The 'Great Myanmar Poverty Debate'

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Abstract

There is a 'micro-macro paradox' in poverty measurement. In a number of countries, declines in income or consumption poverty found in nationally representative household survey data are at odds with people's perceptions of worsening poverty or deprivation more broadly. The objective of this article is to offer a number of potential explanations for this paradox and to present the case of Myanmar where many of these same issues have recently played out. It is argued that there are plausible explanations which reconcile, in part, apparently conflicting positions in Myanmar's 'Great Poverty Debate'.

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1. Introduction[1]

Controversy frequently accompanies claims about changes in, or levels of, poverty. Globally, there is an active debate about whether or not poverty has fallen over the past few decades and, in particular, the magnitude of purported falls.[2] Likewise, similar disputes have occurred at the country level, a well-known example of which is the so-called 'Great Indian Poverty Debate' (Deaton & Kozel (Eds.), 2005). Many of these controversies turn on measurement issues concerning for example, the use of household survey or national accounts data, the chosen methods of adjusting for purchasing power parity (PPP) and price deflation more generally, along with data coverage and comparability (Anand, Segal and Stiglitz, 2010).

There is a parallel debate about poverty levels and trends which has received considerably less attention in the literature. Here, the fault lines are between results of household surveys on consumption or income poverty on the one hand, and findings from focus group discussions, semi-structured interviews, 'qualitative' modules in surveys and so on, which ask about perceived levels of, and/or changes in, poverty or deprivation, on the other. In a number of instances, declines in income or consumption poverty found in household survey data are at odds with people's perceptions of worsening poverty or deprivation more broadly.

One objective of this article is to review the empirical literature on this 'micro-macro paradox'[3] and offer a number of potential explanations for it. A second objective is to present the case of Myanmar, where a similar 'micro-macro paradox' has recently occurred. The 'Great Myanmar Poverty Debate' serves to illustrate certain of the explanations for the paradox found in the broader literature and raises issues of its own.

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1 This paper has greatly benefitted from the input of Sten Backlund, Albert Berry, David Dapice, Rafael de Hoyos, Koji Kubo, Michael Lipton, Htun Htun Oo and Debbie Aung Din Taylor, to whom I am very grateful. All errors are my own

2 Major contributions include Ravallion (2010), Reddy and Pogge (2010), Bhalla (2010), Sala-i-Martin (2006).

3 The term is being used in a different sense than in the aid literature, where it refers to the coexistence of positive assessments of aid effectiveness at the project level but a lack of association between aid flows and growth at the national level (Mosley, 1986).

The paper makes two main contributions to the literature. First, it directs attention to an important issue, the 'micro-macro paradox', which has received relatively scant attention in debates about poverty trends[4]. Second, it is among the very few recent published works on poverty in Myanmar, a key policy issue (Myint, 2011), in a country of considerable general interest given recent political and economic reforms.

The format of the paper is as follows: Section 2 offers a number of potential explanations for the 'micro-macro paradox' from the empirical literature. Section 3 presents Myanmar's 'micro-macro paradox' and suggests a number of potential explanations for it. Section 4 concludes.

It is important to clarify at the outset my role in the Myanmar poverty studies. I was contracted by the United Nations Development Programme to draft three reports, the *Poverty Profile* (IHLCSPTU 2011a), *MDG Data Report* (IHLCSPTU 2011b) and *Poverty Dynamics Report* (IHLCSPTU 2011c), drawing on data from the Integrated Household Living Conditions Survey (IHLCS). I worked closely with staff at the IHLCS Project Technical Unit, who were responsible for data analysis and produced tables which I requested. I was not given direct access to the database and two subsequent official requests for data access have proved unsuccessful. As a consequence, the analysis of Myanmar's 'micro-macro paradox' is partial and based exclusively on published data. As discussed in Section 3, analysis of the IHLCS database would be required to probe in greater detail certain discrepant and anomalous results.

[4] Exceptions include Kanbur (2001 and 2010) and Stewart et al. (2007).

2. The 'Micro-Macro Paradox'[5]

There is a body of literature which has examined the relationship between data on income or consumption poverty from household surveys and information using dialogical methods, such as focus group discussions and semi-structured interviews, which ask about perceived levels of, or changes in, poverty or deprivation. The core conclusion of this empirical literature is that the research methods often generate different research results. The overlap between populations or characteristics or populations identified as 'poor' according to different methods has tended to be quite modest and not surprisingly, wide differences emerge in findings about levels of poverty or deprivation.[6] Further, discrepancies have been found with respect to poverty trends. Often, household survey data showing improvements in consumption or income poverty, or other welfare indicators, are at odds with people's perceptions of worsening poverty and deprivation.[7]

What accounts for these contrasting findings? Potential explanations include: i) different dimensions of poverty or deprivation; ii) different population coverage; iii) price adjustments; iv) sampling; v) intra-household issues; vi) visibility bias and vii) recall, nostalgia and other perceptual biases.

Different dimensions of poverty or deprivation

A number of issues fall under this first category of explanation. The most obvious in the literature is simply the fact that consumption poverty does not comprise everything deemed to be of value. Such omissions include the 'social wage', or the stream of benefits derived from public provisioning of health, education and so forth (Kanbur 2001, 2010; Moore et al., 1998). Other dimensions of poverty influencing well-being ranking results include independence and self-

5 This section is based on Shaffer (2013a).

6 Examples from this literature include: Scoones (1995), Bevan and Joireman (1997), Shaffer (1998), Christiaensen et al. (2001), Kanbur (2001 and 2010), McGee (2004), Place et al. (2007), Franco (2007), Saith (2007), Lu (2010, 2011) and Davis and Baulch (2011).

7 Examples include Jodha (1988), McGee (2004), Devereux and Sharp (2006), Wodon (2007) and Levine and Roberts (2008).

respect (Jodha, 1988), esteem and political influence (Scoones, 1995), fatigue and social standing (Shaffer, 1998), vulnerability and insecurity (Chambers 1995; Devereux and Sharp, 2006; Levine and Roberts, 2008), benefits associated with assets and wealth (Davis and Baulch, 2011), relative deprivation or inequality, and so forth. A related issue concerns 'welfare-reducing' consumption expenditure items, or 'consumption bads', which serve to inflate consumption expenditure, such as medical expenses, alcohol and other social vices (McGee, 2004). While it has been recommended that such items be removed from the consumption aggregate, (Deaton and Zaidi, 2002), it is not always standard practice to do so.

Population coverage (spatial and temporal)

Another potential explanation for discrepant results is simply that the populations differ in time or space (Devereux and Sharp, 2006). In a number of cases, data from nationally representative household surveys were compared with studies which were not designed to be statistically representative and which comprised a much smaller number of observations (Shaffer, 1998). This same point applies if the reference period for the comparison of trends differs as appears to be in the case in a number of studies (McGee, 2004; Wodon, 2007).

Price adjustments

It is often the case that price adjustments over time and space do not distinguish between the consumption basket of the poor and others. If the price of the former is rising faster than the latter, consumption increases among the poor will be inflated, and reductions in poverty overstated. The problem has bearing on consumption/income comparisons generally, and poverty comparisons, more specifically.

Sampling

Household surveys data may overstate improvements in consumption expenditure, and consequent declines in poverty, in certain cases. Two examples illustrate the point. First, if the sampling frame is not capturing recent rural to urban migrants, and poverty incidence among these households is higher than prior to migration, reductions in poverty will be overstated. There is some evidence of this in Vietnam (Pincus & Sender, 2008). Second, there is some evidence that inclusion among sampled communities may itself improve outcomes if increased public or donor resources are allotted to such areas to benefit from data access and/or to demonstrate positive developmental impacts. In other words, there is a certain endogeneity associated with the initial sample draw, in cases where the first-stage selection is maintained in subsequent rounds, which could undermine claims that findings are 'truly' representative. The argument has been made to explain the superior performance of communes sampled for Vietnam's Household Living Standard Surveys in 2004, 2006 and 2008, relative to other communes (Hansen & Le, 2013).

Intra-household issues

Consumption expenditure is collected at the level of the household and adjusted by the number of household members or adult equivalents. As such it can mask inequality in the household distribution of consumption, in particular along gender lines. While there are techniques to test for gender discrimination in household consumption (Deaton, 1997), these are at multiple removes from the simple poverty comparisons often undertaken. Accordingly, a worsening of intrahousehold distribution could explain perceptions of worsening conditions, especially for female respondents (McGee, 2004).

Visibility bias

In studies where people are asked about their perceptions of overall trends in poverty, and not changes in their own circumstances, an upward bias in poverty trends may be introduced if

poverty has become more visible to onlookers. Such enhanced visibility may occur for a number of reasons. First, in the context of positive rates of population growth, poverty incidence may indeed fall, yet the absolute number of poor persons increase (Kanbur, 2001 and 2010). The reason is simply because the overall number of persons has increased, not because poverty incidence is rising. Second, poverty may be more readily observable in urban settings due to the closer physical proximity of urban dwellers and the greater visibility of certain characteristics of urban poverty such as begging or street children (Wodon, 2007). In such situations, perceptions of increasing poverty incidence may simply be due to its increasing visibility.

Recall, nostalgia and other perceptual biases

Recall is used in fixed response household surveys, focus groups, semi-structured interviews and so on to collect specific information on consumption expenditure for example, or more general information on changes in overall living conditions. There is a large literature on the potential biases which may arise when using recall, along with the cognitive psychological processes generating them.[8] One form of bias, nostalgia for the past (Morewedge, 2012), is a potential explanation for the perception that poverty has increased, and living conditions have worsened, found in certain studies. Evidence consistent with this interpretation is provided by Dercon and Shapiro (2007, p. 108) drawing on self-reports of well-being status in the 1994 and 2004 rounds of a panel survey in Ethiopia. When asked in 2004 to recall their self-reported well-being status a decade earlier, 29% of households stated that they had been rich or very rich in 1994. In fact, only seven per cent of respondents categorized themselves as such in 1994, according to the 1994 survey data. A related bias concerns the focus on nominal prices changes over a limited set of goods rather than real changes in purchasing power, in the context of moderate or high inflation.

8 Surveys of this literature are found in Sudman et al. (1996) and Tourangeau et al. (2000).

It has been suggested that the preoccupation with nominal changes in the price of bus fares in Bogota, Columbia led to negative assessments of well-being trends over time.[9]

3. Myanmar's 'micro-macro paradox'

> *… the strong impressions gained from visits to many areas of Lower and Upper Myanmar extending over three years is that rural poverty has not declined much, if at all. The team has never observed the gains reported in the [Integrated Household Living Conditions Survey (IHLCS)] HHS. If the other areas of Myanmar did much better, this might help to explain the difference. But it is unlikely that this has been the case. The team did observe severe problems with food security, problems that were often not getting any better and the HHS reports the opposite. The findings cannot be reconciled (Dapice et al., 2011, p.3)*

A team associated with the ASH Center for Democratic Governance and Innovation at Harvard University's Kennedy School in collaboration with a NGO in Myanmar, International Development Enterprises (IDE)[10], conducted a series of studies in 2009 -2011 relying heavily on focus group discussions and semi-structured interviews, along with national level data, which suggested a significant fall in rural incomes in recent years in Myanmar. These analyses were widely consulted in the international donor community in Myanmar and became known as the 'Harvard Studies'. They presented a picture of rural immiseration involving negative price shocks for rural producers, declining productivity, lack of credit, growing indebtedness, increasing landlessness, falling opportunities for wages employment, dwindling assets and so forth. On the other hand, nationally representative household survey data from the Integrated Household Living Conditions Survey (IHLCS) suggested a decline in food poverty and total poverty between

9 I thank Albert Berry for this point.

10 IDE/Myanmar became a separate entity, Proximity Designs (www.proximitydesigns.org), with whom the Harvard ASH Institute team has subsequently collaborated.

2004/05 and 2009/10, increases in consumption expenditure and improvement in a number of proxies of poverty such as small asset ownership. As evidenced by the above quotation, there does indeed appear to be a 'micro-macro paradox' in Myanmar.[11]

The objective of this section is to determine to what extent there are plausible explanations for these apparently conflicting results. The discussion of potential reasons for the discrepant findings presented in section 3.4 is preceded by a summary of the main features of the IHLCS and 'Harvard Studies' in section 3.1, a presentation of 'headline' findings on poverty in section 3.2 and discussion of internal and external validity in section 3.3.

3.1 The Integrated Household Living Conditions Survey (IHLCS) and the 'Harvard Studies'

The IHLCS is a multi-topic, integrated household survey whose design closely mirrors that of the World Bank's Living Standard Measurement Survey (LSMS). It contains a detailed consumption module along with modules on education, literacy, health, nutrition, assets, labour and employment and so on. The same questionnaire was administered over the same time period in 2004/05 and 2009/10 to facilitate comparability between survey rounds. The IHLCS is nationally representative in the sense that sampling was done probabilistically and standard errors calculated for the statistics generated. The 2009/10 IHLCS also contained a 50% panel which allows for the tracking of flows of households into and out of poverty, and not simply the stock of poverty at two points in time.

The 'Harvard Studies' involved field visits of approximately 2 weeks each in 2009 and 2010 followed up by a trip in 2011. The core findings were presented in a series of reports authored by the team members (Dapice et al., 2009, 2010 and 2011). The methodology of the 2009 and 2010 field visits[12] has been described as follows by the authors:

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11 The two studies also differed with respect to trends in landlessness and debt, which are not probed in this article.

12 The methodology of the 2011 'update' visit was not reported.

> *The methodology included long, open-ended exchanges with traders and millers … and with farmers. Village visits with large groups of farmers typically broke up into discussions with smaller groups held during visits to various sites within their villages …In its discussion with millers, traders … IDE field staff; and with farmers, the research team focused above all on the rice marketing chain, on rice yields and prices, on the availability and cost of rural credit, on food security and indebtedness, on water scarcity and rural welfare. In essence, it asked the same questions of hundreds of people, and what it heard in response informs all of the findings reported and suggestions offered in the report (Dapice et al., 2010, pp. 8, 63).*

The site visits were conducted in townships in Myanmar's main rice growing Divisions including Ayeyarwady and Mandalay along with Sagaing, East Bago and West Bago.

3.2 'Headline' findings on poverty

Table 1 presents summary findings on trends in food poverty and poverty from the IHLCS data. Both poverty thresholds rely on consumption expenditure data which has been adjusted for differences in household composition, economies of scale in consumption and price differences. The poverty lines were calculated using the food share method which anchors the poverty thresholds on basic caloric intake. In the case of food poverty, the food consumption basket of a reference population group is adjusted and costed at a level which meets basic caloric intake needs. The poverty line simply adds an allowance for non-food expenditure based on the non-food share in consumption of the reference population group. Poverty levels are presented using the industry standard Foster-Greer Thorbecke (FGT) class of poverty indices, which measure poverty incidence (P0), poverty intensity (P1), or the average shortfall from the poverty line, and

poverty severity (P2) which assigns more weight to higher poverty shortfalls (by convention, the poverty shortfall is squared).[13]

INSERT TABLE 1 HERE

The IHLCS data in Table 1 suggest that food poverty has been halved between 2004/05 and 2009/10 from 9.6% to 4.8% while poverty incidence has fallen from around 32% to 26%. Both of these differences are statistically significant. In fact, all poverty measures reveal statistically significant declines over the time period in question with the exception of the severity of food poverty. The first 'headline' finding from the IHLCS dataset is a reduction in consumption poverty between 2004/05 and 2009/10.

Table 2 further probes this result by presenting data on consumption expenditure and a number of poverty 'proxies' for the bottom three deciles of the consumption distribution. Poverty proxies are variables which should trend in the same direction as consumption poverty. The consumption expenditure data reveal statistically significant gains among the bottom three deciles of between seven and 14 per cent. Smaller positive gains were found in caloric intake, which are statistically significant for the bottom decile. In addition, there has been a large and statistically significant increase in the percentage of households owning TVs and radios for all three deciles[14], an important finding given that measurement error is less severe for questions about asset ownership. On the other hand, the food share in consumption, or the Engel's Curve, has increased among the top three deciles in statistically significant fashion (see Section 3.3 below for further discussion). To summarize, data on consumption expenditure and various poverty proxies are broadly consistent with a fall in consumption poverty with the exception of results on the increasing food share in consumption.

INSERT TABLE 2 HERE

[13] The details are presented in a *Technical Report* (IHLCSPTU 2011e) accompanying the *Poverty Profile.*

[14] Trends in bicycle ownership were not statistically significant, though increases in motorcycle ownership were large and statistically significant (IHLCSPTU, 2011a, pp. 19, 108)

As discussed above, the dialogical techniques used in the 'Harvard Studies', including focus group discussions and semi-structured interviews, painted a picture of rural immiseration. The language in the reports is strong, warning of an "incipient social crisis" (Dapice et al., 2010, p. 10) and the potential for a "humanitarian crisis rivaling Nargis in its destructiveness" (Dapice et al., 2009, p.15). At least six processes of impoverishment were identified including falling farm-gate prices for paddy, which is the main producer crop in Myanmar, along with increasing costs of inputs, declining productivity of paddy cultivation due to decreased use of fertilizer and labour-intensive weeding and transplanting, increasing indebtedness, declining access to credit, and falling rural employment opportunities. National level data were presented on trends in rice production and real paddy prices to support the claims made in the field studies, and to serve as the basis for their generalization over a wider population. Tables 3 and 4 reproduce these data.

Table 3 shows a very dramatic decline in the real price of paddy which has almost halved between 2005/06 and 2009/10. The price data in question are referred to as 'local prices' in the 2011 report (Dapice et al., 2010, p. 12), but refer to wholesale prices, as clarified in a later publication (Dapice 2012, p. 6, note 2). Table 4 reveals trends in milled rice production per capita drawing on estimates from the Food and Agricultural Organization (FAO) and the US Department of Agriculture (USDA). The authors favour the USDA dataset on grounds, *inter alia*, that the estimation methodology is more sound (see note 28). The USDA data do show declining rice production/capita over the decade (see discussion in Section 3.4 below). The FAO data, on the other hand, suggest an increase of around 22% over the decade. In summary, the dialogically generated narrative of rural impoverishment in the 'Harvard Studies' appears to be consistent with national level data on wholesale paddy prices and USDA data on rice production per capita for the decade as a whole (2000-2009).

INSERT TABLES 3 AND 4 HERE

3.3 Internal and external validity

In its present usage, internal validity concerns whether or not results may be deemed trustworthy while external validity is about extrapolating or generalizing results over a larger population. The two main sets of issues, discussed in turn below, relate to methodological design and implementation and anomalous findings.

Methodological design and implementation

All major data collection exercises, including large fixed-response household surveys, contain errors. There are indeed examples in the empirical literature where methodological flaws call into question the validity of particular surveys and/or their comparability over time.[15] The key question, in the present case, is whether design or implementation flaws could have led to biases in IHLCS results. A detailed assessment of the quality of the IHLCS, conducted by a Statistics Sweden advisor with extensive household survey experience, did not come to this conclusion (ICLCSPTU, 2011d). On the contrary, it found that 'all main quality indicators have been addressed in the best possible way, from sample accuracy to controlling for bias from coverage errors, and to editing and cleaning' (Backlund 2010a). More specifically, the detailed *Quality Assessment* gave the IHLCS very high marks in dealing with potential errors related to sampling, incomplete coverage, respondent and interviewer effects, non-responses, outliers, imputations and comparability with the IHLCS 2004/05 (IHLCSPTU, 2011d).

The favourable assessment is due, in part, to the fact that steps were taken to ensure high data quality. At the level of data collection, consistency checks were performed by on-site supervisors to detect anomalous results and reduce measurement error. Field enumerators attended multiple training sessions and were recruited locally to bridge cultural or linguistic barriers with respondents. Data entry and cleaning were supported by technical staff from the World Bank while the sampling strategy was designed by Statistics Sweden. Analysis was

15 For evidence from sub-Saharan Africa, see Sahn and Younger (2010).

undertaken by the IHLCS technical unit, housed at the United Nations Development Program, with specialized training in analysis of poverty and related issues.

In terms of external validity, one point to note is that a number of townships representing approximately 5% of the population of Myanmar were excluded from both the 2004/05 and 2009/10 IHLCSes due to inaccessibility. Even if poverty had increased appreciably in these areas it could not have had a large effect on national poverty estimates because of their small population size. For example, a 20% increase in poverty in these areas would translate into a 1% increase in poverty nationally.

To sum up, by comparative standards, the methodology of the IHCLS appears to be of high quality. While there is undoubtedly error in the ensuing data, there are not obvious reasons to suggest systematic bias in results *based on* the assessment of the methodological design and implementation of the household surveys.

The methodological design and implementation of the 'Harvard Studies' does raise a number of issues. This assessment is based on the above published account of the methodology along with email exchanges with one team member and the former Country Director of IDE/Myanmar, which organized the site visits. There are at least three points which, *prima facie*, are potential cause for concern with respect to internal validity.[16]

First, the sites visits were of very short duration, apparently involving a few hours of discussion per site, over a limited time period of around two weeks in 2009 and 2010 each. The authors note this limitation in the context of their discussion of gender issues. They refer to 'the team's hesitation to presume to understand, on the basis of very short visit and group interviews, gender dynamics within rural households' (Dapice et al., 2010, p.8). It is not implausible that these same concerns would apply more broadly.[17]

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16 Some of these points are echoed in Backlund (2010b).

17 The site visits included other activities such as inspection of rice stocks within households. Further, study results also drew on the knowledge of IDE staff who were well-informed of local conditions, including rice yields and local labour demand.

Second, it is unclear how, or if, the team dealt with the potential problem of strategic reporting. Study participants may have had incentives to depict conditions in an excessively negative light to (continue to) benefit from the support of the IDE. It has been suggested that accounts of dramatic falls in rice production and paddy prices must be interpreted in the larger context of policy debates, and associated lobby efforts, in favour of direct support to rice producers.[18] The authors are aware of strategic reporting in discussing data collection in Myanmar, in general: 'most participants [in the economy] have an incentive not to tell the truth. State agencies appear to report good news upwards … private actors … have incentives to reveal as little as possible' (Dapice et al., 2010, p.7). The same potential problem, however, may apply to the 'Harvard Studies'.

Third, in all dialogical inquiry, issues arise with respect to the role of the facilitator/interviewer. The phrasing of 'lead-off' questions, the nature of subsequent probing, the filtering and interpretation of results very much depends on who is conducting the exercise. There is no way of eliminating the influence of facilitators on dialogical results but there are techniques to reduce 'undue' influence leading to biases. For examples, detailed focus group discussion and semi-structure guidelines may be produced, with detailed subsequent probes, to detect 'leading' questions, ensure their local relevance, and impose greater structure on the dialogue to facilitate comparability across sites. In addition, results should be transcribed in full, findings coded and analysed by multiple team members, to enhance the validity of interpretation. It does not appear that such techniques were used in the 'Harvard Studies', which seem to have been a series of more informal discussions accompanied by note-taking.

In terms of external validity, the selection criteria for the research sites and the participants in focus group discussions and semi-structured interviews were unclear in the published reports. Apparently, efforts were undertaken to ensure the representation of 'best' and

[18] I thank Koji Kubo for this point.

'worst' villages, and a 'random' selection of farmers,[19] though the exact methodology was not spelt out. Accordingly, it is unclear to what extent results may be extrapolated to a broader population. At times, the authors urge caution in such generalization (Dapice et al., 2011, p.13). Yet, elsewhere they imply that their findings are indeed generalizable. For example, after describing 'grim and desperate' conditions in the Dry Zone, they argue that 'the findings and suggestions offered with specific reference to the Dry Zone in this report out to be read with this belief that they are rather more generally applicable' (Dapice et al., 2010, p. 11). The question of the extrapolation of study results in taken up in Section 3.4, which re-examines, *inter alia*, the national level data presented in the 'Harvard Studies' in support of the small *n* narrative information. Suffice it to say that, *absent national level data*, the basis for the extrapolation of the small *n* results is not evident based on the methodology of the studies.

In summary, the methodological design and implementation of the 'Harvard Studies' does raise a number of 'red flags' which potential bearing on the internal and external validity of results. At the very least, such concerns raise questions about the magnitude of reported declines in income and the legitimacy of extrapolating results beyond the study sites.

Anomalous findings

There were at least two anomalous findings in the IHLCS data, which raise questions about the poverty data. The first, discussed in Section 3.2 above, concerned the rising food share in consumption amongst the lowest three deciles between 2004/05 and 2009/10.[20] This increase is inconsistent with Engel's Law, which maintains that food shares in consumption should fall as consumption or income rises. The puzzling result led us to urge caution in the interpretation of results on poverty trends, in particular the magnitude of the apparent decline (IHLCSPTU, 2011a,

19 Personal correspondence of September 7, 2013 with Debbie Aung Din Taylor, formerly IDE/Myanmar Country Director.

20 A second anomaly not probed in this article, is that the Engel's curves are very flat for both years, falling rapidly only at the upper end of the consumption distribution.

pp. 19, 103). Likewise, the 'Harvard Study' team argued that 'it would make no sense for the share of income spent on food to rise, as it did, if poverty were falling. For it is widely held that higher real incomes lead to lower shares of total consumption consisting of food' (Dapice et al., 2011, p. 3).

There is a great deal of empirical support for the Engel's Law when considering the population as a whole (Anker, 2011). A less remarked fact in the literature is that Engel's Law does not systematically hold at the bottom end of the income or consumption distribution. In his review of the early empirical literature, Lipton (1983; 1988, p. 13) held the Engel's Law 'does not hold for the poorest 5-15 per cent in low-income countries and regions' given unmet food demands of the very poor. Similarly, a recent paper drawing on the World Bank's Global Income Distribution Dynamics (GIDD) dataset, found the above relationship to be positive at low levels of per capita consumption expenditure (de Hoyos, 2010).[21] The lead author concluded that the apparent anomaly was actually an empirical regularity in the GIDD data.[22] A number of potential reasons have been offered for this finding including increasing food demands as household composition changes or malnutrition recedes, and substitution of more expensive food with lower caloric value per unit price.[23] Access to the IHLCS dataset would allow further investigation of these issues. While the issue remains to be conclusively settled in Myanmar, one glaring anomaly in the IHLCS results does not appear as anomalous as originally thought.

The second main anomaly concerns the levels of caloric intake for both IHLCS rounds.[24] Overall, levels of caloric intake in 2004/5 and 2009/10 were found to be 3441 and 3405 calories per adult equivalent per day. In per capita terms, the comparable figure is approximately 3000

21 Anker's (2011) did *not* come to this conclusion, though he relied on household budget surveys from national statistical organizations which do not contain the same detailed consumption modules as does the GIDD database.

22 Personal correspondence with Rafael de Hoyos, July 23, 2013.

23 I thank Michael Lipton for these points.

24 I thank David Dapice and Debbie Aung Din Taylor for this point.

calories per day for both years.[25] This figure is unbelievably high as comparable survey- based estimates of caloric intake in Asia range from around 2100 to 2500 (Smith & Subandoro, 2007, p. 77). As noted in Table 2 above, relatively high levels of caloric intake were equally found in the bottom three deciles of the consumption distribution. Such data strongly suggest that poverty incidence levels have been underestimated in both rounds of the IHLCS. It is not obvious however, that this 'levels' bias affects the trend estimates which are the focus of this article. Better understanding of the reasons for the very high caloric intake figures would be required to address the possibility of a 'trends' bias.[26]

3.4 Explaining Myanmar's 'micro-macro paradox'

Of the explanations for the 'micro-macro paradox' found in the broader literature discussed in Section 2, three appear, *prima facie*, relevant in the present context, namely: i) different dimensions of well-being; ii) different population coverage and; iii) price adjustments. Certain issues did not figure directly in the Myanmar debate, such as intra-household biases, and/or cannot be further probed on the basis of existing data, such as various perceptual and recall biases. Other issues were unlikely, *prima facie*, to have high relevance such as Kanbur's (2001, 2010) variant of visibility bias discussed above, given quite low rates of population growth of around 1%/annum (see discussion below).

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[25] The adult equivalent scales used in the IHLCS assigned values of 0.9 for adult females and 0.7 for children aged 0 to14 years (relative to adult males) (IHLCSPTU, 2011e). Population data used to convert the adult equivalent figures in per capita terms are based on age structure estimates for 2005 and 2010 found in the UNDESA's *World Population Prospects* (UNDESA, 2012).

[26] It has been suggested that the IHLCS data were manipulated, though it is not evident how this would have been possible given tight supervision of the data by international personnel (an onsite World Bank expert supervised data processing in the initial stages). Further, if data were manipulated in the same way in both rounds, it would not affect the trend estimates. Nevertheless, such a possibility cannot be ruled out.

Different dimensions of well-being

The first point to emphasize is that the IHLCS results were based on consumption expenditure while the 'Harvard Studies' focused on income. At times, there is a tendency on the part of the authors of the 'Harvard Studies' to conflate the two, as for example, when they argue that their findings are 'hard to square with the substantial ***income*** [my emphasis] gains for the rural poor that the Household Survey [IHLCS] reports' (Dapice et al., 2011, p. 4). The key question is whether or not there are forces which could drive a wedge between trends in consumption expenditure and primary income, or income generated directly from employment, production and exchange. There are at least three possibilities.

First, direct transfers could have increased, offsetting declines in income and smoothing consumption expenditure. Dapice et al., (2011, p. 3), suggest the possibility of increased remittance flows as a partial explanation for the conflicting results. It is unlikely, however, that remittance income increased over the period in question in that economic growth fell in many South-East Asian countries hosting migrants from Myanmar following the financial crisis in 2007-08, adversely affecting remittances. Table 5 provides an estimate of such remittance flows to Myanmar drawing on the World Bank's Remittances database (World Bank, 2013a). Real figures have been deflated using the IMF's estimates of Myanmar's consumer price index (IMF, 2013), which is further discussed in Section (ii) below. According to these data, for the period 2004/05 to 2009/10 remittances fell by around $US 39 million in nominal terms and $US 84 million in real terms. While these data do not take into account informal transfers, it is hard to believe that they would overturn these results.[27]

INSERT TABLE 5 HERE

A second potential wedge between consumption expenditure and income could occur if households draw down on assets to finance current consumption. As discussed in Section 3.2 above, the 'Harvard Studies' found evidence of such asset sales including land. The IHLCS data

[27] The methodology for the estimation of the World Bank's remittance data is explained in Ratha (2003).

presented in Section 3.2, on the other hand, found increasing holdings of small assets such as TVs and radios. The surveys did find increasing rates of landlessness for the poor, from around 32% to 34%, though this change was not statistically significant. Overall, these data do not suggest large asset sales which could have permitted consumption smoothing in the context of declining primary income.

A final possibility is that home consumption among rural producers increased markedly. In the context of declining farm-gate prices, or high consumer inflation, farmers may retreat from the market economy and increase production for own use. Such home consumption is valued at retail prices which could be interpreted as inflating 'true' consumption expenditure as it reflects a statistical imputation. Access to the IHLCS database would be required to further investigate this possibility.

Population coverage

There are at least four potential ways that different population coverage may provide an explanation of the conflicting results from the IHLCS surveys and the 'Harvard Studies'. The populations covered in the two research studies may differ by: i) functional/occupational group; ii) spatial/geographical location; iii) time period and/or iv) position within the poverty transition matrix.

In terms of functional/occupational group, the 'Harvard Studies' results drew heavily on their discussion with farmers. Perhaps, poverty increased among rural producers and fell among other occupation groups, accounting for the discrepant results. Alternatively, the population share of rural producers may have fallen, due to the structural transformation of the economy, for example, lifting new urban migrants out of poverty. Table 6 investigates these possibilities by providing data on the poverty and population shares of different occupational groups (by industrial classification). The core finding is that there has been a decline in the poverty contribution of in agricultural/hunting/forestry which mirrors the fall in overall poverty. Further,

the population share of this grouping has stayed constant at around 50%. Accordingly, it does not appear that different functional/occupational populations account for the contrasting results.

INSERT TABLE 6 HERE

A second possibility concerns different spatial or geographical populations. The 'Harvard Studies' were limited to Townships in five Divisions, namely Mandalay, Ayeyarwady, Sagaing, East Bago and West Bago. In the 2010 study, 8 of 21 townships visited were in Ayeyarwady (Dapice et al., 2010, p. 64). Perhaps, consumption poverty increased in the areas visited but not elsewhere. Table 7 addresses this issue by presenting data on poverty trends disaggregated by Division. It is noteworthy that total and rural poverty increased in Ayeyarwady while falling in the other areas (though high standard errors raise caution about this trend result). In addition, Ayeyarwady Division is the largest contributing region to national poverty at around 19%. A partial explanation for the 'micro-macro paradox' may be that the 'Harvard Studies' findings were based on results from townships in the Ayeyarwady Delta where poverty increased. Obviously, this explanation does not apply to findings from other broad Divisions, though potentially to specific Townships within these Divisions which may have experienced increasing poverty.

INSERT TABLE 7 HERE

A third potential explanation concerns populations at different time periods. The reference periods in the IHLCSes are 2004/05 and 2009/10. The dialogical studies did not appear to have this exact temporal period in mind. In some cases, the reference period is much broader as in the finding that, 'the current situation is the worst they could ever recall' (Dapice, 2009, p. 51). More generally, the focus group discussions and interviews were not intended to be comparable to the IHLCS time series, so there was no particular reason to ask about changes from 2004/05.

The national level data adduced in support of the dialogical results, on the other hand, does, in principle, allow for consistent temporal comparisons. The two main sources of

information are data on trends in rice production and paddy prices. According to the authors: 'the team believes that per capita rice production in Myanmar dropped from ***2005/6*** [my emphasis] to 2009/10 and also that the price of paddy and of many pluses fell by half in real terms' (Dapice et al, 2011, 3).

There is an immediate problem in that the start date in the reference period should be 2004/05, not 2005/06, to be comparable with the IHLCS series. This difference is important as it overturns the key finding of the 'Harvard Studies' on rice production. Table 8 re-examines the data of rice production per capita presented in Table 4 above. I examine only estimates of the United States Department of Agriculture (USDA) which the Harvard team favours, as the FAO data do not show falling output/capita from either 2004/05 or 2005/06.[28] Data are drawn from the USDA's online Production, Supply and Distribution (PSD) database (USDA/FAS 2013) revised upward from the data reported by the 'Harvard Study' in 2009. Data on annual population growth rates are from the United States Census Bureau (USCB) of around one per cent reported in Table 4, and the World Bank's World Development Indicators of 0.8%. There are two points to note. First, data from the 2010 'Harvard Study' do indeed show falling output per capita from 2005/06 to 2009/10 but *not* from 2004/05 to 2009/10. Second, the upwardly revised USDA estimates using the USCB and World Bank population growth indicators show increasing production per capita of between 15 and 17% over the time period 2004/05 and 2009/10. In summary, the USDA's 'lower bound' estimate of milled rice production show increasing, not decreasing, trends over the comparable time periods as the IHLCSes.

INSERT TABLE 8 HERE

[28] I skirt the debate about the relative merits of the FAO and USDA data. It should be noted that there is a great deal of 'back of the envelope' estimation involved in both. In fact, the USDA warns of 'greater subjectivity' in its estimates of foreign production though argues that validity is enhanced by the use of a wide range of information sources 'beginning with its agricultural attaches located at U.S. embassies abroad' (USDA, 1999, pp. 9, 14). Given the absence of this source of information in Myanmar, the caution about 'subjectivity' is doubly germane.

The second piece of national level evidence presented in support of the 'Harvard Studies' concerns trends in real wholesale paddy prices which apparently experienced an 'astonishing plunge' (Dapice et al., 2011, p. 13) between 2005 and 2010 (see Table 3 above). Table 9 presents additional data on this issue. As discussed in Section 3.2 above, The 'Harvard Study' used wholesale price data from a Ministry of Agriculture and Irrigation (MoAI) publication entitled *Myanmar Agriculture at a Glance*. In Myanmar, the two most widely consulted sources on wholesale paddy prices[29], are the Central Statistical Office's (CSO) *Statistical Yearbooks*, as well as the Market Information Service (MIS) Bulletins of the Department of Agricultural Planning, MoAI.[30] Another important point to note is that the most appropriate reference period for the comparison with the IHLCS data is 2004 and 2009. The reason is that both the 2004/05 and 2009/10 IHLCSes were administered in December/January and May. The former period follows the harvest of the monsoon paddy which accounts for around 80% of total rice production, while the latter period follow the summer paddy which accounts for the remaining 20% (FAO/WFP 2009, p.17). The price deflator is the Consumer Price Index from the IMF's World Economic Outlook Indicators rather than the official CPI which lacks consistency due to a methodological change in 2009.[31] The key finding is that both of these price data show increasing, not decreasing, real wholesale prices of between 19 and 30% between 2004 and 2009, though falling prices over the (incorrect) time period used in the 'Harvard Studies' of 2005/06 to 2009/10.

INSERT TABLE 9 HERE

To summarize, data from the two most widely consulted informational sources in Myanmar show higher, not lower, real wholesale paddy prices in 2009 than in 2004. There are

29 I thank Koji Kubo for this information.

30 A shortcoming of the MIS series is that it appears to lack consistency following Cyclone Nargis in 2008 (personal correspondence with Koji Kubo, August 21, 2013).

31 As the official series likely underestimates inflation, the data presented in Dapice et al. (2010) actually understates the fall in real prices.

two main caveats however, to note about this results. First, national data on farm-gate, rather than wholesale, prices would provide a more accurate assessment of the situation facing producers in the absence of evidence that they trend in the same direction. Second, a more complete account of the situation facing rural producers would require, *inter alia*, an assessment of changes in relative prices of both inputs and outputs. Here there is some evidence of increasing costs of production associated with rises in the price of imported chemical fertilizer (Kubo, 2013a and 2013b). Nevertheless, the data presented in Table 9 do raise questions about the 'astonishing plunge' in real wholesale prices of paddy reported in the 'Harvard Studies'.

The final point about population coverage concerns groups within the poverty transition matrix. As discussed in Section 3.1 above, the 2009/10 contained a 50% panel which allows one to track specific households and distinguish between those who entered into and escaped from poverty, along with those who stayed poor or non-poor. Table 10 presents preliminary results of this transition matrix. The main caveat is that they data have not been adjusted to account for measurement error which will likely bias upwards estimates of poverty transitions (Deaton, 1997). Nevertheless, the important finding is that even in the context of falling overall poverty, descents into poverty account for non-negligible population shares in the Divisions visited by the 'Harvard Study'. It is not inconceivable that the experiences of such populations were reflected in study results.

INSERT TABLE 10 HERE

Price adjustments

In the broader literature on poverty measurement, some of the controversies about poverty trends stems from the fact that, as above, the price deflator is not based on the consumption basket of the poor (Anand et al., 2010). If price inflation is higher among the poor than among the general population, real income or consumption gains of the poor will be overstated. An analogous

situation appears to have arisen in Myanmar with potential bearing on both trends in poverty incidence and consumption expenditure.

With respect to poverty incidence, the poverty line was calculated using the food share method.[32] In this approach, the food basket used to estimate caloric intake for the food poverty line[33], and the non-food share in consumption, used to calculate the full poverty line, are based on the consumption patterns of a reference population. In Myanmar, the reference population was the second quartile of the consumption distribution.

Table 11 presents data on trends in food expenditure per calorie for different population groups based on published data from the Poverty Profile. A more complete analysis would require access to the IHLCS database. The population groups selected are the bottom and bottom threes deciles, which broader correspond to the 2004/05 total of those in food poverty and total poverty, respectively. Data are also presented for the second quintile of the population, which roughly corresponds to the reference population, as data are not disaggregated by quartile in the published reports. Food price inflation is approximated by changes in food expenditure per calorie presented in the bottom row. The important finding is that the cost of calories has risen at a faster rate for the food poor (13%) and the total poor (10%), than for the reference population (7%). This implies that there is a case for raising the 2009/10 poverty line to be 'truly' comparable in 2004/05 and 2009/10. Such an adjustment would undoubtedly affect trend estimates of poverty, though it is unclear to what extent, as this would require knowledge of the distribution below the poverty line. It also implies that some of the real gains in consumption expenditure at the lower end presented in Table 2 are overstated, given the heavy weighting of food expenditure in total expenditure.[34]

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32 For details, see, for example, Ravallion (1994).

33 The caloric intake is scaled up or down to the level of basic nutritional needs. In Myanmar, caloric intake norms, which differed by gender, location and age, were set at 2800 calories/day for adult males in rural areas (IHLCSPTUe, 2010, p. 52).

34 With access to the IHLCS database, this 'index number problem' could be further investigated by creating price deflators specific to the consumption bundles of the food poor and total poor.

INSERT TABLE 11 HERE

4. Conclusion

What then, to make of the 'micro-macro paradox' in Myanmar? Baldy stated, the conflicting results are closer than they appear at first sight. It is likely that the 'Harvard Studies' overstated the extent of declines in rural income and the IHLCS overstated the decline in consumption poverty and probably, the increase in consumption expenditure. Furthermore, the two studies are not directly comparable as they referred to different spatial and temporal population groups.

More specifically, the view that the 'Harvard Studies' overstated falling rural incomes is based on: i) the short time duration of the dialogical studies, the rather 'informal' methods used, along with the potential of strategic reporting by focus group discussion participants which raise questions about the magnitude of purported income falls; ii) national level data showing increasing rice production per capita from 2004/05 to 2009/10; iii) national level data on wholesale paddy prices showing higher real prices in 2009 than 2004. The view that the IHLCSes may have overestimated the decline in poverty, and increase in consumption expenditure, is due to the fact that food prices appear to have increased more rapidly among the poor than other population groups including the reference population used to calculate the poverty line.

The claim that the population groups used in the two studies were not strictly comparable rests on the following considerations: i) the selection criteria used in the 'Harvard Studies' for focus group discussion participants and study sites was not spelt out and the small *n* study is not statistically representative of a broader population as was the IHLCS (in the sense that standard errors could be calculated for the statistics generated); ii) according to the IHLCS, consumption poverty actually increased in Ayeyarwady Division, which represented around 40% of the townships covered in the 'Harvard Studies' in 2010; iii) the reference period in the dialogical studies was different than in the IHLCSes, which involved comparisons between populations in 2004/05 and 2009/10; iv) the initial time period in the 'Harvard Studies' for national level data on

rice production was erroneously set at 2005/06 rather 2004/05, an error which explains the different trend results; v) the most widely used data in Myanmar on trends in real wholesale paddy prices show higher prices in 2009 than 2004, though negative trends if the incorrect initial period of 2005/06 is used; vi) data on the dynamics of poverty reveal a significant number of descents into poverty, despite the overall reduction, which may have been disproportionately reflected in the small *n* studies.

Myanmar's 'Great Poverty Debate' is far from resolved. Conflicting results remain, such as evidence of price squeezes on farmers due to increasing input prices on the one hand, yet evidence of improvements across a range of poverty proxies, including small asset ownership, on the other hand. Additional analysis, and greater data availability, are necessary to fully unravel the mystery of the 'micro-macro paradox' in the Union of Myanmar.

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Tables

Table 1 Poverty Trends, Household Survey Data

	2004/05	2009/10	Mean Difference	Confidence Interval (95%)		*p* value
Food Poverty[a]						
Incidence (P0)	9.6	4.8	4.8	3.4	6.2	0.000
Intensity (P1)	1.3	0.6	0.7	0.5	1.0	0.000
Severity (P2)	0.3	0.1	0.2	-0.2	0.6	0.276
Poverty[a]						
Incidence (P0)	32.1	25.6	6.5	3.0	10.0	0.000
Intensity (P1)	6.4	4.1	2.3	1.5	3.1	0.000
Severity (P2)	7.0	1.0	6.0	5.8	6.2	0.000

[a]FGT Values*100
Source: IHLCS 2004/05 and 2009/10 (Reported in IHLCSPTU 2011a)

Table 2 Trends in Consumption Expenditure and Poverty Proxies, Household Survey Data

	2004/05	2009/10	Mean Difference	Confidence Interval (95%)		*p* value
Consumption Exp[a]						
Decile 1	248	281	33.7	30.9	36.4	0.000
Decile 2	320	349	29.3	28.4	30.2	0.000
Decile 3	366	391	25.0	24.1	25.8	0.000
Caloric Intake[b]						
Decile 1	2577	2656	79.0	14.0	144.0	0.000
Decile 2	2992	3015	23.0	-42.2	88.2	0.490
Decile 3	3142	3181	19.0	-55.5	93.5	0.617
Food Share						
Decile 1	72.4	74.1	1.7	0.28	3.11	0.019
Decile 2	72.0	73.4	1.4	0.08	2.7	0.038
Decile 3	71.6	73.3	1.7	0.55	2.85	0.004
TV Ownership[c]						
Decile 1	6.9	15.3	8.4	5.4	11.4	0.000
Decile 2	9.6	20.2	10.7	7.0	14.3	0.000
Decile 3	13.0	25.0	12.0	7.6	16.3	0.000
Radio Ownership[c]						
Decile 1	14.2	23.6	9.4	5.2	13.6	0.000
Decile 2	17.9	29.2	11.3	7.3	15.2	0.000
Decile 3	19.9	36.0	16.1	11.7	20.5	0.000

[a]December 2009 Kyats ('000)
[b]Daily caloric intake per adult equivalent
[c]Percentage of households
Source: IHLCS 2004/05 and 2009/10 (Reported in IHLCSPTU 2011a)

Table 3 Trends in Wholesale Paddy Prices ('Harvard Study')

	2005-06	2006-07	2007-08	2008-09	2009-10
Paddy Price[a]	203.9	230.5	234.8	242.3	249.9
Union CPI (%)[b]	103	130	173	209	212
Real Paddy Price	198.0	177.3	135.7	116.0	117.9

[a] Ministry of Agriculture and Irrigation, *Myanmar Agriculture at a Glance 2010*
[b] Central Statistical Office, *Selected Monthly Economic Indicators*
Source: Dapice et al., 2011, 13

Table 4 Milled Rice Output ('Harvard Study')

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
FAO Output[a]	12.4	12.7	12.6	13.4	14.4	16.1	17.9	18.3	17.7	18.0
USDA Output[a]	10.8	10.4	10.8	10.7	9.6	10.4	10.6	10.7	10.15	10.6
FAO Output/cap[b]	248	249	241	252	265	291	317	318	303	303
USDA Output/cap[b]	228	217	222	217	192	206	207	207	205	201

[a] Million metric tons
[b] Kilograms per person, per year.
Source: Dapice et al., 2010, 15.

Table 5 Remittance flows to Myanmar ($US Millions)

	2004	2005	2006	2007	2008	2009	2010	2004/05	2009/10	Change 2004/5 - 2009/10 (%)
Nominal	117	129	115	81	55	54	115	123	85	-39
Real	117	116	82	44	24	22	43	117	33	-84

Source: World Bank (2013a)

Table 6 Poverty and Population Shares of Occupational Groups

	Poverty			Population		
	2010	2005	Change	2010	2005	Change
Agriculture, hunting and forestry	54.2	58.9	-4.7	50.2	50.2	0
Fishing	3.4	3.2	0.2	2.2	2.8	-0.6
Mining and quarrying	1.7	1.4	0.3	1.6	1.2	0.4
Manufacturing	6.3	7.1	-0.8	5.9	7.4	-1.5
Electricity, gas and water supply	0.5	0.1	0.4	0.5	0.3	0.2
Construction	4.6	2.8	1.8	4	2.7	1.3
Wholesale/retail trade and repairs	7	7.9	-0.9	10.5	11.6	-1.1
Hotels and restaurants	1.3	0.6	0.7	1.3	0.9	0.4
Transport, storage and communications	2.8	2.6	0.2	3.8	3.3	0.5
Financial intermediation	0.1	0.1	0	0.2	0.2	0
Real estate, renting and business activities	5.1	4.2	0.9	7.1	5.8	1.3
Public administration, defines, social security	0.6	1.2	-0.6	1.3	2	-0.7
Education	1	1.2	-0.2	2.7	2	0.7
Health and social work	0.4	5.2	-4.8	0.7	5.6	-4.9
Private HH as employers & undifferentiated production activities	10.8	3.1	7.7	7.9	3.1	4.8
Extra-territorial organizations and bodies	0.1	0	0.1	0.1	0.2	-0.1
Total	100	100		100	100	

Source: IHLCS 2004/05 and 2009/10 (Reported in IHLCSPTU 2011a)

Table 7 Poverty Trends by Division
(Standard Errors in Parentheses)

	Rural		Total		
	2005	2010	2005	2010	National Poverty Share (%) 2010
Sagaing	27.4	14.9	26.6	15.1	6.1
	(4.58)	(1.43)	(3.88)	(1.49)	(0.54)
Bago	31.8	18.2	31.6	18.3	7.2
	(4.99)	(2.13)	(4.95)	(2.00)	(0.71)
- Bago (E)	30.2	20.1	30.9	20.2	4.4
	(6.73)	(4.03)	(7.00)	(3.57)	(0.65)
- Bago (W)	33.8	15.9	32.6	15.9	2.8
	(7.13)	(0.62)	(6.74)	(1.07)	(0.17)
Mandalay	44.7	31.6	38.9	26.6	15.0
	(5.27)	(7.25)	(4.07)	(5.77)	(2.66)
Ayeyarwady	30.3	33.9	29.3	32.2	18.6
	(2.49)	(2.87)	(1.91)	(2.94)	(2.23)
UNION	35.8	29.2	32.1	25.6	100
	(1.90)	(1.55)	(1.67)	(1.36)	

Source: IHLCS 2004/05 & 2009/10 (Reported in IHLCSPTU 2011a)

Table 8 Trends in Milled Rice Production, 2004/05 to 2009/10

	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2004/05 – 2009/10 Change (%)
USDA (2010 'Harvard Study')[a]	9.6	10.4	10.6	10.7	10.75	10.6	
USDA (2013 Update)[b]	9.6	10.4	10.6	11.8	11.2	11.6	
USDA Output/cap. (Dapice et al., 2010)	192	206	207	207	205	201	5
USDA Output/cap. (2013 Update, USCB Pop. Growth)	191	206	207	229	214	220	15
USDA Output/cap. (2013 Update, WB Pop. Growth)	191	207	209	231	217	224	17

Source: [a] Dapice et al. (2010); [b] USDA/FAS (2013);

Table 9 Trends in Wholesale Paddy Prices, (2004-2010)

	2004	2005	2006	2007	2008	2009	2010	2004-09 Change (%)	2005/6-2009/10 Change (%)
Nominal[a] Price (CSO)	5032	6596	10326	12884	14082	16146	14900		
Nominal[b] Price (MoAI)	4068	5568	9049	11372	14275	11957	13089		
CSI Index (IMF)[c]	100	111	140	186	228	246	267		
Real Price (CSO)	5032	5942	7376	6927	6176	6563	5581	30	-11
Real Price (MoAI)	4068	5016	6464	6114	6261	4861	4902	19	-7.5

[a] *Emata*, 35% broken, kyats/50KG bag, Yangon.
[b] *Emata*, kyats/30 viss bag.
Sources: [a] CSO, *Statistical Yearbooks* 2006, 2011; [b] MoAI/DAP/MIS, *Agricultural Commodity Prices* (Various Issues); [c] IMF, *World Economic Outlook Data* (online)

Table 10 Poverty Transition Matrix
(Standard Errors in Parentheses)

	Chronic Poor	Transitory Descents	Transitory Escapes	Non Poor
Sagaing	3.1	7.5	19.1	70.3
	(0.5)	(0.67)	(4.22)	(4.92)
Bago	5.6	9.7	17.9	66.8
	(0.7)	(1.32)	(3.25)	(3.24)
- Bago (E)	6.2	10.5	19.1	64.3
	(1.1)	(2.33)	(4.85)	(4.07)
- Bago (W)	5.0	8.9	16.7	69.4
	(0.8)	(1.19)	(4.25)	(5.10)
Mandalay	14.8	8.0	20.5	56.6
	(3.8)	(1.66)	(2.39)	(5.43)
Ayeyarwady	11.5	14.3	13.3	60.9
	(1.6)	(1.60)	(0.88)	(2.16)
UNION	10.0	11.3	16.5	62.1
	(0.8)	(0.66)	(1.17)	(1.84)

Source IHLCS 2009/10 (Reported in IHLCSPTU, 2011a)

Table 11 Trends in Food Price Inflation (2004-2009)

	Decile 1			Deciles 1-3			Quintile 2		
	2005	2010	%Dif	2005	2010	%Dif	2005	2010	%Dif
Caloric Intake	2577.3	2656.5	3.1	2903.8	2944.0	1.4	3229.8	3231.2	0.0
Cons. Exp. (2009 kyats)	247827	281494	13.6	311129	340438	9.4	386631	410082	6.1
Food Share	72.4	74.1	2.3	72.0	73.6	2.2	71.9	72.5	0.8
Food Exp (2009 kyats)	179427	208587	16.3	223856	250408	11.9	278049	297157	6.9
Food Exp/Calorie	69.6	78.5	12.8	77.1	85.1	10.3	86.1	92.0	6.8

Source. Calculated from IHLCSPTU (2011a).