

# **An analysis of Tanzania's 1998 imports**

**A sector of origin and end use analysis of Tanzania's goods imports, undertaken for the Macmod model**

Per Granberg

WP 2002: 2



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## **Indexing terms**

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## Introduction

This paper report on an analysis made of Tanzania's 1998 imports, undertaken as part of the Macmod project. The analysis entails the classification of imported goods according to their sector of origin and their end use. The arguments and assumptions underpinning these efforts may be of considerable interest for the Macmod operators. In the years ahead these operators will probably have to undertake analysis of a similar kind, in order to update the coefficients etc of the Macmod model. The present paper aims to ease these efforts a little, by putting the details of the present analysis on record.

The present effort relates to a revision of the Macmod model initiated under the project heading: Macmod-Phase III. This project *i.a.* aims to describe in numerical terms the nature of production and consumption inputs in terms of product category and origin (i.e. in terms of the type of products in question, and whether they are imported or domestically produced). The ultimate aim of the exercise is to enable the construction of production and consumption functions that are both up-to-date and flexible with respect to the origin of production inputs.

Information of a related kind is already available from the recently published Input Output table of Tanzania for 1992<sup>1</sup> (henceforth referred to as: IO92). On closer inspection, however, it is clear that there are limits as to how representative the IO92 estimates are with respect to our present purpose. Thus, the present effort is instigated by the problems encountered in earlier attempts to incorporate IO92 data into the Macmod model. These attempts failed to produce reasonable results, presumably because the IO92 data, and especially the IO92 import data, were out of tune with current realities.

The present paper represents part of a wider effort at addressing this issue. The wider effort includes the rebuilding and updating of the IO92 table, with a view to make it a proper data-source for Macmod.<sup>2</sup> The efforts in question are reported in Working Paper WP2002:1, Chr. Michelen Institute, Norway

## Data Source

The primary source of data input into the present exercise was the comprehensive import statistics collected by the Tanzania Revenue Authority (TRA). In their basic form these statistics are detailed at level of individual commodities. Such data are not published, but used as 'raw material' for the production of other, more aggregated statistics. The import data used in the current exercise, specified at the commodity levels indicated below, were obtained directly from the Tanzania Revenue Authority.

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<sup>1</sup> Input Output table of Tanzania for 1992; Research Papers and Reports: No. 1; President's Office – Planning Commission – National Bureau of Statistics; Dar es Salaam; December 1999.

<sup>2</sup> Note that the IO92 table here referred to is an aggregated version of the published IO92 table. The level of aggregation mirrors the Macmod sector specification, and the structure of rebuilding the need for more information pertaining to the issue of import substitution et al.

It may be noted that these import data covered two alternative concepts of import: Direct Imports and Home Use Imports. The two are in principle conceptually different. In practice, however, the two did not diverge much in terms of 1998 value. In our analysis we have adopted the estimates of Direct Imports, which showed the better correspondence to the import-data given in other statistical publications.

It is emphasised that the Import Statistics cover imports of goods only. Service imports are therefore not covered by the present analysis. In consequence, it ignores around 1/3 of all 1998 imports. This is not done because the service imports are considered unimportant. It simply reflects the fact that data on service imports are unavailable in similar detail.<sup>3</sup> Such imports therefore have to be handled in a very different way, and at a much more aggregated level. This, however, is not the topic of the present paper.<sup>4</sup>

### Classification codes

The various end-use ratios and sector-of-origin classification codes employed in the present analysis are set by the present author. Information from the IO92 etc has been used, when available and relevant. For most imports the correct sector-of-origin code and end-use allocation is fairly obvious. Crude oil is a case in point; it is obviously a mining product used as an intermediate input in petrol refining.<sup>5</sup> In other cases the correct end-use group may be less evident. Petrol is a case in point. It is obviously an intermediate input to public transport. Some petrol, however, will be sold to private motorists, in which case the correct end-use category is private consumption. Some sections of the end-use classifications therefore entail a degree of uncertainty.

### Classification principles

The technique used for the present kind of analysis is briefly explained in the above. Thus: import data, specified at a fairly detailed commodity level, is classified two-ways:

- Firstly: by sector of origin; i.e. according to the domestic sector most likely to produce the type of products in question, given the Macmod sector specification. The relevant sectors are:
  - Agriculture: Export crops
  - Agriculture: Food crops
  - Agriculture: Other products
  - Mining
  - Manufacturing: Beverages
  - Manufacturing: Tobacco

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<sup>3</sup> The difference in detail basically reflects the well-known fact that goods are subject to customs clearance, and services are not.

<sup>4</sup> The treatment of service imports is described in another paper, dealing with the rebuilding and updating of the IO92 table. See Working Paper WP 2002:1, Chr. Michelsen Institute, Norway.

<sup>5</sup> Note that table IA1 allows a few important intermediate imports, such as crude oil, to be 'linked' directly to the receiving sector in question. This represent important information about the 'focal points' of the economy, and are of great import in the subsequent IO-updating exercise.

- Manufacturing: Petroleum
- Manufacturing: Other products
- Secondly: by end-use category. The end-use category in question is the economic activity likely to receive (and consume) it. The relevant end-use activities are:
  - intermediate consumption,
  - private consumption,<sup>6</sup>
  - gross fixed capital formation.

## Summary of Inputs

The relevant data inputs used in the Import analysis are detailed in table IA1 (of the Statistical Annex). The table includes two sections: A and B, representing alternative levels of commodity aggregation. Hence:

- Section A refers to a moderately aggregated commodity level, here termed the 2 digit HS-code level. At this level total goods imports are broken down into approx. 100 different commodity groups.
- Section B refers to a more disaggregated commodity level, here termed the 4 digit HS-code level. At this level total goods imports are broken down into several thousand different commodity groups.

Section A and B also represents alternative degrees of import coverage. Thus:

- Section A gives full import coverage. It covers all import categories, irrespective of size.
- Section B gives partial import coverage only. It covers the major import categories, defined as the 2 digit HS groups accounting for more than 1% of the total cif-value of goods imports.

The following data inputs and outputs are given in section A of the table:

- the HS code and description of the various commodity groups (as specified at the 2 digit level);
- the corresponding sector-of-origin classification number;
- the corresponding end-use classification fractions;
- the corresponding 1998 data in respect of imports cif and import duty;
- the corresponding end-use classification estimates in respect of 1998 imports cif and import duty.

In addition, each commodity group specified in section A of the table carries the letter-code: A or B, indicating the aggregation level at which the end-use estimates were calculated. Hence:

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<sup>6</sup> Note that this category only covers imports directly supplied to *private* consumption purposes. Imports to public (government) consumption are not classified as final consumption, but as intermediate inputs into the production of public sector services.

- Code A indicates that the end-use estimates of the 2 HS-digit commodity group in question were calculated at this level; i.e. they were calculated from the end-use ratios specified at the 2 digit HS level.
- Code B indicates that the end-use estimates of the 2 HS-digit commodity group in question are derived from estimates calculated at the 4 HS-digit commodity level; i.e. from end-use ratios specified at the 4 digit HS-level. The ratios and operations in question are detailed in section B of the table.

## Summary of Results

Section A of table IA1 details all relevant end-use estimates, and the corresponding sector-of-origin codes. These estimates, however, are specified at the 2 HS-digit level. All that remains, for the present Macmod purpose, is to aggregate the estimates into relevant sector-of-origin totals. Tables 1 and 2 give the results of doing so.

Table 1: Summary results: Imports cif. (1998) TZS'mill

Sector of origin	Intermed. uses	Private Consumpt.	Capital Formation	Total
Agriculture: Export crops	0	0	0	0
Agriculture: Food crops	15.980	32.047	0	48.027
Agriculture: Other products	471	344	0	815
Mining	55.780	408	0	56.189
Manufacturing: Beverages	661	11.856	0	12.517
Manufacturing: Tobacco	1.105	279	0	1.384
Manufacturing: Petroleum	36.680	4.580	0	41.260
Manufacturing: Other products	307.790	218.263	358.348	884.402
Total (goods only)	418.468	267.778	358.348	1.044.594

Source: Table IA1

Table 2 Summary results: Import Duty (1998) TZS'mill

Sector of origin	Intermed. uses	Private Consumpt.	Capital Formation	Total
Agriculture: Export crops	0	0	0	0
Agriculture: Food crops	1.624	3.373	0	4.998
Agriculture: Other products	36	56	0	91
Mining	3.545	55	0	3.600
Manufacturing: Beverages	91	2.118	0	2.209
Manufacturing: Tobacco	12	4	0	16
Manufacturing: Petroleum	1.758	214	0	1.972
Manufacturing: Other products	29.205	35.475	18.499	83.180
Total (goods only)	36.270	41.296	18.499	96.065

Source: Table IA1

## Alternative Import Analyses

It is recalled that this paper owes its production to the argument that the present import analysis may serve as a model for future import analyses. This reflects the underlying argument that Macmod's database will need to be regularly 'serviced' with up-to-date information, and that this will necessitate the undertaking of new import analysis of the

present kind. The relevance of the first argument seems fairly obvious; Macmod can hardly be relied on to produce reliable forecasts unless it is fed proper data inputs.

The relevance of the second argument is less obvious. While it is evident that imports, a main supply element in the economy, should be represented by proper up-to-date data, it is less obvious that these data have to be made from scratch according to the present recipe. Import data, after all, are readily available from other sources, import data of the end-use type being regularly produced and published as part of Tanzania's official economic statistics.<sup>7</sup>

One inadequacy of these data immediately springs to mind: they are not detailed according to the Macmod sector-of-origin classification. This dimension is vital in the present context. The end-use classification, however, is just as vital. It is also the most challenging and labour intensive of the two. It would therefore ease the workload considerably if official end-use statistics could be employed for the present purpose.

At a first glance it might seem that the official end-use analysis corresponds quite closely to the end-use analysis detailed in this paper. Thus, they both detail the same three end-use categories:

- Intermediate Use, i.e. inputs into local production activities,
- Final Consumption., i.e. private (final) consumption,
- Capital Formation, i.e. gross fixed capital formation.

Closer inspection, however, reveals significant differences between the two, differences that make it unfeasible to rely on the official statistics for the present purpose. Table 3 illustrates this argument. It compares the 1998 end-use analysis made for the present exercise to the one published by the Tanzanian statisticians. The two are seen to differ widely with respect to the distribution of imports over the three end-use categories.

Table 3: Alternative end-use estimates (1998)

End-Use Category:	Nat. Acc.	Macmod
Intermediate Use	178.420	418.468
Final Consumption	357.752	267.778
Capital Formation	506.925	358.348
Total	1.043.097	1.044.594

Source: Tables 4 and 1

The official National Accounts estimates of table 3 are seen to allocate significantly more imports to the final use categories: Final Consumption and Capital Formation, and much less to Intermediate Uses. These differences must reflect a difference in analytical approach. The National Accounts data probably display an inclination to classify goods as consumption or capital items if they are clearly intended for such use, even if they are not yet in a final state of production.

Table 4 gives a further breakdown of the National Accounts data. It illustrates the above argument quite clearly in the case of Buildings & Constructions (BC). By their very nature BC products can not be imported (except in very special cases, such as the

<sup>7</sup> The statistics in question are entitled: Imports (cif) by Major Category.

purchase of diplomatic property abroad.) Even so, the BC products represent a prominent part of Capital Formation imports according to table 4. The likely explanation is that the imports in question consist of building and construction materials, which although not yet in a 'final state' are clearly destined to end up as capital formation products.

Table 4: Tanzania 1998 Imports (cif) by Major Category, TZShs'mill.

Major End-Use Category:	Import value
Capital Goods	506.925
of which: Transport equipment	160.192
Buildings & constructions	87.741
Machinery	258.992
Intermediate Goods	178.420
of which: Oil	68.080
Fertilisers	7.776
Industrial raw material	102.564
Consumer Goods	357.752
of which: Food & foodstuffs	150.950
Other Consumer goods	206.802
Total	1.043.097

Source: Bank of Tanzania, Economic Bulletin for the quarter ended 31st March, 2001

The classification principle demonstrated in table 4 is in itself entirely reasonable. In terms of the IO format, however, it is not acceptable. All imports processed by local producers or contractors *must* be classified as intermediate inputs going into these production activities, even though they are clearly destined to end up as private consumption or capital formation.

### A Model for future Import Analyses

In the above section we demonstrated the unfeasibility of relying on the official end-use estimates for the present purpose. Tailor-made estimates are an indispensable element in any serious updating of the Macmod database. Given the effort required to produce such an analysis we have argued that the present Import Analysis may serve as a model for future analyses. This will save both time and effort.

It will also assist in keeping a reasonable degree of consistency between new and old Import Analyses. The significance of the latter argument should not be ignored, provided that one accepts the view that the underlying economic structures will typically develop gradually and progressively, rather than abruptly and dramatically.

Accepting the present Import Analysis as a model for future reference does not, however, imply that it should be copied blindly by future analyses. Developments in economic structures, although gradual, will make themselves felt. Mainly this will be felt in the form of volume-changes in individual import flows, leaving the relevance of sector of origin keys and end-use ratios intact. In some cases end-use ratios may nevertheless be

affected. This may for instance be the case for petrol, which is used both for intermediate input and private consumption purposes.

Such changes, of course, should in principle be taken into account. In practice, however, this may be a very difficult task. The problem is that there tends to be no information on these end-use impacts. Proper judgement must therefore be exercised by the analyst in question. This counsel, moreover, may serve as a general warning. End-use analyses can seldom if ever be based on solid facts alone. By their very nature they tend to build upon both solid facts and more tentative assumptions. Sound judgement must therefore always be exercised in undertaking such analyses.

## Statistical Annex

Table IA1: Analysis of Tanzania's 1998 Imports (goods), by Sector of Origin and End Use

### Notes to table

- General note about classification principles:
  - Sector of Origin
    - The Sector of Origin of a given imported commodity is the domestic sector most likely to produce the type of product in question (given the Macmod production sector specification).
    - The Sector-of-Origin classification is made at the 2-digit HS-level, except for HS group 27, which is split between two sectors (mining in the case of crude oil, and petrol refinery in the case of oil products).
  - End-Use
    - The End-Use of a given imported commodity is the 'purpose' most likely to consume it. The relevant End-Use purposes are:
      - intermediate consumption,
      - private consumption,
      - gross fixed capital formation.
    - The end-use-analysis is made directly at the 2-digit HS-level if the group represents less than 1% of the overall import (cif) value. It is done at the 4-digit HS-level if the corresponding 2-digit group represents more than 1% of the total. It is also done at the 4 digit level in a few other 'strategic' cases.
- Specific notes referred to in section A of the table are:
  - A: End-Use estimate calculated directly at the 2 HS-digit commodity level; i.e. from End-Use ratios specified at the 2 digit HS level.
  - B: End-Use estimate calculated at the 4 HS-digit commodity level; i.e. from End-Use ratios specified at the 4 digit HS-level. The ratios and operations in question are detailed in section B of the table.

# Summary

This paper reports on an analysis made of Tanzania's 1998 imports, undertaken as part of the Macmod project. The analysis entails the classification of imported goods according to their sector of origin and their end use.

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