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Poverty, Growth, and Inequality in Thailand

Anil B. Deolalikar

April 2002

ERD Working Paper No. 8

POVERTY, GROWTH, AND INEQUALITY IN THAILAND

Anil B. Deolalikar

April 2002

Anil Deolalikar is Professor of Economics and of International Studies at the University of Washington. This paper stems from RETA 5923: Pro-poor Growth and Institutional Constraints to Poverty Reduction in DMCs. The views expressed in the paper are those of the author and do not necessarily reflect the view or policies of the Asian Development Bank.

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Foreword

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Abstract

A number of empirical studies using cross-country data have found that poverty incidence responds very strongly to economic growth. This paper explores the impact of economic growth as well as changes in income inequality on poverty reduction using provincial data from Thailand over the period 1992-1999. The results suggest that, while income growth has a strong positive effect on poverty reduction, income inequality has a sharply negative effect. Income inequality reduces the rate of poverty reduction in two ways: first, increased inequality is associated with increased poverty after controlling for economic growth, and second, high levels of initial inequality reduce future growth rates, thereby impeding the poverty reduction that would have taken place in the presence of rapid growth. What this suggests is that income inequality can play a critical role in affecting the rate of poverty reduction, especially in a low-growth environment. Given that near-term prospects for growth in Thailand are guarded, it may be particularly important for poverty reduction policies in that country to focus on improving income inequality, or at least preventing a further worsening of income inequality.

I. Introduction

While the thesis that economic growth is an important determinant of poverty reduction has been around for some time, the last few years have seen the rise of a large empirical literature on the nature of the relationship between poverty and growth. These studies have attempted to estimate the growth elasticity of poverty to ask the question, Do the poor in particular, as opposed to all segments of society, share the benefits of economic growth proportionally? Virtually all of these studies have been based on cross-country data.

There are two main problems with the use of cross-country data to analyze this relationship. First, there are enormous data comparability problems in pooling data from a large number of countries that differ from one another in terms of the quality, frequency, and type of their poverty data collection (e.g., whether data are obtained from national income accounts or household surveys) as well as in terms of concepts, measurement, and definitions of key variables. These differences are likely to introduce significant (systematic) measurement error in the estimation of poverty-growth elasticities.

Second, the cross-country studies ignore the fact that the growth-poverty relationship is likely to be highly country-specific; the “average” elasticity estimated by the various studies is unlikely to capture the wide range of country experiences. In some countries, economic growth has been associated with rapid poverty reduction, while in others it has not. Even in a given country, growth can be sharply poverty-reducing at one point in time and can have a much smaller effect on poverty reduction during another time period.

To some extent, these problems can be mitigated by the use of intracountry data—data on regions, provinces, or districts within a country. Since data on different regions within a country typically are derived from the same statistical survey or administrative data collection system, there is much greater comparability of data across observation units. In addition, subnational entities, such as provinces, often share the same political and policy framework, and are socially and culturally more similar to each other than individual countries are to each other. The estimation of an average poverty-growth elasticity for a country, although not desirable, makes more sense than an average elasticity for the entire developing world.

In addition to the use of highly aggregate cross-country data, another shortcoming of the poverty-growth literature is the omission of changes in the distribution of income as a source of poverty. Changes in income inequality, along with economic growth, jointly affect the rate at which poverty is reduced. For instance, the impact of growth on poverty reduction will be smaller

if growth is associated with a worsening distribution of income.¹ The vast majority of existing studies on the poverty-growth relationship have ignored this contemporaneous effect of changes in income inequality on poverty reduction.

The objective of this paper is to use provincial data from Thailand to explore the impact of economic growth and changes in income distribution on poverty reduction between 1992 and 1999. Thailand is an ideal country for which to estimate an intracountry relationship between growth and poverty for three reasons. First, the large number of administrative provinces in the country (viz., 76) offers a relatively large sample for estimation purposes. Second, the country conducts at regular intervals a nationally representative household consumption and income survey (the Socioeconomic Survey), the sample size for which is large enough to calculate reliable provincial means. The survey has employed the same concepts and definitions of income since 1988, making data for different time periods comparable. Third, Thailand has experienced large changes in mean income and income inequality over the period 1992-1999. While the period 1992-1996 saw rapid economic growth and a modest reduction in income inequality, the period of the economic crisis (1997-1999) was associated with a sharp decline in mean income and a sharp increase in income inequality. These changes offer a unique opportunity to study the effect of both growth and distributional changes on poverty reduction.

II. Previous Studies

Much of the growth-poverty literature can be divided into two camps on the basis of the analytical methodologies adopted. One strand of the literature has analyzed the cross-country relationship between economic growth and the per capita income of individuals in the first quintile of the distribution (i.e., the relative poor). For example, using essentially the same data and similar econometric techniques, Roemer and Gugerty (1997), Gallup et al. (1999), and Dollar and Kraay (2000) have estimated the growth elasticity of per capita incomes of the “poor” to be close to unity, which implies that growth in average income leads to a one-for-one increase in the incomes of the poor. Timmer (1997), also using broadly similar methodology, has, however, obtained a growth elasticity of around 0.8, indicating less than proportionate gains for the poor from economic growth. Using provincial data from the Philippines over the 1980s and 1990s, Balisacan and Pernia (2002) find a much more subdued effect of growth on incomes of the poor than is generally suggested by cross-country data. They find that, on average, the growth elasticity is just above 0.5, indicating that income growth across Philippine provinces has not translated into one-for-one to changes in the welfare of the poor.

The second strand of literature has examined the effect of economic growth on absolute poverty. Ravallion (2000), Ravallion and Chen (1997), and Bruno et al. (1998) find that the elasticity

¹ Of course, what matters to poverty reduction is not the degree of overall income inequality but the inequality of incomes in the vicinity of the poverty line.

of the poverty headcount ratio is typically greater than two, viz., that when average income increases by 10 percent, the proportion of poor declines by more than 20 percent. Other studies such as Morley (2000), De Janvry and Sadoulet (2000), and Smolensky et al. (1994) report a smaller elasticity of around one percent, but these are obtained from a smaller sample of countries. Ravallion and Chen (1997) also use poverty lines that combine an absolute and a relative component, but their elasticities are highly sensitive to where the poverty line is located. The elasticity of poverty to growth estimated by them ranges from -2.6 to -0.7, depending on whether the threshold is established at 50 percent or 100 percent of the average income observed at the initial period of observation.

It is important to note, however, that a large and negative estimated elasticity of poverty with respect to growth does not imply that growth alone is sufficient for poverty reduction. A number of other variables, including sociocultural factors and the nature and quality of institutions in a country, play an important role in bringing about poverty reduction, both directly as well as indirectly via growth (Deolalikar et al. 2002).

III. Poverty in Thailand

A. Poverty Line

There have been a number of different poverty lines in use over the last 20 years in Thailand. However, in 1996, the NESDB developed a new poverty line that was officially accepted by the Thai cabinet,² and which is now used as the standard poverty line in most poverty analyses in the country. This official line is used throughout this paper, unless otherwise noted. Not only does this poverty line vary across rural and urban areas and across the five regions owing to spatial variations in the cost of living, but it also varies across households of different sizes and demographic composition, as subsistence needs are assumed to differ by age and sex of individuals. The national average of the official poverty line was Baht 878 per person per month in 1998 and Baht 886 per person per month in 1999.

In 1999, the poverty line (which had an average value for the entire country of Baht 10,632 per capita per annum) was only about one seventh (14.4 percent) of GDP per capita. Converted to a daily figure, the poverty line is significantly lower than the minimum wage, constituting less than one fourth of the minimum wage in 1999 (which averaged nationally at about Baht 135 during that year). In terms of US dollars, the official Thai poverty line in 1999 translated into approximately \$0.75 per day.³

² The poverty line is based on a technique developed by Kakwani and Krongkaew (1996).

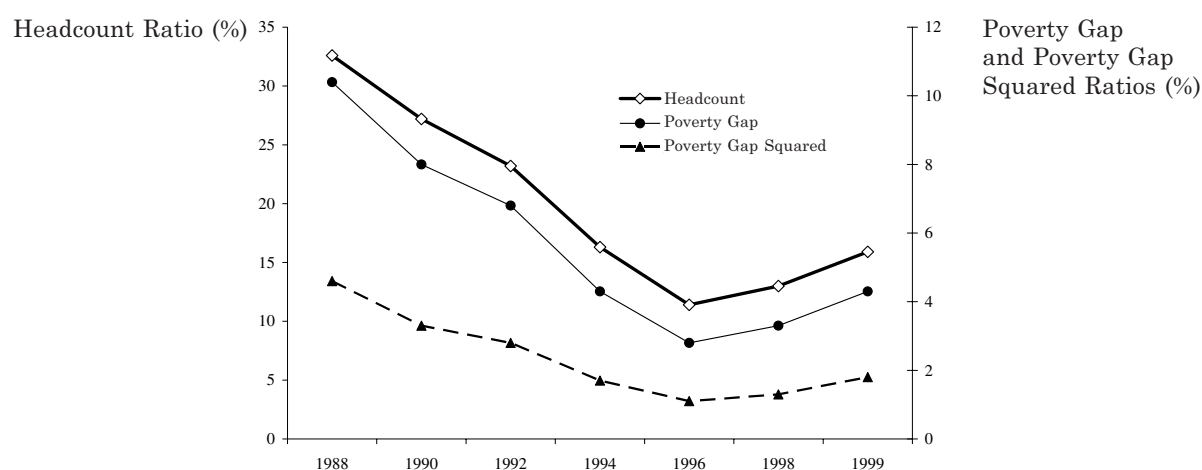
³ Note that this figure is different from the commonly-used “dollar-a-day” poverty line, as that line refers to a dollar in 1993 purchasing power parity-adjusted terms. Thailand’s official poverty line in 1999 was equivalent to 1993 PPP \$1.60.

B. Extent of Poverty and Changes in Poverty

1. Headcount Ratio

Data from the Socioeconomic Survey (SES) show a sharp decline in the incidence of income-poverty from 1988 to 1996 (Figure 1).⁴ The incidence of income-poverty declined from 32.6 to 11.4 percent, with the number of income-poor declining from about 18 million to 7 million. On average, 1.4 million persons were being lifted annually out of income-poverty between 1988 and 1996. The onset of the economic crisis put a halt to these impressive rates of poverty decline. The headcount ratio of income-poverty increased from 11.4 percent in 1996 to 13 percent in 1998 and 15.9 percent in 1999.⁵ This meant that an additional one million persons became poor in 1998, with 1999 seeing another 2 million persons added to this number.

Figure 1: Measures of Income-poverty, 1988-1999



⁴ The analysis in this paper is based on primary analysis of data from the Socioeconomic Surveys (SES). See Annex 1 for a description of the SES.

⁵ Since the Socioeconomic Survey of 1999 was a special survey that was conducted only during the four months of June-September 1999, results from earlier SESs are strictly not comparable unless data from the earlier SESs are analyzed only for the second and third quarters (which cover the June-September months). However, it was observed that the use of two or four quarters of data for earlier SES samples made little difference to the results presented in this paper. Therefore, unless otherwise noted, statistics presented in this paper for years other than 1999 are based on data covering all four quarters, while those for 1999 are based on two quarters of data.

2. Poverty Gap

A shortcoming of the headcount ratio is that it does not say anything about the depth of poverty, viz., the extent to which the incomes of the poor are below the poverty line. The poverty gap index fills this shortcoming by measuring the shortfall between the incomes or consumption expenditures of poor households and the poverty line. The sum of all individual poverty gaps in a sample can be interpreted as the minimum amount of income transfers needed to bring all of the poor just up to the poverty line in the presence of perfect targeting.⁶ A poverty gap of 4.3 percent for Thailand in 1999, as shown in Figure 1, suggests that, if perfect targeting were possible, an income transfer of Baht 38 ($= 0.043 \times \text{national poverty line of Baht 886}$) per person per month would be required to eliminate poverty. The total volume of income transfers required to bring all of the poor to an income level just above the poverty line would then be Baht 28 billion ($= \text{Baht } 38 \times 12 \text{ months} \times 61.66 \text{ million persons}$).⁷

The poverty gap measure for Thailand follows roughly the same pattern over time as the headcount ratio. There was a small increase in the poverty gap between 1996 and 1998, but a much sharper increase from 1998 to 1999.

3. Severity of Poverty

A problem with the poverty gap index is that it is not sensitive to the distribution of income among the poor and hence to the severity of poverty. A redistribution of income from a destitute individual to someone much better off (but still under the poverty line) will leave the poverty gap index (and the headcount index) unchanged, although it is clear that this redistribution will have increased the severity of poverty in the population. The poverty gap squared index, which belongs to the broader family of Foster-Greer-Thorbecke (FGT) indices, is sensitive to the distribution of income among the poor, since it weights the shortfall between an individual's income and the poverty line more heavily the further below the poverty line that individual's income falls. A shortcoming of this index is that, unlike the headcount and the poverty gap indices, it does not lend itself to an easy interpretation. Its use, therefore, lies mainly in comparing the severity of poverty over time or across different subgroups in the population.⁸

⁶ Perfect targeting implies that each individual below the poverty line would receive a transfer that would permit his or her income or consumption to reach the level of the poverty line and that no one above the poverty line would receive any transfers.

⁷ It should be realized that these are hypothetical numbers. Besides the fact that perfecting targeting is rarely possible in practice, few developing-country governments would choose to continue making income transfers to the poor in perpetuity, in part because there would be significant disincentive effects of making transfers to each poor individual based on his or her income shortfall (relative to the poverty line).

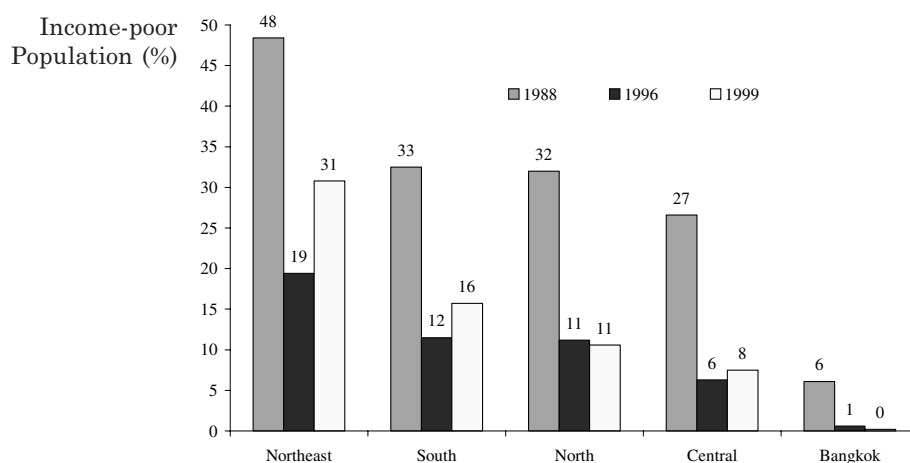
⁸ All of the three measures discussed here (headcount ratio, poverty gap index, poverty gap squared index) are fully decomposable across different subgroups in the population.

Like the headcount ratio and the poverty gap index, the poverty gap squared index in Thailand also fell sharply from 1988 to 1996, but then reversed itself in 1998 and 1999. Interestingly, the increase in all three measures of poverty in 1998 and 1999 was sufficient to erase a considerable amount of progress in poverty reduction and put the country back to where it was in 1994 in terms of poverty outcomes. In this sense, the economic crisis in Thailand had a very significant adverse impact on poverty and the poor.

C. Regional Variations in Poverty

In Thailand, as in most other countries, there are very large regional differences in both the level of poverty and the rate of poverty reduction over time. Historically, the Northeast has been the poorest region in the country, followed by the South, North, Central region, and Bangkok (in that order). In 1988, for instance, nearly one half (48.4 percent) of all Northeasterners were poor, compared to only 6 percent of Bangkok residents (Figure 2). By 1996, the year before the

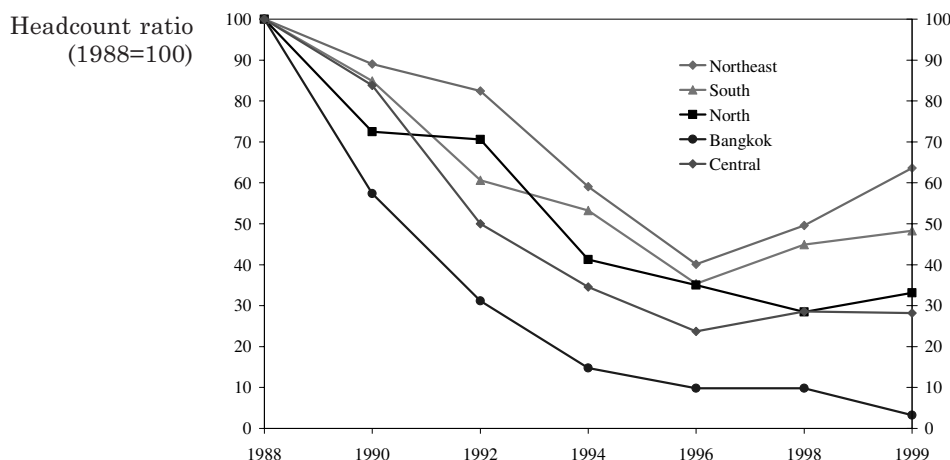
Figure 2: **Headcount Ratio of Income-poverty (%)**
by Region 1988, 1996, and 1999



economic crisis, the incidence of poverty had declined in all regions, but the Northeast continued to be the poorest region in the country. In the period after the crisis (1996-1999), the incidence of poverty increased sharply in the Northeast, somewhat in the South and Central regions, but declined in Bangkok and the North. The fact that the relative ranking of the regions by the incidence of poverty was roughly similar in all three years (1996, 1998, and 1999) suggests that the regions that were poor to begin with did not experience more rapid poverty reduction.

In fact, the evidence suggests exactly the opposite, viz., that poverty has declined more rapidly in the better-off regions than in the poorer regions. This is observed clearly in Figure 3, which shows the headcount ratios of poverty from 1988 to 1999 across the five regions, starting from a common base of 100 in 1988. Figure 3 shows that the Northeast had the smallest relative decline in poverty between 1988 and 1996, with the incidence of poverty in 1996 being 40 percent

Figure 3: **Headcount Ratio of Income-poverty, by Region, 1988-1999**
(1988 poverty headcount = 100)



of its 1988 level. The South and the North were also relative laggards in poverty reduction, having poverty rates in 1996 that were about a third of the corresponding 1988 levels. Bangkok was the best performer, having achieved a poverty headcount in 1996 that was only 10 percent of its 1988 level.

The regional disparity in poverty reduction performance actually grew wider with the onset of the crisis. Between 1996 and 1999, the incidence of poverty increased sharply in the Northeast, somewhat in the South and Central regions, and declined in Bangkok and the North. Thus, by 1999, the poverty headcount in the Northeast was nearly two thirds of its 1988 level, while the corresponding ratio for Bangkok was a mere 3 percent. The North was somewhere in between, having a poverty headcount in 1999 that was one third of its 1988 level.

The sharply adverse impact of the crisis on poverty in the Northeast, the South, and the North may seem puzzling in view of the fact that the economic crisis of 1997 originated in the financial center of Thailand (viz., Bangkok). However, migration of labor played an important role in transmitting the impact of the financial crisis to regions outside Bangkok. As the financial shock spread to the real economy shortly after July 1997, aggregate demand fell, and firms responded by cutting back on employment and reducing wages. This resulted in a decrease in the remittances that migrant workers in Bangkok sent to their families back in the Northeast. In addition, although there was no large-scale return migration of migrant workers out of Bangkok, the heavy volume of out-migration from the Northeast, which had been a mainstay of Thai labor markets in the last two decades, slowed down sharply in the aftermath of the crisis. Both the decline in remittances and the reduced outflow of migrants from the poorer regions of the country to the better-off regions probably accounted for the decline in household income and increase in poverty in the Northeast, North, and South during 1998 and 1999.

The interprovincial variations in poverty incidence are even greater than the inter-regional variations shown in Figure 2. For instance, an average poverty headcount ratio of 30.8 percent

in the Northeast in 1999 masks the enormous disparity in poverty rates across the two provinces of Ubon Ratchathani (8.7 percent) and Surin (50.5 percent). Figure 4 highlights these provincial differences by showing a poverty map of Thailand. The Northeast is seen to have the highest concentration of poverty in the country. High levels of poverty are also observed in a few of the Northern and Southern provinces.

IV. Economic Growth, Inequality, and Poverty Reduction across Provinces

What are the reasons for these large provincial and regional differences in poverty and poverty reduction in Thailand? To what extent are these differences in poverty performance attributable to provincial differences in economic growth rates?

As already noted in Section II, there is a large emerging literature on the relationship between growth and poverty which argues that economic growth is one of the important determinants of poverty reduction across a cross section of countries. This point has been empirically established for a cross section of developing countries as well as for some individual countries over time. But little is known about the effect of economic growth on poverty reduction in Thailand.

At an aggregate level, it is clear that poverty has fallen rapidly in Thailand during periods of strong growth in the economy, and that it has increased during periods of weak or negative growth (Figure 5).

However, one problem with analyzing the relationship between growth in per capita GDP and changes in poverty at an economywide level (as shown in Figure 5) is that there are relatively few data points to estimate the relationship precisely. Another problem is that the scatter plot in Figure 5 does not control for contemporaneous changes in income inequality that may also be important in influencing changes in poverty.

An attempt is made in this paper to use household survey data from five different rounds of the Thai Socioeconomic Survey (1992, 1994, 1996, 1998, and 1999) to estimate the relationship between economic growth, poverty headcount ratio, and income inequality at the provincial level. The household survey data are used to construct the (sample-weighted) incidence of income-poverty (i.e., headcount ratio), mean household income per capita, and the Gini coefficient of per capita income inequality for each of the 76 Thai provinces. The cross-province data are then used to estimate the econometric relationship between changes in poverty incidence on one hand and economic growth (proxied by changes in mean per capita income) and distributional changes (proxied

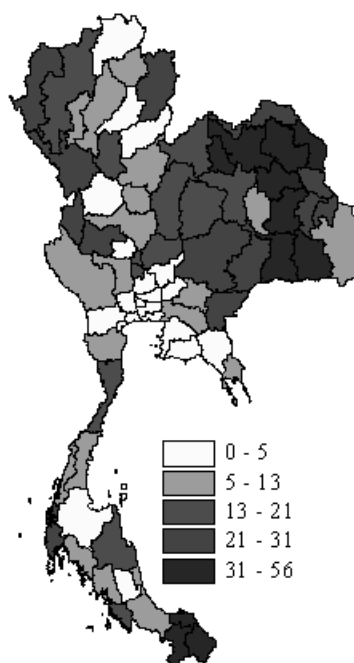
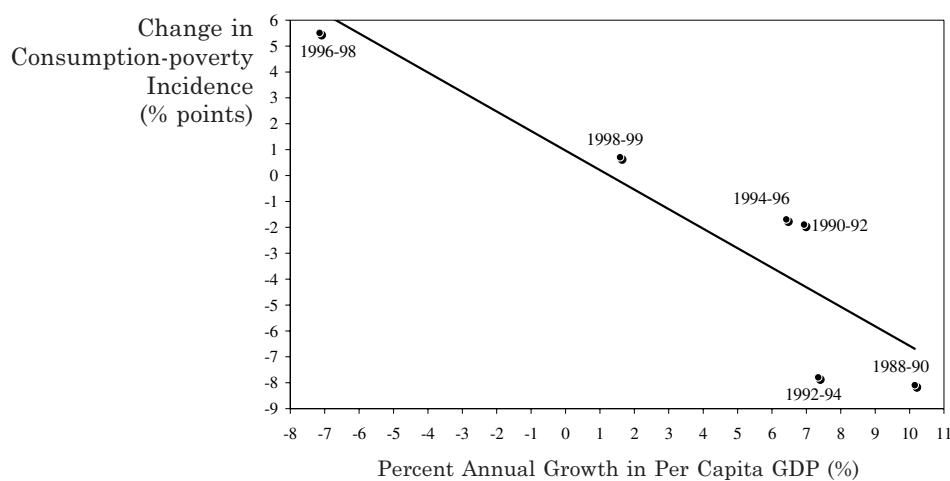


Figure 4:
Poverty Map of Thailand

Figure 5: Growth Rate in Per Capita GDP and Changes in Incidence of Consumption-poverty, 1988-1999



by changes in the Gini coefficient) on the other. In addition to the three variables of mean income per capita, Gini coefficient of income inequality, and poverty incidence, we also calculate and use provincial means of selected demographic variables (such as household size, proportion of children aged 0-15 years in the population, and proportion of the elderly aged 60 years and over) and socioeconomic variables (e.g., average schooling of adults, proportion of population residing in female-headed households, and proportion of population that is urban) on which data are readily available in the SES.

A. Relationship between Levels of Poverty, Inequality, and Mean Income

A scatter plot of poverty incidence against mean per capita income (Figure 6) shows a strong log-linear relationship between the two variables. The “levels” regression produces a growth elasticity of poverty of -2.2, indicating that a one percent increase in mean per capita income is associated with more than a two percent decrease in the percentage of population that is poor (Table 1). Obviously, this is a very strong relationship and suggests that poverty levels are very strongly influenced by mean per capita income in a province. However, poverty is also very strongly associated with income inequality (measured by the Gini index of income), as observed in Figure 7. The association is positive, implying that, controlling for mean income, a more unequal distribution of per capita income is associated with a sharply higher level of poverty. The estimated distributional elasticity of poverty is 3.2, indicating a three-for-one increase in poverty incidence with an increase in the Gini coefficient of income inequality.

When other socioeconomic and demographic variables are included as additional determinants of poverty (see Equation 2 in Table 1), there is little change in the estimated growth and distributional elasticities. The coefficients on mean income and the Gini index continue to retain their signs as well as their significance. The only other variables that are significant in

Table 1: Determinants of Poverty across Provinces, Pooled 1992-1999 Data (Levels Estimates)

Independent Variable	Log of Poverty Headcount Ratio						First-stage OLS Levels Estimates	
	OLS Levels Estimates			2SLS Levels Estimates		Log of mean income per capita	Log of Gini coefficient	
	Equation 1 Coeff.T-ratio	Equation 2 Coeff. T-ratio	Equation 3 Coeff. T-ratio	Coeff. T-ratio	Coeff. T-ratio			
Log mean income per capita	-2.174 3.220	-2.456 3.391	-20.39 18.21		-2.094 2.868			
Log Gini coefficient								
Mean age of household head (years)		-0.002 0.003	-0.17 0.74	0.077 -0.022	2.71 -2.48	-0.031 0.005	0.001 -0.004	
Percent of population residing in female-headed households								
Mean schooling years of adults (18 years and older)		0.089	2.23	-0.387	-6.49	0.187	-0.005	
Percent of population urban		-0.001	-0.69	-0.004	-1.04	0.002	0.001	
Mean household size		-0.131	-1.84	0.002	0.01	-0.046	0.006	
Percent of population aged 0-15 years		-0.011	-1.40	0.073	5.47	-0.028	0.005	
Percent of population aged 60 years and over		-0.014	-1.24	-0.073	-2.54	0.026	0.001	
Time (1=1992, ..., 8=1999)	-0.029	-0.006	-0.16	-0.192	-2.73	0.117	0.030	
Time squared	0.004	0.000	0.09	0.026	3.38	-0.014	-0.003	
Intercept	6.910	9.115	7.33	-0.105	-0.10	8.693	3.578	
Number of observations	377	377	377	377	377	377	377	
F-ratio	499.78	234.03	72.00	161.44	161.44	94.17	2.92	
Significance level of F-ratio	0	0	0	0	0	0	0	
R-squared	0.875	0.882	0.560	0.557	0.557	0.731	0.067	

Figure 6: **Cross-provincial Relationship between Poverty Incidence and Mean Per Capita Income Growth, 1992-1999**

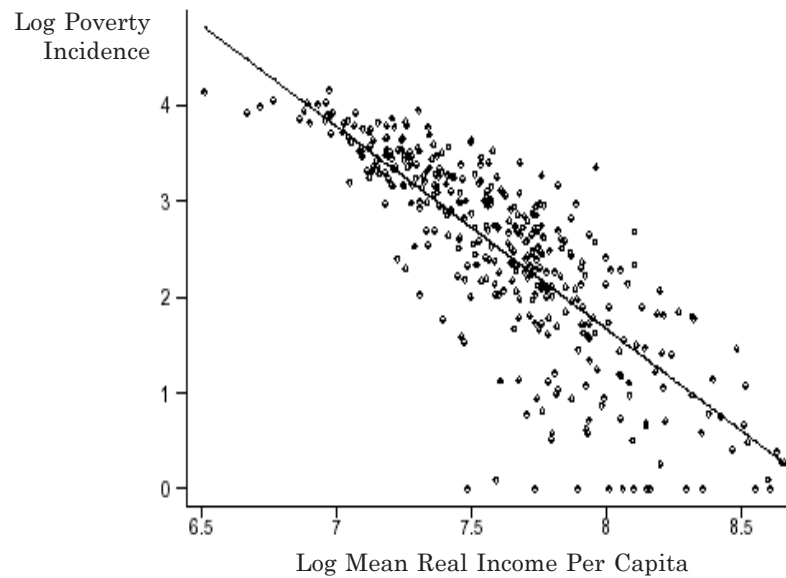


Figure 7: **Cross-provincial Relationship between Poverty Incidence and Income Inequality, 1992-1999**



the relationship are household size and adult education, with household size being associated inversely with poverty and education being associated positively. The latter result seems counter-intuitive, but it simply indicates that an improvement in the mean level of schooling in a province is associated with greater poverty after controlling for improvements in mean per capita income.

In both of the above equations, a very large proportion (about 88 percent) of the inter-provincial variation in poverty is “explained” by variations in mean per capita income and in income inequality. Of this, approximately three quarters (i.e., 67 percent) is explained by variations in mean income alone, with the remainder being explained by variations in income inequality.

Equation (3) in Table 1 estimates a “reduced-form” relationship between poverty on one hand and socioeconomic and demographic variables on the other (with mean income and income inequality omitted as regressors). There are four main findings here. First, the effect of mean education on poverty is observed to be strongly negative in the reduced-form poverty equation, indicating that the education effect on poverty is mediated by mean income and/or income inequality. (In other words, mean schooling reduces poverty largely by raising mean income.)

Second, poverty is inversely associated with residence in female-headed households, with a one percentage point increase in female headedness in a province being associated with a 2.2 percent increase in that province’s incidence of poverty. Third, although mean household size is no longer a significant determinant of poverty, the age composition of the population is. A larger proportion of children aged 15 years and below in the population is associated with significantly higher levels of poverty, but a larger population share of the elderly (i.e., those aged 60 years and over) is actually associated with lower levels of poverty. The latter finding suggests that, instead of being a burden, the elderly in Thailand are important income contributors to poor households, and their numbers are associated with a reduction in provincial poverty incidence.

Fourth and finally, the results indicate that provincial poverty incidence has been falling, but at a diminishing rate, over time. In the early 1990s, poverty was declining at an annual rate of 16.6 percent, but the rate had already slowed down to 6 percent by 1996, the year before the onset of the economic crisis. During the crisis years, poverty reversed its decline and started rising.

It is quite likely that mean provincial income and provincial income inequality may not be exogenous with respect to poverty incidence. Certain unobserved provincial variables, such as “social capital” or initial endowments, may affect mean income, income inequality, and poverty simultaneously. Additionally, high levels of poverty may be the cause of low mean income (rather than the other way around), as a high incidence of poverty may mean that a large proportion of the population is effectively outside the market and production economy of the province. One way around this problem would be to employ instrumental-variable (IV) methods to estimate the poverty-growth relationship, treating both mean income and the Gini index as endogenous variables. The demographic and socioeconomic variables already discussed above could be used as instruments for mean income and income inequality.

The absolute magnitude of the 2SLS estimates are only slightly smaller than the OLS estimates: a growth elasticity of poverty of 2.1 and a Gini coefficient elasticity of poverty of 2.9 (Table 1). The robustness of the estimated poverty elasticities to alternative specifications is

comforting, and suggests that there is indeed a very strong cross-provincial relationship between poverty on one hand and mean income and income inequality on the other.

B. Relationship between Changes in Poverty, Inequality, and Mean Income

Levels regressions have the disadvantage that they do not control for unobserved provincial heterogeneity. To the extent that unobserved (or observed) factors unique to a province (such as its location, quality of land, proximity to power centers, historical circumstances, institutions, administration, and “culture”) jointly affect its poverty incidence, its mean level of per capita income, and its level of income inequality, a “levels” regression of the type reported in Table 1 would be biased, and might simply reflect a spurious correlation between poverty and mean income and between poverty and income inequality. A solution to this problem would be to use fixed-effects estimation techniques that effectively control for unobserved and time-invariant heterogeneity across provinces. Obviously, fixed-effects estimation, which involves allowing each province to have its own intercept in the regression, is only possible with the availability of longitudinal (or panel) data on provinces.

Figures 8 and 9 show the relationship between changes in poverty, income inequality, and mean income. (These graphs effectively show the fixed-effects relationship between the relevant variables.) The relationship between poverty on the one hand and mean income and inequality on the other continues to remain surprisingly strong.

Figure 8: Cross-provincial Relationship between Annual Changes in Poverty and Annual Changes in Mean Real Income Per Capita, 1992-1999

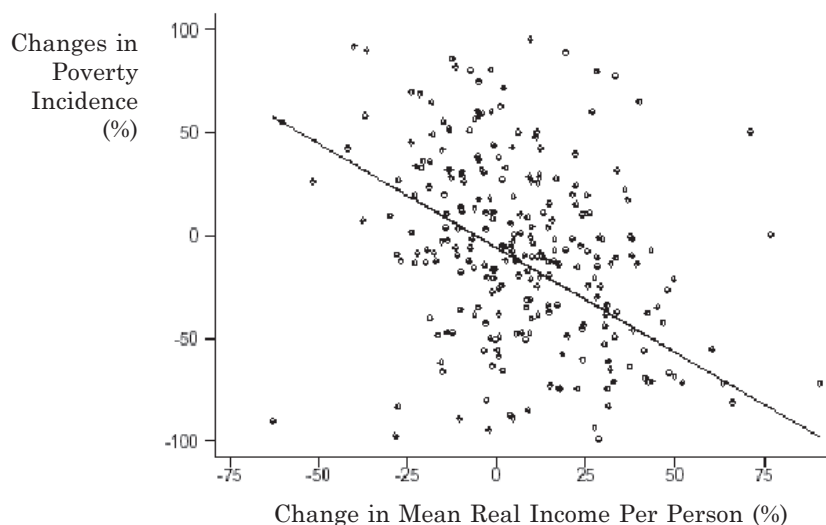
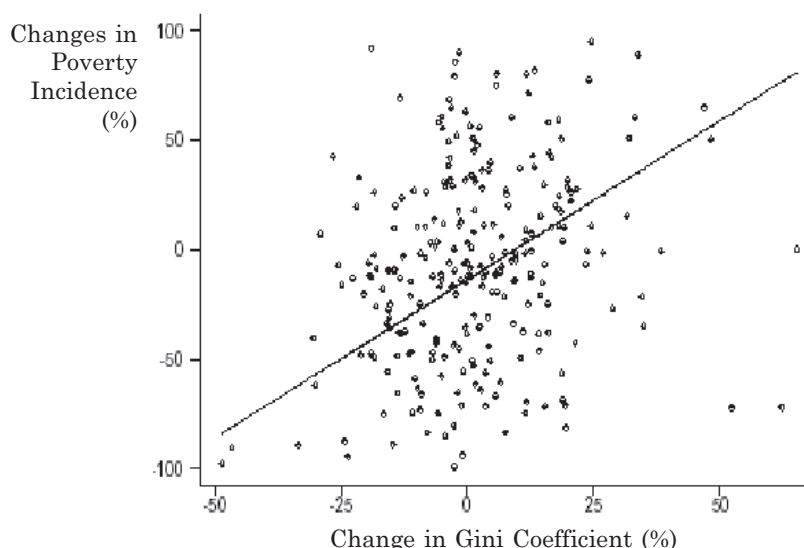


Figure 9: Cross-provincial Relationship between Annual Changes in Poverty and Annual Changes in Income Inequality, 1992-1999



The fixed-effects estimate of the growth elasticity of poverty is virtually identical to the levels estimate (viz., 2.2), but the fixed-effects estimate of the Gini elasticity of poverty is somewhat smaller (3.0 versus 3.2) (Table 2). These estimates are again virtually unchanged when changes in demographic and socioeconomic variables are added to the regression. The addition of the provincial fixed effects obviously increases the explanatory power of the regressions, although the provincial effects in total add only 4 more percentage points to the explanatory power of the model. This does not, however, mean that sociocultural and institutional factors (which are reflected in the provincial fixed effects) are relatively unimportant in explaining differences in poverty, since they are important in determining mean income growth and distributional changes.

What these results demonstrate very powerfully is that while there is a strong relationship between poverty reduction and mean income growth, this is a *ceteris paribus* relationship. In other words, mean income growth reduces poverty substantially only if the distribution of income does not change substantially during the process of growth. If it does, the effect of growth is significantly reduced, as increases in inequality have an even stronger effect on poverty. Consider a hypothetical province that has a mean provincial monthly income per capita of Baht 2,500, a Gini coefficient of 45 percent, and a poverty incidence of 20 percent. The results suggest that a 5 percent increase in mean income per capita would reduce poverty incidence to 17.8 percent as long as there were no changes in income inequality. But if the Gini coefficient of income inequality were to simultaneously increase by 5 percent along with mean income per capita, poverty incidence in the province would actually increase from 20 to 20.8 percent. Thus, worsening income inequality can substantially offset, even reverse, the beneficial effect of economic growth on poverty reduction.

Table 2: Determinants of Poverty across Provinces, Pooled 1992-1999 Data (Provincial Fixed-effects Estimates)

Independent Variable	Log of Poverty Headcount Ratio						
	OLS Levels Estimates			2SLS Fixed-Effects Estimates		First-stage OLS Levels Estimates	
	Equation 1	Equation 2	Equation 3	Effects Estimates		Log of mean income per capita	Log of Gini coefficient
	Coeff.T-ratio	Coeff. T-ratio	Coeff. T-ratio	Coeff. T-ratio	Coeff. T-ratio	Coeff. T-ratio	Coeff.T-ratio
Log mean income per capita	-2.171 2.956	-2.159 2.997	-14.85 16.41		-2.087 2.011	-5.63 1.84	
Log Gini coefficient							
Mean age of household head (years)		-0.026	-1.69	-0.038	-1.72	0.008	1.12
Percent of population residing in female-headed households							0.002
Mean schooling years of adults (18 years and older)		0.004	1.03	0.002	0.25	-0.004	-2.24
Percent of population urban		0.002	0.04	-0.264	-3.35	0.173	6.75
Mean household size		-0.013	-2.59	-0.010	-1.38	0.003	1.31
Percent of population aged 0-15 years		-0.072	-0.77	0.117	0.88	-0.149	-3.45
Percent of population aged 60 years and over		-0.002	-0.20	0.033	2.34	-0.006	-1.20
Time (1=1992, ..., 8=1999)		0.010	0.72	0.024	1.25	-0.005	-0.79
Time squared	-0.028 0.003	-0.058 0.006	-1.49 1.54	-0.253 0.025	-5.01 4.57	0.136 -0.014	8.27 -7.55
Intercept	7.884 377	9.274 377	7.41	4.382 377	3.41	7.083 377	-0.004 377
Number of observations							16.97
F-ratio	137.29	51.71	12.96	28.06		31.92	2.32
Significance level of F-ratio	0	0	0	0		0	0.01
R-squared	0.917	0.920	0.830	0.828		0.880	0.433
F-test for significance of provincial fixed effects	1.97	1.81	6.22	7.47		4.83	2.52
Significance level of provincial fixed-effects F-test	0	0	0	0		0	0

Note: Figures in bold are significantly different from zero at the 10 percent level or lower.

C. Effect of Initial Inequality on Economic Growth

In both the “levels” and fixed-effects analysis discussed in the two earlier sections, one maintained assumption is that economic growth and income inequality are independent of each other. However, in a recent paper, Barro (2000) has raised the possibility that initial levels of inequality have a negative effect on subsequent growth rates in developing countries, although he does not find a similar effect for more developed economies. Human capital investments are one mechanism through which improvements in the distribution of income may foster growth. In developing countries, credit constraints may prevent the poor from investing in human-capital investments (e.g., schooling) that offer high rates of return. In such a situation, a redistribution of assets and incomes from the rich to the poor will result in more human-capital investment, and this in turn will raise the average productivity of investments and thereby the growth rate of the economy.

The provincial data for Thailand strongly support Barro’s findings (Table 3). Lagged levels of inequality, as measured by the Gini coefficient, are observed to have a strong negative effect on the growth of mean real income per capita with or without controls for other socioeconomic and demographic variables. The regression estimates indicate that a one percent increase in the initial level of the Gini coefficient is associated with a 0.5 percent decline in the subsequent growth of real income per capita. This is a large effect, and implies that poverty reduction is affected in two ways by income inequality: first, increased inequality is associated with increased poverty after controlling for economic growth; and, second, high levels of initial inequality reduce future growth rates in the economy, thereby impeding the poverty reduction that would have taken place in the presence of rapid growth.

V. Conclusions

Throughout much of its recent history, rapid economic growth in Thailand served to reduce large numbers of poor people out of poverty. This happened despite increasing income inequality, because growth was very strong. However, just as growth stalled and eventually reversed with the onset of the economic crisis of 1997, the distribution of income started worsening. The combination of a negative growth rate and worsening income inequality has resulted in a sharp increase in poverty incidence in the country after 1997. It is not clear whether the increase in inequality is a transitory effect of the crisis or the beginning of a new trend (since income inequality, after a large increase from the 1970s to the early 1990s, had been declining from 1992 to 1998).

Analysis of provincial data from 1992 to 1999 suggests that, while income growth has had a positive effect on poverty reduction, income inequality has a sharply negative effect. Indeed, income inequality serves to reduce the rate of poverty reduction in two ways: first, increased inequality is associated with increased poverty after controlling for economic growth, and, second,

Table 3: **Effect of Lagged Inequality on Growth of Mean Income Per Capita across Provinces, Pooled 1992-1999 Data**

Independent Variable ^a	Equation 1		Equation 2	
	Coeff.	T-ratio	Coeff.	T-ratio
Log Gini coefficient	-0.529	-5.71	-0.514	-5.64
Mean age of household head (years)	-0.016	-1.79		
Percent of population residing in female-headed households	0.004	1.44		
Mean schooling years of adults (18 years and older)	-0.089	-3.96		
Percent of population urban	0.001	0.83		
Mean household size	0.097	2.08		
Percent of population aged 0-15 years	-0.009	-1.90		
Percent of population aged 60 years and over	-0.004	-0.52		
Time (1=1992, ..., 8=1999)	0.027	0.62	0.030	0.67
Time squared	-0.005	-1.13	-0.007	-1.46
Intercept	3.063	5.97	2.057	5.96
Number of observations	301		301	
F-ratio	8.68		20.83	
Significance level of F-ratio	0		0	
R-squared	0.230		0.174	

^aAll independent variables are expressed as once-lagged values of the corresponding variable.

Note: Dependent variable is percent growth of real mean income per capita across each survey period (i.e., 1992-94, 1994-96, 1996-98, and 1998-99). Figures in bold are significantly different from zero at the 10 percent level or lower.

high levels of initial inequality reduce future growth rates, thereby impeding the poverty reduction that would have taken place in the presence of rapid growth.

What all of this suggests is that income inequality can play a critical role in poverty reduction, especially in a low-growth environment. Given that near-term prospects for growth are guarded in Thailand (as they are in most of the countries of the region), it may be particularly important for poverty reduction policies to focus on improving income inequality, or at least preventing a further worsening of income inequality, in the country. This could be accomplished by expanding educational opportunities for lower-income students, investing in infrastructure in historically poor and disadvantaged areas, and providing fiscal and other incentives to encourage private sector investment in backward areas, among other things.

Annex 1: The Thai Socioeconomic Surveys

The first Socio-Economic Survey (SES) was conducted by the National Statistical Office (NSO) in 1957. It was only in 1988 that the survey began to be undertaken every two years (the interval was 5 years between 1957 and 1987). The SES is undertaken throughout the year, and has a typical sample size of about 25,000 households. For instance, the SES 1998 surveyed a total of 23,549 households comprising of 86,058 individuals. In 1999, the NSO conducted a special (periodic) SES to gauge the effects of the economic crisis on household income and consumption. This survey had a much smaller sample size than the usual SESs (7,789 households), as it was conducted only during the four months of the year (June-September 1999).

The SES typically obtains information on household income and household expenditure, household consumption patterns, changes in assets and liabilities, ownership of durable goods, and housing characteristics. The SES uses a stratified two-stage sampling design, with the primary sampling units being blocks for municipal areas and villages for nonmunicipal areas and the secondary sampling units being households within each of these blocks/villages.

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