TOURISM AND THE ECONOMY OF TANZANIA: A CGE ANALYSIS*

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Abstract

Although much literature exists to demonstrate the importance of tourism as a foreign exchange earner, little is known about how tourism expansion affects the economy of a developing country (LDC). This paper employs a CGE analysis to demonstrate the potential contribution of tourism for economic growth in Tanzania using a SAM for 1992. The efficacy of tourism taxation and infrastructure development as important ways to amplify the beneficial impact of tourism is demonstrated. The findings indicate that tourism expansion has substantial impact on the economy as shown by increases in real GDP, total welfare and exports. Improvement of infrastructure appreciably amplifies the effects of tourism expansion and tourism taxation has an unambiguously favourable impact on tax revenue and welfare. As LDCs lack sufficient resources to enhance growth, tourism may provide as a source of tax revenue to finance infrastructure projects that will benefit the economy as whole, as well as tourists.

KEYWORDS: Tourism, Tanzania, CGE analysis, Infrastructure Development
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1. INTRODUCTION

In most developing countries endowed with significant tourist attractions, tourism has emerged as a new impetus for economic growth given its ability to generate foreign exchange and employment. A concise analysis of the economic impact of tourism for a developing country is important to guide the policy intended to develop tourism and augment its benefit on the economy (see Dwyer and Forsyth, 1993). Tourism impacts on the economy through tourists' expenditure on different (mostly non-traded) goods and services (Hazari and Sgro, 1995:243). Thus, the tourist expenditures may be regarded as an inflow of foreign exchange that can lead to appreciation of exchange rate hence reduction of the domestic price of exports, which acts as a disincentive to exporters. More generally, the economic impact of tourism can be examined by analysing its impact on the growth of production, use of the factors of production or on the country's balance of payments (Mikić, 1988: 302).

This paper examines the economy-wide impact of tourism in Tanzania using a CGE analysis. In a destination country such as Tanzania, tourism can be broadly defined to include the provision of goods and services necessary to maintain tourists, e.g. transport, accommodation and restaurants. Tanzania is an interesting case for analysis. The country is endowed with various natural resources that form a mainstay of tourist attractions; almost a third of the land area is allocated to natural parks. Trends in the performance and growth of tourism in Tanzania (see Curry, 1986; Wade *et al*, 2001) show that for the last decade, tourism has grown to be an important sector in Tanzania. As a share of total exports, tourism earnings increased from 15% in the 1980s to over 40% in the 1990s, becoming the second largest foreign exchange earner after agriculture. Tourism earnings as a share of GDP increased significantly, from about 1% in the 1986-92 period to over 6% in the 1993-98 period; one of the highest in SSA countries (see WTO, various years).

Previous economic impact studies of tourism have concentrated on estimating different multiplier values of tourism for different countries using Input-Output (IO) analysis (Archer and Fletcher, 1990; Sinclair, 1998; Wagner, 1997). In the specific case of Tanzania, both Curry (1986) and Kweka *et al* (2001) used IO analysis to demonstrate economic significance of tourism. However, the essence of economic impact of tourism is about the potential structural changes that tourism expansion imparts on the destination economy, which eventually lead to two problems. Firstly, as tourism expansion is associated with positive and negative impacts, is the net effect positive or negative? Secondly, in what way can the positive effects be maximised and the negative effects be

minimised? Much more generally, tourism has attracted relatively little attention in the literature on economic development (Sinclair, 1998:2)[1]. The use of CGE analysis is beneficial as it incorporates economy-wide feedback effects in examining different impacts on various sectors, and allows assessment of net effects that may be positive or negative. In addition, CGE analysis provides modelling framework in which welfare effects can be numerically measured.

This is the first time a CGE modelling is applied on tourism analysis for a developing country such as Tanzania. In addition, the model is also used to examine the efficacy of taxing tourism and importance of improving infrastructure as plausible ways to augment the benefits of tourism for a developing country. These issues have not been incorporated in any previous CGE analysis of the economic impact of tourism. Section 2 introduces both the SAM and model required for the CGE analysis and explains the treatment of tourism. Section 3 outlines the motivation and design of the simulations carried out. Section 4 presents selected results of the simulations. Finally the paper concludes in section 5.

2. THE SAM AND MODELLING FRAMEWORK

2.1 Description of the SAM

A SAM may be defined as a matrix (usually with identical rows and columns) presentation of accounts that describe all the transactions within an economy. Such transactions are carried out by different economic agents either through market or via identifiable transfers. The concept and principles of SAM are fairly standard (for details see Pyatt and Round, 1985). In implementing a CGE model, one may either construct a SAM or use an existing one. The latest available SAM for Tanzania was constructed for year 1992 (see Wobst, 2001), but its major limitation is that it used the older (1976) IO Table.

We use the most recent IO Table for 1992 (URT, 1999) in generating our SAM for the year 1992 supplemented by information from existing SAM and other statistical publications. In addition, the values of household income used in generating our SAM took into account the informal and non-wage subsistence labour income (see Kweka *et al*, 2001). The important thing to consider in generating a SAM is to ensure micro consistency (*income* = *expenditure* for each account), and that the SAM be a good representation of the economy and the issue being examined.

[1] The survey by Sinclair (1998) includes a comprehensive review of literature on most aspects of tourism economics.

The generated SAM represents the basic structure of the Tanzanian economy for 1992. Productive activities are categorised into 23 productive sectors (activity accounts)[2] with an explicit representation of the major export (e.g. coffee, cotton, other cash crops) and tourism-related (e.g. hotels and restaurants, food and beverages, land transport) sectors. The productive sectors produce exports and domestic goods using five factors of production: three labour categories (skilled, unskilled and rural agriculture labour), capital and land. The SAM includes two households (urban and rural) and one representative enterprise. All *capital* earnings accrue to enterprises, while labour and land earnings accrue to households[3]. The *indirect taxes* account is distinguished into *indirect* (output) *tax* and *sales tax* both of which are charged to activities and paid by producers[4]. *Income taxes* are paid by *households* and *enterprises*.

The *tourist* account shows income (from *ROW*) and expenditure (on composite goods) of international tourists. Thus, tourist along side other (domestic) consumers including the households, private investment and government specifies the demand side of the economy. The government is divided into recurrent and investment components to capture the spending structure of the public sector. The former receives income from domestic taxes and foreign aid (grants) from the *ROW*. The rest of the world (*ROW*) account records income (outflow) from imports, factor payments[5] and government transfers. Finally, *capital* account is used to collect savings from the domestic institutions (*households, enterprise,* and *government recurrent*) and the *ROW*, the total of which is used to finance *investment* (fixed capital formation).

Treatment of Tourism in the SAM

As noted earlier, tourism impacts on the economy through tourists' consumption of various goods and services. As an important feature of the SAM and the model, it is necessary to highlight on data used to (and how we) represent tourism in the SAM data. Tourist expenditure pattern, showing amount of money spent on different goods or services was obtained from the Tourist expenditure surveys compiled by the Tourism department. The shares of consumption of different goods/services are applied to the 1992 tourist expenditure total to obtain the value of spending on each expenditure item. Each expenditure item was matched to the respective IO sector. As IO

[2] In the *activity/commodity* account, each sector produces one commodity, and each commodity is produced by one activity (no secondary production).
[3] In addition to factor income, households also receive transfer income from *enterprise* and remittances from the *ROW*.
[4] The distinction between the two taxes makes it possible to exempt exports from paying sales taxes.
[5] Payments for foreign primary factors apply only to skilled labour and capital.

Table is readily balanced, each of the value of tourist expenditure is subtracted from the respective total export.

2.2 The Structure of the Model

As with most other CGE analyses, the model outlined in this study is neoclassical in structure and broadly follows Robinson *et al*, 1999 which builds from that of Dervis *et al*, 1982 that is widely used in CGE analysis of developing countries. It may be described as a single-country, small open economy, and as static CGE model extended to incorporate international tourism. The specification of elasticity values and the SAM took into account the availability of data and the structural features of the economy.

The purpose of the model is to examine the effects on the economy of expansion of international tourism using the above-described SAM for 1992. Total supply (employment) of primary factors is fixed in the model, thus, equilibrium in the labour market is determined by changes in factor prices. Production technology is specified in a multi-level nesting structure; the production of domestic output is defined as a function of intermediate inputs and value added, that are combined at the top-level nest of the production block according to a Leontief function. The model employs the Constant Elasticity of Substitution (CES) function to capture the relationship between factor use and level of output. The CES function is also used to aggregate supply of domestic output with that of imports, while the CET (Constant Elasticity of Transformation) function aggregates domestic goods in terms of export and domestic sales given the Armington (1969) assumption that goods are differentiated by their country of origin.

Tourist expenditure (*TOUEX*) is a CES composite of the goods and services consumed by tourists. This allows a limited degree of substitution between goods in tourist expenditure. Note that tourism exports demand is downward sloping, with a Cobb-Douglas price elasticity of demand ($\varepsilon = -1$). Unlike typical exports that are subject to the small country assumption, Tanzania can influence the price of its tourism. The following equation describes the tourism export function.

$$TOUEX = TOUE \cdot \left(\frac{PTOU}{ER} \right)^{-\varepsilon}$$

Where *PTOU* is the dual price index of the above tourism CES composite function; *TOUE* is a fixed tourist income in foreign currency, and *ER* is the exchange rate.

Macroeconomic closures

Once the supply and demand sides of the economy have been specified in a CGE model, one needs to describe market-clearing conditions and macroeconomic closures that have been implemented to ensure equilibrium. These conditions were met and the calibration process successfully replicated the benchmark equilibrium data set (SAM). The supply of the composite product equal its demand, where the equilibrating variables are sectoral prices; aggregate factor supply equals demand, where the equilibrating variable becomes the average factor prices (since total supply of primary factors is fixed). Note that all factors are intersectorally mobile. Although in practice capital may not be mobile in the short run, making all factors mobile assures that sectoral rental rates are the same across sectors (Robinson *et al*, 1999:16). In effect, the model assumes a long-run equilibrium, in which there is no unemployment.

The balance of payment condition requires equality between the country's spending and earnings of foreign exchange whereas the saving-investment (*SI*) condition requires aggregate savings to equal aggregate investment. The later is achieved by fixing savings (hence a *neoclassical* "savings-driven" model), and the former by fixing the trade balance. In this case, domestic savings adjust through changes in gross income. Government income is determined by domestic tax receipts and transfers from abroad such that government saving is determined as a residual after subtracting total expenditure from total revenue. Foreign saving is fixed exogenously.

Like many other CGE models, the elasticity values are imposed upon the model, and all other parameters are calibrated to replicate the benchmark equilibrium data. Both the Armington elasticity of substitution and transformation (CES and CET) between domestic and import goods, and between domestic and export sales respectively, are taken from Wobst (2001). Values for the elasticity of substitution between all primary factors are obtained from the GTAP (Global Trade Analysis Project) database (see Hertel, 1997:19.9). Elasticity values for the CES combination of different labour categories are based on our reasoned knowledge of the Tanzanian economy. They indicate, for instance, very high substitutability between skills in the primary sectors, but low in the manufacturing and especially service sectors. In the case of tourism, the own-price elasticity is set at unity (–1)[6].

[6] Tourism demand elasticity value for Tanzania is unavailable. However, those on other (for instance, Mediterranean) countries have been found to approximate unity (see Sinclair and Stabler, 1997:50).

3. MOTIVATION AND SIMULATION DESIGN

To achieve a meaningful analysis of the economic impact of tourism for a country such as Tanzania, a series of four simulations are carried out. The choice of simulations is policy-driven in that it reflects the thrust of both government policy to enhance growth of the economy by improving infrastructure in general, and promoting the growth and role of the tourism sector in particular. In addition to the foreign exchange and tax revenue earnings, growth of tourism has an important role of stimulating economic activity for many sectors of the Tanzanian economy given its significant linkage effects (see Kweka *et al*, 2001). For instance, growth of tourism can stimulate expansion of the food and beverage industry, which in turn can accelerate production of food crops, thus benefiting the agriculture and welfare of rural sector. However, for output impact of tourism to be viably realised, improvement of infrastructure is necessary, for enhancing both the productive efficiency of the economy and integration of rural and urban economic activities.

The *first simulation* imposes a 20% growth of tourism by increasing tourism expenditures by 20%[7]. This is our basic simulation intended to examine the impact of expansion of the tourism sector on the economy of Tanzania. An expansion of tourism has the initial effect of raising real incomes by increasing the marginal product of the mobile factors initially employed in the tourism sectors. As a result, demand for factors rises in these sectors necessitating movement of resources out of other sectors to the tourism thus giving rise to various adjustments in the rest of the economy. Firstly, a tourism increase is an inflow of foreign exchange that has effects on the real exchange rate, and that tourism competes with other sectors for resources; both of which may harm primary exports. Secondly, domestic demand for goods and services may rise due to the real income impact of tourism expansion, which will increase domestic prices. In addition, an increase in tourism expenditure also increases imports of goods and services demanded by tourists and by increased production of domestic goods. In this way, tourism expansion may affect the trade balance positively or negatively.

The *second simulation* examines the impact of increasing infrastructure efficiency by lowering costs of distribution and marketing by 10%. Following the approach in Wobst, 2001 and Arndt *et*

[7] An increase in tourism expenditure by 20% is a reasonable scenario as it reflects the magnitude of tourism growth in Tanzania. For instance, between 1991 and 1999 period, international tourism arrivals increased at an annual average of 15%, while the foreign exchange receipts from international tourism has been growing at about 29% per year in the same period.

al (2000), this is modelled through the decrease of the marketing margin coefficients represented by the retail trade sector (ret). As stated in the IO Table (URT, 1999), all marketing and distribution costs are allocated to the retail trade sector. The investment, including additional government spending on infrastructure development, is not explicitly modelled. Poor infrastructure remains one of the critical problems facing developing Sub Sahara African (SSA) countries including Tanzania. The existing infrastructure bottlenecks such as inadequate and poor transport & communication network, roads and railways, inefficient ports and regular power cuts seriously limit productivity and growth. Efficient infrastructure is required to ensure timely supply of goods and services for production and consumption. Inefficient infrastructure leads to high costs of marketing and distribution (transaction costs) usually reflected in high price (or shortage) of goods and services that may limit consumption and welfare. Infrastructure improvement will benefit the economy in general; and will be a requirement for taking fuller advantage of the expansion of tourism.

Clearly, an improvement in infrastructure will amplify the economic benefits of tourism in two ways. Firstly, given the distant location of Tanzania's main tourist attractions an improvement in infrastructure may cut down the price of holidays as costs of transport, marketing and distribution decrease; such an improvement will increase real consumption and hence welfare. Secondly, infrastructure improvement will improve access of tourists to the attractions, thus encouraging further growth of tourism. Our *third simulation* is designed to demonstrate the extent to which infrastructure improvement enhances the economic impact of tourism - the effects of tourism expansion under a better (more efficient) infrastructure. It is implemented simply by combining simulations one and two, and computing the percentage change in the effects of tourism expansion due to the improvement in infrastructure.

Finally the *fourth simulation* imposes a 10% tourism tax as way of amplifying the benefit of tourism on the economy. The government is likely to encourage development of tourism given, among others, its potential to raise additional tax revenue. The literature on tourism economic impact advocates the introduction of taxes on international tourism as one of the means to amplify the benefits of this growing industry (see Tisdel, 1983; Bird, 1992; and Adams and Parmenter, 1995). This contention is based on the fact that most other benefits of the expansion of tourism

may be associated with adverse effects on the economy (such as reduction of primary exports) and may involve costs such as increased imports (see Forsyth and Dwyer, 1993).

4. SIMULATION RESULTS

The objective of our analyses is to examine the overall economy-wide effects of tourism given the basic structure of the Tanzanian economy for 1992. Results are shown for selected macroeconomic indicators such as real GDP, welfare and trade; and the structure of presentation is similar for of each of the four simulations to allow possible comparison. All the nominal variables have been deflated using a GDP deflator, constructed as a weighted index of domestic prices to obtain real changes.

4.1 Impact of Growth in International Tourism

Results from the *first simulation* are shown in Table 2. A 20% increase in tourism demand results in an increase in real GDP (at factor cost) of 0.1% (about Tshs. 1.6 bill). Total welfare is calculated as a sum of welfare of different agents, namely the households, enterprises and government. For households, the welfare values are given as changes of real total income. The value of government welfare is calculated as change in real expenditure on goods and services (for both consumption and investment) and government savings. Enterprise welfare value is given as change in enterprise savings. A 20% increase in tourist expenditure led to a 0.04% increases in total welfare. Enterprise and urban households recorded a positive change (0.7% and 0.1% respectively), while rural and government experienced a fall in welfare.

The fall in rural household's welfare may be explained by the decline in real incomes due to a contraction of output (hence employment) in the agriculture exports sectors[8]. The rise in the domestic prices of goods and services due to tourism expansion decreases the real consumption of goods and services by households, government and private investment. Additional tourism expenditure will also lead to additional government tax revenue, given direct increase in consumption by tourists and net increase due to multiplier effects on output. Total tax revenue increased by 0.2% (TShs 400 mill.)

[8] As noted earlier, expansion of tourism adversely affects primary export due to the appreciation of real exchange rate. Sectoral output of most agricultural exports (especially coffee, cotton, and textile) contract significantly

TABLE 2

MACROECONOMIC EFFECTS OF TOURISM GROWTH (REAL CHANGES)

Indicator	Value (TShs bill.)	%
Real GDP	1.597	0.097
Total Welfare	0.782	0.043
o/w Urban Household	0.623	0.102
Rural Household	-0.316	-0.045
Enterprises	1.126	0.669
Gov. consumption	-0.514	-0.179
Gov. investment	-0.137	-0.227
Total tax revenue	0.472	0.248
Tourist consumption	7.220	17.956
Private consumption	-9.538	-0.816
Total exports	1.602	0.721
o/w Tourism	6.896	17.956
Non-tourism	-5.294	-2.881
Total imports	-0.568	-0.097

Notes: In this and subsequent Tables, - indicates a result is not applicable/reported; o/w = of which.

An important motive for promoting tourism by developing countries is improvement of the trade balance by increasing export earnings. Total exports increase by TShs 1.6 bill (0.7%), of which tourism increased by TShs 7 bill (18%), but non-tourism exports contracted by TShs 5 bill (3%). Competitive imports increased, but by less than proportional decrease in intermediate imports, making an overall decrease in total imports by less than –0.1%. Thus, with a net increase in total exports, tourism expansion has a favourable impact on the balance of trade.

4.2 Impact of improvement in infrastructure efficiency

The results of the *second simulation* are reported in Table 3. Compared to the results of the previous simulation, an improvement in infrastructure has greater and more positive expansionary

following the increase in tourist expenditures. For instance, a 20% increase in tourism expenditure led to over 10%

effects on the economy. Real GDP increases by 0.5%, and total welfare rises remarkably by about 2%. Enterprises recorded the highest rise in welfare (about 4%). Contrary to the results of the previous simulation, welfare increases for both households, where the rural household's (2.3%) welfare increases by nearly twice as much as that of urban household's (1.3%). This result is consistent with that for Mozambique by Arndt *et al* (2000:121), in which it was found that lower marketing margins yield welfare gains across the economy, with rural households benefiting more. This confirms the fact that infrastructure constraints are more acute in the (remote) rural areas, where consumers spend much of their consumption expenditure to access basic necessities. In addition, both government accounts experienced increases in welfare by over 0.4%.

TABLE 3
MACROECONOMIC EFFECTS OF INFRASTRUCTURE EFFICIENCY (REAL CHANGES)

Indicator		Value (TShs bill.)	%
Real GDP		7.851	0.479
Total Welfare		31.189	1.715
o/w	Urban Household	7.646	1.258
	Rural Household	15.916	2.292
	Enterprises	5.886	3.496
	Gov. consumption	1.518	0.528
	Gov. investment	0.222	0.368
Total tax revenue		0.343	0.180
Tourist consumption		0.152	0.377
Private consumption		17.692	1.514
Total exports		3.218	1.448
o/w	Tourism	0.145	0.377
	Non-tourism	3.073	1.672
Total imports		2.223	0.380

Consumption of marketed goods rises significantly for all demand categories given the improved distribution of marketed commodities from a better infrastructure and the ensuing fall in domestic prices; the CPI falls by over 1%. Both private investment and consumption show the highest increase of 2%. The price of tourism falls (-0.8%). Consequently, tourists' consumption demand increase by 0.4%. Total exports increase by 1.4% of which non-tourism exports increased significantly by a 2% compared to tourism exports (0.4%). Clearly, the significant impact on exports implies that infrastructure improvement will have a positive impact on the balance of trade as total imports grew by lesser extent (0.4%). Infrastructure improvement is thus trade creating as both aggregate export and imports grow, because the lower marketing margins

decrease in coffee production and over 13% decrease in its exports.

increase returns to producers supplying to export market and lower the domestic market price for purchasers of imports. These results imply that the beneficial impacts of tourism on the economy are likely to be higher the more efficient is the infrastructure.

4.3 The Impact of Tourism under Efficient Infrastructure

Table 4 reports results of the *third simulation*. Note that the counterfactual is obtained by netting-out the effects of infrastructure improvement from the combined effects of the two simulations. Although small in magnitude, the estimates should be examined relative to the 10% infrastructure improvement. They show that the economic impact of tourism expansion is, for most variables, positively higher with a more efficient infrastructure in place. Although real GDP remains unaffected, total welfare increases by TShs 18 millions (about 3% of the base value) of which enterprises has the largest contribution. The welfare of rural household increase by 9%, while that of urban households decline by 8%. The change in tax revenue is slightly negative (-0.6%).

The price of tourism falls (by 3%) more than in the base scenario, hence increase in both the tourist consumption and tourism exports; both by 0.4%. The non-tourism exports decline by 2 mill Shillings less, thereby with the increase in tourism exports, total exports recorded an increase of about 50 million Shillings (3%). Clearly efficient infrastructure increased consumption of imports; competitive imports increased marginally by 1%, and intermediate imports declined more by 0.1%, making the net increase in total imports of 0.7%.

It may therefore be argued that a better infrastructure may alleviate the adverse effects of tourism expansion on traditional exports. However, the model is not designed in such a way that infrastructure improvement can directly reduce the real exchange rate appreciation effects of tourism expansion. Instead, the model allows efficiency gain on sectors to expand output/returns due to lower marketing and distributional costs associated with poor infrastructure. In particular, export volume may increase due to a rise in producer price following improvement in infrastructure.

TABLE 4
MACROECONOMIC EFFECTS OF TOURISM GROWTH UNDER EFFICIENT INFRASTRUCTURE (REAL CHANGES)

Indicator		Without efficient infrastructure		With efficient infrastructure*		Net % Change**
		Value (TShs bill.)	%	Value (TShs bill.)	%	
Real GDP		1.597	0.097	1.589	0.097	0.0
Total Welfare		0.782	0.043	0.802	0.044	2.3
o/w	Urban Household	0.623	0.102	0.571	0.094	-7.8
	Rural Household	-0.316	-0.045	-0.288	-0.042	6.7
	Enterprises	1.126	0.669	1.155	0.686	2.5
	Gov. consumption	-0.514	-0.179	-0.501	-0.174	2.8
	Gov. investment	-0.137	-0.227	-0.134	-0.222	2.2
Total tax revenue		0.472	0.248	0.469	0.247	-0.4
Tourist consumption		7.220	17.956	7.246	18.022	0.4
Private consumption		-9.538	-0.816	-9.787	-0.837	-2.6
Total exports		1.601	0.721	1.651	0.743	3.1
o/w	Tourism	6.896	17.956	6.921	18.022	0.4
	Non-tourism	-5.294	-2.881	-5.27	-2.867	0.5
Total imports		-0.568	-0.097	-0.564	-0.096	1.0

Note: *The results are obtained by deducting the effects of infrastructure efficiency from the effects of the combined infrastructure efficiency and tourism expansion simulations, thereby indicating the net interactive effects of tourism expansion with improvement in infrastructure. **These net effects are then expressed as percentage change relative to the 'without infrastructure' scenario.

4.4 Effects of a tourism expenditure tax

Table 5 reports results of the *fourth simulation* – imposing a 10% tax on all tourist expenditures. It is found that the tourist tax significantly increases government revenue by TShs 4 bill (over 2%) and real GDP by 4.2 bill (0.3%). Total welfare increases by about similar magnitude to real GDP (0.2%). Unlike in the previous scenario, the welfare of both households and government increase while that of enterprises falls. The fall in enterprise welfare is due to decline of its real income (in fact real earnings from capital fell).

TABLE 5

MACROECONOMIC EFFECTS OF A TOURISM TAX (REAL CHANGES)

Indicator		Value (TShs bill.)	%
Real GDP		4.170	0.255
Total Welfare		3.960	0.218
o/w	Urban Household	0.779	0.128
	Rural Household	0.005	0.001
	Enterprises	-0.216	-0.128
	Gov. cons	2.964	1.031
	Gov. invest.	0.428	0.709
Total tax revenue		3.930	2.066
Tourist consumption		-3.973	-9.880
Private consumption		1.475	0.126
Total exports		-3.789	-1.705
o/w	Tourism	-3.794	-9.880
	Non-tourism	0.005	0.003
Total imports		0.237	0.041

The imposition of the tourism tax has an immediate effect on the price of tourism, which increases proportionately. Consequently, both the tourist consumption demand and tourism exports fall by nearly 10%. However, the effect on non-tourism exports is positive albeit insignificant. Total exports fall by nearly 2%. The impact of the tourism tax on total imports is positive, being a net effect of a fall in competitive imports by less than -0.1% (due to a general fall in tourist consumption), and a rise in intermediate imports by about 0.1%.

4.5 Sensitivity Analysis

It is important to test the robustness of empirical CGE analysis, as the key conclusions may depend on assumptions made about parameters or relationships in the model (see Maio *et al.,* 1999; Tembo *et al.,* 1999). Sensitivity analysis can provide an indication of the robustness of the results to reasonable variations in the parameters (Bandara, 1991:31; Maio *et al.,* 1999:458). This section examines the sensitivity of the results with respect to changes in different elasticity values, and pinpoints some of limitations pertaining to data and the CGE approach.

Two sensitivity analyses are conducted. Firstly, we examine the possible sensitivity of the above results when the values of different elasticities used in the model are doubled. Secondly, as the elasticity of tourism demand differs significantly for different countries (see Sinclair, 1998), and

an estimated elasticity of demand for Tanzania is unavailable, we investigate the possible effects on our basic results by changing the elasticity of tourism demand to greater than unity (i.e. $\varepsilon. = -2$). Results (not shown here, but are available upon request) for selected macroeconomic indicators show that all the base case results are robust to the two sets of changes in elasticities. In particular, it is notable that the results are not affected at all by the change in the elasticity of tourism demand. The only exception is that total imports increase when the elasticity of substitution in consumption (*ESUB*) is doubled. Although the study utilises secondary published data, the general problem of reliability of data in developing countries needs to be acknowledged. However, in CGE analysis one is concerned with relative changes rather than changes in absolute magnitude. The most important point is that the SAM is balanced, comprehensive (reflects the circular flow of income), represents the economy, and, features the issue being examined. In addition, the robustness of externally generated data such as elasticity values is supported by the sensitivity analysis.

With regard to the modelling and CGE approach in general, there are problems of adopting a purely neoclassical approach to modelling the economy of a developing country. Such problems include certain structural rigidities of LDCs such as missing or inefficient (especially factor and financial) markets (see, Maio *et al*, 1999; Devarajan *et al*, 1994). Some of these are reflected in the model partly by the choice of elasticity values, and partly by the SAM data. However, the extent to which one can modify the basic model to include all the structural rigidities of a developing economy may be severely limited by availability of data.

5. CONCLUSION

This paper employed a CGE analysis to demonstrate the potential contribution of tourism for economic growth in Tanzania using a SAM for 1992. The analysis considered two important ways to maximise the beneficial impact of tourism on the economy of Tanzania: the introduction of a tourism tax, and an improvement of infrastructure efficiency. The findings indicate that tourism has substantial impact on the economy as shown by increase in GDP, total welfare and exports. A better infrastructure stimulates economic activities substantially. For instance, the rural household income and welfare increases notably higher than that of the urban household. Furthermore, improvement of infrastructure is shown to appreciably amplify the beneficial effects of tourism. Furthermore tourism is found to have unambiguously favourable impact on tax revenue.

The results also point out the likely distributional implication of tourism expansion. The rural households are shown to benefit less from tourism expansion. The rural households are the main producers of primary exports that are adversely affected by the appreciation of foreign exchange following increase in tourism. Given the rural-urban nature of the Tanzanian economy, existing insufficient and inefficient infrastructure limits the extent to which rural-urban areas can be integrated to effectively benefit from tourism activities. Therefore, the impressive growth of tourism is less likely to be effective in the government urge to fight poverty as the majority of poorest households are in rural areas, unless there is a deliberate effort to improve infrastructure and distributional mechanisms.

However, the findings should be interpreted with our choice of macroeconomic closures in mind, and limitation in using CGE approach for policy prescription for a developing economy such as Tanzania. Nevertheless, the main policy implication is that, in order to sustain the growth of tourism and its potential to contribute to economic growth in Tanzania, the need for improved infrastructure is imperative. Such measures may involve increased government investment spending for such areas as infrastructure improvement. As LDCs lack sufficient resources to enhance economic growth, tourism may provide a source of tax revenue to finance infrastructure projects that will benefit the economy as whole, as well as tourists themselves.

References:

Adams, P.D. and Parmenter, B.R. (1995) 'An applied general equilibrium analysis of the economic effects of tourism in a quite small, open economy' *Applied Economics,* 27, 10:985-994.

Archer, B.H and J. Fletcher (1990) 'Multiplier Analysis in Tourism' Cahiers du Tourisme, Serie C, No. 103. Centre Des Hautes Etudes Touristques.

Armington, P.S (1969) A Theory of Demand for Products Distinguished by Place of Production' IMF Staff Papers 16: 159-176.

Arndt, C., H. Jensen, S. Robinson, and F. Tarp (2000) 'Marketing Margins and Agricultural Technology in Mozambique', *The Journal of Development Studies*, Vol.37 No.1 October, 121-137.

Bird, R.M (1992) 'Taxing Tourism in Developing Countries.' *World Development*, 20 (8): 1145-1158.

Blake, A. (2000) 'The Economic Effects of Tourism in Spain' TTRI *Discussion Papers*, No. 2000/2, University of Nottingham.

Curry, S (1986) 'The Economic Impact of Tourist Industry in Tanzania: An Input-Output Analysis' *Industry and Development*, Vol.19, 55:75.

Dervis, K., J. de Melo and S. Robinson (1982) *General Equilibrium Models for Development Policy*. Cambridge: Cambridge University Press.

Devarajan, S, J. Lewis and S. Robinson (1994) *Getting the Model Right: The General Equilibrium Approach to Adjustment Policy*, World Bank and International Food Policy Research Institute, Washington, D.C. Draft Manuscript.

Dwyer, L and P. Forsyth (1993) 'Assessing the Benefits and Costs of Inbound Tourism' *Annals of Tourism Research*, Vol. 20, pp.751-768.

Hazari, B and P.M Sgro (1995) 'Tourism and growth in a dynamic model of trade' *Journal of International Trade and Economic Development* 4 (2) 243-252.

Hertel, T.W (1997) *Global Trade Analysis: Modelling and Applications*, New York: Cambridge University Press.

Kweka J, O. Morrissey and A. Blake (2001) 'Is Tourism a Key Sector in Tanzania? Input-Output Analysis of Income, Output, Employment and Tax Revenue' *TTRI Discussion Paper* No. 2001/1.

Maio, L., F. Stewart and R. Hoeven (1999) 'Computable General Equilibrium Models, Adjustment and the Poor in Africa' *World Development,* Vol. 27 No. 3, 453-470.

Mak, J. and E. Nishimura (1979) 'The Economics of a Hotel Room Tax.' *Journal of Travel Research*, 17(4): 2-6.

Mikić, M. (1988) 'Tourism's Contribution to the Yugoslav Economy' *Tourism Management* December, 301-316.

Morley, C. L (1994) 'Discrete Choice Analysis of the Impact of Tourism Prices.' *Journal of Travel Research*, 33(2): 8-14.

Pyatt, G. and J.I. Round (1985) *Social Accounting Matrices: A Basis for Planning*, A World Bank Symposium, World Bank.

Robinson, S., A. Y. Naude, R.H. Ojeda, J.D. Lewis and S. Devarajan (1999) 'From stylised models: Building Multisector CGE Models for Policy Analysis', *North American Journal of Economics and Finance* (10) 5-38.

Sinclair M.T and M. Stabler (1997) *The Economics of Tourism*, Routledge.

Sinclair, M.T (1998) 'Tourism and Economic Development: A survey' *Journal of Development Studies,* vol. 34 (5), 1:51.

Taylor, L. (1990) *Socially Relevant Policy Analysis: Structuralist CGE Models for the Developing World*, MIT Press.

Tisdell, C.A (1983) 'Public Finance and the Appropriation of Gains from International Tourists: Some Theory with ASEAN and Australian Illustrations' *SER*, 28: 3-20.

United Republic of Tanzania (1999) *Input Output Table of Tanzania for 1992*, Planning Commission, Dar es Salaam, Tanzania.

Wade, J.D, B.C. Mwasaga and P.F.J Eagles (2001) 'A Historic and Market Analysis of Tourism in Tanzania' *Tourism Management*, vol. 22, 93:101.

Wagner, J.E (1997) 'Estimating the Economic Impacts of Tourism', *Annals of Tourism Research*, Vol. 24, 592:608.

Wobst, P. (2001) *Structural Adjustment and Intersectoral Shifts in Tanzania: A Computable General Equilibrium Analysis*, IFPRI Research Report 117, Washington DC.

WTO (World Tourism Organisation) *Yearbook of Tourism Statistics* (various years), WTO, Madrid.

Zhou, D, J.F Yanagida, U. Chakravorty and P. Leung (1997) 'Estimating Economic Impacts from Tourism' *Annals of Tourism Research*, Vol. 24 No. 1, 76:89.