

SUPPORTING HOUSEHOLDS AND COMMUNITIES DURING REGIONAL DISASTERS: DROUGHT IN RURAL MALAWI

Simon Davies¹, University of Bath, UK, November 2007

Abstract

This presentation draws on two recent works by the author. The first of these analyses the impact of household shocks – such as sickness – and regional shocks – such as drought – on household consumption in rural regions in a developing country, Malawi. Using rigorous econometric techniques, the paper finds that household shocks such as sickness can have important consequences for household consumption. However, many households receive gifts from friends and neighbours which help them to cope with these shocks. Regional shocks however are a different story; neighbours are unable to use gift-exchange as a means of supporting each other as almost all households in the region suffer from, say, a drought. Instead, only a lucky few (around 10%) who have relatives who send them money from the cities or other regions unaffected by the shock are able to insulate themselves against such disasters. Households are forced to sell livestock (savings) and productive assets (hoes, ploughs,...) in order to survive. Research has shown that this can have negative consequences for communities for years to come. In order to prevent whole communities from suffering, external help is needed during these shocks. This is the focus of the second paper. It analyses a programme undertaken by Concern Worldwide with funding from the British Department for International Development which aimed to secure the food entitlement of households in a Malawian region that suffered from a severe drought during the 2005/06 agricultural season, while the rest of the country generated surplus agricultural production. Cash transfers were given to around two thirds of households in the region using modern technological methods. The households were then able to purchase surplus grain produced elsewhere, and did not have to sell their productive assets in order to do so. The programme helped to support food consumption, contributed towards education and farming inputs for the following agricultural season, and greatly assisted local business.

¹ Email author: sd245@bath.ac.uk. Draft papers available on www.bath.ac.uk/~sd245/.

“Remittances as Insurance for Household and Community Shocks in an Agricultural Economy: The Case of Rural Malawi” – A Summary

Rural households in developing countries have to cope with regular income shocks. Some, such as health shocks, are largely unique to the household whilst others, such as droughts, affect the whole community. Previous research (e.g. Dercon et al., 2005) find that these shocks can have a persistent negative impact on consumption levels in households already near the breadline.

In order to survive these shocks, households resort to a number of coping strategies. They might be forced to sell (productive) assets, potentially reducing future agricultural output, and keeping them poor. Alternatively, they might sell livestock (effectively savings) – this is helpful during periods of idiosyncratic shocks, but community shocks result in everyone selling livestock, depressing the price. Other coping mechanism includes increased labour market participation; substituting towards cheaper forms of nutrition, and remittances. Here, the focus is on remittances as a means of insuring shocks.

Shocks such as illness might be insured through gifts and remittances from within the home village, but insuring against shocks affecting the entire community is more difficult. This requires remittances from places where the weather pattern is as uncorrelated as possible with the home village, or where livelihood sources are different (such as cities).

A number of authors have looked at insurance in developing countries with a wide range of results. For example De Weerd and Dercon (2006) find that unexpected health shocks result in a 7.3% decrease in consumption in rural Tanzania, whilst predictable ones tend to be already integrated into households' consumption. Asfaw and von Braun (2004) find that when household heads suffer ill health in Ethiopia, purchased food consumption declines, but total food consumption is unaltered.

In addition, a few authors have analysed the spatial, or geographical, nature of risk in developing economies. Paulson (2000) finds that remitters are less likely to move from other Thai regions to Bangkok the more Bangkok's rainfall covaries with that of their home province (in Thailand, economic growth is strongly correlated with the previous year's rainfall). Rosenzweig and Stark (1989) find that household in rural India attempt to diversify risk spatially by sending their daughters to marry into other villages where weather patterns are as uncorrelated as possible with their home village given the constraint of travel expenses.

This study combines these two approaches. It aims to look at the use of remittances in insuring shocks in an agricultural economy, whilst considering that remittances are received from different geographical sources. Those from far away are more suitable for insuring weather-related shocks, whilst those from close to home may be more suitable for insuring idiosyncratic shocks (in order to reduce the problem of information asymmetry which exists over large geographical distances).

Key results

Use a household level panel dataset (4 rounds) from rural Malawi containing 2355 observations. The survey was conducted between 2000 and 2002 and data are supplemented with weather data by the Famine Early Warning System Network.

Table 1: Correlations between shocks and remittances by sources†

	Shock			
	Health	Death	Flood	Drought
Local Remittances (Dummy)	0.0308	0.0237	-0.0455*	-0.0364*
Distant Remittances (Dummy)	0.0294	0.0067	-0.006	0.0493*
Local Remittances (Value)	0.0355*	0.0341*	-0.0408*	-0.0251
Distant Remittances (Value)	-0.0235	-0.0021	0.0788*	-0.0034

* indicates significance at 10% level, † Local remittances are considered to be from the home village or district, distant remittances from another district, urban areas or abroad.

- Remittances from close to home (local) are positively correlated with idiosyncratic shocks (health, death), but negatively correlated with community shocks.
- Distant remittances are positively correlated with shocks affecting the whole community (flood, drought) or else insignificant.

Table 2: Probit: Receive Remittances (1=Yes, 0=No) †

	Total	Distant	Local
Sick Member Dummy	0.174***	0.131	0.161**
Death Dummy	0.132	0.066	0.129
Flood Dummy	-0.147	0.103	-0.310**
Drought Dummy	-0.083	0.506*	-0.527*

* indicates significance at 10% level, † Local remittances are considered to be from the home village or district, distant remittances from another district, urban areas or abroad. Only key coefficients reported. Other variables included are Flood, Drought, Log of Per Capita Income, Female head, Age, Age squared, Education, Household size, Head married dummy, Migrant dummy, Whether accessed credit, Whether head belongs to any business, political, religious or social organisations, livestock and non-livestock asset indexes, and round and region dummies.

- Probit models indicate that more likely to receive remittances from either local or distant sources following health shock.
- Less likely to receive remittances from local sources following floods or droughts.
- More likely to receive remittances from distant sources following drought shock.

Estimate model based on theoretical and empirical work by a wide range of authors. Notably Cochrane (1991); Mace (1991); Harrower and Hoddinott, 2005; Barrera and Pérez-Calle (2005); Dercon et al. (2005); de Weerd and Dercon (2006) and many more.

The aim is to understand whether shocks impact on change in consumption after controlling for other elements that may have influence. If not, then shocks can be considered insured. The model is augmented to include interactions between remittance receipts and shock variables to assess whether remittances can have a moderating impact.

$$\Delta \ln c_{t,v}^h = \alpha + \beta S_{t,v}^h + I_1[\alpha^{l_2} + \beta^{l_2}(S_{t,v}^h)] + \delta S_{t,v}^l + I_2[\alpha^{l_2} + \delta^{l_2} S_{t,v}^l] + \varphi X + \varepsilon_{t,v}^h$$

The dependant variable is the change in log of consumption. S's indicate household shocks (superscripted h) and community shocks. I's are interaction terms between remittances and shocks. X are household characteristic controls. In addition, round and region dummies are included. ε is the error term.

Errors are corrected for heteroskedasticity using White's (1980) method as well as for potential clustering, and initial household characteristics (collected during the first interview round) are used in order to eliminate the possibility of endogeneity amongst this set of control variables. Key coefficients are reported in the table below:

Table 3: Dependant variable: change in log of consumption

	1	2	3	Receive Distant Remittances		Receive Local Remittances	
				Yes	No	Yes	No
Sick Member Dummy	0.534***	0.640***	0.640***	-0.172	0.583***	0.239	0.637***
Sick*RemLocal		-0.389**	-0.372**				
Sick*RemDistant		0.009	0.001				
Death Dummy	-0.071	-0.064	0.188	-1.160**	0.112	-0.008	-0.049
Death*RemLocal			-0.338				
Death*RemDistant			-0.828				
Flood Dummy	0.141	0.123	0.015	0.417	0.046	0.324	0.153
Flood*RemLocal			0.174				
Flood*RemFar			0.626				
Drought Dummy	-0.806***	-0.934***	-0.960***	-0.600	-1.092***	-1.995***	-0.688***
Drought*RemLocal		-1.115***	-1.078***				
Drought*RemDistant		1.012*	1.055**				

*, ** and *** indicate significance at the 10%, 5% and 1% levels respectively. Only key coefficients reported. Other variables included are Flood, Drought, Female head, Age, Age squared, Education, Household size, Head married dummy, Migrant dummy, Whether accessed credit, Whether head belongs to any business, political, religious or social organisations, livestock and non-livestock asset indexes, Log of Initial Per Capita Income and round and region dummies.

- Drought has a strong negative impact on change in consumption. Interaction variable between Drought and Distant Remittances shows that household which remittances moderate the impact of drought for those that receive them, and drought shocks insignificant for those that receive distant remittances. Also cannot rule out the possibility that Drought*Distant Remittances and Drought sum to 0.
- Flood insignificant, perhaps because variable not sensitive enough to pick up difference between household which have lost everything (for example, those with poor quality land at the centre of the flood) and those that actually benefitted from the increased rainfall (those at the edge, with good quality land).
- Death insignificant.
- Health shocks positive and significant! Needs further investigation.

Results robust to:

- Fixed effects (panel).
- Excluding households for which a probit correctly predicted health shocks.

- Separate analysis of food, non-food and non-food excluding health consumption.

There are some interesting results when health shocks are analysed in more depth. For example, when we consider *who* suffers from illness. In addition, consumption is split into food, non-food, and non-food excluding health.

Table 4: Dependant Variable change in log of per capita consumption

	Food Consumption	Non-Food Consumption	Non-Food excl. Health
Sick Adult Female	-0.009	-0.172	-0.197
Sick Adult Male	0.366***	0.266**	0.171
Sick Girl	0.433***	0.492***	0.614***
Sick Boy	0.489***	0.298**	0.305**

*, ** and *** indicate significance at the 10%, 5% and 1% levels respectively. Only key coefficients reported. Other variables included are Flood, Drought, Female head, Age, Age squared, Education, Household size, Head married dummy, Migrant dummy, Whether accessed credit, Whether head belongs to any business, political, religious or social organisations, livestock and non-livestock asset indexes, Log of Initial Per Capita Income and round and region dummies.

- Health shocks suffered by adult females never impact on change consumption. Adult females do not appear to benefit from increased food or non-food consumption following health shocks!
- Children benefit from increased food, non-food, and non-food excluding health. Otherwise put, they benefit from increased food consumption, health consumption, and other non-food consumption following health shocks.
- Adult makes benefit from increased food consumption and increased health consumption.

Interesting results are also obtained when male and female headed households are analysed separately.

Table 5: Dependant Variable change in log of per capita consumption

	Food Consumption		Non-Food Consumption		Non-Food excl. Health	
	Female Head	Male Head	Female Head	Male Head	Female Head	Male Head
Sick Adult Female	0.624**	-0.252	0.213	-0.325*	0.123	-0.317
Sick Adult Male	0.392	0.371***	0.347	0.276**	0.046	0.203
Sick Girl	0.330	0.469***	0.603**	0.503***	0.708*	0.639***
Sick Boy	0.364	0.537***	0.212	0.308**	0.008	0.339**

*, ** and *** indicate significance at the 10%, 5% and 1% levels respectively. Only key coefficients reported. Other variables included are Flood, Drought, Female head, Age, Age squared, Education, Household size, Head married dummy, Migrant dummy, Whether accessed credit, Whether head belongs to any business, political, religious or social organisations, livestock and non-livestock asset indexes, Log of Initial Per Capita Income and round and region dummies.

- Males do best in male headed households, and females in female headed households!

There remains the possibility that health shocks are endogenous and this is driving some of the results – notably in relation to health. That is, there is a possibility that health shocks and change in consumption are determined

simultaneously. The Instrumental Variable or excluding the lowest income categories for whom the simultaneity problem will be most serious is used to correct this, with all major results remaining robust.

Conclusions

Coming back to the main theme of the work, there is some evidence confirming the hypothesis that idiosyncratic (household) shock can be and are insured close to home through remittances. In addition, the evidence is not strong, but nonetheless, is in favour of the idea that community shocks can be insured with remittances from outside of the home district. Geography matters for insurance in agricultural economies.

It should be noted that few households actually benefit from distant remittances, however:

Table 6: Receipt of Remittances by Source

Receive Remittance From:	Obs	Mean
Local*	2355	26.80%
Distant†	2355	10.60%
Total	2355	34.60%

† Local remittances are considered to be from the home village or district, * distant remittances from another district, urban areas or abroad.

This, combined with the econometrics results, and other economic insights has one clear policy implication: Limited state and donor resources in developing countries should be used to insure households against exogenous, community shocks such as weather shocks. This will help to minimise any crowding out which may occur if the state or donors insure idiosyncratic shocks, and minimise incentive and asymmetry of information problems. It will reach more households (since few receive distant remittances), and help insulate households in agricultural economies from the long run impact of weather related shocks which hinders development prospects.

“A Regional Multiplier Approach to Estimating the Market Impact of Cash Transfers: The Dowa Emergency Cash Transfer Programme in rural Malawi” – A Summary

Although Malawi as a whole benefited from a bumper harvest in 2005/06, some areas suffered from poor rains. The impact of a poor harvest is seen when food stocks are exhausted which occurs during the “hungry season” of December to March just before the following year’s harvest is due around April.

One area affected by a poor harvest is northern Dowa District. Concern have been operating in this area for a number of years, and implemented an emergency response with the intention of allowing households to meet their food entitlement. With this aim in mind nearly MK14m was distributed to 8,384 beneficiaries in December 2006 and MK17m to 10,161 beneficiaries in January 2007. This represents over 60% of the total population in the area.

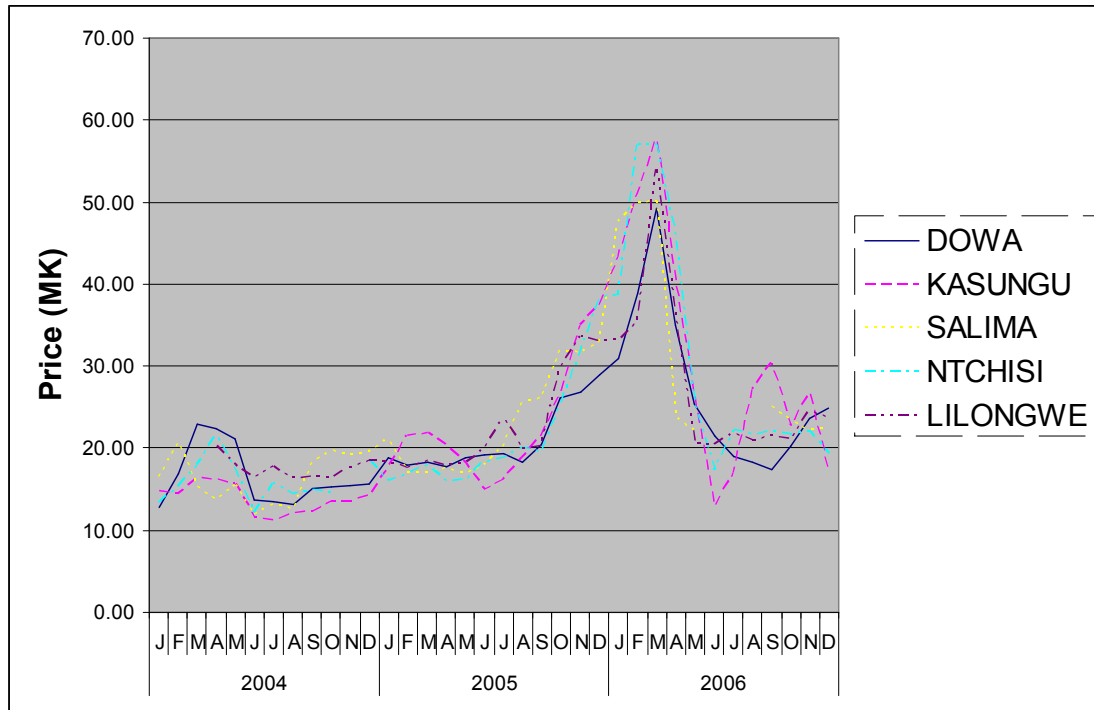
Unlike other food programmes which offer aid in kind, the Dowa Emergency Cash Transfer (DECT) programme intended to allow households to purchase their own food by distributing cash to those in need. This is a particularly useful strategy given that Malawi as a whole produced a grain surplus. This combined with a maize export ban ensured large supplies of maize were already in the country giving the market a chance to respond to shortages in northern Dowa District.

Maize shortage forces up prices in affected areas; the high prices combined with the additional purchasing power now given to the households in the area means that maize is attracted into the region helping to keep prices to a minimum and allowing households to meet their food requirements. The main aim of the programme appears to have been met with some success. However, such a programme will inevitably have secondary social and economic impacts. A study carried out during the implementation of the programme used qualitative and quantitative methods to help understand these secondary economic effects. This article provides a short summary of the methods used and the principal findings.

Maize Prices

Any significant injection of cash into a small local economy is likely to have an impact on prices. Price information was gathered during the DECT programme as well as during a similar programme in 2005/06 and is combined with medium-run pricing data obtained through FEWSNET.

Figure 1: Maize Price Fluctuations in Dowa and Neighbouring Districts



Source of data: MoAFS through FEWSNET Reports (<http://www.fews.net/>)

Available evidence suggests that supply was able to respond to increased demand in accessible areas minimising any inflationary effects. In more inaccessible areas, the programme may however have created additional inflation. Anecdotal evidence suggests that this is partly due to risk aversion on behalf of traders who are unwilling to travel to unknown areas, even with the prospect of large profits. Quantifying any inflationary pressure created by the project is however difficult to assess since Malawi as a whole had a large maize surplus and government policy prohibits export causing excess supply and a nation-wide price crash in January.

Use of Transfers

An additional benefit of the programme is that beneficiaries can use the money as they judge best. This prevents such occurrences as beneficiaries of food aid selling their maize back to traders. It also allows traders a market for their product and helps to support other businesses during a difficult period of the year. Finally, the readiness with which beneficiaries identified themselves to shopkeepers and traders suggests that there is some pride in being seen as a beneficiary and helped to gather evidence on spending habits from traders. The uses of transfers are described in the table below.

Table 7: Percentage of Transfer Spent on Different Goods - DECT

Product	Dec-06	Jan-07
Maize	51.00%	48.89%
Fertiliser	9.00%	4.30%
Saved	5.00%	5.36%
Rice	5.00%	4.53%
Beans/Pulses	4.00%	4.56%
Wheat	4.00%	4.50%
Cassava/Potato	4.00%	4.51%
Debt Repay	3.00%	2.68%
Milling	4.00%	3.99%
Tea/Salt/Other		
Food	4.00%	2.55%
Medical	3.00%	3.69%
Body Care	2.00%	2.34%
Other	2.00%	5.15%
Education	0.00%	2.95%
(Total food excl. maize)	25.00%	28.14%
	100.00%	100.00%

Source: Concern Worldwide, "December Transfer Monitoring Report" and DECT PTM Survey – Author's calculations.

Understanding of beneficiaries' purchases mean that their spending could be assigned to different groups of traders, farmers, shopkeepers etc. which benefited indirectly from the DECT programme and this was then used as the basis for estimating the multiplier.

Multiplier Effect

The report uses two methods to estimate the regional multiplier resulting from the DECT Programme in the area affected.

Firstly, using beneficiaries' reported spending patterns, secondary beneficiaries were identified and interviewed to ascertain their own spending patterns. This permitted the cash injection to be "followed" around the local economy until it is spent elsewhere. Groups which benefit were classified and spending by each group with all other groups was analysed in matrix form with one group's spending being another group's income. This allows for the creation of a "Reduced" Social Accounting Matrix (RSAM) from which the regional multiplier was calculated using standard techniques and the total impact for each group estimated after all spending rounds have been completed.

Individuals representing each group were interviewed to obtain quantitative expenditure information and additional qualitative information. Under different assumptions, a regional multiplier of between 2.00 and 2.79 was estimated with beneficiaries' spending being treated as the exogenous stimulus. The lower region of these estimates is favoured as being under more realistic assumptions of 10% of initial beneficiary spending being outside of the region, and rent and transport expenditure largely leaving the region.

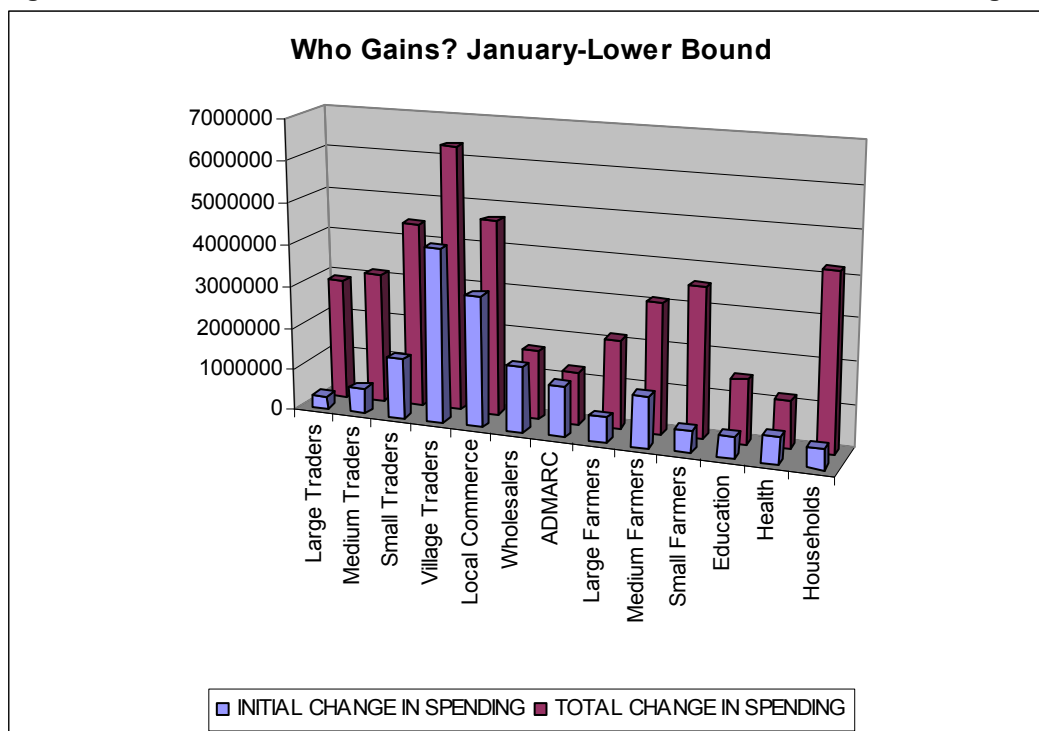
Using data from the 1998 Malawian census, this report goes on estimate the multiplier for northern Dowa District at 2.11 using the "minimum

requirements” method, helping to confirm the multiplier estimate as being in the lower region of the estimates using the RSAM. These estimates are in line with upper estimates other similar studies have found in developing countries and are a result of the links between different groups within the local economy. These links mean that several traders within the local region are likely to handle a good before it reaches the final consumer, with each adding value by transporting or repackaging it.

Secondary DECT Beneficiaries

The direct beneficiaries of the DECT programme spend most of their cash in the local economy. This creates secondary beneficiaries in the form of the traders who sell their goods, the school and clinics which receive their fees, the local stores that now have additional trade. The story does not stop there, as the secondary beneficiaries then spend this income with each other and with other groups in the region. The RSAM can be used to estimate the total increase in income for each group resulting from the cash injection. Noting that each group’s total gain is estimated and that more individuals are included in some groups than others, local commerce and village traders are significant winners with many people making purchases from these two groups in rural areas with small towns. Smaller farmers gain more than their larger counterparts; an unsurprising result given that smallholders are the backbone of the Malawian economy. Households are also gain (both beneficiaries’ and others’) since part of the money finds its way back into their pockets in the form of wages, casual labour payments and gifts. Finally, both clinics/hospitals and schools also gain with a part of the money being spent on health and education. Total gains in Malawian Kwacha for each group are shown in the table below.

Figure 2: Total Gains from DECT cash transfers in Malawian Kwacha for each group



Education and Health

Qualitative evidence indicates that the impact for schools is particularly important and deserves greater attention. The schools interviewed reported improvements in enrolment/drop-out rate as well as fee-paying which was put down almost exclusively to the DECT programme. One school also indicated improvements in students' concentration resulting from being properly fed thanks to DECT.

The expenditure on health is born out through an interview with a private clinic in the area. The clinic reported better business in December and January this year compared with the same period last year. This was put down partly to the DECT programme. The doctor reported one case of a man who had been ill and in great pain for 3 weeks before coming to the clinic. The man said he was a Concern beneficiary, and did not have the money to pay for treatment beforehand.

Labour Market

Anecdotal evidence suggests that there may be a reduction in unemployment as a result of the programme. It is more likely however that labour market benefits are in the form of reduced underemployment with those already (self-) employed working harder to meet increased demand. Similar anecdotal evidence suggests that there has been not only a demand-side impact on labour but also a supply-side impact. Beneficiaries are less likely to offer their services in the form of casual labour creating problems for larger farmers.

Understanding the impact on the labour market is key to understanding the degree to which the multiplier represents increase production of goods and services resulting from the increased demand. In the short run, increased consumption on aggregate can only be met through increased work; if no additional employment is created, increased consumption on one person can be met only through another's reduced consumption.

Traders' Views on DECT

Qualitative information suggests that local businesses and traders have strongly positive views regarding the DECT programme. Most recognised the benefit for themselves personally, and were particularly grateful of the demand stimulated and from which their businesses benefit during the most difficult period of the year. Although some reported initial misgivings about the mis-use of the cash, there is now general satisfaction with the fact that the transfers tend to go the females and are not abused.

Anecdotal evidence collected from businesses regarding spending habits of beneficiaries (who can usually be readily identified) supports the theory that beneficiaries are spending their transfers on worthwhile goods including food; school fees; health etc. Some however indicates that a small amount is spent on "extravagant expenditure" with one bar reporting busy nights on the day of the distribution.

Conclusions

Overall the programme has been a success both in terms of its main aims of ensuring that households are able to meet their food requirement, as well as for the rest of the local economy. The beneficiaries have spent their money in ways which have both permitted their survival and helped to improve their longer run situation by investing in health, education and fertiliser.

Such programmes are new, and there remains much to be understood about their total impact in both the long and short run. Donors must be cautious that such programmes do not have inflationary effects and it is important to track the usage of the transfers. This analysis however suggests that under the right circumstances (particularly a food surplus in nearby areas) there is room for cash transfer programmes in the traditional aid armoury to help fight hunger, and improve the lot of impoverished regions in more far-reaching ways.

Simon Davies
University of Bath
Bath
BA2 7AY
United Kingdom

Full papers available on author's website or via email:

Email: sd245@bath.ac.uk

Web: <http://www.simon-davies.org.uk/research.html>