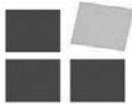# Why Poverty Persists

Poverty Dynamics in Asia and Africa

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1. Overview: poverty dynamics and persistence in Asia and Africa

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INTRODUCTION

A decade ago, around the time the Chronic Poverty Research Centre (CPRC) was conceived, I co-edited a special issue of the *Journal of Development Studies* with John Hoddinott entitled 'Poverty dynamics and economic mobility in developing countries' (Baulch and Hoddinott, 2000). This issue, which subsequently became a book, contained a collection of six studies on poverty dynamics drawn from the (then) very limited pool of household (longitudinal) panels in developing countries. Since then, the number of panels available in developing and transition economies has expanded considerably.[1] However, most of these panels still span relatively short periods of time, have just two rounds, and pay limited attention to the issues of tracking, attrition and measurement error (Dercon and Shapiro, 2007). This book, which is based primarily on the work commissioned by the CPRC's poverty dynamics and economic mobility theme, brings together six more panel studies from Asia and Africa. The distinguishing feature of these studies is that they are longer term and/ or have more waves than most panel studies and pay careful attention to tracking, attrition and measurement error.

This chapter provides a broad introduction to the methodological issues that arise when analysing poverty dynamics in longer panels, together with the main findings from the six country studies. The methodological issues discussed include how one should identify and measure the chronically poor, attrition and tracking, the pernicious influence of measurement error, modelling poverty transitions, and sequencing and integrating qualitative and quantitative methods. The findings from the country studies are organised around the three key research questions which the CPRC's theme on poverty dynamics and economic mobility have sought to answer over the last five years, which are:

- What enables individuals and households to escape chronic poverty?
- What prevents individuals and households from escaping chronic poverty?
- What leads individuals and households to fall into chronic poverty?

Given the large amount of research which has been conducted on these questions, together with the related issues of economic mobility, over the last decade, both by the CPRC and others (most notably the International Food Policy Research Institute's (IFPRI) Pathways from Poverty programme), it is only possible to provide a broad introduction in this introductory chapter.[2] Nevertheless, it is hoped that this overview will provide a useful non-technical introduction to poverty dynamics and economic mobility for non-technical readers, and that the country studies and references cited will be useful for those interested in pursuing these issues further.

METHODOLOGICAL ISSUES

Identifying and Measuring Chronic Poverty

The early studies of poverty dynamics in developing countries, such as those in Baulch and Hoddinott (2000), identified chronic poverty in two different ways. The first 'spells' approach counted the number of periods in which individual or household welfare (usually measured in income or expenditure terms) was below the poverty line, and then classified households who were poor in two or more adjacent survey rounds (waves) as chronically poor (McKay and Lawson, 2003).[3] As most of the longitudinal household surveys available in developing countries at that time consisted of panels with just two waves, this effectively meant that the twice poor were identified as the chronically poor. The second 'components' approach, which required more panel waves, identified the chronically poor as those whose average intertemporal welfare (again, usually measured in income or expenditure terms) was less than the poverty line (Jalan and Ravallion, 2000). This approach assumes that there are no difficulties in transferring welfare between 'good' and 'bad' years, which seems unrealistic in many developing countries. Thus neither of these approaches to identifying the chronically poor are entirely satisfactory, as they either ignore welfare in periods when people were non-poor or assume that costless transfers between survey waves are possible. However, they do have the advantage of being easy to implement providing that panel data are available.

In the last five years, a number of other ways of identifying and measuring chronic poverty have been proposed. These include Foster's (2007, 2009) class of chronic poverty measures, Calvo and Dercon's (2007, 2009) discounted measure, Porter and Quinn's (2008) family of intertemporal poverty measures with increasing compensation, and Duclos et al.'s (2010) chronic and transient measures based on the equally distributed poverty gap. The first two of these chronic poverty measures, which build on the spells approach, were originally presented at a CPRC conference held in Manchester in October 2006. Foster builds on the spells approach by adapting the standard triplet of static poverty measures proposed by Foster, Greer and Thorbecke (1984) to a multi-period context by introducing a duration cut-off for chronic poverty. In contrast, Calvo and Dercon introduce discounting to derive an intertemporal poverty measure which does not require a duration cut-off. Porter and Quinn (2008) and Dercon and Porter (Chapter 3) build on Calvo and Dercon's approach to derive an axiomatically sound intertemporal poverty measure which penalises bad years much more heavily than good ones. Finally, Duclos et al. have recently extended the components approach using the equally distributed equivalent (EDE) poverty gap, and derive a statistical correction for the biases that arise when, as is usual, the number of panel waves available is small.

A distinguishing feature of all these chronic poverty measures is that they require at least four rounds of panel data to operationalise them, so applications of them are still rare. However, Porter and Quinn (2008) calculate and compare five chronic poverty measures for rural Ethiopia. Foster (2007, 2009) and Foster and Santos (2008) illustrate their class of chronic poverty measures using biannual panel data from Argentina, while Duclos et al. (2010) illustrate their EDE measures using annual panel data from rural China.[4]

A significant drawback to all these chronic poverty measures is that they fail to take account of what is perhaps the most durable form of chronic poverty – death. For, as Kanbur and Mukerjee (2003) note, a glaring paradox in all commonly used poverty measures is that 'the death of a poor person reduces poverty'.[5] Other drawbacks of the new chronic poverty measures are that the duration cut-offs and discount rates are often arbitrarily defined, the frequency and duration between panel waves is not considered (by Foster, and Foster and Santos), and (with the exception of Duclos et al.) little attention is given to the precision of the estimates of chronic poverty produced. Further work, on both the axiomatic foundation of, and estimation procedures for, chronic poverty measures is needed before they become part of the development economist's standard toolkit. Nevertheless, as more multi-wave panel data from developing

countries become available, the use of chronic poverty measures is likely to grow.

Attrition and Tracking

Attrition has been described as 'the panel researcher's nightmare' (Winkels and Withers, 2000).This is because if the members who attrit (drop out) of a panel differ systematically from those who stay in it, then the data set of continuing members is no longer representative of the original population. Furthermore, we know that the reasons why households attrit from a panel (such as death, marriage, migration, political instability and violence, and separation or divorce) will usually be correlated with poverty dynamics and economic mobility more generally. Empirical results based on panel data in which only continuing panel members are included may therefore be seriously affected by attrition bias (a form of sample-selection) and should be treated with caution (Alderman et al, 2001).

One way to deal with attrition is to adapt Heckman's (1979) standard two-stage selection model, by modelling the probability of household attrition in the first stage, and then modelling poverty dynamics or welfare taking into account the probability of attrition (via the inverse Mills ratio) in the second stage. However, it is usually difficult to identify convincing instrumental variables, which must be correlated with attrition but not with the outcome variables. An alternative and now more commonly used approach of adjusting for attrition is to compute inverse probability weights (Fitzgerald et al., 1998; Wooldridge, 2002). This approach relies on identifying auxiliary variables, which can be related to both attrition and the outcome variable, to adjust for the probability that some households (or individuals) are more likely to dropout than others.[6] It is important to note, however, that inverse probability weights only adjust for what Fitzgerald et al. describe as 'selection on observables'. If there are also unobservables, especially time varying unobservable variables which also influence the probability of drop-out, modelling attrition requires the identification of appropriate instrumental variables (Wooldridge, 2002; Outes-Leon and Dercon, 2008).

The question that then arises is what variables are suitable for modelling attrition? Clearly these variables must be observed for both panel households and attritors, and be correlated with the probability of attrition. In selection models, lagged values of the outcome variable are often used as instrumental variables, but this requires that at least three waves of panel data are available. Measures of the quality of the interview can also be used as instrumental variables (Maluccio, 2004) as they seem likely to be related to the probability of attrition but not to the outcome

variable. If inverse probability weights are used, household demographic variables, community level shocks or treatment variables are often used as the auxiliary variables. As these variables are usually correlated with the outcomes, demographic, community and shock variables cannot be used in selection models but they can be used for calculating inverse probability weights.

The majority of comparative studies, in both industrialised and developing countries, show that while attrition from panel surveys is rarely purely random, it does not seem to bias estimates of poverty dynamics from panel surveys too seriously.[7] This does not, of course, mean that the issue of attrition can be ignored when analysing poverty dynamics as, in certain surveys, the level of attrition can be severe.[8] However, what really matters is not the magnitude of attrition but whether the probability of attrition is systematically related to certain household or community characteristics. As has been demonstrated in the longest running panel survey in the world, the Panel Study of Income Dynamics in the USA, attrition rates in excess of 50 per cent have not seriously distorted their results. All the studies of poverty dynamics in this book therefore contain a detailed analysis of attrition. These are summarised in Table 1.1. Due to the care with which most of these panels have been collected, attrition at the household level turns out to be less than 15 per cent (or 2.3 per cent per year) in four of the six studies. And even in Nepal and South Africa, where attrition rates of 22 and 38 per cent respectively were experienced, logit/probit analysis shows that the pattern of attrition only leads to minor biases.

Whether and how to track individuals who move out or away from their original (core) households is obviously closely related to attrition. Early panel studies typically used arbitrary tracking rules (such as returning to the same dwelling or relocating the original household head) to decide which households to follow in subsequent waves. As Rosenweig (2003) points out these tracking rules result in the loss of a considerable amount of detail about migrants and the processes of household formation and dissolution, both of which are important in explaining poverty dynamics. More recent panel studies have typically paid greater attention to tracking, and can follow both household members who split from their original households but remain living in their original communities (local tracking) and, in a few cases, following migrants to major cities, or other districts and provinces.[9] In some panels, including Lohano's study of rural Sindh Pakistan (Chapter 5), tracking household splits leads to the sample size of panels actually increasing over time.[10] Panels with tracking offer considerable scope for understanding how household formation, dissolution and migration affects poverty dynamics, although the empirical methods

Table 1.1   Household attrition in the country studies

Country	% of households attriting between first and last waves	Period[a]	Number of panel waves	Method of Tracking	Remarks
Bangladesh	6.3%	1996/97– 2006/07	2	Local (within sub-districts)	Rural households only
Ethiopia	12.1%	1994– 2004	5	Local (within village), excluding splits	Rural households
Nepal	21.9%	1995/6– 2003/4	2	Local (within primary sampling units)	Rural and urban households
Pakistan	5.4%	1987/88– 2004/05	2	Local (within administrative 'taluka'), including splits and descendants	Rural households in Sindh Province
South Africa	37.9%	1994– 2004	3	Local (within province), including splits and descendants	Rural and urban households in KwaZulu-Natal
Vietnam	14.6%	2002–06	3	Local (within commune), excluding splits and temporary migrants	Rural and urban households

Source: Based on the country studies in Chapters 2 to 7 of this book.

Note: The "Period" column shows the year(s) of the first and last survey waves used for each country study.

used to analyse tracked households are still relatively undeveloped. One approach is to either recombine split households with their original house-holds or 'back-cast' households observed in the latest survey wave.[11] A second approach, which is more popular in industralized countries, is to ignore the household as a unit of analysis altogether and create panels of individuals. Neither of these approaches are, however, entirely satisfac-

tory, as information on the changing structure of households and new household members is ignored. A third, and probably the most appealing approach, is to embed a multinomial logit model within a sample selection model, as suggested by Dahl (2003) and implemented in Badiani et al.'s (2007) study of the extended ICRISAT panel in southern India. As more panels with tracking in developing countries become available, other approaches are likely to be developed.

To conclude this section, four cautionary points are in order. First, while it is possible to correct for attrition bias, it is always wise to try and minimise attrition at the data collection stage. Some useful strategies for reducing attrition in panel data are described in Hill (2001) and Thomas et al. (2010). Second, with multiple wave panels some individuals (and even households) may be missing from one wave of a panel only to reappear at a later date. While inverse probability weights can also be used to adjust for temporary attrition (and also for item non-response, when particular questions are not answered), such households and variables are often simply dropped from the sample. Third, there are few studies of poverty dynamics that include household splits, let alone model the complex processes of household formation and dissolution. As noted above, the empirical approaches for dealing with this are still being developed. Finally, many significant factors in the poverty experiences of individuals and households tend to be "suppressed" by the construction of panels, although they are informative in their own right. Qualitative and participatory studies, for example, suggest that extreme poverty often leads to the migration of household members, the dissolution of households, and in the most extreme and heart-rending cases, the death of unsupported individuals.

Measurement Error

Measurement error poses probably the single biggest lacuna in the study of poverty dynamics using panel data. As expenditures and incomes (the welfare measures used by the vast majority of household panels) cannot be measured precisely, some of the observed movements out of and into poverty will be statistical artefacts. Indeed, as Baulch and Hoddinott (2000) argue, even in the hypothetical situation in which all households are either persistently poor or persistently non-poor, measurement error in the welfare variable would lead to some poverty dynamics being observed. While it is reasonable to assume that many of the reported movements out of and into poverty are genuine, how much difference measurement error makes to observed poverty dynamics is not known.

For panels with at least three waves, it is possible to adjust for

*Table 1.2   Poverty dynamics adjusted for measurement error using the
              reliability index*

Country, years of survey waves	Reliability index	Chronically poor		Poverty exits		Never poor	
		Observed	Adjusted	Observed	Adjusted	Observed	Adjusted
Ethiopia 1994–99–2004	0.468	9.7%	10.5%	24.8%	10.0%	55.0%	76.2%
South Africa, 1993–98–2004	0.871	29.2%	31.8%	10.2%	18.1%	36.1%	40.0%
Vietnam, 2002–04–06	0.911	11.8%	12.3%	16.6%	14.2%	70.0%	73.5%

Source: Author's calculations. Chronically poor and never poor households are
households whose expenditures were above or below the national poverty line in both the
initial and final year of the panel. All calculations use national poverty lines and deflated
expenditures.

measurement error with a minimum of assumptions by adapting an
approach proposed by Heise (1969).[12] This approach relies on a lack
of correlation between measurement errors in different panel waves to
extract a reliability index which can be used to adjust observed expendi-
tures or income.[13] Use of the adjusted expenditures or incomes to compute
poverty measures or transition matrices can then provide a lower limit for
the impact of measurement error on poverty dynamics. Table 1.2 shows
the impact of applying the reliability index approach to three of the panels
used in the country studies in this book.

   With reliability indices ranging from 0.468 to 0.911, the percentage of
chronically poor and never poor households (that is households who are
poor or non-poor in both the first and last waves of the panel) increases, as
expected. The percentage of households exiting poverty or entering it (not
shown) can either rise or fall.[14] After adjustment, the share of households
in chronic poverty in the three countries rises by 0.5 to 2.6 percentage
points while the share of households moving out of poverty falls by 14.8
points in Ethiopia, 2.4 points in Vietnam but rises by 7.9 points in South
Africa. Except in Ethiopia, the differences between these observed and
adjusted numbers are relatively small, with the difference being smallest
for the panel with the shortest duration (Vietnam). The difference between

the adjusted and observed poverty exits in Vietnam and South Africa also makes sense, once the Asian country's consistently strong growth and poverty reduction records are compared with South Africa's. The large increase in the percentage of never poor households in rural Ethiopia is harder to explain but is clearly linked to its much lower reliability index. This is in turn related to the influence of climatic and other shocks on the correlation of expenditures between rounds in the Ethiopian Rural Household Survey (ERHS).[15]

When panel data are only available for two points in time, as is often the case, other methods need to be used to account for measurement error. Some of these methods rely on validation surveys and misclassification matrices (Kuha and Skinner, 1997), others on comparisons with proxy indicators (Rosenweig, 2003) or assets (Carter and Barrett, 2006) or comparing poverty transitions based on incomes with those based on expenditure (Woolard and Klasen, 2005). More sophisticated adjustments employ instrumental variables and three-stage least squares (Fields et al., 2003, Glewwe, 2000; Lee et al., 2009), Markov models (Cappellari and Jenkins, 2002), latent structure analysis (Breen and Moisio, 2004) and pseudo panels (Antman and McKenzie, 2005). Unfortunately, these methods are difficult to compare as they employ different identification assumptions and have been applied to different panel data sets with different welfare measures and periodicity. A general trend which does, however, emerge from these studies is that the more sophisticated the method of adjustment, the larger the proportion of observed poverty dynamics which is attributed to measurement error. As there is so little agreement on adjustment methods among microeconometricians and statisticians, there is an urgent need for a cross-country and cross-methods study to assess the impact of measurement error in household panels. Until such a study is completed, the share of poverty dynamics that can be attributed to measurement error is likely to remain a major unresolved issue.

Modelling Poverty Dynamics

To date, there is no single commonly accepted method for modelling poverty dynamics. Some analysts like to model poverty status and transitions as discrete variables, while others prefer to model the changes in a continuous welfare measure such as income or expenditure. Still others use continuous variable models to cross-check the results of discrete variable models, or vice-versa. Each of these strategies for modelling poverty dynamics are used in the chapters in this book.

The multinomial logit (MNL) model is the most commonly used discrete choice model in studies of poverty dynamics. It is employed by

four of the six studies in this book. However, the MNL model is not
without its critics. First, it may be criticised for reducing a continuous
welfare variable (expenditures or incomes) to discrete categories in just
the same way that bivariate poverty probits and logits are criticised for
reducing a continuous variable to two discrete categories (Ravallion,
1996).[16] Second, the MNL model is predicated on the assumption of the
independence of irrelevant alternatives (IIA).[17] Third, the MNL model
uses unordered categorical outcomes which do not recognise the natural
order of poverty transitions.

There are two possible responses to these criticisms. First, the MNL
model may be generalised to relax the IIA assumption and non-ordered
nature of its categorical outcomes. For example, Baulch and Vu estimate a
sequential logit model in their chapter on Vietnam. Other alternatives for
modelling poverty dynamics within a discrete choice framework include
the ordered logit (or probit) and stereotype logistic models.[18] Second,
expenditure or incomes can be modelled directly using a fixed or random
effects estimator, as Dercon and Porter, and May et al. do in their chapters
on Ethiopia and South Africa.

While the fixed effects approach avoids what many see as the imposi-
tion of an essentially arbitrary poverty line, and also allows time-invariant
heterogeneity to be differenced out, this approach does have the drawback
that it is difficult to link changes in the welfare variable to poverty transi-
tions.[19] One way to make this linkage more explicit is to include poverty
status in the initial year, as one of the dependent variables in a fixed effects
regression which can then be interacted with other variables of interest.
However, it is important not to use poverty dynamics categories as regres-
sors as this introduces endogeneity into the estimating equation. Another
way to link the expenditure variable with poverty status is to use inter-
quantile regressions calibrated to the average expenditures of the chroni-
cally poor and never poor in all survey rounds.[20] Baulch and Vu (Chapter
7) and Quisumbing (Chapter 2, this volume) apply this approach to panel
data from rural Vietnam and rural Bangladesh, to test whether the chroni-
cally poor and never poor have different expenditure generating functions,
with interesting but mixed results.

Finally, when there are a large number of panel waves, Markov
chains and hazard models can be used to model poverty transitions. This
approach has been used to good effect by Cappeliari and Jenkins (2002)
and Jenkins and Rigg (2001) on data from the British Household Panel
Survey model, and by Stevens (1999) for the Panel Study of Income
Dynamics in the USA. While this is an appealing approach, as it allows
exits and entries from short and long spells of poverty to be distinguished,
few developing country data sets have enough waves to exploit this

approach.[21] In addition, hazard models are subject to the criticism that they reduce a continuous variable to discrete categories.

To sum up, while a range of modelling approaches employing both discrete and continuous variables have been used for modelling poverty dynamics, no approach is clearly superior to another. Each approach has its pros and cons depending on the data being employed and the research questions under investigation. Until such time as more robust empirical methods are developed, comparing and contrasting the results from several modelling approaches, as in the Baulch and Vu, and May et al. and Quisumbing studies in this book, offers the best protection against misleading inference.

Sequencing Quantitative and Qualitative Methods

Although the focus of this book is on learning about poverty dynamics and chronic poverty through panel studies, other research conducted by the CPRC has used different combinations of qualitative and quantitative methods to examine chronic poverty. Indeed, one of the other objectives of the CPRC's poverty dynamics and economic mobility theme was 'to develop an integrated and sequenced approach which merges large N quantitative resurveys with medium N qualitative methods'. This work has gone furthest in Bangladesh, where a three-phase qual-quant-qual follow up to previous IFPRI panels was conducted in 2006/07.[22] This research, which deliberately nested focus group discussions and life histories as a sub-sample of a larger N household panel survey has been influential because it is able to counter the charge of anecdotalism that smaller and less systematic qualitative studies are often criticised for. In addition, analysing quantitative and qualitative data side by side has enhanced the CPRC's understanding of poverty dynamics by throwing up many issues (such as dowries, life cycle issues, insecurity and the social context) that are often missed by quantitative analysis of panel data alone. The pairing of qualitative and quantitative data also allowed the researchers to go much further in probing causation than either qualitative or quantitative methods would have in isolation (Davis and Baulch, 2010). A second CPRC-funded q-squared study is currently underway in Tanzania. This is expected to provide further evidence of the benefits of nesting and sequencing qualitative and quantitative methods (da Corta and Higgins, 2010).

KEY FINDINGS FROM PANEL STUDIES

The reasons why poverty persists over time is central to the CPRC's mission. In its first Chronic Poverty Report (CPRC, 2004), the CPRC

argued that it is important to distinguish between the drivers and main-
tainers of chronic poverty. The drivers of chronic poverty are the events
which cause households to fall into poverty from which it is then hard
to escape, while the maintainers are the institutions and processes which
make poverty persistent and traps people in poverty for extended dura-
tions. While the drivers and maintainers of chronic poverty are sometimes
difficult to distinguish from one another, they provide a useful framework
for thinking about the complex interplay of economic, social and politi-
cal forces which trap people in chronic poverty. They are also useful in
identifying the events and processes which lead people to fall into chronic
poverty, and the processes of accumulation which allow households to
escape from chronic poverty.

Microeconomic studies, especially those which use panel data, tend to
view chronic poverty as the result of a conjunction of poor endowments,
low returns to those endowments and vulnerability to shocks. These main-
tainers of chronic poverty follow naturally from the conceptual frame-
work for analysing poverty dynamics set out by Baulch and Hoddinott
(2000), which envisages a newly formed rural household allocating its
endowments of labour and capital across a number of activities in a risk
prone environment. The choices made by the household in each period,
together with the returns it receives and the shocks it experiences, map out
a series of outcomes in income and asset space which in turn trace out the
household's poverty dynamics and welfare trajectory. When poor endow-
ments and low returns coincide, these usually result in repeatedly low
incomes and slow (or minimal) accumulation of assets. These factors trap
the household into poverty for extended periods of time.

The household's welfare trajectory is not, however, entirely determined
in advance because of nature intervening in the form of shocks (both nega-
tive and positive) which affect both the household's endowments and the
returns it receives from those endowments in the following period. The
negative shocks can be seen as the drivers of chronic poverty, as they are
the events which propel households into poverty, while the positive shocks
can be seen as the drivers which help households escape poverty. The
next three sub-sections review the key findings from the panel studies in
this book, and other recent research regarding the maintainers of chronic
poverty and the drivers of entries and escapes.

What Prevents People from Escaping Chronic Poverty?

Chronic poverty is the result of a set of interwoven economic, political
and social forces. The factors and processes that trap people, and the
households in which they live, in chronic poverty inevitably vary between

countries. Nonetheless, a number of stylised facts about the maintainers of chronic poverty emerge from the panel studies in this book, and panels in other countries. Broadly speaking the maintainers of chronic poverty can be grouped into two: low levels of endowments; and the inability to accumulate assets because of low returns to these endowments.

Endowments consist of all the assets which households may possess. In addition to labour, which is typically the most abundant asset of the poor, endowments include five types of capital: physical capital (productive assets and housing), natural capital (land), human capital (knowledge, skills and health), financial capital (cash, bank deposits, livestock and other stores of wealth) and social capital (the networks and informal institutions that facilitate coordination and cooperation). It is useful to define assets widely in this way in order to capture the different ways in which they may be combined to generate incomes or, more generally, livelihoods.

Lack of assets (widely defined) is often identified as a crucial maintainer of chronic poverty. Most of the studies in this book find a relationship between growth in expenditure and initial endowments of land, livestock and human capital. Low endowments of land, and to a lesser extent livestock, have been hypothesized as leading to asset-based poverty traps in a series of papers by Michael Carter, Christopher Barrett and others, which developed an asset-based theory of poverty traps and tested it empirically.[23] This work uses household-level panel data on asset holdings, drawn mostly from pastoral communities in sub-Saharan Africa, to identify whether a 'bifurcation point' exists at which asset holdings (usually defined in terms of an index of physical productive assets) tend towards high or low level equilibria. The identification of such asset thresholds is potentially very important for policy purposes as it indicates the amount of assets which households need to acquire in order to escape from poverty.[24] Unfortunately, more recent studies using panel data from outside Africa find limited evidence for the sort of asset-based poverty traps hypothesised by Carter and Barrett (Naschold, 2008; Quisumbing and Baulch, 2009; McKay and Perge, 2010). While these studies find evidence of groups of chronically poor people, they do not find much evidence for the elongated S-shaped dynamic asset paths, which are the foundation of Carter and Barrett's theory. This is linked to the existence of well-developed markets for capital and labour in the more densely populated developing countries in which more recent studies have been conducted (Quisumbing and Baulch, 2009).

Lack of education is also a crucial maintainer of chronic poverty. All the country studies in this book find that the household head having little or no education is a significant correlate of chronic poverty. In rural Ethiopia, the probability of being chronically poor in 1994–2004 was more

than a fifth lower for households whose heads had completed primary edu-cation (Dercon, Hoddinott and Woldehanna, 2007). In KwaZulu-Natal in South Africa, May et al. find that low initial education is the only variable for which a poverty trap can be clearly identified between 1994 and 2004. They conclude that while education is a way out of poverty, those who start with low education have additional burdens to overcome. In Nepal, Bhatta and Sharma find that while the transient poor have only completed a quarter of a year more of schooling than the chronically poor, the never poor have more than a year and a half's additional education. Finally, in Vietnam, Baulch and Vu show that failure to complete primary schooling by the household head is one of the key factors (along with geography and ethnicity) that lock households into chronic poverty, while completion of higher secondary school is an extremely strong predictor that a household is never poor.

Education is important not only because it gives people the knowledge to improve their livelihoods but also because it provides access to formal (salaried or wage) employment, which a number of studies show is an important escape route from chronic poverty (see next sub-section). For example, May et al. show households with few members in employment in the initial panel wave found it difficult to improve their well-being sub-sequently. In addition, education is one of the few assets which cannot be sold or taken away from a person who unexpectedly falls into poverty. The sacrifices which poor households are willing to make in order to educate children bear testament to the crucial role that education has in interrupt-ing the intergenerational transmission of poverty in most countries.

Adverse geography has been identified as a key maintainer of chronic poverty by both the micro and macroeconomic literature on poverty traps (Bloom et al., 2003; Carter and Barrett, 2005; Sachs et al., 2004). Many of the CPRC's early working papers argue that many chronically poor people live in remote rural areas, which are usually mountainous and iso-lated from the centres of economic or political activity by lack of commu-nications and markets (CPRC, 2004). These findings are largely echoed in the empirical findings of the country chapters in this book. For example, in rural Ethiopia, most of the chronically poor live in remote, semi-arid areas such as Tigray and Shoa, while in rural Vietnam, chronic poverty is highest among people living in the Northern Mountains and Central Highlands regions (Baulch and Vu). Similarly, in Nepal, chronic poverty is highest in the mountains and rural hills (Bhatta and Sharma). Where good data on transport infrastructure (particularly roads), soil types, and rainfall exists, these tend to confirm the physically disadvantaged nature of remote rural areas.

It is important to recognise, however, that such areas typically have

much lower population densities than less remote, better connected, lowland areas and therefore that their high poverty and chronic poverty headcount ratios do not necessarily indicate particularly large numbers of chronically poor people.[25] While adverse geography is perhaps best regarded as part of endowments (that is a household's natural capital), remoteness clearly also affects the returns received on other endowments.

A growing number of panel studies, including five of those in this book, identify ethnicity, caste and race as playing a crucial role in perpetuating chronic poverty. Ethnicity (which from here on is taken to subsume caste and race) is one of the stronger correlates of poverty that emerges from many, although by no means all, cross-sectional poverty profiles. However, the statistical association between ethnicity and poverty is often dismissed on the grounds that other factors (such as adverse geography, infrastructure, poor education and language skills, and low endowments of other assets) can explain the chronic poverty of minority groups.

Panel studies, however, reveal that the disadvantages experienced by ethnic minorities are long-lived and durable, and that ethnic minorities usually experience slower rates of growth and poverty reduction than the dominant ethnic groups. In Ethiopia, Dercon and Porter show that chronic poverty is much higher among the ethnic minorities than the majority Amhara and Oromo groups. In Nepal, Bhatta and Sharma show that poverty is higher among low caste Dalit and Janajati households, and that the odds that a Dalit household is chronically poor are substantially higher than for the dominant Braham-Chettri-Newar group. In post-apartheid South Africa, May et al. show that low educational endowments, which are strongly related to race, is one of the key characteristics underlying structural poverty in the province of KwaZulu-Natal. Finally, Baulch and Vu show that in Vietnam ethnic minority status is one of the factors which lock households into chronic poverty. Other studies in Vietnam (Baulch et al., 2010; Van de Walle and Gunewardana, 2001) find evidence of differences in returns and unequal treatment of minority groups, a finding echoed for scheduled castes and tribes in India by Gang et al. (2008) and for indigenous peoples in Latin America (Patrinos and Hall, 2006). This fits with the conclusions emerging from a growing number of quantitative and qualitative studies in other countries which show that minorities typically experience multiple forms of both hidden and overt discrimination.[26] As such, ethnicity is a crucial determinant of the returns which the chronically poor receive for their endowments.

A social relations perspective – see, in particular, Hickey (2010) and Mosse (2010) – adds an important political dimension to the CPRC's analysis of chronic poverty and ethnicity. Traditional anti-discrimination policies, such as affirmative action programmes, equal opportunity

programmes and employment quotas, are often ineffective because of silent (or at least muted) opposition by powerful vested interests (Branhoultz-Speight, 2008). As Mosse argues a multidimensional conception of power, which includes not only direct power but also the 'agenda-setting' powers that set the terms in which poverty becomes (or usually fails to become) politicised, is needed to understand the politics of exclusion. This underlines the controversial nature of many of the policies needed to tackle the root causes of chronic poverty, as they require fundamental changes in political participation and representation for minorities and other disadvantaged groups.

A final factor which is often forgotten is the powerful role which customs and social obligations can play in keeping poor people poor. CPRC's q-squared study in Bangladesh, for example, found that dowries and other expenditures associated with weddings have serious economic repercussions, with many households identifying dowry payment as a leading cause of chronic poverty and impoverishment (Davis, 2007; Davis and Bach, 2010). This is echoed in Quisumbing's study of Bangladesh and Lohano's study of Pakistan in this book. 'Bride price' may play a similar role in some African countries (Turner, 2009). It is important to recognise that such customs are deeply embedded within the systems of social relations in which the chronically poor survive, and cannot simply be legislated away. As with policies to promote opportunities for ethnic minorities, there is a need to go beyond prescriptive policies, and find innovative ways of addressing the negative socio-economic effects of dowry and bride price, both at the local and national levels.[27]

What Leads People to Fall into Chronic Poverty?

People fall into chronic poverty due to a combination of shocks and other negative events, plus a lack of resilience (usually associated with low assets, broadly defined). While such shocks and negative events can be seen as the drivers of chronic poverty, it is important to realise that their consequences are mediated through the framework laid out at the beginning of this section. Thus households with poor endowments and low returns to those endowments will be much more likely to fall into poverty due to a shock than a richer or better connected household experiencing an equivalent shock. This is perhaps demonstrated most clearly in a remote rural village experiencing a natural disaster, such as a drought or flood. Although most households in the village will suffer from the shock, it is typically the poorest households who are hit hardest, as they have fewer assets to dispose of, less diverse incomes, and weaker social networks to fall back on.

Shocks may be defined as adverse events that lead to a loss of consumption, income, assets, or another welfare indicator (Quisumbing, Chapter 2). Shocks can be agroclimatic, economic, health-related, legal, political or social. While the timing of agroclimatic, economic, legal and political shocks is usually uncertain, there are certain categories of health shocks (such as illness related to old age) and social shocks (wedding and funeral expenses) whose timing is broadly predictable. Some shocks may have negative effects for some households and positive effects for others (for example, dowry payments made from the bride's to the groom's family). Some events which should have a positive impact on household welfare in the long term, (such as international labour migration) may have negative effects in the short-term (for example, mortgaging land to fund the expenses associated with international migration). Furthermore, when the intended outcome does not materialise, positive events can become negative shocks (such as a return to the host country after a short-period of employment overseas accompanied by loss of land).

Are shocks at the individual or household level more important than community or area-wide shocks in leading people to fall into chronic poverty? The answer to this is almost certainly context specific. The economics literature traditionally distinguishes between idiosyncratic shocks (at the individual and household level) and covariant shocks (at the community or area level).[28] But, in practice there is a continuum of shocks that start at the individual level and proceed through the household, community, area, sub-national, national and regional levels to shocks, such as climate change, which are essentially global. It seems likely that area-wide shocks such as droughts or rain failure have greater importance in arid and semi-arid environments such as Ethiopia and Pakistan. However, infectious diseases (in both humans and animals), crop diseases and pests, and other vectors seem likely to have their biggest impact in more densely populated humid areas near the coast (Bloom and Sachs, 1998). Low-lying coastal countries, such as Bangladesh and Vietnam, are also extremely susceptible to floods and storms, as are the earthquake-prone countries along the Pacific 'ring of fire'. The jury is therefore still out on whether, and in which environments, individual and household level shocks are more important drivers of chronic poverty than more widespread shocks.

Individuals and households have different susceptibility to shocks. Vulnerability (at least vulnerability to poverty) is therefore a function of both shocks and resilience (Shepherd, 2007). Resilience, which is broadly the capacity to ride out shocks, is lower when asset holdings are limited, as is usually the case with chronically poor households. Sales of labour and productive assets are common ways in which individuals and households supplement their resilience and smooth their consumption between

good and bad years (Kochar, 1995). So too is debt, although its informal and sometimes highly exploitative nature, means that it can often lead to 'adverse incorporation' (Wood, 2003). As the MNL models in this book's chapters on Bangladesh, Ethiopia, Nepal and Vietnam show, lack of education also makes individuals more vulnerable to chronic poverty. However, even well-educated individuals can fall into poverty when the demand for their services collapses in times of economic crisis. All these examples demonstrate how both endowments, and the returns to those endowments, matter to resilience in particular and poverty dynamics in general.

Resilience is also a function of the life cycle. The combination of shocks with partially predictable negative events (such as dowries for daughters coinciding with medical treatment for elderly parents) usually occur during particular stages of an individual's life cycle. An increasing number of qualitative studies and q-squared studies demonstrate that it is usually two or three negative events happening in rapid succession, rather than a single large shock, that propels individuals and households into chronic poverty.[29] The qualitative interviews that were conducted as part of the Bangladesh and Pakistan studies (Quisumbing, Chapter 2, and Lohano, Chapter 5) finds that sequences of shocks were important to downward mobility in rural Bangladesh and Sindh, Pakistan. Unfortunately, analysis of panel data often does not pick up the importance of such sequences of shocks, either because the time-window applied (typically 12 months) is too short or because of recall and reporting errors (for example, poor households typically report less episodes of illness than better-off households). It can also be very difficult for questionnaire surveys to code shocks accurately (for example, a flood will typically cause crop damage, soil erosion, loss of assets, loss of employment, and spread disease – all of which could be classified as shocks). In addition, as noted by Quisumbing, given the typical sample size of panel surveys, the number of occurrences of particular sequences of shocks may be too small to produce many statistically significant results.

Nonetheless, when shock modules are designed carefully and analysed sensitively they can help analysts to tease out how shocks and other negative events drive households into poverty. For example, Quisumbing uses interaction effects to show how rural Bangladeshi households with less than median assets are especially hard hit by the combined impact of dowries and expenses from illness. Similarly, in rural Pakistan, Lohano finds that the drought of 1999–2002 had especially adverse effects on landless households because a collapse of employment opportunities occurred at the same time as rising food prices. In rural Ethiopia, Dercon and Porter show that a large number of households have been seriously affected by drought and illness, and that these households have significantly lower levels of per capita expenditure once other factors are controlled for.

One important issue, which the studies in this book cannot address, concerns whether major shocks have long-lasting effects which transmit poverty inter-generationally. This is because even if a panel spans ten or 15 years, this is typically not enough time for young children, who are the most vulnerable to shocks, to grow up and start their own households. So a combination of methods and data sources are typically needed to analyse the intergenerational transmission of poverty (Berhman, 2006). A few panel studies, for example the Kinsey resettlement panel in Zimbabwe, suggest that droughts have long lasting effects on the height of young children and link this to subsequent cognitive development (Alderman et al., 2006). Similarly, the Instituto de Nutricion de Centro America y Panama (INCAP) study in Guatemala, shows that a relatively simple nutrition intervention can have large and long-lasting effects on the nutrition, cognitive development and earnings of recipient children (Hoddinott et al., 2008).

What Enables People to Escape from Chronic Poverty?

Escape from chronic poverty is typically due to a combination of improved returns to endowments, asset accumulation, and good fortune. These factors are the converse of the maintainers and drivers of chronic poverty in that improved returns to endowments, in particular labour, help to break the cycle of low incomes and investment that perpetuate poverty. Meanwhile the acquisition of educational qualifications, jobs or productive assets often act as the triggers which allow households to escape poverty. As with descents into poverty, however, this process is not deterministic. An absence of shocks combined with unexpected positive events can boost the possibility of escape from poverty.

The panel studies in this book confirm that household members obtaining employment or establishing successful non-farm businesses are frequently associated with escapes from chronic poverty. These factors are found to be particularly important in increasing the returns to labour in the South African and Vietnam studies. So too is migration (and the remittances which migrants send back home), although this only comes out clearly in the studies (Pakistan, South Africa) which were able to track migrants. These findings echo the processes which enable people to move out of poverty from the bottom-up, set out in a recent World Bank multi-country study (Narayan et al., 2009). Based on narratives from 15 countries in Africa, Asia and Latin America, this study found that the main reasons people gave for moving out of poverty emphasized their own initiative in finding jobs and starting new businesses (Narayan et al., 2009).

Probably the most important endowment for escaping poverty is

education. Initial education is found to significantly improve upward mobility in the MNL models estimated in the chapters on Bangladesh, Nepal and Vietnam. Initial education and changes in education are also found to be important in the continuous regressions estimated in the South African study, although questions about endogeneity arise in the case of the change variables. In land-scarce contexts, access to land and other productive assets is also important in escaping poverty. In rural Bangladesh and Pakistan, the area of land owned in the first year affected the subsequent growth of expenditures, while in Nepal, land ownership had a negative relationship with both chronic and transitory poverty.

Ownership of other productive assets also matters in some categorical and continuous variable models, although because they are hard to measure and can be used to smooth consumption, their effect on expenditure and poverty are variable. Both the Bangladesh and Nepal studies suggest that ownership of livestock is particularly important to households who escape poverty. As other studies (IFAD, 2001) have demonstrated raising livestock can be an important way for poor households to accumulate assets, while providing income and some degree of protection against shocks.

People who escape poverty are often relatively young, while the households in which they live are at relatively early stages in their life cycle. Younger individuals are typically more mobile and adaptable, while younger households are less likely to experience the financial burdens of ill health and social obligations which plague older households. Indeed, when poor households split, it is often the younger household(s) who escape poverty while the older household (typically consisting of the parents and their dependents) remains in poverty (Lohano, Chapter 5; and Davis and Baulch, 2010). There is also often a demographic premium from children growing up and joining the labour force, as demonstrated by the importance of household composition variables in the Bangladesh, South African and Vietnam chapters. Even if the jobs which young adults gain are unskilled and low paid ones, the incomes that result can make an important contribution to household welfare. However, there are other lifecycle events – in particular young adults becoming parents – which can easily offset these gains, and soon push younger households back below the poverty line.

Standard neoclassical economic models, which tend to view patterns of accumulation as gradual processes, rarely capture how shocks and negative events regularly interrupt, and in some cases prevent individuals and households escaping from poverty. The life histories collected as part of the Bangladesh q-squared study show that the processes which lead individuals and households to escape chronic poverty tend to be gradual,

and are often interrupted by short-term setbacks.[30] Typically, these are slow 'saw-tooth' processes of accumulation in which households build up their physical, human and social capital despite the regular occurrence of shocks and other negative (but predictable) events such as dowries. Households who escape poverty are not households who are unaffected by shocks but those who are more able to cope with them (that is who are more resilient). Furthermore, the causes of improvement for some (such as a microfinance loan or sending a household member overseas to work) are the causes of decline for others, demonstrating that risk profiles change with socio-economic position. The factors which promote household resilience to shocks (such as assets and education) often overlap with the factors which allow households to take advantage of opportunities.

The processes which lead individuals and households to escape from chronic poverty are therefore diverse, and vary from context to context. Or, as the Buddhist proverb quoted in one of the IFPRI Pathways studies states, 'There are many paths to the same moon' (Eschavez et al., 2006). A particular livelihood strategy may allow one household, with particular endowments and networks, to succeed in escaping poverty but plunge another household, with different endowments and networks into deeper poverty. This poses a quandary for policymakers, as there can be few blueprints to assist escapes from chronic poverty. The provision of appropriate labour market and migration policies, business enabling environments, saving and credit institutions and infrastructure can, however, certainly help the chronically poor to seize the opportunities for growth and asset accumulation that arise.

CONCLUDING THOUGHTS

The studies in this volume demonstrate the value which panel studies bring to the analysis of poverty dynamics and the drivers and maintainers of chronic poverty. Without panel data it is impossible to distinguish between a stock of persistently poor people and large flows of people moving in and out of poverty. Panel data also allows the role of initial conditions in both locking households into chronic poverty and creating the foundations for accumulation and growth to be examined. While most panels only provide a partial picture of the importance of shocks and other negative events in driving people into chronic poverty, it is clear that some shocks have long-lasting impacts and that greater attention needs to be paid to the sequencing of shocks. Greater attention also needs to be given to the factors that allow people to seize the opportunities that allow them to escape from poverty, as well as the endowments which provide

most resilience against shocks. Two remaining puzzles concern the share of poverty dynamics that can be attributed to measurement error and the most appropriate methods for modelling poverty dynamics. As longer panels with more waves become available in Africa and Asia, our knowledge of the processes and interventions that can break the cycle of persistent poverty will continue to grow.

NOTES

1. See   http://www.chronicpoverty.org/uploads/publication_files/Annotated_Listing_of_ Panel_Datasets _in_Developing_and_Transitional_Countries.pdf.
2. See http://www.ifpri.org/book-746/ourwork/program/pathways-poverty.
3. The terms 'spells approach' and 'components approach' are also due to McKay and Lawson (2003).
4. The Chinese panel used by Duclos et al. (2010) has annual waves and spans the period from 1987 to 2002, but has missing waves in 1992 and 2004.
5. Kanbur and Mukherjee (2003) also propose a family of lifetime poverty measures, based on income profiles over the complete lives of individuals, which avoid this paradox. However, due to the data requirements, there have been no empirical applications of these lifetime poverty measures.
6. For a practical illustration of the use of inverse probability weights see CPRC Toolkit Note 2 (http://www.chronicpoverty.org/publications/details/testing-and-adjusting-for-attrition-in-household-panel-data).
7. See, *inter alia*, Alderman et al. (2001) and Falaris (2003) for developing country studies on attrition, and Fitzgerald et al. (1998) and Nicoletti, C. and F. Peracchi (2005) for attrition in industrialised countries.
8. See, for example, the panel surveys in Bolivia, Kenya and South Africa used by Alderman et al. (2001).
9. There are, as yet, no panel studies which have tracked panel members internationally, though there is known to be one member of an Ethiopian Rural Household Survey panel now living in Sweden and several members of the Vietnam Household Living Standards Survey living in Australia and the USA.
10. Other examples include the CPRC-DATA-IFPRI panel in rural Bangladesh (Quisumbing, 2008), the Kagera Health and Demographic Survey in Tanzania (Dercon and Shapiro, 2007), and the Indonesian Family Life Surveys (Thomas et al., 2010).
11. Both of these approaches have been used by CPRC research in Bangladesh: see Sen (2003) and Baulch and Davis (2008).
12. It is also possible to apply this approach to two wave panels in which two continuous welfare measures (such as expenditure and income) have both been collected. See Bhatta and Sharma (Chapter 4), Luttmer (2000) and McCulloch and Baulch (2000). Bhatta and Sharma estimate a reliability index of 0.748 for Nepal.
13. The reliability index can be calculated as: $\lambda_Y = \sqrt{[\rho(Y_{t-1}, Y_t)\, \rho(Y_t, Y_{t+1})/\rho(Y_{t-1}, Y_{t+1})]}$ where Y_{t-1}, Y_t and Y_{t+1} are the welfare measure (typically income or consumption) in three adjacent waves of a panel survey, and p is the Pearson correlation coefficient (Heise, 1969; Glewwe and Gibson, forthcoming). An adjusted welfare variable, which has the same estimated mean as the observed income variable but a variance which is the same as the true rather than observed income, may then be calculated as: $Y_{it}^{adj} = \bar{y}_i + \lambda_y (Y_{it} - \bar{y}_i)$.
14. Observed and adjusted estimates for poverty entries are not presented, as the number of households falling into poverty in the Bangladesh and Vietnam panels are very small. This is the result of their strong growth during the years spanned by the panels.

15. Note also that the welfare measure used in the Ethiopian calculations is per adult equivalent rather than per capita expenditure, which may further reduce the correlation of expenditure between rounds.
16. For a two wave panel, these are poor/poor, poor/non-poor, non-poor/poor, and non-poor/non-poor respectively.
17. The IIA assumption states that the odds ratio for one category in the MNL model is independent of the odds ratios for other categories (Greene, 1998).
18. To the author's knowledge neither of these models, both of which relax the IIA assumption, have been used for modelling poverty dynamics.
19. Fixed or random effect models also confer certain econometric advantages including the elimination of unobserved (time-invariant) heterogeneity, the reduction of collinearity, and providing more degrees of freedom (Baltagi, 2005).
20. If the mean intertemporal expenditure of households moving into and out of poverty is sufficiently different from one another, which they usually are not, then inter-quantile regressions could also be used for modelling transitions into and out of poverty.
21. See Baulch and McCulloch (2003) for an application of the proportional hazards model to a five-year panel from rural Pakistan.
22. See Baulch and Davis (2008) and Davis and Baulch (2009) for further details.
23. See, *inter alia*, Carter and Barrett (2006), Barrett et al. (2006), Lybbert et al. (2004) and Barrett and Carter (2001).
24. For example, in rural Ethiopia it has been suggested that possessing the two draught animals needed for ploughing upland fields corresponds roughly to the asset-poverty threshold in the grain plough systems of the Northern Ethiopian Highlands.
25. See Chapter 2 of the 2009 World Development Report for illustrations of this for the static poverty headcount.
26. See, *inter alia*, Badiani et al. (2007) for India, MRGI (2007) for China, and Duncan (2004) for Southeast Asia.
27. See, for example, the Kishoree Kintha programme in Bangladesh, which provides transfers of cooking oil to households whose daughters stay unmarried and in school http://www.povertyactionlab.org/evaluation/empowering-girls-rural-bangladesh.
28. See, for example, Rosenweig et al. (1988).
29. See Bird and Shinyakewa (2005), Devereux and Sharp (2006) and Davis and Baulch (2011).
30. See Davis and Baulch (2011). Selected annotated and anonymised life histories from the Bangladesh study are available at http://www.sdri.org.uk/bangladesh.asp.

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