# *Economic multipliers for Tanzania: implications on developing poverty reduction programs*

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## Abstract

Economic multipliers analysis results provide useful information to policy makers with a simple way to estimate potential impact of new policies. In this study, an economic multiplier model of Tanzania was estimated from an updated 2004 social accounting matrix. Results indicate that agro-processing industries have the highest economic multiplier (>3). Sectors with the lowest economic multipliers included export-oriented agricultural sectors. Low economic multipliers were associated with lack of backward and forward linkages within the economy. Poverty reduction in Tanzania can be achieved by focusing more on value adding and producing commodities that target the domestic market. This will generate more economic impact than focusing on exporting and importing raw materials.

## Introduction

Tanzania's economic growth and development highly depends on performance of the agricultural sector, which employs more than 80% of the workforce and generates more than 50% of the total export earnings. Public policies have been long favoring cash crops such as coffee, cotton, sisal and tea, which are export oriented. Consequently, income and wealth distribution have been skewed towards those regions growing these crops. Past policies included interventions in input and output markets through cooperative unions and marketing boards that paid prices that were higher than corresponding border parity prices. Trade liberalization policies that were introduced in the 1980's have pushed towards removing input subsidies and price control. The focus is on developing market oriented economy with little intervention from the government. Still, there is a lingering hangover that creates bias towards cash crops. Apart from cash crops, new sectors that are favored by the government include trade and tourism. The government normally spends substantial amount of money on export and import support programs to promote trade and also advertisements to promote tourism. These policies, however, are not supported by rigorous economic analysis in order to identify those sectors with high economic multiplying effects. In this study, we estimated output economic multiplier for the 43 sectors that are important for Tanzania's economic growth and development. The objective is to give policy makers reference points when identifying high impact development pathways or developing poverty reduction programs.

Economic output or sectoral output can be defined as value of production for a given time period. It is the value of sales plus or minus inventory. Economic output is also measured either as the total value of purchases by intermediate and final consumers, or as intermediate outlays plus value added. The output multiplier therefore, estimates the total change in sales, resulting from a one unit increase of sales in final demand. The output multipliers are also often used to assess the interdependence of sectors in the economy. An economic multiplier is a single number that summarizes the total economic benefits resulting from an increase in economic output. The number summarizes economic impacts, which can be expected from changes in a given economic activity. It is usually decomposed into direct, indirect and induced economic effects. Direct effects represent economic impact accruing to the sector under study. Indirect effects are changes in the inter-sectoral transactions as both backward and forward linked sectors respond to supply inputs and services demanded by the industry under study. The third component is an induced economic effect that is due to changes in household spending associated with income (employment) changes in the directly and indirectly affected sectors. Despite the importance of economic multipliers for development planning, there has been no study that attempts to estimate these multipliers for Tanzania. In this paper we fill this gap by reporting output multipliers estimated using updated Social Accounting Matrix (SAM).

Pyatt and Round (1979) shows that a SAM represent flows of all economic transactions that take place within an economy (regional or national). It is a statistical representation of the economic and social structure of a country, which refers to a single year and provides static picture of the economy. SAMs are square such that column sums equal row sums in the sense that all institutional agents (firms, households, government and the foreign sector) are both buyers and sellers. Columns represent buyers (expenditures) and rows represent sellers (receipts). The SAM

therefore provides a complete account of the circular flow of the economy and tracks how national outputs are produced and how household income is generated and distributed. The fundamentals of SAM theory and applications can be found in Pyatt and Round (1979, 1985).

## Technique used to updating the 2001 SAM

Thurlow and Wobst (2003) discussed in detail the processes of developing the 2001 Tanzania SAM and its structure, which is presented in Table 1. In the table, activities represent domestic production by producers and its disposition between exports and domestic markets. Commodities consist of the disposition of domestic and imported goods to final consumers. The distinction ensures that only domestically produced goods are exported, which include intermediate products for re-export. The distinction also allows more than one activity sector to produce a given commodity. This is useful when different technologies for producing the same goods or services exist. The rows in the SAM represent the source of income. For example, the commodity accounts include purchases of intermediate goods, public and private consumption goods, and investment (savings). The household row represents income sources from factors and remittances from government, firms, households, and from the rest of the world. The columns represent expenditure of income by each account. For example, the household column includes purchases of consumption goods, payment of taxes, private savings, and payment to external transfer account. A square SAM is balanced when the sums of respective rows and columns equal, roughly corresponding to the conventional notion of double-entry-book-keeping and satisfying the market clearing conditions.

**Table 1:** The structure of the Tanzania social accounting matrix

| | | | | **Expenditure** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Endogenous accounts** | | | | **Exogenous accounts** | | | |
| **Receipts** | A | C | M | F | E | H | G | T | D | I |
| Endogenous accounts | | | | | | | | | | |
| Activities (A) | | ac | | | | ha | | | | |
| Commodities (C) | ca | | Cm | | | ch | gd | | er | Cs |
| Margins (M) | | mc | | | | | | | | |
| Factors (F) | fa | | | | | | | | | |
| Enterprise (E) | | | | ef | | | | | | |
| Household (H) | | | | hf | he | | hg | | hr | |
| Exogenous accounts | | | | | | | | | | |
| Government (G) | | | | gf | ge | | | tr | | |
| Taxes (T) | ta | tc | | tf | te | tp | | | | |
| Trade (D) | | rc | | rf | | | | | | |
| Investment (I) | | | | dp | | psv | gsv | | | fsv |

In Table 1, conditions that expenditures equal receipts mean the following. Activities: intermediate inputs (ca) + value added (fa) + tax collection (ta) = domestic sales (ac) +production for own consumption (ha). Commodities: domestic sales (ac) + marketing margins (mc) + indirect taxes (tc) + value of imports (rc) = intermediate inputs (ca) + marketing margins (cm) + private consumption (ch) + government commodity demand (gd) + value of export (er) + private investment demand (cs). Margins: marketing margins (cm) = transportation costs and other marketing services (mc). Factors: value added (fa) =factor income to enterprise (ef) + factor income to households (hf) + factor income to

government (gf) + factor taxes (tf) + factor remittance to the rest of the world (rf) + depreciation (dp); and enterprise or corporations: factor income to enterprise (rf) =enterprise payment to households (he) + dividends payment to government (ge) + direct taxes (te). Other conditions include the following. Households: production for own consumption (ha) + private consumption (ch) + income tax payment (tp) + private savings (psv) = factor income (hf) + dividends from enterprises (he) + governments transfers (hg) + income from rest of the world (hr). Government: government commodity demand (gd) + government transfer to households (hg) + government savings (gsv) = factor income to government (gf) + dividends from enterprise (ge) + tax revenue (tr). Tax Revenue: Total government revenue (tr) = commodity taxes (ta) + indirect tax (tc) + factor tax (tf) + enterprise direct tax (te) + income tax (tp). Trade: value of export (er) + household income from rest of the world (hr) +foreign savings (fsv) = value of imports (rc) + remittance to the rest of the world (rf); and investment: private investment (cs) = depreciation (dp) + private saving (psv) + government saving (gsv) + foreign saving (fsv).

In updating the SAM, the basic assumption was that the technology or the production coefficients of the 2001 SAM have enough information that can be used to estimate production coefficient and non-zero sub-matrices of the 2004 SAM. After estimating the sub-matrices of the new SAM for 2004, we used Robinson, Cattaneo and El-Said (2000) cross entropy procedure to remove possible introduced errors. The theory underlying this procedure can be found in Golan, Judge and Miller (1996). The main feature of this procedure is that the row sums of the new SAM are known with certainty and column sums involve measurement errors. The objective is to estimate a new SAM without measurement errors where the rows and column sums are equal. The desirability of this procedure is that values known with precision can be included in the model by adding more constraints.

During data collection, the aim was therefore to get accurate values of the row sums, for 2004. We used this information and share matrix for 2001 to estimate the 2004 SAM. The macro variables were obtained by visiting with senior personnel in the Ministry of Finance, National Bureau of Statistics, Planning Commission, Treasury, Bank of Tanzania, and Tanzania Revenues Authority for macro level and tax data. These data were supplemented from published reports such as URT (2005), TRA (2005), BOT (2006a, 2006b, 2006c) and several unpublished reports from the Ministry of Agriculture and Food Security, Ministry of Natural Resources and Tourism and the former Ministry of Water and Livestock Development (for crop and livestock production). Other data sources were the FAO's statistical database (crop and livestock production and trade data) and macro data from World Bank's Development Indicators. After balancing the SAM, the new sub-matrices have to be consistent with macroeconomic variables summarized in Table 2.

**Table 2:** Tanzania Gross Domestic Product by Kind of Economic Activity at Current

| **Economic activity** | **Value** |
|---|---|
| Agriculture | 5,211,861 |
| Mining and Quarrying | 278,262 |
| Manufacturing | 791,416 |
| Electricity and Water | 177,614 |
| Construction | 637,769 |
| Trade, Hotels and Restaurants | 1,319,172 |
| Transport and Communication | 509,948 |
| Financial and Business Services | 1,550,266 |
| Public Administration and Other Services | 1,044,230 |
| Less Financial Services indirectly measured | -233,218 |
| Total GDP | 11,287,320 |

Source: http://www.tanzania.go.tz/economicsurvey1/2004/tables/table1.html

## Economic Multiplier Model

SAM-based economic multiplier models belong to the class of general equilibrium models that use fixed prices in assessing the economic effects of exogenous change in income and demand. The common distinguishing features of these models include three basic assumptions. First, prices are fixed. Accordingly, conclusions about quantities are drawn on the basis of values. Second, functional relationships are taken as linear in the SAM columns. This implies among other things, that Leontief production functions relied on the production process along the

activity column and there are no substitution between imports and domestic production in the commodity column. Third, the model is demand driven. Accordingly, there are no supply side constraints on economic activities (Round 2003). There are two major steps involved in the calculation of SAM-based economic multipliers. First, calculate the SAM coefficients or shares that represent the structure of the SAM, which is analogous to an input-output model. Second, divide the SAM into endogenous and exogenous accounts to create an invertible matrix. Endogenous accounts are usually limited to those related to production (activities and commodities), factors of production and households or private institutions. The corporate or enterprise account, which represents distributed profit and property income, can be treated as either being exogenous or endogenous. In this study, the enterprise account was treated as endogenous since enterprise's economic performance is influenced by house decisions. Exogenously determined accounts include: government outlays, taxes, trade and investment. This is because government outlays and taxes are policy determined and trade is outside domestic control. Since the model has no dynamic features, investment is exogenously determined (Round 2003; Thorbecke 2000).

After dividing the SAM into exogenous and endogenous we estimated a Leontief inverse matrix using the updated SAM. The elements of the Leontief inverse matrix constitute the SAM-based economic multipliers. Each element of matrix represents a multiplier for each sector. The column vector in the matrix captures the impact of an exogenous shock to the corresponding account on all endogenous account in the SAM. The diagonal elements of the matrix measure the direct impact of the shock to the initial sector and should be equal to one. The off-diagonal elements represent the indirect impact of the shock affecting other sectors, the return to factors, and household income by type of households. To estimate the induced effect, repeat the procedure explained above but drop the households account from the analysis. The induced effect is the difference between the off diagonal elements of the first matrix and the second that does not include household account (Lindal and Olson 2000).

## Results and Discussion

The economic multipliers estimated from the updated 2004 SAM are presented in Table 3. As indicated before, economic multipliers show the total amount of economic activities that are generated by new spending (including the original shilling) in the economy. For example, the economic multiplier for meat processing and dairy products was estimated to be 3.12. This means that increasing the output of this sector by 1,000 TZS; it will create demand for primary inputs used in processing, which is valued at 888 TZS (e.g., demand for live cattle or milk). The induced economic effects will generate 1,224 TZS through household spending due to new incomes and employments. As the processing sector expands, it will employ more people and supplies of primary and intermediate inputs will receive more money. A chain of increased expenditures associated with increase in income will spur more economic activities. For example, increased production in the processing sector may increase demand for food or clothing; sectors that are not directly related to the processing of meat and dairy products. When the estimated economic multiplier is equal to one, it means that new or expanding industries cannot have economic impact beyond the jobs and income generated by the original expenditure or there is no ripple effects or spin-off activities that can generate more income and jobs.

Based on the estimated output multipliers (Table 3), the Tanzania production sectors can be grouped into four categories depending on their potential impacts for furthering domestic production, adding value to domestic goods, increasing household incomes and thus poverty reduction. The first category has an economic multiplier greater than 3 and includes 5 sectors. In this category, the first three sectors are related to the agro-processing industries. Agro-processing and milling add value to domestically produced goods, increase demand for intermediate inputs and thus creating more jobs. The many problems of persistent poverty associated with low productivity, post-harvest losses and poorly integrated markets in Tanzania are often exacerbated by under-developed agro-processing industries. Little attention has usually been paid to commodities supply and value chains through which value added products reach the final consumers in both the domestic and international markets. This neglect results in enormous potential losses of value added and employment opportunities and thus chronic poverty. Growing of cassava, fruits and vegetables also exhibits high economic multipliers. This can be attributed to low domestic marketing costs and capital requirements associated with cassava, fruits and vegetables production. Costs of production for these products are relatively low and utilize the subsistence factor, which contributes about 44% of rural household incomes.

The sectors in the second category have economic multipliers ranging between 2 and 3 and include 17 sectors. Two out of 17 are related to agro-processing industries, 2 to service provision and tourism, 3 to manufacturing industries, and the rest to crop production, operation of poultry and livestock and fishing and hunting. An economic multiplier of greater than 2 is still high. In this category, the first four high ranked sectors include:

textiles and leather products, fishing and fish farms, growing of other roots and tubers and manufacturing of basic and industrial chemicals. The importance of the first three sectors with regard to poverty reduction can be linked to similar reasons mentioned above. Importance of manufacturing of basic and industrial chemicals can be linked to poverty alleviation through increased productivity of other sectors and creation of high-paying jobs.

**Table 3:** Estimated economic multipliers using the updated SAM for 2004

| Rank | Sectors | Total | Direct | Indirect | Induced |
|---|---|---|---|---|---|
| 1 | Processing of meat and dairy products | 3.11 | 1.00 | 0.89 | 1.22 |
| 2 | Processed food | 3.10 | 1.00 | 0.88 | 1.22 |
| 3 | Grain milling | 3.09 | 1.00 | 0.89 | 1.20 |
| 4 | Growing of cassava | 3.02 | 1.00 | 0.88 | 1.14 |
| 5 | Growing of fruits and vegetables | 3.01 | 1.00 | 0.84 | 1.17 |
| 6 | Textile and leather products | 2.98 | 1.00 | 0.86 | 1.12 |
| 7 | Fishing and fish farms | 2.96 | 1.00 | 0.85 | 1.12 |
| 8 | Growing of other roots and tubers | 2.96 | 1.00 | 0.83 | 1.14 |
| 9 | Manufacturer of basic and industrial chemicals | 2.95 | 1.00 | 0.84 | 1.11 |
| 10 | Hunting and forestry | 2.93 | 1.00 | 0.79 | 1.14 |
| 11 | Beverage and tobacco products | 2.89 | 1.00 | 0.80 | 1.09 |
| 12 | Growing of beans | 2.89 | 1.00 | 0.81 | 1.08 |
| 13 | Growing of oil seeds | 2.86 | 1.00 | 0.79 | 1.07 |
| 14 | Petroleum refineries | 2.78 | 1.00 | 0.76 | 1.03 |
| 15 | Growing of other crops | 2.74 | 1.00 | 0.75 | 0.99 |
| 16 | Hotels and restaurant | 2.66 | 1.00 | 0.70 | 0.97 |
| 17 | Operation of poultry and livestock | 2.53 | 1.00 | 0.66 | 0.87 |
| 18 | Growing of tea | 2.53 | 1.00 | 0.65 | 0.89 |
| 19 | Growing of maize | 2.51 | 1.00 | 0.65 | 0.86 |
| 20 | Rubber plastic and other manufacturing | 2.47 | 1.00 | 0.63 | 0.85 |
| 21 | Growing of sorghum and millet | 2.33 | 1.00 | 0.59 | 0.74 |
| 22 | Utilities | 2.12 | 1.00 | 0.48 | 0.64 |
| 23 | Growing of wheat | 1.91 | 1.00 | 0.35 | 0.56 |
| 24 | Iron steel and metal products | 1.91 | 1.00 | 0.39 | 0.51 |
| 25 | Growing of paddy | 1.83 | 1.00 | 0.36 | 0.48 |
| 26 | Business and other services | 1.82 | 1.00 | 0.34 | 0.48 |
| 27 | Wholesale and retail trade' | 1.80 | 1.00 | 0.51 | 0.29 |
| 28 | Growing of other cereals | 1.70 | 1.00 | 0.30 | 0.41 |
| 29 | Wood paper printing | 1.63 | 1.00 | 0.26 | 0.36 |
| 30 | Transport and communication | 1.62 | 1.00 | 0.26 | 0.37 |
| 31 | Glass and cement | 1.57 | 1.00 | 0.25 | 0.32 |
| 32 | Growing of sugar cane | 1.51 | 1.00 | 0.22 | 0.29 |
| 33 | Manufacture all equipment | 1.24 | 1.00 | 0.10 | 0.14 |
| 34 | Public administration health and education | 1.22 | 1.00 | 0.09 | 0.13 |
| 35 | Real estate | 1.09 | 1.00 | 0.04 | 0.05 |
| 36 | Growing of coffee | 1.07 | 1.00 | 0.03 | 0.04 |
| 37 | Growing of cotton | 1.00 | 1.00 | 0.00 | 0.00 |
| 38 | Growing of Tobacco | 1.00 | 1.00 | 0.00 | 0.00 |
| 39 | Growing of cashew nuts | 1.00 | 1.00 | 0.00 | 0.00 |
| 40 | Growing of sisal fiber | 1.00 | 1.00 | 0.00 | 0.00 |
| 41 | Mining and quarrying | 1.00 | 1.00 | 0.00 | 0.00 |
| 42 | Manufacturer of fertilizer and pesticides | 1.00 | 1.00 | 0.00 | 0.00 |
| 43 | Construction | 1.00 | 1.00 | 0.00 | 0.00 |

Sectors in the third and fourth categories have economic multipliers ranging, respectively, from 1 to 2 and 1. For economic multiplier of 1, it means that the sector has only the direct effects. Sectors related to manufacturing, which have high demand for imported inputs dominate the third category. It is commonly believed that international trade and importation of new technologies can be a significant source of productivity and economic growth and thus poverty reduction. Through adoption and imitation of imported technologies, countries can take advantage of research and development originating from abroad to improve the efficiency of domestic production. The argument is that importing intermediate goods that embody improved technologies from an industrial country can significantly boost a country's productivity. Countries that are more open to trade, therefore, benefit more because they have better access to improved technologies by importing intermediate goods. However, there is increasing evidence indicating that the extent to which the use of imported intermediate inputs increase productivity crucially depends on the technological gap. Tanzania imports most of its intermediate inputs from OECD countries and the technological gap is huge. Capital-intensive industries may increase productive efficiency, but limit new job creation. In developing countries, job creation is associated with income distribution and thus poverty reduction.

Except for manufacturing of fertilizer and pesticides and construction, sectors in the fourth category are export oriented. In Tanzania, these sectors are also given priority in the development planning processes, as are important earners of foreign exchange. However, most of the crops are exported as raw materials without adding value as supported by the estimated economic multipliers. This deprives the country an opportunity to create more jobs and generating high income for both domestic investors and farmers. The general view that can be deduced from Table 6 is that the objective of poverty reduction in Tanzania can be quickly achieved developing policy that support adding value to domestically-produced goods and for domestic markets. This will generate high economic impact than focusing on export-oriented cash crops. As an example, while Tanzania concentrates her efforts to attract foreign investments in three sectors: tourism (hotel and restaurants); support of whole sale and retail trade; and mining and quarrying, the sectors with the highest economic multipliers (i.e., processing meat and dairy products, food processing and grain milling) are virtually forgotten.

## Conclusion and Policy Implications

This study demonstrates how a Social Accounting Matrix (SAM) can be updated using macroeconomic variables and use the updated SAM to estimate economic multipliers that can be used to identify development pathways. The SAM has an advantage of producing simple and transparent results that can be easily understood by policy makers. For example, whereas cash crops that are favoured by Tanzania policy makers have least total economic effect, adding value to domestically produced goods and growing cassava and fruits and vegetables has greater economic effects. However, these activities are overlooked by Tanzania policy makers. In general, goods that use locally available intermediate inputs have the highest economic multipliers. These results support the point that both upstream and downstream sectoral linkages were important for income generation and expenditure; a stimuli for increased demand for locally produced goods.

In general, increased demand and supply in any sector have the potential of increasing incomes as households specialize and intensify production to supply additional demand for intermediate goods and factor of productions. The economic multiplier analyses results indicate that direct impacts on upstream production (e.g., manufacturing of basic and industrial chemicals); direct downstream value adding activities (e.g., processing of meat and dairy products); and induced effects occurring via increased employment and income as a result of increased sectoral production activities are all important for income generation and poverty reduction. These linkages have a great overall multiplier effect of increased sectoral production. As indicated early on, the economic multipliers are most significant when any incremental income generated is used to increase labor demand of non-tradable goods such as cassava and vegetables and especially when production of that good is associated with the subsistence factor. It is also obvious that for all sectors with economic multiplier greater than one, the greater proportion of the overall economic multiplier effects were attributable to induced effects, which is related to increased income rather than to inter-industry intermediate input demand.

In conclusion, while economic multiplier models do a good job of estimating the output impacts from an economic shock or increased expenditure, they do not directly assess the impact on increased costs of production. In addition, these models are static and do not consider the inherent changes over time in a dynamic economy. These limitations do not mean that the estimated multipliers are invalid especially when the injection has little impact on price changes. The estimated multipliers for each sector are unique and can be used as reference points during identification of development pathways with highest impacts on the economy.

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## References

Bank of Tanzania (BoT).2006a. Monthly Economic Review March 2006. Bank of Tanzania, Dar-es-Salaam, Tanzania.

Bank of Tanzania (BoT).2006b. Economic Bulletin for Quarter Ending December 2005. Volume XXXVII No.4. Bank of Tanzania, Dar-es-Salaam, Tanzania.

Bank of Tanzania (BoT). 2006c. Annual Report 2004/2005. Bank of Tanzania, Dar-es- Salaam, Tanzania.

Golan, A., Judge, G., Miller, D., 1996. *Maximum Entropy Econometrics: Robust Estimation with Limited Data*. New York: John Wiley and Sons.

Lindal, S.A. and D.C. Olson. 2000. The IMPLAN Input-Output System. Minnesota: IMPLAN, Group, Inc.

Pyatt, G. and J.I. Round.1979. "Accounting and Fixed Price Multipliers in a Social Accounting Matrix Framework." *The Economic Journal* 89: 850-973.

Pyatt G., and J. I. Round (eds). 1985. Social Accounting Matrices: A Basis for Planning, Washington, D. C.: The World Bank.

Robinson S. and M. El-Said. 1997. Estimating a Social Accounting Matrix using Cross Entropy Difference Methods. TMD Discussion Paper No: 21. Washington, D.C.: IFPRI.

Round, J. 2003. "Social Accounting Matrices and SAM-based Multiplier Analysis." In the Impact of economic Policies on Poverty and Income Distribution: Evaluation Technique and Tools, edited by Bourguignon, F., A. Luiz and S. Pereira. Washington, D.C.: The World Bank.

Tanzania Revenue Authority (TRA). 2005. Annual Report for 2003/04. Dar-es-Salaam, Tanzania: Euro Printing and Packaging Ltd.

Thorbecke, E. 2000. The Use of Social Accounting Matrix. Paper Presented at the 26th General Conference of the International Association for Research in Income and Wealth, Cracow, Poland.

Thurlow, J. and P. Wobst. 2003. Social Accounting Matrices for Tanzania. IFPRI: Washington, D.C.

United Republic of Tanzania (URT). 2005. The Economic Survey for 2004. Planning and Privatization Commission, President Office, Dar-es-Salaam, Tanzania.