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The Commercialisation of Poverty in  
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**SELLING OUR WAY INTO POVERTY: The Commercialisation of Poverty in**

**Malawi**

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# **SELLING OUR WAY INTO POVERTY: The Commercialisation of Poverty in Malawi**

## **Abstract**

*The aim of the article is to investigate the impact of commercialisation on household poverty in Malawi using the 1997/98 Integrated Household Survey data. The results indicate that overall those household who were more commercialised were better off than those who did not and thus commercialisation should be encouraged as a means of alleviating poverty. In terms of regional analysis the southern region and the central region results indicate that the more commercialised households were actually worse off. Furthermore, the livelihoods of the most vulnerable households (female headed and poor households) did not benefit from commercialisation. Therefore, in terms of policies, it is important that government should identify groups that are likely losers to commercialisation and hence the need for compensatory or socially protective policy design to socio-economic groups whose incomes have been reduced by commercialisation.*

## **Keywords:**

Commercialisation, Poverty, Propensity Score Matching, Household Model, Malawi.

**JEL classification:** C31, I31, Q12

## **1. INTRODUCTION**

Malawi is one of the first countries in sub-Saharan Africa to adopt the structural adjustment programmes following an economic crisis in the late 1970s that manifested in negative growth rates in gross domestic product in 1980 and 1981. Most macroeconomic policies under the structural adjustment programme focused on liberalisation of international and domestic trade including liberalisation of agricultural prices and marketing, removal of agricultural subsidies, reduction in trade tariffs and removal of non tariff barriers to trade, liberalisation of the exchange rate system, liberalisation of the financial sector and interest rates and provision of investment incentives. Among other things, these reforms were expected to raise the incomes of smallholder farmers and hence increase their entitlement to food through the market. Even though these reforms have been in line with the general trend in the development discourse which is in favour of commercialisation, how well it works in different contexts depends on the characteristics of the households, potential of the local market as well as the legal and political framework in which the commercialisation is to take place.

Furthermore, the success of further commercialisation in relieving poverty depends on how well the households are currently integrated in the market and to what extent the opportunities provided by specialisation have already been exploited. This article aims at providing evidence of the magnitude and nature of the welfare impact of commercialisation in Malawi.

The central hypothesis is that increased participation in trade at the local market is likely to increase consumer/producer surplus for the participating household and thus increase the household's welfare. Hence, agricultural market participation is likely to increase the consumption level of the household through increased levels of trade.

The question that comes to the fore after considering the above issues is as follows; what has been the impact of commercialisation on poverty? Another related questions is, are there any biases in the distribution of benefits to different groups, and if so, what are the sources of these? The purpose of this paper therefore is to answer the above questions.

The article is structured along six main sections. In Section 2, we review the links between commercialisation and poverty. We lay the theoretical framework and empirical strategy in section 3. The econometrics is discussed in section 4 while section 5 presents results of the analysis. Lastly, conclusions and policy implications are presented in the section 6 of the article.

## **2. COMMERCIALISATION AND POVERTY**

This section sketches a framework for thinking through the effects of commercialisation on household poverty (Figure 1). Poverty as a characteristic of households or individuals is defined in terms of a predetermined minimum level of real income (or consumption), and is measured in terms of the numbers of people who live below this minimum

(headcount poverty). Commercialisation is likely to cause beneficial outcomes through several links.

[Figure 1 around here]

First is the subsistence food channel. The reduction of transaction cost creates a stronger price incentive for a producer to engage in trade. The access to markets and effective transportation networks would lead to an increased number of suppliers. This increase in suppliers leads to more reliable supply of food crops and less volatile prices at the markets. One effect of this is the lowering of the risk involved in trade which would then allow otherwise risk-averse and vulnerable households to specialise and benefit from selling cash crops as well as consuming larger variety of goods acquired from the market.

The second link between commercialisation and poverty is through the employment market. Commercialisation of agriculture leads to a substantial expansion of demand for hired labour, which contributes to the income earning possibilities of poor households. This employment link allows households to increase their purchase of food items and non food items which leads to improved household welfare.

The final link is through the market surplus. Commercialisation does not only relate to selling cash crops but commercialisation of food crops is also an important part of enhanced livelihoods in poor households. Usually production for the market is only done when the household's basic demand for food has been ensured. It is the surplus that is

marketed. Either way, whether it is cash crops or surplus food crops, when they are marketed they provide the household with income which enhances household welfare.

It is however important to note that the way in which these possible increased welfare of the household finally translates into increased welfare of the individuals depends on the decision making process within the household.

### **3. THEORETICAL FRAMEWORK AND EMPIRICAL STRATEGY**

In this article the term commercialisation is used based on the definition by Braun & Kennedy (1994) who defined commercialisation as the market integration of household economy so that larger part of consumption is acquired through market transactions, as such our commercialisation variable is defined as a proportion of the consumption that is bought from the market, i.e. as a proportion bound between 0 and 1. This takes the value 1, if a household derive over 50 per cent of its income from cash agriculture and 0 for a household who derive over 50 per cent of its income from own consumption. In our analysis commercialisation is equated to participation in market agriculture on the basis of 50 per cent cut off point.

The analysis of whether participation in any programme enhances the livelihood of rural people can be formulated in the framework of Roy's (1951) self-selection model developed to explain occupational choice and its consequences for the distribution of income. Like Roy's model where individuals choose between fishing and hunting

depending on their endowments in occupation-specific skills, our model assumes that households decide either to engage in cash market agriculture (participation) or not (non-participation) based on utility maximisation. For each household  $h, h = 1, \dots, N$ , let  $U_{jh}$  be the utility associated with each decision  $J_h$  where  $J_h \in J$  is an indicator variable so that  $j = (1, 0)$  representing the decision to either participate or not, respectively. We assume that total utility is a function of daily per capita household expenditure associated with each alternative so that total utility is given by:

$$U_{jh} = \alpha(\ln y_{jh}) + \delta_j z_h + e_{jh} \quad (1)$$

where  $\ln y_{jh}$  represents the natural log of per capita household expenditure,  $z_i$  represent all other background factors that relate observed factors to total utility.  $e_{jh}$  is a random component which captures other unobserved factors that affect total utility,  $\alpha$  and  $\delta_h$  are unknown parameters. We assume that the criterion on which households make their choices is by comparing utility associated with each alternative. Let  $V_h^*$  denotes the difference in utility between two choices which can be expressed as:

$$V_h^* = U_{1h} - U_{0h} = \alpha(\ln y_{1h} - \ln y_{0h}) - \delta z_h - e_h \quad (2)$$

where  $e_h = e_{1h} - e_{0h}$  and  $\delta = \delta_1 - \delta_0$ . Although the difference in utility cannot be observed, the decision taken by a household is observed as a binary outcome such that:



$$J_h \in j = 1 \text{ if } V_h^* > 0 \text{ and } j = 0 \text{ otherwise} \quad (3)$$

Other things being equal, equation (3) indicates that households choose to participate in the programme only if the utility from participation is higher than the alternative, non-participation. We therefore assume that the difference between expected daily per capita household expenditure associated with each alternative is a key decision variable that influences household participation decisions. Assuming that this daily per capita household expenditure varies among households depending on their participation status and differences in observable characteristics  $x_h = x_h \in z_h$ , expenditure equations associated with each alternative can be written as:

$$\ln y_{1h} = x_h \beta_1 + \sigma_1 \varepsilon_{1h} \text{ if } j = 1 \quad (4a)$$

$$\ln y_{0h} = x_h \beta_0 + \sigma_0 \varepsilon_{0h} \text{ if } j = 0 \quad (4b)$$

where  $\ln y_{0h}$  and  $\ln y_{1h}$  denote the natural log of daily per capita household expenditure associated with participation and non-participation, respectively.  $\beta_1$  and  $\beta_0$  are unknown parameters,  $\sigma_1$  and  $\sigma_0$  are standard deviations.  $\varepsilon_{1h}$  and  $\varepsilon_{0h}$  are the error terms with

$$E(\varepsilon_{jh} | x_h) = 0$$

Our aim is to establish if indeed commercialisation enhances household expenditures in Malawi. If daily per capita household expenditure for all participants were recorded before commercialisation and if households were randomly selected into the programme,

the impact of the programme would be estimated by simply taking the difference between mean expenditures before and after the programme, i.e.:

$$\pi_h(ATE) = \ln y_{1h} - \ln y_{0h} \quad (5)$$

such that  $\pi_h(ATE)$  would be a measure of the impact of commercialisation . A common problem in programme evaluation is the missing data problem where outcomes (i.e., daily per capita household expenditure) for households are observed for only one state and no information in the counterfactual state is available. Using average daily per capita household expenditure for non-participants to estimate the average treatment effect (ATE) in absence of the counterfactual outcome data for participants would bias the true impact of the programme due to endogeneity and sample selection biases. From equations (4a) and (4b), the observed outcome is expressed as:

$$\ln y_h = (1 - j) \ln y_h + j \ln y_h = (1 - j)(x_h \beta_0 + \sigma_0 \varepsilon_{0h}) + j(x_h \beta_1 + \sigma_1 \varepsilon_{1h}) \quad (6)$$

This shows that participation is endogenously determined. Given the selection criterion in equation (3), the conditional expectation of household expenditure associated with decision  $J_h \in j$  can be expressed as:

$$E(\ln y_{1h} | x_h, j = 1) = x_h \beta_1 + \sigma_1 E(\varepsilon_{1h} | \varepsilon_h > -\gamma_h) \quad (7a)$$

$$E(\ln y_{0h} | x_h, j = 0) = x_h \beta_0 + \sigma_0 E(\varepsilon_{0h} | \varepsilon_h < -\gamma_h) \quad (7b)$$

where  $\varepsilon_h$  is the error term for selection (participation) equation,  $z_h$  is a vector of variables that determine participation decision and  $\gamma$  is a vector of unknown parameters. The terms  $E(\varepsilon_{1h} | \varepsilon_h > -\gamma z_h)$  and  $E(\varepsilon_{0h} | \varepsilon_h < -\gamma z_h)$  in equations (7a) and (7b) respectively are non-constants due to correlation between the error terms of the selection (participation) and outcome (expenditure) equations.

This correlation arises because it is impossible to observe a household with and without programme participation simultaneously, and lacking a panel data set that allows observation of households before and after programme participation, impact analysis in this article is based on comparing household outcomes differentiated by participation in market agriculture (commercialisation) while simultaneously controlling for various other factors that affect the outcome in question (for example, levels of prior owned human and physical capital). However, not all of the “other factors” can be measured or even observed. For example, in Malawi many farmers reveal a strong preference to secure food needs before engaging in market agriculture. This behaviour is probably affected by issues of risk aversion, know how and lack of insurance. Traditional agriculture may be the consequence of risk aversion, but may be related to know how and lack of insurance, other factors such rainfall and soil quality differences, innate abilities, entrepreneurship, social skills, and management abilities make some households more productive than others, but these cannot be fully observed or adequately measured. If these same factors also affect a household’s participation in market agriculture, selectivity bias results and attribution becomes difficult (Heckman 1979). As reported in Morduch (1997), this type

of selection bias can lead to an overestimation of impact by as much as 100 percent (McKernan 1996).

## **4. METHODOLOGY**

### **4.1 The data**

This article uses data from the 1997–98 Malawi Integrated Household Survey (IHS) conducted by the National Statistical Office (NSO). The survey was administered to 12,960 households over a 12-month period. In rural areas, a three-stage sample selection process was used, consisting of the traditional authority (TA), the sub district spatial unit, as the first stage and enumeration areas (EA) within the TA as the second stage. Roughly, one TA was selected for every 50,000 households in the stratum. Twelve EAs were selected in each selected TA. Both TAs and EAs were selected with probability of selection proportional to population size. Twenty households were randomly selected within the selected EAs as the third stage of rural sample selection. All selected households in an EA were interviewed in the same calendar month. Interviewing was carried out in each of the 12 selected EAs in a TA in turn through the 12 months of the survey year in order to capture seasonal variation. The questionnaire was administered in two parts. The first was a large questionnaire that was administered to the respondent household in a single visit. This consisted of approximately a dozen modules on household composition, educational attainment, health and nutritional status, agriculture,

home-produced and purchased consumption items, assets, and so on. The second part was a diary of expenditure.

## **4.2 Analytical Framework**

In this section we discuss the analytical framework that informs the econometric estimation of commercialisation and poverty. The article uses the Propensity Score Matching (PSM), this method has been used in recent times to evaluate the impact of various programmes (Bryson *et al.*, 2002; Heckman *et al.*, 1999). Rosenbaun & Rubin (1983) showed that it is possible to use a base set of covariates to predict the likelihood than a household will participate in commercialisation ( $p(X)$ ) using logit, probit, or some other method. This is known as the propensity score and is measured on a unit scale (1 being treated, 0 being the untreated or control). These propensity scores are used to match treatment group households with control group households. The difference in per capita household expenditure can then be compared by groups of matched data, and the average treatment effect (ATE) can be calculated.

Conditioning on propensity scores was shown to reduce selection bias by Rosenbaun & Rubin (1983) and the method has since been used to analyse various issues-from effect of treatment on medical outcomes (Imbens 2000; D'Agostino 1998) to the effect of fertility on marital dissolution (Vuri 2001). It has also been a growing part of the analysis on labour markets (Sianesi, 2004; Lechner, 2002; Bryson *et al.*, 2002; Heckman, 1997; Heckman *et al.*, 1999; Hirsch & Mehay, 2002; Angrist & Kruger, 1999, Smith & Todd,

2005; Dehejia & Wahba, 1999, 2002; and Dehejia, 2005) and other evaluation economic issues like globalisation (Balat & Porto, 2005) and in other economic evaluations (Heckman *et al.*, 1998; Blundell & Dias, 2002; Heckman & Navarro-Lozano, 2003).

The propensity score works because if treatment and control groups are similar in X, then there are no selective differences in the outcome of interest between the two groups (Heckman *et al.*, 1999). Propensity score matching has added bonus of being more convenient than other methods e.g. instrumental variables since they condition the analysis on only the variables thought to influence the outcome, and do not require additional variables.

The aim is to determine whether household expenditure for participants in market agriculture (a proxy for commercialisation), especially for female-headed and poor households has improved or dropped due to commercialisation.

To assess the impact of commercialisation, we apply matching methods on per capita household expenditure for participant households and non-participant households. The idea behind matching is to create randomness in programme assignment on assertion that if untreated households (non-participants) have the same probability of participation as treated households (participants), then average per capita household expenditure for non-participants is a good approximation of what participants would have earned had they not participated in the programme. The difference in average per capita household expenditure between the two groups, referred to as the **‘average treatment effect’** would

therefore yield unbiased estimates of the gross gains to participants from the programme (Dehejia & Wahba, 2002). Thus, our parameter of interest is:

$$E(\pi_{ATE_h} | z_h, J = 1) \equiv E(\ln y_{1h} - \ln y_{0h} | j = 1) \quad (12)$$

where  $E(\pi_{ATE_h} | z_h, j = 1)$  is the average treatment effect,  $y_{1h}$  and  $y_{0h}$  are the per capita household expenditures of participant households and non participants households respectively.

According to Smith & Todd (2005), using conditioning variables to identify control units (non-participants) to match with the treated units (participants) becomes difficult if the number of variables  $z_h$  is large with different dimensions, some being continuous and others discrete, referred to as the ‘curse of dimensionality’. To address this problem, Rosenbaum & Rubin (1983) showed that if outcomes (e.g., per capita household expenditure) are independent of participation conditional on  $z_h$ , then they (outcomes) are also independent conditional on the propensity score,  $p(z)$ . This implies that  $\Pr(j = 1 | z_h) = E(J_h | z_h) \equiv p(z)$  such that:

$$y_1, y_0 \perp J_h, z_h \Rightarrow y_1, y_0 \perp J_h, p(z)$$

where  $p(z)$  has lower and upper bounds  $0 < p(z) < 1$ . This assumption reduces the multi-dimension of conditioning variables to a single index, the propensity score with which matching can be performed. However, Imbens (2000) suggests that a weaker assumption

of untreated outcome (i.e., per capita household expenditure for non-participants) being independent conditional on covariates  $z_h$  and therefore on the propensity score  $p(z)$  [*i.e.*,  $y_0 \perp j = 0, z_h \Rightarrow E(y_{0h} | p(z)) \cong E(y_{0h} | j = 1)$ ] suffices to identify the distribution of  $E(\pi_{ATE_h} | z_h, j = 1)$  over a common support of  $z_h$  given  $j = 1$ , i.e.:

$$\hat{\pi}(ATE) = \frac{\int_{s_z} E(\pi_{ATE_h} | z_h, j = 1) F_z(z_h | j = 1) dz_h}{\int_{s_z} F_z(z_h | j = 1) dz_h} \quad (13)$$

where  $\hat{\pi}(ATE)$  is the expected value of the programme effect which is the average over a region of common support of  $z_h$  denoted as  $s_z$  and  $F_z$  is the density of  $z_h$ . This makes it possible to compare per capita household expenditure for participants and non-participants with different values of  $z_h$  but having the same propensity score  $p(z)$ . The general matching estimator can be given by:

$$\hat{\pi}_{ATE} = \frac{1}{n_1} \sum_{h \in t \cap s_z} [y_{1h} - \hat{E}(y_{0h} | j = 0, p(z))] \quad (14)$$

Where  $\hat{E}(y_{0h} | j = 0, p(z)) = n_0^{-1} \sum_{h \in c}^{n_0} w(t, c) y_{0h}$ ,  $n_1$  and  $n_0$  denote number of participants and non-participants within a region of common support  $s_z$ .  $w(\cdot)$  is a weighting function that depends on the distance between the propensity score for participants and non-participants. From equation (13), a match for each participant household  $h \in t \cap s_z$  is constructed as a weighted average over per capita household expenditure for non-participants with the same propensity score as participants (see, Smith & Todd, 2005).



For empirical application, four matching estimators are used, namely, *nearest neighbor*, *radius*, *kernel* and *stratification matching*. The *nearest neighbour matching* involves estimating the difference in average per capita household expenditure between participants and non-participants having the closest propensity score as for participants. We implement *nearest neighbour matching with replacement* to minimise asymptotic bias by allowing non-participants to be matched with more than one participant. The ‘average treatment effect’ is calculated as the difference between average per capita household expenditure for participants and non-participants. *Radius matching* is similar to *nearest neighbour matching* except that participants are matched with non-participants within 0.1 radius of the propensity score for participants. With *Kernel matching*, all participants are matched against a weighted average for all non-participants with weights that are inversely proportional to the distance between propensity scores for participants and non-participants. Finally *stratification matching* involves dividing the sample into different intervals of the propensity score. Within each interval or block, participants and non-participants have the same average propensity score. The difference in the average per capita household expenditure between the two groups is estimated for each block and the overall average income is computed using weights based on the distribution of participants across all blocks. For details see Abadie *et al.*, (2001), Dehejia & Wahba (2002) and Becker & Ichino (2002).

## **5. RESULTS AND DISCUSSIONS**

### **5.1 Sources of Household Income**

This section begins with a description of the sources of income. This is important for two reasons. First, by affecting wages and cash agricultural income, trade opportunities are likely to have large impacts on household resources and on poverty. As argued by Deaton (1997) and others, the short-run effects of price changes can be assessed by looking at income shares. Secondly, the description of income shares is also useful because it highlights the main channels through which trade opportunities can have an impact on household income.

Table 1 reports the average income shares for different sources of income. At the national level, the main sources of income are income from home consumption (43.1 per cent), and wages (28.2 per cent). Regarding agricultural income, the sale of cash crops accounts for 5.1 percent of total income, while the sale of livestock and products account 1.3 percent of household income.

There are important differences in income sources between poor and non-poor households. While the share of own-production is over half of the total (55.9 per cent) in the average poor household, it is less than half (38.1 per cent) in non-poor households. In contrast, while wages account for 30.9 per cent of the total income of the non-poor, they account for only 21.5 per cent of the income of the poor. The shares of the income

generated in non-farm businesses are 2.3 per cent and 10.5 per cent in poor and non-poor households respectively.

It is interesting to compare the different sources of income across the regions. In rural areas (southern, central and northern region), for instance, the percent of total income accounted for by own-production ranges from 36.0 per cent to 49.6 per cent; the share in urban areas is only 4.3 per cent. The share of non-farm income in rural areas is between 1.4 per cent in the northern region and 16.9 per cent in the southern region, which should be compared with a 21.4 per cent in urban areas. In urban areas, in contrast, wages account for over half (55.8 per cent) of household income, and the contribution of agricultural activities is much smaller.

The results indicate that in rural areas, households derive most of their income from subsistence agricultural and agricultural wage employment. Cash crop activities and non farm activities comprise a smaller fraction of total household income.

[Table 1 around here]

## **5.2 Average Household Budget Shares**

In order to investigate some of the consumption effects of commercialisation in Malawi, Table 2 reports the average budget shares spent by Malawian households in different goods. As expected, most of the budget was spent on food, with a national average share

of 61.5 per cent. The average was higher in rural areas (ranging from 59.2 per cent to 65.0 per cent) and lower in urban areas (35.2 per cent).

Further, the poor spent a larger share of total expenditure on food than the non-poor. At the national level, for instance, 76.0 per cent of the total expenditure of an average poor household was devoted to food, while for non-poor households the average was 55.4 per cent. Other goods accounting for a significant share of total expenditure were clothing, housing and gifts, transfers or loans. However, these average shares were always below 10 per cent. The usual differences between urban and rural households and between the poor and the non-poor were observed. For instance, differences between the poor and non-poor in expenditures other than food depends largely on the region of residence. The patterns are more diverse for the non-poor households than poor households in both rural (southern, central and northern regions) and the urban areas. In the rural areas, the non-poor have proportionately larger expenditures for clothing, housing and gifts. In urban areas, the non-poor households spend more on education, housing, travel and gifts. The urban non-poor households, fuels account for a greater proportion of household expenditure than their non-poor counterparts. Another observation from this table is that on average expenditure levels for urban households are double the levels of in rural areas, reflecting differences in cost of living between the rural and the urban areas.

There is one fundamental lesson that can be learnt from Table 2. In Malawi, as in many low income developing countries, the largest fraction of household expenditure is spent on food. In consequence, the largest impacts of trade policies and economic reforms on

the consumption side will be caused by changes in the prices of food items. Expenditures on other non-food items are relatively less important in terms of total expenditure, the welfare impacts being lower as a result.

[Table 2 around here]

### **5.3 Absolute and relative household per capita expenditure**

Table 3 presents absolute and relative estimates of per capita household expenditure differential for different groups. The average expenditure for participating and non participating households in commercialisation is reported in the first and second column respectively. The third column displays the difference between average per capita household expenditure for participating and non participating households and the t-statistics (in brackets) testing the null hypothesis that the mean difference is zero. The fourth column presents relative percentage change in average per capita household expenditure between the two groups.

If the average daily per capita household expenditure for non participating households were accurate estimates of what the participating households would earn had they not participated in market agriculture, negative figures from last column in Table 1 would imply significant reductions in daily per capita household expenditure for participating households. From the table it can be seen that for the whole sample the results are highly significant at 1 per cent level. This means that daily per capita expenditure for

participants would increase by 17 per cent. In terms of regional differences, it is important to note that the only the results from the southern region are not significant, indicating that commercialisation had no impact on households in the southern region. These results suggest that commercialisation would enhance the daily per capita household expenditure for the central, northern and urban regions.

[Table 3 around here]

The per capita household expenditure for participating households in the central region would increase by 7 per cent, while those in the northern region would be enhanced by about 18 per cent and the highest benefits would be in the urban areas where the expected benefit from commercialisation would be an increase in daily per capita household expenditure of participating households by over 50 per cent. Among the poor households, commercialisation would actually reduce daily per capita household expenditure for participating households by 13 per cent, while female headed participating households would sacrifice 12 per cent of their expenditure.

In general raw data presented above seem to indicate that participants benefit more from commercialisation than non participating households. While this may imply that commercialisation is conducive to enhance expenditures for participating households, it also indicates that the benefits are not always positive for all groups. Nonetheless, using average daily per capita household expenditures to make inferences about the impact of

commercialisation may be flawed due to counterfactual problems since we do not have data for before and after the event.

The results from the propensity score matching estimates of the effect of commercialisation on poverty are presented in Table 4. Because of the different matching methods used, different sample sizes are used for each of the estimates and the different matching methods can be considered a sensitivity analysis of the propensity score matching overall. All estimates are based on the common support and satisfy the balancing requirement.

[Table 4 around here]

Table 4 indicates that estimates of average treatment effects are consistently positive and not statistically significant across sub samples suggesting that commercialisation does not generate beneficial outcomes to participating households. In general, the sizes of the estimates from different matching estimates are different. As noted by Smith & Todd (2005), results from the different methods are sensitive to the set of variables used in the propensity scores as well as the sample used in estimating the average treatment effect. In other words, the results are sensitive to the matching method used.

From the table, only estimates from the radius matching method are statistically significant while those from the rest of the matching methods are not significant and the estimates from the nearest neighbour method are negative. In general, estimates of the net

gains to programme participants are positive at 1 per cent level using the radius matching method. This suggests that the household per capita expenditure of participating households was 7.3 per cent higher than what they would have spent had they not participated in commercialisation.

For the regional analysis, it is intriguing to note that estimates from all four matching methods in the southern region are consistently negative and highly significant, suggesting that commercialisation has negative effects on household per capita expenditure. Results indicate that participating in commercialisation significantly reduces household per capita expenditure by between 12.1 per cent and 22.4 per cent. In contrast the rest of the regions indicate a positive gain from commercialisation. In the central region only the radius matching method is significant at 10 per cent indicating a benefit of 6.3 per cent in household per capita expenditure of participating households. The results from the northern region are positive and significant for two matching methods (radius and kernel matching methods). The estimates show that households in the northern region spent between 11.4 per cent and 17.4 per cent more on household expenditure per person per day than what they would have spent had they not participated in market agriculture. The major winners from commercialisation were those residing in the urban areas where the gains ranged from 23 per cent to 24 per cent. This could be as a result of the commercialisation affecting households through changes in wages and from table 1; households in the urban areas derived a higher proportion of their income from employment (69.2 per cent and 53.7 per cent for poor and non poor households respectively).



The last section of table 6 analyses the extent to which the livelihood of the vulnerable groups, namely female headed and poor households, is affected by commercialisation. The estimates indicate that commercialisation generates positive expenditure gains for male headed households (8.6 per cent more per capita expenditure than without commercialisation using the radius matching method) while generating negative benefits to female headed household who experienced reductions in household per capita expenditure of about 13.5 per cent by participating in commercialisation.(stratification matching method).

Similarly, empirical results from all matching methods indicate that poor households experienced reductions in household per capita expenditure of between 11.2 per cent and 12.5 per cent than what they would have spend had they not participated in commercialisation. This contrasts with the gains of between 11.1 per cent and 24.4 per cent in household per capita expenditure experienced by non poor households (radius and kernel matching methods).

## **6.0 CONCLUSION**

In this article, some of the impacts of commercialisation on households in Malawi have been investigated. Malawi is a low income country, with widespread and prevalent poverty at the national and regional levels. In rural areas, poverty is still higher. In Malawi, the government and international institutions have long been actively searching

for programmes and policies to improve the living standards of the population. Concretely, a set of reforms were implemented during the 1990s, including liberalisation, privatisation, and deregulation of marketing boards in agriculture. After episodes of economic reforms, households are affected both as consumers and as income earners.

Using simple comparison without controls, the results indicate that overall those household who had participated in commercialisation had a higher welfare indicator than the comparators. In terms of regional analysis the southern region and the central region results indicate that the participants were actually worse off than non participant. The livelihoods of the most vulnerable households in Malawi (female headed and poor households) did not benefit from commercialisation.

Using the propensity score matching techniques, we find some evidence from radius matching that commercialisation leads to higher household per capita expenditure. The matching results indicate that commercialisation participants gained about 7 per cent more household expenditure above what they would have spent had they not participated in the commercialisation.

The results from the regional analysis show a reduction in welfare for households in the southern region using all four matching methods of between 12 per cent and 22 per cent, respectively. In contrast, results for the rest of the regions suggest that commercialisation leads to an increase in household per capita expenditure by 6 per cent in the central region (radius matching method), increases of between 11 per cent and 17 per cent in the

northern region (radius and kernel matching methods) and between 23 per cent and 24 per cent in the urban areas (for all four matching methods). These contradictory findings can be explained by the differences in the relative contribution of cash crop sales and wage employment to the total household income and the average budget shares. The southern region has a higher contribution of household income coming from non farm businesses (Table 1) than the rest of the rural regions. On the other hand, urban areas have the highest contribution to total household income from wage employment for both the urban poor and non poor. This indicates that commercialisation may not be appropriate in areas where the largest fraction of household expenditure is spent on food and the largest impacts of trade policies and economic reforms do not affect changes in the prices of food items because expenditures on other non-food items are relatively less important in terms of total expenditure, the welfare impacts being lower as a result.

In spite of the contrasting evidence across the areas, it is intriguing to find strong evidence that the livelihood of women would have worsened in due to commercialisation. Results indicate that female headed household participants reduced their household per capita expenditure by 14 per cent due to commercialisation. The finding underscores the need for designing gender-focused economic reform programmes.

Finally, results from matching techniques indicate that poor households' per capita expenditure is between 11 per cent and 13 per cent less than what it would have been had they not participated in commercialisation.

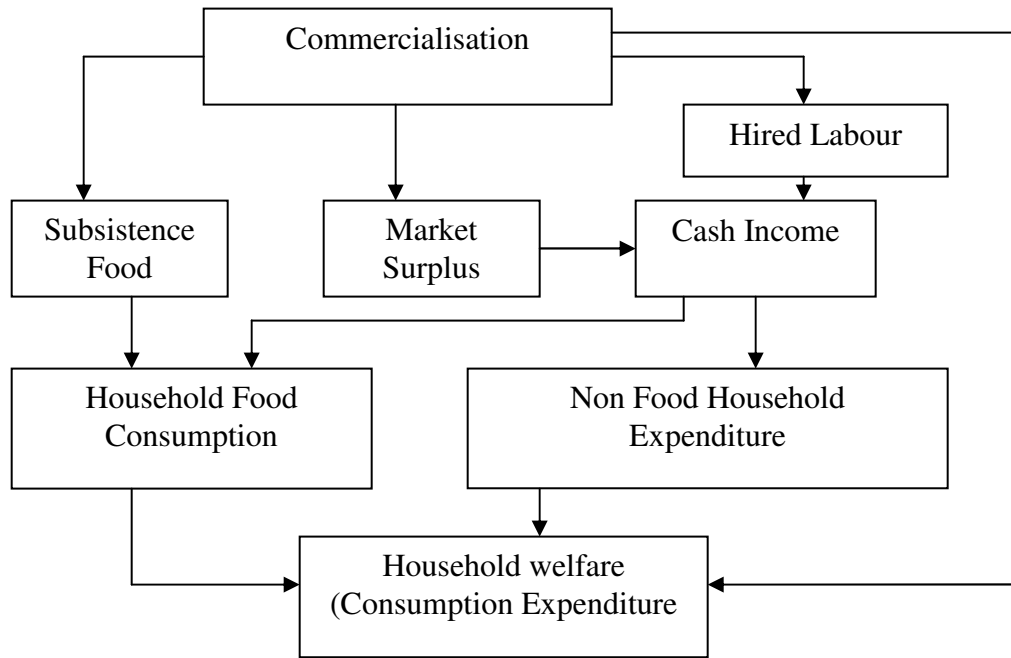
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Figure 1: Commercialisation and Poverty



Source: Bokosi, 2007

Table 1: Sources of Household income (percentage)

	National			Southern Region			Central Region			Northern Region			Urban Region		
	Total	Poor	Non-poor	Total	poor	non-poor	Total	Poor	non-poor	Total	poor	non-poor	Total	poor	non-poor
Net food crop sales*	-0.6	-0.5	-0.6	0.9	1.6	0.7	-2.2	-2.2	-2.2	0.1	-0.5	0.5	-0.5	-1.0	-0.4
Net cash crop sales*	5.1	6.7	4.5	1.1	2.0	0.9	9.0	10.7	8.3	5.1	5.9	4.7	1.0	0.2	1.1
Net livestock and products sales*	1.3	1.8	1.0	0.9	1.5	0.7	1.3	1.8	1.0	2.4	2.4	2.5	0.1	0.2	0.0
Net non farm business sales*	8.2	2.3	10.5	16.9	2.8	21.4	1.6	2.1	1.4	1.4	1.7	1.1	21.4	8.1	23.6
Employment income	28.2	21.5	30.9	31.2	27.1	32.4	26.6	16.8	30.7	24.2	22.1	25.5	55.8	69.2	53.7
In-kind income	2.7	1.5	3.2	1.9	2.0	1.8	4.0	1.3	5.2	1.1	0.9	1.2	5.0	0.8	5.7
Interest income	0.7	0.1	1.0	1.3	0.1	1.6	0.4	0.1	0.5	0.0	0.0	0.1	1.7	0.2	1.9
Rental income	1.5	1.0	1.6	1.3	1.2	1.3	1.8	1.3	2.0	1.0	0.2	1.5	3.0	3.6	2.9
Other income	4.4	3.5	4.8	3.7	1.2	4.6	4.3	4.0	4.4	7.2	7.0	7.3	4.8	2.5	5.2
Incoming income transfers	5.3	6.2	5.0	4.8	6.3	4.3	3.7	4.1	3.6	12.7	11.4	13.5	3.4	4.6	3.2
Value of home production consumed	43.2	55.9	38.1	36.0	54.2	30.3	49.6	60.0	45.1	44.7	48.9	42.2	4.3	11.8	3.1
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total per capita daily income (MK)	10.39	4.96	18.39	9.39	3.66	18.65	11.01	5.80	17.80	12.34	7.69	19.76	31.69	8.56	55.57

\*Net sales are calculated as the difference between total sales and total costs (for inputs or other costs) except for net food crop sales which does not represent the difference between sales and purchases of food crops



Table 2: Average Budget Shares (percentage)

	National			Southern Region			Central Region			Northern Region			Urban Region		
	Total	poor	non-poor	Total	poor	Non-poor	Total	poor	non-poor	Total	Poor	non-poor	Total	poor	non-poor
Food	61.5	76.0	55.4	59.2	74.4	52.5	62.9	78.4	57.0	65.0	74.3	59.8	35.2	57.5	29.8
Fuels	3.7	4.3	3.4	3.3	4.1	3.0	4.1	5.3	3.7	3.1	2.4	3.5	3.9	7.7	3.0
Clothing	6.6	5.2	7.2	6.2	4.7	6.8	6.4	4.9	7.0	8.9	7.6	9.6	6.7	5.5	7.0
Education	3.2	1.7	3.8	3.8	1.7	4.7	2.6	1.3	3.2	2.8	2.8	2.8	6.3	1.7	7.5
Health	1.3	1.1	1.3	1.7	1.2	1.9	1.0	1.0	1.0	0.8	0.9	0.7	2.3	2.2	2.4
Household consumer durables	3.4	2.1	3.9	3.6	2.2	4.2	2.9	1.9	3.3	4.0	2.7	4.7	4.1	2.8	4.4
Housing and repairs	7.8	3.0	9.8	9.3	4.3	11.6	7.3	2.0	9.4	3.6	1.7	4.5	19.5	11.2	21.4
Travel related	2.2	0.8	2.8	2.1	1.0	2.6	2.5	0.6	3.2	1.5	1.0	1.8	4.4	1.8	5.1
Gifts, transfers, or loans	5.1	2.0	6.4	5.1	2.6	6.2	5.2	1.5	6.5	4.7	1.6	6.4	8.4	4.2	9.4
Investment related	1.0	0.3	1.3	0.7	0.2	0.9	1.2	0.3	1.5	1.1	0.6	1.4	2.2	0.9	2.5
Personal goods	2.7	3.0	2.6	3.0	3.0	2.9	2.6	2.4	2.6	3.3	3.5	3.4	3.0	3.3	2.9
Other	1.5	0.5	2.1	2.0	0.6	2.7	1.3	0.4	1.6	1.2	0.9	1.4	4.0	1.2	4.6

Table 3: Average per capita household expenditure differentials in Malawi Kwacha (MK)

<b>Overall</b>	MP (S.E.)	NP (S.E.)	Difference (t-statistic)	Relative expenditure differential (%)
<b>Full sample</b>	14.24	12.13	2.11***	17.39
(MP=3110, NP=3476)	(0.304)	(0.171)	(6.209)	
<b>Southern Region</b>	11.91	11.96	-0.05	-0.42
(NP=1120, NP=1348)	(0.390)	(0.308)	(0.110)	
<b>Central Region</b>	12.96	12.12	0.84**	6.93
(MP=811, NP=1568)	(0.364)	(0.225)	(2.05)	
<b>Northern Region</b>	15.07	12.73	2.34**	18.38
(MP=333, NP=477)	(0.805)	(0.415)	(2.808)	
<b>Urban Regions</b>	18.24	11.77	6.47***	54.97
(MP=846, NP=83)	(0.857)	(1.531)	(2.33)	
<b>Poor households</b>				
<b>Full sample</b>	6.28	6.74	-0.46	-6.82
(MP=1718, NP=1862)	(0.057)	(0.049)	(6.19)	
<b>Southern Region</b>	5.86	6.73	-0.87***	-12.93
(MP=690, NP=734)	(0.093)	(0.075)	(7.35)	
<b>Central Region</b>	6.60	6.73	-0.13	-1.93
(MP=440, NP=831)	(0.103)	(0.075)	(1.031)	
<b>Northern Region</b>	6.91	6.98	-0.07	-1.00
(MP=162, NP=242)	(0.158)	(0.127)	(0.362)	
<b>Urban Regions</b>	6.40	6.02	0.38	6.31
(MP=426, NP=55)	(0.116)	(0.274)	(1.118)	
<b>Female-headed households</b>				
<b>Full sample</b>	12.81	11.48	1.33**	11.59
(MP=653, NP=952)	(0.603)	(0.316)	(2.11)	
<b>Southern Region</b>	10.84	11.59	-0.7556	-6.47
(MP=308, NP=488)	(0.645)	(0.460)	(0.977)	
<b>Central Region</b>	10.40	11.33	-0.93	-8.21
(MP=131, NP=337)	(0.644)	(0.528)	(0.989)	
<b>Northern Region</b>	12.15	11.51	0.64	5.56
(MP=67, NP=111)	(1.149)	(0.718)	(0.506)	
<b>Urban Regions</b>	19.39	11.29	8.10	71.74
(MP=147, NP=16)	(2.095)	(3.182)	(1.257)	

Notes: MP =Market participants; NP=non-programme participants; \*P<0.10, \*\*P<0.05, \*\*\*P<0.001; Stars indicate that the means are statistically different between participants and non-participants.

Table 4: Estimates of expenditure gains from commercialisation (Ln per capita daily expenditure in Malawi Kwacha)

ATE	Nearest neighbour				Radius Matching				Kernel Matching				Stratification			
	nT	nC	ATE	S.E.	nT	nC	ATE	S.E.	nT	nC	ATE	S.E.	nT	nC	ATE	S.E.
Full sample	2307	1159	-0.011	0.051	2307	4026	0.073***	0.019	2307	4026	0.013	0.039	2307	4026	0.002	0.042
<i>Regional Analysis</i>																
Southern Region	737	499	-0.224***	0.042	737	1591	-0.121***	0.032	737	1591	-0.187***	0.039	737	1608	-0.216***	0.040
Central Region	547	410	-0.025	0.056	547	1811	0.063*	0.034	547	1811	-0.011	0.036	547	1811	-0.035	0.043
Northern Region	277	180	0.058	0.078	277	522	0.174***	0.054	277	522	0.114**	0.058	276	533	0.099	0.070
Urban Regions	746	71	0.199	0.140	746	75	0.247**	0.107	746	75	0.229**	0.111	746	75	0.228**	0.114
<i>Gender Analysis</i>																
Male Headed	1885	909	0.005	0.065	1885	2902	0.086***	0.020	1885	2902	0.045	0.042	1885	2902	0.039	0.050
Female Headed	422	242	-0.162	0.113	422	1124	-0.017	0.045	422	1124	-0.077	0.076	408	1138	-0.135*	0.080
<i>Poverty Analysis</i>																
Non poor Households	1101	461	0.112	0.087	1101	1840	0.244***	0.017	1101	1840	0.111*	0.064	1101	1840	0.087	0.065
Poor Households	1206	678	-0.125***	0.024	1206	2185	-0.114***	0.014	1206	2185	-0.112***	0.019	1206	2186	-0.112***	0.020

ATE='average treatment effect'; S.E.-bootstrapped standard errors; \*, \*\* and \*\*\* indicates statistical significance at 90%, 95% and 99% level of confidence, respectively.

nT=number of treated, nC= number of controls