INCOME INEQUALITY, KUZNETS CURVES, AND GROWTH WITH A SPECIAL EMPHASIS ON THAILAND

by

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Final Project for the MA in Economics
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Chapter 1

Introduction

Introduction

The relationship between economic growth and income inequality has been long debated. It was increasing income inequality that first inspired theories on growth and their effects via the industrial revolution. Frederich Engels led the way in 1845 with his commentary on the deplorable conditions of the working class in England. Before industrialization swept across Europe, Engels stated, “the workers enjoyed a comfortable and peaceful existence...Their standard of living was much better than that of the factory worker today. They were not forced to work excessive hours [and] most of them were strong, well built people” (quoted in Williamson, 1991, p. 5-6). Karl Marx carried on the case against capitalist accumulation in Das Kapital: “the greater the social wealth, the functioning capital, the extent and energy of its growth...the greater is the industrial reserve army ... and the greater is official pauperism” (quoted in Williamson, 1991, p. 6).

Capitalism’s apologists and defenders ran to the call for explanations and so theories on the effects of industrialization on income began to emerge in the post industrial revolution years. From this has come many ideas on inequality’s position in the growth models of neoclassical economics and endogenous growth theories. The issues involved are very relevant today in parts of the world where growth rates are surpassing any historical precedent while inequality continues to grow. Increasing inequality in mature economies like the United States are also evident. Nevertheless, the exact role that inequality plays in growth is still unclear but, generally, two hypothesis have emerged. The first is that industrialization breeds
inequality. The second is that inequality fosters accumulation and thus industrialization through investment from savings. The difference is in causality.

Up until recently, it has been the belief that inequality did foster accumulation and more rapid industrialization, a view guided by the belief that the national product could not be raised if the poor were given a larger share because redistribution from rich to poor reduces the surplus available for accumulation (Williamson, 1991, p. 7).

Adam Smith first held the view of a trade-off between growth and equity which spawned from the belief that national product could not be raised while giving a larger share of income to the poor. The theory rests on the idea that redistributive policies would diminish savings and result in a loss of investment. In the 1950s and 1960s many felt that a shift in the distribution of income was a necessary prelude to economic development. Simon Kuznets (1955) presented evidence that the United States and Britain experienced an initial increase in income inequality followed by a decrease in income inequality during the years of the industrial revolution and shortly after. Even today, we hear, mostly among politicians, that scarce domestic savings are the cause of productivity slowdown in the US and elsewhere. Welfare programs that work to alleviate poverty and redistribute income among income groups take much of the blame in these arguments against slow growth (Williamson, 1991, p. 67-68).

However, the Smithian trade-off paradigm didn’t hold true for many of the developing nations in South East Asia that found growth could be enhanced by raising the value of the poor’s assets through investments in public healthcare, mass education, rural infrastructure projects, and staple foods (Williamson, 1991, p.68). This sparked a renewed interest in the relationship between growth and income distribution which produced literature on augmented
growth theories and also on policy implications, market distortions, and new measures for human capital in order to better understand how increases in national income are distributed and how that distribution enhances or neglects more income growth.

**Purpose of the Paper**

The purpose of this paper comes in three parts; first, to better understand the way economists measure inequality through ratios like the Gini coefficient and to shed some light on the limitations of such measures; second, to compare the trend in income inequality and growth among developing nations and to put those trends in perspective through a comparison with the United States and Britain; and finally, to suggest how differences, as in the case of Thailand, might be explained by economic theory.

**Limitations**

In most studies of income distribution, the aspect of income distribution under consideration is relative income inequality. The Gini coefficient is one way of measuring relative income inequality. It is not a measure of absolute income or absolute poverty, something entirely different and sometimes more revealing than relative inequality. Social welfare judgments are made according to which approach is taken. Absolute income or absolute poverty focus on the income of everyone and how incomes of the poor and rich have changed in absolute terms. The implicit welfare judgment is that more income is preferred to less and that a dollar of income accruing to a poor person adds more social welfare than a dollar accruing to a rich person. Relative measures of inequality focus on shifts in total income from rich to poor or vice versa. Value in this case is placed on the desirability of
incomes accruing to persons at different positions in the income distribution. Although the Gini coefficient may rise in a country and therefore indicate increased relative inequality, it could be that absolute poverty has been reduced and therefore the shift of income shares from rich to poor is justified on social welfare grounds where the number of poor is the measure of welfare.¹

This paper focuses on the Gini coefficient for relative measures of inequality in order to understand how national income is distributed and how that distribution changes during economic development. In this way, very little can be said about absolute poverty in the countries examined. Nevertheless, there are important implications for increasing inequality as seen in countries, like Thailand, where high growth rates have resulted in an increasing share of income going to a small percentage of the population.

Overview

Chapter 2 will cover the literature on growth theory and its evolution to include some measure of the effects of income distribution. Chapter 3 will cover measures of income inequality using Gini coefficients. Some of the data for Thailand will be revealed in this chapter. Chapter 4 is an analysis of the data on gini coefficients and GDP per capita for developing countries in a comparison with the US and UK. Chapter 5 will conclude by attempting to answer some questions on why Thailand is not following a Kuznets curve during its development and why this is important.

¹ See Gary S. Fields, 1980, chapter 2, for a detailed discussion.
Chapter 2
Inequality and Growth

The Kuznets curve

Although the preoccupation of economists with the relationship between inequality and growth originated with Engels and Marx, it wasn't until the work of Simon Kuznets (1955) that modern research looked for a formal connection. Kuznets advanced the idea that as a country's national income grows, inequality will initially increase. After a country reaches some threshold level of income, however, inequality begins to fall and the country moves towards a more egalitarian distribution. Hence, the evolution of the distribution of income follows an inverted U-curve.

The hypothesis of the Kuznets curve is based on economic theories of development that explain growth as a process by which the working population moved from agriculture to a more productive industrial sector. The higher productivity of labor in the industrial sector meant higher wages for those workers. Over time, a larger fraction of the population would be located in those sectors with higher productivity than agriculture and therefore income distribution would eventually become more egalitarian. The major offset to the widening of income inequality associated with the shift from agriculture to industry or rural to urban, was a rise in the income share of the lower groups within the nonagricultural sector of the population. The lower income groups within the urban sector grew relative to the sector as a whole. Income inequality within the urban sector is greater than income inequality within the agricultural sector, thus an initial increase in income inequality for the whole country in the
initial stages of development. According to Kuznets, "once the early turbulent phases of industrialization and urbanization had passed, a variety of forces converged to bolster the economic position of the lower-income groups within the urban population" (p. 17). Once this increasing portion of the urban population was "native", i.e., born in the cities rather than newly immigrated from the rural areas, inequality decreased due to the advantage of this group in securing income shares by the best means within the city. Also, in democratic societies, the political power of the lower income groups led to a variety of legislature supporting redistribution and other means for securing shares of the nation's income (p. 17).

Support for Kuznets' theory came soon after in studies that mapped out cross-sectional data across countries. The evidence showed a Kuznets curve did indeed exist for the now developed countries over the period of industrialization. Ahluwalia (1976) explains his findings as "a reflection of a wider access to productive employment opportunities in the expanding nontraditional sector and a correspondingly lower pressure of population on the rural areas. Both forces can be expected to operate in favor of the lower income groups" (p. 320).

The Kuznets theory assumes that income distribution is endogenous, explained by the theory as an outcome of the development process. Growth, on the other hand, is treated as exogenous and therefore not affected by income distribution. This implies causality in the Kuznets process from growth to income distribution only. Therefore, although one can justify redistributive policies on the basis of equity considerations, redistribution cannot be said to increase growth (Chang, p. 2; see also Greenwood and Jovanovic, 1990 for discussion of counter-arguments to the direction of causality).
There are two well known problems with the original empirical data of the Kuznets hypothesis. One is that the conclusions of the hypothesis rely on cross-sectional rather than time-series data to explain historical trends over time. This leads to inferences about the process of development by viewing countries at different stages of development. Second, the data is made up of Western developed countries and the results are often applied to non-Western nations that are developing under a very different setting. Finally, causal inspection suggests much more variation in relative inequality within countries grouped by GDP per capita than between them. In essence, the level of income is an imprecise predictor of income inequality in a comparison across countries (Fields, p. 67; see Anand & Kanbur, 1993 for a recent discussion on the Kuznets process).

To disprove the inevitability of increasing inequality in the development process, Gary S. Fields (1980) used multiple regression analysis to determine the relationship between income and inequality. The results indicate that income distribution does not have to get worse before it gets better. His conclusion is that the inverted U is avoidable (p. 68-70).

The problems with the empirical evidence of the Kuznets curve had discouraged many economists from further examining development and equity in the 1970’s. Also, the tendency of economists to focus on the short-run fluctuations in growth through business cycles ignored the long-run implications of the Kuznets curve until recently (Barro and Sala-I-Martin, p. 12). Paul Romer (1986) and Robert E. Lucas (1988) helped turn attention to long-run growth. Through the use of dynamic macroeconomics it was discovered that cross-country data yield a significant relation between inequality and long-run growth of income. In this case, however, assumptions about causality can go either way.
Long-Run Growth and Human Capital

Economists began to think about long-run growth models in the 1950’s following Robert Solow’s (1956) work on a model that attempted to explain why poor countries as a group are not catching up to rich countries. The work of Solow and others on the problem of cross-country convergence contributed to the refinement of the theory which has become known as neoclassical growth theory. The theory relies on two very important assumptions; 1) that technological change is exogenous; and 2) that the same technological opportunities are available in all countries of the world (perfect competition). In other words, advances in the long-run growth path are the result of advances in technology which occur as a result of forces that impinge from outside. Technology grows at different rates in different countries through a country’s given growth accounting residual (Romer 1994, p. 3). The standard production function employed in neoclassical growth models is

$$ Y = Ae^{\alpha t}K^\alpha L^{1-\alpha} $$

where

$Y = \text{GDP}$

$K = \text{the stock of human and physical capital}$

$L = \text{unskilled labor}$

$\alpha = \text{a constant reflecting the technological starting point of society}$

$e^\infty = \text{the exogenous rate at which technology, } A, \text{ evolves}$

(Solow 1956)

Within this formula, $\alpha$ indicates the percentage increase in gross domestic product resulting from a 1% increase in capital. This assumes that capital is paid its private marginal
product and that it confers to no external economies. This formulation displays diminishing returns to capital and labor as long as \( \alpha \) is less than 1 (Pack, pp. 55-56).

In the neoclassical model, growth in per capita income occurs through \( \nu \), the annual rate of productivity improvement. This can be interpreted as improvements in knowledge such as organizational routines, rearrangements of the flow of material in a factory, better management of inventory, or other changes that do not require knowledge to be embodied in new equipment. Determinants of \( \nu \) are left unexplained within the model (Pack, pp. 55-56). This assumes that technological progress occurs in an exogenous manner. This implies a positive, possibly constant, per capita growth rate in the long run, while retaining the neoclassical prediction of conditional convergence. Conditional convergence exists because the steady-state levels of capital and output per worker depend on the saving rate, growth rate of population, the position of the production function-characteristics, and other variables that may vary across economies. The obvious short coming of a model that attempts to explain long-run growth is that the long-run per capita growth rate is determined by an element, technological progress, that is outside the model (Barro et al, pp. 10-11).

From the above explanation, neoclassical theory can be viewed as implying convergence across countries in either growth rates or income levels. Poorer countries will initially exhibit lower capital-labor ratios, which implies a higher marginal product of capital. Eventually, poorer economies will exhibit higher rates of growth in capital stock until convergence is reached in capital-labor and capital-output ratios between rich and poor countries (Pack, p. 63).

In contrast to neoclassical growth theory, endogenous growth theory implies the possibility of sustained differences in both levels of and rates of growth of national income.
Diminishing returns to human and physical capital do not occur because of the externalities or the productivity gains obtained from the availability of specialized inputs made possible through research. Convergence, therefore, will not necessarily occur (Pack, p. 63).

Unsatisfied with the neoclassical way of thinking about convergence and competition, Robert Lucas (1988) and Paul Romer (1986) attempted to uncover the private and public sector choices that cause the rate of growth of the residual to vary across countries. The focus of endogenous growth theory is to account for forces within the economy that account for growth. In simple terms, differences in growth are the result of research and design efforts that are instigated by market forces and spillover effects. Therefore, technological opportunities vary across regions and there is no perfect competition. The rate at which countries converge in per capita income is dependent on resources put into technological advancement through research and design. Increases in investment of this nature increases output per worker which in turn increases income which in turn increases the rate of investment (Romer 1994, p. 7-8).

**R&D and Human Capital**

In endogenous growth theory, the importance of research and design in the development process cannot be overemphasized. Paul Romer (1990) continues the debate over perfect competition with an explanation of how nonrival inputs like a chemical process, a chip design, a mechanical drawing, or a metallurgical formula are at least partially excludable and therefore intentionally produced by profit maximizing firms. ¹

¹ An input is excludable if someone with a property right can exclude others from using it. The initial cost of producing a nonrival input is fixed, and therefore increasing returns (“nonconvexities”) and declining long-run average cost can occur in the production process. If the nonrival input is excludable through patents, a
The story that Romer is telling is one in which firms are participating in research and design in order to produce better or newer products that can be protected from being produced by other firms. On an aggregate level, it can be seen that two identical economies with only rival inputs, developed in isolation, would not gain from opening trade with each other. But with nonrival inputs they can gain from specializing in research and trading the products so developed. This leads to greater efficiency in the resources committed to research (p. 101; also see Romer, 1990b).

However, this reduction in research redundancy through opening of trade only applies to like economies. When one country has a higher ratio of skilled human capital to raw labor, opening trade will also affect the relative price of human capital and labor. Reductions in incentives to produce nonrival inputs through research can occur if an abundant supply of cheap labor exists (see Romer 1989; Grossman and Helpman 1989). According to Romer, for a country like the United States, increased trade with Mexico might slow down the rate of growth even if increased trade with Europe or Canada would speed it up (p. 101). Romer (1989) argues that there is evidence for a negative effect of labor growth on technological change. Higher rates of labor force growth are associated with lower rates of productivity growth in the United States over time and across counties in general (Romer 1990, p. 101).  

Robert Lucas (1990) points out some of the problems of the neoclassical approach to growth and the implications of these problems. The theory assumes several things 1) a

---

1 Since evidence suggests a high private and social rate of return on research, more resources should be devoted to it. Basic research is often not excludable, but Japan is a case in point as it spends considerable more on commercial research that generates excludable benefits than does the United States (Romer 1990, 101).
constant return to scale production function; 2) homogenous capital and labor inputs; and 3) production per worker changes with capital per worker. Under these assumptions, the Law of Diminishing Returns implies that the marginal product of capital is higher in the less productive economy. If trade is assumed free and competitive, new investment will occur only in the less productive economy and this will continue until capital-labor ratios, and hence wages and capital returns, equalize (p. 92).

Lucas compares the predicted marginal product of capital, MPK, for the U.S. and India using a standard neoclassical growth model with the two countries producing an identical good with homogenous capital and labor inputs (land and natural resources which are very different between the two countries are ignored). Using the findings of Summers and Heston (1988) that production per person in the United States is about 15 times that in India.³

Lucas feels that the neoclassical assumptions must be “drastically wrong.” He has four candidates to replace them: 1) non-homogenous labor; 2) external benefits of human capital; 3) political risk inhibiting; and 4) monopsony power over the general level of wage rates.

³ Lucas assumes an average U.S. and India capital share of β = 0.4. Lucas solves the production function

\[ y = A x^\lambda \]

where \( y = \text{income per worker} \)
\[ x = \text{capital per worker} \]

Solving for the marginal product of capital, \( r \), gives us:

\[ r = A \lambda x^\lambda - 1 \quad \text{in terms of capital per worker, and:} \]
\[ r = \beta A \lambda / (\lambda - 1) \quad \text{in terms of production per worker.} \]

The only difference between the countries lies in \( y \) so that if we take the ratio of India’s MPK to that of the U.S., it will equal the ratio of the \( y \)’s raised to the power \((\beta - 1)/\beta\). This is \((1/15)^{1/3}\), or \(15^{1/3} = 58\). The formula implies that the marginal product of capital in India must be 58 times that of the United States (Lucas 1990, p. 92). If this were true, we should see a tremendous flow of capital from the United States into India. In fact, as Lucas points out, it is likely that there would be no investment in the United States at all but that it would flow entirely to India.

From the above calculations, it is clear that the assumptions of the neoclassical growth model are polemic. In reality, the countries are not producing one identical good. India is still largely agricultural; land is important in India’s production function; labor is not homogenous; and there are impediments to the free flow of capital.
According to Lucas, there are external benefits of human capital that further explain differences in capital formation. Instead of explaining differences as a function of \( A \), the level of technology in each country, Lucas assumes that the economy's technological level is equal to its human capital per worker \((h)\) raised to some power. So substituting effective labor for natural labor and adding an externality for human capital solves the problem of very little capital flows from rich countries to poor. His externality is explained as knowledge spillover.

\[ Y = AX^\beta (EL)^{1-\beta} \]

or,

\[
\frac{Y}{EL} = y = Ax^\beta
\]

where

- \( x \) = capital per effective labor
- \( y \) = output per effective labor

According to Krieger's (1968) estimates of per capita income (a proxy for \( y \)) that India could obtain if it had the same \( k \) as the U.S., given age, level of education and sector, India per capita income is approximately .38 that of U.S. per capita income. To get the effective labor ratio for India and the U.S., Lucas uses the above production function setting \( L = 1 \) for both countries. Then \( X \) is the same for both countries, as are \( A \) and \( \beta \).

The only difference on the right-hand-side affecting per worker income is \( E \). Then India's \( E \) is .2 of U.S. \( E \) since \( .2^\beta = .38 \). Then to get the ratio of marginal products of capital (the \( r 's \) in equation (2)) he simplifies by making the ratio of per capita incomes equal to 1/3 which is an approximation to .38. The ratio of India's \( r \) to that of the U.S. from equation (2) is 1/3 raised to the power \((\beta - 1)/\beta \). So \( 1/3^{1/5} \) equals \( 3^{1/5} = 5 \). This represents a substantial correction from .58 but not enough to explain the scarceness of capital flow to India (Lucas 1990, p. 93).

\( \beta \) His underlying production function is now

\[ Y = AX^\beta (EL)^{1-\beta} h^c \]

By dividing both sides by \( EL \),

\[
\frac{Y}{EL} = \frac{AX^\beta (EL)^{1-\beta} h^c}{EL} \quad \text{or}
\]

\[
\frac{y}{h} = Ax^\beta \]

where

- \( x \) = capital per effective worker
- \( y \) = income per effective worker
- \( h \) = human capital per worker

By first solving for \( c = .36 \) and then for \( h = 1/5 \), Lucas finds that the ratio of \( r 's \) is now \((1/3)^{1/5} (1/5) = 3^{1/5} (5)^{1/5} \) \( = 1.04 \).
each of us is more productive if we live in a world where others are highly educated (Lucas 1990, p. 94).  

Neoclassical growth theory has also been augmented to include human capital as well as physical capital in the Cobb-Douglas production function. The rate of investment in human capital is measured by the number of the working age population that attends secondary school as a ratio of total labor. In their analysis of cross-country data applied to the original Solow growth model, Gregory Mankiw, David Romer, and David Weil (1992) conclude that $Y = A(t) K^{1/3} H^{1/3} L^{1/3}$ is a reasonable assumption for aggregate output. This production function gives improved results over the original model in explaining growth. They conclude that when income rises, investment in human capital increases in the same proportion. They deny that the Solow model requires absolute convergence of $y$, income per worker, among countries, but argue for "conditional convergence" which means that each country tends to converge to its own steady state path, depending on its physical capital savings rate ($s^k$), human capital savings rate ($s^h$), and population growth rate ($n$) (p. 410).  

Remarks  

The end result of all this work is that there is some room for policy in the debate on long-run growth. If investment in human capital and research, feedback between trade policy  

---

6 In this model, however, knowledge spillover across national boundaries is assumed to be zero. Lucas's model is based on the assumption that the external benefits of a country's stock of human capital accrue entirely to producers within that country. Lucas acknowledges that in reality, while some of the external benefits of increases in individual knowledge are local, confined to single cities or even small neighborhoods of cities, others are worldwide in scope. The problem lies in quantifying world scale benefits (Lucas 1990, p. 94).

7 The model, however, maintains the neoclassical assumption that technology is the same across countries since it is a function of time ($t$). Nevertheless, it has important implications for the role of knowledge in the development process in that it accounts for some of the migration of human capital that occurs from places where it is scarce to places where it is abundant (the focus of Lucas, 1988).
and innovation, intellectual property rights, the links between private firms and universities, and the costs and benefits of an explicit government led technology policy have a positive relation with growth, than the implications for policy are quite obvious (Romer 1994, p. 21). The debate is then further taken to the realm of income inequality if it is assumed that the distribution of wealth is exogenously given. The work of Romer (1987a.) and others discovered a negative relation between initial income level and growth (Romer 1994, p. 8). While the Kuznets curve deals with the question of how the level of income affects income distribution, the question to be addressed is how income distribution affects the change in income. How does inequality fit into the development process through its effects on overall income and growth and what are the policy implications of this relationship?

**Income Inequality**

*Politicoeconomic theory*

Relying on the theory that economic growth is largely determined by the accumulation of capital, human capital, and knowledge usable in production, Torsten Persson and Guido Taballini (1994) continue to struggle with the role of income distribution in the development process. They draw a connection between accumulation of capital and knowledge and the ability of individuals to appropriate privately the fruits of their efforts, which in turn crucially hinges on what tax policies and regulatory policies are adapted (p. 600).

The authors expand on previous work that demonstrated an inverse relationship of growth to inequality (see Andrew Berg and Jeffrey Sachs, 1988; Alesina and Rodrik, 1994). They formulate a simple general-equilibrium model that formally captures the idea that in a society where distributional conflict is more important, political decisions are likely to result in
policies that allow less private appropriation and therefore less accumulation and less growth. The model’s politico-economic equilibrium determines a sequence of growth rates as a function of parameters and initial conditions in order to capture the importance of policy for growth. The implication is that the greater the income inequality the lower is equilibrium growth (p. 600-601).

Using postwar data from a broad cross section of countries, both developed and less developed, the model shows a strong negative relation between income inequality at the start of the period and growth in the subsequent period (Persson and Tabellini, p. 601, 607).

They also find the effects of equality on growth quantitatively significant. A one-standard-deviation increase in equality increases growth by about half a percentage point. This relationship, however, is limited to democracies. Their theory predicts that growth should be inversely related to inequality in a democracy, but not necessarily in a dictatorship. For other variables in the model, however, there is no impact on political regime for development. Therefore, the authors conclude that the effect of equality on growth may indeed operate through a political mechanism (Persson and Tabellini, p. 612-613).

Roberto Chang (1994) supports the finding that income distribution and long-run growth are related. The author plots the 1960-85 average annual growth rate of per capita GDP as a proxy for a country’s income growth rate against the share of its national income earned by the middle 20 percent of its population, a rough proxy for income equality (see Figure 2.1). The slope of the estimated regression line is positive, indicating that, on average, countries that grew faster between 1960 and 1985 also had a more egalitarian distribution of

\[ g^* = G(w, r, \theta^* (w, r, e^*)) \]

where: \( w \) = an endogenous average endowment of skills, \( r \) = the exogenous return on an asset, \( \theta \) = a policy variable, \( e \) = an exogenous individual-specific endowment of skills, \( m \) = median endowment.
income (p. 3-4). However, the correlation of two variables does not necessarily indicate a cause and effect relationship. The causal relationship between growth and equality can only be theorized as in Persson and Tabellini (1994) which assumes that the level of equality leads to some growth rate but not that the growth rate affects changes in equality.

**Figure 2.1**

**Income Distribution and Long-Run Growth**

*GR6085 (Income Growth)*

*Mid20 (Income Distribution)*

Source: Roberto Chang 1994, p. 3

*Financial imperfections*

Financial imperfections theory is another way to think about the relationship between income distribution and growth. It assumes that a more even distribution of wealth may
enable more families to start high-growth investments, increasing overall growth. This is consistent with the empirical positive association between growth and equality: countries with very unequal initial wealth distribution must grow more slowly and exhibit less income inequality than countries in which initial wealth was more evenly distributed.

Oded Galor and Joseph Zeira (1993) examined a model in which parents leave bequests to their children which in turn are left to their children, etc. The bequests are used for education which becomes an investment because educated workers have a higher marginal product and therefore earn higher wages. In the long run, the population is divided into two groups: wealthy families earning high and fast-growing income, and poor families whose members are unskilled, low-wage workers caught in a relative poverty trap. The number of families that become wealthy or poor, and hence the economy’s overall growth, depends on the initial distribution of wealth which determines which families can pay for education (p. 36-37).

The policy implications for this theory are that redistributive policies may accelerate growth by helping poor families finance set-up costs and escape from relative poverty. They also suggest that reducing imperfections in borrowing markets may, in the long run, reduce income inequality (Chang, p. 8). However, some have argued that expansion of secondary education favors only the rich (see Adelman in Savoie and Brechen, 1992; Blaug, 1992.). Also, the model is assuming some given distribution of wealth and no social mobility (Chang, p.8).
Conclusion

Alternative models can generate a positive relation between growth and equality. The causal relationship can be demonstrated by either politoeconomic theory or financial imperfections theory. The two, however, differ in the assumptions they make and which variables are taken as exogenous and which are endogenous. In the case of Persson and Tabellinin (1994), initial wealth is exogenous. In Galor and Zeira (1993), it is assumed there is very little social mobility which contradicts the fact that advanced economies exhibit a high degree of social mobility (Chang, p. 8). Nevertheless, the existence of a connection between growth and distribution of income is clear.
Chapter 3
Measuring Inequality

Introduction

Income inequality is measured in many different ways. Depending on the discipline through which it is being measured, whether it be economics, political science, or sociology, the method of measurement and aims of the analysis will differ. These differences will produce different results on income inequality. The studies on inequality differ in the following ways (Chotikapanich, p. 6):

1. Adjustments to the data;
2. Methodology used;
3. Main interest of the researcher;
4. Variables used as indicators of welfare; and
5. Unit of analysis; for example, household unit or individual.

It is quite clear after reading much of the literature on measuring income inequality that the art of examining disparities between groups is far from perfect. There are more methods than I care to examine, and for each method there are several variations. In every study, there is a mixture of several methods, and each study has a different mix. To make things more complicated, no two studies using different methodologies can be easily compared, for their results are clearly uniquely tied to their method of analysis.

In the case of Thailand, the above problems discourage a reliable comparison of income inequality over time, a situation compounded by the changes in data collection and
definitions of variables in the data that have occurred from year to year. Several authors have examined the issue of income inequality in Thailand but their methodologies are different and the data they rely on are inconsistent. In one respect this has led to better measures of income disparities through a process of trial and error. In another respect, it makes moving forward a slow process. Coming up with an overall picture of how income inequality has changed over time in Thailand is only now within reach. Nevertheless, there is still much guess work involved.

Working with the published results of past research, some authors have re-examined inequality using newer methods. One such author is Yukio Ikemoto. The aim of Ikemoto’s study was to identify the changes in income distribution in Thailand between 1962 and 1986 (Ikemoto 1991, pg. ix). Another author is Duangkamon Chotikapanich. For Chotikapanich, the problem was to develop a better measure of income inequality. He does this using the Thai data for the years 1975/76 and 1981 only (Chotikapanich, pg. 3).

The following section examines the work of these two authors as well as the work of others for comparison. Some attempt will be made to distinguish the best method(s) for measuring income inequality. The purpose of this literature review is to distinguish which studies of inequality, for the countries used in this study, are the most reliable in terms of methodology. This section will only review methodologies used to measure inequality in Thailand and not all of the countries examined in this paper as that would be both consuming and redundant. Instead, the World Bank data on Gini coefficients, which is organized by quality of the research, is used for all other countries. All data used in this paper will conform to the same standards set for the Thai data.
### Table 3.1

Review of Gini Coefficients of Past Studies

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### Social Welfare Model

Most measures of income inequality are derived from one of four mathematical models: deviations, combinatorics, entropy, and the social welfare function. Most economists rely on the social welfare function because it is heavily influenced by economic theory.

The social welfare theory attempts to rank alternative economic distributions according to their social welfare. The underlying assumptions of this ranking are that 1) social
ordering should be based on individual orderings of alternative social states; 2) the Pareto principle that assumes that if state A is ranked higher than state B for one individual, and all other individuals rank A at least as high as B, then A should be ranked higher than B in the social ordering (Coulter, p. 115).

Welfare economists are concerned with the distribution of social welfare. Social welfare is usually measured in terms of income or wealth. In other words, social welfare is a function of income. Furthermore, social welfare theorists assume that the relationship between income and welfare is the same for everyone, that is, all persons have the same utility functions. This assumes that increased income means increased welfare and that the effect of income on an individual’s welfare is independent of other resources the person might possess. Finally, income determines an individual’s welfare independent of the amount of income possessed by other individuals (Coulter, p. 118).

The concept of social welfare is defined as society’s view of fairness or desirability of a given distribution. Preference of one distribution over another, when measured by an additive welfare function, has nothing to due with fairness. Further, because individual welfare is additive, social welfare is the sum of individual welfares. Whatever raises the mean of a distribution raises the mean of social welfare, but it may not increase fairness. Therefore, doubling the income of the richest will increase social welfare (Coulter, p. 118).\footnote{The most commonly used indexes of inequality under the social welfare model are: \begin{itemize} \item Atkinson’s Index IR; \item Kolm’s Index II; \item Kaiser’s Index of Population Quality; and \item the Generalized Lorenz Dominance.}
Overview of Inequality Theory

According to Philip Coulter (1989), inequality theory relies on two types of criteria for evaluating inequality measures: conceptual and technical. Conceptual criteria are concerned with the major properties the conception of inequality shall possess. The choice of an inequality measure determines the definition of inequality. The technical criteria are mostly concerned with the index characteristics that affect convenience of computation or interpretation (p. 11). The following is a brief summary of some of the main conceptual criteria for income inequality measurement.

Polarity

Polarity determines whether a concept ranges from minimum to maximum value ranges from equality to inequality or in the opposite direction. Different indexes have different polarities and the correct choice of polarity usually depends on the investigator's preference (p. 12).

Sensitivity to Concentration

Inequality among components is defined as any differences in the size of their shares. Concentration is a major variant of inequality. Furthermore, all concentration is inequality but not all inequality is concentration. Inequality as a concept is not concerned with where a surplus or deficit is located. It is only an identity of the number or proportion of units that must be redistributed in order to create uniform shares, not with their location. Concentration is concerned with the location of a surplus. In other words, concentration attempts to index
the clustering of surplus in some fashion. This is done by appointing a weight to each share (p. 12).

The multiplication principle is the main operational difference between inequality and concentration indexes. A concentration equation must contain at least one of three possible types of multiplication in its summational core. The most widely used type is exponentiation. Some concentration indexes require ordering components from largest to smallest and multiplying each share by its numerical rank. Finally, some indexes involve multiplying each share by its logarithm. All three operations have the same effect, producing sensitivity to concentration (p. 13).

Comparative Standard

Inequality indexes compare each share to some comparative standard. In the case of indexes based on the deviations and social welfare models, this comparison is explicit. It is implicit in all measures based on other models.

Indexes based on the deviations and social welfare model explicitly compare each share of a distribution to some standard. This is usually done by subtracting each share from the standard and either taking its absolute value or squaring the difference. Deviations indexes often compare each share to the mean of the distribution, the mode or the largest share, the next smaller share, each other share, and the best other share in terms of occurrence or sequence in time (p. 14).

It is important to know which comparative standard is appropriate to a given distributional analysis. The standard used in an inequality index influences its sensitivity to
various properties of the distribution. Different measures produce different results when applied to the same distribution (p. 14-15).

**Intragroup or Intergroup Inequality**

An intragroup measure indexes inequality among persons in a single population. An intergroup measure indexes inequality between people in two different groups. There are different measurement methods for intergroup and intragroup indexes and it is up to the investigator to determine which approach is more significant.

**Principle of Transfers**

The Pigou-Dalton principle of transfers (Pigou, 1920; Dalton, 1920) is basically the idea that if some income is transferred from the richer to the poorer, income inequality declines. It assumes that the transfer is not so large as to render the recipient richer than the sender.

An inequality measure should be sensitive to transfers at any level in a distribution and regardless of whether the transfer occurs between two shares above or below the mean or between two shares on opposite sides of the mean (Coulter, p. 17).

The principle of diminishing returns (Kolm, 1976) is a variation of the Pigou-Dalton criterion. It states that inequality measures should be sensitive to two factors: 1) the distance of the transfer, measured by the difference between donor and recipient, and 2) the level in the distribution at which the transfer takes place. There is some room for the investigator to decide if transfers are more important at some levels of the distribution than others, and if so, where they are more important, and how much so (Coulter, p. 18).
Ordinary Lorenz Dominance Criteria

Most of the arguments about income inequality rely on Gini coefficients for their data. This paper is no exception. The gini coefficient is calculated from a Lorenz curve. Although in practice the curve is not actually calculated and drawn out, any statements about a comparison between gini coefficients must follow the Ordinary Lorenz Dominance Criteria.

The Lorenz curve is a straight line in a case of perfect equality. The diagonal in figure 1 labeled A is the standard to which actual Lorenz curves are assessed. As the curves move away from the diagonal A, the distribution of income becomes more unequal. Thus, curve C is characterized by more inequality than curve B. The Lorenz criterion states that units in distribution B are more equally distributed than units in distribution C, if the Lorenz curve for B is nowhere below and somewhere above the Lorenz curve C. Curve B is said to “Lorenz-dominate” curve C (Coulter, p. 23-24).

All scale invariant measures that satisfy the transfers principle will produce the same rank ordering of several distributions if their Lorenz curves do not intersect. When two Lorenz curves intersect, such as curves C and D, an index that satisfies the transfers and scale invariance principles might give one ranking while another similar index might yield a different ranking (Allison, 1978). When two Lorenz curves do not intersect, the ordinary Lorenz criterion is sufficient for determining which distribution contains greater inequality (Coulter, p.24).
Figure 3.1

Ordinary Lorenz Curve Dominance and Intersection

Cumulative percent of income

Cumulative percent of income recipients

Gini Coefficient

Gini coefficients are the measurement of the space between the curve and the straight diagonal as a percentage of the entire area to the right of the diagonal. As this area becomes larger, the Gini coefficient will increase to a maximum of .999, in which the Lorenz curve is
the perimeter of the triangle and 100% of all income is held by .999% of the population. This case is literally impossible as income is measured in terms of consumption and all people must consume in order to survive. In actuality, Gini coefficients usually range from about .34, in the case of Japan, to about .62, in the case of Brazil. These numbers are sometimes presented with the decimal moved over and in that case would represent a percentage, for example, 32%.

Oshima

Harry Oshima became one of the pioneers of the study of income inequality in Asia with his work in the 1960s. His calculations of Gini coefficients for Asian economies were some of the first. Since then, Oshima has produced over 30 years of research on the issue which culminated in his book *Strategic Process in Monsoon Asia’s Economic Development*, 1993. The book is basically a summary of Oshima’s previous works but it offers a very good look at the processes that have affected development and income distribution in Asia over the years. His 1993 work relies on Gini coefficients from Ikemoto to establish some stylized facts about income distribution in general and income inequality in Asia more specifically.

The most interesting finding of Oshima is that income inequality follows a Kuznets curve in Asia but that the turning point on the curve arrives much earlier for Asia than it did for Western countries. Moreover, the entire Kuznets process was completed within fewer years

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2 There are several other criteria that income inequality indexes should meet. They are not as universally accepted as the above criteria but they should be mentioned nevertheless. They are as follows:

1. Principle of scale invariance
2. Principle of constant additions
3. Population symmetry
4. Sensitivity to number of components
for Asian countries than it did for the industrialized West. This is partly due to the forces at play during the industrial revolution versus the forces of capital mobility and transfers in the modern century (see Oshima 1993, chapter 9 and Oshima 1984).

Ikemoto 1991

The first available reliable data for income distribution in Thailand came from the first 1968/69 Socio-Economic Survey (SES 1968/69). Several surveys followed, about every 2-4 years. For data prior to 1968, data from the 1962/63 Household Expenditure Survey (HES 1962/63) were used, but it is widely accepted that this data set is unreliable and incomplete. Scholars used the data to examine income inequality in Thailand for each period covered by the surveys. These studies differ in several ways which make comparisons between them difficult. For example, a different period is covered or a different income concept, such as household income or per capita household income, is used. These differences may create different outcomes for each period that will in turn suggest a trend in income inequality that may not be true (Ikemoto 1991, p. 9). Some of the studies reviewed by Ikemoto include Oshima (1970), Kerdpibule (1972), Chantaworn (1975), Meesook (1975, 1976, 1979, 1980), Wattanavitukul (1978), Krongkaew (1985), Hutaserani and Jisuchon (1988), and Ikemoto and Limskul (1987).

While there are problems in many of these studies, they have made important contributions to the estimation of distribution. Nevertheless, comparison between them would give misleading results because of the differences in methodologies incorporated or the period examined. Ikemoto attempts to solve this problem by adjusting the data in the surveys for
consistency and then estimating the inequality in each period corresponding to the surveys using the same methodology. This consistency allows for an intertemporal comparison.

The unit of analysis in Ikemoto’s estimations is household income. Although household income is a less accurate measure of welfare than per-capita household income, it is the only income concept that is available for the entire period 1962 to 1986 (Ikemoto 1991, pg. 9). Per capita household income takes into account the household size and, in the case of Thailand, tends to provide a higher Gini coefficient than household income (Ikemoto 1991, p. 13).³

Within each index there are several ways to calculate which will cause differences in the index’s value. For the Gini coefficient there are several adjustments Ikemoto uses to compensate for the fixed interval of income found in the data. These intervals, which can be chosen arbitrarily in connection to the randomness of census collection in many countries, will move households into new intervals with inflation if the intervals are fixed in nominal terms. This will change the Gini coefficient from one period to the next. The methods used by Ikemoto to compensate for this are the decile method and Kakwani’s continuous method. The Theil index and the variance of income logarithm have also been calculated by the decile method (Ikemoto 1991, p. 14).

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³ Ikemoto utilized several of the measures of income inequality. These include:
1. Gini coefficient
2. Theil index
3. Variance of income logarithm
4. Atkinson’s measure

These measures can give different conclusions about income inequality. For example, some measures may give a higher weight to lower income classes. We cannot determine which method to use a priori. It is best to use several and make comparisons.
Table 3.2

Income Inequality in Thailand

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<tr>
<td>Gini coefficient</td>
<td></td>
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<tr>
<td>1. Decil method</td>
<td>0.4128</td>
<td>.4263</td>
<td>.4174</td>
<td>.4410</td>
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<tr>
<td>2. Kakwani's method</td>
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<td>Theil index</td>
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<td>.3110</td>
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<tr>
<td>Varlog</td>
<td>0.4801</td>
<td>.6454</td>
<td>.6639</td>
<td>.7445</td>
<td>.8053</td>
</tr>
</tbody>
</table>

Source: Ikemoto 1991, p. 14

The results of Ikemoto's study reveal that income inequality increased from 1962 to 1986 but equalized for the period 1969-1975. All of the different methods demonstrate the same trend, that is that income inequality increases each year except 1975, except the varlog method. Even though the varlog had the convenient characteristic of decomposability into between- and within-group components, it does not satisfy Pigou-Dalton's transfer principle and should therefore be left out of the analysis (Ikemoto 1991, p. 15).

Ikemoto concludes that income inequality increased from 1962 to 1986 except for the period from 1969 to 1975. According to Ikemoto these results are consistent with the early phase of the Kuznets inverted U (Ikemoto 1991, p. 9). The problem with his estimates is that it relies on household income rather than per capita household income which is generally accepted as a better measure of welfare.
Yukio Ikemoto (1992) recognizes the importance of the 1980’s for Thailand’s development process. It is a period marked by an early decrease in economic growth, drastic changes in fiscal and monetary policies, and followed by very high growth rates. From this process, a new middle class emerged. The big question is whether this process changed the makeup of Thai inequality. It is also an interesting case study for development economists working on the relation between high growth rates and income inequality. This brings in the question of the applicability of the Kuznets curve to development policies.

Harry Oshima (1991) reported a decline in his Gini coefficients from .50 in 1986 to .43 in 1988 (p. 134). Other authors also reported a decline in inequality for the same years. However, their methodologies come into question, and Ikemoto (1992) points to several of them using the data from the Socio-Economic Survey (SES) for 1981, 1986, and 1988 (p. 213).

According to Ikemoto, income distribution is shown to have become more unequal if measured by household income as Hutaserani and others did. Per capita household income gives the opposite result.

Most will agree that income inequality worsened in Thailand regardless of the method used in the period 1981 to 1986. Using per capita household income, Hutaserani and Tapwong (1990) found the change in Gini coefficients to move from .453 in 1981 to .5 in 1986. Using household income, the Gini coefficients are .437 in 1981, and .470 in 1986 (Ikemoto 1992, p. 214, 224). Regardless of method, the trend is the same for inequality in the period.
For the period 1986 to 1988, the change depends on measurement unit. For per capita household income, the result is that inequality decreased while household income shows an increase in inequality. The discrepancy is caused by differences in household size.

Statistically, there is a tendency for household size to increase as income level increases which means that a higher income level is partly the result of a larger number of income earners in the household (Ikemoto 1992, p. 225).

Income inequality in Thailand is most vivid between regions. Ikemoto examines inequality in this respect by looking at Gini coefficients between regions. Income inequality increased between regions, from 1981 to 1986 but fell for the period 1986 to 1988. Inequality within each region increased from 1981 to 1986 but also fell for the period 1986 to 1988 except in Bangkok which increased. (Ikemoto 1992, p. 229).

Finally, Ikemoto demonstrates the importance of migration in considering the effects on inequality. Migration has been documented by previous studies to be an important element in the study of inequality (see Ashakul, C. 1991, Ashakul, T. 1989, Ikemoto, 1991). Ikemoto points to its significance in the Thailand case.

Urban-rural migration increased rapidly in the 1980s and accounted for nearly 30% of all migration (Ikemoto 1992, p. 233). Migration is subject to both pushing and pulling factors; the recession of the early 1980s and the recovery of agriculture in the later 1980s. This means that declines in urban poverty in Bangkok may have been caused by pushing urban poor back to rural areas and not by raising their standard of living. On the other hand, an increase in poverty from 1986 to 1988 in Bangkok might be related to migration from rural to urban areas during the economic boom in that period (Ikemoto 1992, p. 233; see also Sussangkarn et al. 1988)
Chotikapanich (1994)

In a much more detailed and technical analysis of the problems of measuring income inequality, Chotikapanich (1994) carefully examines the past studies of inequality and reveals their flaws while retaining their successes. These studies can be broken into two groups, the early studies and the latter studies. The first group is made up of Stifel (1967), Oshima (1970), Wongvipanont (1971), McCleary (1972, 1973), and Kerdphibul (1975). These authors studied income inequality for the years 1962/63 and 1968/69. Aside from Kerdphibul, who did not adjust the data for income in-kind, the authors concluded that income inequality worsened over the interval (Chotikapanich 1994, p. 5).

The latter studies include Meesook (1975, 1979), Krongkaew (1977), Chotikapanich (1981), Krongkaew and Tinakorn (1985) and Jitsuchon (1987). These studies all used household per capita income as the key variable except Chotikapanich who used household per capita expenditure. They are all in agreement that income inequality at the regional and subregional level increased between 1968/69 to 1975/76 and between 1975/76 to 1981. Chotikapanich found that between 1968/69 and 1975/76 there was a reduction in the inequalities between subregions while the inequality within subregions increased. Krongkaew and Tinakorn found that, over the same period, income disparities between subregions widened (Chotikapanich 1994, p. 10).

The difference in the data can be found in the adjustments made to the data and the unit of analysis. All the studies reviewed by Chotikapanich use price indices to deflate the data when two years were involved. Regional price indices were also used to adjust the data from different regions so that they are comparable, and the per capita figures were expressed at constant price. However, Chotikapanich suggests that there is a differential price level
across income classes. All the previous studies assume that the prices paid by the household in different income classes are equal. In some cases, this could have a significant impact on the inequality measure obtained. Chotikapanich suggests that the differential price level between income classes should be taken into consideration when inequality is studied (Chotikapanich 1994, p. 11). His results, however, indicate that this adjustment makes no significant difference in the results for the Thai case.

The unit of analysis used by most of the studies is the per capita household concept. This assumes that every person in the household has equivalent weight. This assumption is founded on conclusions of Meesook (1979) who discovered little difference between the results on disparity based on the per capita income concept and per adult-equivalent income. As pointed out by Chotikapnaich, Meesook's concept of adult-equivalent was set up with the assumption that the requirement of children under 11 years of age was only half of the adults. Meesook did not provide sufficient justification why children under 11 years of age was chosen as the cut-off point (Chotikapanich 1994, p. 11). Because of this, Meesook may have failed to capture the effects of age composition.

Chotikapanich adjusts the data for household size, composition and differential price levels affecting different households. His adjustment procedure requires calculation of adult equivalent scales. In calculating inequality, Chotikapanich used his own Lorenz curve function. The use of adult equivalent scales requires the unit of analysis to be household expenditure rather than income (Chotikapanich 1994, p. 2).

The data used in Chotikapanich's analysis are taken from the Socio-Economic Surveys were conducted in 1975/76 and 1981 by the National Statistical Office of Thailand (NSO). These surveys treat the household as the main sampling unit. The definition of household
changed between the two studies. In 1975/76 the household was defined as "a group of two or more persons who make common provisions for food and other living essentials. Members of a household pool their income and have a common budget to a greater or lesser extent. They may be related or unrelated or a combination of both. In 1981, the definition of household was changed so that "married children either they or their spouse, have their own income, eat with a household whether they pay for meals or not were treated as separate households" (NSO taken from Chotikapanich, pg. 20; see also Krongkaew and Tinakorn 1985). The major consequences from this change in definition are 1) a significant reduction in the size of the household between the two surveys which will cause a bias in the comparison if the variables are treated in per capita terms; and 2) the data collected for 1981 may not reveal the actual household expenditure (Chotikapanich 1994, p. 22).

The really interesting thing about Chotikapanich's study is his path-breaking use of adult-equivalent scales with Thai data. In order to determine the relative economic positions, household size and composition must be accounted for. This is achieved by measuring household adult-equivalent income using the concept of consumer unit scales or adult-equivalent scales. The adult male is used as the standard unit for comparison. The concept of consumer unit scales in household consumption patterns was introduced by Prias and Houthakker (1955). The consumer unit scales measure the weight given to a specific individual belonging to an age-sex group in the household. These weights are measured in terms of expenditure on the specific commodity. Chotikapanich creates commodity scales for food, clothing, housing, medical care, and non-necessity for Thailand for the 1975/76 and 1981 data. The results are used to adjust the household income and expenditure data to be on a per-adult-equivalent basis (Chotikapanich 1994, p. 26).
### Table 3.3

Regional total expenditure scales, 1975/76

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### Table 3.4

Regional total expenditure scales, 1981

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<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>female</td>
<td>1.1034</td>
<td>1.1783</td>
<td>0.7132</td>
<td>0.9346</td>
<td>0.7124</td>
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<tr>
<td>adolescent</td>
<td>0.8214</td>
<td>0.9449</td>
<td>0.6907</td>
<td>0.4218</td>
<td>0.5545</td>
</tr>
<tr>
<td>children</td>
<td>0.4215</td>
<td>0.3288</td>
<td>0.4369</td>
<td>0.3832</td>
<td>0.3058</td>
</tr>
</tbody>
</table>

*Source: Chotikanich 1994, p. 35*

The four age-sex groups are defined as follows:

- **male** = adult male above 21 years of age
- **female** = adult female above 21 years of age
- **adolescent** = male or female of 14 to 21 years
- **children** = male and females under 14 years of age

Changes in the scales from 1976 to 1981 are interesting in and of themselves. The changes show a pattern of decreased expenditures except for females in the North and
Northeast and the adolescent scale in the Northeast. The reduction is distinctive in the South in scales for females, adolescents and children. Chotikapanich suggests this could be due to the fact that between these two years of data, the Southern region has grown faster than the rest of the country, particularly in the economic sector of tourism and services. This growth created more jobs in the area which must have considerably changed the ordinary lifestyles and caused the consumption pattern and habit to change substantially (Chotikapanich 1994, p. 35).

A more detailed break down of expenditures in Thailand based on the 5 commodities mentioned above, also gave interesting results about the changing pattern of consumption in Thailand between the years in review (see Chotikapanich 1994, p. 37-38). However, this data seems unreliable because of the high results on some of the variables. For example, the female scale for medical care in 1981 was 4.2796. These results may have explanations but it seems better to avoid explaining unreasonable results. Chotikapanich does not use the results of the commodity specific scales but relies on the total expenditure scales to adjust all the household expenditure data in order to obtain the household per adult-equivalent expenditure (Chotikapanich 1994, p. 40).

Price adjustment for the data was accomplished in two steps. The 1981 household expenditure data were deflated to 1975/76 price. Household expenditure was deflated according to commodity categories: food, clothing, housing, and medical care. Total expenditure was deflated using the general consumer price index. The commodity price indices and the consumer price index between 1975/76 and 1981 are those calculated by the Price Index Division, Department of Business Economics, Ministry of Commerce. Following this, both the 1975/76 data and 1981 data were readjusted for differential price levels between
regions, subregions and expenditure classes using the price indices calculated by Chotikapanich (Chotikapanich 1994, p. 79).

In calculating the price indices for each income group in each subregion, Chotikapanich uses the Geary-Khamis system of international comparisons. He based this decision on the fact that regional comparisons demonstrate the same characteristics as national comparisons (see, Khamis, 1970, 1972, and 1984 for detailed explanation). The resulting price indices are used to deflate the household level of expenditure so that expenditure of household in different income classes and in different subregions are expressed at constant prices (Chotikapanich 1994, p. 55). Because of length of the data, it is not listed here.

Chotikapanich examines several methods for calculating the Lorenz curve. He reduces the list to three best methods: the equation proposed by Kakwani and Podder (1976), the Rasche, Gaffney, Koo and Obst (1981) equation; and Chotikapanich’s simple functional form proposed in his study. After testing the three methods, his conclusion is that the best method depends on the purpose of the study. If the main aim is one of measuring inequality as a whole, the proposed equation of Chotikapanich gives the best results. If the study aims at examining details in the expenditure distribution such as the expenditure shares, the Rasche, Gaffney, Koo, and Obst equation gives the best results (Chotikapanich 1994, p. 136).

The values of Gini coefficients using the expenditure data after adjusting for the adult-equivalent scales and for the differential price levels between expenditure classes are listed below.
Table 3.5

Gini coefficients after adjusting for differential price levels and adult-equivalent scales.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>North</td>
<td>.44621</td>
<td>.43693</td>
<td>.37983</td>
<td>.43043</td>
<td>.36608</td>
<td>.41362</td>
</tr>
<tr>
<td>Northeast</td>
<td>.41134</td>
<td>.42511</td>
<td>.42108</td>
<td>.44849</td>
<td>.31519</td>
<td>.37431</td>
</tr>
<tr>
<td>Central</td>
<td>.41168</td>
<td>.47848</td>
<td>.39999</td>
<td>.41732</td>
<td>.36589</td>
<td>.43455</td>
</tr>
<tr>
<td>South</td>
<td>.47107</td>
<td>.44514</td>
<td>.42334</td>
<td>.3999</td>
<td>.40639</td>
<td>.42153</td>
</tr>
<tr>
<td>Bangkok</td>
<td>.44087</td>
<td>.41515</td>
<td>.41099</td>
<td>.33786</td>
<td>.40579</td>
<td>.39386</td>
</tr>
</tbody>
</table>

Source: Chotikapanich 1994, p. 141

By comparing the results of the adjusted data to the coefficients that were not adjusted for adult-equivalent scales, Chotikapanich concludes that the use of per-capita expenditure generally overestimates the extent of inequality. The effect of differential price levels between expenditure classes is found to be insignificant in this case (Chotikapanich 1994, p. 141).

By using the data in adult equivalent expenditure at constant prices, the inequality indices for Thailand as a whole were calculated for the years 1975/76 and 1981 using the direct method of calculating the Gini coefficient. The Gini coefficients calculated are .43994 and .51130 for 1975/76 and 1981 respectively. This finding is consistent with the findings of previous studies although the change in the coefficient is more dramatic in Chotikapanich’s study (Chotikapanich 1994, p. 143).

The differences in Chotikapanich’s findings and previous studies stem mostly from the effect of using a different conceptual framework when considering inequality. The units of
measurement that have been used in the earlier studies of inequality in Thailand were either
the household unit or the per capita unit. According to Chotikapanich, the use of per capita
unit overestimates and also distorts the magnitude of change of inequality overtime.
Therefore, the belief that inequality has been deteriorating in all areas and that the Northern
and Northeastern regions are the regions with the worst inequality is not supported by results
obtained by Chotikapanich after adjustments for household size and price movements over the
period 1975/76 to 1981 (p. 144).

Chotikapanich has the most complex method for measuring inequality in Thailand than
any other author reviewed for this paper. His careful attention to price adjustments, adult
equivalent scales, and methodology for measuring Gini coefficients leads me to believe his
estimates are accurate. He successfully argues in favor of using adult-equivalent scales and
price adjustments across regions and sub-regions although adjustments for price levels
between income class had little effect on the outcome. The use of household per capita-
expenditure is a better unit of analysis than income for measuring welfare because it takes into
account differences in the makeup of households which can vary widely between regions and
sub-regions.

Nevertheless, there is the issue of changing definitions in the data for household. This
change makes it likely that the results prior to 1975 may incorrectly display some trend in
income inequality in Thailand when compared to post 1975 data. Furthermore,
Chotikapanich's use of adult-equivalent scales and adjustments for differential price levels
between regions makes it difficult to compare his results with other less complex studies for
other years. Chotikapanich limited his analysis to 1975/76 and 1981 and this makes it difficult
to come to any conclusion about the changes in inequality over time in Thailand based solely on his study.

**Conclusion**

This chapter reviews several methods of measuring income inequality in Thailand in an attempt to sort out the data by methodology. Some methods have been shown to be better measures of income inequality. In some cases this problem is specifically related to the Thai data. In others it is just a matter of relative accuracy.

It has been shown that per capita household income is a better measure of welfare than household income. The use of adult equivalent scales can offer an even better measure of welfare although the calculation of these scales is limited to Chotikapanich’s study of inequality for the years 1975 to 1981. Finally price scales for regions and sub regions can also give more accuracy to the data.

In calculating the Lorenz curve to derive the Gini coefficient, income intervals can be adjusted using Kakwani’s continuous method to account for inflation’s influences on the distribution of population within these intervals. Ikemoto relied on this method for his estimations of inequality for the years 1969 through 1986. Chotikapanich used the Kakwani method in his estimations of inequality for 1975 to 1981. However, for measuring inequality as a whole Chotikapnaich suggests a new functional form for the Lorenz curve which may give better results. For measuring expenditure shares, the Rasche, Gaffney, Koo and Obst equation gives the best results (Chotikapanich, p. 144).

From this section, it should be clear that data on inequality can be estimated in many ways, of which only a few are reliable. Without a clear understanding of how Gini
coefficients, or any other form of measurement, are calculated, conclusions about changes in income distribution over time can be incorrectly determined. Data for this paper is taken from several different authors for each country or region. In each case, only data which meets the criteria pointed out in this section will be used. Not all these studies use the same unit of analysis or the same methodology. Nevertheless, as long as per capita household income, expenditure, or just household income is used as the unit of measure for welfare and the data has been correctly adjusted for price differentials, the coefficients are reliable enough for purposes of this paper.

Table 3.6

<table>
<thead>
<tr>
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<td>Hutaserani and Tapwong (1990)</td>
<td>.426</td>
<td>.453</td>
<td>.500</td>
<td>.478</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(per capita household)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chotikapanich (1994)</td>
<td>.439</td>
<td>.511</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(per adult-equivalent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ikemoto and Limskul (1986)</td>
<td>.431</td>
<td>.449</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(household income/Kakwani’s</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>continuous method)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ikemoto (1992)</td>
<td>.474</td>
<td>.474</td>
<td>.488</td>
<td>.515</td>
<td></td>
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</tr>
<tr>
<td>(household income)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oshima (1997) (extrapolated)</td>
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<td></td>
<td></td>
<td>.51</td>
<td>.52</td>
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</tbody>
</table>
Chapter 4
Analysis

Introduction

Collecting data to calculate Gini coefficients can be difficult. In many cases, sufficient data are unavailable to draw any conclusions about the trend in inequality for that specific country or region over time. In other cases, there is more than sufficient data. In this section, Gini coefficients for several countries are presented and discussed using simple statistical techniques to dispel some commonly held beliefs about inequality among developing nations while at the same time an attempt is made to develop a few new stylized facts about income inequality and development. The problems of data on Gini coefficients as reviewed in Chapter 3 should be kept in mind when reviewing this analysis.

Data

The data needed for an analysis of income inequality include Gini coefficients for each country over a substantial period. A substantial period could mean anything in this case which leaves the analysis open to a serious pitfall. If data are available for a 30-year period, than it could be assumed that this is a long enough period to view changes in income inequality over time. However, the starting point of each country will be different in its path towards economic growth. If one believes in the notion of conditional convergence, than it should be assumed that each individual country has a different starting point and will reach some individual steady state. Therefore, in comparing Gini coefficients between countries over time, there must be some indication of where each country positions itself among the population of
countries in terms of GDP per capita. A comparison of Gini coefficients to GDP puts the discussion in a better perspective.

The data needed, therefore, is GDP per capita and Gini coefficients for each country over a period starting from its initial growth "startup" and continuing through towards the steady state. Here is another problem: knowing when a country reaches its steady state is difficult to measure. The United States and Canada, most of Europe, Japan, and perhaps Taiwan have reached and are maintaining a steady state. For other countries in the analysis it is difficult to say if and when they will reach it. If the Kuznets hypothesis is correct, Gini coefficients should demonstrate decreasing values once some level of output is reached. Although this level could be different for each individual country, it is not clear at what level of output Gini coefficients will begin to fall. Furthermore, it is unclear whether Gini coefficients should fall before or after the steady state is reached.

A comparison of countries, therefore, may provide some idea as to when, if at all, inequality begins to fall in terms of GDP per capita. It could be assumed that several countries with similar starting points and similar growth rates, should show similar trends in income inequality. This, however, assumes no differences in history, politics, and culture which may have a significant impact on the distribution of income in each individual country. The comparison, therefore, may examine countries with similar economic growth patterns but dissimilar income distributions. This chapter will not go into a discussion of each history to explain any differences but will serve only to point out the differences. The differences themselves are interesting enough to warrant this ahistorical approach.

Finally, because population growth rates change during economic growth, and the age distribution of that population also changes, it is important to incorporate demographic
changes over time with a discussion of GDP per capita. This paper will analyze data in terms of GDP per capita using the Chain index. Data were obtained from the Penn World Tables for all countries. The values are stated in 1985 international prices as found in the PWT.

It is acknowledged that GDP per capita alone in any form does not accurately estimate any level of development. There are many other factors such as fertility rates, education, mortality rates, diet, etc. that provide a more detailed idea of the extent of development in each country. For this paper, it is assumed that a comparison of GDP per capita and Gini coefficients estimates some level of development because lower Gini coefficients can serve as a proxy for redistributive policies that allow access to healthcare, education, etc. and higher GDP per capita may infer lower absolute poverty.

Analysis of the Data

Countries that show a Kuznets Curve

By graphing GDP per capita and Gini coefficients for each country, patterns become apparent. These patterns change dramatically across countries. If we were to ignore GDP per capita levels and look strictly at the change in Gini coefficients over time, several countries appear to demonstrate a Kuznets curve. Korea, Malaysia, Brazil and the Philippines all seem to follow a pattern of an inverted U. However, the Philippines have an ending GDP per capita in figure 4.1 of less than $1800 while Korea, figure 4.2, and Malaysia, figure 4.3, have an ending GDP per capita of between $5000 and $6000. Clearly the Philippines has not reached the point of development that those countries have, but the graph shows a downward sloping curve. This can be explained very easily. If the Philippines’ development is to follow a Kuznets curve, perhaps it has not even begun the upward slope of the curve. Its GDP is
equivalent to that of other South East Asian countries before they began their high rates of growth and its pattern looks similar to Korea in 1961 through 1969 (see Figure 4.2).

Figure 4.1 Philippines

Nevertheless, each country begins at a different starting point and is subject to different spillover effects. The Philippines may begin to show the signs of a Kuznets curve once growth rates begin to climb, and it could move very rapidly up that slope in an effort to "catch up". However, it could be that the Philippines has a very unique historical and political
position that affects income distribution in ways that are not evident in other SE Asian countries.

Even for Malaysia, we cannot fully say that there is evidence of a Kuznets curve during its development. This is because the country is still developing. The curve may do a complete turn around over the next several years or decades. This is the problem of knowing when the steady state is reached and therefore when to look for a Kuznets curve.

**Figure 4.2 Korea**
Korea, however, seems to closely follow a Kuznets curve. Income inequality increased during the initial years of development in the 1960s and 1970s. In 1976, at a per capita income of $2,558, Korea peaked on the curve and began to descend towards a more egalitarian distribution. Gini coefficients continued to decline and Korea now enjoys one of the lowest Gini coefficients in the region. If Korea can be said to be close to a steady state equilibrium\(^1\), than the GDP per capita ($2,558) at its peak on the Kuznets curve could be used as a base from which to compare other South East Asian countries as they move towards development.

Malaysia reached a per capita income of $2,849 in 1976 and began its decline in Gini coefficients soon after. This number is roughly equal to that for Korea and so it should be that Malaysia is on the downward slope of the Kuznets curve. However, as mentioned in the discussion above, Malaysia is nowhere near the level of development of Korea after the same number of years. Furthermore, Gini coefficients between the two countries are dramatically different. Malaysia began with a much higher degree of income inequality than that of Korea. Malaysia has grown slower. Although GDP per capita converged in 1976, Korea’s growth accelerated past that of Malaysia in the following years. It could be that as Korea reached some level of development, its need for human capital in the form of education and skills and its need for investment in the form of savings could have been fulfilled by policies of redistribution in the form of education and training and tax policies that encourage investment or fulfilled in some other way that is a direct result of a more dispersed income. Malaysia, lacking redistribute channels, suffered through comparatively lower growth rates in the latter years, although those growth rates are still very high by world standards.
Indonesia demonstrates a very clear Kuznets curve but at a much earlier GDP per capita of $1,124. Furthermore, Indonesia demonstrates a very low starting and ending Gini coefficient. In fact, its ending Gini coefficient, assuming the country has gone through the Kuznets process, is one of the lowest in comparison to all countries. It is even lower than that of Japan. However, like the Philippines, GDP per capita is very low and so it may be that

1 See Oshima (1992) for a discussion on Korean full-employment.
Indonesia may yet experience a shift upwards in its inequality curve followed by another fall in inequality.

Figure 4.4 Indonesia

Brazil also demonstrates a Kuznets curve until 1981 when its GDP started to decline and we see a seemingly random pattern in its Gini coefficient. Nevertheless, it could be argued that the country was on a Kuznets curve until some shock to the system threw the
country off the curve. If so, its turning point on the curve occurred at a GDP per capita of $3,458.

Figure 4.5 Brazil

For the United States, income inequality has been argued to have followed a Kuznets curve, the turning point being around 1929 (Williamson and Lindert, 1980; Kuznets, 1946). In 1929, GDP per capita was about $713 in 1929 prices (Friedman and Schwartz, table 4.9).
Using the CPI to convert that value into 1985 prices, GDP per capita was around $4,458 for 1929. This figure is close to the values found for Korea, Malaysia, and Brazil.

For the U.K., it is generally believed that income inequality followed a Kuznets process which peaked sometime between 1860 and 1880 (Williamson 1985; Williamson, 1991; Kuznets 1955). Jeffrey Williamson found inequality in Britain to have increased up until around the 1860s and most likely closer to between 1867 and the early 1870s after which a noticeable decline is present (Williamson, 1991, p. 15; Williamson, 1985, p. 72). Income per capita for the UK for 1871\(^2\) was about 53 £ in 1929 £ per year (Friedman and Schwartz, Table 5.8). Converting into U.S. currency by multiplying by the exchange rate for 1929\(^3\), and then deflating into 1985 prices, income per capita at the turning point was roughly $1,619 (Friedman and Schwartz, Table 4.9; U.S. Department of Commerce).\(^4\)

By taking the mean average for all the countries in the data set that demonstrate a Kuznets curve, US, UK, Malaysia, Brazil, Indonesia, and Korea, and finding the variance between those numbers, it should be possible to make some guess as to when other countries should make the turn towards a more equally distributed income. It should also be possible to see any difference in turning points in terms of GDP per capita between Western countries, the US and UK, that developed during the industrial revolution and non-Western, mostly Asian, countries that have developed or are developing within the last 30 years.

The mean turning point for all countries in the sample is $2,677 per capita. By leaving out Indonesia, the lowest GDP figure and a possible outlier because it could be argued that the country has a long way to go before it reaches a steady state, average income per capita

\(^2\) Reported as 1871.5, the first year for which data was available.

\(^3\) The exchange rate for 1929 was 4.8569 U.S. $s.
becomes $2,988. The standard deviation for the first number is about $1213 while the standard deviation for the latter is about $1056.³

These numbers provide some basis for comparison between all countries in income inequality and GDP per capita but it should be kept in mind that this is a guess at some stylized facts rather than the discovery of any new facts.

Table 4.1 Turning Points of the Kuznets Curve

<table>
<thead>
<tr>
<th>Country</th>
<th>Year</th>
<th>Per Capita GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>1929</td>
<td>4,458</td>
</tr>
<tr>
<td>UK</td>
<td>1870/71</td>
<td>1,619</td>
</tr>
<tr>
<td>Korea</td>
<td>1976</td>
<td>2,558</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1976</td>
<td>2,849</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1978</td>
<td>1,124</td>
</tr>
<tr>
<td>Brazil</td>
<td>1974</td>
<td>3,458</td>
</tr>
</tbody>
</table>

U.S. 1985 international prices

² The income per capita calculated is not very accurate and is not stated in international prices because of this process.
³ Calculations for the variance used a sample population of countries that show a Kuznets curve:

\[ s^2 = \frac{\sum (X - \bar{X})^2}{n - 1} \]

where

\[ \bar{X} = 2.677 \] (note: the mean has been rounded to the nearest integer)

\[ n = 6 \]

GDP per capita (X) | X - \bar{X} | (X - \bar{X})²
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4458</td>
<td>976</td>
<td>3171961</td>
</tr>
<tr>
<td>2558</td>
<td>-183</td>
<td>14161</td>
</tr>
<tr>
<td>2849</td>
<td>108</td>
<td>29384</td>
</tr>
<tr>
<td>1124</td>
<td>-1617</td>
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<td>3458</td>
<td>717</td>
<td>609961</td>
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<tr>
<td>1619</td>
<td>-1058</td>
<td>1119264</td>
</tr>
<tr>
<td></td>
<td>≥ 0</td>
<td>≥ 7356840</td>
</tr>
</tbody>
</table>

\[ s^2 = \frac{7356840}{5} = 141368 \]

For the second calculations without the Indonesian outlier, \( s^2 = \frac{4460182}{4} = 1115045.5 \) \( s = 1056 \)
Countries that show increasing inequality

Chile is a country that has demonstrated increasing inequality over all the years for which data are available. During this time, however, growth rates were very low and the economy moved forward only slightly from 1971 to 1989. Inequality in the country increased dramatically suggesting a shift of income away from the lower income families to higher income families rather than an overall increase in income with a higher percentage of that income going to higher income families.

Figure 4.6 Chile
The trend for Thailand seems to be very different from that of Malaysia, Korea, and the Philippines. Thailand is the only country in the comparison that demonstrates increasing inequality over the entire period while also having some of the highest growth rates not only in the comparison, but also by world historical standards. Per capita GDP reached $3,942 in 1992, far above that of Korea’s turning point, but inequality continued to climb. Furthermore, the beginning point of its Gini coefficients is below that of Malaysia and only slightly higher than that of Korea.

Figure 4.7 Thailand
If we use the mean average calculated above for countries that show some sign of a Kuznets curve, GDP per capita in Thailand is just within 1 standard deviation of this average turning point of $2,988. If we use the figures calculated with the Indonesia data, Thailand is more than 1 standard deviation from the mean, although it is very close.\(^6\) Also, Thailand is still under the number for the US and therefore Thailand's GDP per capita is not necessarily far past the turning point of other countries. However, the Asian countries by themselves have been argued to reach the Kuznets peak much earlier than the Western countries and in the case of Thailand, this is not true. Also, Thailand reached full employment in 1992 and one would therefore, expect to see Gini coefficients begin to fall as pressures begin raise the wage level (Oshima, 1997, 1993 p. 210). At this point, it would be necessary to calculate Gini coefficients for the years after 1992 in order to assess whether or not Thailand has followed the path of the US.

**Countries that Exhibit Flat Inequality Curves**

Japan and Taiwan both experienced very little change in income inequality over the data set. Taiwan moved slightly towards more equality in the years 1966 to 1972 with GDP per capita at about $2,192 when inequality “peaked”, within the data set, in 1966. Oshima (1994) found that the peak for Taiwan was 1953 with a Gini coefficient of .56 followed in 1959/60 with a Gini of .44 (p. 238). However, it seems unlikely that such a dramatic shift in income inequality, from a Gini coefficient of .56 to .32, within a ten year period could take place and if it did it seems unlikely that it would remain so stable in the

\(^6\) For the first figure, Thailand is $106 within 1 standard deviation. For the second figure, Thailand is $52 away from 1 standard deviation. Whether or not these numbers are significantly different from the mean is not calculated.
years that followed. It is more likely that the data for Gini coefficients for this earlier period is measured by some other means than that for the rest of the data set which might make it seem inflated by comparison.  

Figure 4.8 Taiwan

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7 Oshima relied on data for 1953 and 1959/60 from Shirley W. Y. Kuo, The Taiwan Economy in Transition, Boulder, Colorado: Westview Press, 1983. The data were not categorized by the World Bank as "High Quality".
If 1966 was the turning point for Taiwan, that would place it well within 1 standard deviation of the mean of $2,677 including the Indonesian data. For the data which excludes Indonesia, Taiwan is also within 2 standard deviations form the mean of $2,988.

In Figure 4.8, the sharp increase in 1973 followed by a sharp decline in 1974 should not be labeled a Kuznets curve because variances in Gini from year to year can move drastically but do not represent a long-run trend that the Kuznets theory seeks to explain. This is why it is important to use ‘GDP per capita’ rather than ‘year’ on the x axis but with labels identifying each point so that the graphs can maintain some proportionality.

Japan also exhibits a relatively unchanged income distribution since 1962 but the data may be inconclusive due to the lack of data prior to 1962, when incomes per capita were already $3,554, well past the mean turning point. It could be argued that Japan witnessed increasing inequality in the years before 1962 followed by a decrease in income inequality somewhere close to the mean GDP per capita turning point. This would be supported by declining Gini coefficients in the data following 1962. Oshima argues precisely this point claiming inequality increased in the 1950s (Oshima 19??, p.).

Thus, if the guess work on when the peak was reached in Taiwan and Japan is correct, these two countries also seem to support the evidence of a mean turning point somewhere around $3,000 per capita.
Conclusion

The findings of this analysis show that the Kuznets process does indeed take place for several countries but that this process is not an unconditional characteristic of development. Korea, Malaysia, Philippines, and Brazil and possibly Indonesia, Taiwan and Japan all demonstrate increasing income inequality in the initial stages of development followed by decreasing inequality at some level of GDP per capita. Furthermore, it has been found that this level of GDP per capita is very similar for all countries under study and that this level is
consistent with the average level of GDP for the United States and Britain during their turning points.

Although some studies have suggested a turning point in the Kuznets process for Asia much earlier, in terms of income per capita, than the Western countries, this is not the case. However, it may be that income inequality transitions take fewer years to go through the entire Kuznets process than they did during the age of the industrial revolution. This makes intuitive sense and is consistent with economic theory. The technological shift during industrialization of the West took place over several decades tandem with discoveries and innovations (Oshima, 1992, p. 97; see also Oshima 1987). In contrast, Asian countries had the ability to move directly from agrarian economies to industrialized ones without experiencing the many stages in advancement of the industrial revolution by means of capital flows and imports of technology.

Finally, the data for Thailand suggest that it is one of the few countries that experienced only rising income inequalities over the data set and it is the only country to have experienced both rising income inequality and high growth rates. It is this example, among others, that may prove the Kuznets process to be conditional and not necessarily a function of economic growth rates or GDP per capita. It could be argued that the Thai Gini coefficients will fall in the near future, creating a Thai Kuznets curve but with a turning point higher than other countries, except perhaps the US. Possible explanations for Thailand’s laggard performance will be given in chapter 5.

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Oshima (1992) found that "in Asia, the peak is reached when the economy is still predominantly agricultural with per capita incomes much lower than in the West where the peak was reached when the economy was predominantly industrial" (p. 95). His conclusions are based on data for the United States but leave out any discussion of the UK. See also Oshima, 1994.
Chapter 5
Conclusion

From the analysis in chapter 4, it should be apparent that the Kuznets process is not necessarily a given for development. While some countries demonstrate an increase in inequality in the initial stages of development followed by a decrease in inequality, others do not. It seems likely that the differences may come from differences in policy. Brazil, for example, followed a Kuznets curve quite closely until 1981 when it was suddenly thrown into a random pattern of decreases and increases in inequality from year to year while GDP fluctuated as well. While many countries experienced a falling Gini coefficient associated with a decrease in inequality, the opposite holds true for other countries and so it is unlikely that GDP alone influences the distribution of income. This finding is consistent with the recent literature on inequality and growth.

Most likely, national income has some affect on income inequality and inequality has some affect on income, but it seems that policy might play some significant role in establishing that relationship. The differences between Malaysia and Korea, for example may stem from policy choices. If policies hold some commonalities among countries then a common Kuznets path may appear among them with a common GDP per capita turning point. This may be what is seen in all the countries of the data that show a Kuznets curve; there may be some common policies that led them to that distribution and income level.

Thailand is a case where income is growing and the distribution is becoming more and more unequal. There are several explanations for Thailand that stem from conditions of the business cycle and the inherent conditions of a country made up of drastically different
regions with different natural and created endowments. Financial imperfections and a lack of
tax policies designed to redistribute income are important theoretical explanations for the
trend in income inequality in Thailand as well.

Explanations for Thailand

Business Cycle and Regional Differences

Most of Thailand was unaffected by the commercialization of agriculture which
remained basically subsistent for rural regions. Agricultural prices fell in the 1980s thus
creating lower wages for the already low agricultural sector while urban wages rose during
this same period (Oshima, 1997, p. 23). In 1988, with a recovery of agricultural prices and
lower unemployment, the Gini still increased but by a lower margin. The decade of the 1980s
was a period of recession, monetary reform, and recovery in the later half of the decade.

By 1992, under full employment, Thailand's Gini coefficient was expected to fall but
instead increased once again. During this period, foreign investment created a big demand for
skilled labor and less for unskilled labor. The result was a severe shortage of skilled workers
due to the slow growth of secondary education (enrollment rates in Thailand are the lowest
among South East and East Asian countries). The influx of labor with low educational levels
from the rural areas held down wages of unskilled workers while a lack of physical
infrastructure outside of Bangkok created congestion of foreign investment in and around the
city (Oshima, 1997 p. 24-25).

The main feature underlying the trend in inequality in Thailand is the dramatic
differences between regions, with most of the industrial and service sectors located in
Bangkok, the only major city in the country (Oshima 1993, p. 210). Regional variations are
more extensive in Thailand than in any other South East Asian country. Furthermore, it is the rapid growth of per capita income in and around Bangkok which affects the growth of inequality in Thailand as a whole (Oshima, 1997, p. 23).

Financial Imperfections

The idea of a connection between a country’s financial superstructure and its real infrastructure began with Goldsmith (1969). Goldsmith states, the financial superstructure of an economy “accelerates economic growth and improves economic performance to the extent that it facilitates the migration of funds to the best user, i.e., to the place in the economic system where the funds will yield the highest social return” (p. 400). Causality is unclear in the theory but it makes intuitive sense that economic growth fosters investment in organizational capital which in turn fosters further growth.

According to Greenwood and Jovanovic (1990), the Kuznets process supports the dynamics of the development process. An economy initially grows slowly when its financial markets are underdeveloped. As the financial superstructure begins to form, the economy’s growth and savings rates both increase and the gap in the distribution of income across rich and poor widens. The developed economy has an extensive financial superstructure for financial intermediation and the distribution of income thus stabilizes while the savings rate falls (pp. 1078-79). Lindert and Williamson (1985) found this correlation between rising inequality coinciding with rising savings and accumulation rates during the industrial revolution (pp. 342-343). The Smithian trade-off paradigm developed out of this evidence as it was witnessed by contemporary critics and supporters alike.
In Thailand there is certainly a lack of financial superstructure outside of Bangkok, supporting the division in income groups by creating interregional inequality. The financial support needed to make investments in capital, human as well as physical, are lacking while growth remains almost entirely within the Bangkok and surrounding areas, thus discouraging the creation of financial structure outside of those areas; something like an interregional catch 22. While there may be a trade-off occurring in Thai development, it is not in terms of equality for growth but rather, growth in one region for growth in another.

In order to examine this problem in more detail, a look at savings rates in conjunction with inequality in Thailand would be required. By doing this, and assuming that domestic savings rates lead to investment, the relationship between financial institutions and development and income distribution in Thailand could be better understood.

Policy

While Brazil may provide an excellent example of policy choices that knock a country off a Kuznets curve, Thailand provides an excellent example of a country that cannot follow a Kuznets curve. Both cases may owe much of these circumstances to a lack of redistributive policies. Because the focus of this paper is Thailand, the policy implications for that country will be examined but the case of Brazil should be looked at some other time in a search to find evidence supporting the findings for Thailand.

It could be argued that there should be some trickle down affect of income from the relatively rich to the relatively poor. With GDP at almost $4,000 per capita, it seems that some of this income would find its way down the income ladder. In Thailand, much of what drives income inequality is not only interregional inequality but also intraregional inequality.
Inequality within Bangkok is severe and because of the tremendous weight this area has in the makeup of GDP, it is a big source of inequality in overall income distribution (Oshima, 193, p. 210).

Furthermore, each income group, by deciles or some other measure, has its own set of parameters for income distribution. If each income group follows its own Kuznets curve, as Ahluwalia (1976) points out, the turning point occurs much earlier for higher income groups and substantially later for lower income groups. If there is a trickle down effect, it takes a long time to reach the bottom. The slow transition to a more equal distribution of income within lower income groups and the heavy weight, in terms of a percentage of the population, that this group has in determining the Gini coefficient for the whole country, could heavily influence inequality for the country as a whole. In this case, redistributive policies may make a difference in income distribution by speeding up the process of the trickle down effect.

The politico-economic theory of Persson and Taballini (1994) found a negative relation of inequality to growth based on some exogenous level of wealth which determines the makeup of voters and therefore, policies, of a democratic nation. In this case, a redistributive policy of higher taxes will deter investment and cause slower growth. If the society is made-up of wealthy voters, taxes will be lower due to a lesser need for redistribution and this in turn will spawn greater investment in capital accumulation, the engine of growth. The trade-off paradigm lives on.

Thailand is not a true democracy in that although it has a parliamentary system with an influential King, the system is filled with corruption, and coups, although not so common in recent years, have been more the norm than the exception in Thailand. In a system like this, voters may have little impact on policy choices. Also, a very important link in communication
between voters and government is one based on culture which either encourages or inhibits, or is somewhere in between, political action.

Inequality may be harmful for growth because of the cost to investment that redistributive policies involve. But in Thailand something else is happening. High growth rates have been maintained while the gap between rich and poor constantly increases. Persson and Taballini address the problem of how inequality affects growth but they do not address the problem of how growth affects inequality. Perhaps in a non-democracy like Thailand, this is the real issue. Instead of trying to understand the causal relationship, it might be better to look at ways to alleviate inequality growth while maintaining, at least in theory, economic growth.

Alesina and Rodrik (1994) also stay within a politico-economic framework to explain the impact of inequality on growth through tax policies. However, they differ from other authors in several ways, one of which may apply to the Thai case. Tax revenues provide a public good necessary for private production. This relationship is consistent with the inverted U curve relationship between taxes and growth established in Barro (1990). A tax rate on capital slightly above the growth maximizing tax rate has only a second-order effect on accumulation but it would have a positive first-order effect on the instantaneous consumption level of any individual who receives labor income. The net effect is beneficial for society except in the eyes of the pure capitalist (Alisina and Rodrik, p. 476). Briefly, there could be a redistribution of income through a slight increase in taxes that would only inhibit growth in the slightest sense. Further, redistributive policies could have positive long-term effects on growth if theses policies lead to human capital accumulation that is necessary for the later stages of growth which would in turn inspire further growth.
In Thailand, again the problem is one of politics and/or culture. Changes in taxation are not easily influenced by voters and instead would have to come from the government. If the government in Thailand is of a pure capitalist nature, one in which growth is essential over all side effects, then tax policies may not change in exchange for a more equal distribution of income at the expense of a slightly lower growth rate.

Summary

The problem for Thailand, at this point, seems to be a political one. Strong authoritarian-like regimes have been cited as economic dictatorships where growth rates take precedent over distribution (see East Asian Miracle). Further examination of economic theory as it applies to Thailand should come first before a conclusion can be made.

The findings of this paper are that although Thailand is not necessarily past the designated turning point as established by other countries that have followed a Kuznets curve, it is at least a late comer in that regard. Further study through the measurement of Gini coefficients for more recent years should give a better understanding of whether or not Thailand is avoiding the Kuznets process. Nevertheless, policy choices could be the focus of further investigation into the problem of inequality and growth in Thailand.
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