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Poverty and Inequality in Myanmar, 2005 to 2017

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Abstract
Nationwide survey data on household consumption expenditures within Myanmar indicate that between 2005 and 2017 average real consumption levels increased and the estimated level of poverty incidence declined. Nevertheless, the Gini coefficient of expenditure inequality increased. The above events occurred within both rural and urban areas. Inequality between rural and urban areas also increased. This paper critically reviews the statistical information on which the above summary is based. In addition, it is demonstrated that the available studies describe poverty and inequality in particular years but do not explain their changes over time. Explaining the factors influencing changes in poverty incidence and inequality is important because it can potentially contribute to development of a policy framework for achieving poverty reduction while inequality is kept at a low to moderate level. Descriptions of poverty, like the World Bank's poverty profiles, do not provide that.

Key words: Myanmar; poverty incidence; inequality; poverty profile.

JEL codes: I32; D12; N35; O15

POVERTY AND INEQUALITY IN MYANMAR, 2005 to 2017*

INTRODUCTION

Are the people of Myanmar becoming economically better off over time, and if so, to what extent? To assess changes in standards of living, measures of average levels of consumption per person, adjusted for inflation, provide a useful beginning, but a poor ending. The distribution of that consumption across the population is also important. Do the poor benefit, in absolute (inflation-adjusted) terms, when average consumption grows? If so, do they benefit relative to their better off neighbours, or are the gains from growth concentrated disproportionately on the rich? Answers to these two, very different questions can in principle be provided by measures of absolute poverty incidence and inequality, respectively. These statistical measures are highly relevant for the design of economic and social protection policy when the objective is the achievement of inclusive economic growth. They are also important for monitoring progress in its achievement, or otherwise. Not surprisingly, indicators of poverty incidence and inequality feature prominently in the internationally agreed 2015 Sustainable Development Goals.[1]

Information on poverty incidence and inequality is difficult to obtain and the answers are always somewhat uncertain. The commonly used measures require household survey-based data on the distribution of consumption (or incomes) across the population and not just average levels. Because household-level surveys are so costly, small and imperfect samples

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[1] They are SDG Goal 1 (No poverty) and Goal 10 (Reduced inequality). For more details, see https://www.undp.org/content/dam/undp/library/corporate/brochure/SDGs_Booklet_Web_En.pdf (accessed 27 November 2019).

are almost always used to estimate the characteristics of large and diverse populations.[2] In the case of Myanmar, information of this kind has been particularly scarce and even moderately reliable data have become available only quite recently. This paper provides a critical summary of the statistical data currently available for Myanmar on these matters, covering the period 2005 to 2017.

With the advent of a more democratic form of government, following the November 2015 elections, the Myanmar people expect to see profound social and economic reforms. Reforms are ongoing (Warr 2016), but economic reforms primarily intended to boost growth have the potential to increase economic disparities among households. The experience of the period preceding most of these reforms, 2005 to 2015, provides a baseline against which subsequent, post-reform analyses of poverty and inequality can be compared, once the data become available, beginning with the short, initial post-reform period 2015 to 2017.

Examining the factors influencing the levels of poverty incidence and inequality and their changes over time can potentially contribute to development of a policy framework for achieving poverty-reducing economic growth while inequality is kept at a low to moderate level. In particular, it is important to know the extent to which changes in poverty and inequality can be influenced by public policy and which policy measures are likely to be more effective than others. As the discussion of the currently available studies on Myanmar will show, research of this kind remains largely an aspiration, rather than a reality.

The paper begins with a non-technical summary of the analytical issues involved in measuring poverty and inequality. Readers already familiar with the arcane economic literature on these matters may wish to skip this section. The Myanmar data sources used in this study are then described. The following sections then summarise the findings from

[2] The exception to 'almost always' is that census data, in principle covering the entire population, can sometimes be used to supplement and check the results of the more frequent and less costly sample surveys.

existing studies on three economic variables, covering the period 2005 to 2017: levels of average mean consumption expenditures; the headcount measure of poverty incidence; and the Gini coefficient of inequality. This discussion does not present research findings based on new data, but critically reviews the information currently available. The following section then summarises the findings of a recent study estimating the impacts on the above three variables of a major natural disaster. In May 2008 Tropical Cyclone Nargis devastated parts of Myanmar with important effects on average consumption, poverty and inequality. The final section concludes.

MEASUREMENT OF POVERTY AND INEQUALITY[3]

Measure of welfare

Measures of poverty and inequality normally focus on the distribution of either real household consumption expenditures or real household incomes, measured per person or per adult equivalent within the household. Consumption expenditure is generally the preferred indicator of current welfare because income includes saving, which is relevant for future, but not current household welfare. In the case of Myanmar, the available data – described in the following section – measure consumption expenditures at the household level, but not incomes. The word 'real' means that the money value of expenditure is adjusted to allow for inflation. It is best to understand 'real consumption' in terms of the quantity of goods and services consumed, rather than their monetary value. 'Per adult equivalent' means that total household expenditures are divided by the number of 'adult equivalents' in the household, a measure of household size that weights children less heavily than adults because their consumption requirements are considered smaller.[4]

[3] Readers wishing a fuller discussion of the measurement of poverty and inequality are referred to Houghton and Khandker (2009), available online.
[4] In most recent studies, the calculation of 'adult equivalent' uses the weights recommended in Deaton and Zaidi (2002).

As indicators of economic welfare, the resulting measures are far from perfect. For example, whether household consumption or income is used as the basis for these calculations, the primary focus is on the goods and services that the household is able to purchase with its own money. Neither measure, income or expenditure, includes the value to the household of services provided in kind, by local, state or national governments, without involving monetary payment. When some payment does occur for these goods or services, only the value of that payment is counted and this amount may be far below the value to the household of the good or service provided. Despite this point, it would not be correct to say that the consumption or income measures are based exclusively on monetary outlays. In the case of rural households in particular, consumption or income is always adjusted for the value of home-produced food, in addition to purchased food, although other household-produced goods and services are generally ignored.

In Myanmar, as in virtually all countries conducting similar surveys, the unit of observation is the household, meaning that data on consumption expenditures are recorded for the household as a unit, not the individual. No information is collected on the distribution of consumption *within* the household. Consequently, the resulting measures of poverty incidence and inequality are based solely on the distribution of expenditures *between* households. In the subsequent discussion it will be assumed that the *real value of household expenditures per adult equivalent* is the welfare measure being used.

The cumulative distribution of expenditures

The core statistical concept is the cumulative distribution of expenditures per adult equivalent, illustrated in stylized form in Figure 1.[5] For each household the value of expenditures per adult equivalent is calculated and the households are then sorted by this

[5] Figure 1 is a stylized representation designed to illustrate the method of calculating poverty incidence. It is not intended to provide an accurate representation of the full cumulative distributions of expenditures for Myanmar. The same point applies to Figures 2 and 4, below.

variable, ranging from those for which real expenditure per adult equivalent is the lowest to the highest.[6] These data are displayed on the horizontal axis of the diagram. The cumulative distribution then shows, on the vertical axis, the percentage of the population belonging to households for which (the logarithm of) real expenditure per adult equivalent is *less than* the amount shown on the horizontal axis.

The poverty line

The poverty line is a level of real expenditure per adult equivalent deemed necessary for a household to capable of attaining a 'decent' standard of living. Although some studies implicitly attribute a scientific meaning to it, this author's view is that the poverty line is a value judgment, rather than a scientific concept - an arbitrary level of real expenditure per person, used for statistical convenience to distinguish households that are 'poor' from those that are 'non-poor'. It involves an opinion – a judgment about the level of expenditure required for a household to achieve a 'decent' standard of living, given the economic environment that the household faces. According to this view, arguments about what the 'true' poverty line is, or should be, are misguided.[7] Statistical agencies establish these poverty lines. The approach of this study is to take them as given, recognising that they are value-judgments, and then to analyse their implications for changes in poverty incidence over time. The vertical 'Poverty Line' shown in Figure 1 represents one such possible poverty line.[8]

Recognition that the poverty line involves an arbitrary judgment has an important implication. Since poverty incidence depends on the poverty line, discussion of whether the 'true' level of poverty incidence in a particular country at a particular time is, say, 20 per cent or 40 per cent is meaningful only in relation to the poverty line that is being used. Different

[6] The data are normally expressed as the logarithm of consumption, to compress the numerical spread of the household consumption data without affecting its ordering.
[7] Some authors disagree with the perspective expressed here. See, for example, Reddy and Pogge (2005).
[8] When expenditures are measured as their logarithm, then of course the poverty line must also be calculated as its logarithm.

agencies invent different poverty lines, reflecting different value judgments about the appropriate division between 'poor' and 'non-poor' households. Unless the poverty line is made explicit, arguments about the 'true' level of poverty incidence are meaningless.

In comparing poverty incidence over time, the crucial point is that the purchasing power of the poverty line must be *held constant*. The purchasing power of the poverty line should be understood in terms of the actual quantity of goods and services it can buy – its real value. This real value is held constant by adjusting the monetary value of the poverty line to allow for changes over time in the prices of goods and services. This makes it possible to study systematically changes in the proportion of households with real expenditures falling below this real threshold, holding constant the value judgments underlying the poverty line. That is, while the absolute real value of the poverty line is arbitrary, its adjustment over time to allow for inflation is not arbitrary.

Poverty incidence

In Figure 1 the percentage of individuals belonging to households with real expenditures below the poverty line is shown by the vertical intersection between the poverty line and the cumulative distribution. This measure is known as the headcount measure of poverty incidence.[9] Because the cumulative distribution of expenditures is upward-sloping by construction, it is necessarily the case that the higher the poverty line, the higher the measured headcount level of poverty incidence.

Inequality

Whereas poverty incidence is about *absolute* purchasing power, inequality is about the *relative* purchasing power of different households.[10] There are many statistical measures of

[9] Other measures of poverty incidence are used, including the poverty gap and poverty gap squared measures, but they tend to move in the same direction as the headcount measure.

[10] The discussion of inequality in this chapter focuses more narrowly on the distribution of purchasing power. In a broader sense, inequality also relates to the distribution across individuals of wealth, assets and political power.

inequality but all share the feature that if the real purchasing power of every household increased (or decreased) by the same proportion, say by doubling, measured inequality would not change. In contrast, if all real expenditures doubled but inequality remained constant, poverty incidence would necessarily decline. The cumulative distribution of real expenditures would shift to the right, but the real value of the poverty line would remain constant.

The most commonly used inequality measure is the Gini coefficient, illustrated in Figure 2, which is based on a Lorenz curve of expenditures, a modified form of the cumulative distribution discussed above and resting on the same underlying data. Households are arranged along the horizontal axis, sorted by expenditure per adult equivalent, from the poorest (left hand side of the axis) to the richest (right hand side). The position of a particular household on the horizontal axis depends on the percentage of all households whose expenditure per adult equivalent is *lower than* that particular household. The vertical axis shows, for each household on the horizontal axis, the cumulative percentage of total expenditure of all households whose expenditure per adult equivalent is lower than that household. If all households had the same levels of expenditure per adult equivalent, all households would lie on the diagonal dotted line labelled 'Complete equality'. Otherwise, if expenditures are distributed unequally, the graph of all households must lie somewhere below this diagonal.

Consider household *X*, which happens to lie in the centre of the horizontal axis, meaning that half of all households are poorer than *X*. By construction, all households poorer than *X* must account for less than half of all expenditures, so on the vertical axis, household *X* must take a value below 50 per cent. The Lorenz curve is the graph of all such households in the sample. The greater the degree of inequality, the further the Lorenz curve is from the diagonal. This is the basis for the Gini coefficient, given by the area A / (A+B). The index varies between the hypothetical values of 0 and 1, where 0 represents complete equality and 1

is the value the index would hypothetically take if a single household had all the expenditure. Neither of these two extremes is ever observed empirically and measured Gini coefficients always lie in the interval between 0 and 1. The Gini coefficient is sometimes expressed as a percentage, in which case it varies between 0 and 100. The higher the number, the greater the inequality.

Sampling error

Because of the cost of conducting detailed household surveys, mean expenditures, poverty and inequality at the population level are almost always estimated through sample surveys, covering only a small fraction of a country's heterogeneous population. These samples produce estimates of population statistics that inevitably involve error. Statisticians endeavour to minimize sample bias, such that the statistically expected value of sample-based estimates are equal to their true population values, but because of limited sample sizes, random sampling error is unavoidable. Sample estimates have a variance. The smaller the sample, the higher the sample variance and therefore the less reliable are the sample-based estimates of the true population parameters. Therefore, when sample-based estimates change over time, it is reasonable to ask the likelihood that these changes could have arisen by chance, due to random sampling error. The smaller the sample and the greater the within-sample variation, the greater is the sampling variance and the less reliable are the population estimates based on the sample. In practice, this means that when sample variances are large, measured changes over time are not necessarily statistically significant, in turn meaning that measured changes of this size could have arisen purely by chance, due to random sampling error. Statisticians have developed tests of significance designed to estimate the probability that this could have occurred.

DATA SOURCES FOR MYANMAR

Household Income and Expenditure Survey (HIES), 1989 to 2004

Household expenditure data have been collected in surveys conducted by the Myanmar government at least since 1989. A survey known as the Household Income and Expenditure Survey (HIES) was undertaken in intermittent years, including 1989, 1997, 2001 and 2004.[11] Based on these surveys, various issues of the *Myanmar Statistical Yearbook* published average values of household consumption expenditures and their commodity composition, arranged by socio-economic and geographical groups, for the above years. These published average consumption data were expressed on a per household basis, rather than per household member or per adult equivalent. Nevertheless, no estimates of poverty incidence or inequality, based on these data, were ever published. These measures may have been calculated by government officials, but if so, they were considered secret. That is, the published summaries reported data about household level averages of real consumption expenditures but not their distribution across households. The distributional information contained in these data were unique but to the best of the present author's knowledge, no external researcher has ever received access to these data and no analysis of their implications for poverty or inequality has been published. It is not clear whether any of the original raw data still exist.

Integrated Household Living Conditions Assessments (IHLCA), 2005 and 2010

In 2004/05 and 2009/10 the United Nations Development Program (UNDP) conducted two moderately large household surveys, in conjunction with the Myanmar government, and

[11] This survey may have been undertaken in some additional years, unknown to the author. UNDP/World Bank (2019b) states that this survey was conducted every six years, beginning in 1989 and ending in 2012, but this information is incorrect.

published detailed estimates of poverty incidence based on the data collected.[12] No inequality measures were included and inequality was not discussed. These two surveys were known as the Integrated Household Living Conditions Assessments (IHLCA). Unlike the earlier HIES data described above, these household level data were made available to qualified researchers for independent analysis.[13]

The detailed sampling procedures have been documented in IDEA and IHLCA (2007a, b, c) and IHLCA (2011a, b, c). The full survey included roughly 18,000 households in 2005 and a similar number in 2010, with data collected throughout the country. Approximately half of the sample was a panel, meaning that it covered the same households in each of the two years. Panel data are useful for statistical analysis of the causes of changes in the distribution of household expenditures, but the discussion in this paper will relate to the full sample.[14] The statistical methods used by government statistical agencies and other researchers to estimate poverty incidence vary widely.[15] The IHLCA reports estimate poverty incidence based on household expenditures on: (i) food consumption expenditures, including estimates of the value of home-produced food; (ii) non-food consumption expenditures, including clothing and other apparel, home appliances, house repair, education, travel and other household personal services; and (iii) housing expenditures, represented by yearly user costs, approximated by actual rental value, in the case of rented housing, or estimated rental value in the case of owner-occupied housing.

[12] For brevity, these two surveys will subsequently be referred to as the 2005 and 2010 surveys.
[13] Warr and Aung (2019) is one such study using the raw household level data, including the panel component.
[14] The research value of panel data derives from the fact that the households are the same in different years of the sample. This facilitates analysis of the impact of external variables affecting the households, because these impacts are not compounded in the data with changes in the characteristics of the particular households contained within the sample, as is the case when the sample changes over time.
[15] As noted above, poverty lines can differ, but a deeper statistical problem, affecting both poverty and inequality estimates, is that the household level data themselves are often constructed differently. Statistical agencies in some countries use household expenditures as the basis for their calculations which others use incomes. Moreover, the items included in the calculation of income or expenditure also differ widely. Warr *et al*. (2017) make this point by comparing poverty and inequality measurement in the eight poorest Association of Southeast Asian Nations (ASEAN) countries, including Myanmar. No two ASEAN countries include the same items in their definitions of household incomes or expenditures.

The expenditure data collected were based on recall of expenditures and the actual collection and recall periods are important. The 2005 and 2010 data were each collected in two rounds: December 2004 and May 2005; and December 2009 and May 2010, respectively. For non-food items the recall period was six months. For food items the recall period was seven days for some items[16] and 30 days for others.[17] Two important omissions from the IHLCA calculations were health-related expenditures and expenditures on household consumer durables. The proportion of expenditure allocated to these items may vary with the level of household income, so measured inequality and changes in it could be affected by their omission. The raw household survey data collected in the IHLCA survey include actual expenditures on these two items and the ownership of consumer durables. Warr and Aung (2019) amends the data used by the IHLCA team to include these two items, but since these amendments do not change estimated poverty incidence and inequality markedly they will be ignored in the present discussion, focusing on the published IHLCA data.

Myanmar Poverty and Living Conditions Survey (MPLCS) 2015

The World Bank undertook a relatively small sample survey in 2015, again in conjunction with the Myanmar government, called the Myanmar Poverty and Living Conditions Survey (MPLCS 2015) and published detailed estimates of poverty incidence and inequality for that year. The earlier IHLCA data were largely ignored in the subsequent reports, World Bank (2017a and 2017b). The design of the 2015 survey essentially discards the previous two surveys conducted by UNDP and begins again.[18] The sample size of the MPLCS was 3,648

[16] The 7-day recall items were: (i) pulses, beans, nuts and seeds; (ii) meat, dairy, eggs; (iii) fish and other seafood; (iv) roots and tubers; (v) vegetables; (vi) fruits, (vii) spices and condiments; and (viii) other food products, including dried rice noodles, cake, vermicelli biscuits and tofu, alcoholic beverages and food and beverages consumed outside the home.

[17] The 30-day recall items were: (i) rice and other cereals; (ii) oils and fats; (iii) milk products; (iv) other food items such as green tea leaves, betel leaves, coffee, and potato chips.

[18] The subsequent reports, World Bank (2017a and 2017b) similarly focus almost entirely on the 2015 data, largely ignoring the findings of the two earlier surveys.

households, one fifth the size of the earlier IHLCA samples, limiting the reliability of the national estimates obtained and eliminating the capacity of the data to produce estimates of poverty incidence at the state or division level. The MPLCS survey also abandoned the panel component of the earlier IHLCA surveys.

The above sampling decisions are not explained in the World Bank reports, but their implication is that while it is possible to use the earlier 2005 and 2010 data to study the causes of the changes in poverty incidence and inequality that occurred over that short interval, the subsequent discontinuity in the data impedes any similar study covering the interval between 2010 and 2015. It is not possible to comment on the sampling or commodity details of the MPLCS survey because these details have not been published. The household level data collected by MPLCS 2015 have not yet been released for independent analysis.

Myanmar Living Conditions Survey (MLCS) 2017

Most recently, in June 2019, the World Bank, in association with UNDP and the government of Myanmar, released summary results from a medium-sized 2017 survey, called the Myanmar Living Conditions Survey (MLCS). The findings are summarised in UNDP/World Bank (2019a and 2019b). The sample size was 13,730 households, almost four times the size of the World Bank's earlier MPLCS survey and three quarters of the size of the UNDP's two IHLCA surveys. There is apparently no panel component. Details of the sampling methods have not been published and the household level data have not yet been released for independent analysis.

Table 1 summarises the characteristics of the above four surveys conducted between 2005 and 2017. The UNDP's two IHLCA surveys, 2005 and 2010, used a common sampling methodology, but the World Bank's 2015 MPLCS survey and the UNDP/World Bank 2017 MLCS survey used sampling methods that differed from this and from each other. It needs

hardly be said that comparison of the findings from these studies is precarious at best. The changing design of the surveys themselves, compounded by the stand-alone nature of the reports based on each of them, hardly facilitate this exercise. Nevertheless, since these studies are all that is available, if conclusions are to be drawn about changes in economic welfare over time, this is the exercise that must now be attempted. The important point is that we are discussing statistical *estimates* of real consumption, poverty and inequality, based on imperfect information and these estimates must be viewed critically.

MEAN CONSUMPTION EXPENDITURES

Estimated levels of real consumption expenditures, based on the above survey data, are summarised in Table 2, for the period 2005 to 2017. Between 2005 and 2010, the mean value of real consumption expenditures barely changed, increasing by only 1.4 per cent over the entire five years. Taking into account the size of the sample and the estimated sample variance, Warr and Aung (2019) show that, in statistical terms, this small change was not significantly different from zero. The 2005 to 2010 period can therefore be regarded as one of no growth. Between 2010 and 2015, mean expenditures increased by 13.4 per cent, roughly ten times the increase over the previous five years. Over the full decade the change was 15 percent, an annual compound growth rate of just under 1.5 per cent. This story was roughly similar for urban and rural areas. In urban areas measured mean expenditures actually declined (by 2.8 per cent) between 2005 and 2010, then increased by 22.5 per cent over the following five years. In rural areas the corresponding changes were 3.7 and 16 per cent, respectively. Over the full decade urban and rural real expenditures increased by 19 and 16 percent, respectively.

Although the estimated annual rate of growth of real consumption over this decade was only slight, average living standards apparently did improve. Figure 3 summarises supporting

evidence on this point, using data on assets owned by households, drawn from World Bank (2017a). The data sources include the three household expenditure surveys for 2005, 2010 and 2015 mentioned above, together with the 2014 census. Ownership of mobile phones, rice cookers, motorcycles, electric fans and television all increased significantly. In addition, the use of electric lighting and tin roofs both expanded and reliance on thatched roofing declined correspondingly. It could not be said that there was no improvement, starting from very low levels of asset ownership in 2005.

According to the UNDP / World Bank reports relating to the 2017 survey, average real consumption increased by a further 17 per cent between 2015 and 2017.[19] Overall, these data indicate that average real consumption in Myanmar increased by 35 per cent between 2005 and 2017, but fully half of that estimated increase occurred over the two years between 2015 and 2017. If correct, these findings indicate the impact of early economic reforms.

An important point can be extracted from this information: the radical difference between the story for urban and rural areas. In urban areas estimated average real consumption increased by 58 per cent over the full 12 years but two thirds of that change occurred over the two years between 2015 and 2017. In rural areas, estimated real consumption rose by only 22 per cent over the full 12 years and only a quarter of that change occurred over the two years from 2015 to 2017. The implication is clear. The gain in estimated real consumption that occurred between 2015 and 2017 was heavily concentrated in urban areas and the gap between urban and rural consumption levels widened. In 2005 the ratio of average real consumption per adult equivalent between urban and rural areas was 1.18. A decade later, in 2015, it was 1.21 and in 2017 it was 1.52. The recent gains in estimated real consumption at the national level were heavily concentrated on urban people.

[19] Levels of asset ownership are reported for 2017, but in a format that does not support comparison with the earlier years.

POVERTY INCIDENCE

Drawing upon the household expenditure surveys described above, in conjunction with the World Bank's (2017) poverty line, Figure 4 illustrates the calculation of poverty incidence for 2005 and 2017, holding the real purchasing power of the poverty line constant. In this illustrative graph, levels of expenditure in 2005 and 2017 are both expressed in 2017 prices. According to the estimates described above, over this 12-year interval almost one quarter of the population (23.4 per cent) belonged to households that moved from levels of real expenditure per adult equivalent below the poverty line to levels above it.

Revising the poverty line

In its first report on poverty incidence in 2015 (World Bank 2017a), the World Bank presents calculations of poverty incidence based on the UNDP (2007) poverty line. It then places great emphasis on the necessity of revising these poverty lines. It generates a new, higher poverty line based on World Bank (2014) and compares the resulting poverty incidence with those obtained using the earlier UNDP poverty line. A subsequent report (World Bank 2017b), focuses on this issue again, producing a still higher real poverty line and a third series of poverty estimates.

The reasons given for this emphasis on raising the real value of the poverty line are said in World Bank (2017a and 2017b) to relate to changes in living conditions within Myanmar. But if living conditions change, measured poverty incidence will presumably change, given the poverty line. That is what the measurement of poverty incidence is intended to reveal. The suggestion that a change in living conditions necessitates a change in the real value of the poverty line does not make sense. This aspect of the two World Bank reports remains mysterious. In any case, as shown above, 'living conditions' in Myanmar

changed far more rapidly between 2015 and 2017 than they had during any previous interval and the World Bank apparently saw no necessity to change its poverty line again.

The World Bank's calculation of the 2017 poverty line takes account of expenditure on some commodities not captured by the early UNDP poverty line, such as mobile phones, but this is a minor point. The principal change is in the overall level of the poverty line, not the inclusion of a handful of new commodities. The real value of the World Bank (2017) line is roughly 30 per cent higher than the UNDP (2007) line. Figure 5 shows the resulting levels of poverty incidence for Myanmar estimated from the three poverty lines mentioned above: UNDP (2007), World Bank (2014) and World Bank (2017). In the construction of this diagram, for each poverty line its nominal magnitude was adjusted over time in the same way, using the consumer price index. Of course, a higher real poverty line necessarily produces a higher estimated level of poverty incidence. In addition, when changes in poverty incidence are being studied over time, holding the poverty line constant but at different alternative values, we are studying changes in different regions of the cumulative distribution of expenditures. Accordingly, the resulting changes in measured poverty incidence should not be expected to be identical. Nevertheless, Figure 5 shows that the resulting pattern of changes in poverty incidence over time is similar, regardless of which poverty line is used.[20] It is not apparent what the revision of the poverty line achieved, or why the World Bank was so insistent upon it.

In its vast literature on global poverty, the World Bank has emphasised the relevance for the world's poorest countries of an international poverty line of US$ 1.90 per day, measured at 2011 purchasing power parity (PPP),[21] updated in October 2015 from the

[20] The reductions in aggregate poverty incidence over the full decade, calculated from the World Bank (2014) and World Bank (2017) poverty lines, were 18.4 and 16.1 per cent, respectively.

[21] The use of purchasing power parity (PPP) exchange rates takes account of the fact that US$ 1, converted at the market exchange rate, does not purchase the same quantities of goods and services in all countries. It typically purchases more in poor countries than in richer countries, mainly because labour costs are lower in the former and services, in particular, are correspondingly cheaper. The PPP conversion factor is the ratio of the

previously recommended US$ 1.25, also at PPP.[22] It is therefore relevant to compare the poverty lines recommended for Myanmar with this yardstick. The poverty line recommended in World Bank (2017b) is 1,303 kyats per adult equivalent per day (1,241 kyats per capita per day), in January 2015 prices.[23] At the January 2015 market exchange rate of 1,025 kyats per US$, this converts to US$ 1.27 per day. The World Bank's 2011 PPP conversion factor for Myanmar is 3.767, similar to the conversion factors for neighbouring poor countries Laos and Cambodia.[24] The recommended poverty line for 2015 therefore converts to US$ 4.78 per day at 2011 PPP, roughly two and a half times the World Bank's recommended international poverty line for poor countries. This discrepancy is acknowledged in World Bank (2017b), but not explained.[25]

An explanation may lie buried in the World Bank's 2017 *East Asia and the Pacific Update* report, which cites poverty incidence in Myanmar, using the $1.90 international poverty line (at 2011 PPP), as 6.5 per cent. In addition, it reports poverty incidence in Myanmar, using a poverty line for 'lower middle-income countries' of US$ 3.20 (at 2011 PPP), as being 30.2 per cent, comparable with the Bank's estimated poverty incidence for Myanmar in 2015 of 32.1 per cent. Other World Bank documents show that the Bank's internal classification of Myanmar, which has potential implications for its lending policies, was amended in 2014 from 'low income' to 'lower middle-income'.[26]

PPP exchange rate, expressed as local currency unit per US$, to the market rate. See Houghton and Khandker (2009).

[22] See http://www.worldbank.org/en/topic/poverty/brief/global-poverty-line-faq (accessed 20 June 2019).

[23] In comparison, median expenditures per adult equivalent in 2015 were 1,644 kyats (World Bank 2017b) and mean expenditures were 1,933 kyats (author's calculation, using mean expenditures in December 2009 prices from World Bank (2017a), as in Table 3 above, adjusted for changes in the consumer price index).

[24] Calculated from https://data.worldbank.org/indicator/ny.gdp.pcap.pp.cd (accessed 20 June 2019).

[25] The report states (p. 29) that at US$ 1.90, 2011 PPP, poverty incidence for Myanmar in 2015 "was estimated at 6.5 per cent" (roughly one fifth of the 32.1 per cent level estimated in the report). The subsequent discussion dismisses the relevance for Myanmar of the U$ 1.90 international poverty line, but provides no coherent reason.

[26] See the Excel file OGHIST, downloadable from the World Bank website: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (accessed 21 June 2019).

'Lower middle-income' is a broad statistical category used by the World Bank for countries with Gross National Income per capita (Atlas method) ranging between US$ 996 and US$ 3,895. In 2015 the World Bank's estimate of Gross National Income per capita in Myanmar moved from just below, to just above this arbitrary lower threshold, reaching US$ 1,190 in 2015. Myanmar is far from typical of most countries in this 'lower middle income' category, which also includes Indonesia, Bolivia and Ukraine. Of course, the World Bank's definition of the 'lower middle-income' category of countries and its US$ 3.20 recommended poverty line for all such countries, are both arbitrary.

The desire for consistency with this change of Myanmar's internal World Bank classification may help explain the Bank's eagerness to raise Myanmar's poverty line to one that the World Bank arbitrarily uses for all countries in this income category. If this explanation is correct, the World Bank's eagerness to change Myanmar's poverty line was apparently motivated by the desire for consistency with its own internal operating procedures, having nothing to do with understanding poverty and its causes in Myanmar or with finding effective policy solutions, and the explanation provided for this change was misleading.

Poverty profile

The reports World Bank (2017a and 2017b) and UNDP / World Bank (2019a and 2019b) provide comprehensive descriptions of the characteristics of the poor in 2015 and 2017. For example, as Table 2 indicates, in both years estimated poverty incidence was higher in rural than in urban areas. From Table 3, poverty incidence in 2015 varied significantly by geographic region. It was highest in the Coastal Zone, followed by Hills and Mountains region, then the Dry Zone and lowest in the Delta region, which includes the largest city, Yangon. The incidence of poverty varied with the education of the household head. The better educated, the lower the average level of poverty incidence. Young couples with

children had the highest incidence of poverty and couples with no children the lowest. The more children, the higher the average level of poverty incidence and finally, households whose head was between 35 and 44 years of age, presumably coinciding with the largest average number of dependent children, are the most likely to be poor. Similarly, poor households are less likely than the non-poor to possess legal title to land that they cultivate or to their dwelling, and less likely to own a bank account. The profile for 2017 shows that poverty incidence is highly concentrated among agricultural workers without land.

This description of poverty at a particular time is called a poverty profile. Its findings are interesting but unsurprising in light of earlier work on poverty in developing countries. This analysis has two central defects. First, inexplicably, there is almost no attempt to compare the findings for any one year with those from earlier years. For example, the poverty profile for 2017 makes almost no comparison with the profile for 2015. Indeed, the format of the two profiles is so different that the reader is precluded from making this comparison.[27] The 2017 findings are described in stand-alone form, as though the 2015 reports, let alone the earlier reports for 2005 and 2010, did not exist.

Second, the deeper analytical weakness of these profiles is that they describe correlation and not causation. For policy purposes, what is needed is knowledge of the causes of poverty and changes in it, so that these causes can be addressed. The two World Bank reports dealing with the 2015 findings and the two UNDP/World Bank reports dealing with the 2017 findings describe the poor but make no attempt to explain why people are poor, or why poverty changes over time.

[27] An exception to this statement is the case of education. Comparison of the 2015 and 2017 profiles is possible in this case because the data are presented in a similar format. The comparison reveals that the decline of poverty between 2015 and 2017 was highest among households for which the household head was better-educated.

To illustrate the difference between correlation and causation, suppose, hypothetically, that poor people were found to be less likely than the non-poor to consume ice cream or to wear brand-name clothing. No one would imagine that non-purchase of these items caused poverty. Obviously, the causation runs in the opposite direction. Saying that poor people do not purchase these commodities would reveal nothing about why they were poor. Policies to facilitate their purchase might be popular, but they would not assist poor people to exit poverty.

Now, what about education? Does inferior education cause poverty or does poverty cause families to skimp on the education they are able to give their children? Both effects presumably operate, but if we are to know how improved education might affect poverty incidence we need to separate these two causal links. We need to know how improved education affects poverty, net of the reverse effect. Similarly, does non-possession of a bank account cause poverty, or the reverse? Again, both effects probably operate. A poverty profile merely describes the poor. It doesn't explain why they are poor.

To design policies that can reduce poverty it is necessary to know its drivers – what causes changes in poverty incidence – and not just its correlates. A poverty profile may superficially appear to provide an explanation for poverty, but it really doesn't. Simply knowing that being poor is correlated with something else reveals very little about how poverty might be reduced. Indeed, if the poverty profile was interpreted in that incorrect way, the results could be harmful to the cause of poverty reduction. A rigorous analysis of the drivers of poverty reduction is needed, but in the case of Myanmar this analytical work has not yet been done.

INEQUALITY

Each of the standard measures of inequality declined between 2005 and 2010, increased between 2010 and 2015, then declined between 2015 and 2017 to a level exceeding the 2005 level. Inequality in 2017 was higher than earlier levels measured in Myanmar, but not high relative to levels in other Southeast Asian countries, as shown in Table 4. Inequality is higher within urban areas than rural areas, as shown in Table 2, but an analytical point that will be important for subsequent discussion is that inequality at the national level depends not only on inequality within sub-groups, such as urban and rural areas, but also on inequality between these groups. The discussion of mean consumption levels above revealed that inequality between urban and rural areas apparently increased between 2015 and 2017, even though estimated inequality declined within each of these areas.

THE POVERTY AND INEQUALITY IMPACT OF CYCLONE NARGIS

In May 2008 coastal and near-coastal areas of Myanmar suffered the effects of a massive tropical cyclone. The areas directly affected, as identified by post-cyclone satellite imagery, contained about 14 per cent of the country's total population (Tripartite Core Group 2008). Within this area, the cyclone killed an estimated 138,000 people and obliterated public and private assets on a vast scale (Guha-Sapir *et al.* 2016). In those regions of the country directly affected by the cyclone, virtually all standing crops and stored food stocks, along with most capital goods such as vehicles and other machinery were destroyed, along with many buildings, and in coastal farming areas, salt-water inundation reduced soil fertility (Larkin 2010). Steinberg (2013, p. 46) cites estimates of property damage equivalent to 27 per cent of annual GDP and describes Cyclone Nargis as "the single most devastating disaster to strike Burma/Myanmar in recorded history."

Cyclone Nargis seems a candidate for explaining at least some of the puzzling decline in recorded inequality that occurred between 2005 and 2010. A recent long-term historical study, Scheidel (2017), has argued that over several millennia of human history substantial reductions in economic inequality have almost always resulted from only two types of events: man-made disasters such as warfare, revolution and state collapse; and natural disasters such as mass epidemics, earthquakes, volcanic eruptions, tsunamis and unexpected climatic disruptions. Scheidel argues that disasters reduce inequality by destroying the assets owned by better-off people, leveling the distribution of economic welfare among the survivors.

Warr and Aung (2019) develop a statistical methodology for estimating the impact that an exogenous event (in this case, the cyclone) had on the distribution of consumption, including its effects on poverty incidence and inequality. The method is to use panel data – in this case, those contained in the 2005 and 2010 UNDP survey data described above – to estimate a hypothetical distribution of household consumption expenditures in 2010 representing the counterfactual situation in which the cyclone did not occur. The impact of the cyclone was then measured as the difference between this hypothetical distribution of consumption (without the cyclone) in 2010 and the observed distribution of consumption (with the cyclone) in the same year, as recorded in the 2010 survey data. This analytical exercise was possible only because of the existence of the panel component within the UNDP surveys. Within this panel component (roughly half the total sample), the same households were surveyed in both 2005 and 2010.

The findings were that the estimated impact of the cyclone was to reduce average real consumption within the directly affected region by 14.9% and at the national level by 6.4%, compared with what it would otherwise have been in 2010 if the cyclone had not occurred. Similarly, the cyclone increased poverty incidence within the directly affected area by an estimated 12.9% of that population and at the national level by 2.8% of the total population.

The estimated effects on inequality were surprising and not at all straight-forward. First, and contrary to Scheidel's argument, the cyclone *increased* inequality within the population directly affected. The reason was that the *absolute* loss of consumption was, on average, largest among better-off households, as Scheidel contends, but the *proportional* loss was larger for the poor. Scheidel's argument logically requires that the disaster harms the rich more than the poor in proportional terms, and not just in absolute terms.[28]

Second, the estimated impact on overall inequality at the national level combines two components: within-region changes in inequality, and between-region changes. As described above, the within-region component was an increase in overall inequality because the Cyclone-Nargis affected region experienced an increase in inequality and there was no impact in the non-affected region.[29] The between-region component depends on whether the region negatively affected was initially better-off or worse-off than the rest of the population, unaffected by the cyclone.

Cyclone Nargis reduced average consumption within the affected region by 13%, but this region, including the business centre and former capital, Yangon, was the wealthiest part of Myanmar, both before and after the cyclone. In 2005, before the cyclone, average consumption expenditures within the region subsequently affected by Cyclone Nargis were 35% higher than the non-affected regions, and in 2010, after the cyclone, average consumption expenditures within the affected region were still 12% higher than in the non-affected regions, despite the damage caused by the cyclone. Accordingly, the impact of the cyclone was to reduce between-region inequality.

[28] A reduction in measured inequality requires the rich to lose relative to the poor. That is, in the case of a negative shock like the cyclone, the proportional loss to the rich must exceed the proportional loss to the poor.

[29] This was an assumption of the analysis. As Warr and Aung (2019) describe, some indirect price effects could have occurred, deriving from reduced food production in the directly affected region.

The reduction in between-region inequality was so large that it outweighed the increase in within-region inequality. That is, Cyclone Nargis did contribute to a reduction in national inequality within Myanmar, accounting for about one fifth of the observed decline. But this did not occur for the reason suggested by Scheidel's argument. The within-region impact of the cyclone was the opposite of his prediction. Inequality declined at the national level because the cyclone just happened to impact the part of the country that was initially the best-off, leaving the poorest regions of the country untouched.

CONCLUSIONS

National-level household surveys of Myanmar's population for 2005, 2010, 2015 and 2017 make it possible to study changes in average real consumption, poverty incidence and inequality over the 12 years spanned by these four surveys. The availability of these household level data, and their use for research purposes, is unprecedented for Myanmar. This paper has reviewed critically the data contained in these surveys and the calculation of poverty and inequality that can be derived from them. Because the sample surveys are relatively small, the findings from them should be viewed with caution and even some skepticism. The data indicate that over the 12 years ending in 2017, mean real (inflation-adjusted) consumption per person in Myanmar increased by 27 per cent and median real consumption increased by 35 per cent. At the same time, measured poverty incidence almost halved, but inequality increased significantly.

The two five year intervals 2005 to 2010 and 2010 to 2015, were very different. Average real consumption expenditures were virtually stagnant during the first period but rose by 13% during the second. Nevertheless, poverty incidence declined by similar amounts

– 6.5% of the population in the first period and 6.2% in the second. In the first period, this combination of outcomes was possible because inequality declined markedly. In the second period the reduction in poverty incidence occurred in spite of an increase in inequality that exceeded the decline in the first period, a combination of outcomes was possible only because of the large increase in average consumption that occurred between 2010 and 2015.

The decline in measured inequality between 2005 and 2010 and the subsequent increase between 2010 and 2015 both remain largely unexplained. According to one recent study, the negative impact of Cyclone Nargis in May 2008 explains about one fifth of the decline in inequality between 2005 and 2010. Other, as yet unknown factors must explain the rest. There is ample scope for further research to reveal these causes.

The available data also indicate that between 2015 and 2017, average consumption increased far more rapidly and poverty incidence declined more rapidly, on an annual basis, than it did over the preceding decade. If these statistical estimates are even roughly correct, they indicate welcome progress in the post 2015 period. Inequality is a different story. Until now, public policy discussion within Myanmar has focused on poverty incidence with little attention to inequality. At the early stages of economic development some increases in inequality may be inevitable, and perhaps even appropriate, though that is a matter of opinion. But if inequality continues to increase it seems certain to become a focus of policy attention within the near future.

The data indicate that since 2015 economic gains have occurred in both urban and rural areas, but that these gains are heavily concentrated on the former. The findings of this paper reveal a widening gap between the economic welfare of Myanmar's urban and rural populations. The recent political experience of neighbouring Thailand demonstrates that unchecked disparities of this kind can become severely destabilising.

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Table 1. Household expenditure surveys: 2005 to 2017

Name of survey	Year	Source	Sample size (households)	Level of representation	Timing of data collection	Panel data exist	Household data available
Integrated Household Living Conditions Assessments (IHLCA-I)	2004/05	UNDP / GoM	18,634	National; Rural/Urban; State/ Region	November, December 2004 and May 2005	Yes (9,102 households)	Yes
Integrated Household Living Conditions Assessments (IHLCA-II)	2009/10	UNDP / GoM	18,609	National; Rural/Urban; State/ Region	December 2009, January 2010 and May 2010	Yes (9,102 households)	Yes
Myanmar Poverty and Living Conditions Survey (MPLCS)	2015	World Bank / GoM	3,648	National; Rural/Urban; Agro-zone	January through April 2015	No	No
Myanmar Living Conditions Survey (MLCS)	2017	UNDP/World Bank / GoM	13,730	National; Rural/Urban; State/ Region	unstated	No	No

Note: UNDP means United Nations Development Programme. GoM means Government of Myanmar.

Source: Author's compilation, from IDEA and IHLCA (2007a, b, c), IHLCA (2011a, b, c), World Bank (2017a) and UNDP and World Bank (2019b).

Table 2. Estimated mean consumption, poverty incidence and inequality, 2005 to 2017

Variable	2005	2010	2015	2017	Change 2005 to 2017
Mean real consumption[a]					
National	1,950	1,977	2,243	2,628	34.8%
Urban	2,205	2,144	2,625	3,475	57.6%
Rural	1,875	1,944	2,175	2,286	21.9%
Poverty incidence (%)[b]					
National	48.2	42.4	32.1	24.8	-23.4
Urban	32.2	24.8	14.5	11.3	-20.9
Rural	53.9	48.5	38.8	30.2	-23.7
Gini coefficient of inequality[c]					
National	0.256	0.220	0.317	0.303	0.047
Urban	0.315	0.262	0.366	0.318	0.003
Rural	0.212	0.188	0.280	0.263	0.051
Memo item: Median real consumption[a]					
National	1,711	1,860	2,006	2,181	27.5%

Notes:

[a] Real consumption measured as Kyat per adult equivalent per month, 2017 prices. 'Adult equivalent' calculations use the weights recommended in Deaton and Zaidi (2002). Data for 2015 from World Bank (2017a); data for 2017 from UNDP / World Bank (2019b). 'Change' means percentage change from 2005 to 2017.

[b] Based on 2017 UNDP/World Bank (2019b) poverty line. 'Change' means absolute change from 2005 to 2017.

[c] Data for 2005 and 2010 from Warr and Aung (2019); data for 2015 from World Bank (2017a); data for 2017 from UNDP / World Bank (2019b). 'Change' means percentage change from 2005 to 2017.

Source:

[a] Data for 2005 and 2010 from Warr and Aung (2019), updated to 2017 prices using consumer price index data from World Bank, *World Development Indicators*. Data for 2015 from World Bank (2017a); data for 2017 from UNDP / World Bank (2019b).

[b] Data for 2005, 2020 and 2015 from World Bank (2017a); data for 2017 from UNDP / World Bank (2019b).

[c] Data for 2005 and 2010 from Warr and Aung (2019); data for 2015 from World Bank (2017a); data for 2017 from UNDP / World Bank (2019b).

Table 3. Poverty profile, 2015

(percentage of group population who are poor)

-Geographic Region		Education of head		Family structure		Number of children		Age of head (yrs.)	
Category	Poverty Incidence	Category	Poverty incidence	Category	Poverty incidence	Category	Poverty Incidence	Category	Poverty incidence
Hills and mountains	40.0	Tertiary	4.5	Three Generations	34.9	0	16.7	15 – 34	29.8
Dry Zone	32.1	High school	11.8	Couple with young children	38.1	1	22.5	35 - 44	36.0
Delta Region	26.2	Middle school	21.4	Couple with older children	20.4	2	34.3	45 – 59	31.7
Coastal Zone	43.9	Primary school	32.6	Couple with no children	13.6	3+	52.7	60+	30.2
		Below Primary	42.8	Others	14.8				
		Monastic school	32.7						
		None	49.7						

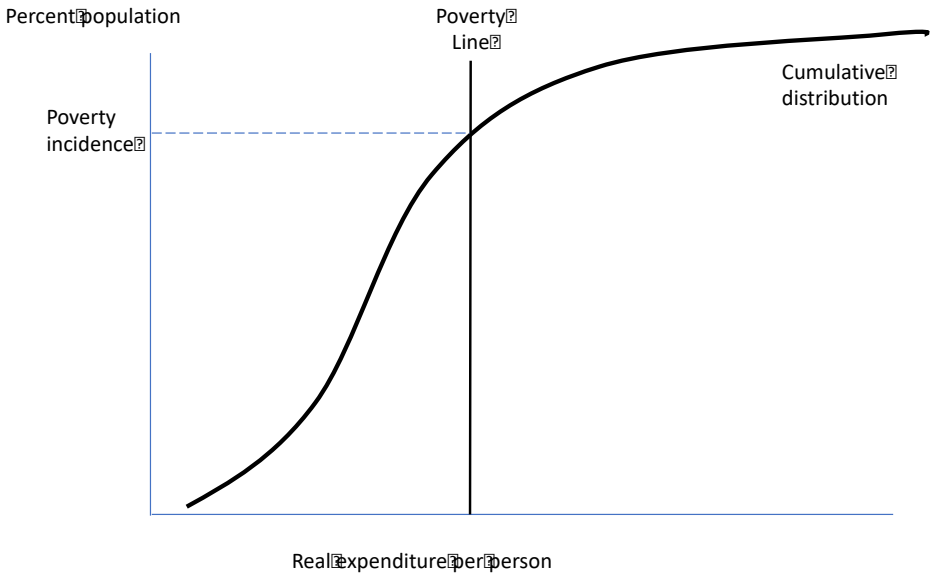
Note: Poverty incidence is measured as percentage of group population.
Source: Author's compilation from World Bank (2017b).

Table 4. Measures of inequality, Myanmar and neighbouring countries

	Gini Coefficient (%)	Ratio of top 10 % to bottom 10 %
Myanmar, 2005	25.6	3.9
Myanmar, 2010	22.0	3.4
Myanmar, 2015	31.7	7.4
Myanmar, 2017	30.0	6.5
Thailand, 2012	39.4	10.9
Vietnam, 2012	38.7	11.6
Indonesia, 2009	35.6	8.3

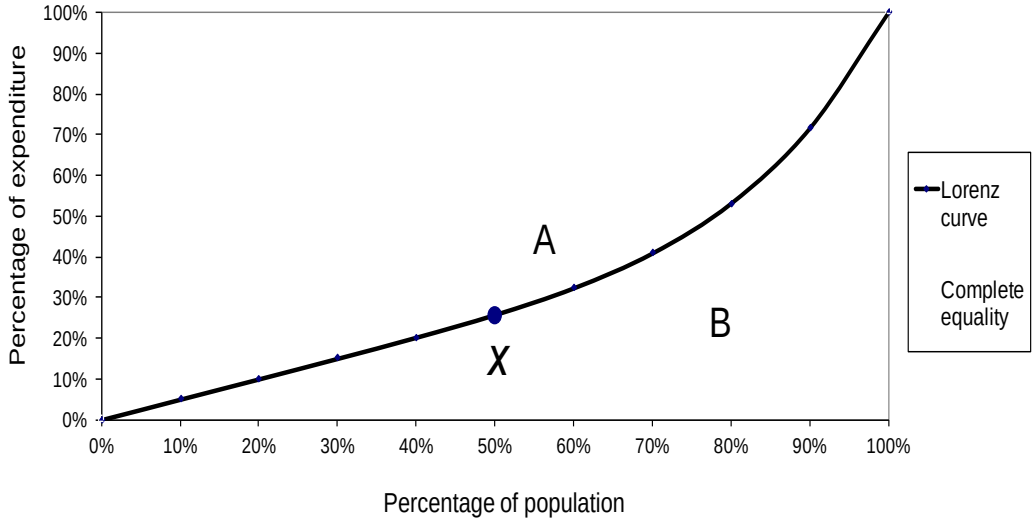
Source: Author's compilation from World Bank (2017b).

Figure 1. The cumulative distribution of expenditures and the headcount measure of poverty incidence



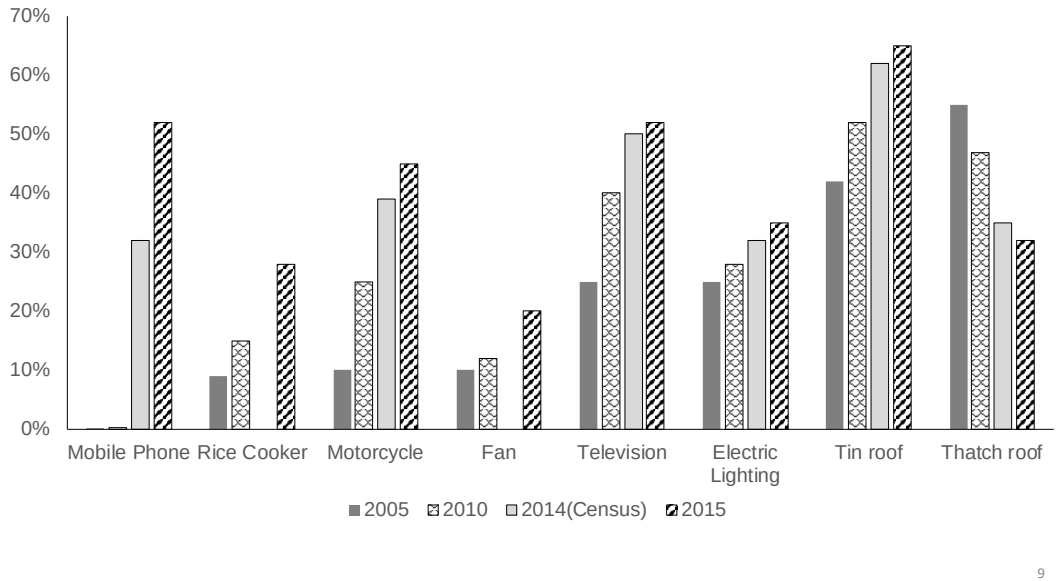
Source: Author's construction.

Figure 2. The Lorenz curve and the Gini coefficient of inequality



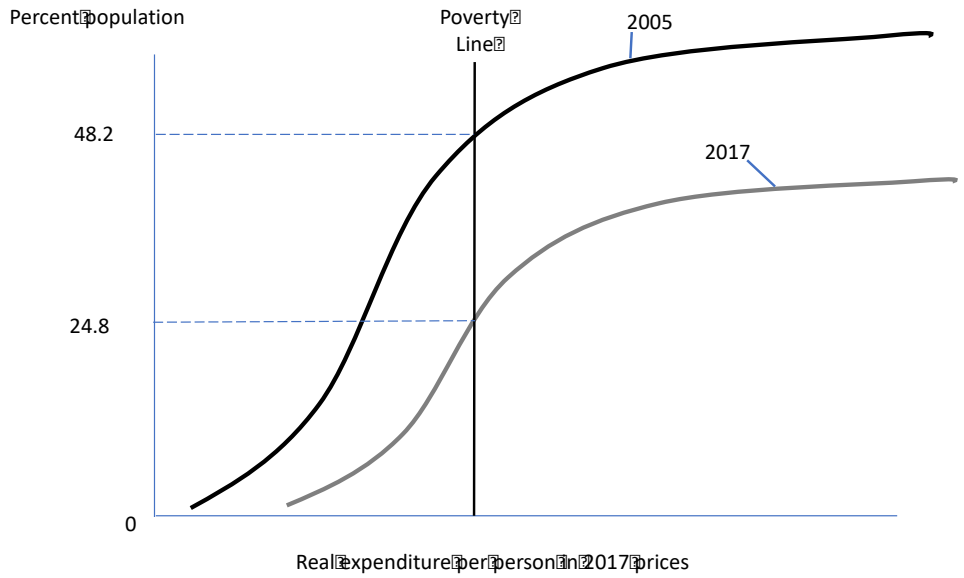
Source: Author's construction.

Figure 3. Myanmar: Asset indicators, 2005 to 2015



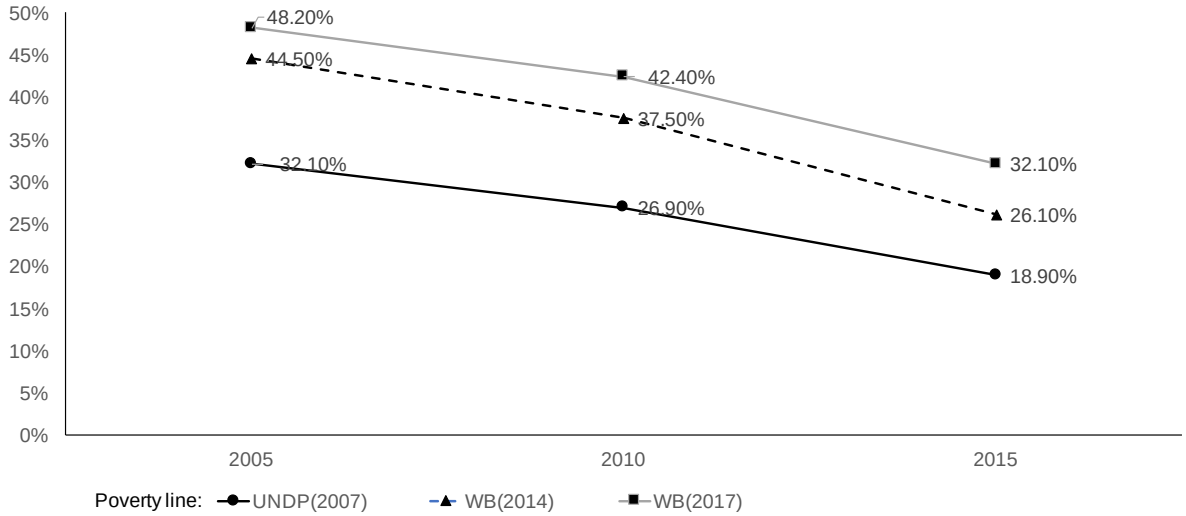
Source: Author's compilation, based on data from World Bank (2017a).

Figure 4. Myanmar: Poverty incidence 2005 and 2017



Source: Author's construction, based on UNDP / World Bank (2017) poverty line.

Figure 5. Myanmar: Poverty incidence, 2005, 2010 and 2015, based on varying poverty lines



Source: Author's compilation, based on UNDP (20007), World Bank (2014) and World Bank (2017) poverty lines.