

Chapter 5

Trends and Effects of Food and Overall Poverty in Mawlamyine

5.1 Introduction

One of the most important Millennium Development Goals (MDG) is the eradication of extreme poverty. Myanmar is currently noted as having a very poor rank within the International Monetary Fund's (IMF) findings in terms of real GDP per capita. More precisely, Myanmar is currently 161st out of 182 countries, with a GDP of only 1246 USD per capita in 2010 (IMF, 2010). Extreme poverty and inequality problems in Myanmar are not surprising in that it is one of the few remaining nations displaying all of the characteristics of dualism and economic mismanagement that typify underdevelopment. For example, the Myanmar economy still relies upon a majority share of agricultural output and has achieved no discernible technological progress to date. Macroeconomic mismanagement is notorious.

But Myanmar is also weak in reliable statistical data and advanced analytical techniques that could explain the poverty and point to the most efficient and cost-effective policies for its alleviation. Given the poverty analysis, it behooves economists and researchers to measure, explain, and propose ways to correct the exact depth of poverty and inequality in Myanmar. To improve the scope and depth of that analysis, the present paper uses two official documents concerning countrywide

poverty, one from 1997 and another from 2004-2005, to supplement our primary survey results.

This paper will seek broader conclusions for the country as a whole through an in-depth case study of poverty and inequality in Mawlamyine Township, Southeastern Myanmar. As a port city lying at one end of the East-West Economic Corridor, Mawlamyine has a greater potential to escape from a high incidence of poverty and inequality than most other areas of the country. If this research can propose solutions that work, the rural, urban, and semi-urban inhabitants of Mawlamyine may become better off. If it cannot, or if the recommendations fail, then *a fortiori* they will probably fail even more resoundingly elsewhere in the country. This chapter is a revised version of the paper which was sent to the Canadian Journal of Development Studies.

5.2 Poverty Literature and Technical Poverty Measures

5.2.1 Definition of poverty based on selected literature and standards

Although economics has many sub-branches apart from macro- and microeconomics (labour, environmental, industrial organization, international trade), poverty should never be ignored in analyzing the growth and development of low income countries. Separate analyses by rural, semi-urban or urban areas are also essential for effective policy formulation and household targeting under limited government budgets and difficult logistical conditions for bringing food and health care to the neediest citizens. This is why the poverty analyzed in this study will be broken down into food vs. non-food and absolute vs. relative poverty.

“*Absolute poverty* means to represent a specific minimum level of income needed to satisfy the basic physical needs of food, clothing, and shelter in order to ensure continued survival.” (Todaro, 2003, p. 52)

Meanwhile “*relative poverty* is defined in relation to the overall distribution of income or consumption in a country; for example, the poverty line could be set at 50 percent of the country’s mean income or consumption” (Coudouel, 2002, p. 33).

Two further choices must also be made in selecting an appropriate meter stick for absolute, relative, food or non-food(basic necessities) poverty. First, should computations be based on physical consumption, monetary consumption expenditures, and/or income? Even though the method used for measures of the incidence of poverty could be different, general poverty conditions are thought to move in tandem across various measures. Secondly, should the society, the household, the individual, or the adult male equivalent be taken as the unit of measurement and analysis? If, for example, one is interested in comparing two countries or regions without knowing exactly who the poor are, we may use the Gini or Theil indices; but if we wish to intervene to relieve individual households, the Foster-Greer-Thorbecke measures of absolute incidence, depth, and intensity of poverty must be calculated. In practice, the conjoint use of relative and absolute measures provides both comparative perspective across time and space, and the ability to target those most in need.

5.2.2 International poverty lines

Poverty lines, as reflections of the minimum income needed to meet basic needs, inevitably differ across countries and regions with variations in diets, infrastructural, market development, price levels and ratios. It is commonly agreed by the FAO and other sources that an adult male equivalent needs 2100 calories and 95 grams of protein intake per day. But as living expenses vary from country to country, minimal poverty lines of many developing countries may be as low as \$1 or \$ 1.25 a day, or as high as \$1.45 or \$2 a day; while poverty lines of some specific developed countries may reach \$ 5 or even \$ 10 a day (World Bank, 2008). For example, in the case of Malawi, the poverty line is just around \$26.11 per month (Ravallion *et al.* 2008).

5.2.3 Technical Poverty Measures

Foster-Greer-Thorbecke measures of absolute poverty

The incidence of poverty informs local governments and non-governmental organizations of the proportion of poor in society (“incidence” or “head count”), the “depth” or average level of under-fulfillment of basic needs, and the “severity” or “intensity” to which specific households need urgent assistance. The incidence or “head count index” (HCI) is calculated as the share of the population whose income or consumption is below the poverty line; that is, the share of the population that cannot afford to buy a basic basket of goods (Coudouel *et al.*, 2002).

$$\text{HCI} = m/n$$

Where

m = total number of poor

n = total population

This result is consistent with the general formula for the three FGT indices of inequality (Todaro and Smith, 2003):

$$FGT_{\alpha} = \frac{1}{n} \sum_{i=1}^m \left[\frac{z - y_i}{z} \right]^{\alpha}$$

Where

y_i = consumption or income of i -th poor individual or household

z = poverty line

n = total population

m = number of poor

α = the level of absolute poverty analysis 0 = incidence, 1 = depth, and 2 = intensity

Over the period of 1987-1998, the number of HCI-poor regions in the world declined, except for the East Asia and Pacific region (excluding China) for 1998 (Todaro 2003). While the share of population living on less than \$ 1 a day was 26.6 percent in 1987, it edged down to 25.2 percent in 1993, and then fell to 14.9 percent in 1996.

Once the headcount index is calculated, it is helpful to know the average depth or “gap” of that poverty among the poor households on a per capita basis for the entire society. Among other advantages, this allows one to compare two societies, like China and Myanmar with populations of vastly different size. It also gives a direct estimate of the amount of taxation that must be levied per capita so as to theoretically bring all citizens up to the poverty line. The Poverty Gap Index is a

special case of the FGT formula where “ α ” changes from 0 to 1. Therefore, the formula for the Poverty Gap becomes:

$$PGI = \frac{1}{n} \sum_{i=1}^m \left[\frac{z - y_i}{z} \right]$$

In order to gauge the fiscal impact of bringing everyone up to the poverty line, some policy makers sum individual household gaps across all households. “A poverty gap that measures the total amount income necessary to raise everyone who is below the poverty line up to that line” (Todaro and Smith 2003, p. 206). In other words,

$$\text{Total Poverty Gap (TPG)} = \sum_{i=1}^H (Y_p - Y_i)$$

Even when we know the average depth of poverty in a given region, public, community or non-government resources may be inadequate to bring relief to all of the poor. That is why we need to know which households, individuals, or male-equivalents suffer from the most acute poverty, which, in the case of food insecurity or health care access, may be life-threatening. This is why a third measure, the “intensity” or “severity” of poverty has been developed. This final FGT measure is calculated as the squared poverty gap and results when α changes from 1 to 2:

$$\text{Severity of poverty or SPG} = \frac{1}{n} \sum_{i=1}^m \left[\frac{z - y_i}{z} \right]^2$$

Apart from the above absolute measures, relative poverty may exert a psychic toll upon the least well-off households. Development planners are therefore also interested in exploring the inter-household variations in the distribution of income, typically reflected in the Gini or Theil indices. Under conditions of similar

incidence and depth of absolute poverty, intervention programs should clearly target those villages, regions or countries where income distribution is the most skewed.

Human Poverty Index

In 1997, the United Nations Development Program launched a poverty measure called the Human Poverty Index (HPI) as a variant of the well-known Human Development Index or HDI. The HPI was expressly not a dollar-based income measure similar to those of the World Bank. Rather the UNDP sought a proxy measure of “human poverty” as the long-term result of chronic income deficits. In the UNDP measure, three weights were given to life, basic education, and overall economic provisioning. These, in turn, were measured by the percentage of the population not using improved water sources, the proportion of children under weight for their age, the adult literacy rate and the probability at birth of not surviving to age 40. Although different emphases and data are used in the official computations and results between the World Bank’s absolute poverty measures and the UNDP’s HPI, both may be used in the analysis of growth and development issues of countries concerned with reducing poverty under the challenge of the Millennium Development Goals. In the present paper, however, our one year-cross-sectional survey precludes use of the HPI measure.

5.2.4 Literature on Poverty

Poverty and inequality can be analyzed either through the World Bank and UNDP techniques noted above, or through using regression analysis. The majority of poverty analyses are computed based on the usual poverty measures,

while some perform regression analyses. As an example of the former, Ravallion *et al.* (2008) proposed raising the international poverty line from \$1 to \$1.25 a day after making computations with updated data. Additionally, the authors found that developing countries must deal more with relative poverty than they had expected. “The authors’ proposed schedule of relative poverty lines is bounded below by \$1.25, and rises at a gradient of \$1 in \$3 when mean consumption is above \$2.00 a day” Ravallion *et al.* (2008) p.23.

To exemplify regression analyses, Thurow (1967) searched for the causes of poverty in the United States by using a multiple regression model. The percentage of families in poverty, living on farms, nonwhite vs. white, with no labour, and headed by those with less than eight years of schooling were hypothesized to explain poverty. An index of industrial structure and dummy variables for two states were also added to the equation. The results showed that a weak labour force participation rate, low quality workforce, lack of off-farm employment opportunities, and inadequate industrial structure explained the incidence of poverty in his model.

5.2.5 Previous research on poverty in Myanmar

U Nyunt Shein and Hla Hla Myint (2001) focused on the distribution of poverty across the various states and divisions in Myanmar. Their estimated poverty ratios were calculated based on Myanmar Household Survey data from 1997 in order to give comparative information for the country as a whole based on a national average standard.

“A joint United Nations Development Programme (UNDP)–Government of Myanmar Integrated Household Living Conditions Assessment (2007) places poverty incidence at

32%, with rural poverty significantly higher (36%) compared to urban poverty (22%). Cyclone Nargis, which hit the country in 2008, resulted in extensive loss of life and physical damage and may have further worsened poverty incidence in the country” (Asian Development Bank, 2010, p. 1).

Dolly Kyaw and J. Routray (2006) investigated the incidence of poverty, access to resources, and the factors influencing income of male and female – headed households in the dry zone of Myanmar. They conducted a household survey in 2003 with 220 households from six villages. A poverty line of 252 Kyats per person per day was applied as an absolute poverty line based on the authors’ computation of the cost of basic needs. After exploring the factors influencing the per capita income of rural households, the study found significantly higher poverty in female-headed households. Gender-focused rural development strategies should therefore be adopted for promoting the welfare status of their study area.

5.3 Truncated Regression Model , Hypotheses , and Data

The truncated regression model is a kind of censored regression model in that the low or “left” end, or the high or “right” end or both can be cut to the natural extreme values of the actual sample (Franses and Paap 2004). This should theoretically provide a better fit and higher explanatory value to the model. Indeed, in the case of naturally truncated data, “neglecting the truncation can lead to biased estimators” (Franses and Paap, 2004, p. 135).

In this paper, the last option (double truncation) is considered as our dependent variable, the share of total expenditures, naturally displays truncation. For our sample, the left-end share of food expenditure equals 0.029, and the right-end

value equals 0.91. Shares of food expenditure which are ≤ 0.029 and ≥ 0.91 not observed. Therefore the share of food expenditure is a truncated variable which lies between $0.029 < y_i < 0.91$.

General Truncated Regression Model

$$y_i^* = \beta'x_i + \varepsilon_i, \quad (5.1)$$

Where $y_i = y_i^*$ is only observed if:

$$a < y_i < b, \text{ for } i = 1, 2, \dots, N.$$

'a' and 'b' are left and right truncation value which are lower truncation and upper truncation. ε_i are residuals and independently and normally distributed with mean "0" and a common variance " σ^2 ". $\varepsilon_i = N(0, \sigma^2)$. The same application has been applied to the share of non food expenditure.

Interest in double truncation can be seen only rarely (e.g. Goldman 2000, Franses and Paap, 2004). The log likelihood function associated with these data could be written down based on the model given by Goldman (2000) and Eviews 7 user guide as follow;

$$L(\beta, \sigma) = \sum_{i=1}^n \log f(y_i - x_i' \beta) / \sigma \cdot 1(a < y_i < b) - \sum_{i=1}^n \log(F((b - x_i' \beta) / \sigma) - F((a - x_i' \beta) / \sigma)).$$

" f and F are the density and distribution functions. The likelihood function is maximized with respect to β and σ , using standard iterative method" (Eviews, no date, p.283).

5.3.1 Applying poverty into the truncated regression model

The use of truncated regressions in poverty analysis is quite rare. One previous author Takayama (1979) employed a censored income distribution truncated

from above by the poverty line to overcome the theoretical and practical limitations of the Gini coefficient and to transform the latter into a measure of poverty. He felt that a similar approach could be used applied to other measures of poverty. In our model application, firstly we have simple computation of poverty index – incidence, poverty gap, and squared poverty gap. Consequently, inequality in living standards via Gini coefficients has been calculated overall and by geographical location with respect to roads: urban, semi-urban and rural. Secondly, the poverty intensity variable is taken as an explanatory variable in our truncation model so as to shape the policy variable for each of these geographical subsamples.

5.3.2 Hypotheses

Hypothesis 1: the Engel coefficient for food is increased by the intensity of poverty and the age of the household head; and reduced by education, a high dependency ratio and living in a rural area.

Hypothesis 2: the Engel coefficient for nonfood is reduced by the intensity of poverty, distance from EWEC and finding only casual jobs; and increased by education and female migration.

5.3.3 Data

The data we used in our study are unprecedented primary data collected in May-July 2009 from 375 households in Mawlamyine Township, Mon State, Myanmar. Interviews were conducted to collect income and expenditures of each household for minutely detailed subcategories of employment category, food, clothing, transportation, housing, health, insurance, communication, and education.

For the present paper, the relevant consumption subcategories were re-aggregated into food and basic non food item (health , education and clothing).

5.4 The Results from the Poverty Measures used in the Study Area

5.4.1 Thinking about poverty whether income or consumption

One of the innovations of this research is to estimate and compare poverty based upon both a household's income and its expenditures per capita. Most previous research on poverty reports only income per capita in order to compare with the international standards of \$1 (and more recently \$1.25) per day. But the poorest households frequently must borrow money or sell their assets to meet their basic needs, making expenditures higher than actual income. This short term strategy born of desperation is clearly not sustainable in the long run.

To date, the majority of computational studies have accessed primary survey data on households which may be problematic or incomplete. For instance, interviewers may only have the chance to interview with household members who know only about expenditures rather than with the household head who is, theoretically, more cognizant of the income side. The Mawlamyine dataset used in this research is unique in that it is one of the rare datasets to have been collected in Myanmar, and that 370 out of 375 respondents were able to give detailed reports of both income and expenditures.

Coudouel *et al.* (2002) has suggested for such a case that it is preferable to use consumption estimates for the following reasons,

“Consumption is a better outcome indicator than income. Actual consumption is more closely related to a

person's well-being in the sense defined above, that is, of having enough to meet current basic needs. On the other hand, income is only one of the elements that will allow consumption of goods; others include questions of access and availability.

Consumption may be better measured than income. In poor agrarian economies, incomes for rural households may fluctuate during the year, according to the harvest cycle. In urban economies with large informal sectors, income flows also may be erratic. This implies a potential difficulty for households in correctly recalling their income, in which case the information on income derived from the survey may be of low quality. In estimating agrarian income, an additional difficulty in estimating income consists in excluding the inputs purchased for agricultural production from the farmer's revenues. Finally, large shares of income are not monetized if households consume their own production or exchange it for other goods, and it might be difficult to price these. Estimating consumption has its own difficulties, but it may be more reliable if the consumption module in the household survey is well designed.

Consumption may better reflect a household's actual standard of living and ability to meet basic needs. Consumption expenditures reflect not only the goods and services that a household can command based on its current income, but also whether that household can access credit markets or household savings at times when current income is low or even negative, perhaps because of seasonal variation, harvest failure, or other circumstances that cause income to fluctuate widely" (Coudouel et. al., 2002, p. 30).

On the other hand, there are two major reasons why income could be preferred as the basis for inequality comparisons over expenditures. First, all previous theories of income, poverty, and distribution have been expressed in terms of either household or per capita income (and not expenditures). Indeed, GDP itself is usually viewed as an income concept, not an expenditure concept. The second reason is that expenditures in a given year or period may either underestimate or overestimate

sustainable long-term income. For example, a very poor household may have to borrow from neighbors or friends in order to maintain adequate nutrition, clothing etc. On the other hand, a very rich household may save and/or invest excess income, which would not be visible in short-run expenditures. Therefore, we decided to use both variables (income per capita and consumption per capita) so as to be able to decide which indicator gave the best results statistically for poverty reduction policies in Mawlamyine.

5.4.2 Determination of appropriate poverty lines for the study area

When poverty lines are of interest for policy analysis, several methods are available. Notably, there is the (1) food energy intake method²⁵; and (2) costs of basic needs method²⁶. The poverty line was constructed for this study based on the absolute poverty concept of living below the subsistence minimum daily calorie requirement of 2100 kcal and 94 grams of protein per person, and other essential goods (Foster *et al.*, 1984; Ravallion, 1998).

Since Myanmar official computations of poverty lines were based on both “the cost of basic needs” and “minimum caloric requirements,” we chose to accept the poverty lines calculated in 2005. Table (5.1) presents that poverty lines for Myanmar (2004) duly inflated by the consumer price index (CPI) year by year. The result produces an estimate of the food poverty line of 243,243 Kyats and of the

²⁵ .A popular practical method of setting poverty lines proceeds by finding the consumption expenditure or income level at which food energy intake is just sufficient to meet pre-determined food energy requirements (Ravallion, 1998).

²⁶ .This method stipulates a consumption bundle deemed to be adequate for basic consumption needs, and then estimates its cost for each of the subgroups being compared in the poverty profile; this is the approach for Rowntree in his seminal study of poverty in York in 1899, and it has been followed since in enumerable studies for both developed and developing countries (Ravallion, 1998).

overall food plus non-food poverty line of 333,089 Kyats per person per year in 2009. This is the equivalent of 912.57 Kyats a day, a little more than a dollar at the current market exchange rate. To make sure to include unexpected expenses, we rounded up to 920 Kyats a day for the Myanmar overall poverty line for our survey year 2009.

Table 5.1 Food, non-food and poverty lines (Kyats)

	Poverty lines (Kyats) 2004	Poverty Lines (Kyats) 2009
Food poverty line	118,402	243,243.12
Non food Poverty Line	43,734	89,846.41
Poverty line	162,136	333,089.53

Source: Authors' calculation by inflating 2004-05 Myanmar national poverty lines with CPI.

5. 4.3 The results from poverty measures

As we have decided to use income and consumption, Table (5.2) reports the poverty incidence, depth and intensity of poverty under both per capita income and expenditures.

Table 5.2 Poverty under per capita income and expenditure

Sample Unit	Per capita income			Per capita consumption		
	Incidence	Depth	Intensity	Incidence	Depth	Intensity
Entire	33%	0.083	0.03	59%	0.184	0.074
Urban	22%	0.04	0.01	56%	0.143	0.052
Semi-urban	44%	0.114	0.04	67%	0.22	0.088
Rural	28%	0.088	0.042	47%	0.171	0.078

Source: Authors' calculations for 2009.

The estimated incidence in Mawlamyine of 33% of poverty under per capita income computation and 59% under per capita consumption are far worse than the official 2005 figures for Mon State (Table 5.3). In 2004-05 on average, only 22 % of the population of Mon State (21 % rural, 23 % urban) was estimated to be under the poverty line. Comparing 1997 and 2005 rates for the whole country, the countrywide poverty ratio did increase significantly from 22.9 % to 32%. The Asian Development Bank (ADB) estimates that Myanmar's poverty was further exacerbated by Cyclone Nargis in May 2008.

Table (5.3) also presents the poverty condition for the whole of Myanmar including Mon State. Historically, Mon State has had relatively less poverty than most states as evidenced by the 1997 and 2005 surveys, with rural poverty remaining below urban poverty. Assuming those government figures are accurate and calculated using comparable methodologies across years, our 2009 findings (Table 5.2) demonstrate that the HCI has increased, as the ADB has surmised. This is all the more dramatic in that Mon State is one of the states and divisions with less than average poverty. Moreover, the semi-urban areas seem to have the highest incidence of poverty, followed by the rural areas for per capita income and urban areas for per capita consumption. Clearly, a differential dynamic in poverty incidence by area is at work. This differential dynamic is not new. Urban poverty in Mon State declined from 27% in 1997 to 23% in 2004-05, while rural poverty increased from 16.1% to 21% (Table 5.3).

Table 5.3 Dynamic changes in the poverty headcount by State or Division, 1997-2005

	Rural 1997		Urban 1997		Total 1997		Rural 2005		Urban 2005		Total 2005		Rural 1997-2005		Urban 1997-2005		Total 1997-2005	
	Incidence (%)	Rank (lower is better)	Incidence (%)	Rank	Incidence (%)	Rank	Incidence (%)	Rank (lower is better)	Incidence (%)	Rank	Incidence (%)	Rank	Change in Incidence (%)	Change in rank	Change in Incidence (%)	Change in rank	Change in Incidence (%)	Change in rank
Bago(E)	25.4	13	26.6	10	24.7	12	27	4	22	4	27	4	1.6	-9	-4.6	-6	2.3	-8
Bago(W)	25.4	14	26.6	11	24.7	13	30	5	24	8	29	5	4.6	-9	-2.6	-3	4.3	-8
Sagaing	24.3	12	27.6	13	24.9	14	30	6	35	14	31	6	5.7	-6	7.4	1	6.1	-8
Kayin	12.8	3	11.8	6	12.7	6	12	1	8	1	12	1	-0.8	-2	-3.8	-5	-0.7	-5
Yangon	16.7	8	16.6	7	16.7	7	17	2	14	2	15	2	0.3	-6	-2.6	-5	-1.7	-5
Mon	16.1	7	27.1	12	19.9	8	21	3	23	5	22	3	4.9	-4	-4.1	-7	2.1	-5
Ayeyarwaddy	17.3	9	47	17	22.7	11	34	7	23	6	33	7	16.7	-2	-24	-11	10.3	-4
Kayah	37.4	16	30.8	14	35.4	15	45	11	24	7	39	11	7.6	-5	-6.8	-7	3.6	-4
Magwe	36.3	15	44.9	16	37.9	16	44	13	26	10	42	13	7.7	-2	-18.9	-6	4.1	-3
Mandalay	23.9	11	18.8	8	22.3	10	38	8	26	12	34	8	14.1	-3	7.2	4	11.7	-2
Chin	47.1	17	19.8	9	42.1	17	81	17	46	17	73	17	33.9	0	26.2	8	30.9	0
Rakhine	19.2	10	34.5	15	22	9	41	10	26	9	38	10	21.8	0	-8.5	-6	16	1
Tanintharyi	7.4	1	9.8	5	8.1	1	37	9	21	3	34	9	29.6	8	11.2	-2	25.9	8
Shan (S)	13.4	4	7.1	2	12	3	44	12	26	11	40	12	30.6	8	18.9	9	28	9
Shan(E)	13.4	5	7.1	3	12	4	55	15	35	13	51	15	41.6	10	27.9	10	39	11
Shan(N)	13.4	6	7.1	4	12	5	56	16	37	15	52	16	42.6	10	29.9	11	40	11
Kachin	11.9	2	4.6	1	10.1	2	47	14	38	16	44	14	35.1	12	33.4	15	33.9	12
Union	22.4		23.9		22.9		36		22		32		13.6		-1.9		9.1	

Source: Ministry of National Planning and Economic Development, 1997 and 2007 Note: Shan W, E and N were combined in 1997. Bago E and W were combined in 1997.

What could explain these trends? Perhaps the overall poverty incidence, depth and intensity are increasing because of changes in demographic conditions, such as population increases over time, while economic conditions remain constant. Cyclone Nargis may have contributed to stagnation or even reductions in well-being both directly through the loss of property and health in Mawlamyine and indirectly through the destruction of productivity of the Irrawaddy delta rice production, causing food prices to rise.

Table (3.2 b) in Chapter 3 has presented the population density in Mawlamyine. Another possible explanation of that population density is that higher dependency ratios interact with greater job scarcity to pull more rural dwellers into poverty.

Additionally, weather and natural conditions are more critical to poverty dynamics in rural areas dependent upon agriculture. For instance, in Chin state, natural disasters such as drought and rats have destroyed the cereal crop in that state, causing poverty to rise steeply. These problems are intensified by the remote geographical location of Chin State, which makes bringing aid more difficult.

Table 5.4 Poverty Headcount Ratio and National Poverty Rate in Other Southeast Asia countries

Country	HCR in Mid 1980s	HCR in Early 1990s	HCR : International Poverty Measure In Late 1990s and early 2000		National Poverty Rate (%)			
			\$ 1 a day	\$2 a day	Year	Rural	Urban	Total
Cambodia		39.0(1994)	34.1(1999)	77.7	1999	40.1	18.2	35.9
Indonesia		15.1(1990)	7.5(2002)	52.4	2002	21.1	14.5	18.2
Lao PDR		45.0(1992)	39(1997)	81.7	1997	41	26.9	38.6
Malaysia	20.7(1984)	12.8(1992)	0.2(1999)	9.3	1999	12.4	3.4	7.5
Myanmar					1997	23.9	22.4	22.9
Philippines	49.3(1985)	45.3(1991)	15.5(2003)	47.5	2003	47.4	20.4	34
Thailand	32.6(1988)	23.2(1992)	1.9(2002)	32.5	2002	12.6	4	9.8
Vietnam		58.2(1993)	13.1(2002)	58.5	2002	35.6	6.6	28.9

Source: ADB, (2004) Key Indicators of Developing Asian and Pacific Countries, Poverty in Asia: Measurement, Estimates, and Prospects, p.26 and 30

Table (5.4) shows the poverty headcount ratio and national poverty rates in other Southeast Asia countries. Under such comparison (Note: The figures are not fully comparable since we lack information on what methods other countries using to compute poverty.), the Myanmar figures of poverty in the late 1990s and early 2000s were generally less than those of Cambodia, Laos, Philippines and Vietnam.

5.4.4 Lorenz curves in rural, semi-urban and urban areas

A given level of absolute poverty may or may not signal a problem of inequality in income distribution. In order to determine the level of inequality among study units, we have calculated the Gini coefficient for both the entire sample and for the rural, semi-urban and urban subsamples (Table 5.5).

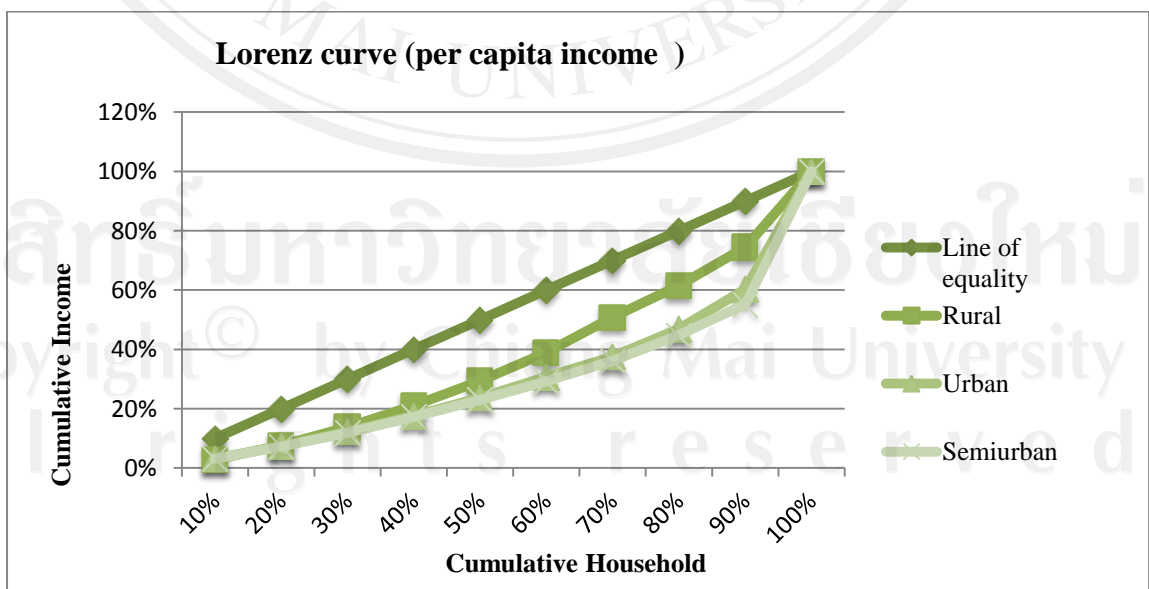
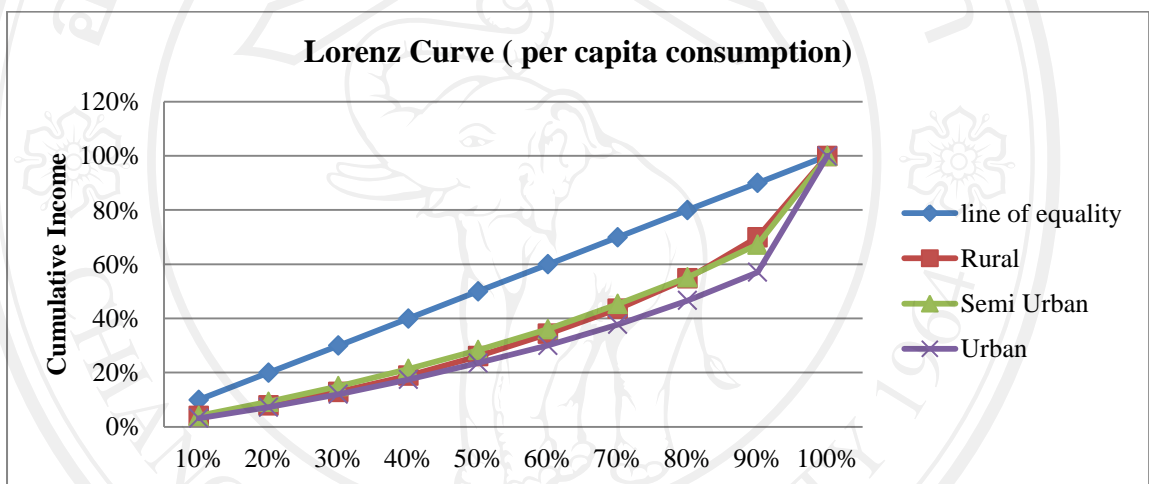
Table 5.5 Two types of Gini Coefficient (under per capita income and per capita consumption)

	Gini Coefficient	
	With Per Capita Consumption	With Per Capita Income
Entire	0.41	0.47
Urban	0.47	0.49
Semi Urban	0.35	0.48
Rural	0.38	0.36

Source; Author's calculation

Observing the Gini coefficients, we may conclude that rural areas have greater equality than urban areas under both income and expenditure criteria. Although equality under the income criterion in rural areas outpaces the semi urban areas the reverse is true under the consumption criteria. Figures 1 displays the Lorenz curves for both criteria.

Figure 5.1 Lorenz Curves in Rural, Semi-urban and Urban areas



Although the share of food consumption is generally higher in developing countries, rural poverty is less than urban poverty in our sample. Though semi-urban wards are just adjacent to the urban wards, poverty and inequality are notably worse in the semi-urban areas. One reason might be that those wards have more poor households than others. Another might be that some of those semi-urban areas such as Thiri Mingala, Tharyaraye and Zayyarthiri quarters were first settled in 1989, Myaingtharyar in 1991 and Zayyarmyaine in 2004 and the families that resettled were from other areas of the country, leading to a lower level of economic development. As those semi urban areas have been only recently opened up; public utilities such as water and electricity systems are not yet well developed.

Table (3.14) in Chapter 3 presents the health institutions in Mon State under government control. In terms of ratio (per capita), the capacity of 700 beds is not considered enough to take care of the entire population of Mon State (estimated at more than 3 million people in 2008). This gives only 1 bed for every 4286 people in public health care institutions. The health care personnel data in Mon State for the ten years after 1988 (Table 3.15) are unsatisfactory as all figures are under public institutions and we lack data on private health clinics and health personnel data.

5.5 Implications for food and non-food (necessities) consumption

The previous analyses of the incidence, depth and intensity of poverty have all referred to a standard food-poverty line for Myanmar. If policy is to be designed to help people improve their consumption patterns and achieve a better standard of living, we must also understand the determinants of their food vs. other basic (i.e. non-food) consumption behaviour. The standard measure of that is the Engel

coefficient, in other words, the percentage of all expenditures that is devoted to food. According to the well-known Engel hypothesis, that percentage will go down as income increases but will never reach zero given that food consumption is a non-optional part of economic behaviour. To improve the accuracy of our results for policy formulation, we apply double truncated regression. For our sample, the left-end share of food expenditure equals 0.029, and the right-end value equals 0.91. The corresponding values for other basics necessities (health, education and clothing) are 0.00 and 0.69, respectively.²⁷

5.5.1 Variables in our model

The two dependent variables food consumption and nonfood necessities shares are computed as percentages of total household expenditure.

A word of explanation is in order for the expected signs of some of the Engel equation explanatory variables of the last two hypotheses. First, we use the intensity of *poverty* (i.e. the severity of the absence of adequate income) instead of the usual (+) income and (-) income squared terms common to most Engel coefficient regressions. This is because our objective is analyze poverty not income. Since poverty and income in the sample are positively and significantly correlated at the 0.40 level, including both would lead to redundancy in the model.

Descriptions of the variables used in our double truncation model are given in Table (5.6). In order to gauge the effects of the characteristics of the household head's decision on household expenditure, the gender of household head

²⁷ The remaining third category of expenditures is for other basics non-essential goods.

(GENDER_HH) was assigned the value 1 for those whose head was female.

AGE_HH measures the age of the household head in years.

Table 5. 6 Variables and its descriptions in model

Variable name	Its descriptions
pc_food_exp	food expenditure (ratio)
pc_nonfood	basic non food expenditure (ratio)
distance	distance from the highways
urban	urban
rural	rural
genhoh	Gender of household head
agehoh	age of household head
Jobtran	do transportation employment
Jobodd	odd jobs
totedu	total years of education of family members
Dependent	dependency ratio
remittan	remittance (kyats)
ownby	Own motorcycle (1 = yes, 0 = otherwise)
jobhealth	Do health-care services (1,0)
jobother	Do other services (1,0)
joblend	Do lend to others (1,0)
jobsala	Do salaried work (1,0)
sav	Household savings rate (% savings over total income)
EWEC	Know about EWEC (Yes=1, otherwise =0)
selfcon	Total value of self-consumed products per year(kyats)
labourother	Total labour in other services(health , accommodations , telephone)
migrantm	Migrant males
migrantf	Migrant females
hohf	Female household head (1,0)
povinc	intensity of poverty in income
povcon	Intensity poverty in expenditure
jobfruit	Grow fruit and vegetables (*1,0)
jobcrops	Grow other field crops (1,0)
addicon	Tobacco, alcoholic expenditures, and betelnut
tips	Get tips from clients or superiors
othdona	Other donations(national disaster)

The process of a multi-colinearity test has been applied in choosing variables after focusing on theories and literature. The total years of household *education* variable is expected to be negative in explaining food consumption if households care about the effective management of their families and the search for higher paying jobs. Our expectation is that the family will reduce their food expenditure and increase their expenditures on such other basics (health, education and clothing) if it has more education. We further anticipate a negative sign for the *dependency ratio* in the share of food consumption equation and a positive sign in the other basics (health, education and clothing) expenditure, in as much as infant and elderly dependents may sometimes have high requirements for health care and education.

Distance from the EWEC should lower the proportion of food consumption expenditures, since outlying farmers can self-supply a portion of their food. On the other hand, the majority of people who work at *casual jobs* are from disadvantaged semi urban and urban areas. Finally, *rural people* will likely have to spend more on health, education and clothing than urban and semiurban people because of their distance from markets and institutions.

As our interest is to narrow the gap of inequality, poverty under consumption and income are taken into account in our model so as to find which one is more effectively determined by the explanatory variables. Thus, the poverty intensity as dummy (1,0) is taken into the regression if the household is below the poverty line. In that case, it's the household's related poverty sign shows up to be "1" and to be "0" if otherwise.

5.5 .2 Priori consideration of the model

Before running the model, the coefficient of food in total was expected .The sign on the number of household members was anticipated to be positive sign (+) because the more household members, the more share to spend for food over such non food items as housing and heating. The total education variable could be negative in explaining food consumption if households care about the effective management of their families and the search for higher paying jobs. Our expectation is that the family will reduce their food expenditure and increase their expenditures on such basic nonfood (health, education and clothing) if the family has more education.

For the saving rate of the households in Mawlamyine normally people save since they want to avoid risk of unforeseeable factor in future. So they save some amount without spending on food and nonfood. Their saving in Mawlamyine is unlikely to be that of the rich people. So we expect to get the negative sign in food expenditure. People owning motorcycle has something to do with more cost in maintenance and gasoline fees, it will have a reduction effect on food and basic non food items expenditure . Poverty intensity or depth of poverty make the family to spend more to get food and less to get other basic needs .

Furthermore, the distance variable on the share of food expenditure is expected to have a negative sign as those households living closer to the city and/or the road have more chances to spend on a variety of food items. That makes rural households have a lower proportion of food consumption expenditures, particularly since they may also be farmers with the ability to self-supply a portion of their food. Indeed, even though it may not be economically efficient, people in rural families have grown the vegetables and some kinds of meat animal such as chickens, ducks,

goats and pigs. Regarding the dependency ratio variable, we anticipated a negative sign in the share of food consumption equation and a positive sign in the nonfood (health , education and clothing) expenditure, in as much as infant and elderly dependents may sometimes have high requirements for health care and education. As employment in health care services is not common in Mawlamyine, we consider that household with those jobs are very conscious of both food and basic nonfood item . So , the effects of those job on both expenditures will be positive .

Growing fruits job, especially, encourages saving some food item however it is not rice nor other staple crops . Therefore, we expected that variable to encourage household 's both food and basic nonfood item too. On the other hand, the majority of people who work at odd jobs are from urban and semi urban areas and normally they are not caring to take food at home lunch time. So , household with that job may have less spending on food . At the same time, working odd jobs are labourers don't care to have basic nonfood such as buying clothing frequently , taking healthcare .

If family earns remittance (money) , they have more chance to spend on both food and nonfood items too . On the other hand , family with migrant workers for both male and female help to reduce family food expenditure for them and the family has more chance to spend on nonfood item like clothing especially for female migrants . Household with drinkers or additive consumption like alcoholic , betelnut , cigar , those expense will have an negative effect on 2 ways . One might be reducing food expense because of more spend on additive consumption. Second reason might be the habit of betelnut consumption and drinking does not encourage to people to eat food (heavy food) .

5.5.3 The results of the double truncation model

As our data are mostly concerned with double truncation, the truncation for food and nonfood for the truncation regression are $0.029 < y(\text{food}) < 0.91$ and $0.00 < y(\text{nonfood}) < 0.68$, respectively. Descriptive statistics for dependent variables present in Table (5.7).

Table 5.7 Descriptive statistics for shares of food and of non-food (necessities) expenditure

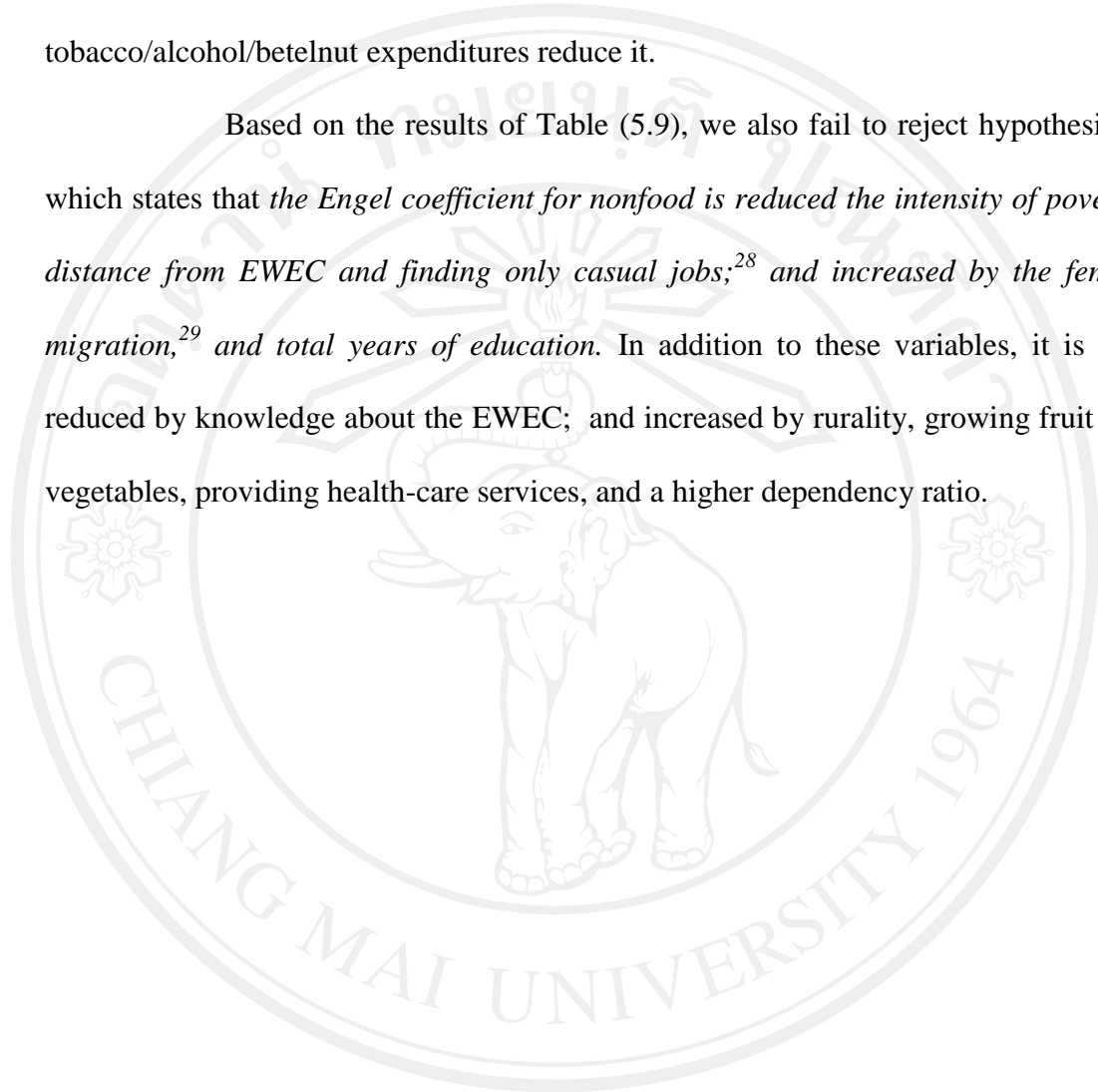
	PC_FOOD_EXP	PC_NONFOOD
Mean	0.59288	0.122131
Median	0.62	0.089678
Maximum	0.9	0.677159
Minimum	0.03	0
Std. Dev.	0.159768	0.10054
Skewness	-0.880416	1.941223
Kurtosis	3.737	7.756499

In order to avoid the double accounting in our model, we use the poverty dummy separately for income poverty line and consumption poverty. Based on AIC and Log likelihood criteria after running the model with each poverty separately, we do chose to carry on our poverty variable under consumption although both of the variables give the significant results.

The results shown in Table (5.8) lead us to accept hypothesis 1, to the effect that *the Engel coefficient for food is increased by the intensity of poverty and the age of the household head; and reduced by education, dependency ratio and living in a rural area*. In addition, the results indicate that salaried work in other servies,

field crops, household savings are found to be associated with a higher food Engel; while owning a leather sofa, lending to others, labour in other services, and tobacco/alcohol/betelnut expenditures reduce it.

Based on the results of Table (5.9), we also fail to reject hypothesis 2, which states that *the Engel coefficient for nonfood is reduced the intensity of poverty, distance from EWEC and finding only casual jobs;*²⁸ *and increased by the female migration,*²⁹ *and total years of education.* In addition to these variables, it is also reduced by knowledge about the EWEC; and increased by rurality, growing fruit and vegetables, providing health-care services, and a higher dependency ratio.



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²⁸ . Reflected in this case by receiving tips.

²⁹ And in this case the value of remittances

Table 5.8 The Effect of poverty on food expenditure ratio

Dependent= Engel coefficient for food Variable	Before Wald test				AfterWald test			
	Coefficient	Std. Err.	z-Stat	Prob.	Coefficient	Std. Err.	z-Stat	Prob.
Constant intercept term	0.53	0.05	11.84	0.000	0.51	0.04	11.82	0.000
POVERTY								
Intensity poverty in expenditure	0.33	0.08	3.90	0.000	0.34	0.07	4.62	0.000
OTHER ECONOMIC STATUS								
Own leather sofa (1=yes, 0 = no)	-0.19	0.04	-5.16	0.000	-0.19	0.04	-5.09	0.000
Own motorcycle (1 = yes, 0 = otherwise)	-0.03	0.02	-1.47	0.142				
Other donations (national disaster)	-0.00	0.00	-2.73	0.006	-0.00	0.00	-2.78	0.005
EDUCATION								
Total years of education	-0.00	0.00	-3.22	0.001	-0.00	0.00	-4.35	0.000
EMPLOYMENT								
Do salaried work (1,0)	0.06	0.02	3.59	0.000	0.07	0.02	4.38	0.000
Do lend to others (1,0)	-0.12	0.05	-2.39	0.017	-0.11	0.05	-2.27	0.023
Total labour in other services (health, accommodations, telephone)	-0.04	0.02	-2.26	0.024	-0.04	0.02	-2.07	0.038
Do other services (1,0)	0.07	0.04	1.96	0.050	0.06	0.04	1.78	0.075
Grow other field crops (1,0)	0.73	0.39	1.86	0.063	0.75	0.40	1.88	0.060
Migrant females	-0.01	0.02	-0.74	0.457				
Migrant males	-0.01	0.01	-0.72	0.469				
CONSUMPTION BEHAVIOUR								
Tobacco, alcoholic expenditures, and betelnut	0.00	0.00	-3.55	0.000	0.00	0.00	-3.35	0.001
Household savings rate (% savings over total income)	0.09	0.02	5.70	0.000	0.09	0.02	5.49	0.000
HH STRUCTURE/SOCIODEMOGRAPHY								
Age of household head	0.00	0.00	2.48	0.013	0.00	0.00	2.50	0.012
Dependency ratio	-0.02	0.01	-2.31	0.021	-0.02	0.01	-2.16	0.031
Rural	-0.04	0.02	-1.88	0.061	-0.05	0.02	-2.12	0.034
Urban	-0.01	0.02	-0.65	0.519				
Distance from EWEC	0.02	0.01	1.45	0.148	0.03	0.01	2.05	0.040
Female household head (1,0)	-0.01	0.02	-0.49	0.622				
<i>Log likelihood</i>	278.09				275.65			
<i>Akaike information criterion</i>	-1.419				-1.433			

Table 5.9 The Effect of poverty on other basic expenditures

Dependent= Engel coefficient for other basic needs Variable	Before Wald test				After Wald test			
	Coefficient	Std. Err.	z-Stat.	Prob.	Coefficient	Std. Err.	z-Stat.	Prob.
Constant intercept term	0.11	0.03	3.86	0.000	0.07	0.02	4.91	0.000
POVERTY								
Intensity poverty in expenditure	-0.11	0.06	-2.09	0.037	-0.13	0.05	-2.66	0.008
OTHER ECONOMIC STATUS								
Value of remittance (kyats)	0.00	0.00	2.49	0.013	0.00	0.00	1.66	0.097
Own motorcycle (1 = yes, 0 = otherwise)	-0.02	0.01	-1.55	0.121				
EDUCATION								
Total years of education	0.00	0.00	5.52	0.000	0.00	0.00	5.09	0.000
Know about EWEC (Yes=1, otherwise =0)	-0.03	0.01	-2.06	0.040	-0.02	0.01	-1.84	0.066
EMPLOYMENT								
Get tips from clients or superiors	0.11	0.04	2.91	0.004	0.11	0.04	2.87	0.004
Do health-care services (1,)	0.20	0.09	2.25	0.025	0.19	0.09	2.15	0.032
Grow fruit and vegetables (1,0)	0.06	0.03	1.96	0.050	0.07	0.03	2.10	0.036
Casual jobs	-0.02	0.01	-1.87	0.061	-0.02	0.01	-1.44	0.151
Migrant females	0.02	0.01	1.74	0.082	0.02	0.01	1.66	0.097
Migrant males	-0.01	0.01	-1.13	0.257				
CONSUMPTION BEHAVIOUR								
Household savings rate (% savings over total income)	-0.02	0.01	-1.62	0.105				
Total value of self-consumed products per year(kyats)	0.00	0.00	-0.91	0.361				
HH STRUCTURE/SOCIODEMOGRAPHY								
Dependency ratio	0.02	0.01	3.56	0.000	0.02	0.01	3.98	0.000
Distance from EWEC	-0.02	0.01	-2.02	0.043	-0.02	0.01	-1.90	0.057
Rural	0.03	0.02	1.79	0.073	0.02	0.02	1.38	0.168
Age of household head	0.00	0.00	-1.29	0.198				
Female household head (1,0)	0.01	0.01	0.49	0.628				
Urban	0.00	0.01	-0.15	0.884				
<i>Log likelihood</i>	375.57				370.49			
<i>Akaike information criterion</i>	-1.9644				-1.975			

Three policy conclusions flow from our analyses of hypotheses 1 and 2. First, consistent with the writings of Todaro (e.g. 2003), rural-based employment and welfare improvement programs should precede any effort to promote rural-urban migration. Families should be encouraged to remain rural areas, and to unite larger family units under a single roof. Education and female migration can then be used to achieve a healthier balance among food and non-food basic necessity consumption.

Second, public health care institutions and personnel should be upgraded. Based on our survey experience, most of the younger generation from rural areas are paying inadequate attention to education and healthcare.

Third, within non-food necessities, health care plans for dependents should therefore be checked. The factor that a high dependency ratio induces families to spend more on education, health and clothing is especially serious because, as we have seen, health institutions and personnel are already lacking in the public institutions to which the poor would normally go. Investments in the public health sector would therefore be a “pro-poor” policy.

5.6 Conclusion and Policy Recommendations

Based on the results of our calculation of poverty measures, the problems of poverty and inequality are acute in the Mawlamyine area, although inequality under poverty (in terms of per capita consumption) turns out to be less in urban areas.

Considering poverty measures alone, the semi-urban area should be paid attention to much more within growth-with-equity development schemes. In order to consider which specific policy mix should be adopted, we combine the analysis of poverty

measure results with the truncation regression results. Below, we consider our conclusions point by point:

(1) Government should invest both monetary capital and management supervision to increase the road infrastructure, educational institutions, and Nargis clean-up as fast as possible.

(2) The semi-urban areas with the highest incidence of poverty should be given priority targeting for anti-poverty programs. In the meantime, in-kind aid such as a special food scheme policy should be seriously considered for poor families with a high severity of poverty. Adequate calorie sources should be given first, and then, if necessary, small protein supplements.

(3) Special relief programs should also be visibly aimed at the urban poor to reduce the income gap and social unrest in metropolitan areas.

(4) Transportation and mobility-related job creation should form the nucleus of the anti-poverty thrust in Mawlamhyine. If people living in rural and semi-urban areas can be partially subsidized to afford motorcycles, they can undertake jobs in the business, sales, and other services sectors. Otherwise, the entire positional advantage of Mawlamhyine as a major transit and border trade city at the terminus of the EWEC will remain unrealized.

(5) Adult education will also be necessary. This is particularly true in the case of females, who must be equipped with knowledge to seek higher paying jobs outside the household, notably in the transportation, business and service jobs. Although metal jobs are not currently a significant force in reducing the food Engel coefficient, this and other traditional artistic and cultural jobs within the sector should be maintained against the day when jobs in building the transportation infrastructure

will no longer be available. A combination of wage-rate subsidies and low-interest loans may be envisaged to promote investment and job-seeking in these areas.

(6) Consistent with the writings of Todaro, rural-based employment and welfare improvement programs should precede any effort to promote rural-urban migration. Families should be encouraged to remain rural areas, and to unite larger family units under a single roof. Education and female migration can then be used to achieve a healthier balance among food and non-food basic necessity consumption.

(7) Public health care institutions and personnel should be upgraded. Based on our survey experience, most of the younger generation from rural areas are paying inadequate attention to education and healthcare.

(8) Within non-food necessities, health care plans for dependents should therefore be checked. The factor that a high dependency ratio induces families to spend more on education, health and clothing is especially serious because, as we have seen, health institutions and personnel are already lacking in the public institutions to which the poor would normally go. Investments in the public health sector would therefore be a “pro-poor” policy.

The above results can guide actions to reduce the twin problems of inequality and poverty in near future.