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**A REGIONAL MULTIPLIER APPROACH TO ESTIMATING THE IMPACT  
OF CASH TRANSFERS ON THE MARKET:  
The Case of Cash Transfers in Rural Malawi\***

**Simon Davies<sup>†</sup> and James Davey<sup>‡</sup>**

**Abstract**

This paper analyses the impact on the local economy of an emergency cash transfer programme in rural Malawi. The results are of interest given the growing use of cash transfers as development aid as well as the increasing popularity of such transfers as a form of social protection across Sub-Saharan Africa. Using a form of social accounting matrix, we find that there are widespread benefits for regional economy as a whole (with multiplier estimates of 2.02 to 2.45) and for certain groups in particular. Small farmers and small businesses gain particular advantage as this is where poorer households' purchases are focused; education and health also benefit. Such payments can also help to support the regional economy during the most "lean" periods of the year.

*(124 words)*

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## **1 Introduction**

Development aid in the form of cash transfers is a recent phenomenon which is becoming ever more popular with such programmes being used following the Asian Tsunami in 2004 (Doocy et al., 2006; Harvey, 2007). Furthermore, there are moves to provide social safety nets in Sub-Saharan Africa in the form of cash transfers (Farrington et al., 2006). This is the case in Malawi for example, where the Government of Malawi and UNICEF are currently undertaking a pilot programme to assess the plausibility of a nationwide scheme.

Despite these trends, little is known about the overall impact of such transfers on local economies. To date, few such programmes have been undertaken and little research has been conducted regarding the impact of often comparatively large (compared to the size of the local economy) cash injections. Exceptions include Barrientos and DeJong (2006) who conclude that cash transfers “are an effective tool in reducing child poverty” (p.548); Mattinen and Ogden (2006) who evaluate a cash transfer programme carried out in Somalia by *Action Contre la Faim*. The programme used the traditional *hawalaad* system to bypass the country’s poor formal financial infrastructure and conclude that such transfers are useable in conflict environments – even on a long-term basis. Willibald uses evidence collected in several African countries where ex-combatants have benefited from cash transfers as part of the demobilisation and reintegration process. Despite noting several caveats, he poses the question “does money work?”, which he answers with a simple “yes”.

A better understanding of the wider effects of cash transfers is of paramount importance given their increased popularity and the lack of in-depth studies analysing the consequence. Several authors have suggested that cash transfers can have a beneficial impact on the wider economy (e.g. Devereux et al, 2006). In an excellent overview of cash transfers, Harvey (2005) cites programme evaluations which show local traders can benefit in terms of increased turnover (estimated to be between 15 and 50% increases from an ICRC voucher programme in the West Bank) and multiplier impacts, estimated to be in the range of 1.5 and 2.6 in Mexico.

This paper contributes to the understanding of impacts of such programmes on the regional economy. We take a regional multiplier approach in order to estimate the total contribution to the regional economy of the Dowa Emergency Cash Transfer (DECT) programme, carried out in Dowa, Malawi during the 2006/07 agricultural season. A “Reduced Social Accounting Matrix” is constructed which allows us to estimate not only the total impact, but also permits us to identify which economic actors, apart from the recipients, benefit from the programme. The results are verified using a “minimum requirements” approach to multiplier estimation based on 1998 census data.

A large harvest in Malawi in the 2005/06 agricultural season ensured that the country as a whole had a food surplus that would last well into the following agricultural season. Some areas however, suffered from isolated crops failures that negatively impacted on harvests and incomes.

One such area was Traditional Authority (TA) Chakhaza in northern Dowa district in central Malawi, where particularly low rainfall during the agricultural season devastated the maize harvest on which inhabitants’ diets rely. In previous years poor maize harvests had been offset by income from the tobacco cash crop, but poor prices for tobacco offered in 2006 greatly reduced this income dealing a double blow to household livelihood security.

The net result of this situation in Dowa District was 59,400 people or approximately 11,000 households unable to access enough food in the 2006 to 2007 consumption year (Brewin et al. 2006). According to the Malawi Vulnerability Assessment Committee (MVAC) the missing food entitlement for this population was in the range of US\$85 to US\$117<sup>1</sup> for the year (MVAC 2006), a considerable amount for a small holder farmer to raise from their own resources. Without external assistance these households would have faced malnutrition and been forced to exploit risky coping strategies<sup>2</sup> to maintain even minimal food consumption.

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<sup>1</sup> Using an exchange rate of US\$1=MK140

<sup>2</sup> Risky coping strategies include selling basic assets necessary to produce minimal amounts of maize, and transactional sex with its link to HIV/Aids. Transactional sex has been shown to increase during food crises (Conroy et al., 2006: p.129).

## 2 Literature Review

Although they are taught in every first year economics course, the estimation of regional multiplier has fallen out of favour with economists. In addition, most work carried out in this area has tended to favour industrialised countries with few such studies being undertaken in the developing world. Despite this, the regional multiplier is an ideal tool to analyse the impact of cash transfer programmes on the market.

Regional multipliers can be used to help evaluate the total impact on a region of an exogenously stimulated change in demand. They have been widely used in the UK and the US to help understand the consequences of Government intervention in a region through transfer payments or investment; and to understand the wider economic impact of tourism on a region (Frechtling and Horváth, 1999; Steele, 1969; Mulligan and Gibson, 1984). Recent trade literature seeks to understand the effect of foreign direct investment (FDI) on the receiving country or region partly through the linkages that are created with local firms (supply side) and workers (demand side) (Javorcik, 2004; Coe and Helpman, 1993). The recent growth of remittances also lends itself to such analysis.

Although multiplier studies rarely concentrate on developing countries, one study of the impact of a project on income in Malawi has been conducted, and several examples exist for developed countries. Giles and Jennings (1982) attempt to establish, through the multiplier, the total national impact of the Viphya Pulp Mill<sup>3</sup> which was to be constructed during the early eighties at the edge of the Viphya plateau in Malawi, an area already used for the growing of pine trees to make paper for export. Using a simple definition of the multiplier, they use national data to estimate a marginal propensity to save of 0.2, and a marginal propensity to import of 0.14. This produces a multiplier estimate of  $k = 1/(s + m) = 2.94$  which is used, with the associated estimates of foreign currency gains to estimate the impact of the mill on the entire Malawian economy (calculated to be an increase in GDP of 1.9% by 1988). Regions within countries can be expected to exhibit higher marginal rates of import (from

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<sup>3</sup> The Viphya Pulp Mill was never constructed due to negative impact assessment reports which indicated that the mill would have negative consequences on pollution in Lake Malawi and on fish stocks.

other regions). Thus, estimates for a small region such as Dowa District would usually be lower than 2.94.

A series of articles appearing in the Oxford Economic Papers in the late 1960s perform estimates for regional multipliers in the UK. Archibald (1967) aims to narrow the plausible range of regional multiplier values for UK regions of a similar relative size to that of Dowa. After a few reasonable assumptions, he narrows this range down to  $1.2 < k < 1.7$ , much lower than Giles and Jennings' (1982) national estimates for Malawi. These estimates are confirmed by Steele (1969) who uses Ministry of Transport data to estimate regional imports and exports. Steele (1969) goes on to show that including feedback effects has a positive but very small impact on the total multiplier effect<sup>4</sup>. The present study does not attempt to measure the feedback effect.

Greig (1971) notes that cash injections into the local economy are not neutral and are likely to spark other changes. In the case of Malawi, a cash injection may be compensated by a decrease in other transfers, for example from relatives living in Lilongwe, the nearby capital or nearby provincial towns. Although not the aim of this paper to estimate such consequences, this is potentially a non-negligible effect in Malawi, where around 20% of households receive gift or remittance income (Davies et al., 2006) which makes up 6.3% of total household income (Chipeta and Kachaka, 2005). Thus the impact on change in regional income could be better written as:  $\Delta Y = k(\text{INJECTION less IMPORTED GOODS less OTHER LOSS})$ .

Mulligan and Gibson (1984) estimate multipliers for 21 communities in south western United States using and comparing four different indirect methods. In all cases, employment is used to estimate the multiplier. One of the principal indirect methods used by these and other authors is the “minimum requirements” approach which uses non-basic employment in industry  $i$ ,  $E_{Ni}$  (employment producing for consumption *inside* the region) as a proxy for regional production and consumption. Total employment in the region  $E_T$  is the sum of basic and non-basic employment. A version of this method is used in this report to confirm the results found by more detailed analyses.

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<sup>4</sup> Feedback effects are the benefits to the local economy caused by leakages from other regions' multipliers which themselves arose from leakages in the region of interest.

This method is endorsed by Woller and Parsons (2002) who formulate the estimate non-basic employment as  $E_N = a + b \log_{10} POP$  suggesting that a good linear relationship between basic employment in each section and population is achieved by regressing the log to the base ten of the population of the community on basic employment. Using this method, they find a multiplier of 2.24 for the village health bank programme of Project HOPE in Portoveijo, Ecuador.

Moore (1975) uses the minimum requirements approach to estimate multipliers in the United States by city population and minimum employment percentage. He finds multipliers ranging from around 1.25 to almost 5 for large, almost self-sustaining cities. A similar example for a developing country, Nicaragua, is found in Brodsky and Sarfaty (1977). Using the minimum requirements approach, they estimate multipliers of between 1.25 and 1.69 for different municipalities.

Frechtling and Horváth estimate the multiplier effects of tourists in the Washington DC economy using a previously developed regional input-output model. Since some industries, notably services, are less likely to have leakages to other regions, each industry multiplier is estimated separately with estimates between 1.24 and 1.39. These authors also note the importance of the employment-multiplier interaction which is expanded upon in this report.

Estimating the economic impact of peacekeeping in former war-torn countries, Carnahan et al. (2006) use a “back-of-the-envelope” calculation to apply an income multiplier of 1.5 for local expenditure on peacekeeping activities. This is much lower than the national figure for Malawi estimated by Giles and Jennings (1982). Since peacekeeping expenses, like the DECT programme, can be seen as exogenous to the local economy, it is interesting to note some of their other findings. In particular, such expenses have an inflationary impact, but these are mostly localised and do not impact on the broader economy. UN peacekeeping activities generate jobs and the overall economic impact is positive (even aside from the simple fact that peace is a necessary precondition for economic growth). However, the authors do conclude that outside

intervention creates a dependency culture where outside agencies become a major component of local economic activity.

This study develops a Social Accounting Matrix which allows not only for the calculation of the multiplier, but also provides an indication of the economic actors who benefit from the secondary consumer expenditure.

### **3 The Dowa Emergency Cash Transfer Programme**

To meet the humanitarian need in TA Chakhaza Concern Worldwide developed a programme to deliver cash rather than food aid; this was felt the most appropriate response in the circumstances where the lack of food was due more to issues of access rather than supply. The programme, targeted just over 10,000 households with cash transfers for five months. The average transfer was US\$12.26<sup>5</sup> per household per month; the actual transfer was varied for each household according to size and adjusted each month to match changes in staple food prices.

Due to the increasing focus on cash transfers for social protection as well as in humanitarian interventions stakeholders in Malawi were interested in developing delivery mechanisms that could deliver transfers on a national scale (Concern, 2006). To meet this objective Concern contracted the development bank, Opportunity International Bank Malawi (OIBM), to deliver the transfers using mobile banks. To eliminate or reduce misallocation of funds each beneficiary was issued with a smart card that held bio-metric information as well as their cash entitlement.

The third and final objective of the programme was a research agenda based around the impact of the cash on local markets. This agenda was felt to be extremely important as there was very little literature regarding the effect of cash transfers in humanitarian situations. Good data collection and evidence building was expected to inform the design of future programmes to maximise their benefit. This study is itself a product of this research agenda.

At the time of writing the DECT programme had just ceased field operations; although findings of the external evaluations were yet to be released, early indications

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<sup>5</sup> Using an exchange rate of US\$1=MK140



are of a successful programme. The primary objective of meeting the humanitarian need was monitored monthly using a number of key indicators. The panel data showed that mean number of meals had risen from an average of 1.41 in November prior to the first transfers to 2.41 in April a clear improvement. Concern also tracked livelihood impacts using a Coping Strategy Index (CSI). “A household’s Coping Strategy Index score is the sum of the number of times over the last 30 days a household has resorted to various coping strategies which are weighted in order of severity. The higher a household’s score, the more destructive that household’s coping strategies are” (Brewin et al. 2006). The CSI for DECT beneficiaries was averaged at 77 in November prior to the first transfers dropping to 38 in April; this improvement strongly indicates a positive impact on livelihood security for targeted households.

In addition to the quantitative data, focus group discussions made it clear that there is a strong beneficiary preference for cash, as the choice and flexibility offered by cash allowed households to make decisions based on their individual circumstances. The significant sums that this study records as accruing to education and health facilities clearly demonstrates this decision making in action.

The impact of the modality development and research objectives are more difficult to gauge at the time of writing as their aim was to inform future programmes and policy. However, a great deal of interest has been expressed by governments, donors and other stake holders in Malawi and the wider region in the programme evaluations and research. One indication of success of the modality is the degree that the banking service has been adopted by the beneficiaries and wider community. Focus groups work has found that “50 to 60% of households would be interested in having access to credit and savings facilities through a mobile bank” (Brewin 2007), and were willing to pay for the service themselves. As a result Concern and OIBM are planning to maintain mobile banking services in TA Chakhaza.

#### **4 Developing a Social Accounting Matrix for Dowa District**

The principal method used to calculate the multiplier and to analyse the regional spillover effects of the DECT programme is the Social Accounting Matrix (SAM). The SAM classifies market actors and analyses financial flows between them. This framework permits the estimation of the flow of the cash around the local economy. More specifically, it allows us to “follow” the exogenous cash injection around the local economy and to identify secondary and other higher order beneficiaries of the programme. In this case, the SAM is constructed for Traditional Authority Chakhaza which is situated in northern Dowa district, the region in which the DECT programme took place.

The SAM is notoriously difficult to construct and requires accurate income and expenditure data of a type not widely available in developing countries<sup>6</sup>. This study uses data collected as part of the DECT Monitoring and Evaluation (M&E) process which analyse consumers’ reported spending of their transfer.

Based on reported consumer expenditure patterns, interviews were conducted with the secondary beneficiaries to establish spending patterns of all relevant actors in the local economy. Secondary beneficiaries’ assets are treated as fungible for practical reasons, and due to the fact that many are businesses which tend to exhibit large degree of fungibility of assets.

All interviewees were asked to recall expenditure in the month of January. Follow-up questions for each expenditure item were asked in order to ascertain where and from whom each purchase was made. For each category of economic actor, average expenditure flows with all groups (including their own) were calculated. Expenditure formed the basis for the construction of the SAM, with income being used only to verify responses. This is primarily due to time constraints and the fact that expenditure is seen as being less sensitive information than income helping to ensure more honesty in responses and a greater degree of accuracy.

This approach is different from the one often taken in constructing a SAM. In particular average rather than total expenditure flows around the local economy are

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<sup>6</sup> For a detailed study see Adelman et al. (1987)

used. Since our aim is not to describe the whole of the inputs and outputs of the region but instead to allow us to “follow” financial flows around the region, this approach is justified. As with all similar studies, this approach makes the assumption that marginal propensities to consume are equal to average propensities to consume. Alternatively, all income elasticities are assumed equal to unity. This is an unrealistic assumption but is a common one in such analyses, and an assumption of the basic multiplier concept. Due to differences from the standard model, we refer to our SAM as a “Reduced Social Accounting Matrix” (RSAM).

It is a weakness of the model that income earned through secondary household income generated by the DECT project (for example through labour or gifts) is treated as income from the cash transfer programme. This assumption is justifiable only on the grounds of simplicity, and the fact that the impact is small. The model could be improved by allowing consumers to spend “normal” income such as that earned through casual labour in a different way. This would require further data on total consumer expenditure rather than focussing on the use of the transfers.

This framework allows for the DECT transfers to be “followed” around the local economy until it leaves. These leakages are largely in the form of imports (of fertiliser for example), tax or savings.

*Average* income and expenditure is calculated based on a sample of interviewees rather than *total* regional financial flows. Although this leaves the potential for selection bias, it is believed that a reasonable sample has been obtained of “typical” actors, and that the information provided is of a high degree of accuracy. Sensitivity analysis reveals that the calculation of the multiplier alters very little when one observation is removed or one added, and there is no consistency in the direction of the change in the multiplier. This indicates that the estimates obtained are of a reasonable degree of accuracy. Furthermore, although the numbers interviewed in some categories is low, it should be recorded that the region is small (with a population of under 64,000 in 1998), and these represent a reasonable proportion of the entire population for many of the categories. This is notably the case for schools, hospitals and the parastatal Agricultural Development and Marketing Corporation

(ADMARC) which has traditionally played an important role in both buying and selling agricultural produce and inputs.

Previous literature<sup>7</sup> provides guidelines regarding the classification of key economic actors. It was of specific interest however to understand the impact of the programme on key groups of individuals in the community. The standard categorisation was thus modified to take this into account. Table 1 shows the principal actors identified through field visits, data previously collected by Concern Worldwide and the opinions of those familiar with the area.

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<sup>7</sup> See, for example, Adelman et al. (1988) and Pyatt and Rand (1985)

**Table 1: Relevant Economic Actors**

<b>Category</b>	<b>Division</b>	<b>Description</b>	<b>Number Interviewed</b>
Maize (and other) Traders	Large Traders	>1000mT maize traded per year.	3
	Medium Traders	100-1000mT per year.	3
	Small Traders	50-100mT per year.	4
	Village Traders	Traders who sell a wide range of items around villages, including maize, other food stuffs, and non-food stuffs.	5
	ADMARC	The parastatal “Agricultural Development and Marketing Corporation”	2
Commerce	Local Commerce	A catch-all category including canteens, taverns, fixed market stalls, shops.	11
	Wholesalers	Includes suppliers of farming inputs, construction materials and large food stores.	5
Farmers	Large Farmers	>25mT maize produced per year.	6
	Medium Farmers	5-25mT per year.	3
	Small Farmers	0.25-5mT per year.	3
Households	Consumption, Labour, Gifts/Remittances	Information taken from CWW’s M&E data and verified with supplementary checks.	
Institutions	Schools	Any schools requiring payment of school fees.	4
	Health	Large Hospitals and small, private clinics.	2
	Savings/Investment	Private and Business saving is accounted for.	--
Government	External Financial Flows	Notably taxes. The impact of the fertiliser subsidy is not analysed and no attempt is made to quantify it.	--
Imports		Any purchases made outside of TA Chakhaza. Includes gifts made to relatives outside of the local area.	--

Some activities are analysed in detail to assess the impact of the transfers on the main sectors (maize, fertiliser) or those of specific interest such as education and health. Expenditure by one actor represents income for another actor.

Interviewees overwhelmingly reported that they did not separate business from other household income. Thus even large traders reported spending on health and education. The exception to this rule is wholesalers which are often national firms and for which only business expenditure was entered. This helps to provide a more accurate picture of the local economy.

Classifying interviewees posed several difficulties. Definitions for farmer and trader size were provided in Agar and Chiligo (2007), and it was possible to ascertain “normal” production/trading levels from farmers and traders in order to help categorise these groups. Other information such as sales in January and farm size was also obtained where necessary to assist in classification.

This categorisation of farmers and traders has been used to allow comparison with previous studies of the value chain in Dowa District and which were of interest to the overall evaluation of the programme (Agar and Chiligo, 2007), however, it should be noted that it is an approximate classification with those falling into the medium-sized categories are often only slightly larger than “small” or slightly smaller than “large”.

Other problems occur because traders are often not only traders. The fact that Malawian maize traders call themselves “businessmen” pertains to this difficulty. Businessmen are often involved in several areas of commerce placing their money in different areas depending upon the time of year. The aim is to ensure continual movement of money in order to turn a profit and not to waste potentially productive resources by leaving them in the bank<sup>8</sup>. This occurs for a number of reasons including high, and often unpredictable, inflation levels; the seasonality of many business enterprises (with income and thus sales being strongly linked to agricultural cycles); the lack of access to a formal banking sector in rural areas; and a social climate in which the perception of having high savings may be problematic for social relations.

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<sup>8</sup> Although money in the bank might be earning interest, this is often below the rate of inflation in Malawi. Furthermore, businessmen are conscience of the fact that the rate of return which can be earned by investing the money elsewhere (usually in a secondary business) is higher than the bank interest rate. Finally, Malawi traditionally has an unstable macroeconomic climate and unstable inflation causing the real rate of return to be risky and potentially negative. If a less risky return can be earned elsewhere then the money will again be preferred out of the bank. Although the macroeconomic environment is stabilising in Malawi, such habits take a long time to break as trust must be earned with consistently stable and trustworthy macroeconomic policy. Furthermore, the apparent risk aversion of businessmen in Dowa exacerbates this.

Examples of “difficult-to-class” businessmen include a former teacher who was a large trader, owned a fixed store and had financed and owned a private secondary school. In another example a medium-sized (nearly large) farmer also traded maize and owned a fixed stall in the market. In yet another example, a large trader also owned a fixed market stall and a mini-bus. An attempt was made to classify such businessmen according to their main activity. However, it should be noted that this was an imperfect science, and their main activity varied throughout the year.

Despite these problems, we believe our classification into categories to be a reasonable representation of the main business activities of respondents. Furthermore the results are robust to modifying the categories of respondents in borderline cases.

In order to ascertain the initial use of the cash post-transfer monitoring data collected by the DECT Monitoring and Evaluation team were used. These data contain information on the source of maize purchase, and on the funds used for other purposes. Spending patterns are summarised in Table 2.

**Table 2: Percentage of Transfer Spent with Different Sectors – DECT**

<b>Sector</b>	<b>Jan-07</b>
<b>Large Traders</b>	1.73%
<b>Medium Traders</b>	3.49%
<b>Small Traders</b>	8.34%
<b>Village Traders</b>	23.94%
<b>Local Commerce</b>	18.14%
<b>Wholesalers</b>	9.05%
<b>ADMARC</b>	7.12%
<b>Large Farmers</b>	3.49%
<b>Medium Farmers</b>	6.95%
<b>Small Farmers</b>	3.08%
<b>Education</b>	2.95%
<b>Health</b>	3.69%
<b>Households</b>	2.68%
<b>Savings</b>	5.36%
	100%

**Source: Adapted from ACG Consultants, “December Transfer Monitoring Report” and DECT Post Transfer Monitoring Data – Authors’ calculations.**

With a matrix of average expenditure flows around the regional economy, we are able to calculate a multiplier for the DECT cash injection and analyse which groups were the key secondary beneficiaries. Proportional income and expenditure is calculated by

dividing each income category by total expenditure for each group in order to find the “technology matrix”, which is denoted **A**.

The technology matrix is subtracted from the identity matrix, **I**, and the resulting matrix is inverted to obtain a multiplier matrix, **M**. This is the matrix equivalent to calculating the standard multiplier,  $k=(1/(1-MPC))$ . In matrix form, this can be denoted as  $\mathbf{M}=(\mathbf{I}-\mathbf{A})^{-1}$

The multiplier matrix gives per sector multipliers which are then multiplied by the exogenous change in expenditure (denoted by **x**) given by the DECT transfers in order to find the total change in demand for each industry, denoted by **y**. In matrix form, this can be written as  $\mathbf{y}=\mathbf{M}\mathbf{x}$ . For simplicity, the exogenous changes in expenditure are taken to be beneficiaries’ spending of their cash transfers, given in Table 2 above, whilst the income and expenditure balancing factors are assumed to be the other exogenous categories including imports/exports and external institutions<sup>9</sup>.

#### ***4.1 Multiplier Estimations***

All expenditures not made by direct beneficiaries of the programme relate to January 2007. Since spending patterns are likely to vary greatly throughout the year as businessmen pursue different activities and household consumption bundles change with the agricultural cycle, we choose to focus on the month of January. Seasonal differences are also exacerbated by the fact that the school year and health problems also vary with the agricultural season (Conroy, 2006b, p.35). Estimations are however provided of the multiplier based on beneficiaries’ reported uses of transfers in December 2006; February, March and April 2007.

Several estimations of the multiplier are provided which should be viewed as upper and lower bounds and which differ depending upon the assumptions made. Upper bounds assume that all rent payments (for housing, businesses and farms); petrol consumption; and travel expenses are made within the region. The lower bound assumes such payments leave the region. In reality, interviewees indicated that part of

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<sup>9</sup> For a good exposition of constructing SAM to calculate multipliers see Pyatt and Round (1985).



these expenses were made within TA Chakhaza and part outside meaning that the true multiplier is likely to lie somewhere between these boundaries.

The upper bounds also contain one other assumption which is likely to make the estimates of the multiplier biased upwards. All purchases by beneficiaries were assumed to be made within TA Chakhaza, with savings being the only first round leakage from the local economy. Although anecdotal evidence from interviewees suggests that this is not too far from the truth, there is certainly some leakage. The lowest bounds allow for 10% of the initial spending to occur outside of the region. Although no empirical evidence was collected to support this (we use data collected by the DECT Monitoring and Evaluation team), anecdotal evidence suggests that these estimates offer more reasonable boundaries for the regional multiplier since many beneficiaries living near the boundaries of the area often choose to shop in market towns (and large villages) outside of TA Chakhaza. Multiplier estimates for January 2007 of between 2.02 and 2.79 are presented in Table 3.

**Table 3: Multiplier Estimates, January 2007**

	<b>Lower Bound</b>	<b>Upper Bound</b>
<b>All Beneficiary Expenditure Assumed Local</b>	2.30	2.79
<b>10% Beneficiary Expenditure Assumed External</b>	2.02	2.45

Similar values are obtained for other months by adjusting beneficiary spending while holding all other links unchanged. These estimates may seem large, however, they are of the same order of magnitude as several other studies have found in other countries. Giles and Jennings (1982) find a multiplier of 2.94 for the whole of Malawi for the Viphya Paper Mill Project; Woller and Parsons (2002) find a multiplier of 2.24 for a village health bank project in Ecuador while Moore (1975) estimates multipliers for different regions in the United States finding results between 1.25 and 5.00, depending upon the region. These results are also confirmed using a different method for calculating the regional multiplier. The “minimum requirements” approach used to verify and expand on these results finds a regional multiplier of 2.11 for TA Chakhaza. Finally, the linkages between and within sectors in Dowa are important. Several economic actors are likely to exchange any good before it reaches the consumer, even once that good is inside TA Chakhaza. Each agent adds value to the consumer with each having a highly specialised role. This serves to increase the multiplier.

The multiplier indicates that the total impact of such a programme for the whole region is significantly larger than the amount of aid initially given. In particular, businesses repeatedly indicated that they were grateful to the programme for helping to maintain a stream of business income at a time of the year which is often difficult.

The transfer permits beneficiaries to access goods and services they would not otherwise have had access to. The question must arise as to whether additional goods and services were created to meet the additional demand or whether goods and services were diverted from other people's consumption, that is, whether the transfer had a redistribution effect.

Since both unemployment and underemployment are rife<sup>10</sup> in Malawi there is ample room for increased demand for rurally-produced goods and services to increase production of these services.

Finally, anecdotal evidence in the form of complaints from large farmers supports the theory that the cash transfers have reduced supply of labour while increasing demand. Targeted beneficiaries are also the most likely group to offer their labour services on farms in the form of *ganyu* (casual labour). The cash transfers make them less dependent on *ganyu* income and their labour is transferred to either work on their own small farms or they remain unemployed. A potentially important side effect of labour being transferred from large to small farms relates to productivity. If small farms are less productive than larger ones, then the total output of the region will suffer as a result. Analysis of this impact is beyond the scope of this paper.

Despite these caveats, it is likely that the programme did generate additional production on a local level, with many local businesses reporting increased demand during distribution days. There were no examples of businesses reporting employing additional workers as a direct response to the increased demand, suggesting that the scheme contributed to reducing underemployment of those already employed rather

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<sup>10</sup> The ISH2 (2005) indicates that the average employed Malawian works an average of 27.7 hours per week, whilst the average unemployed Malawian works an average of 4.6 hours per week. These figures disguise great seasonal variation with long hours being worked when it is necessary for agricultural work to be undertaken and few hours at other times.

than having an impact on unemployment. The “minimum requirements” approach used to estimate regional multipliers suggests that there is a link between the multiplier and unemployment.

#### ***4.2 Impact of DECT for Different Sectors***

The multiplier suggests that there are “rounds” of spending. The cash transfer is spent in the first round by the primary beneficiaries; the secondary beneficiaries then spend the income they have received from the first round, and so on. The main secondary beneficiaries are identified by Concern Worldwide’s own data which tracks recipients’ spending of the transfers. Using the RSAM framework we estimate the total gains of each group after all spending rounds have been completed.

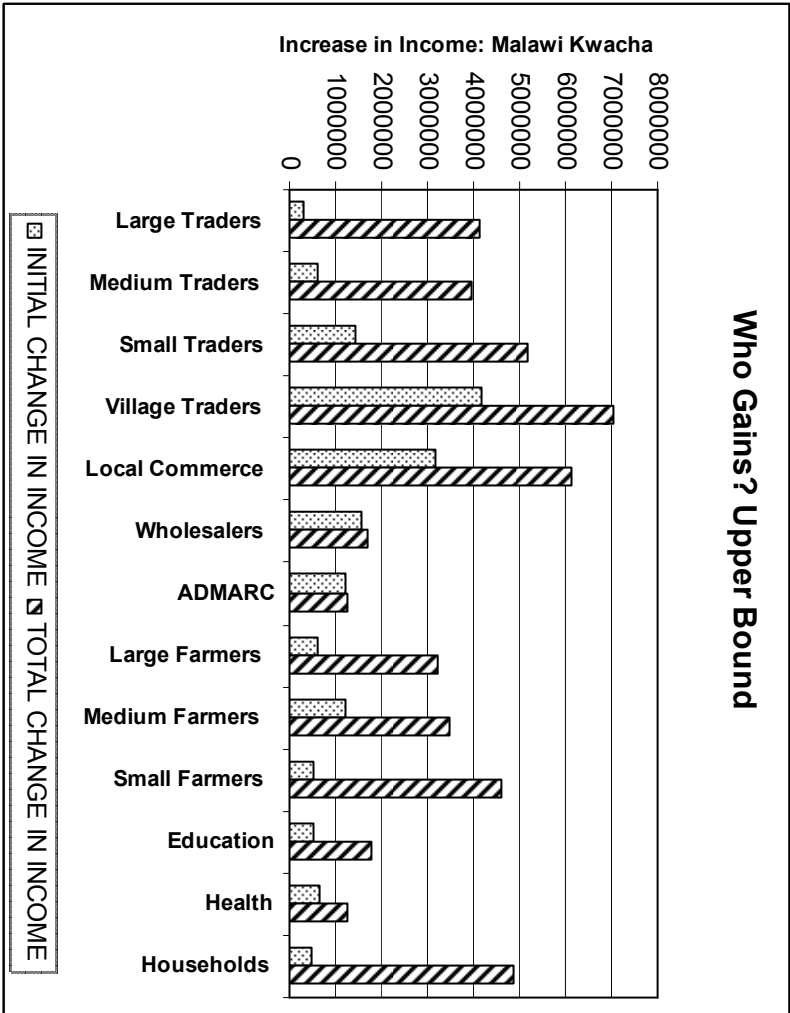
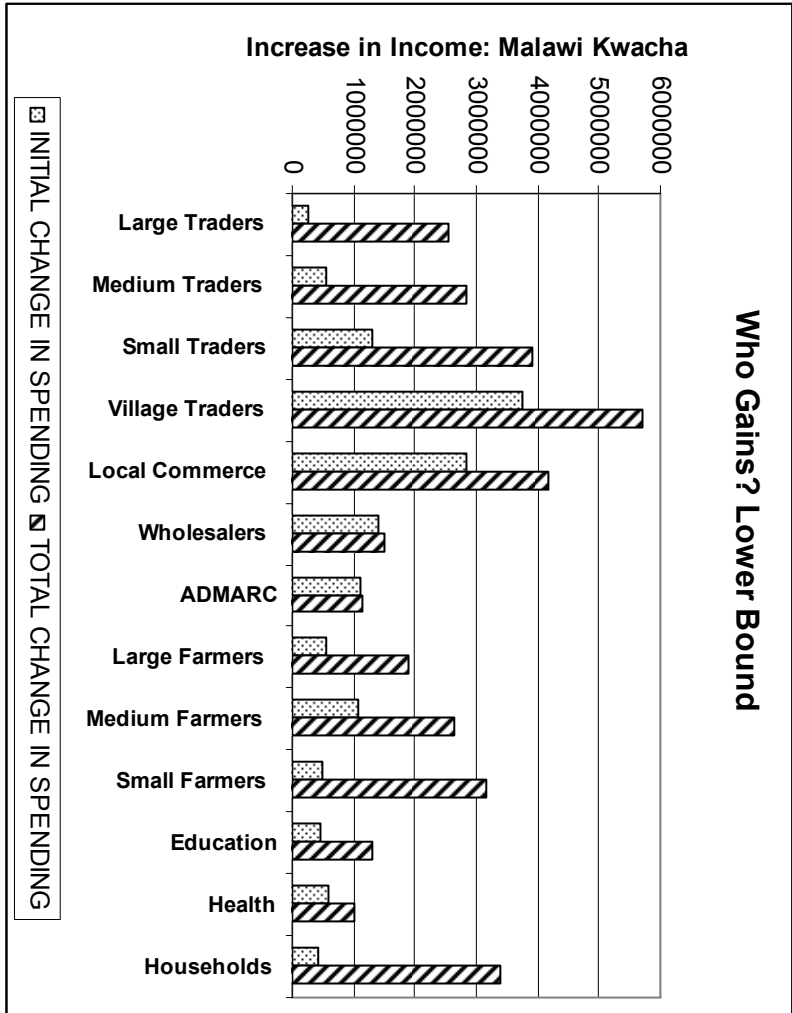
Figures 1 and 2 show the increase in income for each group for January 2007; all other months follow similar patterns. The lower bars show the value of total initial spending by beneficiaries in Malawi Kwacha; whilst the higher bars indicate the total increase in income of each group as a result of the DECT programme after all spending rounds have been completed. In January, a total of MK17,400,400 (around US\$124,290<sup>11</sup>) was distributed.

It is important to note that these represent total income for each group, and not income per economic agent. So, for example, although the total gain for village traders is large, this must be divided between all village traders. Similarly, the gains for wholesalers are relatively small but there are fewer wholesalers than village traders.

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<sup>11</sup> Using an exchange rate of US\$1=MK140

Figure 1 and Figure 2: Sectorial Gains, January



The major difference between the upper and lower bounds is that without exception, each group gained more in the upper bound scenario in which transport and rent are assumed to be local expenditure. The pattern of the gains however is similar.

DECT beneficiaries spent only a small proportion of their transfer with large traders, however, the total gain for this group is much larger. This is unsurprising given that the supply chain works in both directions with some smaller traders bulking and selling on to larger traders who export to major towns such as Lilongwe (Agar and Chiligo (2007), and other small traders purchasing maize from larger traders and then selling on to the public.

The gain for village and small traders in the initial round is evidence that households purchase a large proportion of their consumption needs from these groups, who, in turn source their produce from larger traders and farmers of all sizes.

Although traders here refer principally to maize traders, it must be noted that many traders, particularly smaller ones deal in a variety of produce. Since farmers held large stocks of maize and were selling directly to the public, traders' share of spending was lower than it normally would be. Several traders also reported diversifying in order to meet consumer demand as a result.

Although classification of farmers can be difficult, it appears that the main secondary beneficiaries from the initial spending by primary beneficiaries are medium-sized farmers. It is known that many farmers also trade and accumulate maize stocks to sell during the hungry season when prices tend to be higher. The fact that medium-sized farmers gain the most initially may be due to the fact that they are more accessible and are more likely to sell their crop directly to consumers than large farmers. Smaller farmers are likely to see their maize stocks run out more rapidly than their medium-sized counterparts, limiting their sales to consumers.

It is, however, the smaller farmers who gain the most after all spending rounds are complete. This should not be surprising as it is well-known that Malawi relies on small-scale farmers, with this group producing the vast majority of national food

produce (Conroy, 2006a, p.24). The greater part of any increase in food demand due to the DECT project will therefore necessarily benefit this group.

Some beneficiaries reported purchasing maize and fertiliser from ADMARC, however their overall gain is limited with few other groups sourcing from ADMARC.

The lack of income for wholesalers over and above that directly stimulated by the DECT beneficiaries is perhaps surprising. This is particularly the case since many village traders and those falling into the “local commerce” category source their products from wholesalers and both of these groups are large secondary beneficiaries.

There are two explanations for this result. Firstly, many of those who run fixed market stalls source their wares from wholesalers outside of TA Chakhaza, in particular from the capital, Lilongwe and Mponela, a large trading centre situated outside the area studied. Thus, the additional gain is very small for wholesalers within the region. Secondly, many of those involved in local commerce reported being involved in several business activities, and that their spending was seasonal. Since the interviewees were requested to provide information on expenditure in January only, which is a “lean month”, many did not re-stock their shops during this period, but instead used up previously purchased stock. It is anticipated that a similar analysis conducted at another time of year (perhaps after the harvest) would bear witness to greater tertiary gains for wholesalers.

Anecdotal evidence suggests that there may be long-term benefits for wholesalers. A major wholesaler in Bowe, a local market centre, indicated that the transfer programme had introduced new business with beneficiaries easily distinguished from regular customers as being “unknown faces”. This leaves the potential for repeat purchases in the future.

The expenditure on health is borne out through an interview with a private clinic in Bowe. The clinic reported better business in December 2006 and January 2007 compared with the same period the previous 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 DECT beneficiary, and did not have the money to pay for treatment beforehand.

Households, including those of the direct beneficiaries, are also indirect beneficiaries, with part of their spending finding its way back to them in the form of wages and inter-household gifts. Although, as previously indicated, the labour market has not been explored in detail in this study, there is potential for the DECT programme to stimulate labour demand (employment). Such stimulation may exist but is likely to be minimal.

Interviews with schools within TA Chakhaza offer enlightening anecdotal evidence regarding the important impact of the DECT programme for education<sup>12</sup>. All of the four schools interviewed indicated that they knew pupils whose parents were DECT beneficiaries. The CCAP secondary school in Bowe said that “many, many students [have said] ‘when my mother gets something from Concern, I will pay [the school fees]’”. All schools indicated that the programme has helped “very much” to pay school fees. An Assemblies of God primary school said that there had been no increase in enrolment in January 2007, whilst the Anglican Secondary School, All Saints, in Bowe said that the corresponding time last year a full three quarters of the 112 enrolled at the beginning of January had dropped out by the fifth week of term. This compares with only two out of 98 pupils this year, and both of these had moved to other schools.

All Saints Secondary School said that by the end of February 2007, half of the 98 enrolled pupils have contributed towards their fees this year. The Government Secondary School in Bowe said that after five weeks of term in the previous year only six pupils had paid their fees, compared with between 20 and 30 this year. They also indicated that a surprisingly large number of pupils had promised contributions towards their fees by Monday 13<sup>th</sup> February, 2007. The official did not realise that a cash distribution was due in Bowe on Thursday 8<sup>th</sup> and Friday 9<sup>th</sup> February 2007. Another school had been promised fees by the end of February 2007. The interviewee

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<sup>12</sup> Note that schools are included here as economic actors. Thus school income resulting from the project/spending on school does not include expenditure on school books/uniforms/stationary which tend to be included in local commerce expenditure or represent imports (a leakage of money) since a large part of such expenditure is made outside of TA Chakhaza.

believed this was to coincide with the selling of tobacco produce and did not mention the DECT programme as a possible explanation.

Two of the secondary schools had noticed a marked improvement in the pupils' ability to learn. They put this down to them being better fed, partly thanks to the DECT projects. One of these schools said that they are currently completing a full school day lasting until 2.30pm whilst at the same time in the previous year the pupils were too hungry and exhausted to learn, and school frequently finished between 11am and midday because of this. It should be noted that none of the schools where interviews were held benefited from a recently introduced Government/WFP school feeding programme.

It may be interesting to pursue the impact on school attendance, fee-paying and pupil concentration in any future cash transfer programme.

## **5 Multiplier Using Minimum Requirements Method**

A quick review of the multiplier literature reveals a simple and relatively accurate “short-cut” for calculating the multiplier (Mulligan and Gibson, 1984; Woller and Parsons, 2002a; Woller and Parsons, 2002b). The “minimum requirements” approach uses production for local consumption as a proxy for local consumption. In the short-run, with no technical progress, increase in production for local consumption requires an increase in employment. The approach first estimates the minimum employment necessary in each region in order to be self-sustaining depending upon the population of the region in question. This can be done per industry, or in total, with the per industry approach favoured. Since the aim here is simply to give a demonstration, we will concentrate on the simpler aggregate model. A model disaggregated by industry would pose additional problems in Malawi since industries tend to be highly region specific.

There are a several steps to calculating the multiplier using the minimum requirements approach: Using data from the 1998 census, each of the 316 Traditional Authorities (TAs) in Malawi is categorised into one of 16 classes depending upon its population. Table 4 below illustrates these classes. The median population in each group is calculated.



For each industry and in total, the minimum percentage employed within the class is assigned to each region within that class as the minimum requirement. Anything above this is considered to be employment for export and not for local consumption. Thus, increased employment in this area will not contribute to local consumption and will not contribute to the multiplier effect. Results are reported in Table 4:

**Table 4: Mean Populations and Minimum Requirements by Class**

<b>Class</b>	<b>Median Population</b>	<b>Minimum Requirement</b>	<b>Number Observations</b>
1	250	0.398773	16
2	1250	0.263990	18
3	3500	0.226375	33
4	7500	0.355007	45
5	12500	0.346761	48
6	17500	0.358088	37
7	22500	0.443577	22
8	27500	0.404358	16
9	32500	0.460144	19
10	37500	0.473491	13
11	42500	0.414524	16
12	47500	0.625386	8
13	52500	0.582249	8
14	57500	0.584443	6
15	65000	0.649797	5
16	90000	0.636194	6

Each class now has a mean population and a minimum requirement for each industry. The minimum requirement is regressed against the  $\log_{10}$  of the mean population in order to obtain a line of best fit. That is:  $E_N = \beta_0 + \beta_1 \log_{10} POP$  where  $E_N$  is the non-basic employment (employment generating production for consumption within the region);  $POP$  is the population of the region, and  $\log_{10}$  is chosen following Ullman and Dacey (1960) and Woller and Parsons (2002) who found that plotting the minimum employment requirement across industry sector and local population on a  $\log_{10}$  scale closely fits a straight line. The slope is significant at the 1% level but the intercept is not statistically different from zero.

**Table 5: Dependent Variable: Minimum Requirement**

	<b>Coefficients</b>	<b>Standard Error</b>
<b>Intercept</b>	-0.1062	0.1557
<b>log(10)Median Population</b>	0.1318	0.0363*
<b>R Square</b>	0.4844	

\* = significant at 1% level

The resulting equation is used to estimate the multiplier impact of an exogenous stimulus for each region. The population of TA Chakhaza is 63,654. This is placed into the generated equation to find the non-basic employment for TA Chakhaza of:

$$\begin{aligned} E_N &= -0.1062 + 0.1318 * \log_{10} POP \\ &= -0.1062 + 0.1318 * \log_{10}(63,654) \\ &= -0.1062 + 0.1318 * 4.8038 \\ &= 0.5269 \end{aligned}$$

The relevant multiplier,  $k$ , is then calculated for Dowa as:

$$k = 1 / (1 - 0.5269) = 2.11$$

This result is of a similar order of magnitude as the more complicated methods used in this report. Indeed, this estimate lies at the lower end of the range for the multiplier (2.00 to 2.45) predicted by the RSAM method assuming 10% of beneficiary expenditure is outside of TA Chakhaza. This both lends weight to the minimum requirements method for calculating the multiplier, and helps to confirm the results found using the RSAM approach.

The multipliers for other Malawian regions can be found simply by plugging in their populations into the equations estimated above.

The minimum requirements method does not permit to look at the impact of a change in exogenous expenditure on different groups within a region. It does however, help to analyse the relationship between the multiplier and unemployment.

### 5.1 *The Minimum Requirements Approach and Unemployment*

This paper introduces the novelty of estimating the relationship between the multiplier and unemployment. Using the same 1998 census data which collected information on employment, the multiplier is estimated and regressed against unemployment in each TA in Malawi to find the following relationship:

The relationship is weak, however both the intercept and slope are statistically significant at the 1% level and there clearly exists a negative relationship between the unemployment rate and the multiplier. That is, as the regional multiplier increases, regional unemployment decreases. This is particularly interesting for any transfer programme. It suggests that any region with a “large” multiplier will see increase benefits in terms of increase employment. Future research could look into the strength of this relationship while controlling for other factors, which the data used in this present analysis do not permit us to do.

**Table 6: Dependent Variable: Unemployment Rate**

	<b>Coefficients</b>	<b>Standard Error</b>
<b>Intercept</b>	0.0361	0.0049*
<b>Multiplier</b>	-0.0150	0.0028*
<b>R Square</b>	0.0861	

\* = significant at 1% level

Despite the weak relationship between the unemployment rate and the multiplier, this helps to illustrate that the DECT programme may have had an impact on unemployment, however, the present analysis has not attempted to quantify the strength of this relationship. As previously suggested, the impact of cash transfer on the labour market may be an interesting area to pursue in any future cash transfer programme.

## **6 Conclusions**

We have used two methods to estimate a multiplier of between 2.02 and 2.45 for the DECT programme. Furthermore, our analysis suggests that the economic impact of the programme is far-reaching. There are potential benefits in terms of employment, and the programme helps to support businesses during a period of the year which is usually particularly difficult. Small farmers and small businesses are notable secondary beneficiaries of the DECT programme, but education and health also benefit.

The spending patterns also indicate that there are potential long-run benefits, ranging from investment in fertiliser helping to improve the following year's harvest, to increased investment in education.

Although cash transfers should not be used under all circumstances, where the market is able to respond to increased demand, cash transfers should be considered as an alternative to in-kind aid. Under the right market conditions, not only are the primary beneficiaries' able to meet their needs, but the whole of the local community can become potential secondary beneficiaries.

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