the labor force in agriculture. In the first decade, the GNP per capita had a negative relation with income inequality and the labor force in agriculture had a positive relation with income inequality. The relation between sector dualism and income inequality was not clear in this decade. Data for energy consumption

TABLE 3.1 CHANGES IN ECONOMIC DEVELOPMENT INDICATORS AND INCOME INEQUALITY INDICATORS FROM 1953 TO 1970 IN TAIWAN

Income Inequality Indicator	1953	1961	1966	1970
Gini coefficient	.58	.42	.32	.29
Income shared by the highest quintile (%)	61.4	52.0	41.5	38.7
Economic development indicator				
GNP per capita (at 1981 price)	17155	24356	33826	45198
Energy consumption per capita	-	379.2*	499.0	689.2
Labor force in agriculture (%)	55.4	49.2	44.2	35.8
Sector dualism coefficient	17.1	17.6	17.9	17.8

* 1962 data.
Source: (see Appendix data source 1, 3, 5, 8, 9)

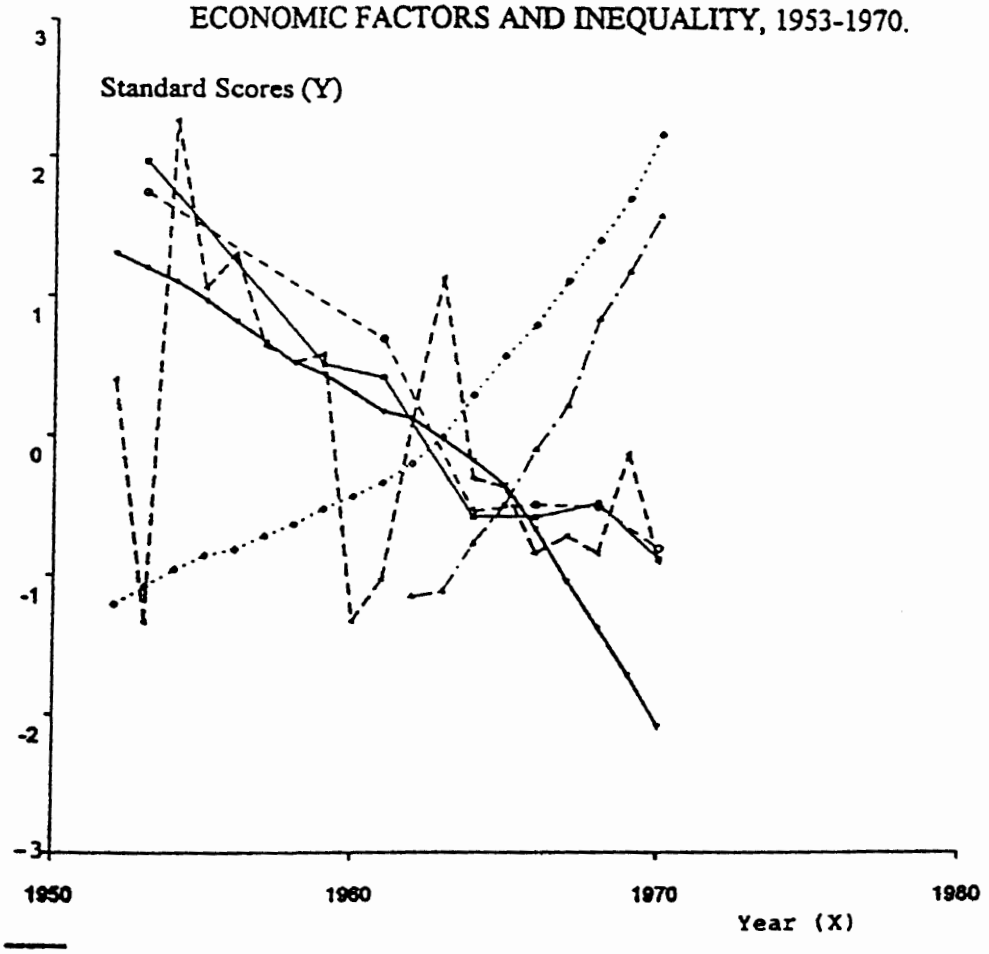
per capita in the 1950s are not available. But according to some cross-national studies, the correlation between GNP per capita and energy consumption per capita is high (usually the correlation coefficient is greater than .9). For example, according to Nielsen (1994), the correlation coefficient between GNP per capita and energy consumption per capita is .96. Data for other periods in this study show the correlation coefficient between GNP per capita and energy consumption per capita is equal to .99. It is reasonable to say that the energy consumption per capita increased from some unknown figure to 379.2 (liter oil equivalent per person) in this decade, and the relation between energy consumption per capita and income inequality in this period was probably negative.

In the second decade, 1960 to 1970, the Gini coefficient declined further from .42 to .29 and the income shared by the highest quintile declined from 52 percent to 38.7 percent. The decrease in Gini coefficient was 31 percent and the decrease in the income shared by the highest quintile was 25.6 percent. At the same time, GNP per capita increased further from 24,356 NT dollars to 45,198 NT dollars (at 1981 prices), and energy consumption increased from 379.2 (liter oil equivalent per person) to 689.2 (liter oil equivalent per person). The change in GNP per capita was 86 percent and the change in energy consumption per capita was 82 percent. In this decade, the labor force in agriculture declined further from 49.2 percent to 35.8 percent. The sector dualism coefficient only changed slightly from 17.6 percent to 17.8 percent. The decrease in labor force in agriculture was 27.2 percent. In this decade, the indicators of economic development indicated stronger economic development than the previous decade. GNP per capita grew faster, and labor force in agriculture shifted a greater proportion of

workers to modern sectors. But this further economic growth did not enhance or worsen the productivity of the labor force in agriculture. The sector dualism coefficient was largely unchanged. In sum, in these two decades, economic development did not worsen the gap between the productivity of the labor force in agriculture and productivity of the labor force in other modern sectors. On the other hand, in this decade income inequality declined at almost the same rate as in the first decade. In the second decade, GNP per capita and energy consumption per capita still had a negative relation with income inequality. Labor force in agriculture had a positive relation with income inequality, and sector dualism did not have a clear relation with income inequality.

Figure 3.1 displays the changes in standardized variables by year. During the two decades, 1950 to 1970, the Gini coefficient and income shared by the highest quintile changed by three standard deviations (+2 to - 1). In the same period, GNP per capita changed from more than one negative standard deviation to around two positive standard deviations, and labor force in agriculture changed from more than one positive standard deviation to two negative standard deviations. It was clear that GNP per capita had a negative relation with income inequality, and labor force in agriculture had a positive relation with income inequality in these two decades. Data for energy consumption were available from 1962. After 1962, the Gini coefficient and income shared by the highest quintile declined somewhat more slowly than before 1963 but still significantly. At the same time energy consumption increased rapidly. Therefore, after 1962 the relation between energy consumption per capita and income inequality was negative. In these two decades, the sector dualism coefficient fluctuated widely around zero standard

FIGURE 3.1 CHANGES IN STANDARDIZED VARIABLES: ECONOMIC FACTORS AND INEQUALITY, 1953-1970.



——— ◂ Sector dualism coefficient.

——— ▿ Percent of labor force in agriculture.

– - – △ Energy consumption per capita.

..... ◇ GNP per capita (at 1981 NT$ price).

——— ○ Income shared by the highest quintile.

——— □ Gini coefficient.

Source: (see Appendix data source 1, 3, 4, 8, 9)

deviation.Thus, according to the figure, the relation between sector dualism and income inequality was not clear during the two decades. In sum, the data also support the analyses made above.

The slopes of GNP per capita and labor force in agriculture in the second decade were steeper than that in the first decade. This means that economic development in the second decade was more rapid than that in the first decade. In the second decade, the change in GNP per capita was similar to the change in energy consumption per capita. Finally, in these two decades the influence of economic development and labor force shifting from the agricultural to modern sectors on productivity of the labor force in agriculture fluctuated. That is, economic development and labor force shifting in some years had a positive effect and in some years it had a negative effect on productivity of the labor force in agriculture. This result differs from the theoretical argument that economic development increases the gap between the productivity of the labor force in agriculture and productivity of the labor force in other modern sectors. Table 3.2 displays changes in economic development and income inequality from 1970 to 1988 in Taiwan. In the decade, 1970 to 1980, the Gini coefficient nearly leveled off (changing from .29 to.28), and the income shared by the highest quintile also declined only slightly (from 38.7 percent to 36.8 percent). At the same time, GNP per capita increased from 45,198 NT dollars to 94,580 NT dollars (at 1981 prices) 7 and energy consumption increased from 689.2 (liter oil equivalent per person) to 1620 (liter oil equivalent per person). The increase of GNP per capita was 109 percent and the increase of energy consumption was 135 percent. Labor force in agriculture declined from 35.8 percent to 20 percent in this decade, and the

TABLE 3.2 CHANGES IN ECONOMIC DEVELOPMENT AND INCOME INEQUALITY FROM 1970 TO 1988 IN TAIWAN

Income Inequality Indicator	1970	1976	1980	1988
Gini coefficient	.29	.28	.28	.30
Income shared by the highest quintile (%)	38.7	37.3	36.8	38.0*
Economic Development Indicator				
GNP per capita (at 1981 price)	45198	69964	94580	146111
Energy consumption per capita	698.2	1180.0	1620.0	2072.8
Labor force in agriculture (%)	35.8	28.0	20.0	12.7
Sector dualism coefficient	17.8	14.6	10.8	6.6

*1987 data.
Source: (see Appendix data source 1, 3, 5, 8, 9)

sector dualism coefficient declined from 17.8 percent to 10.8 percent. The change in labor force in agriculture was 44.1 percent and the change in the sector dualism coefficient was 39.3 percent. That is, according to the changes in GNP per capita and energy consumption per capita, the growth of the economy in this decade was more rapid than the previous decade, and this growth led more of the labor force to move from the agricultural sector to modern sectors. On the other hand, in this period, the growth in the economy also enhanced the productivity of labor force in agriculture. But in sum, the growth in the economy, the shift of labor force from agricultural to modern sectors, and the improvement of productivity of the labor force in agriculture did not improve income inequality further. That is, the relation between economic development indicators and indicators of income inequality disappeared in this decade.

The Gini coefficient increased slightly from .28 to .30 and the income shared by the highest quintile only increased from 36.8 percent to 38 percent from 1980 to 1988. Over the same period, the economy kept growing. GNP per capita increased from 94,580 NT dollars to 146,111 NT dollars (at 1981 prices), and energy consumption increased from 1,620 (liter oil equivalent per person) to 2,072.8 (liter oil equivalent per person). The increase of GNP per capita was 54 percent and the increase of energy consumption was 28 percent. On the other hand, labor force in agriculture declined further from 20 percent to 12.7 percent and the sector dualism coefficient declined from 10.8 percent to 6.6 percent. The decrease in the labor force in agriculture was 36.5 percent and the decrease in the sector dualism coefficient was 38.9 percent. That is, during this period an additional 7.3 percent of labor force in agriculture shifted to modern sectors and the

productivity of the labor force in agriculture improved further and was almost equal to the productivity in modern sectors. The difference was only 6.6 percent. The disappearance of the relationship between economic development and income inequality was still the same in this period. That is, the relationship between economic development and declining income inequality disappeared from 1980 to 1988, too.

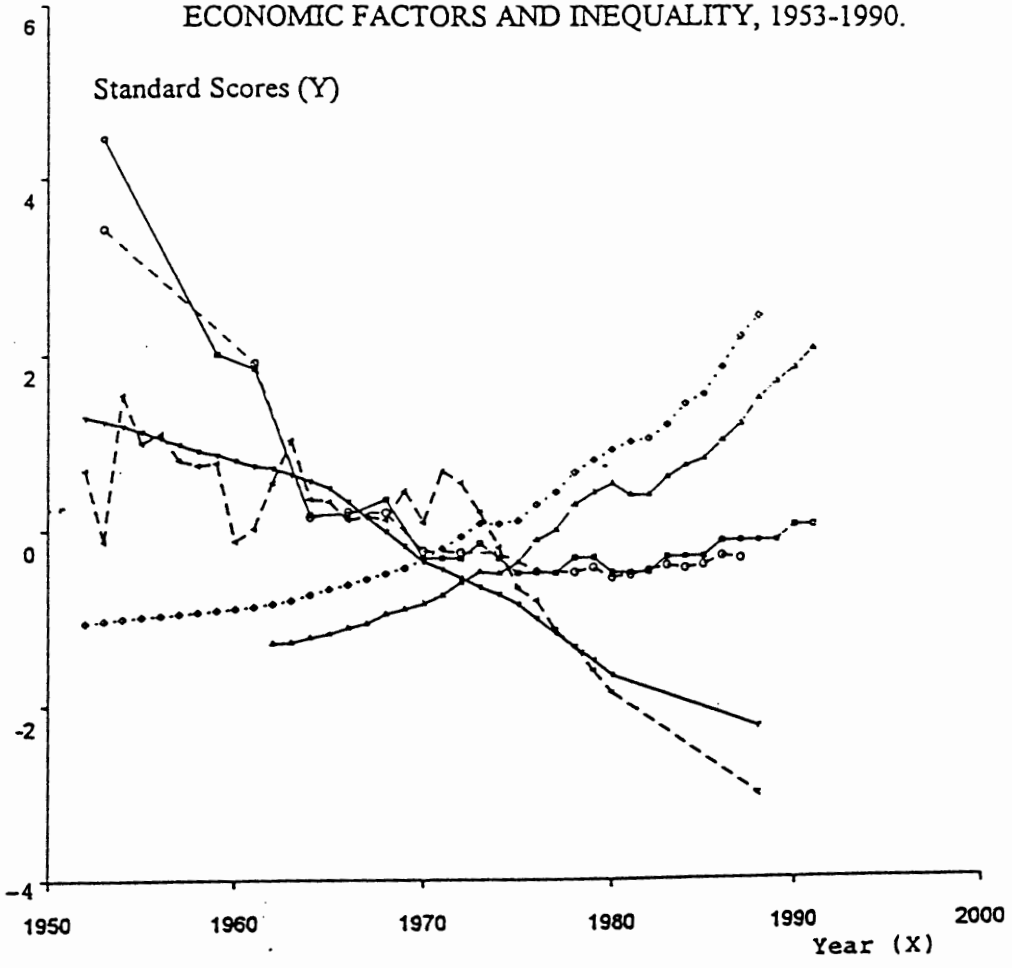
Figure 3.2 displays changes of standardized variables from 1950 to 1990. It is clear that after 1970 the relationship between economic development indicators and income inequality indicators disappeared. After 1970, the Gini coefficient and income shared by the highest quintile leveled off and increased only slightly in the 1980s, but from 1970 to 1990, the GNP per capita and energy consumption per capita kept increasing. The labor force in agriculture and sector dualism coefficient declined rapidly. Further after 1970 the major contribution of economic development was to improve the productivity of the labor force in agriculture. It is clear that sector dualism coefficient declined rapidly after 1970.

In sum, from 1950 to 1970 economic development really had an important effect on the improvement of income inequality in Taiwan. Over the next two decades, economic development increased the income of the majority and income inequality leveled off.

> Prosperity is the real friend of the women, the ethnic and the lumpen proletariat; the poor have gained much more from development than it is now fashionable to believe (Lewis, 1979; 1976).

Such was the experience of Taiwan over the last four decades.

FIGURE 3.2 CHANGES IN STANDARDIZED VARIABLES: ECONOMIC FACTORS AND INEQUALITY, 1953-1990.



◂ Sector dualism coefficient.

▽ Percent of labor force in agriculture.

△ Energy consumption per capita.

○ GNP per capita (at 1981 NT$ price).

Income shared by the highest quintile.

□ Gini coefficient.

Source: (see Appendix data source 1, 3, 4, 8, 9)

In cross-national study of income inequality, Paukert t (1973) gave estimates for 56 countries, including over 40 developing countries. In his analysis the degree of inequality, as measured by the Gini ratio or by the equalization percentage, was linked to the level of the gross domestic product per capita (expressed in 1965 US dollars). He found a sharp increase in inequality as one moves upwards from the group of countries with a GDP of under 100 dollars per capita to the 101 to 200 dollars group of countries. Inequality increased further though less sharply in the 201-300 dollars group of countries. The countries in that group and in the next one (301-500 dollars) were those in which the differences in income were the most pronounced. Further up the income scale and especially in the group of countries with a GDP above 2000 dollars per person there was a clear reduction of inequality. In 1977 Harold Lydall (Lecaillon et al., 1984) examined data for 71 countries that had been assembled by the World Bank. He estimated that the turning-point of inequality, as measured by the Gini coefficient, was reached when GDP per capita amounted to 243 United States dollars (at 1971 prices). In these two studies, the peak of income inequality appears in the group of countries within 200 US dollars to 500 US dollars per capita. According to Kuo et al. (1981), at the close of World War II, per capita income in Taiwan was about 70 US dollars. In 1953, GNP per capita was 176 US dollars, and the Gini coefficient was .58. The .58 was the highest Gini score in the available data. From this point, the Gini coefficient declined gradually. The pattern in Taiwan was similar to these cross-national analyses.

Political Democracy and Income Inequality

From the political democracy perspective, income inequality in a society is reduced by the expansion of the political base. In this section, the study examines the changes in the political environment in Taiwan from 1950 to 1990, and compare them to the changes in income inequality. The study of political democracy has concentrated on six elements: freedom of the press, freedom of group opposition, government sanctions, fairness of elections, executive selection, and legislative selection. The discussion in this section centers on changes in these elements.

In 1895, Taiwan was ceded to Japan at the end of the First Sino-Japanese War and was developed as a Japanese colony. Reverting to Chinese sovereignty in 1945, it became a refuge for the Republic of China's ousted Nationalist government in 1949 following the Communist takeover of the Chinese Mainland. The Republic of China in Taiwan continues to be governed according to the constitution adopted on the Chinese Mainland in 1946. The state of emergency imposed in 1948, granted the president broad powers to override constitutional provisions. Martial law was in effect since 1949. The state is governed by a president. Below the president, authority rests with five Yuans (councils) - the executive, legislative, judicial, examination, and control Yuans. The legislative Yuan is, in theory, elected, but before 1992 only seats created since 1972 had been filled through elections. In Taiwan, local elections have been held more frequently, but the campaigns are restricted. In Taiwan before 1980, the elective offices were powerless. At the local level, Taiwan is also governed as a province of China. The provincial governor

and the Mayor of Taipei are appointed by the central government; the provincial assembly is elected. (The provincial governor and mayors of two special municipalities were elected after 1994.)

In the late 1940s, the Nationalist government which set up in Taipei was dominated by its military and security sectors, as reflected by its declared commitment to "mainland recovery" as the regime's raison d'etre and by the repression directed against opponents of the Mainlander-dominated government. Taiwan in this period was a garrison state (Chan and Clark, 1992). The KMT did not try to hang onto power simply through repression and terror. During the 1950s the regime tried to generate some popular support and legitimacy both by promoting economic development and an increased standard of living, and by introducing political reforms that involved the creation of a new elite segment. In the early 1950s the regime created a system of elections for local governments and the Provincial Assembly, while leaving the "national bodies" under the control of officials elected on the mainland in the late 1940s. There were two other political parties that retreated from mainland China to Taiwan, but the "Kuomintang" (Nationalist party) dominated these elections. At the same time, the government prohibited the formation of an opposition party or other new political parties. Theoretically, there were three political parties in Taiwan in the but the other two parties did not have a significant political influence. Thus, during the 1950s in the political and social realms, authoritarian control was supplemented by limited liberalization in local politics.

Table 3.3 displays the changes in income inequality and changes in political environment from 1950 to 1970. In the 1950s, the Gini coefficient declined from .58 to .42, and income shared by the highest quintile decline from 61.4 percent to 52 percent. In the beginning of the decade due to a reign of repression and terror, there were large numbers of deaths (4751) from political violence. [This did not include the events on February 28, 1947 which led to massive reprisals and the slaughter of up to 10,000 Taiwanese.] In the same period, the number of political executions and government sanctions was also higher than in other periods. In sum, in this first decade the number of political demonstrations, strikes, and riots declined from 15 to one. The number of deaths from political violence declined from 4751 to 595. The number of political executions declined from 317 to one, and the number of government sanctions declined from 45 to 29. On the other hand, the amount of nonpolitical civic organizations and nonpolitical periodicals increased significantly, increasing from 2560 to 4973 and from 245 to 686 respectively. In 1954, the "Association of Broadcasters" was allowed. The changes in electoral indicators (percent of candidates elected, percent of KMT's share of the votes, and percent of KMT's share of the seats) and changes in the number of newspapers were minor. Thus, in this decade, the changes in political democracy were limited, but the society become more stable.

In the 1960s, tolerance for political opposition was quite limited, as evidenced by the arrests of Chein Lei in 1960 for trying to organize to an opposition party and Peng Mingmin in 1964 for writing pamphlets advocating the overthrow of the KMT. In the there were three electoral campaigns for local governments and the Provincial Assembly.

TABLE 3.3 CHANGES IN POLITICAL ENVIRONMENT AND INCOME INEQUALITY FROM 1950 TO 1970 IN TAIWAN

Income Inequality Indicator	Early 1950s	Early 1960s	Early 1970s
Gini coefficient	.58	.42	.29
Income shared by top quintile (%)	61.4	52.0	38.6
Indicators of Changes in Political Environment			
Political demonstrations, strikes, and riots	15	1	9
Deaths from political violence	4751	595	3
Political executions	371	1	1
Government sanctions	45	29	28
Number of civic organizations	2560	4973	5890
Civic organizations' membership as percent of population aged 15-64	29.4	40.0	37.8
Number of newspapers	30	31	31
Number of periodicals	245	686	1534
Percent of candidates elected to the Provincial Assembly	51.8	54.0	60.3
Percent of KMT's share of the Provincial Assembly votes	69	68	69
Percent of KMT's share of the Provincial Assembly seats	84	82	80
Political index	-	22.8*	5.5**

*Bollen's ; **Gastil's
Source: (see Appendix, data source 1, 10, 11, 12, 13, 14, 15)

In 1960s there were three electoral campaigns for local governments and the Provincial Assembly, too. The difference was that "independents" were able to win some elections (for example, they won the mayorships in three of the five largest cities in 1964). Thus, local politicians were forced to become more responsive to their constituencies, and a considerable Taiwanization of the lower levels of the party and government occurred. In the same period, a broadening of the elite segments in the regime occurred. The push for rapid growth necessitated bringing technocrats and administrators, many of whom had been educated at leading U. S. universities, into the top levels of government. Income inequality declined gradually but substantially from .42 (Gini) to .29 (Gini). Changes in the number of political executions and government sanctions are minor, and the number of political demonstrations, strikes, and riots increased. Because martial-law prohibited the founding of new newspapers, in the 1960s the number of newspapers stayed at about 30. Changes in election indicators (percent of candidates elected, percent of KMT's share of the votes, and percent of KMT's share of the seats) were minor, among which only the percent of candidates elected to the Provincial Assembly increased from 54 percent to 60.3 percent. That is, there were fewer candidates relatively to seats and the competition in the electoral campaign was less competing. Very significant progress still occurred in the form of published materials and organizations. Three television stations were founded, but were still under the control of the government or KMT. In sum, when we translate the Bollen's 1965 100 scale political democracy index into Gastil's seven-point index and reverse the direction, we find that in 1965 the Bollen's political democracy index for Taiwan (22.8) was equal to 5.4 on Gastil's political index. Comparing this figure to 1973

Gastil's political index for Taiwan (5.5), we would find that in the second decade the changes in political democracy were minor.

Politically, significant changes in the authoritarian style of rule began to evolve in the 1970s. The island's successful modernization and creation of an Islander (native Taiwanese) business community stimulated pressure for increased participation and government responsiveness. When Chiang Ching-kuo became premier in 1972, he instituted a more liberal program that included bringing younger and more educated officials into top leadership positions, gradually increasing the power granted to Islanders in the government and party. A very important component of this liberalization was that the position of the opposition began to improve. While the formation of an opposition party was still illegal, an informal association of oppositions began to grow after the late 1970s.

The trends of liberalization of Taiwan's politics over the 1970s and the first half of the 1980s increased the scope of free speech and electoral competition and reduced the power of conservatives within the regime. In the meantime the "tangwai--outside the party" used the more liberal atmosphere of the 1980s to stretch the limits of political discourse. The cumulative movement toward political liberalization reached a more dramatic crescendo during 1986 to 1989. The first step was the open formation of an opposition party, Democratic Progressive Party (DPP). The next step was the formal abolition of martial law and the Emergency Decree that had been applied to Taiwan since 1949. Furthermore, the balance of power within the KMT appeared to be moving in a more liberal direction. Chiang Ching-kuo's sudden death in January 1988 threw this trend

into some question, but the new president Lee Teng-hui (who is an Islander) appeared to be consolidating power, moving younger and more liberal leaders into top positions, and pushing through innovative domestic and foreign policies. Table 3.4 displays changes in the political environment and income inequality during 1970 to 1990 in Taiwan. In these two decades, income inequality first leveled off around .29 (Gini coefficient) during most of the period and at the end of the period it increased slightly. In the 1970s, political demonstrations, strikes, riots, and government sanctions were less than in other periods. Data in the 1980s were not available, but due to the abolition of martial law, the demonstrations, strikes increased significantly at the end of the 1980s and this was a phenomena of democracy transition. In the second half of the 1980s, the DPP emerged as a major political opposition of the KMT. This process toward political liberalization and partisan competition, however, has also produced a concomitant increase in the incidence of violent protests and mass demonstrations. (In the early 1990s, the number of demonstration, strikes, and riots were decreased gradually.) A more significant expansion still occurred in the number of civic organizations and periodicals. During these two decades the number of civic organization increased from 5980 to 12605 and the number of periodicals increased from 1534 to 3748, some political (including opposition) but undoubtedly a large majority of wholly nonpolitical publications. The unique phenomenon in this period occurred after the abolition of martial law. The number of newspapers increased dramatically form 31 to 124. As indicators of election, KMT's share of the votes and KMT's share of the seats was declined gradually. In sum, during these two decades, Gastil political rights index changed from 6 to 4 and civil rights index changed

TABLE 3.4 CHANGES IN POLITICAL ENVIRONMENT AND INCOME INEQUALITY FROM 1970 TO 1990 IN TAIWAN

Income Inequality Indicator	Early 1970s	Late 1970s	Late 1980s
Gini coefficient	.29	.29	.30
Income shared by top quintile (%)	38.6	37.5	38.0
Indicators of Changes in political Environment			
Political demonstrations, strikes, and riots	9	1	*
Government sanctions	28	3	*
Number of civic organizations	5980	8080	12605
Civic organizations' membership as percent of population aged 15-64	37.8	41.3	69.4
Number of newspapers	31	31	124
Number of periodicals	1534	1772	3748
Percent of candidates elected to the Provincial Assembly	60.3	61.6	49.0
Percent of KMT's share of the Provincial Assembly votes	69	66	62
Percent of KMT's share of the Provincial Assembly seats	80	73	70
Political rights index	6	5	4
Civil rights index	5	5	3

*Data are not available.
Source: (see Appendix, data source 1, 10, 11, 12, 13, 14)

from 5 to 3. If we translate the two seven scale indexes into a 100 scale score, the improvement of political democracy in these two decade was around 30 percent. It was significant, but in the same period income inequality did not change. That is, the level of democracy has not apparently helped to reduce income inequality in Taiwan. This result was consistent with the conclusion in the cross-national study made by Bollen and Jackman (1985), i.e., political democracy did not have a significant effect on income inequality.

World System/Dependence and Income Inequality

According to Wallerstein (1974), the contemporary world system consists of a single world market, but of a multitude of states which vary greatly in political power, in accessibility by various social classes and economic interests, and in their capability to distort markets and rig prices in favor of some of their constituents. In Wallerstein's view, there are three different positions in the global economy: core, semiperiphery, and periphery. The core dominates, the periphery suffers. And the distinction between semiperiphery and periphery decreases Third World solidarity against the industrial core. But, there are many different branches of the dependency and world system paradigm. Some focus on economic dependence, some focuses on political dependence, some focus on military dependence, and some focus on treaty memberships. This study concentrates on economic dependence and its relation with income inequality. The variables of dependence used in this study include foreign investment, foreign aid, and export to core

countries. The variable of foreign investment only includes current flows of foreign investment. In the study of foreign investment, there are two types of foreign capital. One is current flows of foreign capital, and the other is cumulative foreign capita in a country, such as stocks. According to Bornschier et al. (1978), flows of direct foreign investment and aid have had the short-term effect of increasing the relative rate of economic growth of countries, and stocks of direct foreign investment and aid have had the cumulative, long-term effect of decreasing the relative rate of economic growth of countries. That is, the relationships between the flows of foreign capital and economic development, and between the stocks of foreign capital are different. Of course, a country's position in the world system is changeable, by political performance and economic growth. For example, Barrett and Whyte (1982) suggested "that successes in economic growth and penetration of markets in the core countries were thrusting Taiwan from peripheral up to semi-peripheral status. " The other example is Japan. According to Weede and Kummer (1985), Japan is listed among semi-peripheral countries. But according to Braun (1991), Japan is listed among core countries. In this study, due to the historical relation between Taiwan and Japan in the early twenty century and the reality that in the last several decades both Taiwan's export and import was heavily dependent on Japan, Japan is a core country to Taiwan.

According to Barrett and Whyte (1982), Taiwan's dependence on foreign capital can be divided into three phases. The first stage was during 1895 to 1945. In this stage Taiwan was a colony and dependent on Japan. The second stage was during the early 1950s to the early 1960s. In this stage, Taiwan was heavily dependent on US aid, US aid

made up around 40 percent of gross domestic capital formation. The third stage was after the early 1960s. Taiwan used policy to induce foreign investment to offset the lack of foreign aid. This study concentrates on stages two and three only.

According to Chan and Clark (1992), Taiwan was heavily dependent on the US in military and political policy during the 1950s and the 1960s. Washington saw Taiwan as an essential link in its containment policy in East Asia. It pumped massive sums of economic and military aid to the KMT regime. Washington's generosity in providing massive aid to the KMT state derived from Taiwan's geo-strategic location at the fringe of the Eurasian land mass. The United States was motivated to support and sustain the KMT state because it wanted to deny the island to Beijing (which was perceived to be a client of Moscow). According to Barrett and Whyte (1982), after World War II and the Chinese Civil War, Taiwan became a political client of the United States. In sum, Taiwan's structural position as a forward post in the rimland of Eurasia, as a rival government of China, and as a former colony of Japan enhanced Washington's willingness to contribute to its well-being. The result was that during this period in political, military, and the treaty membership matters Taiwan was heavily dependent on the United States.

After the Japanese lost the war, the island was returned to China in 1945. It suffered under a corrupt and incompetent warlord governor, Chen Yi, who did little to repair the war-damaged economy. During the next few years, living standards declined, runaway inflation consumed existing wealth, and unemployment worsened (Lau, 1990). During 1948 and 1949, the Chinese Nationalists found refuge in Taiwan as they lost the Chinese Civil War. More than a million and a half "Mainlanders" fled to Taiwan at that

time. Due to the above reasons, in that time Taiwan was the poorest country among the developing countries (GNP per capital less than 70 US dollars). There was a serious lack of capital. After the outbreak of the Korean War, Washington regarded Taiwan as an important regional location, and began to pump massive sums of economic and military aid to Taiwan. According to Chan and Clark (1992), foreign aid and foreign markets were important for Taiwan, but foreign investment was never dominated in Taiwan's economy. Overall foreign investment in Taiwan has been much lower than in many other Third World countries, especially those in Latin America. Foreign investment only played an important role in the export surge of 1963-73. In terms of external economic dependency, the record is more mixed. Taiwan has been moderately dependent upon foreign capital. For example, on Bornschier and Chase-Dunn's (Chan and Clark, 1992) indices for MNC (multinational corporation) penetration in the mid 1970s, the island ranked in the top third of all developing countries in current inflows of capital, but was relatively low in total capital stock because of the recency of major MNC investments. Taiwan's export has ranked in the top quarter of the world in trade partner concentration and trade/GNP ratio since the mid 1970s.

Over the period from 1952 to 1968 more than 1.7 billion US dollars in aid was extended to Taiwan, excluding aid in the military assistance program (the latter totaled about 2.3 billion US dollars over the years). From 1958 to 1965 Taiwan ranked fifth in the world in the total amount of U. S. aid per capita, with almost six times as much aid received per capita as the average for 120 countries. Over 80 percent of the aid was in the form of grants. In the 1950s, U. S. aid provide almost 40 percent of gross domestic

capital formation (GDCF). Around half of the aid was spent on military, and rest of it financed the investment in agriculture and infrastructure and also covered Taiwan's trade and budgetary deficits. According to Jacoby (1966), the U. S. aid helped to alleviate the island's crushing defense burden and enabled the regime to stabilize and then to revive its economy. In the absence of the US aid Taiwan's annual GNP growth rate would have been cut by half, its per capital income would have been reduced by three quarters, and it would have taken the island 30 more years to reach its 1964 living standards (Jacoby, 1966). Private foreign investment was minimal in the 1950s, constituting less than 1.8 percent of GDCF per year. In sum, in this period the net flows of foreign capital constituted around 35 percent of gross domestic capital formation. In the same period exports to the US and Japan was around 50 percent. That is, in the 1950s Taiwan's exports were heavily concentrated in the two countries. Income inequality reduced gradually form .58 (Gini) to around .42 (Gini), and income shared by the top quintile declined from 61.4 percent to around 52 percent. In this decade foreign capital and export dependence had a positive contribution to the economic growth (annual growth rate was 9 percent). But the direct relation between world system/dependence and income inequality was mixed.

The data on Table 3.5 display changes in income inequality and dependency indicators from 1953 to 1970. In the 1950s, income inequality improved gradually. But the percent of exports to theUS and Japan almost did not change. At the same time, foreign investment as a share of gross domestic capital formation decreased significantly from 1.6 percent to .04 percent and US aid as a share of gross domestic capital formation

TABLE 3.5 CHANGES IN INCOME INEQUALITY AND DEPENDENCE FROM 1953 TO 1970 IN TAIWAN.

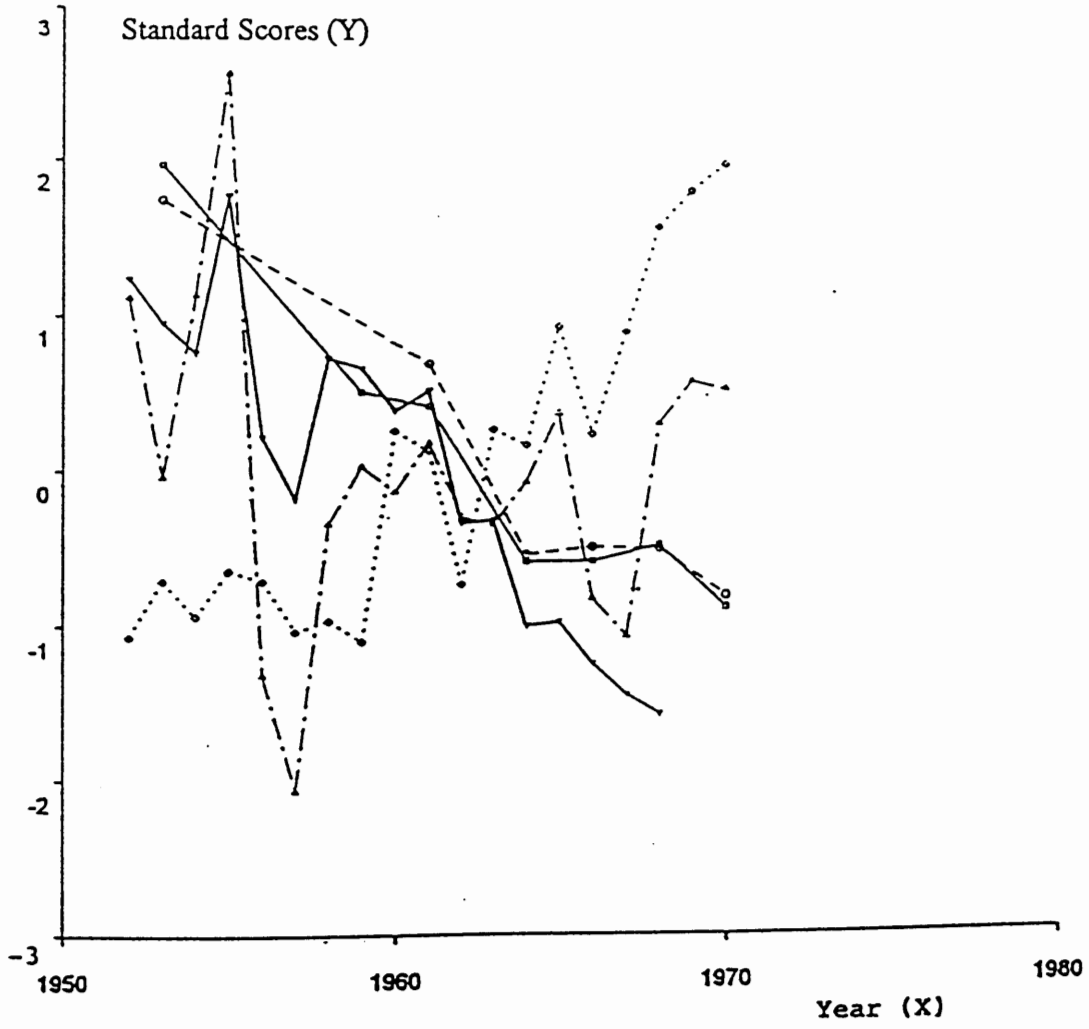
Indicators of Income Inequality	1953	1959	1966	1970
Gini coefficient	.58	.44*	.32	.29
Income shared by the highest quintile (%)	61.4	52.0**	41.5	38.7
Dependency Indicators				
Foreign investment as a share of gross domestic capital formation (%)	1.60	.04	4.40	9.60
Percent of export to the US and Japan	49.8	50.1	45.6	52.7
US aid as a share of gross domestic capital formation (%)	41.0	36.2	5.8	_
Net flows of foreign capital as a share of gross domestic capital formation (%)	36.9	45.6	-1.0	0.9

*Data refer to Barrett and Whyte (1982) "Dependency theory and Taiwan: analysis of a deviant case." p. 1069. American Journal of sociology 87:1064-89.
**1961 data.
Data source: (see Appendix data source 1,16,17)

declined from 41 percent to 33. 8 percent. The net flows of foreign capital as a share of gross domestic capital formation increased from 36.9 percent to 45.6 percent. According to these changes, in this period the relation between income inequality and export dependence was not obvious. Foreign investment had a positive relation with income inequality. US aid had a slightly positive relation with income inequality. The net flows of foreign capital had a slightly negative relation with income inequality. In the 1960s, the Gini coefficient declined from .42 to around .29 and the income shared by the top quintile declined from 52 percent to around 39 percent. US aid declined sharply and then ceased in 1968. Due to a government policy that encouraged foreign investment, foreign investment as a share of gross domestic capital formation increased dramatically from .04 percent to 9.6 percent by the end of the decade. Government monetary policy also changed to increased interest rates in order to induce people to save. The combination of this change with the first change led to sharply declining net flows of foreign capital as a share of gross domestic capital formation. The figure changed from 45.6 to near zero. Finally, the percent of exports to the US and Japan fluctuated around 50 percent. Nevertheless, the relation between the export dependence and income inequality was still not clear. Foreign investment had a negative relation with income inequality. This was different from the previous decade. U. S. aid still had a positive relation with income inequality. The net flows of foreign capital had a positive relation with income inequality.

Figure 3.3 displays changes in standardized variables from 1950 to 1970. The Gini coefficient and income shared by the highest quintile declined gradually and significantly during these two decades.US aid also declined gradually and significantly. That is, the

FIGURE 3.3 CHANGES IN STANDARDIZED VARIABLES: DEPENDENCE INDICATORS AND INEQUALITY, 1953-1970.



▽ U.S. aid as percent of gross domestic capital formation.

△ Percent of export to U.S. and Japan.

◇ Foreign investment as percent of gross domestic capital formation.

○ Income shared by the highest quintile

□ Gini coefficient.

Source: (see Appendix data source 1, 16, 17)

relation between US aid and income inequality was positive in these two decades. Percent of export to the US and Japan fluctuated around zero standard deviation. The fluctuation in the percent of exports to these two countries makes the relation between export dependence and income inequality unclear. Foreign investment fluctuated slightly around negative one standard deviation but increased significantly in the second decade. That is, in the first decade the relation between foreign investment and income inequality was not clear, and in the second decade the relation between foreign investment and income inequality was negative.

In the next two decades, 1970 to 1990, income inequality changed very little. Foreign investment peaked in 1968-71 and then fell back substantially to about 3 percent of GDCF during the 1970s and early 1980s before climbing again to about 7 percent of GDCF in the late 1980s. Foreign capital has dominated a few important export industries, such as electronics, but it never became strong enough to dominate the economy. Because of the US aid, in the 1950s and early 1960s the net inflows of foreign capital were over one third of domestic investment. With the end of foreign aid, the amount of net inflows dropped drastically. In the 1970s, the balance of capital flows turned negative. Capital outflows began to escalate during the 1980s, reaching the level of total domestic investment by mid decade. This development represents the rising foreign investments made by Taiwan's businessmen, who have been motivated by the desire to preserve overseas scales against protectionism in the developed world, particularly in the United States, and to exploit cheap labor in the developing world (for example, Philippines).

In the export dependency aspect, as seen above, the percent of exports to the United States and Japan have almost always accounted for about 50 percent in the first two decades. In the 1970s, this figure still was around fifty percent, and it jumped to almost 60 percent in the mid 1980s. Taiwan has been marked by substantial dependence upon foreign markets, although the degree of this dependence has varied considerably both over time and among specific subdimensions. Its successful export from the early 1960s to the late 1980s certainly indicated that these ties to international markets did not worsen the economy and income inequality.

Table 3.6 displays the changes in income inequality and dependency indicators from 1970 to 1987. In these two decades, the Gini coefficients were around .29 and income shared by the highest quintile were around 38 percent. The changes in these two indicators were little. But, foreign investment declined from 9.6 percent to 3.3 percent in the 1970s and then increased from 3.3 percent to 7.4 percent in the 1980s. The changes in foreign investment were both negative and positive in these two decades. The link between changes in foreign investment and the changes in income inequality is not clear. Further, export dependence declined a little in the 1970s and increased from 45.1 percent to 57.1 percent in the 1980s. As Comparing the changes in export dependence with changes in income inequality, the relation is not obvious. The same is true for the net flows of foreign capital as a share of gross domestic capital formation. It first increased from .09 percent to 3.9 percent in the 1970s and then declined from 3.9 percent to negative 99 percent. The dramatic change in the direction of flows of capital stemmed from Taiwan's businessmen largely invested in the developing countries.

TABLE 3.6 CHANGES IN INCOME INEQUALITY AND DEPENDENCE INDICATORS FROM 1970 TO 1987 IN TAIWAN.

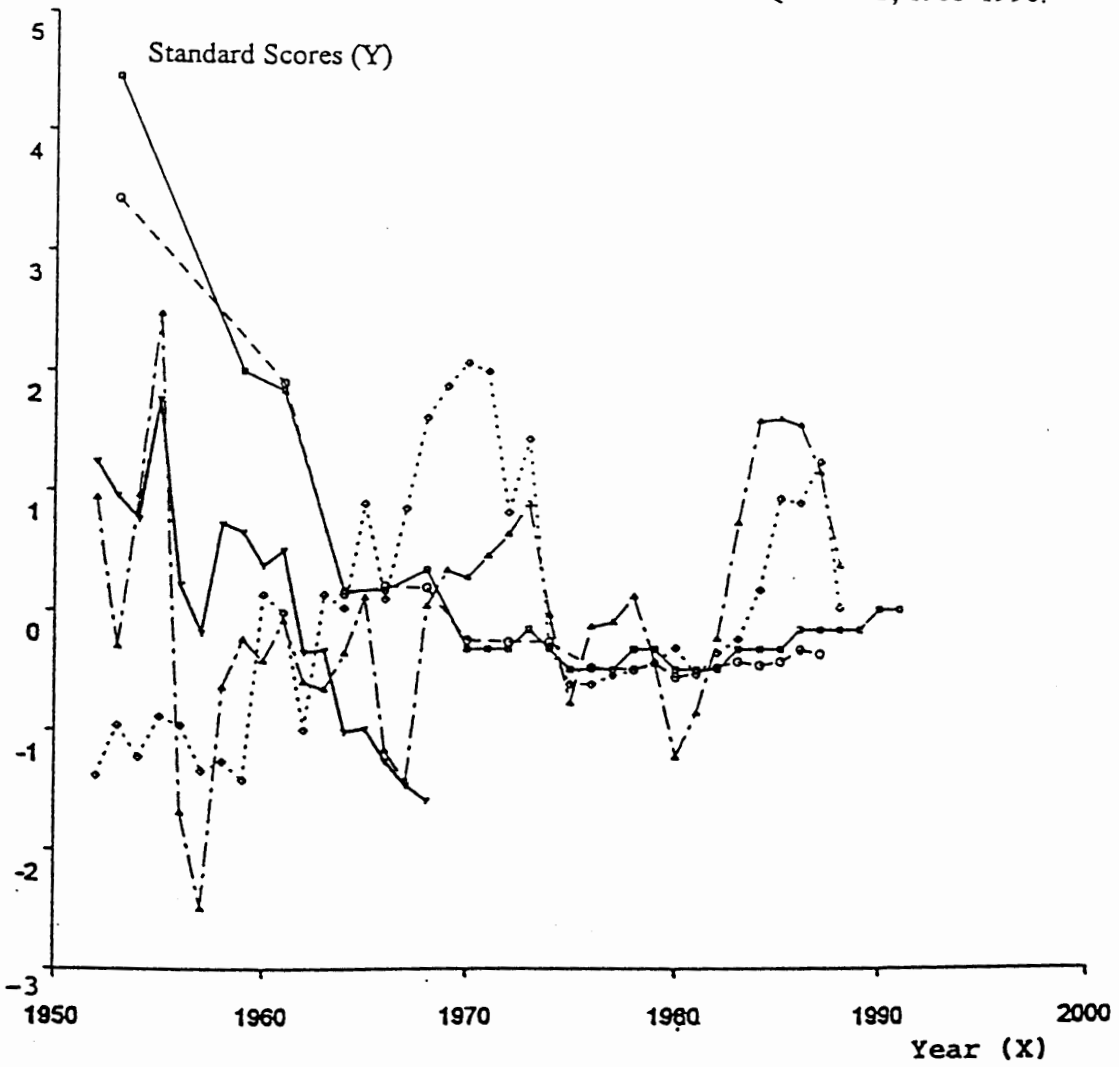
Indicators of Income Inequality	1970	1980	1987
Gini coefficient	.29	.28	.30
Income shared by the highest quintile (%)	38.7	36.8	38.0
Dependency Indicators			
Foreign investment as a share of gross domestic capital formation (%)	9.6	3.3	7.4
Percent of export to the US and Japan	52.7	45.1	57.1
Net flows of foreign capital as a share of gross domestic capital formation (%)	0.9	3.9	-99.0
US aid as a share of gross domestic capital formation	*	*	*

*No further economic aid commitments were made to Taiwan after 1967 (Barrett and Whyte 1982).
Source: (see Appendix data source 1, 16, 17)

Figure 3.4 displays the changes in the standardized variables from 1950 to 1990. After 1970, the Gini coefficient and income shared by the highest quintile almost leveled off and percent of exports to the U. S . and Japan fluctuated around zero standard deviation. Foreign investment first declined significantly in the 1970s and increased significantly in the 1980s, but declined at the end of 1980s.

In sum, during the forty year period only U. S. aid had a positive relation with income inequality. Other dependency indicators fluctuated during the study period, and their relationships with income inequality were not clear. Foreign aid in the 1950s and early 1960s helped the recovery of the economy and at the same time income inequality improved significantly. But if one looks closely at changes in the U. S. aid and income inequality, the relationships between the foreign aid and income inequality are positive. This result fits to the prediction of dependency theory. In the 1950s the flows of foreign capital consisted of US aid, in the form of grants. It did not hold stocks in Taiwan. In fact, America had little established investment or market stake in Taiwan and only at a comparatively late stage did US policy evolve a concern with fostering American private investment in Taiwan (Schreiber, 1970). According to Bornschier et al. (1978), flows of direct foreign aid have had the short-term effect of increasing the relative rate of economic growth of countries. This U. S. aid was really helpful for the economy in that time. This also fits the dependency argument. With economic growth, income inequality improved at the same time.

FIGURE 3.4 CHANGES IN STANDARDIZED VARIABLES: DEPENDENCE INDICATORS AND INEQUALITY, 1953-1990.



▽ U.S. aid as percent of gross domestic capital formation.

△ Percent of export to U.S. and Japan.

◇ Foreign investment as percent of gross domestic capital formation.

○ Income shared by the highest quintile

□ Gini coefficient.

Source: (see Appendix data source 1, 16, 17)

Other Social Factors and Income Inequality

In the following sections, social factors are discussed. These factors include education, natural increase of population, population under age 15, savings, export, and employment. First, the changes in education, population growth, and population structure (age under 15) are discussed. The changes in savings, exports, and employment are discussed in the next section.

As early as 1848 John Stuart Mill predicted that the diffusion of education would lead to a decrease in inequality. One of Ahluwalia's (Lecaillon et al., 1984:11) most important conclusions is that the distribution of incomes depends partly on variables on which socioeconomic policy can exercise an influence--for example, the level of education and the rate of population growth. According to his estimates, an increase from 250 to 500 dollars in income per capita gives rise to a reduction from 12 to 10 percent in the share of total income accruing to the poorest 40 percent; it would be possible, however, to take countervailing measures to augment that share, which, for example, increases by 3.4 percentage points when the literacy rate is increased from 40 to 100 percent and by 1.7 percentage points when the annual rate of population growth is reduced from 3 to 1.5 percent.

The demographic transition and educational expansion from 1953 to 1970 is displayed on Table 3.7. Although some education was available to the people when the island was under Japanese occupation it was usually limited to the primary level (Kuo et al., 1981). Advanced education was rare and almost always limited to medical science.

TABLE 3.7 CHANGES IN SOCIAL FACTORS AND INCOME INEQUALITY FROM 1953 TO 1970 IN TAIWAN.

Indicators of Income Inequality	1953	1961	1966	1970
Gini coefficient	.58	.42	.32	.29
Income shared by the highest quintile (%)	61.4	52.0	41.5	38.7
Social Factors				
Percent of population with secondary education	10.4	14.9	18.3	30.2
Natural increase rate of population (per 1000)	35.8	31.6	26.9	22.3
Percent of population under age 15	42.6*	45.9	44.0	39.7

*1952 data
Source: (see Appendix data source 1, 2, 6, 7)

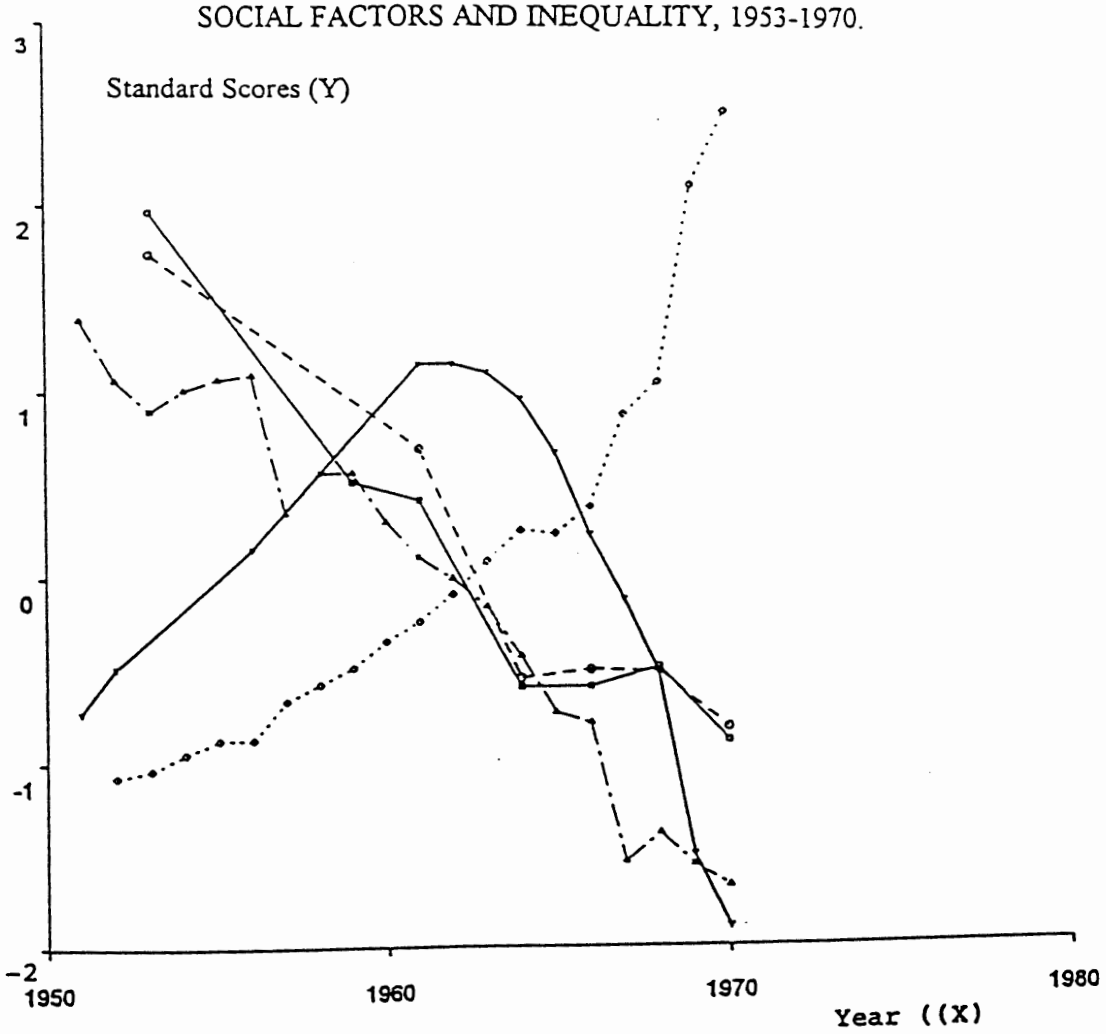
After Taiwan was restored to Chinese sovereignty, the government of the Republic of China made an effort to promote education. Not only was a large portion of government money spent on education, but equal opportunity for education was also emphasized. As result, the level and rate of education increased gradually and greatly. Six-year public education was universal. The illiteracy rate of persons 6 years old and older decreased from 55 percent in 1946 to 28.9 in 1959. The percent of the population with secondary education increased from 10.4 percent in 1953 to 14.9 percent in 1961. College students as a percentage of population increased from .12 percent to .32 percent in 1960. In this period the primary focus of the government was elementary education. The expansion in secondary education was moderate and the expansion in college education was minor. Demographically, the period between post war and 1960 was characterized by a high rate of population growth. The natural increase rate of population occurred rapidly from 20 per 1000 in 1947 to around 35 percent per 1000 in the 1950s. This pattern can be found in several other countries. Due to World War II the percent of population under age 15 increased from 40 percent in 1930 to 43.32 in 1946. In the 1950s due to the high birth rate and the already low death rate, the percent of population under age 15 increased further from 42.6 percent to 45.9 percent by 1961. In the same period, the Gini coefficient declined from .58 in 1953 to .42 in 1961 and income shared by top quintile decline from 61.4 percent in 1953 to 52 percent in 1961.

In the 1960s, the illiteracy rate of persons 6 years old and older decreased further from 28.9 percent in 1959 to 14.7 percent in 1970. The percent of population with secondary education increased dramatically from 14.9 percent in 1961 to 30.2 percent in

1970. This result was due to general improvements in the economic condition and to the fact that military personnel were included in population statistics in 1969. College student as percentage of population increased from .32 percent in 1960 to 1.39 percent in 1970. In 1968 nine years of education was made compulsory. In sum, the 1960s was the period of promotion of junior high education and secondary education also expanded rapidly. After the so called "baby boom" period, in the 1960s the natural rate of population increase began to slow. The rate declined from 31.6 per thousand in 1961 to 22.3 per thousand by 1970. At the same time, the percent of population under age 15 declined from 45.9 percent in 1961 to 39.7 percent in 1970. Income inequality kept declining as well. The Gini coefficient declined from .42 in 1961 to .29 in 1970 and income shared by the highest quintile declined from 52 percent in 1961 to 38.7 percent in 1970.

Figure 3.5 displays changes of standardized variables in this section. The Gini coefficient and income shared by the highest quintile declined gradually and significantly. Population with secondary education expanded significantly, and the natural rate of population growth at first declined slowly and then dropped rapidly. The percentage of population under age 15 first increased rapidly and dropped dramatically in the second decade. In these two decades, the expansion of education had a negative relation with income inequality, but the relations between demographic factors and income inequality were mixed. The natural rate of population growth declined slightly in the 1950s and declined significantly in the second decade, and income inequality declined significantly in both decades. In sum, the population growth had a moderate positive relation with income inequality. In terms of population structure, the population under age 15

FIGURE 3.5 CHANGES IN STANDARDIZED VARIABLES: SOCIAL FACTORS AND INEQUALITY, 1953-1970.



——— ▽ Percent of population under age 15.

– – – △ Natural increase rate of population..

..... ◇ Percent of population with secondary education.

——— ○ Income shared by the highest quintile

——— □ Gini coefficient.

Source: (see Appendix data source 1, 2, 6, 7)

increased slightly in the first decade and declined slightly in the second decade. Comparing this change to changes in income inequality, the relation between population under age 15 and income inequality was both negative and positive at different times.

Comparing the findings to the theoretical argument and some cross-sectional studies, first, expansion of education had a negative relation with income inequality. This was consistent with theoretical argument and the conclusion drawn by Nielsen (1994) and Simpson (1990). Secondly, demographically the outcome was somewhat different from the theoretical argument and the findings of Bollen and Jackman (1985) and Ahluwalia (1976). Population growth had a slightly positive relation with income inequality in the 1950s and it had a stronger positive relation with income inequality in the 1960s, which was consistent with theoretical prediction and the cross-sectional findings. But the percentage of population under age 15 had a negative relation with income inequality in the 1950s. This was different from theoretical prediction. In theoretical argument and cross-sectional studies, scholars emphasize that the percent of dependency (population under age 15) has a positive effect on income inequality, but in Taiwan's study the dependency population expanded in the 1950s and revolved around 44 percent of total population and only declined slightly at the end of 1960s. Why did not the increase worsen income inequality in Taiwan? Economists offer possible explanations. One is that in the 1950s and 1960s the productivity in agriculture improved significantly and this improvement was partly due to the young unpaid labor force in agriculture. Further, in early 1960s the policy of export promotion encouraged the establishment of manufacturing organizations that were very labor intensive, and part of the young labor

force plunged into these manufactures. In sum, part of the dependency population was not like the prediction, because much of this population was not really dependent ! On the contrary they were helpful to the economy and increased the income of their families.

Table 3.8 displays changes in social factors and income inequality from 1970 to 1990. In the 1970s and the first half of 1980s, income inequality leveled off and only in the late 1980s worsened a little. In addition, the illiteracy rate of persons 6 years old and older declined from 14.7 percent in 1970 to 7.4 percent in 1988. Due to the extension of public education to nine years, the percent of primary school graduates enrolling in junior high school increased from 78.6 percent in 1970 to 99.1 in 1988. The percent of the population with secondary education increased almost at the same speed as in previous decade. It increased from 30.2 percent in 1970 to 54.3 percent in 1987. The natural rate of population growth declined moderately from 22.3 per thousand to 18.6 per thousand in the 1970s and declined more rapidly from 18.6 per thousand to 11.4 per thousand in the 1980s. Finally, the percent of population under age 15 declined moderately from 39.7 percent to 27.1 percent over the two decades. In sum, during these two decades, there was no relation between the social factors and income inequality.

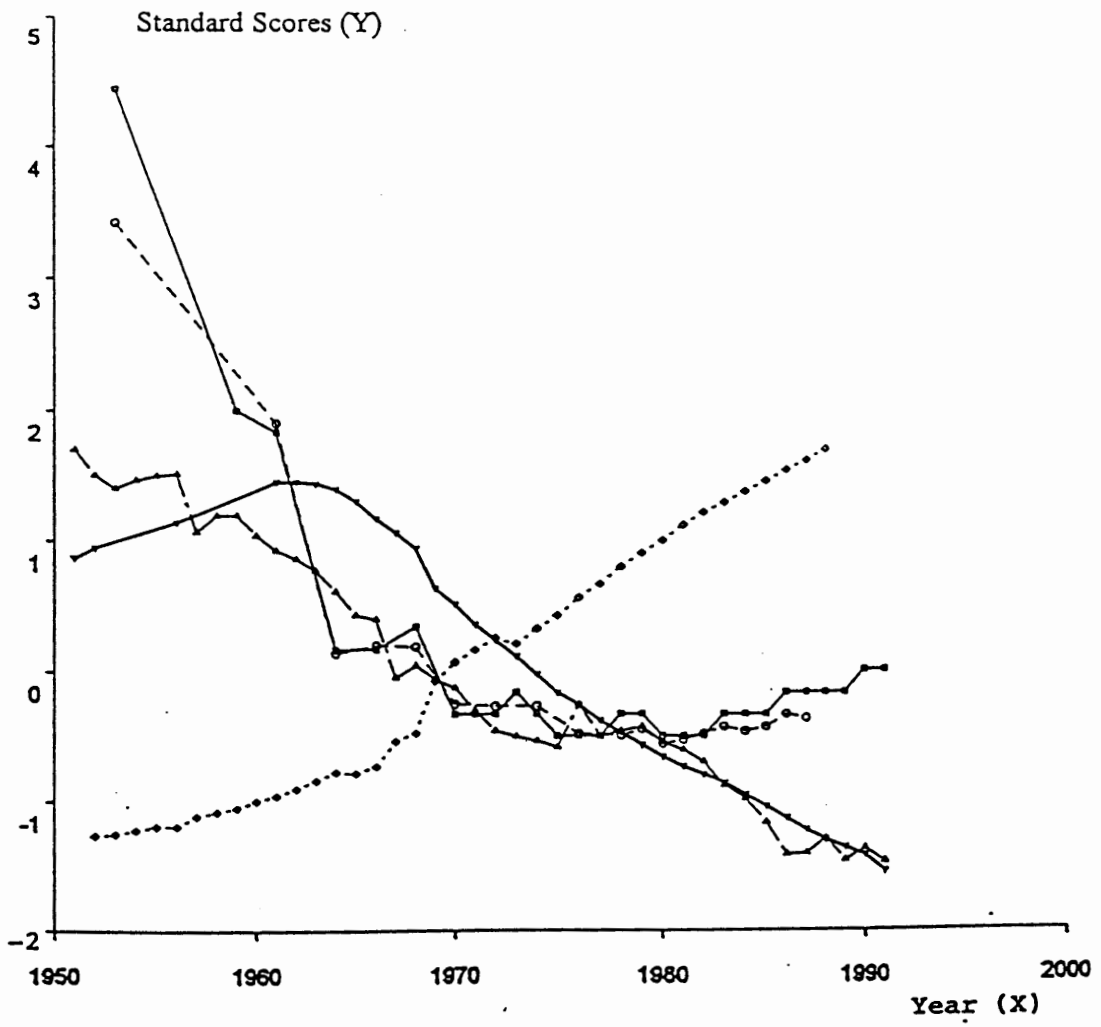
Figure 3.6 displays changes in the standardized variables by year. After 1970 the percent of population with secondary education kept increasing and the percent of population under age 15 kept declining, but income (both Gini coefficient and income shared by top quintile) differentials leveled off. Only in the second half of the 1980s did the natural increase rate of population also level off. That is, after the mid 1980s income

TABLE 3.8 CHANGES IN SOCIAL FACTORS AND INCOME INEQUALITY FROM 1970 TO 1990 IN TAIWAN.

Indicators of Income Inequality	1970	1976	1980	1990
Gini coefficient	.29	.28	.28	.31
Income shared by the highest quintile (%)	38.7	37.3	36.	38.0*
Social Factors				
Percent of population with secondary education	30.2	37.5	44.0	54.3**
Natural increase rate of population (per 1000)	22.3	21.2	18.6	11.4
Percent of population under age 15	39.7	34.7	32.1	27.1

*1987 data
**1988 data
Source: (see Appendix data source 1, 2, 6, 7)

FIGURE 3.6 CHANGES IN STANDARDIZED VARIABLES: SOCIAL FACTORS AND INEQUALITY, 1953-1990.



▽ Percent of population under age 15.

△ Natural increase rate of population..

◇ Percent of population with secondary education.

○ Income shared by the highest quintile

□ Gini coefficient.

Source: (see Appendix data source 1, 2, 6, 7)

inequality did not change and population had an exponential growth rate, but this did not show any effect on income inequality.

Exports, Savings, and Employment

In aspects of economic development, political democratization, and income improvement, Taiwan's case is unusual among developing countries. Scholars have tried to point to some special factors to explain these anomalous. In discussing income inequality, they point to factors like land reform, tax policy, size of companies, exports, savings, and employment to account for changes in income distribution. In the 1970s and early 1980s, studies concentrated on land reform and tax policy (Kuo et al., 1979; 1981; Ho, 1978). In the 1980s, studies concentrated on business size. Some studies were done by one of Taiwan's institutions, Zhonghua Zhengxinso, and also by some foreign institutions, such as the International Center for Economic Growth in the U. S. Some results of the above studies supported their argument that those factors had an effect on income inequality. For example, land reform improved the income of farmers and income inequality declined at the same time (Kuo et al., 1979). Taxation redistributed income and also improved income inequality. Table 3.9 displays the effect of direct taxation on the Gini coefficient (Kuo et al., 1981: 140). In the aspect of business size, in the 1980s the top four Korean enterprise groups (chaebol) controlled around 45 percent of the GNP. In Japan economy was dominated by large, powerful, and relatively stable enterprise groups (Hamilton and Biggart, 1988). According to Scitovsky (Lau, 1990: 152), between 1960 and 1973 Japan's ten largest general trading companies handled half of its exports and

TABLE 3.9 GINI COEFFICIENTS OF INCOME DISTRIBUTION BEFORE AND AFTER DIRECT TAXES FROM 1964 TO 1976 IN TAIWAN.

	1964	1968	1972	1976
Gini Coefficient Before Direct Taxes	.3282	.3348	.2953	.2894
Gini Coefficient After Direct Taxes	.3275	.3309	.2912	.2845
Ratio of Gini Coefficient Before Tax to Gini Coefficient After Tax	1.002	1.012	1.014	1.017

Sources: Department of Budget, Accounting and Statistics, Taiwan Provincial Government, Report on the Survey of Family Income and Expenditure, Taiwan Province, Republic of China; Bureau of Budget, Accounting and Statistics, Taipei City Government, Report on the Survey of Family Income and Expenditure and Personal Income Distribution of Taipei City, various years.

almost two-thirds of its imports. But in Taiwan the five largest business groups (jituanquye) only contributed 5.5 percent of the gross national product in the early 1980s (Hamilton and Biggart, 1988). The largest 100 business groups contributed 29.5 percent of GNP in 1974 and 31.7 percent of GNP in 1983 (Hamilton and Biggart, 1988). Scitovsky (Lau, 1990: 10) emphasizes that the small businesses in Taiwan played a significant role in reducing income inequality. Nevertheless, this study centers on exports, savings, and employment.

In the late 1940s due to the ruin wrought by World War II and the delay of the Civil War in China, there was a great shortage of goods for everyday sustenance. In this period and early 1950s trade balance was always in a deficit. For example, the trade balance in 1952 was negative 71 million US dollars. In the worst year (1954) it was negative 118 million US dollars. Like other developing countries, at this time government policy concentrated on import substitution. The government tried to reduce or control the deficit in trade balance. In the 1950s. growth in imports was significant. At the same time, growth in exports was also significant, especially in the agricultural sector. In the whole decade exports as a percentage of GNP increased around 3 percent, from 8.6 percent in 1953 to 11.2 percent in 1961. Table 3.10 displays changes in income inequality and in exports, savings, and unemployment from 1953 to 1970.

In the 1950s the changes in savings were affected by the several factors. First, due to post-war high inflation, the old currency was devalued to the point that 40,000 dollars of old currency was equal to only one new currency, a policy that was put into effect on June 15, 1949. Secondly, high inflation in the period made both banks and individuals to

TABLE 3.10 CHANGES IN SPECIAL SOCIAL FACTORS AND INCOME INEQUALITY FROM 1953 TO 1970 IN TAIWAN.

Indicators of Income Inequality	1953	1961	1966	1970
Gini coefficient	.58	.42	.32	.29
Income shared by the highest quintile (%)	61.4	52.0	41.5	38.7
Special Social Factors				
Export as percentage of GNP	8.6	11.2	17.0	26.2
Savings as percentage of GNP	8.9	12.8	21.5	25.5
Unemployment (%)	4.4	4.3	3.1	1.7

Source: (see Appendix data source 1, 18, 19, 20)

be interested only in short-term savings deposits. Even if the yearly interest rate for one-year time deposits was 20 percent, and the interest rate was seven percent per month, the interest rate was still below the inflation rate in the early 1950s. In the second half of the 1950s inflation was controlled, but the interest rate was too low to attract substantial amounts of long-term deposits. For example, the interest rate for deposits of three months' duration was 0.85 percent in 1957. The result was that a cumulating savings was hard in the 1950s, especially in the early 1950s, and the contribution of savings to domestic investment was minor. In sum, savings as percentage of GNP only increased slightly from 8.9 percent in 1953 to 12.8 percent in 1961.

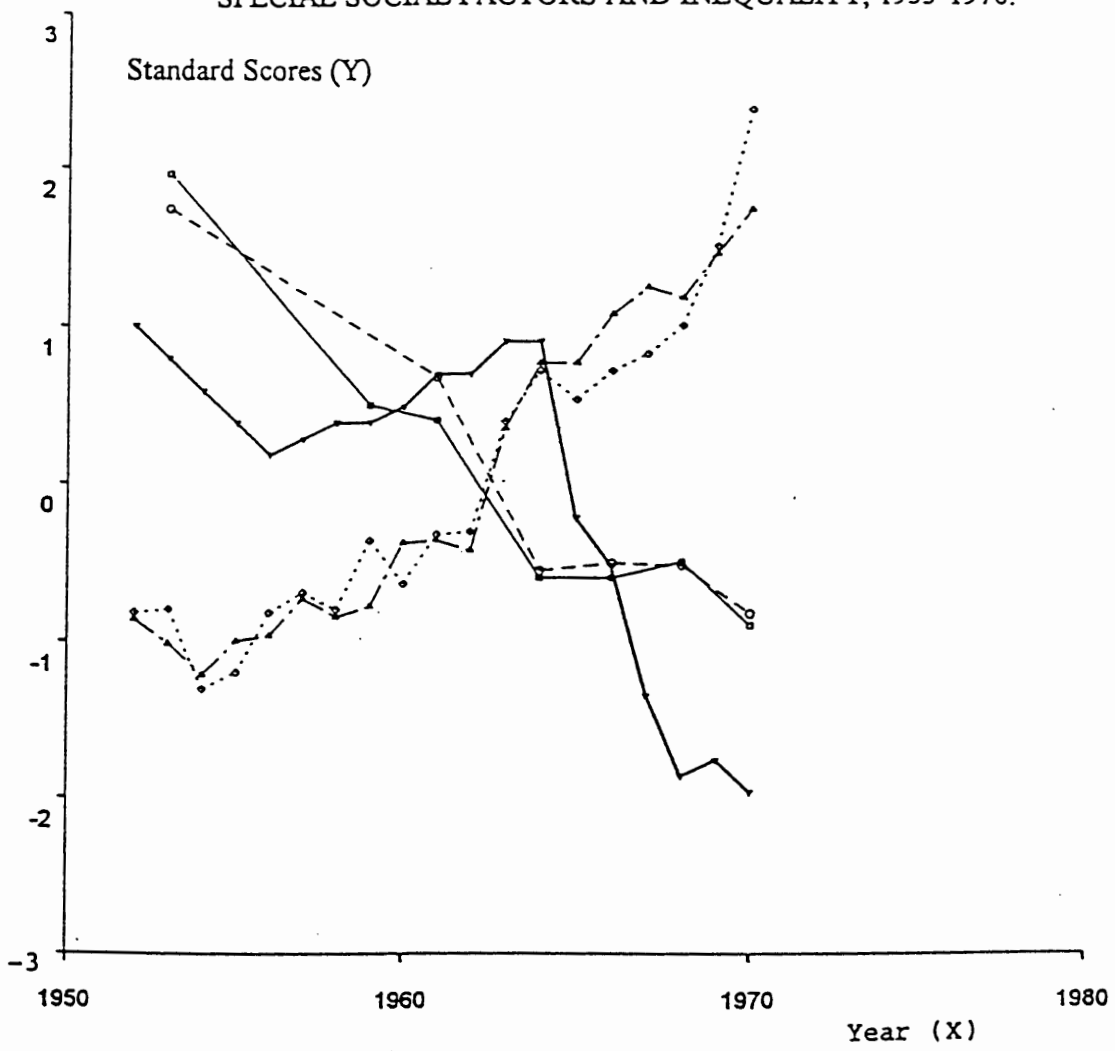
In the 1950s, government policy and foreign aid both concentrated on the agricultural sector and import substitution industries. In the early 1950s the percent of the labor force in agriculture was more than 55 percent. The agricultural population was 4.3 million in 1952. The growing agricultural population made unemployment decline from more than 6.5 percent in the late of 1940s to 4.4 percent by 1953. In the rest of the 1950s, unemployment was around 4 percent.

In the 1960s, the policy of export promotion and the establishment of export processing zones in 1966 made exports increase rapidly. Myers (Lau, 1990:30) argued that during the 1960s and 1970s the demand for manufactured goods in Japan and the West rapidly expanded and for every one percent rise in per capita income in Japan and the West, there was an even larger percentage increase in demand for Taiwan's manufactured goods. Many Taiwanese goods were inexpensive and their quality was improving. Exports as percentage of GNP increased dramatically from 11.2 percent in

1961 to 26.2 percent in 1970. Savings as a proportion of GNP skyrocketed from 12.8 percent in 1961 to 21.5 percent in 1966 to 25.5 percent in 1970. Almost half the investment before 1962 was financed by US aid and almost no private foreign capital flowed into Taiwan before 1961. The situation changed dramatically in the 1960s. The increased domestic savings were augmented by Taiwan's successful economic development, stimulation and management of foreign investment, and other social factors. For example, there was the popularity of opening small businesses, a cultural emphasis on family advancement, the very low social-security safety net, limited consumer credit, the widespread use of bonus payments, policy incentives regarding tax and interest rates, and a loosening of controls over loans to private business (Myers, 1984; Chan and Clark, 1992). There was a rapid expansion of labor-intensive light manufacturing, particularly in food processing, textiles, and electrical machinery industries. The expansion attracted the surplus of labor force in the 1960s. Unemployment declined rapidly from 4.3 percent in 1961 to 1.7 percent in 1970.

The period of the 1950s and 1960s was the crucial time for improvement in income inequality. Comparing the changes in income inequality and changes in these special social factors, in the 1950s the relationship was only slight. But when these social factors were associated with economic growth in the second decade, the relationship became strong. Figure 3.7 displays changes in standardized variables during the 1950s and 1960s. In the 1950s, the Gini coefficient and income shared by the highest quintile declined significantly. from around two standard deviations to less than one standard deviation. On the other hand, unemployment declined significantly but increased a little at

FIGURE 3.7 CHANGES IN STANDARDIZED VARIABLES:
SPECIAL SOCIAL FACTORS AND INEQUALITY, 1953-1970.



▽ Unemployment.

△ Savings as percentage of GNP.

◇ Export as percentage of GNP.

o Income shared by the highest quintile.

□ Gini coefficient.

Source: (see Appendix data source 1, 18, 19, 20)

the end of the decade. Both exports as a percentage of GNP and savings as a percentage of GNP only increased slightly. In the 1960s, both the Gini coefficient and income shared by the highest quintile declined significantly from around 1.5 standard deviations to around negative 1 standard deviation. On the other hand, unemployment increased a little in the beginning of the 1960s but declined significantly in the rest of the decade. Both exports as a percentage of GNP and savings as a percentage of GNP increased significantly from around .5 negative standard deviation to around 2 standard deviations. In sum, the data support the argument that in the 1950s the relation was only slight, but in the 1960s the relation was strong.

Table 3.11 displays changes in these factors and income inequality from 1970 to 1988. First, exports as percentage of GNP grew at almost the same speed as last decade. They increased from 26.2 percent to 50.5 percent in the 1988. In these two decades the value of exports in U. S. dollars increased by 24 percent annually and real exports increased by 15 percent annually. These increases were the result of the export-promotion policy, which consisted of preferential tax treatment and credit subsidies, rebates of customs duties for re-exported intermediate goods and raw materials, and maintenance of an appropriate exchange rate (Lau, 1990). Secondly, savings as a percentage of GNP also grew significantly from 25.5 percent in 1970 to 34.9 percent in 1988. Especially in the 1970s, it grew faster than in the 1980s. With the rapid increase in real GNP per capita in these two decades, savings rose as well. Rapid economic growth generated more savings and more firms were able to reinvest earnings and supplement their financial requirements by short-term borrowing from the banks or private moneylenders. The personal savings

TABLE 3.11 CHANGES IN SPECIAL SOCIAL FACTORS AND INCOME INEQUALITY FROM 1970 TO 1988 IN TAIWAN.

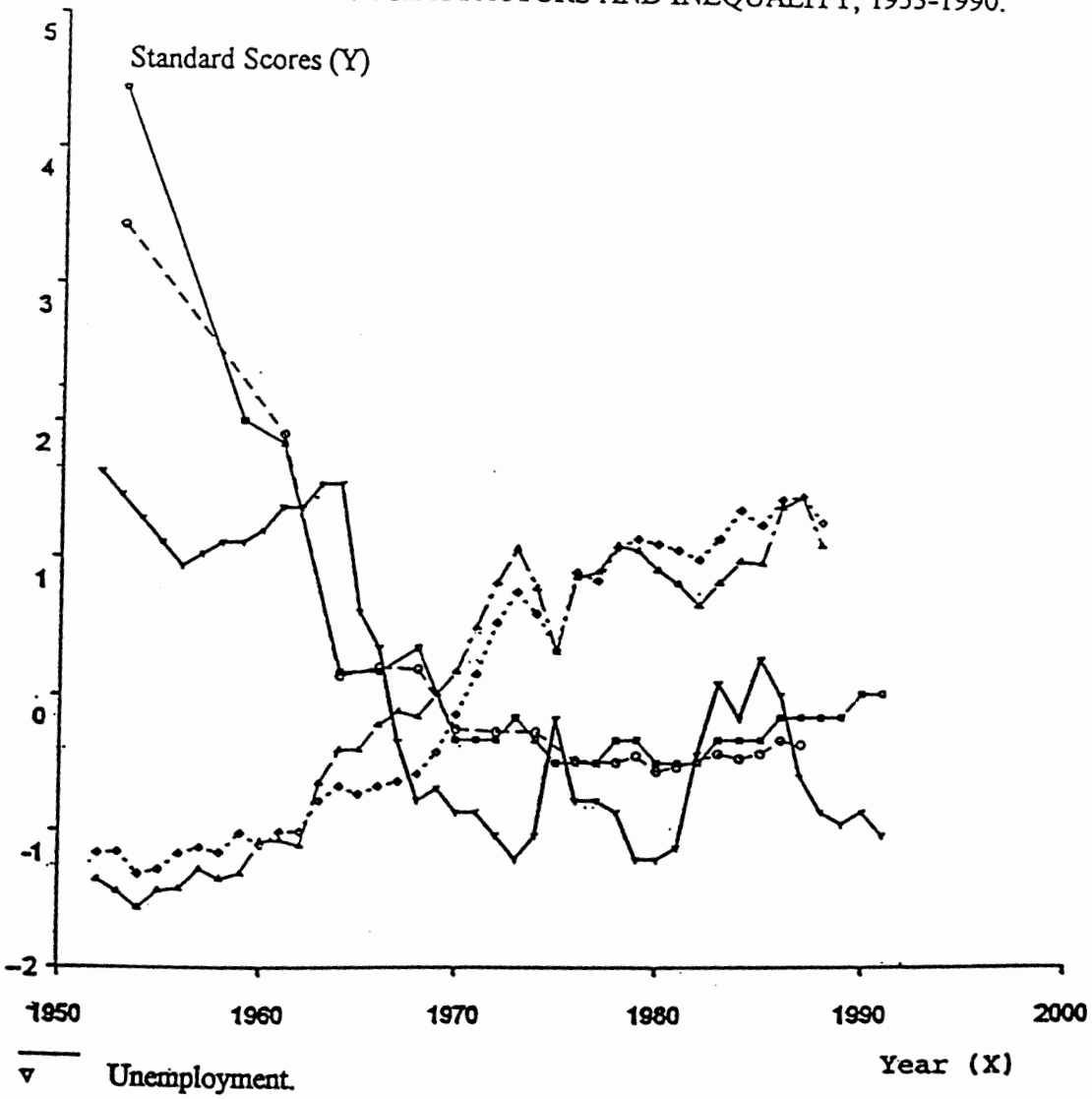
Indicators of Income Inequality	1970	1976	1980	1988
Gini coefficient	.29	.28	.28	.30
Income shared by the highest quintile (%)	38.7	37.3	36.8	38.0*
Special Social Factors				
Export as percentage of GNP	26.2	44.1	47.8	50.5
Savings as percentage of GNP	25.5	32.5	33.0	34.9
Unemployment (%)	1.7	1.8	1.3	1.7

*1987 data
Source: (see Appendix data source 1, 18, 19, 20)

rate reached more than 30 percent of disposable income during this period, which increased from 3 percent in 1952 and 21 percent in 1980. In addition the non-bank financial sector grew extremely rapidly, partly because of the rapid growth in domestic savings. As a result, some financial crises occurred in late 1980s and early 1990s. Also there was a savings-investment gap in the late 1980s. In the 1980s, traditional industries were no longer attractive candidates for new investment and many entrepreneurs were reluctant to venture into new and unfamiliar industries because of real and perceived risk. They were faced with the uncertain exchange rate and political uncertainties created by the illness and death of the President Chiang Ching-kuo. Environmental and labor disputes further contributed to the uncertain business climate. The result was that domestic investment remained stagnant and gross national savings far exceeded gross domestic investment. Thirdly, in these two decades, unemployment fluctuated around 1.6 percent. In this period unemployment was low and stable, except in the early 1980s. The rise in unemployment in the early 1980s was because of the effects of the second oil shock and relative depression in the same period. Yet unemployment was low in most of these two decades because of the expansion of the labor-intense manufacturing after the 1960s and the proliferation of small and medium-size manufacturing firms and services establishments.

In sum, in the 1970s and 1980s, the further increases in savings and exports was not associated with further improvement in income inequality. The fluctuation of unemployment also did not show any obvious relation with income inequality. Figure 3.8 displays changes in these social factors and in income inequality during the whole study

FIGURE 3.8 CHANGES IN STANDARDIZED VARIABLES: SPECIAL SOCIAL FACTORS AND INEQUALITY, 1953-1990.



▽ Unemployment.

△ Savings as percentage of GNP.

◇ Export as percentage of GNP.

○ Income shared by the highest quintile.

□ Gini coefficient.

Source: (see Appendix data source 1, 18, 19, 20)

period. After 1970, both savings and exports as a percentage of GNP first increased rapidly, declined a little, and then increased more slowly over the rest of the period. In the 1970s and 1 1980s unemployment fluctuated under zero standard deviation, except in the early to mid 1980s. The data also show no obvious relation between these social factors and income inequality after 1970. There are some other interesting points displayed by the figure. After 1970, income inequality leveled off at a low level and at the same time unemployment fluctuated at low level. In the four decades the pattern of changes in unemployment was similar to that in income inequality. After the early 1960s both exports as percent of GNP and savings as percent of GNP fluctuated at high levels and only increased a little while at the same time income inequality leveled off at a low level and only increased a little at the end of the last decade. In other words, after the early 1970s, all exports as percent of GNP, savings as percent of GNP, and income inequality only changed within a narrow degree.

CHAPTER IV

CONCLUSIONS

The major purpose of this study was to examine the factors used in most crossnational studies to explain income inequality (based on theoretical arguments) to see how these factors fit Taiwan. Table 4.1 summarizes the findings in this study. Like other single case studies, the results drawn from this study can not be generalized to other cases. But some important findings still have to be emphasized and discussed further.

First, while the inverted U-shape hypothesis is applicable to most developed nations and some developing countries (like Puerto Rico), evidence drawn from the experience of Taiwan is less than clear-cut. This is partly due to the lack of data for the 1940s and because of the relatively imprecise data for the 1950s. Data for the 1950s came from two small sampling surveys and two other surveys that contained information only on farm family incomes. To decide whether changes in income inequality in Taiwan fit the inverted U-shape argument the period of the 1940s and the early 1950s is crucial. A sophisticated observer of Asian agricultural conditions made the following observations following a two-week trip through the west coast rural part of Taiwan in September 1949:

> Of all the farmyards I have seen in the Far East, Southeast Asia, and in the Middle East, that of the average Taiwanese tenant is among the worst, both in appearance and in equipment. Tenants' huts, so-called barnyards, equipment, and livestock, as well as their health point to nothing but poverty (Ladejinsky, 1977:98).

TABLE 4.1 SUMMARY OF FINDINGS IN THE STUDY OF TAIWAN'S EXPERIENCE.

Variables	Relations to Income Inequality 1953-1970	1971-1990
GNP per capita and energy consumption per capita	negative	none
Percent of labor force in agriculture	positive	none
Sector dualism coefficient	none	none
Political democracy	none	none
Export dependence	none	none
Foreign investment	none	none
US aid	positive	-
Education	negative	none
Population growth	positive	none
Population under age 15	none	none
Savings and export growth	negative	none
Unemployment	positive	none

Per capita production in Taiwan's agricultural sector did not surpass peak 1938 levels until after 1960 (Barrett and Whyte, 1982; Ho, 1966). That is, production reached a peak in 1938 and declined radically until 1950. However, it rose rapidly throughout the 1950s and 1960s. These two statements indicate that changes in income were radical in the 1940s and the early 1950s, especially in the agricultural sector.

Secondly, it is obvious that economic development had an effect on income inequality in Taiwan, and that the level of development was crucial. In the 1 1950s and 1 1960s, the relationships between economic development and income inequality were significant, especially in the 1960s, but in the next two decades economic development did not improve income inequality further. According to World Development Report (1985), in the early 1980s Taiwan's income equality was in the top tenth among the measured 86 countries. It was only less equality than some East European communist countries. It was hard to improve income inequality further. Another important finding drawn from sector dualism is that, unlike the theoretical argument that economic development increases the gap between the productivity of the labor force in the agricultural sector and that in other modern sectors, the productivity of the labor force in agriculture increased as well as that of other sectors. From 1950 to 1964 the labor force in agriculture increased 33 percent, and at the same time the real net domestic product (NDP) from agriculture increased by about 80 percent (Kuo et al., 1979:47). From 1953 to 1968 labor productivity in agriculture increased 3.6 percent per year, and labor productivity in the industrial and services sectors increased 7.5 percent per year and 4.1 percent per year, respectively (Kuo et al., 1981: 18). In the next decade labor productivity in these three

sectors increased almost at a same rate (around 4.3 percent per year). Also in the 1950s the improvement of income in the agricultural sector was the most important contributor to changes in income inequality in Taiwan. In the 1950s, both government policy and foreign aid concentrated on the recovery and development of agriculture. A series of land reform policies, the commitment of around 40 percent of U. S. aid spent on agricultural programs, promotion exports of agricultural products, and price manipulation of agricultural products all contributed to improve income in the agricultural sector. By increasing productivity and income in the agricultural sector while at the same time fostering growth in other sectors, Taiwan did not create the income disparity found in most situations and predicted by most theories of development. In the 1960s, however, the major contribution to the improvement of income inequality was ascribed to the expansion of labor-intense manufacturing. The growth of the agricultural sector during the 1950s used up the arable land. The 1960s' labor-intense manufacturing attracted the rural surplus labor force into this sector. This had two results. One was that the economy kept growing, even growing at a faster speed. The other was that due to the reduction of the labor force in agriculture, the productivity of that labor force kept increasing, even at the same rate as in other modern sectors. These two made income inequality improve further.

Thirdly, it is obvious that democratization did not have a significant effect on income inequality in Taiwan during the study period. But the important thing drawn from the study is that the stable political environment and the endeavor of the government to keep society stable was crucial to both economic development and improvement in income

inequality. During the study period the KMT government implemented a series of policies to meet the goal of stability. For example, it released control of local government, allowed the election of local and provincial assemblies, expanded the central political elites to include the Taiwanese, maintained free and competitive markets and led people to concentrate on economic activities, allowed people to form nonpolitical organizations and periodicals. But the significant changes in political environment in the 1970s and 1980s did not improve income inequality.

Fourthly, foreign capital and export dependence did not retard economic development or worsen income inequality in Taiwan. According to dependency theory a peripheral position and dependence on core countries will retard economic growth. In some Latin American countries growth was retarded by an estimated 3 to 4 percent per year. But Taiwan's economy grew at 9 percent per year and income inequality improved at the same time. Taiwan depended heavily on exports to the US and Japan, but the changes in the export dependence were not significant over the most study period. Thus, the relation between the export dependence and income inequality was not clear. The influence of foreign capital in Taiwan did not contradict the argument of world-system/dependence theorists. In the 1 950s a huge amount of foreign aid was granted, and it did not involve holding stocks in Taiwan. After the 1960s foreign investment increased rapidly, but still only contributed less than 10 percent of the total domestic capital formation each year and was especially concentrated in some export zones. The situation in Taiwan is not like other developing countries that have high penetration of foreign capital.

Fifthly, the expansion of education had a negative relation with income inequality. According to Taiwan's experience, the most important thing was the spread of primary school education and junior high school education. However, in the last three decades, Taiwan's secondary education concentrated on occupational training. These "vocational schools" allowed many people to enter the labor force and also improved the income of the laborers. In the late 1 980s, the establishment of new colleges was allowed, and in the early 1990s, the government allowed some "vocational" institutions to upgrade to colleges. These two policies have made college enrollment expand rapidly, but this expansion had no effect on the improvement of income inequality so far.

Sixthly, the theoretically-predicted relation between population growth and between population structure and income inequality was not totally supported in Taiwan's experience. There were two reasons. One was the success in agricultural reformation and the enhancement of productivity of the labor force in agriculture. The other was the expansion of labor intensive manufacturing. The population increased rapidly creating a surplus of labor force and a high dependency population which first went into agriculture in the 1950s and later went into manufacturing in the 1960s and thereafter.

Seventhly, the export-led growth and export expansion and savings expansion had an important influence on economic development. Like the relation between economic development and income inequality, the relation between the expansion of exports and savings and income inequality was stronger in 1960s than in 1950s.

Eighthly, only unemployment had almost the same change pattern as income inequality. Except in the early 1960s, unemployment declined significantly in the 1950s

and 1960s and after 1970 it fluctuated at a low level (1.7 percent). Unemployment had a positive relation with income inequality and after 1970 the low unemployment rate helped to maintain the income inequality at a low level in the 1 1970s and 1 1980s. On the other hand female employment did not have a significant relation with income inequality. According to available data, in 1962 the percent of female employment was 27.45 and it only increased slightly to 30.51 percent in 1970. After 1970, it still increased slowly around 3 percent each decade. In 1991, it was 37.5 percent.

Finally, in the late 1980s and early 1990s income inequality worsened slightly. It still was at the lowest level (Gini .31) among countries in the world. However, due to radical changes in economic structure, the political environment, and other social indicators--for example, the rising proportion of female-headed households, and families with one or no child--income inequality is predicted to increase further in the near future. The pattern may parallel the recent experiences of some developed countries. For example, in the U. S. income inequality declined during 1930s to 1950s, and for the next two decades was characterized by a "curious stability," but the last two decades have been characterized by a resurgence of income inequality in American society. This has been enough to be called the "great U-turn" by Harrison and Bluestone (1988). A similar upswing in inequality has been documented in Canada, Sweden, Australia, and West Germany (Green et al., 1992).

Unstandardized Data

Year	Income shared by the highest quintile %	Gini coefficient	Population with secondary education %	Agriculture as % of NDP	% of labor force in agriculture	Natural increase rate of population (per 1000)	% of population under age 15
1951						38.4	42.1
1952			10.2	36.	56.	36.7	42.6
1953	61.4	.576	10.4	38.3	55.4	35.8	
1954			10.9	31.7	54.8	36.4	
1955			11.3	32.9	54	36.7	
1956			11.3	31.6	53.1	36.8	43.9
1957			12.5	31.8	52.2	32.9	
1958			13.	31.1	51.3	34.	
1959		.44	13.5	30.5	50.8	34.	
1960			14.3	32.9	50.	32.6	
1961	52	.42	14.9	31.6	49.2	31.6	45.9
1962			15.7	29.4	48.9	31.	45.9
1963			16.7	26.8	48.	30.2	45.8
1964	41.1	.32	17.6	28.3	47.1	28.8	45.5
1965			17.5	27.4	46.1	27.2	44.9
1966	41.5	.32	18.3	26.3	44.2	26.9	44.
1967			21.1	23.9	42.	23.	43.3
1968	41.4	.33	22.1	22.1	40.	23.8	42.5
1969			28.	18.9	38.	22.9	40.5
1970	38.	.29	30.2	18.	35.8	22.3	39.7
1971		.29	31.6	14.9	34.8	20.8	38.7
1972	38.6	.29	32.9	14.2	33.6	19.4	37.9
1973		.30	32.2	14.1	32.3	19.	37.1
1974	38.6	.29	33.9	14.5	31.3	18.7	36.2
1975		.28	35.4	14.9	30.	18.3	35.3
1976	37.3	.28	37.5	13.4	28.	21.2	34.7
1977		.28	39.1	12.5	25.9	19.	33.9
1978	37.2	.29	41.	11.3	24.	19.4	33.3
1979	37.5	.29	42.6	10.4	22.1	19.7	32.7
1980	36.8	.28	44.	9.2	20.	18.6	32.1
1981	37	.28	45.8	8.7		18.1	31.6
1982	37.3	.28	47.2	9.2		17.3	31.2
1983	37.6	.29	48.4	8.8		15.7	30.8
1984	37.4	.29	49.6	7.6		14.8	30.2
1985	37.6	.29	50.8	6.9		13.2	29.6
1986	38.2	.30	52.	6.5		11.	29.
1987	38	.30	53.1	6.3		11.1	28.4
1988		.30	54.3	6.1	12.7	12.1	27.9
1989		.30				10.6	27.5
1990		.31				11.4	27.1
1991		.31				10.5	26.3

Year	Energy consumption (liter oil equivalent per person)	GNP per capita (at 1981 NTS price)	Foreign investment as % of GDCF	% of export to US and Japan	US aid as % of GDCF	Unemployment	Savings as % of GNP	Export as % of GNP
1951								
1952		17155	.5	56.1	45.5	4.6	9.8	8.5
1953		18160	1.6	49.8	41.	4.4	8.9	8.6
1954		19214	.9	56.2	37.9	4.2	7.7	5.8
1955		20014	1.8	63.9	53.8	4.	9.	6.4
1956		20377	1.6	42.8	29.2	3.8	9.2	8.5
1957		21188	.6	38.7	22.8	3.9	10.6	9.2
1958		21870	.8	48.1	37.3	4.	9.9	8.6
1959		22812	.4	50.1	36.2	4.	10.3	11.
1960		23524	4.5	49.2	31.8	4.1	12.7	9.5
1961		24356	4.1	50.9	33.8	4.3	12.8	11.2
1962	379.2	25508	1.5	48.3	20.2	4.3	12.4	11.3
1963	383.	27089	4.5	48.	20.5	4.5	17.1	15.2
1964	421.9	29549	4.2	49.5	9.7	4.5	19.6	17.
1965	453.2	31892	6.5	51.9	10.1	3.4	19.6	16
1966	499.	33826	4.4	45.4	5.8	3.1	21.5	17
1967	534.4	36495	6.4	44.1	2.6	2.3	22.5	17.6
1968	604.9	38887	8.4	51.5	.6	1.8	22.1	18.6
1969	643.9	41460	9.1	53.	-	1.9	23.8	21.4
1970	689.2	45198	9.6	52.7		1.7	25.5	26.2
1971	751.3	50050	9.4	53.6		1.7	28.8	31.3
1972	852.8	55708	6.3	54.5		1.5	32.1	37.8
1973	936.3	61668	7.9	55.8		1.3	34.6	41.6
1974	925.	61262	3.3	51.1		1.5	31.7	38.9
1975	1007.5	62797	2.5	47.4		2.5	26.9	34.4
1976	1180.4	69964	2.5	50.6		1.8	32.5	44.1
1977	1256.9	75604	2.7	50.8		1.8	32.9	43.1
1978	1456.3	84610	2.8	51.9		1.7	34.9	47.4
1979	1550.	90005	3.	49.1		1.3	34.5	48.4
1980	1620.1	94580	3.3	45.1		1.3	33.	47.8
1981	1526.5	98179	2.7	47.		1.4	32.	47.
1982	1528.1	99687	3.2	50.1		2.2	30.4	45.8
1983	1666.7	105893	3.5	55.		2.8	32.1	48.5
1984	1753.	115356	4.6	59.3		2.5	33.7	52.1
1985	1800.4	119606	6.6	59.4		3.	33.5	50.2
1986	1944.1	132019	6.5	59.1		2.7	37.8	53.5
1987	2072.8	146111	7.4	57.1		2.	38.5	53.9
1988	2270.1	155168	4.2	53.2		1.7	34.9	50.5
1989	2396.5					1.6		
1990	2507.1					1.7		
1991	2657.2					1.5		

APPENDIX

Data Sources:

1. Quintile income distribution and Gini coefficients refer to the following:

   a. Gini coefficients of the years of 1952 and 1959 refer to Shirley W.Y. Kuo, "Income distribution by size in Taiwan area--changes and causes," in Income Distribution, Employment, and Economic Development in Southeast and East Asia 2 Vols, Tokyo: Japan Economic Research Center, 1975.
   b. The quintile income distribution in the years of 1953, 1961, and 1964, and the Gini coefficient of the year of 1964 refer to Steve Chan and Cal Clark, 1992, Flexibility, Foresight, and Fortuna in Taiwn's Development, p. 163, New York: Routledge.
   c. Quintile income distribution and Gini coefficients, 1966-87, refer to Council for Economic Planning and Development (1989). Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development.
   d. The Gini coefficients of the years 1971, 1973, 1975,1977, 1989-91 refer to "National Income in Taiwan Area, R.O.C.", and "Report on the Survey of Personal Income Distribution in Taiwan Area, R.O.C." by Directorate General of Budget, Accounting and Statistics, Executive Yuan.
   e. The Gini coefficient of the year of 1961 is calculated by this study based on quintile income distribution. The formula is accorded to DGBAS's formula as the following.

      Gini = 1/n times sum of (Yj - Yi), where Yj is larger than or equal to Yi
      Yj = Yi / sum of Yi, and Yi is the disposable income of the ith household.

2. Percent of population with secondary education refers to Council for Economic Planning and Development (1989). The year 1969 and after is affected by including military personnel in population statistics. Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development.
3. Agriculture as percentage of net domestic product (NDP) refers to Council for Economic Planning and Development (1989). Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development.
4. Agriculture as percentage of gross domestic product (GDP) refers to National Income in Taiwan Area, R.O.C., by Directorate-General of Budget, Accounting and Statistics, Executive Yuan, and Social Indicators in Taiwan Area of the Republic of China 1991, Taipei: Directorate-General of Budget, Accounting and Statistics.
5. Percent of labor force in agriculture 1952-1980 refers to Council for Economic Planning and Development, Executive Yuan, Republic of China, Directorate-General of budget, Accounting and Statistics, Taiwan Statistical Data Book 1983. The year of 1988 is calculated from the Survey Report of Labor Force, Directorate-General of Budget, Accounting and Statistics (DGBAS,1988).

6. Natural increase rate of population refers to Taiwan Population Studies Center Demographic Reference: Taiwan, Republic of China, 1965, Vols. 1 and 2; Directorate-General of Budget, Accounting and Statistics, Statistical Abstract of the Republic of China, various issues. The years of 1962 to 1991 refer to Taiwan-Fukien Demographic Fact Book, R.O.C., by the Ministry of the Interior. The natural increase rate of population is equal to (birth-death)/estimate for midyear population.
7. Percent of the population under age 15 refers to Taiwan-Fukien Demographic Fact Book, R.O.C., by the Ministry of the Interior, and Social Indicators in Taiwan Area of the Republic of China, 1991.Taipei: Directorate-General of Budget, Accounting, and Statistics.
8. Energy consumption per capita (liter oil equivalent per person) refers to Monthly Statistics of Energy, Energy Indictors Quarterly, Taiwan Area, R.O.C., and Taiwan Energy Statistics, all by Energy Commission, Ministry of Economic Affairs.
9. GNP per capita (at 1981 NT$ price) refers to Council for Economic Planning and Development (1989). Taiwan Statistical Data Book, 1989. Taipei Council for Economic Planning and Development.
10. Indices of political and civil rights refer to Gastil, R. D. various years. "The comparative survey of freedom." Freedom at Issue (Jan./Feb.). Indices of political and civil rights, in scales on which 1 represents full freedom and 7 maximum authoritarian controls.
    Explanation:

    a. The political rights index is coded annually by Raymond D. Gastil and published by Freedom House. Political rights involve the right to play a part in determining who will govern one's countries and what the laws will be. Countries are coded with scores ranging from 1 (highest degree of liberty) to 7 (lowest degree of liberty), as follows:

        1) Political systems in which the great majority of persons of families has both the right and the opportunity to participate in the electoral process. Political parties may be freely formed for the purpose of making the right to compete for public office fairly general.
        2) Political systems with an open process, which does not always work well, however, due to extreme poverty, a feudal social structure, violence, or other limitations on potential participants or results. As is the case with countries code 1, a leader or party can be voted out of office.
        3) Political system in which people may elect their leaders or representatives, but in which coups d'etat, large-scale interference with election results, and often nondemocratic procedures occur.
        4) Political systems in which full democratic elections are blocked constitutionally or have little significance in determining power distributions.
        5) Political systems in which elections are either closely controlled or limited, or in which the results have little significance.

6) Political systems without elections or with elections involving only a single list of candidates in which voting is largely a matter of demonstrating support for the system. Nevertheless, there is some distribution of political power.
7) Political systems that are tyrannies without legitimacy either in tradition or in international party doctrine.

b. The civil rights index is coded annually by Raymond D. Gastil and published by Freedom House. Civil rights are those rights the individual has vis a vis the state. Particularly important are the freedom of the press and the other media and the independence of the judiciary. Countries are coded with scores ranging from 1 (greatest civil liberty) to 7 (least civil liberty), as follows:

1) Political systems in which the rule of law is unshaken. Freedom of expression is both possible and evident in a variety of news media.
2) Political systems that aspire to the above level of civil rights but are unable to achieve it because of violence, ignorance, or unavailability of the media, or because they have restrictive laws that seem to be greater than are needed for maintaining order.
3) Political systems that have the trappings of civil liberty and whose governments may be successfully opposed in the courts, although they may be threatened or have unresolvable political deadlocks and may have to rely often upon martial law, jailing for sedition, and suppression of publications.
4) Political systems in which there are broad areas of freedom but also broad areas of illegality. States recently emerging from a revolutionary situation or in transition from traditional society may easily fall into this category.
5) Political systems in which civil rights are often denied but in which there is no doctrine on which the denial is based. The media are often weak, controlled by the government, and censored.
6) Political systems in which no civil rights are thought to take priority over the rights of the state, although criticism is allowed to be stated in limited ways.
7) Political systems of which the outside world never hears criticism, except when it is condemned by the state. Citizens have no rights in relation to the state.

11. The number of newspapers and periodicals, the number of civic organizations, and the members of civic organizations refer to Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development 1989.
12. The percentage of candidates elected to the Provincial Assembly refers to Social Indicators in Taiwan Area of the Republic of China, 1988. Taipei: Directorate-General of Budget, Accounting, and Statistics (1989).
13. KMT's share of the Provincial Assembly votes and seats refers to Lui, F. L. (1989) "Ballot power" Free China Review 39:12, 9-15.
14. Political demonstrations, strikes, riots, deaths from political violence, government sanctions, and political executions refer to Taylor, C. L. and D. A. Jodice 1983. World Handbook of Political and Social Indicators, 3rd edn. New Haven, Conn.: Yale University Press.

a. A government sanction is an action taken by the authorities to neutralize, suppress, or eliminate a perceived threat to the security of the government, the regime, or the state itself. The sanction events include censorship of individual or institutions, general restrictions on political activity, and other restrictions on social and political behavior. Censorship includes actions by authorities to limit, curb, or intimidate the mass media, including newspapers, magazines, books, radio, and television. Restrictions on political behavior include general restrictive measures by the authorities, such as the declaring of martial law, mobilizing troops for domestic security, and instituting a curfew. The example for restrictions on political behavior is that one or more foreigners are arrested or detained on charges of spying, sabotage, or unlawful interference in the domestic politics of the state, constituting a perceived threat to internal security. Reports of crackdowns against organized crime or drives by the police to reduce crime in the streets were not included.
b. A political execution is an event in which a person or group is put to death under orders of the national authorities while in their custody. Typically, a political execution is one in which the person executed in charged with activities threatening the security of the state, the regime, the government, or the leadership. Excluded are assassinations and persons killed in riots, armed attacks, strikes, and the like. Also excluded are executions for criminal offenses, such as murder.

15. Bollen's political democracy index refers to Bollen, Kenneth A. (1980) "Issues in the comparative measurement of political democracy" American Sociological Review Vol. 45:370-90.

a. Six components consist of the index, press freedom, freedom of group opposition, government sanctions, fairness of elections, executive selection, and legislative selection. The range of the scale, from 0 to 100, is arbitrary. The 0 point does not represent the lowest degree of political democracy possible, nor does 100 represent complete equality. Further reductions or increases in political democracy are possible for those countries at or near the end points. The countries which score near 100 still have political power concentrated in an elite, and generally the elite underrepresents females and minorities of the country. Limited though it may be, the nonelite in countries that score near the bottom of the index still have some political power.
b. The index of Political democracy is designed to measure popular sovereignty (as represented in electoral processes) and political liberties. It does not consider political stability, voter turnout, socialist party strength, or labor union strength in its construction.
c. It must be remembered that these are observed scores and not true scores. Small different between countries on the index do not necessarily mean that actual level of political democracy differs. For example, in 1965 Sudan scores 37.9 and Togo scores 45.5. This does not mean that the true political democracy score of Togo

is greater than Sudan. Due to measurement error, each true score gives rise to a number of different observed score. So it is possible that Suden and Togo have the same true score even though their observed scores differ. Of course, the greater the distance between observed scores, the more likely two countries' true scores differ.

d. The Gastil's index is a seven scale index. When it is translated into 100 scale index, each scale is equal to 14.29. In this study, the Bollen's index for Taiwan in 1965 is equal to 22.8. When the 22.8 is divided by 14.29, the result is equal to 1.60. Due to the directions of the Gastil's and Bollen's are different, the 1.60 is equal to 5.4 in the Gastil's index (7-1.60 = 5.4).

16. Foreign investment, the percentage of export to U.S. and Japan, and net capital flows into Taiwan as a percentage of total investment refers to Taiwan Statistical Data Book, 1987 and 1989. Taipei: Council for Economic Planning and Development (1987 and 1989).
17. Data of US aid refer to Chan and Clark 1992 Flexibility, Foresight, and Fortuna in Taiwan's Development, p. 173. New York: Routledge.
18. Employment and Unemployment:

    a. Unemployment, 1952-1988, refers to Council for Economic Planning and Development (1989). Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development. p. 13 for the number of people in the labor force and actually employed, and for 1989 to 1991 refers to Yearbook of manpower Statistics, Taiwan Area, R.O.C., by Directorate-General of Budget, Accounting, and Statistics (DGBAS), Executive Yuan.
    b. Employment, female employment, and employment by industry , 1962-1991, refer to Social Indicators in Taiwan Area of the Republic of China, 1991, Taipei: Directorate-General of Budget, Accounting, and Statistics, and Yearbook of Manpower Survey Statistics, Taiwan Area, R.O.C." by Directorate-General of Budget, Accounting and Statistics, Executive Yuan.

19. The savings as percentage of GNP refers to Council for Economic Planning and Development (1989). Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development.
20. The export as percentage of GNP refers to Council for Economic Planning and Development (1989), Taiwan Statistical Data Book, 1989. Taipei: Council for Economic Planning and Development.

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