

Idiosyncratic Shocks and Efficient Risk Sharing: An Investigation of Rural Malawi*

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Abstract

The aim of this paper is to investigate the ability of households in rural Malawi in insuring consumption against idiosyncratic income shocks. We examine the role of alternative instruments that enable households in insuring consumption. Our estimation results show that gifts (and more generally transfers within the family) and borrowing do not appear to be playing a significant role in insuring households against idiosyncratic income shocks. However purchases and sales of assets appear to be playing an important role. Households that face idiosyncratic income shock reduce their asset holding. We also find that households in rural Malawi are particularly vulnerable against demographic shocks: in particular there is a significant labour market effect for households that face demographic shocks. Our results have significant policy implications. Insurance through assets variation (the most common instrument used) is only effective in the short run and in the medium and long run this insurance mechanism could actually lead to a poverty trap. Our results imply that there is an urgent need for the government to implement coping strategies/policies that depend less on asset holdings.

Key Words: Risk Sharing, Insurance, Gifts, Credit, Assets, Labour Market Participation, Malawi.

JEL Classification: O12, Q12.

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1. Introduction

Households in rural Malawi, as in most developing countries, live in a risky environment where the state of health, weather variability, pests and unemployment could all lead to large and unexpected fluctuations in income over time. In addition these households have to often unexpectedly bear large expenses because of marriage, medical costs, funerals and the like. Given the low levels of per capita income, such income and consumption shocks can have devastating consequences.

There exists now a fairly vast literature on the ability of rural households in low-income countries to insure themselves against fluctuations in income.¹ Two different but related questions on the issue of risk and insurance in developing countries have been raised in the literature. The first issue is how insurable are different risks? There is mounting empirical evidence that suggests that households are able to insure against idiosyncratic shocks, i.e., even though income streams are quite volatile, consumption streams are remarkably smooth.² While formal markets for insurance are missing in most developing countries, informal mechanisms play an important role in filling the holes left by market failure. But the magnitude of risk pooling varies from one community to another. Second and often more importantly, if households are able to insure against idiosyncratic shocks, how do they do so? In other words, can we identify markets, institutions or technologies, which are

¹ See Townsend (1994), Alderman and Paxson (1994) and Skoufias and Quisumbing (2003) for surveys.

² For example Townsend (1994) using data from India finds that while the coefficient of variation of income of a set of households in the semi-arid tropics in India is close to 100 the coefficient of variation of consumption of the same set of households is around 50.

available to manage the risk? While the first question is interesting, from a policy point of view the answer to the second question actually turns out to be more important.

Townsend (1994) classifies the set of potential risk-sharing institutions into the following categories: (1) diversification of a given farmer's landholding into various spatially separated plots and into various crops, (2) storage of grain from one year to the next (a form of savings), (3) purchases and sales of assets, (4) borrowing from village lenders or itinerant merchants and borrowing/lending more generally, and (5) transfers within family networks. Households may adopt one or more risk management strategies and instruments to protect them from variation in income. They may choose more conservative production techniques so that output has low risk/variability but also has lower average yield (Morduch (1995)), run down savings (Paxson (1992)), use financial assets (Lim and Townsend (1998) and Behrman, Foster and Rosenzweig (1997)), sell productive assets like livestock (Rosenzweig and Wolpin (1993))³, increase borrowings (Udry (1990) and Udry (1994)), use family or ethnic ties to insure each other by providing state contingent contracts (Rosenzweig (1988), Grimard (1997), Fafchamps and Lund (2003), Ayalew (2003))⁴, send children to work instead of school Jacoby and Skoufias (1997) or make compensating changes in labour market participation in response to idiosyncratic income shocks (Kochar (1999), Rose (2001) and Maitra (2001)).

³ See summary by Fafchamps, Udry and Czukas (1998) on the use of productive assets for consumption smoothing purposes in Africa. Interestingly they themselves do not find any evidence to support the hypothesis that livestock inventories are used to smooth income fluctuations in semi-arid Africa.

⁴ Interestingly both Grimard (1997) and Ayalew (2003) reject the null hypothesis of complete risk sharing within the network group.

However the literature has focussed on the role of one particular institution/mechanism within a community in enabling households to smooth consumption against income shocks. But as Townsend (1994) argues, in studying one market or institution in isolation, one may miss smoothing possibilities provided by another. Very few papers have investigated the role of multiple institutions. Fafchamps and Lund (2003) is one of the few papers that do this. They investigate the role of transfers within the family network (gifts), borrowing and lending, and purchases and sales of assets in households in rural Philippines to smooth consumption against income shocks.

The primary aim of this paper is to examine the effectiveness of different institutions in rural Malawi in enabling households to insure against idiosyncratic shocks. The 1990s have seen profound shifts in most African countries and Malawi is no exception. Due to repeated droughts, Malawi in particular has shifted from self-sufficiency in maize production to being dependent on food imports and food aid. This situation has been exacerbated by the rapid spread and devastation of the HIV/AIDS pandemic that has swept through the African continent in the 1990s. Malawi is one of the poorest countries in the world and the HIV/AIDS pandemic has further undermined the country's efforts to reduce poverty. HIV/AIDS is now itself an important part of structural poverty in Malawi. The numbers are staggering. In 2001, UNAIDS estimated 8000 adult and child deaths arising from AIDS related complications (the crude death rate is 22.3 deaths per 1000). HIV/AIDS is the leading cause of deaths to those aged 20 – 49 (working age adults).⁵ All this has left rural Malawian households struggling to cope not only with prevailing poverty, but also

⁵ See Garbus (2003).

with highly variable income due to different types of risk factors associated with the state of health of the adult (working age) population.

Our paper uses the methodology developed by Fafchamps and Lund (2003) to examining the role of transfers within the family network, lending and borrowing and purchases and sales of assets in enabling households in rural Malawi to smooth consumption against income fluctuations. It also looks at alternative potential instruments, which can help insure households against income fluctuations.

Before proceeding further, let us briefly summarize the main results of our paper. We highlight three important results. First, our estimation results show that gifts (and more generally transfers within the family) and borrowing do not appear to play a significant role in insuring households against idiosyncratic income shocks. This is not a particularly surprising result in the African context. Indeed several papers have found that networks do not play a particularly important role in enabling households to share risk efficiently. For example Udry (1994) finds, using data from rural Northern Nigeria, that even though loan transactions depend on the realization of random shocks for both borrowers and lenders, a fully efficient income pooling equilibrium is almost never attained. Ayalew (2003) using data from rural Ethiopia finds that participation in informal networks is not “open”. For example he finds that land poor households cannot fully participate in these markets while farm households with more land have easier access to these informal networks. Both Udry (1994) and Ayalew (2003) argue that the main reason for full risk sharing not taking place

at a village level is enforcement constraint. In our paper as well we find that gifts and transfers within networks are not playing a particularly important role. We argue that this is possibly because of high degree of correlation between the fortunes of the different households in the village (or the risk-sharing network). Second we find that purchases and sales of assets appear to play an important role. Households that face idiosyncratic income shock reduce their asset holding. There is a fair amount of economic and anthropological evidence that argues that households in Africa use sales of productive assets (particularly livestock) to tide over income shortfalls (see summary by Fafchamps, Udry and Czukas (1998)). In some sense our results are more general, encompassing all assets and not restricted to purchase and sales of livestock only. Finally, our estimation results also show that households in rural Malawi are particularly vulnerable to demographic shocks. In particular we find that there are significant labour market effects for households that face demographic shocks. These results contradict those earlier obtained in the context of Malawi. Previous studies have found that work done by rural households in Malawi on a casual basis, typically wage employment (*ganyu*) plays an important role in smoothing shocks as well as coping with poverty (Melmed-Sanjak and Santiago (1996), GOM (1998) and Devereux (1999)). This implies that there should be a significant positive correlation between income shocks and earnings from *ganyu*. Our results with respect to wage labour strongly contradict this.

2. Methodology

The starting point of our analysis is the assumption that if risk is pooled efficiently, household consumption should be unaffected by idiosyncratic variations in income. Consider N household in a closed economy without storage. Each household $i, i \in (1, \dots, N)$ has an uncertain income $y_{s_t}^i$ where $s \in (1, \dots, S)$ denotes the state of nature and t denotes the time. So the vector of realised incomes of all households in the economy at time t when the realized state is s is denoted by $(y_{s_t}^1, \dots, y_{s_t}^N)$. Household i derives instantaneous utility $V(c_{s_t}^i, \theta_{s_t}^i)$ from consumption $c_{s_t}^i$ and $\theta_{s_t}^i$ denotes a preference shock that captures the need to cover unusual expenditures such as funeral expenses and medical bills. Pareto efficiency requires that ratios of agents' marginal utilities are equalized across the different states so that:

$$\frac{V'(c_{s_t}^i, \theta_{s_t}^i)}{V'(c_{s_t}^j, \theta_{s_t}^j)} = \frac{V'(c_{s_t}^j, \theta_{s_t}^j)}{V'(c_{s_t}^i, \theta_{s_t}^i)} \forall t, i, j, s, s' \quad (1)$$

If we assume a constant absolute risk aversion utility function of the form:

$$V(c, \theta) = -\frac{1}{\gamma} e^{-\gamma(c-\theta)} \quad (2)$$

Then on manipulating equation (1), the relationship between household consumption and community (aggregate) consumption can be written as follows (Townsend (1994), Cochrane (1992), Fafchamps and Lund (2003)):

$$c_{s_t}^i = \theta_{s_t}^i - \frac{1}{N} \sum_{j=1}^N \theta_{s_t}^j + \frac{1}{N} \sum_{j=1}^N c_{s_t}^j + \frac{1}{N} \left(\log \omega^i - \frac{1}{N} \sum_{j=1}^N \log \omega_{s_t}^j \right) \quad (3)$$

where ω^i denotes the welfare weight of household i .

Equation (3), or versions of it, has been extensively used as a basis for testing risk sharing by households. If risk is shared efficiently, equation (3) implies that household income should have no effect on household consumption. This is however not the end of the story. Suppose we find that we cannot reject the null hypothesis that households efficiently share risk. The question that arises now is: what enables these households to share risk efficiently? Unfortunately, these tests say very little on the mechanisms through which risk is shared. What we do in this paper is try and identify potential instruments that enable households to share risk efficiently. We start by looking at the role of gifts, borrowings and purchase/sale of assets.

Let $g_{s_t}^i$ and $b_{s_t}^i$ be the net gifts received and net borrowing of household i in state s at time t , respectively. Further, define Δw_t^i as the change in household assets over the period $(t-1, t)$. The full income constraint of the household can then be written as:

$$c_{s_t}^i = y_{s_t}^i + g_{s_t}^i + b_{s_t}^i + \Delta w_t^i \quad (4)$$

Combining equations (3) and (4), household consumption can be written as:

$$g_{s_t}^i + b_{s_t}^i + \Delta w_t^i = -y_{s_t}^i + \theta_{s_t}^i - \frac{1}{N} \sum_{j=1}^N \theta_{s_t}^j + \frac{1}{N} \sum_{j=1}^N c_{s_t}^j + \frac{1}{N} (\log \omega^i - \frac{1}{N} \sum_{j=1}^N \log \omega^j) \quad (5)$$

Household income $y_{s_t}^i$ can be broken into a permanent component $y_{s_t}^{iP}$ and a transitory component $y_{s_t}^{iT}$ such that:

$$y_{s_t}^i = y_{s_t}^{iP} + y_{s_t}^{iT} \quad (6)$$

The permanent income of the household $(y_{s_t}^{iP})$ together with the welfare weights (ω^i) can be considered to be a function of a vector of household characteristics and initial assets (X_t^i) . The household's transitory income, $y_{s_t}^{iT}$, depends on observed shocks, $z_{s_t}^i$. This representation is different from Paxson (1992) where shocks are constructed from income data. Fafchamps and Lund (2003) argue that there are at least two advantages to using observed shocks. First, this approach minimizes measurement errors and second, it allows us to incorporate consumption shocks as well as income shocks in the analysis. Village-time dummies (V_t) replace the aggregate variables $\left(\frac{1}{N} \sum_{j=1}^N \theta_{s_t}^j \text{ and } \frac{1}{N} \sum_{j=1}^N c_{s_t}^j \right)$, which are unobserved.

Central to our analysis is the idiosyncratic (household specific) shock. We construct two shock variables for each household: SHOCK1, which takes the value one if the household faced a crop shock and severe sickness, and 0 otherwise; and SHOCK2, which takes the value of 1 if the household faced severe sickness, death or a severe crop shock, and 0 otherwise. Notice that the way it is defined, SHOCK1 essentially captures health and the income shock, while SHOCK2 captures health, income and the demographic shock.

Another important issue is the need to take into account the dynamic structure of the problem at hand. We assume that gifts received by the household in period t are in response to shocks in period $t-1$. Ignoring the notation for the state, we can therefore write the estimating equation as:

$$g_t^i + b_t^i + \Delta w_t^i = \alpha_0 + \alpha_1 z_{t-1}^i + \alpha_2 X_t^i + \alpha_3 V_t^i + \varepsilon_t^i \quad (7)$$

Equation (7) implies that, if risk is efficiently shared among all households in the community, gifts and net borrowings will be higher for households that face an idiosyncratic shock and coefficients on the shock variables (α_1) should be positive and significant in the gifts and net borrowing regressions. On the other hand if households sell assets to tide over shocks, then the coefficient α_1 in the change in asset holding regression should be negative meaning that households that face an idiosyncratic shock reduce their asset holding. Shocks affecting a subset of households (aggregate shocks) are assumed to be captured by V_t^i and therefore should have no effect on net flows of funds to household i . The vector of household characteristics (X_t^i) in equation (7) include characteristics of the household head (age, sex, primary occupation and educational attainment), household size (by survey round), household composition (dependency ratio) and land holding in hectares.

It is difficult to predict which of the three channels – gifts, loans or changes in assets – help in efficient risk sharing, as there is no theoretical consensus. The choice of insurance instrument and the efficiency level depend on institutional imperfections. Separate regressions of $g_t^i, b_t^i, g_t^i + b_t^i$ and Δw_t^i on individual shocks will tell us which of these instruments (if any) allows efficient risk sharing by households in rural Malawi.

The regressions are conducted using OLS. We also computed the Random Effects regression but the results were similar and more importantly the null hypothesis that the fraction of variance due to the time invariant component of the error term $\left(\frac{\sigma_u^2}{\sigma_u^2 + \sigma_\varepsilon^2}\right)$ is equal to zero cannot be rejected. So the OLS estimates are consistent. The Random Effect estimates are however available on request.

3. Data and Selected Descriptive Statistics

The data set used in this study comes from a three-round household-level survey conducted by the International Food Policy Research Institute (IFPRI) in conjunction with the Rural Development Department of Bunda College of Agriculture, Malawi. The first round was administered in February 1995, and the last round in December 1995. The survey was conducted as part of a study of the determinants of access to and participation in the existing formal and informal credit and saving programs, and their effects on agricultural productivity, income generation, and food security.

The survey collected detailed information on (1) household demographics, (2) land tenure, agricultural production, livestock ownership, (3) asset ownerships and transactions, (4) food and non-food consumption, (5) credit, savings and gift transactions, (6) wage and self-employment income and time allocation (by individual adult members), and anthropometric status of preschoolers and their mothers.

Table 1 presents the sample means of certain key variables (aggregated over the three rounds). The average household size is 5 persons, with an average dependency ratio of 0.4.⁶ Women head 28% of the households in the sample. The average age of household head in the sample is 42 years. Around 68% of household heads attended primary school. Farming is the main occupation of the majority (66%) of the household heads in the sample. It is argued that asset ownership is an important determinant of access to credit. Land, as one of the most important form of collateral, has been recognized as the major constraint (among others) in the agricultural sector of Malawi, which is one of the most densely populated countries in Africa (Diagne and Zeller (2001)). Table 1 also presents selected descriptive statistics on households' ownership of various types of assets. The average total value of all household assets is about MK 6,700 (Malawi Kwacha).⁷ The average values of land and livestock are, respectively, MK 3,300 and MK 1,600 with an average land size of 1.7 hectares. The households in the surveyed area are mainly small landowners. In fact Malawi is reaching the point where land requirements by rural people may no longer be satisfied (see Diagne and Zeller (2001)). 57% of the value of household assets is made up of productive assets, including the ones for off-farm income-generating activities. The on-farm assets (cultivable land, farm equipment, and oxen) and livestock constitute, respectively, 44% and 11% of the total value of household assets. The survey data set also has information on who within the household owns the asset. We find that the household head owns more than 80% of the total value of all household assets.

⁶ The household dependency ratio is defined as the ratio of the household population younger than 15 or older than 64 to the household size.

⁷ Using the official exchange rate for 1993, this is approximately \$450 US.

Table 2 presents selected descriptive statistics on resource flows into the household (comprising of household income, gifts and loans, again aggregated over all rounds). It is clear that while households derive the majority of their income from farming, non-farm income-generating activities, which are less dependent on weather than farming income, also provide substantial income to Malawi rural households. Surveyed household are net recipients of gifts and net borrowers, though gifts and borrowing do not appear to be particularly important. This is consistent with the results of Diagne (1999) who reports that 71% of adult individuals in the sample did not ask for a loan during the three-round survey, the most common reason for not asking a loan being “dislike of or no need for borrowing”. Another way of looking at this is that the credit market is not as active in Malawi compared to other African countries.

Table 3 presents some more evidence on gift giving and participation in the credit market. The amount of gifts among the surveyed household is quite low. The figures are not only lower than what one would have expected for an African community, but also very low compared to other similar rural communities (for example rural Philippines).⁸ The figures for loan participation are also low and consistent with the results of Diagne and Zeller (2001). In average, participation in gifts and loans (both given and received) is 36.06 and 43.78% respectively.

⁸ See Fafchamps and Lund (2003).

We begin with testing whether there is a change in each of these variables (g_t^i, b_t^i and Δw_t^i) when households face a shock. The variable g_t^i is computed as informal gifts received minus gifts given out.⁹ The variable borrowing b_t^i is computed as loans received minus new loans given, plus loan repayment received minus loan repayment paid. One would expect gifts and borrowing to increase with household shocks.

The results presented in Table 4 are generally supportive of the notion that households use gifts and borrowing to insure against income shocks. Household faced with severe shocks during the survey received more informal gifts as well as gifts and borrowing combined, and the difference is significant in all cases. With respect to the variable borrowing, households faced with SHOCK1 (crop shock, severe sickness) appear to have borrowed more though the difference is not statistically significant ($t = -0.944$). Households faced with SHOCK2 (crop shock, severe sickness or death) appear to have borrowed less but the difference is not statistically significant.

4. Estimation Results

Our first estimation involves regressions of gifts, informal borrowing, gifts and borrowing, and variation of assets on household shocks, households' characteristics and village dummies. The village-time dummies control for both aggregate shocks and differences in village average income level. If gifts, borrowing and combined gifts and borrowing serve

⁹ Gifts from Non Governmental Organizations are provided in the survey data. However, we do not include them, as the aim of the paper is to investigate the informal risk-pooling mechanisms.

to smooth consumption, the coefficients of household shocks should be positive and significant. Also households faced with shocks are expected to run down some of their assets as an attempt to smooth the shocks. This implies that the coefficient of household shocks should be negative and statistically significant. The estimation results, which are presented in Table 5, indicate that five of the eight coefficients have the expected sign. However, only coefficients on the variation of assets are statistically significant. These results indicate that when faced with adverse shocks, households in rural Malawi rely relatively more on the sales of their assets to smooth consumption. Remember that demographic shocks are captured by SHOCK2. To a large extent, in the context of Malawi such a shock arises because of deaths from HIV/AIDS related complications. Our results contradict those obtained by Oni, Obi, Okorie, Thabede and Jordaan (2002) who conclude that AIDS affected households draw down on savings and also borrow more compared to non-AIDS affected households (primarily to cover for medical and funeral expenses). Our estimation results do not provide any evidence of the household resorting to increased borrowing when faced with demographic shocks. If anything, the coefficient estimate of SHOCK1 is negative and weakly statistically significant for the net borrowing regression. This implies that for households facing SHOCK1, net borrowing actually decreases.

However, one should note that variation in asset holding, as an insurance instrument is effective only in the short run. To see this let us assume that assets variation is the only insurance mechanism available in a given community. Consider a household A at time $t = 0$, with an initial level of assets W_0 . Assume that in order to smooth consumption,

household A runs down part of its assets when faced with a shock at time $t = 1$ such that its level of assets at that point of time is $W_1 < W_0$. Household A is unlikely to run into deeper trouble as far as the probability for a shock not to occur in the next two to three periods is equal to one. However, this scenario is almost impossible in the rural environment. The occurrence of risks is unforeseeable and unpredictable. Generally shocks are recurrent in rural areas even though the nature (and magnitude) of these shocks may vary from period to period. Once household A runs its level of assets down, it will require time and resources (in the absence of shocks) for the initial level of assets to be replenished otherwise there is a risk of falling into a poverty trap. Though the above illustration appears to be simplistic, it helps to understand the possible explanation of the poverty level in rural Malawi following the succession of droughts in the 1990s.

We do not report the coefficients for the other variables in the model. They are however available on request. The estimation results show that gifts received by the household are significantly higher for male-headed households and is significantly lower for larger households. Net borrowing is higher for households where the head has attended primary school. Finally change in asset holding is positively related to the head of the household attending primary school and land holding of the household.

Alternative Instruments:

Essentially, the estimation results presented in Table 5 imply that gifts and borrowing do not appear to be playing a particularly important role in insuring households against

idiosyncratic income shocks. The question that arises then is: are there other instruments that the households use? We look at four possible alternative instruments and examine whether households use these instruments to insure against income shocks. The four instruments that we look at are: crop sales (reduction in buffer stock), savings, wage income and off-farm income as dependent variables. The first two variables serve as a measure of assets variation at a disaggregated level in response to shocks and the last two variables serve to investigate whether surveyed households respond to shocks by looking out for additional employment or by exploring other sources of income. We essentially run variations of equation (7), only in this case the dependent variables are different. If households use crop sales and/or run down savings as an instrument to insure themselves then the coefficient associated with the shock variable (α_1) must be negative and statistically significant. On the other hand, if wage income and off-farm income respond to shocks (i.e., households increase labour market participation in response to shocks) the coefficient associated with the shock variable must be positive and significantly different from zero. The results, presented in Table 6, show that none of these four variables help surveyed households to smooth shocks. Three of the eight coefficients have the right sign (SHOCK1 on off-farm income; SHOCK1 and SHOCK2 on savings). Only one of the coefficients is significant, (SHOCK2 on wage income) but in this case the sign of the coefficient estimate is the opposite of what the theory of efficient risk sharing predicts. The coefficient estimates in this case imply that wage income is significantly lower for households that face SHOCK2. Remember that SHOCK2 is essentially a demographic shock, and so our results imply that households in rural Malawi are unable to insure labour

income from demographic shocks.¹⁰ Our results however contradict those obtained in the context of Malawi. Previous studies have found that work done by rural households in Malawi on a casual basis, typically off-farm (*ganyu*) plays an important role in smoothing shocks as well as coping with poverty (Melmed-Sanjak and Santiago (1996), GOM (1998) and Devereux (1999)). This implies that there should be a significant positive correlation between income shocks and earnings from *ganyu* (wage labour). Our results with respect to wage labour strongly contradict this. Though none of the coefficients on savings is significant, their negative sign for both shocks implies that savings decrease with shocks; this is in line with the theory underlying the use of financial savings for insurance purposes.

5. Policy Implications and Concluding Remarks

The primary aim of this paper is to investigate the success (or otherwise) of households in rural Malawi in insuring consumption against idiosyncratic income shocks. Our estimation results show that gifts (and more generally transfers within the family) and borrowing do not appear to be playing a significant role in insuring households against idiosyncratic income shocks. However, purchases and sales of assets appear to be playing an important role. Households that face idiosyncratic income shock reduce their asset holding. Our estimation results also show that households in rural Malawi are particularly vulnerable against demographic shocks. In particular we find that there is a significant adverse labour market effect for households that face demographic shocks.

¹⁰ Our results are similar to those obtained by Kochar (1995), who finds using data from the ICRISAT villages in India, that households are unable to insure against demographic shocks.

Our results have powerful policy implications. Malawi is one of the most densely populated countries in Africa with an approximate population of 11 million people. Nearly half of the population is below the age of 15. It is estimated that roughly 80 percent of Malawi's population live in rural areas and depend on farming as the main source of livelihood. Diagne and Zeller (2001), report that about 60 percent of the rural population live in absolute poverty. Rural food insecurity is widespread as a result of repeated crop failures, which have been translated into severe food shortages. About 80 per cent of rural households could be classified as 'asset poor'. The results of this study raise a major concern as households with limited assets are vulnerable because of at least two reasons: firstly because of their relative poverty and secondly, they have few items to diversify from when faced with shocks.

One possible explanation of the results of this study with respect to the inefficiency of informal gifts and borrowing to smooth consumption is that there may be a relatively high degree of correlation between the fortunes of the households in the survey area. Indeed excluding the repeated crop failures (mostly due to droughts), Southern Africa is one of the regions that have been most affected by AIDS. For example Bollinger, Stove and Palamuleni (2000) report that HIV/AIDS related conditions occupied 70 per cent of hospital beds in Malawi in 1999. It is believed that the prevalence rate of HIV for the adult population is 15 per cent. This has a direct negative impact on households' productive capability. The HIV/AIDS epidemic can be translated as a temporary as well as a

permanent income shock: temporary shock, because the diseased member of the household cannot fully participate in the labour market as well as some other members who are primary carers; a permanent shock when death occur in the case of the household head (and/or the spouse). Devereux (1999), reports that *'the spirit of helping those in need in rural communities is dwindling'* (p. 49). He follows on by saying that *'It is not that people are more mean but they are less able to help because nowadays nobody seems to have enough even for themselves'*, (p. 49). Given the evolution of HIV/AIDS epidemic in southern Africa and Malawi in particular, one could argue that sickness has become an aggregate shock which has some idiosyncratic effects mostly determined by the timing of sickness. For example if a HIV/AIDS-related sickness sets in just before the start of the cultivation season, it has a heavy impact on the households' food and livelihood security. In the same way the length of the duration of a sickness has a great impact on the household.

Given that insurance through assets variation (the most common instrument used) is only effective in the short run and that in the medium and long run, this insurance mechanism could lead to a poverty trap, our results imply that there is an urgent need for the government to implement coping strategies/policies that depend less on asset holdings.

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Table 1: Selected Descriptive Statistics

Number of Households	402
Male Headed Households	291
Female Headed Households	111
Average Household size	5
Average Dependency ratio	0.4
Mean age of household head	42
Head attended primary school (%)	68
Main occupation of household head (%)	
Farming	66
Household work	3
Wage labourer	8
Trader	8
Other self-employment	10
Student	0
Unemployed	2
Other	3
Average value of	
All assets	6,681
Land	3,306
Productive assets ^a	4,154
Livestock (total)	1,571
Non-productive assets ^b	2,528
Share of assets (%) held in the form of	
Productive assets	57
On-farm assets	44
Livestock	11
Land	57
Average size of land holdings (hectares)	1.7
Share of assets owned by head	83
Hectares of land owned by head	80
Share of on-farm assets owned by head	73
Share of cultivable land owned by head	69

Notes:

^a: On-farm assets (cultivable land, farm equipment, and oxen) and livestock.

^b: Non-cultivable land, buildings, furniture, and household utensils.

Table2: Income, gifts and loans

	Mean	Coefficient of variation
Sources of income		
Off-farm self-employment	2793.1	2.742
Wage income	276.001	3.286
Unearned income ^a	22.814	7.637
Crop production	4762.686	2.088
Total value of production sold (MK)	305.893	8.565
Gifts and Loans		
MK total value of gifts received	81.378	3.832
MK value of gifts given out	54.799	4.796
Net-gift for the household	26.604	13.376
Loans received (borrowing)	1281.546	1.617
Loans given out	122.504	3.229
Net borrowing	1149.428	1.764
Net gifts and borrowing	1175.162	1.76
Number of Households		402

Notes:

^a: Include income from sales of some assets, rental.

Table 3: Participation in gifts giving and credit in rural Malawi

Participation during survey	Gifts (%)	Loans (%)
Receive gifts or loan over the three rounds	56.21	78.35
Give gift or loan over the three rounds	56.71	52.48
Receive and give over the three rounds	36.06	43.78
Do not participate over the three rounds	21.64	24.48
Number of Households		402

Table 4: Gifts, Borrowing, Change in Asset Ownership and Shocks

	Gifts	Borrowing	Gifts and borrowing
SHOCK1			
No	0.221 (470)	0.161 (466)	0.283 (466)
Yes	0.302 (288)	0.194 (288)	0.364 (288)
t-test of Difference	-2.494***	-0.944*	-2.342***
SHOCK2			
No	0.203 (379)	0.178 (375)	0.282 (375)
Yes	0.300 (379)	0.176 (379)	0.345 (379)
t-test of Difference	-3.111***	0.068	-1.865***

Notes:

Figures in parenthesis indicate sample size.

Significance: *: 10%; **: 5%; ***: 1%

Table 5: Effects of shocks on gifts, borrowing and variation of assets.

	SHOCK1	SHOCK2
Gifts	0.082 (1.064)	0.051 (1.087)
Borrowing	-0.117* (-1.721)	-0.064 (-1.544)
Gifts + Borrowing	0.038 (0.459)	-0.001 (-0.018)
Change in Asset Ownership	-0.180** (-2.085)	-0.120** (-2.197)

Notes:

Figures in Parenthesis are t-values

Significance: *: 10%; **: 5%

Regressions also control for Characteristics of the Household Head, Household Size and Composition, Household Land Holding and Village-time Dummies

Table 6: Effects of shocks on crop sales, wage income, off-farm income and savings.

	SHOCK1	SHOCK2
Crop Sales	-0.027 (-0.376)	-0.066 (-1.485)
Wage Income	-0.059 (-0.694)	-0.037** (-2.062)
Off-farm Income	0.005 (0.060)	-0.063 (-1.184)
Savings	-0.128 (-1.548)	-0.045 (-0.860)

Notes:

Figures in Parenthesis are t-values

Significance: **: 5%

Regressions also control for Characteristics of the Household Head, Household Size and Composition, Household Land Holding and Village-time Dummies