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CONSTRUCTION OF SOCIAL ACCOUNTING MATRIX FOR KENYA

2009

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Abstract

This paper sought to construct a social accounting matrix for Kenya 2009 given that the most recent SAM dates back to 2003. The objective of this exercise was to construct a micro SAM incorporating accounts of individual activities, primary factors, and economic institutions and to balance the SAM using cross entropy method. The SAM 2009 provides a new opportunity for modelers to use most recent Kenyan SAM to undertake economy wide analysis.

1 BACKGROUND

A Social Accounting Matrix (SAM) is a matrix representation of transactions in a socio-economic system. It is generally a comprehensive and disaggregated framework that shows the generation of incomes by activities of production. It provides information on the income generation process of a country, generating details on the sources and destinations of transactions by economic institutions. Within the SAM framework, one is able to establish the income and revenue links between agents and institutions at an empirical level. Able to generate information on interdependencies in the socio-economic systems and the interaction between various agents within the socio-economic system, a SAM is therefore an important tool for economic analysis.

Pioneer work on social accounting techniques were undertaken by Stone (1978) and Pyatt and Round (1979, 1985). A SAM can be used to undertake several analytical questions, such as economic drivers of growth, the impact of public policies on millennium development goals, food security, and poverty reduction. However, such questions can only be answered depending on the level of disaggregation of a SAM and its availability. In Kenya, for example, the country has set out its development goals and strategies in the economic blue print “Kenya Vision 2030: A Globally Competitive and Prosperous Kenya,” but the most recent SAM that can be used to undertake economy-wide analysis for Kenya dates back to 2003. Moreover, the level of disaggregation of the 2003 SAM does not allow for undertaking in-depth development analysis.

1.1 The Problem

“Kenya Vision 2030” has been put in place as the vehicle that will accelerate the transformation of the country into a rapidly industrialized middle-income nation by 2030. The main anchors of this vision are macroeconomic stability, continuity in government reforms, enhanced equity and wealth creation opportunities for the poor, and development in infrastructure, energy science, and technology, among others. Under the economic pillar, six sectors are projected to experience a 10 percent growth rate per annum: tourism, agriculture, manufacturing, wholesale and retail trade, business process outsourcing, and financial services. While these are important sectors for the economy, there is no evidence on how the choice of these sectors as the main drivers of growth was reached. An analysis of the forward and

backward linkages within the economy would greatly advise policy makers of the main sectors to focus on. This kind of information can be obtained from a detailed SAM.

Secondly, under the social pillar, education and health have been identified as factors that would ensure equitable social development in a just and cohesive society. Within the social sector, the government is expected to increase quality and access to social services through increased funding. It would be important to differentiate private and government production in a SAM in order to establish the economy-wide effects of government social policies. Such an analysis is important in monitoring and evaluation of the medium term implementation framework of the Vision 2030. The Kenya SAM 2003 is too dated and lacks disaggregation needed to effectively analyse the economy-wide effects of the government's social policies and the millennium development goals, which form an important part of social policies.

Lastly, there are new issues arising in the global arena such as climate change, energy use, and environmental conservation. Such issues should also be incorporated appropriately in an integrated data framework so that economy wide effects can be established. This is possible through examination within a SAM framework.

1.2 Objectives of the Study

The main objectives of this study are as follows:

- 1) To construct a micro SAM incorporating accounts of individual activities, primary factors, and economic institutions.
- 2) To balance the SAM using cross entropy procedure in GAMs (General Algebraic Modeling System).
- 3) To construct a macro SAM that consistently captures and represents the macroeconomic framework for the Kenyan economy in 2009.

1.3 Significance of the Study

As previously mentioned, there are new issues arising in the global development arena-- climate change, clean energy development, and environmental conservation, for example-- and these issues are cross cutting and tend to affect different sectors of the economy. It is important to update the SAM so it can facilitate such analysis within a general equilibrium framework to determine the economy-wide impact of these developments. This study intends to construct a 2009 SAM that can be used to analyse the 21st century's emerging issues.

An additional significance of this study will be its contribution to currently ongoing research. For example, the Institute of Economic Affairs, a public policy think-tank, is involved in examining the impact of the Doha negotiations on poverty in Kenya within its trade programme. Initial impacts of the Doha on poverty have been undertaken under the project using the SAM for Kenya for 2003, which is quite dated. A more updated SAM will be appropriate in undertaking analysis of the impact of the on-going Doha negotiations. The same goes for analysis of Kenya under the FAO Policy Support Programme multi-country project "Impact assessment of development paradigms and related policies." This project is aimed at providing conceptual insights on the impact of selected development paradigms and policy

assistance to address specific long term sustainable development issues relevant to poverty and food security by means of strategies and policies. The methodology adopted is CGE analysis using country specific social accounting matrices; but again it would be beneficial to undertake the analysis using a more recent SAM since the only available SAM is for 2003.

Looking to the future, the updated SAM will contribute significantly to answering the 21st century challenges related to millennium development goals, trade liberalization impacts, climate change and environmental impacts. The SAM is intended to include components that would facilitate such analysis.

2 METHODOLOGY AND DATA

2.1 Methodology

1) Construct a micro SAM incorporating accounts of individual activities, primary factors, and economic institutions.

The 2009 micro SAM was derived from the Kenya 2009 supply and use table (SUT). The SUT is a main table in the system of national accounts. It can be used for both analytical and statistical purposes. The SUT's supply table shows the value of all commodities produced in the economy at basic and at purchaser's prices. The use table shows the value of production of each commodity and its use in the economy. In order to derive the SAM from the Kenya SUT 2009, the following issues were considered:

1. Seventeen activity-commodity mappings using the broad economic category (BEC) classification were used based on the official data availed to the public.
2. Institutions were disaggregated as follows:
 - a. 20 households from both rural and urban areas were included, disaggregated by deciles.
 - b. While the original intention was to disaggregate ROW to East Africa Community, European Union, United States, China and the Rest of the World, disaggregated services data was not available even though goods data was available. Consequently, the ROW was not disaggregated.
 - c. Taxes were disaggregated to income taxes, value added tax, import duty, and other taxes.
 - d. Margins were not disaggregated to domestic, import, and export costs due to data unavailability.
3. Factors were aggregated as capital and labour (skilled, unskilled and semi-skilled).

The SUT (Table 2.1) was converted to a SAM (Table 2.2) reflecting relationship between the SUT and the SAM. For example, intermediate consumption (U1) in the SUT became the input-output matrix in the SAM (2,1) because intermediate consumption shows the commodities each activity uses to produce output. Compensation of employees (U8), which is a component of gross value added in the SUT, became factors (3,1) in the SAM, which is the value factor of production that activities use to produce output. Taxes, which constitute value added (U8) in the SUT, became taxes paid by activities to institutions (4,1) in the SAM. The

total for Column 1 in the SAM is the total cost of production, which equals total from for row 1, Gross output. Household and government consumption (U3 and U4 respectively) makes up final consumption in the SAM (2,4); this is the amount of commodities demanded by institutions. Gross fixed capital formation (U5) and changes in inventory (U6) form investment demand for commodities in the SAM (2,5). Exports (U2) in the SUT is the amount of commodities demanded by the rest of the world in the SAM (2,6). The row total for the second row in the SAM is the final demand for composite commodities, while the corresponding column total supply of the composite commodity. The composite nature of the commodity is from the imports (S3) in the SUT – SAM (11,2) that have been used to produce the commodities. Kerwat et al. (2009) also used this methodology for deriving the SAM for Libya.

Factor revenues and domestic and international institutional transfers and savings are derived from the integrated economic accounts. However, as most developing countries rarely produce the integrated economic accounts and the supply and use table in tandem, alternative data sources such as economic surveys (in the case of Kenya) and the central bank reports were used to derive this data.

2) Balance the SAM using cross entropy procedure in GAMs (General Algebraic Modeling).

Given that different data sources were used in deriving the 2009 SAM for Kenya, the SAM derived was initially unbalanced (i.e. rows were not equal to columns). The cross entropy method by Robinson and El- Said (2000) was then used to balance the SAM. Kerwat et al. (2009) explain that this approach attempts to find a new SAM which is consistent with the original matrix but whose corresponding rows and columns have the same totals. This balancing method minimizes the entropy distance of the new SAM from the initial SAM subject to the constraint that row and column totals are equal and will penalize larger deviations between two corresponding cells more heavily than smaller deviations. Each cell in a matrix represents a payment from a column j to a row i represented by $t_{i,j}$. The row totals must equal the column total so that

$$y_i = \sum_j t_{i,j} = \sum_j t_{j,i} \quad (1)$$

y_i represents the total receipts and expenditures of account i . A SAM coefficient matrix a is constructed from a matrix T by dividing cells of each column by the column total so as to obtain:

$$a_{i,j} = \frac{t_{i,j}}{y_j} \quad (2)$$

The cross entropy method by Robinson and El Said (2000) for updating or balancing a SAM explains the estimation of coefficients of the input-output table. The objective is to find a new set of a_{ij} coefficient that minimizes the distance between the prior a_{ij} and the new estimated coefficient matrix.

$$\min \left[\sum_i \sum_j a_{i,j} \ln \frac{a_{i,j}}{\bar{a}_{i,j}} \right] \quad (3)$$

Subject to $\sum_j a_{i,j} y_j^* = y_i^*$ (4)

$$\sum_j a_{j,i} = 1 \text{ and } 0 \leq a_{j,i} \leq 1 \quad (5)$$

Forming the lagrangian r and solving the equation (3)-(5) provides the solution (6). λ_i are the language multipliers associated with the information from the data and the prior.

$$a_{\bar{y}} = \frac{a_{\bar{y}} \exp(\lambda_i y_j^*)}{\sum_{\bar{y}} a_{\bar{y}} \exp(\lambda_i y_j^*)} \quad (6)$$

Table 2-1: Model Supply and Use Table

Category of goods & services	Output at basic prices (S7)	Taxes and subsidies (S6)	Margins (S5)	Supply at purchasers prices (S4)	SUPPLY TABLE									
					ACTIVITIES		Total supply at purchasers price (S2)	Imports (S3)						
					Domestic supply at domestic price (S1)	Total Supply at purchasers price (S8)								
Category of goods & services	Output at basic prices (U7)	ACTIVITIES			Exports (U2)	Household consumption (U3)	Gov. consumption (U4)	GFCF (U5)						
		Intermediate consumption (input-output table) (U1)						Changes in inventory (U6)						
		Value added (U8): compensation of employees, taxes and subsidies, mixed incomes												
		Output at purchasers price (U9)												

Table 2-2: Model Social Accounting Matrix

	ACT	COMM	MARGINS	FACTORS	INST	SAV/INV	ROW
	(1)	(2)	(2')	(3)	(4)	(5)	(6)
ACT	(1)	Domestic Purchase SUT (S1)					
COMM	(2)	Intermediate Consumption SUT (U1)			Final Consumption SUT (U3&U4)	Investment Consumption SUT (U5&U6)	Exports SUT (U2)
MARGINS	(2')		Transport and Trade margins SUT (S5)				
FACTORS	(3)	Gross Value Added SUT (U8)					
INST	(4)	Act. Taxes and Subsidies SUT (U8)	Com. Taxes and Subsidies SUT (S6)	Factor Revenues	Transfers		Transfers
SAV/INV	(5)				Domestic Savings		Foreign Savings
ROW	(6)		Imports SUT (S3)				

Table 2-3: Unbalanced Macro SAM Kenya 2009

	Activities (C1)	Commodities (C2)	Capital (C3)	Labour (C4)	Households (C5)	Government (C6)	Enterprises (C7)	Taxes (C8)	Investment (C9)	Stock (C10)	ROW (C11)	TOTAL
Activities (R1)		4,383,505			344,629							4,728,134
Commodities (R2)	2,154,263				1,958,930	453,607			500,072	-1,932	464,886	5,529,827
Capital (R3)	1,716,687											1,716,687
Labour (R4)	892,809											892,809
Households (R5)				892,809		662,199	196			435,013		2,164,360
Government (R6)								378,898			24,540	573,051
Enterprises (R7)			1,716,687								153,313	1,870,000
Taxes (R8)	(496)	298,897			209,098		41,012					548,511
Savings (R9)					(376,367)	(542,756)	1,828,792				(369,760)	539,909
Stock (R10)									(1,932)			(1,932)
ROW (R11)		882,135										882,135
TOTAL	4,728,134	5,529,827	1,716,687	892,809	2,164,360	573,051	1,870,000	548,511	498,140	(1,932)	882,135	

3) Construct macro SAM that consistently captures and represents the macroeconomic framework for the Kenyan economy in 2009.

The Macro SAM was derived by aggregating the micro SAM so that it consistently captured the macroeconomic framework of the economy is 2009.

2.2 Data Sources

The sources of the data and the year are shown on the table below:

Data	Source	Year
Supply and Use Table 2009	Kenya National Bureau of Statistics	2009
Household Income	Kenya Integrated Household Budget Survey	2005/2006
Labour Data	Kenya Integrated Household Budget Survey	2005/2006
Remittance Data	Central Bank of Kenya	2009
Tax Data	Economic Survey (Kenya)	2009
	Statistical Abstract (Kenya)	2009

The supply table shows the total supply of goods and services supplied in the economy in 2009. The supply table has three sub-matrices: the production matrix, which shows all products produced in the economy; the import matrix, which shows the imports of goods and services in the economy; and the valuation matrix, which has trade and transport margins, taxes, subsidies. The valuation matrix is largely used for converting basic output prices to purchasers' prices. The Use table shows the final use of goods and services in the economy. It provides the input structure of the economy. The two tables when combined produce a supply and use table (SUT), which can be used to obtain the following sub accounts for the social accounting matrix: input-output table, value added sub matrix, exports and imports and consumption data.

The Kenya Integrated Household Budget Survey (KIHBS) 2005/2006 data was collected with the main objective of obtaining a wide spectrum of socio-economic indicators required to measure monitor and analyse the progress in improving living standards in a single integrated household survey. This data contains information on demographics, housing, education, health, agriculture and livestock, enterprises, expenditure and consumption, household social amenities and community perspectives. From the KIBHS data, one is able to use the data on consumption, labour, and transfers to disaggregate the SAM accounts to a required level of aggregation for household domestic consumption, institutional transfers, and taxation. Tax levied on institutions was obtained from the Kenya Economic Surveys, while savings were taken as residuals.

3 RESULTS AND DISCUSSION

A social accounting matrix for Kenya (2009) was constructed from various data sources as explained in section 2.2. The summarised Kenya SAM (2009) is provided in table 3.1, while table 3.2 gives the disaggregation to 17 commodities.

3.1 The Kenyan Economy

The gross domestic product¹ (GDP) at market price is approximately KES 1.7 trillion; this comes from 81 activities within the economy derived from the SUT. These activities have been categorized to 17 sectors by broad economic categories as shown on Table 3.3. The service sector is the largest contributor to GDP (around 50 percent). The manufacturing sector contributes 21 percent to GDP, while food manufacture constitutes 44 percent of manufacturing in general. Mining and quarrying seems to be a less developed sector, as it reduces GDP by 2.2 percent.

3.2 Total Value Added

Total value added, i.e. earnings received from the factors of production (capital in the form of profits paid to capital and labour in the form wages) is also known as GDP at factor cost. GDP at factor cost is KES 1.8 trillion. Production in Kenya is capital intensive, given that it constitutes around 65 percent, while labour (in the form of wages) takes the remaining 35 percent of the value added (see table 3.3). Agriculture, forestry and fishing, and real estate are the most capital-intensive economic sectors (35.3 and 14.3 percent, respectively). Disaggregated to skilled, unskilled and semi-skilled labour, more skilled labour is found in the social sectors of education and health. The public sector has unskilled and semi-skilled labour.

3.3 Intermediate Demand and Transaction Costs

Intermediate demand shows the demand for commodities and services used in the production process. This is shown in the SAM (Table 3.1) by cell (R2, C1), which amounts to KES 1.487 trillion. Intermediate consumption constitutes 39 percent of the total demand. The disaggregated SAM (Table 3.4) provides information on production technologies, i.e. how much input is used per unit of output. Manufactured foods, for example, use approximately 49 percent of inputs from agricultural sector.

The transport margins as shown on Table 3.1 sum up to zero; however, when disaggregated in Table 3.2, manufactured goods and transport and storage spend approximately KES 249 billion on margins. The row/column total for margins equal zero because the same margins are included in the wholesale and retail sector.

3.4 Factor Income Distribution

Households receive their incomes from labour and transfers from government, enterprises, and ROW (Table 3.1). Income from labour forms the highest proportion of household income source (41 percent), followed by transfers from government (30 percent), and remittances from abroad (28 percent). With the disaggregated SAM (Table 3.4), one can establish the sectors from which poor households obtain most of their income, with rural households obtaining most of their incomes from the agricultural sector while the rich urban households derive their incomes from manufacturing and services.

¹ This is given by the identity $GDP = C + G + I + X - M$ i.e. $GDP = \text{private consumption} + \text{government consumption} + \text{investment} + \text{exports} - \text{imports}$.

3.5 Consumption and Savings

Around 87 percent of household income is spent on commodities; the rest of the income is shared between tax and savings. Households have two sources of consumption: own production (KES 345 billion) and marketed production (KES 1.3 trillion). Overall households have negative savings (table 3.1), however, the disaggregated SAM, table 3.4 shows rural and urban households in the fourth decile having positive savings. The government is a major consumer of services such as public administration, education and health; and, like households, the government dis-saves, meaning that the government has a budget deficit. The private sector (enterprises) is the main saver in the economy.

3.6 Government and Investment

The government receives KES 379 billion in income from taxes: value added tax (VAT), income tax, import duties, other taxes, and transfers from the rest of the world. Income tax and value added tax constitutes approximately 63 percent of government income. Income receipt from the ROW is largely in the form of budgetary or development support. Investment demand (C9) is largely made up of mining and quarrying, non-food manufactures and construction. Savings from the enterprises largely finances this investment demand.

3.7 Foreign Trade

Exports (R2, C11) constitute almost 10 percent of domestic production, which amounts to KES 322 billion. Clearly the structure of exports has been changing in Kenya: while previously the main exports came from agriculture, currently 60 percent of the exports are from manufacturing and agricultural exports constitute 17 percent of the total exports. Manufacturing, which includes both food and other manufactured goods, has an export intensity (EI²) of 49.8 percent. Mining, on the other hand, has an EI of 19 percent.

Imports (R11, C2- table 3.1) constitute 35 percent of GDP, KES 601 billion. Non-food manufactured goods constitute 69 percent of imports. The top two import non-food manufactured products for Kenya are petroleum products and transport equipment. Total imports almost double exports, implying a huge negative trade balance. It is possible to establish the import penetration ratio from the disaggregated SAM, where mining and quarrying has a high import penetration ratio of 65 percent followed by other manufactured goods at 37 percent. Other manufactured goods consist of metallic and chemical products.

² Export Intensity = Exports/Gross output

Table 3-1: Balanced Macro SAM Kenya 2009 (KES Million)

	Activities (C1)	Commodities (C2)	Capital (C3)	Labour (C4)	Households (C5)	Government (C6)	Enterprises (C7)	Taxes (C8)	Investment (C9)	Stock (C10)	ROW (C11)	TOTAL
Activities (R1)		2,977,922			344,629							3,322,551
Commodities (R2)	1,486,889				1,323,197	312,670			343,430	-1,362	322,432	3,787,256
Capital (R3)	1,208,877											1,208,877
Labour (R4)	627,137											627,137
Households (R5)				627,137		465,905	143				435,013	1,528,197
Government (R6)								378,898			17,566	396,464
Enterprises (R7)			1,208,877								105,405	1,314,282
Taxes (R8)	-352	207,919			142,294		29,037					378,898
Savings (R9)					-281,923	-382,111	1,285,103				-279,001	342,068
Stock (R10)										-1,362		-1,362
ROW (R11)		601,415										601,415
TOTAL	3,322,551	3,787,256	1,208,877	627,137	1,528,197	396,464	1,314,282	378,898	342,068	-1,362	601,415	

Table 3-2: GDP shares by Broad Economic Categories

Activities by Broad Economic Category (BEC)	Number of activities	SAM GDP	% Share of GDP
Agriculture, forestry and fishing	5	273,011	13.0
Mining and quarrying	1	4,196	(2.2)
Manufactured food	13	402,329	21.1
Other manufactured	17	513,688	5.8
Electricity and water	3	23,279	1.4
Construction	1	177,764	10.5
Wholesale and retail trade; repairs	2	4,039	0.1
Transport and storage	12	178,976	10.0
Accommodation and catering services	1	61,317	3.5
Information and communication	3	86,257	4.2
Financial and insurance services	5	63,571	3.5
Real estate services	1	65,867	3.9
Professional and support services	4	18,747	0.3
Public administration	1	169,007	9.9
Education	3	174,748	10.2
Health and social work	2	64,375	3.8
Other services	4	19,198	1.1

Table 3-3: Distribution of Factors of Production

	Unskilled	Semi-Skilled	Skilled	Capital
Agriculture, forestry and fishing	11.7	6.5	4.2	35.3
Mining and quarrying	1.0	0.2	0.0	0.6
Manufactured food	5.3	2.9	1.8	4.1
Other manufactured	5.6	6.6	1.5	10.1
Electricity and water	1.9	2.1	0.0	2.1
Construction	3.7	5.1	7.3	3.7
Wholesale and retail trade; repairs	14.6	8.5	3.3	5.8
Transport and storage	6.4	6.7	6.0	8.2
Accommodation and catering services	3.5	2.1	2.2	1.5
Information and communication	1.5	5.0	3.3	3.6
Financial and insurance services	0.1	11.1	6.9	4.7

Real estate services	2.7	2.9	0.0	14.3
Professional and support services	5.7	2.3	2.9	2.1
Public administration	15.4	14.8	0.0	1.0
Education	18.0	14.6	37.2	0.8
Health and social work	2.2	7.8	14.4	0.1
Other services	0.7	0.7	9.1	2.0
	13.1	18.7	2.3	65.8

4 CONCLUDING REMARKS

The 2009 SAM has captured the key characteristics of the Kenyan economy. Services have been found to contribute 50 percent of gross domestic product (GDP), followed by manufacturing sector, which contributes 21 percent. The agricultural sector contributes the rest and is considered a key sector in the economy because it contributes an average of 30 percent to rural household incomes. Agricultural production has also been found to be capital intensive, constituting about 65 percent of value added in the agricultural sector. This sector also forms a major intermediate input (over 40 percent). Private sector savings finances investment demand in the economy. With a huge trade balance, it follows that there is a huge balance of payment deficit.

This SAM for Kenya 2009 has been built using the most recent and available data, namely the supply and use table (SUT) 2009 and KIBHS data set 2005/2006. Normally, an Integrated Economic Account (IEA) is required to produce the institutional transfers used in the SAM. Given that the Kenyan government does not produce this data set, several data sources were used. It is hoped that revised editions of this paper can be produced in the future with the availability of more recent household survey data. Additionally, the use of different data sources and the consequent SAM balancing tends to alter the final value of GDP even though the structure of the economy remains the same as the original SAM. One major way to solve this challenge is the use of consistent data sources from SUT and the IEA in SAM construction.

REFERENCES

Basanta K. Pradhan, M. R. Saluja, Shalabh K. Singh. (2006). Social accounting matrix for India: concepts, construction and applications. Sage Publishers, India.

Government of Kenya. (2007). Kenya Vision 2030 for a Competitive and Prosperous Kenya. Ministry of Planning and National Development.

Kerwat J., Dewhurst J., and Molana H. (2009) “Constructing a Social Accounting Matrix for Libya.” University of Dundee.

Löfgren, H., Harris, B., and Robinson, S. (2002). “A Standard CGE Model in GAMS.” *Microcomputers in Policy Research 5*, International Food Policy Research Institute.

Robinson, S. and El-Said, M. (2000). “GAMS code for estimating a social accounting matrix (SAM) using cross entropy (CE) methods.” TMD Discussion Paper No. 64, Trade and Macroeconomics Division, International food Policy Research Institute, Washington.

Pyatt, G. and Round, J. I. (1979). “Accounting and Fixed Price Multipliers in a Social Accounting Matrix Framework.” *The Economic Journal*, Vol. 89, No. 356. pp. 850-873.

Pyatt, G. and Round, J. I. 1985. "Social Accounting Matrices: A Basis for Planning." The World Bank Symposium, World Bank, Washington DC, US

ANNEX

Micro SAM Kenya 2009 (Kshs. Million)

Annex Table 1: Kenya Micro-SAM 2009

		ACTIVITIES													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
ACTIVITIES	1	Agriculture, forestry and fishing													
	2	Mining and quarrying													
	3	Manufactured food													
	4	Other manufactured													
	5	Electricity and water													
	6	Construction													
	7	Wholesale and retail trade; repairs													
	8	Transport and storage													
	9	Accommodation and catering serv.													
	10	Information and communication													
	11	Financial and insurance services													
	12	Real estate services													
	13	Professional and support services													
	14	Public administration													
	15	Education													
	16	Health and social work													
	17	Other services													
COMMODITIES	1	Agriculture, forestry and fishing	35,027	86	154,221	4,404	2	66	49	2,488	29	30	8	9	410
	2	Mining and quarrying		1,737	26	46,764	7	10,206							
	3	Manufactured food	9,922	126	39,865	5,161				22,751	2		0	1,741	
	4	Other manufactured	51,570	3,642	29,784	200,799	24,091	96,482	27,481	82,828	2,953	13,879	7,382	2,752	2,484
	5	Electricity and water		3,696	571	2,589	4,838	1,022	692	8,337	1,917	1,497	435	1,004	3,384
	6	Construction		402	48	245	384	207	3,074	4,113	3,228	938	1,728	1,224	9,017
	7	Wholesale and retail trade; repairs		326			10	438	796	2,570	13,906	102	4,242	107	127
	8	Transport and storage		3,609	422	8,268	12,600	1,711	8,383	21,505	59,063	1,265	4,744	3,286	902
	9	Accommodation and catering serv.		703	18	109	166	336	486	3,663	4,258	80	1,470	1,536	412
	10	Information and communication		2,206	464	2,426	3,439	448	1,583	11,971	3,564	1,344	21,706	5,968	1,528
	11	Financial and insurance services		384	297	1,557	5,337	794	7,913	13,856	8,036	782	1,788	9,979	2,354
	12	Real estate services		127	166	263	1,332	237	1,676	21,184	2,823	1,952	4,953	6,802	1,123
	13	Professional and support services		1,630	150	10,160	6,281	902	2,831	9,888	7,494	387	2,234	2,627	1,236
	14	Public administration		77	3	271	182	47	130	1,717	444	85	236	318	210
	15	Education													
	16	Health and social work													
	17	Other services		69	1	124	83	79	60	1,271	1,226	1,467	825	619	1,639
		Margins													

FACTORS	Unskilled	28,222	2,505	12,748	13,486	4,553	9,036	35,185	15,519	8,390	3,530	251	6,493	13,816	37,183
	Semi-Skilled	22,465	813	9,908	22,856	7,387	17,610	29,371	23,209	7,223	17,143	38,264	10,027	7,786	50,775
	Skilled	1,741		760	611		3,026	1,372	2,494	934	1,371	2,856		1,192	
	Capital	426,405	7,284	49,351	122,679	25,688	45,143	70,356	98,592	18,601	43,013	56,655	172,485	25,097	12,310
INSTITUTIONS	hrur0														
	hrur1														
	hrur2														
	hrur3														
	hrur4														
	hrur5														
	hrur6														
	hrur7														
	hrur8														
	hrur9														
	hurb0														
	hurb1														
	hurb2														
	hurb3														
	hurb4														
	hurb5														
	hurb6														
	hurb7														
	hurb8														
	hurb9														
	Government														
	Enterprises														
	Income Tax														
	VAT														
	Import duty														
	Other taxes														204
	Savings-Investment														
	Stock														
	ROW														
	TOTAL	588,582	18,335	322,675	451,414	67,950	209,128	263,907	328,650	73,238	123,326	138,909	213,697	58,487	171,870

ACTIVITIES	CODE	ACTIVITIES	COMMODITIES													
			15	16	17	1	2	3	4	5	6	7	8	9	10	11
	1	Agriculture, forestry and fishing				374,297		13,928								
	2	Mining and quarrying					17,195		1,140							
3	Manufactured food							302,699	6,713							

	4	Other manufactured					5,357	446,056						
	5	Electricity and water							57,119					
	6	Construction								209,128				
	7	Wholesale and retail trade; repairs					1,394			258,042	945			2,277
	8	Transport and storage									327,597			
	9	Accommodation and catering serv.										71,173		
	10	Information and communication											123,326	
	11	Financial and insurance services												137,152
	12	Real estate services												
	13	Professional and support services												
	14	Public administration												
	15	Education										6,988		
	16	Health and social work												
	17	Other services												
COMMODITIES	1	Agriculture, forestry and fishing	1,246	173	33									
	2	Mining and quarrying												
	3	Manufactured food	3,481	642	7									
	4	Other manufactured	25,188	15,142	5,286									
	5	Electricity and water	4,990	858	1,024									
	6	Construction	1,696	333	501									
	7	Wholesale and retail trade; repairs	1,553	372	261									
	8	Transport and storage	4,529	1,580	1,520									
	9	Accommodation and catering serv.	5,513	871	546									
	10	Information and communication	3,393	1,417	588									
	11	Financial and insurance services	4,214	1,027	2,826									
	12	Real estate services	1,808	1,315	1,690									
	13	Professional and support services	3,103	953	426									
	14	Public administration	258	86	45									
	15	Education												
	16	Health and social work												
	17	Other services	1,655	330	218									
INSTITUTIONS FACTORS	Margins					38,396	4,609	65,707	137,832			(228,685)	(20,582)	2,724
	Unskilled			43,468	5,215	1,675								
	Semi-Skilled			50,361	26,697	2,340								
	Skilled			15,490	6,006	3,774								
	Capital			9,624	1,075	24,517								
INSTITUTIONS	hrur0													
	hrur1													
	hrur2													
	hrur3													
	hrur4													
	hrur5													

	hrur6														
	hrur7														
	hrur8														
	hrur9														
	hurb0														
	hurb1														
	hurb2														
	hurb3														
	hurb4														
	hurb5														
	hurb6														
	hurb7														
	hurb8														
	hurb9														
	Government														
	Enterprises														
	Income Tax														
	VAT			4,296		39,891	38,540	1,726		517	948	7,872	11,340	211	
	Import duty				1,551	193	3,333	18,466					182		
	Other taxes		(556)	54		11,392	61,878	2,344						497	
	Savings-Investment														
	Stock														
	ROW			52,696	40,937	43,719	414,597	267		2,434	9,722	1,429	14,507	4,797	
	TOTAL	181,571	64,092	46,721	471,291	62,935	486,027	1,126,616	61,456	209,128	32,309	318,630	87,462	154,357	142,656

ACTIVITIES			FACTORS										hrur0	hrur1	hrur2
			12	13	14	15	16	17	Margins	Unskilled	Semi-Skilled	Skilled			
1	Agriculture, forestry and fishing												11,749	17,050	24,610
2	Mining and quarrying														
3	Manufactured food												528	649	962
4	Other manufactured														
5	Electricity and water												591	445	855
6	Construction														
7	Wholesale and retail trade; repairs	815						434							
8	Transport and storage	1,053													
9	Accommodation and catering serv.	688	1,377												
10	Information and communication														
11	Financial and insurance services	1,561	196												
12	Real estate services	110,900											1,663	2,291	2,228
13	Professional and support services		58,487												

	14	Public administration			171,870								
	15	Education		617		173,966							
	16	Health and social work	220			63,873							
	17	Other services					29,338						894
COMMODITIES	1	Agriculture, forestry and fishing									5,920	9,491	9,084
	2	Mining and quarrying											
	3	Manufactured food									6,325	9,963	11,852
	4	Other manufactured									2,168	4,130	5,008
	5	Electricity and water									42	99	123
	6	Construction											
	7	Wholesale and retail trade; repairs									40	67	81
	8	Transport and storage									678	1,767	2,280
	9	Accommodation and catering serv.									597	1,006	1,207
	10	Information and communication									82	250	394
	11	Financial and insurance services									188	476	686
	12	Real estate services									720	770	905
	13	Professional and support services									35	59	75
	14	Public administration									43	73	87
	15	Education									406	909	1,328
	16	Health and social work									469	1,481	724
	17	Other services									55	161	160
FACTORS		Margins											
		Unskilled											
		Semi-Skilled											
		Skilled											
		Capital											
INSTITUTIONS	hrur0							7,467	2,021	7			
	hrur1							12,343	5,856	8			
	hrur2							15,006	8,123	188			
	hrur3							16,796	11,860	130			
	hrur4							19,162	15,020	183			
	hrur5							22,310	18,762	174			
	hrur6							22,420	24,014	357			
	hrur7							24,669	33,375	1,025			
	hrur8							22,926	39,477	1,721			
	hrur9							21,099	39,229	2,444			
	hurb0							150	52				
	hurb1							346	98				
	hurb2							868	550	7			
	hurb3							368	777				
	hurb4							1,380	1,236	20			
	hurb5							1,457	2,090	6			

	hurb6							3,565	4,916	70					
	hurb7							4,502	8,655	61					
	hurb8							10,857	23,438	911					
	hurb9							33,585	104,683	34,318					
	Government														
	Enterprises										1,208,877				
	Income Tax											9,793	10,896	10,811	
	VAT		2,104				582								
	Import duty														
	Other taxes														
	Savings-Investment											(15,116)	(28,973)	(23,170)	
	Stock														
	ROW	226	12,917	1,640	782	503	241								
	TOTAL	115,463	75,698	173,510	174,748	64,375	30,596	-	241,274	344,234	41,629	1,208,877	26,977	33,062	51,186

			INSTITUTIONS													
			hrur3	hrur4	hrur5	hrur6	hrur7	hrur8	hrur9	hurb0	hurb1	hurb2	hurb3	hurb4	hurb5	hurb6
ACTIVITIES	1	Agriculture, forestry and fishing	16,829	18,577	19,535	17,916	18,826	15,405	9,354	130	463	10,991	855	1,232	1,354	1,928
	2	Mining and quarrying														
	3	Manufactured food	901	1,484	1,491	1,435	2,032	1,410	790	7	13		16	101	38	178
	4	Other manufactured														
	5	Electricity and water	604	1,133	1,176	791	1,466	1,017	470	3	36	121	34	109	60	221
	6	Construction														
	7	Wholesale and retail trade; repairs														
	8	Transport and storage														
	9	Accommodation and catering serv.														
	10	Information and communication														
	11	Financial and insurance services														
	12	Real estate services	2,542	3,649	3,872	3,830	4,925	4,449	4,925	64	156	251	220	392	574	890
	13	Professional and support services														
	14	Public administration														
	15	Education														
	16	Health and social work														
	17	Other services		9,854	3		2									1,564
COMMODITIES	1	Agriculture, forestry and fishing	13,521	19,331	21,914	24,050	29,811	20,897	25,441	59	318	239	392	946	899	1,709
	2	Mining and quarrying														
	3	Manufactured food	13,787	14,611	16,833	19,044	21,737	20,116	19,898	641	1,005	1,635	2,027	4,257	5,978	10,426
	4	Other manufactured	6,439	7,134	8,426	11,039	13,341	14,434	22,820	134	359	581	633	1,285	2,215	4,146
	5	Electricity and water	203	261	317	630	832	998	1,571	2	8	23	24	47	56	195

	6	Construction														
	7	Wholesale and retail trade; repairs	103	122	152	178	213	232	288	3	6	11	14	31	48	85
	8	Transport and storage	3,392	3,610	4,750	6,357	7,199	8,143	10,396	42	114	229	302	903	1,164	2,858
	9	Accommodation and catering serv.	1,541	1,817	2,267	2,650	3,177	3,453	4,292	45	96	159	201	459	721	1,263
	10	Information and communication	510	812	1,041	1,972	2,283	3,561	5,461	3	36	56	72	225	294	1,093
	11	Financial and insurance services	878	1,188	1,098	1,694	2,650	4,227	4,155	19	27	68	74	167	382	1,270
	12	Real estate services	1,135	1,363	1,632	2,172	2,179	2,831	3,894	54	76	163	185	290	497	627
	13	Professional and support services	93	109	137	165	200	228	300	3	6	9	14	28	59	92
	14	Public administration	112	132	164	192	230	250	311	3	7	12	15	33	52	91
	15	Education	2,201	2,262	3,164	4,300	5,152	4,877	6,490	35	65	234	174	491	643	1,326
	16	Health and social work	1,235	986	1,417	1,710	1,870	1,902	2,761	28	51	60	104	257	442	771
	17	Other services	265	334	433	532	574	664	886	5	23	26	62	112	169	388
		Margins														
FACTORS		Unskilled														
		Semi-Skilled														
		Skilled														
		Capital														
INSTITUTIONS		hrur0														
		hrur1														
		hrur2														
		hrur3														
		hrur4														
		hrur5														
		hrur6														
		hrur7														
		hrur8														
		hrur9														
		hurb0														
		hurb1														
		hurb2														
		hurb3														
		hurb4														
		hurb5														
		hurb6														
		hurb7														
		hurb8														
		hurb9														
		Government														
		Enterprises														
		Income Tax	12,488	12,213	12,820	10,567	12,541	10,973	6,069	180	376	437	1,722	1,548	1,205	1,810
		VAT														
		Import duty														

		Other taxes														
		Savings-Investment	134,038	(40,803)	(5,974)	(53,842)	(16,586)	(31,180)	(34,534)	(1,257)	(2,282)	(13,840)	(4,517)	4,366	(11,868)	(17,046)
		Stock														
		ROW														
		TOTAL	212,816	60,178	96,668	57,380	114,653	88,887	96,037	202	960	1,463	2,622	17,277	4,981	15,885

			INSTITUTIONS												
			hurb7	hurb8	hurb9	Govern ment	Enterprise s	Income Tax	VAT	Import duty	Other taxes	s-1	Stock	ROW	TOTAL
ACTIVITIES	1	Agriculture, forestry and fishing	2,766	4,653	6,133										588,582
	2	Mining and quarrying													18,335
	3	Manufactured food	332	369	526										322,675
	4	Other manufactured													451,414
	5	Electricity and water	346	722	633										67,950
	6	Construction													209,128
	7	Wholesale and retail trade; repairs													263,907
	8	Transport and storage													328,650
	9	Accommodation and catering serv.													73,238
	10	Information and communication													123,326
	11	Financial and insurance services													138,909
	12	Real estate services	1,187	2,619	62,070										213,697
	13	Professional and support services													58,487
	14	Public administration													171,870
	15	Education													181,571
	16	Health and social work													64,092
	17	Other services			5,066										46,721
COMMODITIES	1	Agriculture, forestry and fishing	2,972	5,705	23,232	10,635						(3,824)	(6,243)	56,512	471,291
	2	Mining and quarrying										53	578	3,564	62,935
	3	Manufactured food	15,840	33,248	90,679								(2,090)	84,518	486,027
	4	Other manufactured	7,184	15,937	99,061							174,201	6,393	106,618	1,126,616
	5	Electricity and water	331	997	13,846	2,005								668	61,456
	6	Construction				16,920						160,844			209,128
	7	Wholesale and retail trade; repairs	150	347	1,868										32,309
	8	Transport and storage	4,911	11,691	53,108									55,082	318,630
	9	Accommodation and catering serv.	2,234	5,176	27,842									1,113	87,462
	10	Information and communication	1,840	6,243	46,915	584								12,530	154,357
	11	Financial and insurance services	1,786	4,783	34,468	2,515								773	142,656
	12	Real estate services	947	2,383	43,044										115,463
	13	Professional and support services	157	387	2,340	1,044						12,155		1,052	75,698
	14	Public administration	162	375	2,017	164,646									173,510

	15	Education	2,187	5,545	42,513	90,447										174,748
	16	Health and social work	1,022	2,358	22,470	22,257										64,375
	17	Other services	680	1,619	10,432	1,617										30,596
		Margins														(0)
FACTORS		Unskilled														241,274
		Semi-Skilled														344,234
		Skilled														41,629
		Capital														1,208,877
INSTITUTIONS		hrur0				17,481	0									26,977
		hrur1				14,851									3	33,062
		hrur2				27,753	37								79	51,186
		hrur3				184,026									4	212,816
		hrur4				25,664									149	60,178
		hrur5				54,778	2								641	96,668
		hrur6				9,782									808	57,380
		hrur7				55,333									251	114,653
		hrur8				15,912	4								8,847	88,887
		hrur9				22,290	8								10,967	96,037
		hurb0														202
		hurb1				516										960
		hurb2													38	1,463
		hurb3				1,465									12	2,622
		hurb4				12,453									2,189	17,277
		hurb5				73									1,356	4,981
		hurb6				7,335										15,885
		hurb7				4,064	1								6,668	23,951
		hurb8					7								66,433	101,646
		hurb9				12,128	84								336,569	521,367
		Government						142,294	108,028	23,726	104,849				17,566	396,464
		Enterprises													105,405	1,314,282
		Income Tax	3,478	6,736	15,632											142,294
		VAT														108,028
		Import duty														23,726
		Other taxes					29,037									104,849
		Savings-Investment	(26,561)	(10,247)	(82,530)	(382,111)	1,285,103								(279,001)	342,068
		Stock													(1,362)	(1,362)
		ROW														601,415
		TOTAL	23,951	101,646	521,367	396,464	1,314,282	142,294	108,028	23,726	104,849	342,068	(1,362)	601,415		

SUPPLY TABLE

Annex Table 2: Supply Table Kenya 2009

Products	Agriculture, forestry, fishing	Mining & quarrying	Manuf of food products	Other manufac	Supply of electricity & water	Construction	Whole-sale and retail	Transpo rt and storage	Hotels and restaura nt.	Inform. & commun	Finance and insuranc e	Real estate	Prof. & support activities
Agriculture, forestry and fishing products	763,575	-	-	-	-	-	-	-	-	-	-	-	-
Mining and quarrying products	-	16,038	-	-	-	-	-	-	-	-	-	-	-
Manufactured food products	19,620	-	450,944	6,968	-	-	-	-	-	-	-	-	-
Other manufactured products	-	1,665	9,757	625,723	-	-	-	-	-	-	-	-	-
Electricity and water	-	-	-	-	93,445	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	272,584	-	-	-	-	-	-	-
Wholesale and retail trade; repairs	-	-	-	-	-	-	310,423	-	-	-	-	-	-
Transport and storage	-	-	-	-	-	-	-	491,834	-	-	-	-	-
Accommodation and catering services	-	-	-	-	-	-	-	-	100,642	-	-	-	-
Information and communication	-	-	-	-	-	-	-	-	-	182,367	-	-	-
Financial and insurance services	-	-	-	-	-	-	-	-	-	-	213,973	-	-
Real estate services	-	-	-	-	-	-	1,110	1,388	936	-	2,136	301,546	-
Professional and support services	-	-	-	-	-	-	7,549	-	1,976	-	-	-	85,590
Public administration	-	-	-	-	-	-	-	-	-	-	-	-	-
Education	-	-	-	-	-	-	-	-	-	-	-	-	-
Health and social work	-	-	-	-	-	-	-	-	-	-	-	-	-
Other services	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct purchases abroad by residents	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct purchases in Kenya by non-residents	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	783,195	17,703	460,701	632,691	93,445	272,584	319,082	493,222	103,554	182,367	216,109	301,546	85,590

Products	Public admin,	Education	Health & social work	Other service activities	FISIM	Total output at basic prices	Imports	Taxes on products	Margins	Total Supply at purchasers' prices
Agriculture, forestry and fishing products	-	-	-	-	-	763,575	74,443	8,068	52,791	898,877
Mining and quarrying products	-	-	-	-	-	16,038	59,691	275	3,472	79,476
Manufactured food products	-	-	-	-	-	477,533	63,102	78,610	84,859	704,103
Other manufactured products	-	-	-	-	-	637,146	603,919	156,632	210,962	1,608,658
Electricity and water	-	-	-	-	-	93,445	34	4,925	0	98,404
Construction	-	-	-	-	-	272,584	0	0	0	272,584
Wholesale and retail trade; repairs	-	-	-	-	-	310,423	1,061	336	-290,502	21,318
Transport and storage	-	-	-	-	-	491,834	22,613	1,160	-65,443	450,164
Accommodation and catering services	-	4,252	-	-	-	104,894	1,905	8,852	0	115,651
Information and communication	-	-	-	-	-	182,367	18,614	10,978	3,861	215,820
Financial and insurance services	-	-	-	-	-	213,973	2,652	1,359	0	217,984
Real estate services	-	-	295	-	-	307,411	0	0	0	307,411
Professional and support services	-	4,448	-	-	-	99,563	18,097	975	0	118,635
Public administration	262,947	-	-	-	-	262,947	0	0	0	262,947
Education	-	213,094	-	-	-	213,094	0	0	0	213,094
Health and social work	-	-	99,344	-	-	99,344	0	0	0	99,344
Other services	-	-	-	59,026	-	59,026	0	1,893	0	60,919
Direct purchases abroad by residents						0	22,603	0	0	22,603
Direct purchases in Kenya by non-residents						0	0	0	0	0
Total	262,947	221,794	99,639	59,026	0	4,605,195	888,733	274,063	0	5,767,991

USE TABLE

Annex Table 3: Use Table Kenya 2009

	Agric, forestry, fishing	Mining & quarrying	Manufact.of food products	Other manufacturing	Supply of electricity & water	Construction	Whole-sale and retail	Transport and storage	Hotels and restaurant.	Inform. & Communication	Finance and insurance	Real estate	Prof. & support activities
Agriculture, forestry and fishing products	31,596	67	223,982	6,365	3	0	0	0	2,531	0	0	0	0
Mining and quarrying products	0	1,291	463	55,970	17	16,591	0	0	0	0	0	0	0

	Agric, forestry, fishing	Mining & quarrying	Manuf.of food products	Other manufacturing	Supply of electricity & water	Construction	Whole- sale and retail	Transport and storage	Hotels and restaurant.	Inform. & Communication	Finance and insurance	Real estate	Prof. & support activities
Manufactured food products	11,311	94	41,108	5,413	0	0	0	0	24,874	5	0	0	0
Other manufactured products	41,225	2,909	50,252	301,775	34,095	118,279	23,122	131,514	6,201	52,748	6,199	4,465	2,569
Electricity and water	2,596	389	4,482	7,168	1,274	862	9,077	3,237	2,755	524	846	4,498	143
Construction	2,300	0	726	1,021	451	2,827	3,987	4,555	1,553	1,531	619	9,556	181
Wholesale and retail trade; repairs	146	0	0	0	150	500	1,254	10,243	89	1,721	37	78	93
Transport and storage	8,682	338	23,707	22,523	1,479	7,384	28,030	64,337	2,822	3,916	3,543	1,915	3,364
Accommodation and catering services	1,177	16	278	358	496	666	4,512	8,250	185	1,400	1,244	650	1,759
Information and communication	4,591	1,603	6,533	11,133	931	4,947	16,439	9,410	1,945	2,760	18,177	3,033	2,839
Financial and insurance services	231	174	2,695	6,630	782	7,888	11,608	11,182	1,131	1,719	14,200	3,880	1,655
Real estate services	190	159	808	3,156	385	2,290	30,316	7,234	4,868	7,012	6,764	1,969	2,116
Professional and support services	1,507	62	8,026	4,574	885	2,586	17,632	18,022	2,045	9,454	2,500	2,885	1,507
Public administration	211	9	1,121	639	124	361	2,463	2,518	286	1,321	349	403	211
Education	0	0	0	0	0	0	0	0	0	0	0	0	0
Health and social work	0	0	0	0	0	0	0	0	0	0	0	0	0
Other services	67	0	0	0	81	0	676	2,678	1,036	1,026	300	2,891	168
Direct purchases abroad by residents	102	9	292	357	371	0	2,129	1,917	195	1,282	881	366	1,050
Direct purchases in Kenya by non-residents	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	105,931	7,121	364,473	427,082	41,524	165,179	151,245	275,096	52,516	86,419	55,660	36,588	17,656
Value added, gross	677,265	10,582	96,228	205,610	51,921	107,405	167,837	218,126	51,038	95,948	160,449	264,958	67,934

	Agric, forestry, fishing	Mining & quarrying	Manuf.of products	Other manufacturing	Supply of electricity & water	Construction	Whole- sale and retail	Transport and storage	Hotels and restaurant.	Inform. & Communication	Finance and insurance	Real estate	Prof. & support activities
Compensation of employees	90,580	2,580	31,834	39,828	20,363	39,141	86,541	57,473	22,955	31,404	58,359	23,859	32,333
Other taxes on production	0	0	0	0	0	0	0	0	0	0	0	0	0
Other subsidies on production	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating surplus / Mixed income	586,685	8,002	64,394	165,782	31,558	68,264	81,296	160,652	28,083	64,544	102,090	241,099	35,601
Output	783,196	17,703	460,701	632,691	93,445	272,584	319,082	493,222	103,554	182,367	216,109	301,546	85,590

Products	Final use										Total Use
	Public admin,	Education	Health & social work	Other service activities	FISIM	Total Intermediate Consumption	Government consumption	Private consumption	GFCF	Changes in inventories	
Agriculture, forestry and fishing products	200	17	39	2	0	264,802	13,661	546,986	-5,906	-8,706	88,041
Mining and quarrying products	0	0	0	0	0	74,332	0	0	0	0	5,144
Manufactured food products	2,005	1,806	423	7	0	87,044	0	494,121	0	-3,055	125,993
Other manufactured products	30,988	30,060	26,530	6,731	0	869,661	0	303,026	257,786	9,113	169,072
Electricity and water	1,769	5,283	782	1,266	0	46,949	4,207	42,418	0	0	4,830
Construction	4,699	1,581	218	524	0	36,328	18,247	0	211,922	0	6,087
Wholesale and retail trade; repairs	1,856	818	132	153	0	17,272	0	2,387	0	0	1,660
Transport and storage	7,532	5,862	1,516	3,383	0	190,332	0	181,038	0	0	78,794
Accommodation and catering services	7,396	7,020	776	697	0	36,882	0	30,221	0	0	48,548
Information and communication	15,936	8,648	3,430	1,274	0	113,628	536	79,491	0	0	22,165
											215,820

Products	Public admin,	Education	Health & social work	Other service activities	FISIM	Total Intermediate Consumption	Final use					Total Use
							Government consumption	Private consumption	GFCF	Changes in inventories	Exports	
Financial and insurance services	18,047	3,939	637	2,885	56,877	146,161	3,668	63,740	0	0	4,415	217,984
Real estate services	2,340	3,414	1,320	2,729	0	77,072	0	227,572	0	0	2,767	307,411
Professional and support services	5,131	2,650	1,034	521	0	81,021	1,422	6,644	16,974	0	12,575	118,635
Public administration	717	370	145	73	0	11,320	248,811	2,816	0	0	0	262,947
Education	0	0	0	0	0	0	122,601	90,493	0	0	0	213,094
Health and social work	0	0	0	0	0	0	37,505	61,839	0	0	0	99,344
Other services	2,592	2,351	305	330	0	14,500	2,231	40,966	0	0	3,222	60,919
Direct purchases abroad by residents	2,687	1,370	454	355	0	13,816	0	8,786	0	0	0	22,603
Direct purchases in Kenya by non-residents	0	0	0	0	0	0	0	0	0	0	0	0
Total	103,895	75,188	37,740	20,930	56,877	2,081,119	452,889	2,182,543	480,775	-2,649	573,312	5,767,991
Value added, gross	159,052	146,607	61,899	38,096	-56,877	2,524,077						
Compensation of employees	131,578	129,994	55,855	28,107	0	882,783						
Other taxes on production	0	0	0	0	0	0						
Other subsidies on production	0	0	0	-800	0	-800						
Operating surplus / Mixed income	27,475	16,613	6,045	10,789	-56,877	1,642,094						
Output	262,947	221,795	99,639	59,026	0	4,605,195						