Tanzania Manufacturing Enterprise Survey
Wave IV Dataset
(October-December 1999)

Guide for Users

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The TMES Wave 4 survey was undertaken by CSAE, in collaboration with the Economic and Social Research Foundation (ESRF) in Dar es Salaam. Significant support and additional data were also obtained from the Tanzanian Bureau of Statistics. This survey was designed as a follow up to three annual surveys undertaken in Tanzania between 1993-96 as part of the Regional Program on Enterprise Development (RPED) organised by the Africa Technical Department of the World Bank (see separate dataset and documentation also on CSAE website). This dataset forms part of an ongoing CSAE research project into manufacturing sector performance in Tanzania and Ghana funded by the Department for International Development (DFID).

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1. Introduction

This user guide aims to provide potential users of this dataset with some basic information and explanations to facilitate use of the data by the wider economic research community. This document focuses upon the Wave 4 dataset from a panel survey of Tanzanian manufacturing firms. This dataset is directly comparable to and can be linked with Waves 1-3 which are also currently available on the CSAE website.

A fourth wave of the Tanzania Manufacturing Enterprise Survey (TMES) was conducted in late 1999, involving a team of researchers from CSAE and the Economic and Social Research Foundation (ESRF) in Dar es Salaam. This succeeded in revisiting 89 of the remaining RPED firms (see below) and interviewing an additional 103 replacement firms. Firm-level production and accounts data was obtained for 1996, 1997 and 1998, thus giving a maximum number of six observations per firm over the four waves of the survey.

The timing and results of the first four waves of the TMES are as follows:

Wave of Survey	Timing	Firm Data For	No. Firms	No. Workers
Wave 1	Autumn 1993 (Aug-Oct)	1992	217 firms	1086
Wave 2	Autumn 1994 (Oct-Dec)	1993	213 firms (40 replacements)	653
Wave 3	Early 1996 (Feb- Mar 1996	1994/ 1995*	152 firms (no replacements)	342
Wave 4	November 1999 – Jan 2000.	1996, 1997, 1998	192 firms (103 replacements)	928

** Large firms with written accounts generally report 1994 accounting data; smaller firms without written accounts report 1995 figures.*

The first three waves of the survey, undertaken as part of the World Bank's Regional Program on Enterprise Development (RPED), collected one year of data, plus historical data for some of the key variables. Wave 1 was undertaken in August 1993 (data relates to 1992); Wave 2 was undertaken in October 1994 (data relates to 1993); Wave 3 was undertaken in January 1996 (data is from 1995 for some firms, 1994 for others). Wave 4 was commenced in November 1999 and completed in January 2000. We have firm-level and worker data for 192 firms and worker-level data only for an additional 3 firms.

The original sampling frame was the 1989 Industrial Census (for formal sector firms) produced by the Tanzanian National Bureau of Statistics (or *"Takwimu"*) which nominally included all manufacturing establishments with 10 employees or more. A sample of informal sector firms were also chosen randomly by the interview teams in the locations in which the survey was conducted. Further details on the first three

Waves are contained in the "Dataset User Guide" (CSAE, January 2002) accompanying the respective dataset.

The firms in the four Waves constitute a panel which is intended to be broadly representative of the size distribution of firms across the major sectors of Tanzanian manufacturing industry. These sectors include food processing and beverages, textiles and garments, wood products and furniture, metal products and machinery. Due particularly to the high rates of firm exit observed in Tanzania over this period, it has not been possible to obtain data over all four waves for all of the original sample of firms, but, where necessary, firms that have dropped out of the sample (for a variety of reasons) have been replaced by similar firms.

A fifth wave of the TMES has recently been completed by a team from CSAE and ESRF (January/ February 2002) which has revisited all surviving firms from the Wave 4 sample and gathered comparable data for 1999 and 2000 thus giving a rich panel dataset covering almost a decade.

The first four waves of this dataset are now available to potential users in two ways: firstly, they will be added to the collection of datasets held by The Data Archive at the University of Essex (tel: 01206 872001); secondly, they can be downloaded from the CSAE's website at the following address www.csae.ox.ac.uk/data.

2. List of Files & their Contents

The following files and folders are included in this release with a brief description of their contents. Please refer to subsequent sections of this user guide for a more detailed description of the files, how they link together and how they can be used.

Wave 4 data

spssdata\version1\	section files (tm4t1 – tm4t14) [*.por]	The original (uncleaned) SPSS portable data files created in Jan 2000. Total of 192 firm observations[1]
spssdata\version2\	section files (tm4t1 – tm4t14) [*.por]	The cleaned versions of the SPSS data files; any file that has had any revisions made to it has an 'r' suffix for revised – (note that this suffix is only used in the SPSS files, not the SAS version of the same file)
spssdata\	earnall.por appren.por	SPSS portable files containing the worker level data organised so that each worker is on a separate line (total of 928 worker observations and a limited number of apprentices). These files contain exactly the same variables as the files tm4t13a, tm4t13b, tm4t13c and tm4t14 above (in which each observation is on up to 10 workers per firm)
sasdata\	section files (tm4t1 – tm4t14) [*.sd2]	These are the Version 2 (cleaned) data files in SAS format (*.sd2). Note that the cleaned SAS versions do NOT have the "r" suffix. These are the raw data files which the SAS programs use to extract and organise the main variables of interest.

[1] We have firm level data for 192 firms. There were three additional firms for which we only have worker level data. The tm4t1 file (basic firm characteristics) thus contains 195 observations, whereas subsequent files have 192 observations.

otherdata\	tzprices.xls	An Excel file containing the sectoral price series (from the Tanzanian Bureau of Stats) collected in Sept 2000 used to construct price deflators for firm output etc.
	mainvar.sd2	This is a created SAS dataset containing a number of basic firm-level production, investment and labour market variables for Wave 4; it also contains a number of firm characteristics/ dummy variables [total of 132 variables and up to 381 observations on 192 firms covering 1996, 1997 and 1998] *(Note: the SAS programs written to generate this dataset are currently being edited and will be included with a later version of the Wave 4 release)*
	isic.por	SPSS portable file containing 4 digit ISIC (International Standard Industrial Classifications) code for all firms in Waves 1-4 of survey

Questionnaire

maincoded.xls workercoded.xls	Excel files containing the Wave 4 codebook (main i.e. firm level and worker questionnaires) showing the coding structure utilised in the raw data files

3. Raw Data Files

The data files are in SPSS portable (*.por) format. Each section of the questionnaire has been entered in a separate data file which follows the following structure:

tm4t1.por	Section 1	Firm Contact information (not included here)
tm4t2.por	Section 2	Entrepreneur/ Ownership
tm4t3.por	Section 3	General firm (production data)
tm4t4.por	Section 4	Investment
tm4t5.por	Section 5	Labour
tm4t6.por	Section 6	Regulation
tm4t7.por	Section 7	Finance
tm4t8.por	Section 8	Infrastructure
tm4t9.por	Section 9	Adjustment
tm4t10.por	Section 10	Investor Confidence
tm4t11.por	Section 11	Conflict Resolution
tm4t13a.por	Section 13a	Workers Appendix Questions 1-22
tm4t13b.por	Section 13b	Workers Appendix Questions 23-53
tm4t13c.por	Section 13c	Workers Appendix Questions 54-72
tm4t14.por	Section 14	Apprentices

There are two versions of these raw data SPSS files. Version 1 are the uncleaned files which were compiled at the end of the data collection phase in January 2000. Version 2 are the same set of files, but some of them (those with an '-r' for 'revised' suffix) have been amended on the basis of consistency checks and other data cleaning undertaken subsequently.

The 'cleaned' Version 2 files are also included in their SAS format (*.sd2). The SAS file names do not include the 'revised' suffix. Most of the data analysis that has been undertaken here at CSAE uses this set of SAS files. The created dataset mainvar.sd2 compiles a number of variables extracted from the first five sections of the questionnaire that can be used in production function and other types of analysis.

It is intended that a later release of this dataset will include a selection of the SAS programs which organise and analyse the Wave 4 Tanzania data and merge the four waves of data to create a pooled dataset. These programs and the datasets they generate are currently being edited and will be released shortly. This does not prevent interested researchers from using the underlying data presented here.

The coding of variables contained in these files follows the structure of the questionnaire (see codebook). This is described in more detail in the next section. Variable names follow the section numbers and question numbers in the questionnaire. Hence, variable T3Q5A refers to section 3, question 5a (firm's sales revenue in 1996) and variable T4Q1C refers to section 4, question 1c (replacement value of firm's capital stock in 1998). It is thus relatively simple to track down variables by finding the

question you are interested in and using the variable name structure outlined above to search for this variable in the relevant section data file. Some of the main firm-level variables are included in the listing below.

Firms are identified by a firm ID number (firm), which remains constant across the waves of the survey. In each of the raw data files, the relevant variable is t*eno, where * refers to the section number e.g. in the section 1 file the firm identifier is t1eno. Firm numbers from Waves 1-3 run in series based upon firm location as follows; replacement firms in Wave 4 run from 701 upwards.

Dar es Salaam	1 – 199;
Arusha/ Moshi	201-299;
Iringa/ Njombe	301-399;
Morogoro	401-499;
Mwanza	501-599;
Tanga	601-699.
Wave 4 replacements	701 - 988

In the worker files, individual workers are identified by an ID number (WID in the SAS program files) ranging between 1 – 10, which together with the firm ID number can be used to identify them and manipulate this data.

In the Section 1 data files (tm4t1.*), there are variables which identify each firm's sector and location. There is an additional file called isic.por which gives 4 digit ISIC codes for all of the firms interviewed in the first 4 waves of the Tanzania survey. However, in the interests of maintaining confidentiality, any information that would identify the specific firm interviewed has been excluded (name of firm, address of firm, name of person interviewed). Please contact CSAE if you require further information in this regard.

4. Questionnaire Structure and Coding

The dataset presented here has been extracted from a detailed questionnaire conducted with the owners/ senior managers and, for relevant sections, workers of the sampled manufacturing firms. The questionnaire was originally designed by a team from the World Bank. Over the four waves of the survey, the structure of the questionnaire and the range of questions included has evolved in the light of field experience and in response to emerging research issues. A scanned copy of the Wave 4 codebook is included with the material made available here.

The Wave 4 questionnaire was designed to be consistent with the RPED-style surveys conducted in Tanzania in Waves 1-3 and also with other comparable firm surveys undertaken recently by CSAE researchers in Ghana and Kenya. The questionnaire is divided into a number of sections (see above), grouping questions related to different aspects of firm-level structure and performance; there is also an appendix of supplementary labour market questions which were used in interviews

with a sample of up to 10 workers within each firm, plus any apprentices. The choice of workers was designed to be representative of the range of occupational categories in each firm. Hard copies of the completed firm questionnaires are held by CSAE and may be consulted with the permission of the authors.

5. Selected Firm Level Variables

The following tables (Table 1 and 2) contain a list of the main continuous and categorical variables contained in the mainvar.sd2 SAS data file. These variables have been extracted and organised from the Version 2 raw data files. Table 1 shows the variable name, the section of the questionnaire from which it is extracted, a brief description and the variable reference in the codebook and raw data files.

Note that the variable 'wave' refers to the wave of the survey i.e. Wave 4 whereas the variable 'round' refers to the round (or year) of the data, where round=3 refers to 1996 data, round=4 refers to 1997 data and round=5 refers to 1998 data. The use of the 'round' variable allows the three years of data collected in the Wave 4 survey to be linked with the three years of data (rounds 1-3) collected in the first 3 waves of the survey between 1992 and 1995.

Table 1: Continuous Variables in mainvar.sd2 file (Tanzania Wave 4 only)

Variable Name	Section of Questionnaire	Description	Variable Reference in Raw Data Files
FIRM	0	Firm number in survey	t*eno
WAVE	0	Wave of Survey (1,2,3 or 4)	
ROUND	0	Round of data (1996=4, 1997=5, 1998=6)	
ACC	3	Dummy: firms keeping accounts on an annual basis	t3q1e
PERIOD	3	Time period used to report productio data	t3q2e
SALES	3	Revenue from sales of manufactured output	t3q5e
OUTPUT	3	Value of manufactured output	t3q6e
ADDINC	3	Additional income form selling other goods or supplying services	t3q7e
PCXAF	3	Percentage of output exported to African countries	t3q8e
PCXNAF	3	Percentage of output exported to non-African countries	t3q9e
MISC	3	Total indirect costs (= RENT+ELECT+WATER+PHONE+FUEL+STAT+TRANS +SECUR+INSUR+ADVERT+MAINT+OCOST)	t3q14em
RAWMAT	3	Value of raw materials used in production of OUTPUT	t3q15e
VAD	3	Calculated value added (OUTPUT - MISC - RAWMAT)	t3q18e
WAGES	3	Total wage bill, excluding allowances	t3q21e
LBCOST	3	Total labour cost, including wage bill, allowances and bonuses	t3q22e
PCALC	3	Calculated profits (VAD - LBCOST)	t3q23e
PROFIT	3	(Gross) profit reported by firm, before deducting interest, depreciation and taxation	t3q24e
RMIMP	3	Percentage of imported raw materials	t3q17e
CAP	4	Cost of replacing plant and equipment with new equipment	t4q1d
CAPSAL	4	Resale value of plant and equipments	t4q2d
CAPLB	4	Resale value of land and buildings	t4q3d
EMP	5	Total number of people employed at the end of the year	t5q1e
EMPP	5	Full-time permanent employees	t5q2a5
EMPC	5	Full-time casual employees	t5q2b5
EMPPT	5	Part-time employees	t5q2c5
PCUNION	5	Percentage of unionized labour force	t5q21
UNION	5	Dummy variable: PCUNION > 0	
ANYTRAIN	5	Dummy variable: Formal training programme for the workforce in the last 3 years	t5q24
Constant price, US dollar and ppp USD values			
OUTCP		Firm output, constant 1992 Tanz. Shillings	
VADCP		Firm value added, constant 1992 Tanz. Shillings	
CAPCP		Replacement value of capital, constant 1992 Tanz. Shillings	
OUTUS		Firm output, US dollar value	
VADUS		Firm value added, US dollar value	
CAPUS		Replacement value of capital, US dollar value	
OUTUSP		Firm output, purchasing power parity (ppp) US dollars	
VADUSP		Firm value added, purchasing power parity (ppp) US dollars	
CAPUSP		Replacement value of capital, (ppp) US dollars	
VADEMP		Labour productivity measure	
CAPEMP		Capital/ labour ratio	
VADCAP		Return on capital employed	
Note: dataset also contains constant price, US dollar and USD ppp values of these ratios			
EXPDUM		Dummy for whether firm exports	
PERF		Dummy: subjective assessment of firm's performance	
PRIV		Dummy for whether firm has been privatised	

Table 2: Categorical Variables/ Firm Level Characteristics in mainvar.sd2 file

***Location dummies*:**

DSM	Dummy = 1 for firms based in Dar es Salaam
MOROG	Dummy = 1 for firms based in Morogoro
TANGA	Dummy = 1 for firms based in Tanga
ARUSH	Dummy = 1 for firms based in Arusha/ Moshi
MWANZ	Dummy = 1 for firms based in Mwanza
IRINGA	Dummy = 1 for firms based in Iringa/ Njombe
CAPCITY	Dummy=1 for firms based in capital (i.e. Dar es Salaam)

***Sector dummies (4 main sectors and disaggregated)*:**

The survey covers four main manufacturing sectors: food and beverages (FOOD), textiles and garments (TEXT), wood processing and furniture (WOOD) and fabricated metal and machinery (METAL). For analytical purposes, where possible these main sectors are further disaggregated into a total of ten subsectors:

Sector	ISIC Code	Variable Name
Food products	ISIC 3110 - 3129 (exc. 3117)	FOODX
Bakeries	ISIC 3117	BAKE
Beverages	ISIC 3130 – 3135	BEVS
Textiles	ISIC 3210 – 3219	TEXTX
Garments	ISIC 3220	GARMENT
Footwear	ISIC 3240	SHOES
Wood Products	ISIC 3310 – 3319	WOODX
Furniture	ISIC 3320	FURN
Fabricated Metal	ISIC 3810 – 3819	METALX
Machinery	ISIC 3820 – 3850	MACHINE

***Size dummies*:**

These are based upon average number of employees (including both full and part-time workers, but excluding seasonal workers) over the three waves of the survey.

MICRO	Dummy = 1 for micro firms (1 - 5 employees inclusive)
SMALL	Dummy = 1 for small firms (6 – 29 employees inclusive)
MEDIUM	Dummy = 1 for medium firms (30 – 99 employees inclusive)
LARGE	Dummy = 1 for large firms (100 or more employees)

Ownership dummies:

STATE	Dummy = 1 for 100% state-owned enterprises
SSTATE	Dummy = 1 for firms with some degree of state ownership (less than 100%)
SFOR	Dummy = 1 for firms with some degree of foreign ownership (less than 100%)
TZOWN	Dummy = 1 for private firms with 100% domestic ownership
ANYFOR	Dummy = 1 for firms with any degree of foreign ownership (including 100%)
ANYST	Dummy = 1 for firms with any degree of state ownership (including 100%)

Alternative Ownership Dummies:

PRIVDOM	Dummy=1 for Private domestic owners only
PRIVFOR	Dummy=1 for Private foreign owners only
PRIVDF	Dummy=1 for Private foreign and domestic owners
SPRIVDOM	Dummy=1 for Private domestic owners & some state ownership
SPRIVFOR	Dummy=1 for Private foreign owners & some state ownership
SPRIVDF	Dummy=1 for Private foreign and domestic owners & some state ownership
PCFOR	Percentage of foreign ownership (%)

Legal Status of Firm

SOLO	Dummy=1 for sole trader
PARTNER	Dummy=1 for partnership
LLE	Dummy=1 for limited liability enterprise
PRIVCORP	Dummy=1 for private corporation
STATCORP	Dummy=1 for state corporation
COOP	Dummy=1 for cooperative
SUBDOM	Dummy=1 for subsidiary of Tanzanian firm
SUBFOR	Dummy=1 for subsidiary of foreign firm

Owners Ethnicity

AFRICAN	Dummy=1 for African owners
ASIAN	Dummy=1 for Asian (Indian) owners
MIDEAST	Dummy=1 for owners of Middle East/ Arabian origin
OTHER	Dummy=1 for other ethnicity including European and Chinese

Firm Age

Dummies created using the continuous variable (FIRMAGE), which is based on the year in which the firm first commenced operations (STYEAR).

OLD	Dummy=1 for firms > 20 years
MATURE	Dummy=1 for firms 11 – 20 years inclusive
YOUNG	Dummy=1 for firms 6 – 10 years inclusive
NEW	Dummy=1 for firms < 6 years

6. Tanzanian Price Deflators 1992-99

In order to construct the constant price series for gross output (OUTPUT) and value added (VAD), we have experimented with the use several alternative price deflators.

Consumer Price Index:
We initially used the consumer price index (CPI) for mainland Tanzania as our price deflator. The trend path of this index is shown in Table 3. Price inflation was an important factor throughout the survey period, peaking at 33.1% in 1994, hence our results are potentially sensitive to price changes. It is believed that changes in prices faced by domestic producers for their inputs and outputs may differ considerably from levels of consumer price inflation, due to increased competition in most product markets and a number of additional price distortions facing domestic producers (including indirect taxation and tariffs on their imported inputs).

Table 3: National Consumer Price Index, Mainland Tanzania

	CPI (1992=100)	% change	Food (1992=100)	% change	Non-Food (1992=100)	% change
1988	36.0					
1989	47.0	30.3%				
1990	63.8	35.8%				
1991	82.1	28.7%				
1992	100.0	21.8%	100.0		100.0	
1993	125.3	25.3%	120.1	20.1	133.8	33.8
1994	166.7	33.1%	167.1	39.1	165.8	23.9
1995	216.4	29.8%	216.7	29.7	208.9	26.0
1996	259.0	19.7%	260.9	20.4	254.8	22.0
1997	300.6	16.1%	306.5	17.5	288.0	13.0
1998	339.1	12.8%	351.6	14.7	311.3	8.1
1999	365.8	7.9%	382.5	8.8	328.7	5.6

Source: IMF International Financial Statistics; Bank of Tanzania Economic Bulletin 2000 Q1

To take account of possible inter-sectoral inflation differentials, we also undertook analysis using the food and non-food components of the CPI index (for firms in the relevant sectors). It can be observed that food prices have risen faster in Tanzania since 1992 than prices of a basket of non-food products.

Available producer price data shows that the rate of increase of producer prices has been below the CPI changes for this period. Hence, the use of the CPI as a price deflator will have introduced an artificial downward bias into our calculations of real output and value added for the later years.

Producer Price Deflators:
More recently, we have used 45 producer price series at the 4 digit ISIC level as a set of deflators for firms' real output and value added. This price data was obtained from the National Bureau of Statistics (NBS) in Dar es Salaam and is based upon price indices taken from returns to their Quarterly Survey of Industrial Production (QSIP). This producer price index was last published in 1996 but has now been updated to June 1999. These indices are presented in Table 4 below.

There are firms in our survey which fall within 4 digit ISIC product groups for which there is no price series available in the NBS indices, presumably because there are no firms in their sample producing these products. One example of this is the lack of a price index for furniture (ISIC 3320) in the NBS data, since their survey excludes furniture producers which are mainly small-scale enterprises. In these cases we have used the price index for the ISIC category which is closest to the missing category e.g. we have used the wood products (ISIC 3319) price index to deflate the outputs of furniture firms in our sample. This is obviously not an ideal solution and we hope in the future to develop firm-specific price deflators using internal price data from our survey.

Some data on prices of firm outputs and material inputs were collected in all four rounds of the survey. In the three RPED surveys, product prices can only be derived from data on quantities of products produced and the total value of output or sales. In the Wave 4 survey, firms were explicitly asked for unit sale prices and input prices. It is intended that this data will be used in future analysis of firm growth and productivity to construct a set of alternative producer price series for comparison with the NBS price indices. Other studies have also emphasised the importance of allowing for differential changes in firms' output and input prices when constructing real VAD series.

Capital stock deflator:
We do not have a reliable measure of changes in the domestic prices of firm's plant and machinery and other capital goods. A considerable proportion of these capital goods are imported and hence their shilling value depends partly on changes in nominal exchange rate. The capital stock deflator we have used is a weighted average of the national CPI (weight = 0.8) and the nominal US dollar exchange rate (weight = 0.2). We have some evidence from the producer price series for domestically-produced machinery that capital goods prices have risen in line with changes in the CPI. A comparison of alternative deflators is presented in Table 5.

Exchange Rates:
Table 6 shows trends in the nominal exchange rate of the Tanzanian Shilling against the US dollar (the benchmark currency for cross-country comparative work to date). There has been a substantial devaluation since 1992, although the major nominal devaluation took place from 1988-92 with the move from a fixed to floating rate mechanism. We also calculate a simple real exchange rate measure which suggests an appreciation over the survey period, due to the high levels of domestic price inflation. This will have served to make production for the domestic market more attractive, in comparison to export markets.

Table 4: Producer Price Series by 4 Digit ISIC Categories

ISIC	Activity	1992	1993	1994	1995	1996	1997	1998	1999
3111	Meat products	100	114	152	201	214	230	239	254
3112	Dairy products	100	113	145	174	251	321	331	304
3113	Fruit & Veg Canning	100	90	119	142	134	155	146	160
3114	Fish & sea products	100	114	152	201	243	310	337	354
3115	Vegetable oils & fats	100	119	127	161	195	225	260	286
3116	Grain Mill products	100	110	129	168	175	165	166	178
3117	Bakery products	100	124	168	231	253	226	213	242
3118	Sugar refineries	100	108	166	215	237	249	238	243
3119	Confectionary	100	117	134	147	153	163	190	207
3121	Food products & animal feed	100	139	138	223	221	220	250	283
3122	Food products & animal feed	100	139	138	223	221	220	250	283
3131	Distilled spirits, wine & beer	100	110	140	156	179	188	207	212
3132	Distilled spirits, wine & beer	100	110	140	156	179	188	207	212
3133	Distilled spirits, wine & beer	100	110	140	156	179	188	207	212
3134	Soft drinks	100	129	179	210	327	401	399	391
3140	Tobacco & cigarettes	100	117	179	210	260	261	263	264
3211	Spinning & weaving	100	101	114	186	209	217	220	221
3212	Made up textiles	100	132	187	266	292	346	360	357
3213	Knitting mills	100	104	119	191	227	202	180	197
3214	Carpets & rugs	100	104	119	191	227	236	241	246
3215	Cordage, rope & twine	100	126	180	240	299	328	351	371
3219	Other textiles	100	104	119	191	227	236	241	246
3220	Garments	100	104	119	191	227	236	241	246
3233	Leather products	100	104	119	191	227	236	241	246
3240	Footwear (exc rubber & plastic)	100	104	119	191	221	268	269	280
3311	Sawmills	100	147	156	194	233	241	256	249
3312	Wood products	100	147	156	194	233	241	256	249
3319	Other wood products	100	147	156	194	233	241	256	249
3320	Furniture & fittings	100	147	156	194	259	311	295	295
3511	Industrial Chemicals	100	101	155	184	198	217	247	339
3513	Plastics & Foam	100	101	155	184	198	217	247	339
3811	Cutlery, tools & hardware	100	116	165	241	272	276	278	269
3812	Metal Furniture	100	116	165	241	272	276	278	269
3813	Metal structures	100	119	154	222	282	292	316	319
3819	Fabricated metal products	100	119	154	222	282	292	316	319
3821	Engines & Turbines	100	110	132	159	169	160	160	159
3822	Agric. Machinery	100	105	120	143	241	235	251	251
3823	Metal & wood machinery	100	105	120	143	241	235	251	251
3824	Industrial Machinery	100	105	120	143	241	235	251	251
3829	Other machinery	100	105	120	143	241	235	251	251
3831	Electrical machinery	100	110	132	159	169	160	160	159
3833	Electric appliances	100	110	132	159	169	160	160	159
3839	Other Electrical mach.	100	110	132	159	169	160	160	159
3843	Motor vehicles	100	115	140	156	151	152	152	162
3844	Bicycles & motorcycles	100	115	140	156	151	152	152	162
3849	Transport equipment	100	115	140	156	151	152	152	162

Source: NBS Producer Price Indices, unpublished data (1996-99)

Table 5: Alternative Capital Stock Deflators

	ER	CPI	Cap Defl 1		Cap Defl 2		Cap Defl 3	
			0.5 ER/0.5 CPI		0.8 ER/0.2 CPI		0.2 ER/0.8 CPI	
1988	99.29	56.52	77.91	*1.00*	90.74	*1.00*	65.07	*1.00*
1989	143.38	73.62	108.50	*1.39*	129.43	*1.43*	87.57	*1.35*
1990	195.06	100.00	147.53	*1.89*	176.05	*1.94*	119.01	*1.83*
1991	219.16	128.70	173.93	*2.23*	201.07	*2.22*	146.79	*2.26*
1992	297.71	156.80	227.26	*2.92*	269.53	*2.97*	184.98	*2.84*
1993	405.27	196.40	300.84	*3.86*	363.50	*4.01*	238.17	*3.66*
1994	509.63	261.40	385.52	*4.95*	459.98	*5.07*	311.05	*4.78*
1995	574.76	339.30	457.03	*5.87*	527.67	*5.82*	386.39	*5.94*
1996	579.27	406.10	492.69	*6.32*	544.64	*6.00*	440.73	*6.77*
1997	612.12	471.40	541.76	*6.95*	583.98	*6.44*	499.54	*7.68*
1998	664.67	531.70	598.19	*7.68*	638.08	*7.03*	558.29	*8.58*
1999	739.25	573.60	656.43	*8.43*	706.12	*7.78*	606.73	*9.32*

Source: Author Calculations

Table 6: Tanzania Nominal and Real Exchange Rates

	Nominal Exchange Rate Tsh/US$	Index 1992=100	Real Exchange Rate (a) Tsh/US$	Index 1992=100
1986	32.7	11.0		
1987	64.26	21.6		
1988	99.29	33.4	193.06	88.4
1989	143.38	48.2	219.69	100.6
1990	195.06	65.5	222.17	101.8
1991	219.16	73.6	195.66	89.6
1992	**297.71**	**100.0**	**218.35**	**100.0**
1993	405.27	136.1	238.13	109.1
1994	509.63	171.2	229.86	105.3
1995	574.76	193.1	209.71	96.0
1996	579.27	194.6	177.59	81.3
1997	612.12	205.6	159.20	72.9
1998	664.67	223.3	149.51	68.5
1999	739.25	248.3	154.14	70.6

*Notes: (a) RER = Nominal exchange rate * (US Export Price Index/ Domestic CPI)*