POLICY INCENTIVES AND THE COMPARATIVE ECONOMIC ADVANTAGE IN MALAWIAN AGRICULTURE

T.O. Nakhumwa[1], R.M. Hassan[1], J.F. Kirsten[1], D.H. Ng'ong'ola[2]

The policy analysis matrix (PAM) framework was employed to analyse the comparative economic advantage in production and explore the impact of policy distortions on agricultural competitiveness in Malawi. The study demonstrated that Malawi has strong comparative advantage in the production of tobacco, paprika, macadamia nuts, cotton, tea, phaseolous beans, groundnuts and hybrid maize. Notably, Malawi has weak comparative advantage in the production of open pollinated maize and soybeans, both produced using low input technology. Of interest though, is the fact that low input producers are more efficient users of domestic resources in the production of some major cash crops such as tobacco and paprika. The study also revealed a large disparity between net private and net social profitability. This wide gap is mainly attributed to suppressed market prices over the long years of controlled commodity pricing in Malawian agriculture. Input market prices in Malawi were found to be higher than their equivalent social prices, thus forming an indirect tax on farmers. High transportation costs due to poor road infrastructure and the sales tax imposed on inputs such as chemicals are major factors behind the high input market prices. Elimination of such bottlenecks and policy distortions, improved access to credit and modern technology research investments should contribute to improved competitiveness in agricultural production, especially among small holders given their existing potential.

1. INTRODUCTION

As in most Sub-Saharan African (SSA) countries, Malawian agriculture is characterised by a degree of dualism that has dichotomised the sector into smallholder and estate sub-sectors. The dichotomy is essentially created by the land tenure system and the marketing policies followed in the past. Agricultural production on traditional tenured or customary land is dominated by smallholder system, whereas estate production is exclusively on leasehold and free hold land. Before the introduction of the structural adjustment and market liberalisation programs, different pricing and marketing policies were followed in each sub-sector. Estates had direct access to auction markets, and therefore prices were determined by market forces. On the other hand, smallholder farmers were required to sell their produce through the Agricultural Development and Marketing Corporation (ADMARC) and commodity prices were accordingly pre-determined by this parastatal. The government has been the major source of working capital for smallholder farmers, while commercial

[1] *Department of Agricultural Economics, Extension and Rural Development, University of Pretoria.*

[2] *Department of Rural Development, Bunda College of Agriculture, University of Malawi.*

banks have been the main source of finance for estates since title to the land provided acceptable collateral (Mkandawire, 1990). The smallholder farmers have in the past benefited from subsidised inputs, government controlled extension services and these factors have in a way influenced the agricultural production structure in the country.

Whenever discrepancies exist between market and social prices, the interest of farmers and of the nation can diverge. A crop can be profitable to farmers (e.g., because of output or input subsidies), even though its production may not represent an efficient use of the resources from the social point of view (country's interest). Conversely, a crop can be unprofitable to farmers (e.g., because of output or input price taxation), even though its production represents an efficient use of the nation's resources (Tsakok, 1989). Hence, by comparing private profitability with social profitability not only can the overall effect of government policies be measured, but the influence of individual policies can be quantified by dis-aggregating the overall discrepancy into its constituent parts.

As a consequence of the presence of such policy distortions, comparative economic advantage (CEA) and competitiveness in production have been obscured. To reveal the competitiveness of various agricultural commodities and production practices and evaluate potential gains in economic efficiency from removal of such policy distortions, private profitability need to be compared with potential social profitability. The policy analysis matrix (PAM) framework was used to analyse the impact of some of the government's agricultural policies and other factors that might have affected the country's agricultural sector performance. The study also employed the CEA methodology to evaluate competitiveness in Malawian agriculture in order to inform policy design for efficient allocation and utilization of scarce productive agricultural resources such as land. Section two presents the analytical framework and methods. Results and discussions are presented in section three. Section four presents the conclusions and implications for research and policy.

2. METHODS AND ANALYTICAL FRAMEWORK

The theory of comparative economic advantage is generally attributed to Ricardo (1817), who first extended the optimisation principle defining efficient choice of outputs by firms into the arena of international trade. Ricardo pointed out that a country can achieve net welfare gains by concentrating productive capacity on goods and services in which it is a relatively efficient producer and importing the rest. Knowledge of comparative advantage is important for developing countries, because potential welfare gains from specialisation and trade can be used to foster economic growth. National income often can be increased through policies

encouraging farmers to produce commodities that exploit existing patterns of comparative advantage.

In this study, the comparative economic advantage concept has been placed within the PAM framework. The PAM is a product of two accounting identities. The first defines profitability as the difference between revenue and costs. The other measures the effects of government intervention or divergences (market failures) as the difference between observed parameters and parameters that would exist if the policy distortions were removed. By filling in the elements of the PAM for agricultural activities, one can measure both the extent of policy effects and the inherent economic efficiency (or comparative advantage) of the activity. The PAM is based on the familiar equation

Profit = Revenue - Cost

PAM, as presented in Table 1, has five columns. The first is for revenue, the second, third and fourth are for costs, and the last is for profitability. The first PAM cost column is for tradable inputs and the other two are for domestic factors, i.e., capital, labour and land. The distinction between tradable inputs and domestic resources is vital because domestic exchange rate policies directly affect the former and also certain measures of efficiency require the distinction. Intermediate inputs, including fertiliser, pesticides, purchased seeds, electricity, transportation and fuel are divided into their tradable input and domestic factor components. The policy analysis matrix has three rows. The first two rows represent two different versions of the profit equation above, with the first row evaluated using observed actual market (private) prices and the other evaluated at shadow or social prices. The effects of government policy (or market failure) are then measured in the third row as the simple difference between social and private pricing.

Table 1: Policy analysis matrix

	Revenues	Tradable Input Costs	Capital/Labour Cost	Land Cost	Profits[a]
Private prices	A	B	C	D	NPP
Social prices	E	F	G	H	NSP
Policy effects (or transfers)	K	L	M	N	O

[a] *NPP and NSP denote net private profits and net social profits, respectively.*
Source: Adapted from Monke & Pearson, (1989)

The following indices of economic efficiency and measures of policy intervention and distortions can be derived from the PAM framework:

Value Added (VAD) ⇒ E-F
Cost of domestic resources (CDR)⇒ G+H
Domestic Resource Cost Ratio (DRC) ⇒ (G+H)/(E-F) or CDR/VAD
Effective Protection Coefficient (EPC) ⇒ (A-B)/(E-F) or (A-B)/VAD
Nominal Protection Coefficient (NPC) ⇒ A/E

Social profits measure efficiency or comparative advantage. When systems producing different outputs are compared for relative efficiency, the domestic resource cost ratio, defined as (G+H)/(E-F) or CDR/VAD, serves as a proxy measure for social or economic efficiency. The denominator of the preceding equation derives value added in activity i (VAD_i), and the numerator calculates the economic value or cost of domestic resources (CDR) used to produce commodity i. When CDR is expressed in local currency and VAD in foreign currency, the DRC ratio obtains. Thus DRC analysis measures the relative efficiency in terms of the cost in local currency of domestic resources required to save or generate one unit of foreign exchange. This coefficient is then compared to the effective or parallel exchange rate. However, in this study an alternative measure of economic efficiency that is easier to interpret, the resource cost ratio (RCR) was used. The RCR is obtained from the same equation used above to derive the DRC with the only difference being that both the denominator and numerator are expressed in the same currency units. RCRs of between zero and less than one imply that value added per unit of product *i* is larger than the value of domestic resource used to produce that unit; hence *i* has a comparative advantage. Likewise, RCR of greater than one implies that value of domestic resources used to generate one unit of *i* is greater than the value added per unit of *i*; thus there is no comparative advantage (Hassan & Faki, 1993).

2.1 Determining private and social prices of tradable goods and services and non-tradable domestic resources

Actual prices at which tradable goods and services are bought and sold in the market were used as the private price. To determine social prices of tradables, import and export parity prices have been calculated using the equilibrium exchange rate to convert border prices to local currency values. Social prices of some key non-tradable domestic resources have been estimated using different approaches. For example, gross margins in the best alternative use of land (generating the highest economic returns) calculated at social prices were used as the social value of land (opportunity cost). This approach seemed the most appropriate considering the fact that the land market is not well developed in

Malawi. For a private price, the government-instituted land rent (approximately US$3.3 per hectare/year) was used. Similarly, a social price of labour was computed from the enterprise budgets as the average gross margin per man-hour at social prices. Accordingly, there were variations in the value of labour depending on production zone and technology employed. The government instituted wage rates in the various production zones were used as the private price for labour. Capital was valued at the 35 percent interest rate used by the Malawi Rural Finance Company, a leading lending institution to the agricultural sector.

2.2 Measures of policy effects (K, L, M, N)

The second identity of PAM concerns the difference between private and social valuations of revenues, costs, and profits (Table 1). For each entry in the matrix measured vertically, any divergence between the observed private (market) and the estimated social efficiency price must be explained by the effects of policies that lead to inefficient use of resources. These policies are often introduced because decision makers are willing to accept some inefficiencies (and thus lower social benefits) in exchange of achieving non-efficiency objectives, such as re-distribution of income or the improvement of domestic food security. Accordingly, government policies and market imperfections can cause divergence between private and social prices. Unless the government enacts a protection policy for example, each importable output and input will be available at its import parity price, so that A will be equal to E and B will be the same as F in Table 1. Consequently, any difference between A and E or between B and F is caused by some combination of trade restrictions, price control, tax/subsidy or exchange rate policies.

If A exceeds E, either domestic consumers are forced to pay higher than world prices or the government treasury is directly subsidising production, causing an output transfer (K) equal to (A-E). Similarly, if B is less than F, tradable inputs are subsidised, resulting in an input transfer (L) or (F-B). For domestic factors, the transfer (M, credit and N, land) amounts to (G-C) and (H-D). The net effect (net transfer) caused by policy and market failures (O) is the difference between effects on output (K) and on costs (L, M and N) thus O=(K-L)-(M+N). The net effect can also be found by comparing private and social profits. These measures of net effect must by definition be identical in the double-entry accounting matrix, O=(K-L)-(M+N) or NPP-NSP (Table 2).

The nominal protection coefficient (NPC) is the ratio which contrasts the observed (private) commodity price with a comparative world (social) price. This ratio measures the impact of policy (or any market failures not corrected by

efficient policy) that causes divergence between the two prices. The NPC on

Table 2: Measures of policy effects

Indicator	Formula	Description
Net Effect	O=NPP-NSP or O=(K-L)-(N+M)	Net effects of government policies
Output Effect	K=A-E	Effects generated by domestic private/ border price differences
Input Cost Effect	L=F-B	Effects generated by domestic price/ border differences
Factor Cost Effect	M=G-C and N=H-D	Effects generated by actual price/ shadow price differences

tradable outputs, defined as A/E, indicates the degree of output transfer. An NPC greater than one means that policies are increasing the market price above the world (social) price, thus providing a positive incentive to producers. Likewise, an NPC less than one indicate a negative incentive (or disincentive) to producers. The effective protection coefficient (EPC) is another indicator of incentives measured as the ratio of value added at private prices (A-B) to value added at social prices (E-F), or EPC= (A-B)/(E-F) (Table 1). This coefficient measures the net effect resulting from product market and tradable input and output policies.

2.2 Characteristics of agricultural production systems in Malawi

Relative efficiency in production and hence comparative advantage depends on four factors:

(i) technology which determines production possibilities and influences the rate of product transformation;

(ii) resource endowment which determines the scarcity value of domestic resources such as labour, capital and land;

(iii) international prices which determine the value tradable inputs and outputs, and

(iv) the biophysical environment which determines the biological (yield) potential of agricultural production (Hassan *et al.*, 1998).

Accordingly, DRC measures of CEA were calculated for various commodity groups and farming conditions in the different agro-climates in order to capture

and analyse the impacts of the above listed determinants. An agro-ecological zonation approach based on geographic information systems technique was used to classify production environments according to biophysical conditions. Production zones of relatively homogenous biophysical conditions were grouped together. The classified zones represent Ngabu, Blantyre and Machinga Agricultural Development Divisions (ADD) in the south; Lilongwe, Salima and Kasungu ADD in the centre; and Mzuzu and Karonga ADD in the northern region of the country. Coding production systems by tenure and technology as distinct activities captured variations within agro-ecological zones due to differences in technology and tenure. Two production technologies were identified: high-input and low-input technologies. It was difficult to separate issues of tenancy from technology in Malawi. The smallholder sub-sector in Malawi, is predominantly associated with peasant farming, employing primitive tools and low input technologies. On the other hand, estate farming uses advanced technologies in the form of improved seed and modern inputs such as fertiliser, pesticides and machinery.

To allow for the effect of proximity to market centres, entry and exit ports, and the state of infrastructure on prices of inputs and outputs, as well as transport costs, central market nodes were identified. Three central market nodes namely: Blantyre in the Southern Region of the country, which is located at approximately 740 km from the port of Nacala; Lilongwe in the centre (about 1051 km from the port of Nacala); and Mzuzu in the Northern Region of the country (at a distance of 1418 km from the port of Nacala). The said central market nodes were used as reference points for calculation of prices and transport costs. Nacala was used as the exit and entry point into the country. Variations in resource endowment were reflected in the relative rental values of those resources in the different market centres.

3. RESULTS AND DISCUSSIONS

The study revealed that different Agricultural Development Divisions (ADDs) in Malawi have comparative economic advantage in the production of different crops. It should be pointed out that as a result of using Nacala as the major inlet and outlet port as this study assumed, the ADDs in the northern region of the country, Mzuzu and Karonga ADDs, faced very high transportation costs. On the contrary, ADDs in the southern region, Ngabu, Blantyre and Machinga, had the least transportation costs to the border being in close proximity to Nacala.

Tobacco, the main cash crop and chief foreign exchange earner for Malawi, is grown mostly in the central region of the country. The north and southern regions are second and third producers, respectively. The RCR results indicate

that the country has a very strong comparative economic advantage in the production of burley tobacco in the seven out of eight zones (ADDs). The RCR ranged between 0.23 and 0.88 under high input technologies. Kasungu, Karonga and Lilongwe ADDs being the top three efficient users of domestic resources and Ngabu ADD was the only zone with a high RCR ratio of 0.88 using high input technology. Farmers' returns from this crop averaged about US$2,300 per hectare, the highest value for all crops considered in this study (Table 3). The computed RCRs for burley tobacco by low-input producers in the same zones were between 0.18 and 0.58. The fact that RCRs for the two technology levels show no significant difference, despite the differences in input use, suggests that low-input producers are as economically efficient users of domestic resources as estate farmers.

Paprika is an up coming cash crop in Malawi. There is evidence indicating that some of the areas previously under tobacco are now being used to grow paprika. Despite having a very limited world market and therefore demand as compared to tobacco, this crop has seriously challenged tobacco in terms of both farmers' returns and efficiency in utilizing domestic resources. Farmers' returns averaged US$1300 and US$2000 per ha for low and high-input technologies, respectively. RCRs ranged between 0.18 and 0.19 for low-input producers and 0.26 and 0.29 for high-input producers. The relatively lower RCRs for low-input producers suggest that they are more efficient users of domestic resources relative to their high input counter-parts, though the country has a strong comparative advantage in the production of paprika under both technologies.

Macadamia nuts and tea are the other important cash crops in Malawi confined mainly to the medium and high altitude areas of the country. Tea is the second major export crop to tobacco and the country has a strong CEA in its production as indicated by the low RCR of 0.21. Tea is mainly produced by cooperative estates using high-input technology. Smallholder farmers are also involved in tea production in areas that surround the big tea estates. In their expansion and diversification programs, most tea estates have incorporated Macadamia production. Macadamia nut is a high valued and promising cash crop for Malawi. The country is efficiently producing this crop in the highlands of Mulanje and Thyolo (Blantyre ADD) and Nkhatabay (Mzuzu ADD). RCR results (between 0.13 and 0.22) indicate that the country has a strong comparative advantage in the production of Macadamia nut.

Production of maize (hybrid and open pollinated varieties) was also analysed. Maize is the staple food for about 93 percent of the population and provides 65-70 percent of food energy in the Malawian diet. Approximately 85 percent of the

Table 3: Resource cost ratios(RCR) for the activities analysed

Activity	Technology	Price	RCR (Range)	Zone of comparative Advantage (CA)RCR <1	No CA zone (RCR >1)
Burley Tobacco*	High Input	Export Parity	0.23-0.88	All, Ngabu is marginal	
Paprika*	High Input	Export Parity	0.26-0.29	Lilongwe,Kasungu, Blantyre	
Macadamia-Nuts	High Input	Export Parity	0.13-0.22	Blantyre, Mzuzu	
Tea	High Input	Export Parity	0.21	Blantyre	
Beans*	High Input	Export Parity	0.22-0.54	The rest	Mzuzu, Karonga
Soybeans*	High Input	Export Parity	0.40-1.35	The rest	Mzuzu, Karonga
Hybrid Maize*	High Input	Export Parity	0.35-1.64	The rest	Karonga
Burley Tobacco	Low Input	Export Parity	0.18-0.58	All Zones	
Paprika	Low Input	Export Parity	0.18-0.19	Lilongwe, Kasungu, Blantyre	
Beans	Low Input	Export Parity	0.19-0.55	The Rest, except Ngabu	
Soybeans	Low Input	Export Parity	0.37-3.66	Ngabu	The rest
Ground Nuts	Low Input	200	0.19-0.24	Kasungu, Lilongwe, Machinga,	
Hybrid Maize	Low Input	Export Parity	0.42-2.30	The rest	Mzuzu, Karonga
Open Pollinated Maize (Local)*	Low Input	Export Parity	>1	None	All Zones
Cotton	Low Input	Export Parity	0.16-0.19	Ngabu,Karonga Salima, Machinga	

* *Crops which are almost grown in all eight zones (Agricultural Development Divisions)*

smallholder land is devoted to maize production (Conroy, 1993). Hybrid maize varieties occupy about 20 percent of the land under maize cultivation and the rest is planted to open pollinated (OPV) and local (unimproved) maize varieties, which are low yielding. Although the government places high emphasis on maize production, the country only has a comparative economic advantage in the production of hybrid maize. Unfortunately, this is the maize type which occupy a very small share of the small holder land devoted to maize production. All zones in the south and central region of the country achieved RCRs of between 0.35 and 0.50, using high-input technology. Nevertheless, Mzuzu and Karonga ADDs in the northern region of the country achieved a high RCRs of 0.88 and 1.64, respectively. The high RCRs indicate the low CEA and efficiency in hybrid maize production in these zones.

High cost of transportation may be the reason for this lack of comparative advantage in the northern region. The low world maize price, coupled with high transportation costs, could definitely undermine any competitiveness a region or country may have in production and trade. Production of hybrid maize using low-input technology gave RCRs ranging between 0.42 and 0.76 for the same zones. Mzuzu and Karonga ADDs had resource cost ratios of 1.28 and 2.30, respectively. Again, no comparative advantage in hybrid maize production in these zones. RCRs for hybrid maize production in the Northern Region would improve if the northern corridor (Tanzania) is used to export maize and import inputs. The use of the northern corridor as an import and export route for the Northern Region would greatly reduce transport costs for this production zone, which should result in improved competitiveness of the region in production of other crops as well.

Study results indicate that the country has no comparative advantage in the production of open pollinated maize as RCRs of greater than one were realized in all production zones using the export parity price. Two main reasons for the lack of CEA: low productivity and high transport costs. OPVs are only grown by smallholder farmers for subsistence, who rarely use modern inputs such as fertiliser. Increased productivity through improved land and crop husbandry practices and fertilizer use is vital for any comparative advantage to be achieved in the production of OPV. However, a reduction in transport costs is also expected to improve competitiveness as it entails eventual reduction in input costs leading to increased adoption of modern inputs. On the other hand, the current high transport cost that leads to low farm-gate prices provides a natural protection to domestic production of OPV maize in the region compared to importing maize, which will have high import-parity prices due to high cost of transport.

Production of leguminous crops has not escaped the focus of this study. Smallholder farmers in Malawi are currently the major producers of soybeans, phaseolus beans and groundnuts. Previously, private trade in these crops was barred as the ADMARC was the sole buyer and exporter. ADMARC, a government parastatal was offering very low prices for these crops, a good reason to discourage participation of producers that use high-input technology. Hence, lack of serious involvement in production of certain crops such as pulses, by high-input technology producers has been policy influenced in Malawi. Producers that use high-input technologies abandoned production of all crops, which could not be exported, such as pulses. The study revealed that the country has no comparative advantage in the production of soybeans as an export crop if grown using low-input technology (smallholders). RCR between 1.08 and 3.66 were found in all zones except for Ngabu ADD, which had an RCR ratio of 0.37 (Table 3). Technically, this means that the value of domestic resources used in the production of soybeans is greater than the value of foreign exchange earned. Low productivity is one of the major factors causing the lack of comparative advantage in the production of soybeans under low input technology.

The high transportation costs and the crop's low world market price, further erode chances of comparative advantage in production. However, there is a comparative advantage in the production of soybeans under high input technology in all zones except for Karonga and Mzuzu. RCRs ranging between 0.40 and 0.82 are achieved in zones having a comparative advantage (Table 3).

Malawi was also shown to have a strong comparative advantage in the production of groundnuts, the RCRs for which ranged between 0.19 and 0.24. Groundnuts (Chalimbana a confectionery variety) is mainly grown in the central region and some parts of the southern region (Machinga ADD). An average return to farmers' of US$200 was found for this crop. Productivity for this crop is still low. Phaseolus beans is another legume crop the country has a strong comparative economic advantage in its production showing RCRs in the range of 0.19 and 0.55 in all zones with the exception of Ngabu ADD where the crop is marginally grown (Table 3).

The country also has a strong comparative advantage in the production of cotton, which is mainly a smallholder crop. The long history of price depression discouraged active estate participation in production of cotton, a crop that requires a substantial amount of inputs, particularly chemicals. Cotton production under low-input technology (smallholder) gave one of the highest RCRs (0.16). However, low prices continue to be the major hindrance to increased production.

3.1 Effects of policy distortions

This section compares net private profitability (NPP) and net social profitability (NSP) and analyses sources of disparity between the two. The effect of policy on producer incentives is measured as the difference between the price of a particular product or input valued at market and social prices. The effect of a tariff on imports or the effect of a price control is indicated by K, while the effect of a subsidy on fertilizer or other tradable inputs is indicated by L (Table 2). The effect of labour and capital market distortions is indicated by M and the indirect effects of policies on competing enterprises that lead to distortions in the market value of land are indicated by N (assuming that these effects are reflected residually in the net return to land). Total net policy effects are measured as the difference between private and social net profitability (NPP-NSP) or (O) with a negative value indicating that the government policies on the whole decrease private profitability.

By and large, the net policy effect (O) is negative for all the crops, which is a clear indication that overall, policies are reducing net private profitability below net social profitability (Table 4). This suggests that in general government policies are taxing agriculture. The gap between the two, nevertheless, varies widely signaling different policy pressures on different commodities.

The output price transfers show a significant gap between social and private (market) producer prices, with market (private) prices being lower. The gap between private and social output prices is narrower for tobacco and paprika relative to other crops. This is an indication that private prices in tobacco and paprika are comparable and competitive to the world market prices. Nominal protection coefficients of 0.91 and 0.86 were calculated for tobacco and paprika, respectively (Table 4). This means that private prices for tobacco and paprika were 10 and 15 percent below social prices, respectively. This is attributed to the export tax and cess charged (form of fee) on tobacco and paprika producers. Since tobacco and paprika producers have access to free extension services provided by the Tobacco Control Commission of Malawi and the Agricultural Research and extension Trust, cess, a small fee charged as percentage of the auction price is collected from sales. This fee is used to finance provision of extension services for these crops.

The gap between private and social output prices widens significantly for crops such as tea, macadamia, cotton, groundnuts and beans for various reasons. Estates growing and exporting tea offer low prices to smallholder farmers. The falling world price for tea is a big threat to the tea industry in Malawi. The export tax previously imposed on all export crops reduced further the already small

Table 4: Nominal and effective protection coefficients and sources of difference between the net private and net social profitabilities of crops

Activity	Nominal Protection Coefficient (NPC=A/E)	Effective Protection Coefficient EPC=(A-B)/(E-F)	Net Private Profitability (NPP) US$/Ha	Net Social Profitability (NSP) US$/Ha	Net Policy Effect O=NPP-NSP or (K-L)-(M+N)	Producer Price Policy K=A-E	Tradable Input Policy L=B-F	Credit Policy M=C-G	Land Policy N=D-H
Burley Tobacco	0.91	0.84	2069.17	2725.35	(656.18)	(574.36)	58.03	143.24	(61.42)
Paprika	0.86	0.76	1516.33	2137.27	(620.94)	(591.54)	23.22	76.17	(69.99)
Macadamia	0.58	0.56	1861.65	3697.30	(1835.65)	(1826.28)	12.40	68.14	(71.17)
Tea	0.54	0.51	1560.00	2565.77	(1005.77)	(958.33)	12.78	104.54	(69.88)
Beans	0.70-1.01	0.62-0.99	606.5	1058.75	(452.25)	(437.6)	11.37	29.33	(26.05)
Soybeans	0.57-1.35	0.74-1.23	138.35	202.39	(64.04)	(77.83)	7.43	33.00	(54.22)
Hybrid Maize	0.78-1.48	0.71-1.65	459.90	508.21	(48.31)	(56.35)	6.46	23.40	(37.90)
G/nuts	0.42	0.41	282.37	634.11	(396.74)	(445.95)	0.00	20.67	(69.88)
Cotton	0.40	0.37	206.23	1010.11	(965.00)	(949.04)	8.02	33.99	(26.05)

Figures in parenthesis are negative

profit in this industry. These factors are part of the explanation for the low market prices for tea. The low market prices offered to macadamia farmers are mainly a quality issue. It should also be noted that tea and macadamia farmers have limited markets and hence the lack of competition is contributory to the low market prices. The nominal protection coefficients were as low as 0.54 and 0.58 for tea and macadamia, respectively. This suggests that market prices for tea and macadamia nuts in Malawi are on average 42 percent and 56 percent below world prices, respectively. The extremely low market prices offered for these crops represent a major disincentive and obstacle to increased productivity.

Groundnuts and beans are important crops in Malawi due to their nutritive value. Malawian diets do not have a strong animal protein base and these crops are good alternatives. Groundnuts have very low market prices as shown by the NPC of 0.42, which suggests that the market price for this crop is about 58 percent below its social price. Beans on the other hand seem to have a good market price with a NPC of between 0.70 to 1.01 (Table 4). The maize-biased government policy was meant to suppress other smallholder crops. ADMARC, the sole buyer of all smallholder farm produce, was setting the market price of maize above prices of other smallholder crops in order to promote maize production. This consequently led to a significant shrinkage in areas under non-maize crops. Although output markets have now been liberalised, previous policies seem to continue impacting on product markets. The fact that there are still only a few private traders operating, the market remain uncompetitive with ADMARC still buying the bulk of the smallholder crops mostly in remote rural areas.

Market prices offered for soybean were in some places higher relative to social prices. While the country does not have a comparative economic advantage in the production of soybeans, the government has been encouraging farmers to grow this crop as an import substitute due to its nutritive importance. Domestic production levels, however do not satisfy demand for this crop. The market niche for soybeans extends to neighbouring countries especially Zambia. There's sometimes stiff competition for this crop amongst private traders leading to competitive market prices offered to farmers in some parts of the country, especially in the central region. Since there are no longer subsidies in place, the higher market price relative to social price can not be caused by deliberate government distortion of prices. The world price for soybeans is too low and this crop is only traded within regional boundaries. Furthermore, the high transport costs make soybeans prices uncompetitive at the world market.

The market price of maize was found to be close to or higher than its social price, giving a NPC of between 0.78 to 1.48 (Table 4). It should be pointed out that the

government of Malawi still controls the price of maize due to its important implications for food security. The government instituted a maize price band and usually minimum and maximum prices are determined and announced by ADMARC.

The study found that cotton is the worst affected crop in terms of having the least competitive market price relative to its social price, with a NPC of 0.4, suggesting that the market price is 60 percent below the social price. Cotton is one of the smallholder crops which has for a long time been exposed to implicit taxation. Noteworthy, in order to further its policy of encouraging and protecting domestic industry, the previous government banned all cotton exports and ADMARC was the sole buyer of cotton. This was done to promote David White Head and Sons, a local and only textile industry in Malawi. Although, the produce market is now liberalised, ADMARC still dominates cotton marketing because it has in place a well-developed infrastructure, i.e., storage and processing facilities. Lack of serious competition is the main reason for the low market price of cotton. There are only two buyers of cotton in the country, ADMARC and the National Seed Company of Malawi. These companies are more likely to collude in price setting as experience has shown that the two charge the same price for cotton.

The study also found that, overall, private input prices were relatively higher than their social prices. The poor infrastructure and lack of competition in the transport sector have resulted in very high transport costs, inflating private input prices above their social prices. Input traders charge high market prices as they struggle to recover their marketing costs (inflated by high transport cost) and at the same time make a reasonable profit margin. It therefore means that producers are unnecessarily paying more for inputs than they normally would if the transport industry was competitive. Also, the sales tax imposed on inputs such as chemicals inflate the input market price, pushing it above the social price. The inflated input market price (above social price) is a disincentive to production as domestic producers are forced to produce at a very high cost.

The results of Table 4 indicate that the market rate of interest on capital is higher than the social price of capital. Credit rate in Malawi is usually high because there is virtually no effective competition among lending institutions which are very few. The land policy results indicate that land is cheap in Malawi and traded below its social price. This can be taken as an incentive to production with caution. Since land is under-valued, producers are not obliged to allocate and use this scarce resource efficiently, i.e., production of high valued crops. It is until land in Malawi is attached to its true value producers will not learn to heed to efficiency principles in allocation of such scarce resources.

4. CONCLUSIONS AND IMPLICATIONS FOR RESEARCH AND POLICY

Results of the analysis have shown that Malawi has a comparative advantage in the production of many crops in many production zones of the country. Crops such as tobacco, paprika, cotton, macadamia, tea, groundnuts and beans ranked highly in terms of CEA. The country also has a comparative economic advantage in the production of hybrid maize for export. However, Malawi does not seem to have comparative advantage in production of open pollinated maize, a variety widely grown by smallholder farmers. Similarly, the country did not show comparative advantage in the production of soybeans. It would be more wise and rewarding if the government of Malawi seriously considered diversifying to other high valued crops with a promising world demand such as macadamia, cotton, paprika, and pulses. These are the most viable options the country can rely on in order to sustain a fragile small agricultural economy, instead of placing high priority and most emphasis on tobacco, a crop now facing a steadily falling demand on the world market.

Another interesting observation of this study is that low-input producers seem to be at least as efficient if not more efficient users of domestic resources than high-input farmers in some important cash crops such as tobacco and paprika. This is of special significance since these crops are input-intensive. Therefore, given high input costs in Malawi, any intensive use of such inputs should generate adequate returns. However, productivity in these crops (tobacco especially) does not seem to significantly differ between the low and high-input technologies. In spite of having a strong comparative advantage in most crops, production efficiency remains low under high-input technology. On the other hand, agricultural productivity and efficiency in using domestic resources can tremendously improve amongst low-input producers with increased levels of modern inputs, given their current potential. Access to credit is key to adoption of modern production technologies by small holders. The efficiency potential shown in domestic resource use, and the fact that larger number of farmers fall under this category, should persuade the government to reorient its focus and give more attention to issues aimed at removing the bottlenecks faced by low-input farmers. However, to avoid the trap currently faced by high-input producers, emphasis should also be put on improved management and land and crop husbandry practices.

The study further revealed that the disparity between net private and social profitability is mainly attributed to the output price transfer policies. Overall, private output prices were found to be below their social prices for all crops. This indicates that government policies are taxing agriculture. However, the extent

of taxation varied widely from one crop to another for various policy and market failures. Whereas most of the price-distorting policies have been scrapped, Malawian agriculture is still haunted by distortions created by previous policies. Lack of serious and aggressive private sector participation suggests that it will take some time before the benefits of market liberalisation may be realised and appreciated.

The study has revealed that the higher input prices relative to their social prices is more a function of market imperfections in the transport sector (poor road and market infrastructure), poor market information and lack of competition in the input market. While input and output market liberalisation may have assisted the government relieve some of its financial burdens, nevertheless, the unceremonious departure of the government from non-functioning markets especially in rural areas left both producers and private traders vulnerable. The government left the market ground unprepared with poor road and market infrastructure, lack of market information, and no functioning legal framework to facilitate trade and protect all involved parties (producers, traders, and consumers). The study has demonstrated that high transportation costs are undermining chances of comparative advantage for most crops in the northern region. This underpins the argument that reduction of transport costs in Malawian agriculture can greatly improve the comparative advantage and competitiveness of commodity prices both within and across the borders. Accordingly, the success of market liberalisation in Malawi hinges on the government taking a leading role in the development of proper road and market infrastructure, ensure availability and smooth flow of market information, create a conducive policy environment to encourage effective private sector participation in the market, and also reinforce a sound legal framework to facilitate trade.

More over, efficient land allocation is vital for the improvement of agriculture in Malawi. This scarce resource is still under-valued in Malawi. The implications are that people can afford to keep this vital and scarce resource idle as there is no deterring value to land use. In fact, research findings have indicated that a significant share of estate land is not being put to any economic use while the country is experiencing land scarcity problems. A good number of estates in Malawi possess vast hectarage of land than they can manage (Mkandawire, 1990). Inefficient allocation of this resource is inevitable as already observed that almost 75 percent of smallholder land is under low yielding open pollinated maize varieties. Land rents that would reflect the true scarcity value of this resource is a vital tool especially for estates. A land tax may be due on agricultural land in Malawi to induce productive use of its scarce land resources.

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