DEPARTMENT OF HOUSING

JOB CREATION

A METHOD TO DETERMINE THE TOTAL NUMBER OF JOBS CREATED BY GOVERNMENT ASSISTED HOUSING

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SECTION ONE: BACKGROUND

1.1 BACKGROUND AND PURPOSE

State or Government-assisted housing strives to meet the national goals of economic growth, job creation and effective delivery of housing to the poor. It forms part of the larger framework of the Building and Construction sector and the impact of government investment in housing is in many aspects important because it has the potential to show, for example:

a) The contribution of government-assisted housing to the Gross Geographic Product and its growth.
b) The number of jobs created and/or sustained by government-assisted housing.
c) The growth in industries involved in the production of building materials used in government-assisted projects.
d) The effect on urban development and land values of government-assisted housing.

This study focuses on b) above, namely, the impact of government-assisted housing on the creation of new jobs in the building industry. More specifically, this study is to develop a method of calculating the job creation ability of investment in the residential building industry that is generally acceptable to all role players in the industry.

1.2 INTERPRETATION

The need for the study lies in determining the impact of construction activities in the housing industry. Various attempts[1] have, in the past, been made to estimate this impact but none were found to be acceptable to all role players in the industry.

The aim of the study therefore, is to establish an approach and acceptable method to calculate the number of jobs created by state investment in housing. It is so that the term "housing" has different meanings to different people. The same also applies to the number of jobs and job creation. In order to develop a method to calculate job creation it will be necessary to also establish a clear understanding of what is meant by jobs and by investment in the residential building industry.

The method that needs to be developed should be easy to use and should produce accurate and valid results. This implies, inter alia, that the method must as far as

[1] Different job creating methods have been evaluated as part of Phase One of this study. The result of this evaluation process is provided in a separate report.

possible, represent the South African situation and should therefore be based on data of actual projects.

1.3 APPROACH

As mentioned, the project was completed in two phases. The first phase evaluated different existing methods of calculating job creation whilst the second phase focussed on a new and acceptable method to determine job creation in the building industry. The approach that was followed with respect to the second phase is summarised in the following steps:

- **The establishing of a Reference Framework to assist in the process to formulate a method for estimating job creation.**
- **The application of the Reference Framework as a guide to actually develop a method to calculate job creation.**
- **Describe and outline the method using actual data and typical examples.**

The approach that was followed was developed in such a way that the Steering Committee took part actively in all the steps of the projects. The findings of each step were presented to, and discussed with the Steering Committee and adjustments to any step could therefore be made before the finalisation of the next step.

1.4 LIAISON PROCESS

A requirement of the study is that the method of calculating job creation must be acceptable to the major role players in government-assisted housing. For this purpose the Department for Housing has established a Steering Committee comprising of the following:

- **Department of Housing.**
- **Department of public works.**
- **BIFSA.**
- **SARDA.**

1.5 OUTLINE OF REPORT

The report is presented in four sections. Apart from Section One, which is introductory in nature, the remaining sections are:

- **Section Two describes the Reference Framework that guides the development of the Job Creation Method.**
- **In Section Three, job creation is estimated using actual project figures and relationship identified in Section Two.**
- **In Section Four, the method is applied using typical examples. This section also act as guidelines for the application of the Job Creation Method by the Department of Housing.**

SECTION TWO: JOB CREATION REFERENCE FRAMEWORK

The purpose of this section is to develop a Reference Framework that guides the development of a method to estimate job creation. Although the building sector is considered to be very labour intensive, no generally acceptable formula or parameter exists to calculate the number of jobs created by this industry. By knowing the numbers of jobs created by the construction of residential dwellings, it will be possible to determine the real effect of public investment in housing on employment creation.

The aim with the Reference Framework is to establish an understanding of the different elements that influence job creation and to outline common concepts used in the study.

2.1 CONCEPTS AND TERMINOLOGY

For the purpose of formulating a method to estimate job creation in the building industry, it is necessary to outline and explain certain terms and concepts. These are the following:

- Residential building industry: **This term generally refers to the industry responsible for the construction of all residential buildings, irrespective of the source of financing.**

  The study will focus on residential buildings and more specifically, housing that is funded totally or partly by government under its Housing Subsidy Programme.

- Housing: **Housing refers to household, single persons and/or family accommodation, irrespective of the form, type of structure or source of financing.**

  The study focuses on specific forms of government-assisted housing.

- Government-assisted housing: **This form of housing is totally or partly financed by government according to certain parameters, standards and conditions as well as requirements.**

The study will focus on housing funded totally or partly by government and will differentiate between the following housing products namely:

* *Type A (R16 000):* **The Type A housing category refers to housing that is provided by a developer or local authority. The total cost of a unit is R16 000 and is subsidised by the state under the Housing Subsidy Programme. This form of housing represents the most affordable option to the poor and can include Project linked subsidies, where a subsidy is linked to a specific project, or non-credit linked individual subsidies, which are provided to individual applicants.**

* *Type B (R16 000):* **The Type B housing category refers to housing that is mainly provided by a community. The total cost of a unit is R16 000 and is subsidised by the state under the Housing Subsidy Programme. This form of housing is also referred to as housing provided through the** *Peoples Housing Process***. The main difference between the Type A category and the Peoples Housing Process is that the beneficiaries in the latter provide their labour as input to the building of the top structure. This means that they save the labour cost related to the top structure and these savings are then used to buy, for example, more building material to build a larger/better dwelling. It should be noted that dwelling units developed through the Peoples Housing Process are not free from labour cost. Labour is still required to administer, plan, register, and develop the sites.**

* *Type C (R25 000):* **The Type C housing category refers to a single house on a stand that is developed at an average unit cost of about R25 000 (including land, site and its services). The Government's contribution is the full subsidy amount of R16 000 whilst the outstanding amount is funded by the beneficiary through personal savings, his/her employer or other sources of funding, excluding bonds. This form of housing can include Credit-linked and non credit-linked individual subsidies, and provides an option to qualifying individuals to supplement the housing subsidy, with own or loan funds, to acquire a higher quality or larger dwelling.**

* *Type D (R60 000):* **The Type D housing category refers to multi-storey higher density housing units. Government's contribution to this form of housing is R16 000 whilst an average of about R44 000 is funded through bonds. Thus, the total value of the unit is therefore in the order of R60 000. This form of housing can include Institutional subsidies, where the beneficiary is given an option of rental or purchase on instalment sale. It should be noted that the total unit**

value of this form of housing can vary depending on construction methods and materials, engineering services and the location of the development as well as the beneficiary's capacity to qualify for a bond. However, the average unit cost of R60 000 is a generally accepted unit cost by private developers and is used as a benchmark figure for developing the job creation calculation method. This form of housing is also referred to as *Institutional or Rental* **units depending on the options available to the beneficiary.**

- *Type E (R62 500):* **The Type E housing category refers to a higher quality of housing unit that is developed at an average cost of R 62 500 (including land, site and its services). The Government's contribution to this form of housing is in the order of R 5 000 while the rest is funded though a bond to the value of about R 57 500. These figures are considered by private developers as average unit costs in the market and are consequently used as benchmark figures for the purpose of developing the job creation method.**

  The above five forms of government-assisted housing will be referred to in the rest of the document as the Product Type.

- Job creation: **Job creation refers to the process of creating employment opportunities and can be for a certain period (contract based) or no specific and unknown time period.**

  This study focuses on the creation of new jobs through government-assisted housing and assumes that the employment opportunities will be sustainable for one year or longer depending on governments' continued policy to invest in government-assisted housing.

Based on the above understanding of certain concepts and terms, the next paragraphs outline a conceptual framework with a view to determining the number of jobs created through government-assisted housing.

2.2 CONCEPTUAL FRAMEWORK

The formulation of a method to calculate job creation can best be done in terms of identifying the elements (i.e. variables) that influence the creation of employment opportunities. These variables can be presented as functional relationships between dependent and independent variables.

The following relationships have been identified and adjusted with the Steering Committee's input.

2.2.1 Total Job Creation Relationship

The total number of jobs created by government under its Housing Subsidy Programme consists of the number of direct and indirect jobs created. The direct number of jobs are created by the provision of housing and include activities such as:

- **Management, planning, designing and providing housing.**
- **The provision of internal engineering services to the housing project. This means the provision of different networks (i.e. water, electricity, streets) to service a residential township comprising government-assisted housing.**
- **The building of the residential dwellings.**

The number of indirect jobs created by government-assisted housing projects include the number of jobs created by activities such as:

- **Manufacturing of all building and construction materials.**
- **Provision of bulk engineering services to the residential area.**
- **Other economic activities such as transport and communication, financing and real estate services, government services and activities, etc.**

The total number of jobs created under the Housing Subsidy Programme can therefore be explained as:

TOTAL NUMBER OF JOBS = DIRECT JOBS + INDIRECT JOBS

For the purpose of formulating the job creation method, the total Job Creation relationship thus estimates the potential total number of direct **and** indirect **jobs that can be created through government-assisted housing. It comprises variables such as capital investment, land and Product Type as well as input from other relationships regarding professional, engineering, managerial and administrative services.**

$TE_{siy} = f(C_{siy}, L_s, MA_s, ES_s, PS_s, TS_i, X_{sy})$

where:

TE = Total number of job created by state investment in assisted housing.
C = Total value of investment by state in government-assisted housing.
L = Cost of land.
MA = Management and administrative job creation.

ES = Engineering services job creation.
PS = Professional services job creation.
TS = House construction (top structure) job creation.
X = Indirect job creation.
s = Product Type
i = Geographical area (9-provinces).
y = Year in which investment by government is made.

2.2.2 Direct Job Creation Relationship

The Direct Job Creation relationship refers to the direct number of jobs created under the Housing Subsidy Programme and focuses on the number of jobs created as a result of managing the housing scheme, all the professional services such as town planning, surveying, transferring of land, the provision of engineering services as well as the actual building of the dwelling units. The Direct Job Creation relationship is the following:

$ZE_{siy} = f(C_{siy}, L_s, MA_s, ES_s, PS_s, TS_i)$

where:

TE = Total number of direct job created by state investment in assisted housing
C = Total value of investment by state in government-assisted housing
L = Cost of land
MA = Management and administrative job creation
ES = Engineering services job creation
PS = Professional services job creation
TS = House construction (top structure) job creation
s = Product Type
i = Geographical area (9-provinces)
y = Year in which investment by government is made

Management (MA), engineering services (ES), professional services (PS) as well as providing the top structure (TS), each have their own influence and relationship on the total number of direct jobs created. In order to provide for this difference, separate relationships for each have been developed and are outlined below.

2.2.2.1 Management and Administration Relationship

The aim of the Management and Administration relationship is to determine the number of managerial and administrative jobs created through government-

assisted housing. The main independent variables of this relationship are the cost to administer and manage projects, the number of jobs created and the cost of labour.

$MA_{sy} = f(Oa_{sy}, Ta_{sy}, Ja_{sy})$

where:

MA	**=**	**Total number of managerial and administrative jobs created by state investment in housing.**
Oa	**=**	**Total cost of management and administrative services.**
Ta	**=**	**Total cost of managerial and administrative personnel.**
Ja	**=**	**Labour productivity index.**
s	**=**	**Product Type**
y	**=**	**Year in which investment by government is made.**
i	**=**	**Geographical area (9-provinces)**

The total cost of management and administrative services (Oa) includes all the cost items associated with managing and administering the housing project such as:

- **Marketing the housing project.**
- **Selling individual dwellings.**
- **Developer's margin.**
- **Project management.**
- **Administrative functions (i.e. administering subsidies, funding and project financing).**
- **Cost of financing.**

2.2.2.2 Engineering Services Relationship

The aim of the Engineering Services relationship is to determine the number of jobs created by servicing the sites for government-assisted housing projects. The main independent variables in this relationship are the cost of servicing the sites, the number of jobs created by the different engineering disciplines, the number of jobs created and the cost of labour.

$ES_{swerl} = f(Oe_{swerl}\ Te_{swerl}, Je_{swerl})$

where:

ES	**=**	**The total number of jobs created to service the stands.**
Oe	**=**	**Total cost of engineering services.**
Te	**=**	**Total labour cost for all engineering services.**
Je	**=**	**Labour productivity index for engineering services.**

w = Water provision.
e = Electrical reticulation services.
r = Development of streets.
l = Sewer reticulation system.
s = Product Type

The total cost of providing engineering services (Oe) includes all the cost items associated with engineering services of a housing project such as:

- **Planning engineering services.**
- **Project management.**
- **Construction of services.**

As far as direct job creation is concerned, the engineering services component refers to internal networks and services. The provision of bulk services is catered for under the Indirect Job Creation Relationship. It should also be noted that not all housing schemes and/or Product Types have the same level of services. Different levels of services are provided for different housing schemes and these differences are captured in the cost component for engineering services of the various Product Types.

2.2.2.3Professional Services Relationship

The aim of the Professional Services relationship is to determine the number of jobs created by providing professional services. The main independent variables of this relationship are the cost of services, the number of jobs created by the different professional disciplines, the number of jobs created and the cost of labour.

$PS_{sdfgh} = f(Op_{sdfgh}, Tp_{sdfgh}, , Jp_{sdfgh})$

where:

PS = The total number of jobs created by professional services
Op = Total cost for professional services
Tp = Total labour cost for all professional services
Jp = Labour productivity index for professional services
d = Architectural services
f = Town planning services
g = Attorney/legal services
h = Land surveyor services, etc
s = Product Type

It should also be noted that not all housing schemes and/or Product Types require the same level of professional services. The different levels of services are captured in the cost component for each service for the various Product Types.

2.2.2.4 Top Structure Relationship

The aim of the Top Structure relationship is to determine the number of jobs created during the house building process. The main independent variables of this relationship are the cost of the top structure, the number of jobs created and the cost of labour.

$TS_s = f(Ot_s, Tt_{sz}, Jt_{sz})$

where:

TS = Total number of jobs created during the construction of housing (top structure) by all contractors and subcontractors.
Ot = Total cost of housing (top structure).
Tt = Total labour cost by all contractors and subcontractors.
Jt = Labour productivity index for the construction of houses by all contractors and subcontractors.
s = Product Type
z = Contractors and subcontractors (main contractor, foundations bricklayer, plumbing, glazing, carpentry, joinery and other).

The total cost of the top structure (Ot) refers to the cost of the dwelling, excluding the land, engineering services to the site, all professional and engineering services as well as managerial and administrative costs. It also excludes all movable furniture and household equipment because they do not form part of the house construction process directly. All the costs of providing engineering services and connections to the dwelling (i.e. water and electricity) are included.

2.2.3 Indirect Job Creation Relationship

The aim of the Indirect Job Creation relationship is to determine the total number of indirect jobs created by state investment in government-assisted housing. The main elements of this relationship are the capital investment, the extent of backward linkages, sectoral employment and derived industry specific employment multipliers.

$X_s = f(Cc_s, W, Am_s, Jx_i)$

where:

X	**=**	**Total number of indirect jobs created by state investment in housing.**
Cc	**=**	**Total capital investment by state in government-assisted housing.**
W	**=**	**Inter-industrial linkages (input/output table).**
Am	**=**	**Sectoral inputs (R-value) of materials.**
Jx	**=**	**Sectoral employment.**
s	**=**	**Product Type**
i	**=**	**Geographical area.**

Inter-industrial linkages (W) refer to the buying and selling of goods and services between different economic sectors. In this instance, it represents all the transactions between the building and construction industry and all the other sectors. The other sectors include economic activities such as:

- **Agriculture and forestry (i.e. wood);**
- **Mining (i.e. cement, sand, stone);**
- **Manufacturing (i.e. steel window frames, building machinery, nails, light fittings, stoves, glazing, varnishes and paint);**
- **Electricity, gas and water (i.e. electricity and water for consumption);**
- **Wholesale and retail trade (i.e. wholesalers and retailers providing building materials, office equipment);**
- **Transport and communication (i.e. delivery services);**
- **Financing, real estate and business services (i.e. project funding, loans and bonds);**
- **Government services (i.e. registering of township, ownership, title deed, housing subsidy);**
- **Other activities not mentioned above.**

2.2.4 Assumptions and Conventions

The above relationships can be influenced by structural changes in the provision of government-assisted housing. It is therefore necessary to highlight the following assumptions:

- **State investment in housing will continue for a period of at least 1 year. This implies that the number of jobs that will be created will be sustained by government investment for one year or longer. If government investment, for**

example, does not continue, the jobs that have been created may be lost if no new building contracts can be negotiated by employers or individuals.

- **Conventional development and construction methods will be used (i.e. mortar and brick). This assumption focuses on current building materials and methods that are generally known and applied in the provision of housing under the Housing Subsidy Programme. The use of new technologies in this specific industry, for example, high rise flats at high densities (i.e. 20 to 40 storeys) or new material (i.e. walls made out of plastic/polypropylene) are not taken into account in determining the number of jobs created.**

- **The private sector will continue to be involved in the provision of government-assisted housing. A large portion of housing under the Housing Subsidy Programme is provided by private sector development. These developers have a certain efficiency/productivity rate that is motivated by their profit motive. This assumption therefore assumes that the private sector will remain involved in providing housing under the Housing Subsidy Programme.**

- **The current form, material content and labour cost for each of the Product Types will remain relatively constant. Paragraph 2.1 outlines the Product Types and it is assumed that a major change in the Product Types may change the behaviour of the functional relationships to such an extent that it will need to be revised to ensure its potential to estimate job creation.**

- **Although the method of estimating job opportunities consists of direct as well as indirect job creation, it is necessary that one always focus on total job creation. The distinction between direct and indirect job creation is only provided for calculation purposes.**

SECTION THREE: ESTIMATING JOB CREATION

The aim with this section is to apply the different functional relationships identified in Section Two in order to determine the total potential number of jobs created by the Housing Subsidy Programme. This section focuses on the following three aspects of job creation, namely:

- **Direct job creation.**
- **Indirect job creation.**
- **Total job creation.**

Each of the above elements of job creation is discussed below in terms of the information used, the specific method that is applied as well as the results.

3.1 DIRECT JOB CREATION

This subsection gives an outline of the method used to determine the number of direct job opportunities created by government-assisted housing. The following elements will be highlighted:

- **Management and administration functions.**
- **Engineering functions.**
- **Professional services.**
- **Building the Top Structure.**

3.1.1 Information

The project requires that the method of job creation produce results that represent, as far as possible, the real world situation. This implies that actual data from projects has been gathered and used to establish parameters that can be applied to calculate direct job creation. For this purpose, a sample was taken of existing projects. Attempts were made to draw a representative sample of projects on the basis of the size (i.e. number of housing units), location (i.e. urban, non-urban, provincial), and Product Type (see paragraph 2.1). Although it was not possible to source all the information according to the sample, it was still possible to gather sufficient information on real projects to estimate the number of direct jobs created with confidence. The data gathering process has led to information on, amongst others, the following:

- **100% Housing Subsidy**

- **1 000 unit scheme in the Northern Province**
- **514 unit scheme in KwaZulu-Natal**
- **Standard costs for schemes in Mpumalanga**
- **3 021 units in the Eastern Cape**
- **950 units in schemes in Western Cape**
- **500 unit in Western Cape**

- **Institutional housing**
  - **150 units in Eastern Cape**
  - **1 190 units in schemes in Gauteng**
- **Credit linked**
  - **2 000 units in various schemes in Gauteng**
  - **445 units in KwaZulu-Natal**
- **Bonded units**
  - **Standard costs for bonded houses with different specifications in Gauteng (3 projects)**
- **Peoples Housing Process**
  - **263 units in KwaZulu-Natal**
  - **800 units in Eastern Cape**
- **Other**
  - **Research on salaries and wages of professionals in the building industry.**
  - **Cost structures of various disciplines.**

The above indicates that the sample covers predominantly urbanised provinces and projects close to, or located within metropolitan areas. Rural or non-urbanised areas may possibly influence the cost relationships that in turn will have an impact on the cost of labour and the potential number of direct job opportunities. Labour unit cost tends to be lower in rural/non-urban areas and implies that potentially the same Product Type can be produced at a lower total labour cost. This potential "saving" is often cancelled out by higher costs of rendering professional/engineering and administrative services to these areas as well as higher material cost (due to higher transport cost).

3.1.2 Methodology

The method that was applied to establish parameters to estimate direct job creation was based on the functional relationships defined in paragraph 2.2.2. Values were determined for the independent variables that were derived from the data sources mentioned above. More specifically, the steps can be summarised as follows:

- **The first step was to determine the cost of independent variables in the functional relationships for each Product Type. These cost items formed part of the data gathering process.**

- **Determine the average cost per unit for each independent variable. This was possible by dividing the total cost of a variable (i.e. building materials) by the number of units in the project. In the case of labour unit cost, it was necessary to make estimates of average salaries and wages especially for the functional relationships where professional services are involved.**
- **Calculate the weighted average unit cost of each independent variable per Product Type.**
- **Calculate the dependent variable per project by adding the independent variables for each functional relationship and each Product Type separately, together.**
- **Direct job creation (ZE) is the sum of all the dependent variables, namely Management and Administration Services (MA), Professional Services (PS), Engineering Services (ES) and the Top Structure (TS), for example: ZE = MA+ES+PS+TS.**

In order to apply the method, the dependent variables are expressed in terms of the number of direct jobs created per R1 000 000 investment in government-assisted housing.

3.1.3 Results

Table 3.1 shows the number of direct job opportunities per R1 000 000 investment in government-assisted housing.

TABLE 3.1: DIRECT JOB CREATION PER R1 000 000 INVESTMENT IN GOVERNMENT-ASSISTED HOUSING

PRODUCT TYPE	Direct Job Creation				TOTAL DIRECT JOB CREATION[1]
	Managerial and Administration	Engineering Services	Professional Services	Top Structure	
	MA ***(see par.2.2.2.1)***	*ES* ***(see par. 2.2.2.2)***	*PS* ***(see par. 2.2.2.3)***	*TS* ***(see par. 2.2.2.4)***	ZE[2]
Type A (R16 000)	**0.3933**	**0.6158**	**0.1902**	**14.9827**	**16.1821**
Type B (R16 000)	**0.3017**	**0.6335**	**0.1464**	**3.5959**	**4.6774**
Type C (R25 000)	**0.3246**	**0.7237**	**0.1191**	**15.5820**	**16.7494**
Type D (R60 000)	**0.3164**	**0.3102**	**0.0482**	**20.9758**	**21.6505**
Type E (R62 500)	**0.5277**	**0.3114**	**0.0971**	**21.5751**	**22.5114**

Note (1): Figures do not always add up precisely due to rounding off of decimals.
(2): Total Direct Job Creation (ZE) = MA + ES + PS + TS

According to Table 3.1, a Type A housing project with a value of R1 000 000[2] has the potential to create 16.2 direct job opportunities. The same formula can also be applied to, for example, a Type D housing project that has the potential to create about 21.7 direct job opportunities. It is evident from Table 3.1 that the Top Structure component of the housing project has the highest direct job creation potential.

It is important to note that the state investment in certain Product Types has a leverage effect on the total investment in housing. The state's investment of R5 000 in a Type E unit, for example, has the effect that an average of R57 500 is also being invested by the private sector in the same unit (see Table 3.2). This leverage effect should be incorporated as part of the job creation calculation method. The Type A and Type B housing projects do not generate additional private or household funds and consequently the unit investment in these Product Types are equal to the subsidy amount.

Table 3.2 shows the average total investment per Product Type (unit cost), state and private sector contribution as well as the leverage effect per R1 million state investment.

TABLE 3.2: TOTAL INVESTMENT AND LEVERAGE EFFECT PER PRODUCT TYPE AND PER R1 000 000 STATE CONTRIBUTION IN GOVERNMENT-ASSISTED HOUSING

PRODUCT TYPE	Unit cost	Financing of project		Total investment per R1 mill. state investment	LEVERAGE EFFECT
		State contribution	Private sector contribution (1)		
	R	R	R	R	Multiplier
Type A (R16 000)	**16 000**	**16 000**	**0**	**1 000 000**	**1.0000**
Type B (R16 000)	**16 000**	**16 000**	**0**	**1 000 000**	**1.0000**
Type C (R25 000)	**25 000**	**16 000**	**9 000**	**1 562 500**	**1.5625**
Type D (R60 000)	**60 000**	**16 000**	**44 000**	**3 750 000**	**3.7500**
Type E (R62 500)	**62 500**	**5 000**	**57 500**	**12 500 000**	**12.5000**

Note 1: Bonds, micro loans, personal savings, etc.

Taking the leverage effect of government investment into account, Table 3.3 shows the potential number of direct jobs created by R1 000 000 state investment in housing.

[2] The project value of R1 000 000 refers the actual value of the subsidies under the Housing Subsidy Programme that have been approved and allocated to specific beneficiaries. The R1000 000 exclude monies approved by government that do not form part of individual housing subsidies.

TABLE 3.3: TOTAL DIRECT JOB CREATION PER R1 000 000 STATE INVESTMENT IN GOVERNMENT-ASSISTED HOUSING

PRODUCT TYPE	Leverage effect per R1 mill. state Investment (see Table 3.2)	Direct Job Creation per R1 mill. investment (see Table 3.1)	TOTAL DIRECT JOB CREATION
	(a)	(b)	c =(a)x(b)
Type A (R16 000)	**1.0000**	**16.1821**	**16.1821**
Type B (R16 000)	**1.0000**	**4.6774**	**4.6774**
Type C (R25 000)	**1.5625**	**16.7494**	**26.1709**
Type D (R60 000)	**3.7500**	**21.6505**	**81.1894**
Type E (R62 500)	**12.5000**	**22.5114**	**281.3925**

According to Table 3.3, Project Type E has the largest direct job creation potential. This is due to the relatively high leverage effect of 12.5 per R1 000 000 of state investment in government-assisted housing. Product Type E has also the largest direct job creation multipliers per R1 000 000 total investment. The combined impact of the leverage effect and the job creation multiplier is that this Product Type has the potential to create 281.4 jobs per R1 million state investment in government-assisted housing.

3.2 INDIRECT JOB CREATION

The aim of this sub-section is to outline the method used to determine the number of indirect jobs created by state investment in government-assisted housing. The following elements will be highlighted:

- **Methodology;**
- **Information;**
- **Results.**

3.2.1 Methodology

The method that was followed to determine indirect job opportunities is based on an input-output analysis of employment multipliers. Annexure A provides a synoptic overview of Input-Output analysis as a tool to estimate job creation in any economic activity. This analysis uses an Input-Output Table that represents the national economy and is an ideal instrument to assist in impact analysis of this kind. The notion of multipliers rests upon the difference between the initial effect of an exogenous (in this case investment in government-assisted housing) change, and the employment effects of that change. The effects can be defined in different ways, for example, as direct, indirect and/or induced job creation.

The specific steps followed are summarised below:

- **Apply the latest National Input-Output Table available (see Annexure B).**
- **Close the Input-Output Table with respect to households in order to be able to calculate total employment multiplier analysis.**
- **Calculate the Leontief inverse.**
- **Calculate total employment multipliers (see Annexure C).**
- **Determine per Product Type, the total value of state investment (see Table 3.2).**
- **Determine per Product Type, the total value of private sector (household savings, micro loans, bonds) investment. This step affects only Product Types C, D and E (see Table 3.2).**
- **Determine the non-labour cost per Product Type from the information gathered from actual projects (see par. 3.1.1 and Table 3.3).**
- **Apply the employment multiplier to the sum of the state and private sector investment per Product Type (see Table 3.3).**

The main output of the above method is employment multipliers per Product Type per R1 000 000 state investment in government-assisted housing.

3.2.2 Information

The main sources of information used in developing the indirect job creation method are:

- **CSIR – 1996 Input-Output Table.**
- **Statistics South Africa.**
- **Literature on input-output analysis.**

3.2.3 Results

Table 3.4 shows the number of indirect job opportunities per R1 000 000 state investment (including its leverage effect) in government-assisted housing. The leverage effect is discussed under paragraph 3.1.3 and is also applicable with regard to the calculation of indirect job opportunities.

TABLE 3.4: TOTAL INDIRECT JOB CREATION PER R1 000 000 STATE INVESTMENT IN GOVERNMENT HOUSING

PRODUCT TYPE	Leverage effect per R1 mill. State Investment (see Table 3.2)	Non-labour component[1]	Employment multipliers per R1 mill.	TOTAL INDIRECT JOB CREATION
	(a)	(b)	(c)	(a x b x c)
Type A (R16 000)	**1.0000**	**0.7064**	**21.3755**	**15.0989**
Type B (R16 000)	**1.0000**	**0.8580**	**21.3755**	**18.3392**

PRODUCT TYPE	Leverage effect per R1 mill. State Investment (see Table 3.2)	Non-labour component[1]	Employment multipliers per R1 mill.	TOTAL INDIRECT JOB CREATION
	(a)	(b)	(c)	(a x b x c)
Type C (R25 000)	**1.5650**	**0.6622**	**21.3755**	**22.1509**
Type D (R60 000)	**3.7500**	**0.6309**	**21.3755**	**50.5692**
Type E (R62 500)	**12.5000**	**0.5463**	**21.3755**	**145.9743**

Note 1: The non-labour component is used to determine indirect job creation. The labour component has been used in the direct creation method in the previous section.

According to Table 3.4 the indirect job creation per R1 000 000 for the different Product Types are:

- **Type A (R16 000) 15.1**
- **Type B (R16 000) 18.3**
- **Type C (R25 000) 22.2**
- **Type D (R60 000) 50.6**
- **Type E (R62 500) 146.0**

The above figures mean that for every R1 000 000 subsidy that goes to individual households qualifying for a Product Type A housing scheme, for example, there is the potential to create 15.1 indirect job opportunities. The same R1 000 000 invested in Product Type E units has the potential to create 146.0 indirect job opportunities.

3.3 TOTAL JOB CREATION

Total Job Creation can be determined by adding the direct and indirect jobs together (i.e. *TOTAL NUMBER OF JOBS = DIRECT JOBS + INDIRECT JOBS - see paragraph 2.2.1)***. The result represents the total number of jobs created by the housing industry in one year due to state investment in government-assisted housing. It is important to note that the total number of jobs created by this method includes the leverage-effect of private (i.e. home bonds, personal loans, private saving) as well as government investment (i.e. subsidy).**

The method followed also differentiates between the five Product Types. Total Job Creation can also be determined for either one, or all five of the product types in any combination.

Table 3.5 shows the total potential number of job opportunities per R1 000 000 state investment in government-assisted housing.

TABLE 3.5: TOTAL JOB CREATION PER R1 000 000 STATE INVESTMENT IN GOVERN-MENT HOUSING (INCLUDING LEVERAGE EFFECT OF STATE INVEST-MENT)

PRODUCT TYPE	Direct job creation (a)	Indirect job creation (b)	TOTAL JOB CREATION (a) + (b)
Type A (R16 000)	16.1821	15.0989	31.2810
Type B (R16 000)	4.6774	18.3392	23.0166
Type C (R25 000)	26.1709	22.1509	48.3218
Type D (R60 000)	81.1894	50.5692	131.7586
Type E (R62 500)	281.3925	145.9743	427.3668

The application of the information in Table 3.5 shows that for every R1 000 000 state investment in housing subsidies in each of the Product Types, the following potential total number of job opportunities can be created:

- **Type A (R16 000) - 31.3**
- **Type B (R16 000) - 23.0**
- **Type C (R25 000) - 48.3**
- **Type D (R60 000) - 131.8**
- **Type E (R62 500) - 427.4**

If, for example, R15 000 000 is invested in housing subsidies in a Product Type D housing scheme, then 1 977 new job opportunities can potentially be created. This is done by applying the parameters in Table 3.5 as follows:

Total number of jobs per R1 000 000 invested in Product Type D housing schemes = 131.8 jobs

Total number of jobs per R15 000 000 = 131.8 X $\frac{\text{R15 000 000}}{\text{R1000 000}}$

= 1 977 jobs

The same method can be applied with regard to investment in a Product Type B housing scheme, for example:

Total number of jobs per R1 000 000 invested in Product Type B housing schemes = 23.0 jobs

Total number of jobs per R15 000 000 = 23.0 X $\frac{\text{R15 000 000}}{\text{R1000 000}}$

= 345 jobs

3.4 COST OF JOB CREATION

The preceding analysis shows that the number of jobs created per R1 000 000 state investment differs between the various Product Types. This is also true with respect to the cost of creating the jobs. Table 3.6 shows the cost of job creation per Product Type.

TABLE 3.6: COST OF JOB CREATION PER R1 000 000 STATE INVESTMENT IN GOVERNMENT-ASSISTED HOUSING

PRODUCT TYPE	Total investment per R1 mill. state investment	Total job creation (see Table 3.4)	COST PER JOB
	R	Jobs	R/jobs
Type A (R16 000)	**1 000 000**	**31.2810**	**R31 968**
Type B (R16 000)	**1 000 000**	**23.0166**	**R43 447**
Type C (R25 000)	**1 562 500**	**48.3218**	**R32 335**
Type D (R60 000)	**3 750 000**	**131.7586**	**R28 461**
Type E (R62 500)	**12 500 000**	**427.3668**	**R29 249**

According to Table 3.6, a R1 000 000 state investment in Product Type A housing units, have the potential to create 31.3 jobs at an average cost of R31 968 per job. It is evident from the above that state investment in Product Type B units is the least, whilst investment in Type D and E units are the most efficient in terms of the cost of job creation.

SECTION FOUR: APPLICATION

4.1 APPLICATION AND CONDITIONS

The method to estimate total job creation has been developed for specific application under certain conditions. These conditions are:

- **The initial investment in housing must be done by the state under its Housing Subsidy Programme.**
- **Government-assisted housing should be based on the Product Types outlined in Section Two of the report.**
- **It is advisable to apply the method for projects with a subsidy value of larger than R1 000 000.**
- **Government investment in housing represents the total value of subsidies approved with respect to individual households and excludes any other funds consequential to housing that are transferred to local, provincial or metropolitan authorities.**

4.2 SOFTWARE

The method to estimate total job creation has been computerised in a user friendly *"what if"* model under Microsoft Office (Excel). This model requires limited computer experience and can be used by any person with a Personal Computer, Windows operating system and the Microsoft Office programme with Excel (see Annexure C).

4.3 EXAMPLES

The following example is used to illustrate the use of the Total Job Creation Method, namely:

Example: **What is the total potential number of jobs that will be created by Project ABC. Project ABC's budget is R7 000 000 of which 60% will be used for Product Type A and the rest for Product Type E housing units.**

The example in Table 4.1 shows that R4 200 000 investment in Product Type A housing units has the potential to create about 131.4 job opportunities. The R2 800 0000 investment in Product Type E units have the potential to create about

1 196.6 job opportunities. The total number of jobs created by Project ABC is estimated at about 1 328.

TABLE 4.1: EXAMPLE - TOTAL JOB CREATION FOR PROJECT ABC (PER R 1000 000 STATE INVESTMENT IN GOVERNMENT-ASSISTED HOUSING)

PRODUCT TYPE	State investment	Direct job creation		Indirect job creation		TOTAL JOB CREATION
	(a)	Parameter (b)	Jobs (a)x(b)=c	Parameter (d)	Jobs (a)x(d)=e	(c) + (e)
Type A (R16 000)	**R4 200 000**	**16.1821**	**67.9648**	**15.0989**	**63.4154**	**131.4**
Type B (R16 000)	**0**	**4.6774**	**0**	**18.3392**	**0**	**0**
Type C (R25 000)	**0**	**26.1709**	**0**	**22.1509**	**0**	**0**
Type D (R60 000)	**0**	**81.1894**	**0**	**50.5692**	**0**	**0**
Type E (R62 500)	**R2 800 000**	**281.3925**	**787.8990**	**145.9743**	**408.7280**	**1 196.6**
TOTAL	R7 000 000					1 328.0

4.4 SUGGESTIONS

It is suggested that the Department of Housing consider the following actions:

- **To update the information base on actual projects annually.**
- **To make it a requirement for applicants to provide actual figures before final payments on projects are made. The actual figures on a project basis should at least cover the following:**

  - **Description of the project.**
  - **House type finish, level of services/site sizes.**
  - **Geo-technical input/locality and any other salient information.**
  - **Top Structure:**
    - **material cost, with trade by trade breakdown;**
    - **labour cost (in Rands);**
    - **civil costs (in Rands).**
  - **Builders preliminary and general costs.**
  - **Developer's margin and overheads.**
  - **Total and labour costs per professional services input.**
  - **Total and labour costs per engineering services input.**
  - **Cost and size of land.**
  - **Any other cost.**

- **To review the parameters used in the Job Creation Method annually or when the Product Types have changed. A change in the subsidy component of each Product Type of not more than 10% can be regarded as acceptable. A change above 10% will require the updating of the parameters outlined in Table 3.4.**

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ANNEXURE A: INPUT-OUTPUT ANALYSIS

(Source: "The Theory and Practice of Input-Output Analysis, CSIR (Conningarth Consulting Economist, 2000.)

The Input-Output Table forms the nucleus of any model that analyses and projects the economy on an industry-to-industry basis.

A.1 WHAT IS AN INPUT-OUTPUT (I/O) TABLE?

The I/O Table is a summarised version, in quantified terms, of all transactions that took place between the main economic stakeholders in a particular year. The main feature of an input-output table is that it divides these economic transactions into the main sectors of the economy, starting with Agriculture, Forestry and Fishing right through to Community Services.

The main economic decision-makers who are responsible for the transaction activities contained in the I/O Table are entrepreneurs, workers, households and government (all three levels).

The I/O Table is nothing more than an extension of the National Accounts of a country, i.e. desegregating it into the various sectors of the economy. For this reason I/O-Tables are compiled and published by Statistics South Africa (SSA). These sectoral figures are therefore strictly compatible with the macro national accounting data published by the South African Reserve Bank and SSA on a regular basis.

A.2 STRUCTURE OF INPUT-OUTPUT TABLE

A modern Input-Output Table is an economic tool by which a system of national accounts is extended, classified and depicted in a tabular format. The basic structure of an Input-Output Table is based on the same framework as Leontief's (1936) original statistical Input-Output Table. The Input-Output Table serves as the basis for a broad and rapidly developing economic practice called input-output analysis. Currently, different structural variations of the table are applicable to different situations. In many instances an official authority compiles a standard Input-Output Table for a particular country. In the case of South Africa, this is done by Statistics South Africa (SSA). Researchers usually remodel the official Input-Output Table for a specific purpose.

A.3 THEORETICAL FRAMEWORK OF THE INPUT-OUTPUT TABLE (NATIONAL ACCOUNTS)

The Input-Output Table with regard to an open economy, as illustrated in Table 1, makes provision for two kinds of transactions at a sectoral level, namely the purchase of intermediate and primary inputs on the one side, and the supply of intermediate and final outputs on the other side. This classification distinguishes four types of transactions which can be arranged by means of symbols in such a way that each one could be identified according to a particular quadrant.

Quadrant I represents the intermediate inputs which at the same time are intermediate outputs. Quadrant 1, usually referred to as the transaction table or transaction matrix, displays the flow of goods and services among the various sectors for purposes of production. This flow of goods and services is normally regarded as intermediate in nature. From left to right each row depicts (in Rand value) the goods and services which the producing sectors sell to themselves and to other sectors for application in their specific production processes. In each column, purchases, i.e. inputs, by a specific sector (in Rand value) from other sectors appear. For example, the term X_{ij} indicates sales/outputs from sector i to sector j or "conversely" the purchases/inputs of sector *j* from sector *i*.

Quadrant II shows the final demand for locally produced goods and services on a sectoral basis, classified according to the main consuming sector. The final demand components are indicated by the symbols C, G, I, S and E where:

C = final sales/outputs from the different sectors to households);
G = current purchases by the government sector from the different sectors.
I = gross domestic fixed investments (sales/outputs by the different sectors) which are regarded as capital goods.
S = changes in inventories during the period covered by the table. The relevant figure can have either a positive or negative value, depending on whether inventories increased or decreased in the various sectors. The changes in savings in the Input-Output Table denotes the change of a specific product irrespective of the sector of the economy where the changes occurred.
E = exports in the different sectors.

Quadrant III reflects the remuneration of labour, the gross operating surplus, the nett indirect taxes and the intermediate imports for each sector, thus the primary inputs. It represents gross value added (the portion of gross domestic product which originates from each of these sectors), as well as each sector's intermediate imports. The symbols used to indicate the various types of primary inputs are as follows:

W = remuneration of employees, i.e. the purchase of labour services from households by each sector.
T = indirect tax/payments by the various sectors to the government. This is usually shown as a net figure, for examples taxes less subsidies.
P = gross operating surplus (before direct tax) of each sector, which includes provision for depreciation and undistributed profits.
M = each sector's intermediate imports applied as raw materials or parts in production processes. The imports by a specific sector also refer to the imports of other sectors from which raw materials are purchased.

Quadrant IV shows purchases/inputs by final consumers from primary sources, for example, direct purchases/inputs of labour services (domestic workers) which form part of consumer expenditure, and remuneration to employees in the government sector. The indirect taxes and subsidies included in the final demand and depreciation on fixed government assets, are also

depicted in Quadrant IV. The horizontal V-vector in quadrant IV represents the total value of the various types of primary inputs which were purchased by each final demand component.

The X-row vector at the bottom as well as the X-column vector on the right hand side of the Input-Output Table represents the total gross inputs and total gross output (total production) respectively for the various sectors. As the total inputs for a particular sector are also equal to its total outputs, each X_i in the total gross inputs row should be equal to the corresponding X_i in the total gross output column. This condition, however, does not apply to the final demand and primary input components. Although it appears as if the primary input and the final demand components are related, (for example, payments to employees in relation to private consumer expenditure and nett indirect taxes in relation to consumption expenditure by general government) they are not equal. A condition which applies to the final demand and primary input components, is that the total final demand transactions should balance the total primary inputs.

In Table 1, the total gross outputs and the total gross inputs are associated by the common symbol Z. Z can be defined as the sum of all intermediate sales/outputs as well as sales/outputs to final consumers or, in terms of inputs, the sum of all intermediate and primary inputs. Z is calculated by adding up the figures in the total gross output column or those in the total gross input row.

As already mentioned, the input-output table is a classified explanation of the National Accounts in tabular format (matrix format). Although it is possible to calculate Gross Domestic Product (GDP) by using an input-output table, the total gross output is, however, not the same as the GDP. The total gross outputs measure all transactions (intermediate as well as final demand transactions) which occur in a given year. A product can be counted more than once, resulting in double or multiple counting. The GDP on the contrary, avoids double counting and measures only the production for a given year. Both the GDP and the expenditure on GDP can be read from the input-output table. The GDP is the total of primary inputs less imports, and expenditure on GDP is the same as final demand (Department of Statistics: 1967)

A.4 INPUT-OUTPUT TABLE AS AN ANALYTICAL TOOL

The function of an Input-Output Table is twofold. Firstly, the table presents a descriptive framework of the economic structure of a country by showing the interrelationships between sectors by means of the transactions table. It is an extension of the Macro-National Accounts level. The detailed nature of the input-output table is determined by the availability of data, government disclosure regulations and available research funds rather than by a set of rules. Secondly an input-output table serves as an economic model. Van den Bogaerde (1972:53) points out that an economic model involves the exposition of the relationships between economic variables in the form of equations. These equations are then combined to form a complete model. An economic model can thus be defined as a set of equations which show mutual dependence or interrelationships of economic variables. As input-output table's formal exposition complies with these requirements, it can be considered as a model, which is useful for analytical purposes.

An input-output model as an analytical tool is pre-eminently suitable for measuring the effects of autonomous disturbances in the economy. Given specific assumptions with regard to the nature of the production functions, the input-output model can be generally utilised for the above-mentioned purposes, on account of their mathematical features. The matrices which can be derived from the input-output model, are used as instruments for economic analysis. This is

done by means of the so-called technical input coefficients' matrix and the Leontief inverse matrix. These two key characteristics of an input-output table are briefly discussed below.

A.5 GENERAL ASSUMPTIONS AND CONDITIONS OF AN INPUT-OUTPUT ANALYSIS

The input-output model, as in the case of any other economic model, rests upon assumptions made and conditions which must be complied with in order to make the model useful for economic analyses. Sections A.5.1 and A.5.2 present a brief discussion regarding this aspect.

A.5.1 Assumptions (Economic)

The fundamental assumption with regard to the compilation of an input-output model, as well as the use of this model for analytical purposes, is, firstly, that it is possible to group all production-activities in the economy in homogeneous sectors. Secondly, it is necessary that the mutual interdependence of sectors which features in the model can be expressed in meaningful input functions. This basic assumption mainly allows further assumptions to be made concerning the economic validity of the application of an input-output model as an economic analytical tool.

Firstly, the classification of a number of industries in a specific sector rests upon further assumptions in respect of the inputs of each industry in that sector, namely:

1) Each product or a group of products in supplied by a single sector. The economic implications of this assumption are as follows:
   a) That only one manufacturing method is applied in the manufacture of a product or a group of products, and
   b) That each sector manufactures only one primary product.
2) Each sector's inputs are only a function of the specific sector's production. A more general assumption is usually made, namely, that the input function of the different sectors in linear. According to Chenery and Clark (1959:34), these assumptions are only made as a matter of convenience.
3) The production by different sectors is equal to the sum of the separate sectors' of production. This concept is known as the "additive principle", which negates external advantages and disadvantages.

Secondly, if an input-output model is used as an economic forecasting model, the assumption is made that the technical coefficients remain constant for the period over which the projections is made (reasonable period). Stadler (1973: 208) points out that the above-mentioned assumption implies the following two additional assumptions with regard to the inputs of each industry in a particular sector, namely:

1) That there will be no input substitution resulting from a price change in a particular industry, and
2) There will be no change in technology.

A.5.2 Conditions (Technical)

Two conditions are of great importance with regard to technical coefficients. The first is the non-singular condition which must be valid for a matrix before its inverse can be determined (Business and Economics, 1970: 129). Another condition is the "Hawkins-Simon Stability

Condition" (Hawkins and Simon, 1949: 245-248) which tests the economic validity of the technical coefficients.

A.6 VARIATIONS IN THE COMPOSITION OF THE STANDARD INPUT-OUTPUT TABLE FOR DIFFERENT ANALYTICAL PURPOSE

As indicated in the introduction to this section, the structure of an input-output table is essentially determined by its ultimate use as an analytical tool (model). The general variation in the composition of the input-output table is, firstly, an adaptation with regard to the degree of closeness, and, secondly, the detail of some components of final demand. This adaptation with regard to the table does not affect the basic principles upon which the input-output table functions. However, it can affect the practical interpretation of these.

A.6.1 Open or closed model

An input-output model can be open or closed with regard to specific final objectives. The closeness of the model is determined by the number of final demand components (the exogenous variables of the model) in the transaction table which are incorporated for analytical purposes (the endogenous variables of the model). Various degrees of closeness can therefore be obtained for input-output models.

A.6.2 Details of Final Demand Components

In order to solve a specific analytical problem, it may be necessary to sub-divide the final demand components further. For example, government consumption can be divided into consumption by central, provincial and local governments.

The needs of a regional or multi-regional analysis will therefore determine the presentation of the import and export statistics in the input-output table. Particular imports and exports can be subdivided according to the country of origin or destination respectively or according to the sector in the country of origin or destination.

TABLE 1: SCHEMATIC REPRESENTATION OF AN INPUT-OUTPUT TABLE

INPUTS \ OUTPUTS		INTERMEDIATE DEMAND/OUTPUTS			FINAL DEMAND/OUTPUTS					TOTAL GROSS OUTPUTS
		1	j	n	C	G	I	S	E	
Intermediate Inputs	1	X_{1j}	X_{1j}	X_{1n}	C_1	G_1	I_1	S_1	E_1	X_1
		QUADRANT I					QUADRANT II			
	i	X_{i1}	X_{ij}	X_{in}	C_i	G_i	I_i	S_i	E_i	X_i
	n	X_{n1}	X_{nj}	X_{nn}	C_n	G_n	I_n	S_n	E_n	X_n
Primary inputs	W	W_1	W_j	W_n						W
	T	T_1	T_j	T_n						T
	P	P_1	P_j	P_n	V_c	V_G	V_1	V_s	V_e	P
	M	M_1	M_j	M_n						M
		QUADRANT III					QUADRANT IV			
Total Gross Inputs		X_1	X_j	X_n	C	G	I	S	E	Z

ANNEXURE B

THE INPUT/OUTPUT STRUCTURE OF THE SOUTH AFRICAN ECONOMY
INPUT - OUTPUT TABLE AT BASIC VALUES, 1996 (R million) IMPORTS SHOWN SEPARATELY

SECTORS	SIC Codes	Agric	Min	Man	EGW	Const	Trade	Transport	Finance	Serv	HH	Intermediate	CG_Total	IK_Total	IC_Total	T_Export	Final_Tot	PROD_TOT
Agriculture	1	2754.79	43.07	25582.57	0.00	0.00	1037.22	139.96	70.86	199.49	8646.87	38474.82	463.31	0.00	1569.29	4943.64	6976.24	45451.06
Mining	2	31.56	126.83	11829.32	3033.92	366.51	18.17	43.04	200.16	30.26	399.34	16079.11	205.12	0.00	-1630.52	54553.79	53128.39	69207.51
Manufacturing	3	9777.74	8184.87	90858.25	1848.41	17120.27	15519.70	11503.09	5164.07	6543.17	104225.52	270745.09	12908.51	20812.38	3204.74	60199.89	97125.52	367870.61
EGW	4	408.47	3974.56	7610.40	9145.54	611.12	2278.72	1488.37	1775.72	990.87	8231.93	36515.71	1399.41	0.00	0.00	227.30	1626.71	38142.42
Construction	5	207.14	516.21	0.00	1268.47	15388.05	2304.72	940.62	1638.36	281.10	0.00	22544.66	3378.56	49762.65	0.00	28.98	53170.18	75714.84
Trade	6	2671.00	1589.79	15034.42	736.83	3501.38	11262.75	5577.37	4400.60	4527.17	75320.06	124621.37	4228.90	3983.22	502.89	8518.54	17233.55	141854.92
Transport/Communication	7	1356.43	1427.40	11860.98	439.76	5524.81	2584.63	2999.89	2903.12	4398.92	34567.81	68063.75	1712.27	509.59	81.98	16134.13	18437.98	86501.73
Finance	8	590.05	173.06	12646.01	1115.44	4238.95	18565.15	2961.12	33469.73	7447.58	64613.68	145820.77	7034.99	3464.35	0.00	5741.21	16240.55	162061.32
Services	9	298.52	4937.17	18912.44	655.32	2360.20	1310.02	1200.62	1638.75	2115.31	20159.68	53588.02	-6687.15	0.00	0.00	376.78	-6310.37	47277.65
Households		4505.26	18078.94	54169.04	4873.03	13873.10	42841.67	23700.60	51440.98	12541.19	10812.19	236836.00	148444.00	0.00	0.00	0.00	148444.00	385280.00
Sub-Total: Intermediate input		22600.95	39051.90	248503.41	23116.72	62984.40	97722.75	50554.70	102702.35	39075.04	326977.09	1013289.29	173087.93	78532.19	3728.39	150724.26	406072.77	1419362.06
Total imports		2297.76	5256.75	56608.65	1164.64	5821.20	5559.19	4035.87	4225.60	4145.50	26266.42	115381.57	11685.82	15344.60	928.00	0.00	27958.43	143340.00
Total Intermediate input		24898.72	44308.64	305112.07	24281.35	68805.59	103281.93	54590.56	106927.94	43220.54	353243.51	1128670.86	184773.76	93876.79	4656.39	150724.26	434031.20	1562702.06
Gross operating surplus		19814.67	23950.27	60012.90	13268.89	3769.62	36687.15	28132.72	47417.97	3315.62	0.00	236369.81	11741.19	0.00	0.00	0.00	11741.19	248111.00
Net indirect taxes		737.68	948.59	2745.64	592.18	3139.63	1885.84	3778.45	7715.40	741.49	32036.49	54321.39	2628.06	5504.21	946.61	-2163.26	6915.61	61237.00
Total Primary Inputs		20552.34	24898.86	62758.54	13861.07	6909.24	38572.99	31911.17	55133.38	4057.11	32036.49	290691.20	14369.24	5504.21	946.61	-2163.26	18656.80	309348.00
Total Input		45451.06	69207.51	367870.61	38142.42	75714.84	141854.92	86501.73	162061.32	47277.65	385280.00	1419362.06	199143.00	99381.00	5603.00	148561.00	452688.00	1872050.06
Employment		1,012,594	558,578	1,428,996	39,857	312,051	775,577	280,031	215,082	1,623,976	1,900,000							

ANNEXURE C

THE INPUT/OUTPUT STRUCTURE OF THE SOUTH AFRICAN ECONOMY
INPUT - OUTPUT TABLE AT BASIC VALUES, 1996 (R million)
EMPLOYMENT MULTIPLIERS *(TYPE 2)*

SECTORS	Agric	Min	Man	EGW	Const	Trade	Transport	Finance	Serv	HH
Agriculture	**24.8367**	**1.1989**	**3.0979**	**0.9040**	**1.7468**	**1.5292**	**1.2875**	**1.1455**	**1.6603**	**2.1704**
Mining	**0.1833**	**8.3029**	**0.4970**	**0.9813**	**0.3169**	**0.2063**	**0.1961**	**0.1757**	**0.2473**	**0.2762**
Manufacturing	**2.0607**	**1.9122**	**6.4875**	**1.4418**	**3.0595**	**2.1222**	**2.0222**	**1.6408**	**2.4915**	**2.9178**
EGW	**0.0530**	**0.1285**	**0.0858**	**1.4214**	**0.0820**	**0.0809**	**0.0750**	**0.0688**	**0.0981**	**0.0968**
Construction	**0.0691**	**0.1028**	**0.0645**	**0.2738**	**5.2495**	**0.1578**	**0.1168**	**0.1213**	**0.1222**	**0.0957**
Trade	**1.0697**	**1.1493**	**1.2593**	**0.9516**	**1.6098**	**7.1255**	**1.4104**	**1.3024**	**1.9209**	**2.2889**
Transport/Communication	**0.3317**	**0.3898**	**0.4362**	**0.3109**	**0.7022**	**0.4305**	**3.6722**	**0.4071**	**0.7305**	**0.6715**
Finance	**0.2296**	**0.2987**	**0.3463**	**0.2912**	**0.4784**	**0.5596**	**0.3553**	**1.9854**	**0.6542**	**0.6316**
Services	**2.2350**	**4.9871**	**4.5798**	**2.9750**	**4.6981**	**3.1888**	**3.0254**	**2.9455**	**39.2007**	**4.9363**
Households	**1.8441**	**2.9087**	**2.6071**	**2.2725**	**3.4323**	**3.5483**	**3.0450**	**3.5049**	**3.8277**	**7.7008**
Employment multiplier/R1m	32.91296	21.37898	19.46141	11.82340	21.37555	18.94913	15.20570	13.29735	50.95352	21.78588