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KENYA

TECHNICAL ASSISTANCE REPORT—FURTHER REVIEW OF REBASED GDP ESTIMATES

April 2022

This Technical Assistance report on Kenya was prepared by a staff team of the International Monetary Fund. It is based on the information available at the time it was completed on August 2021.

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KENYA

MARCH 2022

REPORT ON FURTHER REVIEW OF REBASED GDP ESTIMATES MISSION (JULY 21–AUGUST 10, 2021)

Prepared by Emmanuel Manolikakis and Anthony Silungwe

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Glossary

2008 SNA	*System of National Accounts 2008*
CIP	Census of Industrial Production
CIPI	Construction input price indices
CIT	Corporate Income Tax Returns
COE	Compensation of employees
CP	Current price
HCDA	Horticulture Department of Agriculture
GDP	Gross Domestic product
GVA	Gross value added
IC	Intermediate consumption
ICBT	Informal cross border trade
ISIC rev.4	International Standard Industrial Classification, revision 4
ISS	Integrated Survey of Services
ITS	Informal Transportation Study
KIHBS	Kenya Integrated Household Budget Survey
KP	Constant price
KNBS	Kenya National Bureau of Statistics
KRA	Kenya Revenue Authority
Ksh	Kenyan Shilling
MSIP	Monthly survey of industrial production
MSMES	Micro Small and Medium Enterprise Survey
NPISH	Non-profit institutions serving households
NTSA	National Transportation and Safety Authority
PHC	Population and Housing Census
PPI	Producer price index
SUT	Supply and use tables
TA	Technical assistance
VA	Value Added
VAT	Value added tax
XMPI	Export and import price indices

SUMMARY OF MISSION OUTCOMES AND PRIORITY RECOMMENDATIONS

1. A Technical Assistance (TA) mission was conducted in July 2021 to review the data sources and methods used to produce revised estimates of the Kenyan National Accounts (NA) for the period 2009–2019. The mission also provided guidance on producing a revision report to be published at the time of the release.

2. Countries periodically make comprehensive revisions to their national accounts statistics. Comprehensive revisions provide an opportunity for national accounts compilers to adopt the latest international accounting standards as well as integrate improved data sources and methods. The mission focused its review on the data sources and methods the Kenya National Bureau of Statistics (KNBS) used to produce the revised national accounts.

3. The mission observed that the revisions to the national accounts statistics were significant over the entire time period (2009–2019). The most significant revision relates to the estimate of crop production. Revisions were notable in both the 2016 benchmark year and throughout the 2009 to 2019 period. Revisions in the benchmark year stem from the incorporation of estimates derived from improved data sources including the Kenya Integrated Household Budget Survey (KIHBS), expenses associated with agriculture products obtained from the Census of Industrial Production (CIP), the Integrated Survey of Services (ISS), Micro Small and Medium Enterprise Survey (MSMES), and from trade statistics for exports and imports. Revisions to the non-benchmark years are mainly due to significant downward revisions in the price indexes used to estimate nominal crop production and small revisions to crop volumes (both market and own-account production).

4. Revisions to other industries (e.g., manufacturing, wholesale trade and retail trade, land transportation, real estate, and construction) were also notable. Revisions to these industries tended to be upwards over the period. There were two main sources of revision. The first reflected the incorporation of new data sources such as the Census of Industrial production, Population and Housing Censuses and administrative data. The second reflected improved coverage of services such as telecommunication services, transportation services and financial services.

5. The mission identified areas for future research following the release of the revised estimates. The mission recommends that KNBS investigate the use of taxes on products as published by the Ministry of Finance as the benchmark estimate of taxes on products in the national accounts. The mission recommended that the KNBS consider removing the stock of government securities from the stock of loans when calculating estimates of financial intermediation services indirectly measured (FISIM). The mission also recommends that KNBS investigate developing volume indicators for both FISIM and insurance services. The mission recommends that the KNBS works with the Ministry of Agriculture to improve annual estimates

of the volume of crop production. Finally, the mission recommends that KNBS review its revision policy and ensure that revisions to source data are incorporated into the national accounts in a timely manner.

6. The mission recommends KNBS develop a revisions report and release the report concurrent with the revised national accounts estimates. The revision report should include detailed explanations of the improved data sources methods used to produce the revised national accounts. It is best practice for statistical offices to inform users in advance of any major revisions and to provide sufficient documentation for users so they can clearly understand the nature of the changes. Failing to do so may result in confusion and potentially create mistrust. This report should include detailed tables illustrating the new data sources, methods and calculations used to produce the revised estimates. In addition to producing the revisions report it is recommended that the KNBS provide key stakeholders (Central Bank, Ministry of Finance, Ministry of Agriculture) advance notice of the release along with an overview of the KNBS dissemination and communication plan.

7. The priority recommendations are summarized in the following table:

Table 1. Kenya: Priority Recommendations

Target Date	Priority Recommendation	Responsible Institutions
September 2021	Develop clear, detailed explanations of the data sources, methods and calculations used to produce the revised 2009-2019 national accounts and incorporate these into a revision report.	**KNBS**
September 2021	Provide key stakeholders advance notice of the release date well in advance of the release.	**KNBS**
September 2021	Release the revisions report at the time of the release of the revised estimates.	**KNBS**
TBA	Seek funding (staff and operational) to sustain the quality improvements realized during this comprehensive revision. This funding should be used to regularize the receipt of the new source data used to produce the revised estimates.	**KNBS**

DETAILED TECHNICAL ASSESSMENT AND RECOMMENDATIONS

Priority	Action/Milestone	Target Completion Date
Outcome: Data are compiled and disseminated using the concepts and definitions of the latest manual/guide		
GDP by Activity		
H	The mission recommends that KNBS includes a section in the revision report highlighting the revisions to both the overall level of GDP and the constant price growth rates. In cases where large revisions to growth are observed, the KNBS should include contextual information demonstrating how the revised estimates align with major economic events, policy implementation and related social indicators.	September 2021
H	Given that the KNBS has incorporated several new data sources in the compilation of the revised estimates for manufacturing output and valued added it is recommended that they include a table in the revision report comparing the new data sources used to produce the revised estimates with the previous data sources.	September 2021
H	The mission recommends that the KNBS include a table comparing MOA crop production volumes with the demand- based estimates developed by the KNBS. Publication of this table will help users better understand the KNBS's choice of data sources for estimating crop production.	September 2021
H	The mission recommends that KNBS include tables and an analysis in the revisions report that details the data sources, methods, and calculations that KNBS uses to estimate current and constant price estimates of crop production for Kenya's largest crops.	September 2021
M	The mission recommends that KNBS work with MOA to conduct a regular agriculture survey to facilitate better estimation of domestic crop production.	TBD
H	The mission recommends that the KNBS include a table/chart in the revisions report comparing manufacturing output with related economic indicators such as exports and the number of manufacturing firms registered on the business register to demonstrate the quality of the new estimates to users.	September 2021
H	The mission recommends the KNBS include a table and analysis in the revision report comparing the previous data sources used to compile electricity generation with the revised data sources.	September 2021
H	The mission recommends that the KNBS include a section in the revision note summarizing the special study that was undertaken to develop the revised trade margins. This description should include information related to the sample size, the industries covered and whether margins from online sales were considered.	September 2021

Priority	Action/Milestone	Target Completion Date
H	The mission recommends that KNBS includes a section in its revision report outlining the new data sources used to estimate output and value added for the telecommunication industry by service (product). These sections should include a table which identifies the number of providers and services provided covered by the previous estimates as compared to the revised estimates.	September 2021
H	The mission recommends that KNBS includes an analysis of the output of the mobile money services of the telecommunications industry and mobile money transactions in the revisions report.	September 2021
H	The KNBS should include a section in the revision report describing the new data sources used to estimates passenger transportation services. KNBS should confront these estimates with fuel sales, gasoline imports, and tourist arrivals to demonstrate the quality and coherence of the new estimates to users. This analysis should be included in the revisions report.	September 2021
H	The mission recommends that the KNBS includes a detailed breakdown of the revisions to household final consumption expenditure. This should be accompanied by an explanation of how the revisions to crop production, telecommunication services, financial services, and transportation services impacted the composition of household spending.	September 2021
M	The mission recommends that the KNBS national accounts future research includes examining the use of a weighted average of the actual lending and borrowing rates to calculate the reference rate. The data is readily available from the commercial banks' and saving and credit societies' profit and loss accounts.	TBD
M	The mission recommends the KNBS national accounts future research examines the possibility of allocating FISIM consumed by non-financial corporations by economic activity using either information obtained from lenders and depositors, or an allocation based on shares of output as a second-best alternative.	TBD
M	The mission recommends that the KNBS national accounts future research includes the development of estimates of exports and imports of financial services.	TBD
M	The mission recommends that the KNBS national accounts future agenda includes investigating alternative volume measure for insurance output such as the number of policies or the value of the policies enforced.	TBD
M	The mission recommends the KNBS national accounts future research develops estimates of total space/rooms rented to refine estimates of imputed and actual rental income as well as consider differentiating the IC for owner-occupiers from actual renters.	TBD
M	The mission recommends that the KNBS national accounts future research includes adjusting total output of construction to exclude construction material consumed by households.	TBD

A. Background and Overview

8. The figures contained in this report reflect work-in-progress estimates prepared by the KNBS. These figures may differ from the published revised national accounts. The published revised national accounts reflect official KNBS figures to be used by data users.

9. KNBS initiated a comprehensive revision and rebasing of the Kenyan National Accounts Statistics project in 2017. Revised national accounts benchmarks were established for 2016. The previous benchmark year was 2009. This is in line with the IMF Real Sector guidelines which recommend that countries produce benchmark estimates of GDP every five years. A key motivation of this exercise is to obtain more accurate estimates of the national accounts by improving the source data and methodologies used to compile the national accounts.

10. The benchmarking and rebasing project received technical support from the IMF East AFRITAC (AFE) (backstopped by the IMF Statistics Department) and Statistics Sweden. KNBS presented highlights of revised estimates to key users and data providers in March 2021 to prepare for dissemination in April. Concerns were raised during the meeting and addressed through subsequent discussions. However, an issue regarding significant downward revision in Gross Value Added (GVA) for agriculture, forestry, and fishing imposed the need for peer review.

11. A peer review of sources and methods used to derive the 2016 benchmarks and update the historical 2009–2019 historical series was undertaken by the mission team in good collaboration with the national accounts staff of the KNBS. The revised 2016 benchmarks incorporate new sources of information including: *The 2015/2016 Kenya Integrated Household Budget Survey (KIHBS), Integrated Survey of Services (ISS) 2017, the Census of Industrial Production (CIP) 2018, The Survey of Non-Profit Institutions Serving Households (NPISH 2019), the Survey of Informal Transportation and Other Personal Services, the 2016 Micro, Small and Medium Enterprise Survey (MSMES) and the 2016 Census of Establishments (COE 2016), Corporate Income Tax data (CIT) for 2016, the 2019 Study of Trade Margins, and the 2019 Population and Housing Census (KPHC)*. Due to time constraints, a separate in-depth review of these data sources and their statistical methodology was not carried out.

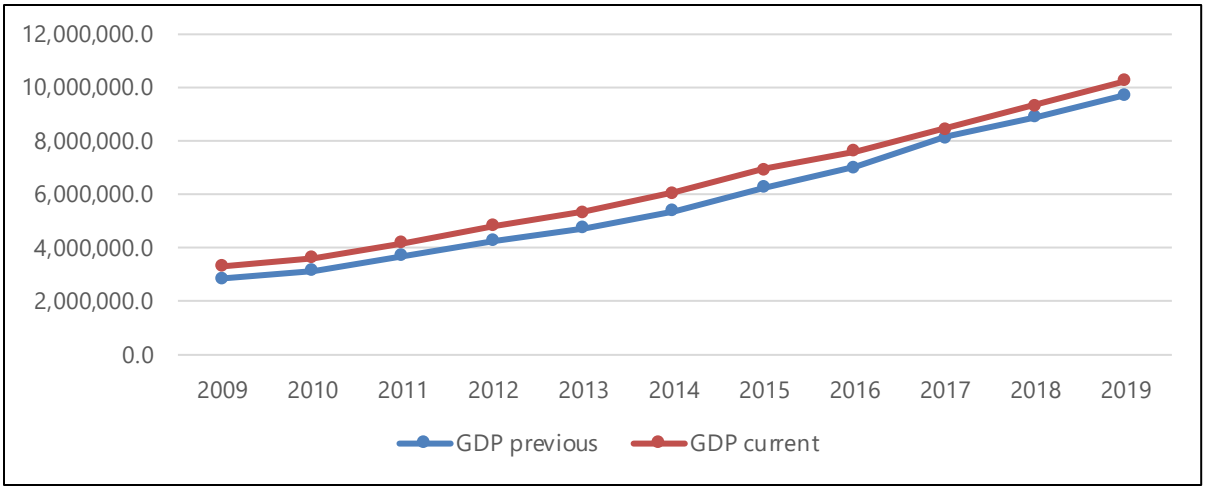
12. The national accounts compilation is aligned with the *2008 SNA*. Supply and Use Tables (SUT) were produced for 2016 and followed the *2008 SNA* recommendations. The benchmark (BM) estimates (e.g., output by sector, household final consumption expenditure) that were used to update the NA time series from 2009–2019 were taken from the 2016 SUT. The 2016 BM estimates are extrapolated using available annual and quarterly indicators to derive revised estimates for 2009–2019. For activities where comprehensive data are available annually, annual estimates for output and intermediate consumption are compiled directly using source data. In cases where limited data exist, output indicators are used to derive output estimates, and BM input-output ratios are applied to output to derive intermediate consumption (IC) estimates at constant prices. Weighted IC price indices are used as "reflators" to estimate IC at current prices. The new GDP series has been recompiled for 2012–2019. The 2012 revised estimates were

retropolated to 2009 (the previous base year) using previous growth rates in most activities.

B. Revisions to Nominal and Real GDP

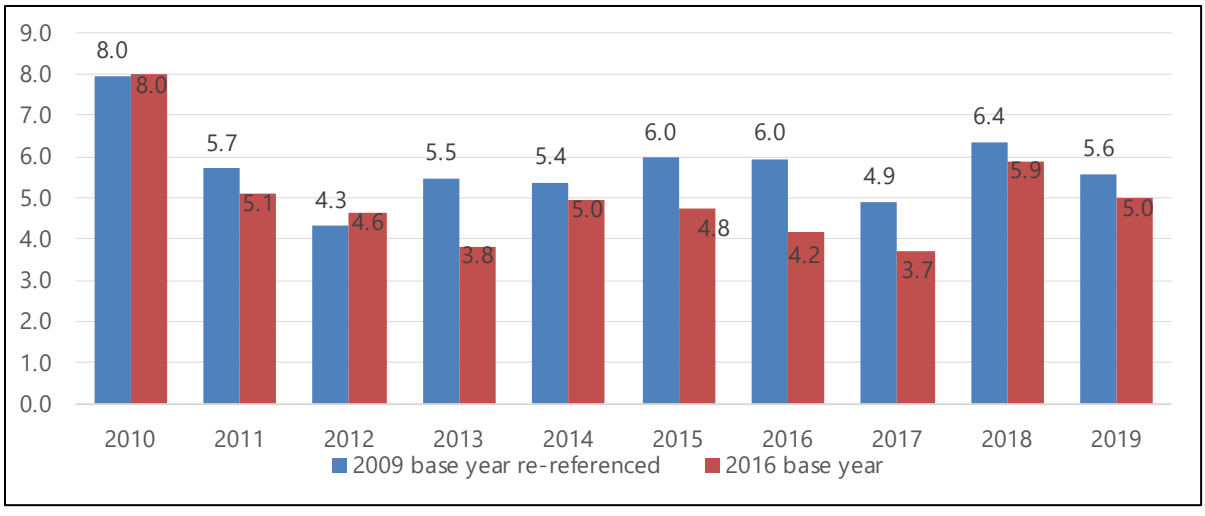
13. GDP in current prices was revised upwards by 8.1 percent in 2016 with all activities revised upwards except for Agriculture and Forestry and Fishing activity which was revised downwards by 30.3 percent.

Figure 1. Nominal GDP Previous and Current



Annual GDP growth in constant prices was revised downward by an average of - 0.8 percentage points over the period. The revision in the benchmark year (2016) was -1.8 percentage points. The largest upward revision (+0.3 percentage points) is observed in 2012 and the largest downward revision (-0.8 percentage points) is observed in 2016. The rebasing to 2016 base year reflected significant changes to the structure of the Kenyan economy. Notably, the share of Transport and Storage, Information and Communication, Accommodations and Food Services, Manufacturing, Construction and Real Estate to total activity increased. Crop production as a share of GDP was revised downwards over the entire period.

Figure 2. Constant Price GDP Growth Rates Previous and Current



Recommendation:

- The mission found the overall revisions to nominal and real GDP were in line with changes in source data and methods adopted with this revision. The mission recommends that KNBS includes a section in the revision report highlighting the revisions to both the overall level of GDP and the constant price growth rates. In cases where large revisions to growth are observed, the KNBS should include contextual information demonstrating how the estimates align with major economic events, policy implementation and related social indicators.

C. Revisions - GDP-Production Approach (GDP-P) by Activity

Agriculture – Crops

14. The mission reviewed the revised estimates of crop production. Crop output and value-added were revised downward over the entire period. On average annual crop production was revised downward by 32.3 percentage points and average revision to constant prices growth rates in crop production was -1.9 percentage points. The nominal monetary crop production at basic prices is largely estimated from the demand side (i.e., the sum of intermediate consumption, final domestic consumption, inventories, and exports less taxes on products, trade margins and imports). The 2016 estimate of household final consumption expenditures (HFCE) was obtained from the 2016 KIHBS and the estimate of intermediate consumption was obtained from the detailed expense information from the CIP and exports less imports.

15. The 2015/2016 Kenya Integrated Household Budget Survey (KIHBS) was the primary data source used to produce the 2016 benchmark estimates of household consumption (acquisitions and own account). Market production has been revised downward in the benchmark year for all crops in both current price (CP) and constant price (KP) output. For own account crop production, most of the important crops such as maize, potatoes and vegetables have been revised downwards, while there have been some slight upward revisions to rice, sugar cane and others.

Table 2. Kenya: Revisions to Nominal Output of Crops (KSh Million), 2016

		Revised 2016 Benchmark	*Previous 2016 Estimate*
maize	Market	97,374	128,573
	own account	58,409	74,055
wheat	market	11,425	
	own account	1,017	
other cereals	market	11,528	33,514
	own account	4,142	2,297
beans and legumes	market	81,438	129,978
	own account	29,063	61,608
rice	market	1,727	1,662
	own account	1,743	1,458
Potatoes and other root crops	market	140,542	385,482
	own account	44,910	62,955
vegetables	market	286,411	513,255
	own account	63,260	111,204
	Total	832,989	1,506,043

16. Demand side data sources are used because the KNBS has deemed that the coverage of these sources is better than estimates of the volume of production obtained from the Ministry of Agriculture (MOA). The MOA collects information on crop yields but the KNBS has determined that the estimates do not adequately capture the output produced and consumed by households i.e., output for own final use. As a result, point level estimates for agriculture are deemed to underestimate actual crop production. In addition, in some cases, reconciling total production with exports and imports has posed serious challenges for national accounts. For example, in 2017 (a drought year) the MOA data on maize crop yields increased from 37.8 million bags in 2016 to 39.5 million bags in 2017 however, contradictorily, imports more than doubled and exports were halved indicating a shortage of maize.

17. The table below compares demand-side and supply side estimates of 2016 crop production. For illustrative purposes, only the output for maize, potatoes and beans are provided. Overall, the supply side approach (using estimates obtained from the MOA) underestimates output of maize, potatoes, and beans. For potatoes, the difference is significant.

Table 3. Kenya: Compares the Output Derived from the MOA and the Demand Approach 2016

		2016
Maize	Production (Million Bags – per MOA)	37.8
	Price (KSh/kg)- Annual Average	35.4
	Output (MOA based Supply Side) KSh Million	120,430.8
	Output (Use Side) KSh Million	155,783.1
	Difference	-35,352.3
	% difference	-22.7%
		2016
Potatoes	Production (Million Tonnes)	1.9
	Price (KSh/kg)- Annual Average	40.3
	Output (Supply Side) KSh Million	74,667.6
	Output (Use Side) KSh Million	185,451.6
	Difference	-110,784.0
	% difference	-59.7%
		2016
Beans	Production (Million Bags)	8.1
	Price (KSh/kg)- Annual Average	76.6
	Output (Supply Side) KSh Million	55,841.4
	Output (Use Side) KSh Million	110,501.2
	Difference	-54,659.8
	% difference	-49.5%

18. Since the KNBS only has periodic access to demand side estimates they apply various extrapolators to each demand component to derive constant price estimates in non-benchmark years. For example, for selected crops the BM estimate of HFCE is extrapolated by annual crop volumes estimated by the MOA. Similarly, intermediate demand is extrapolated by either a production or constant price volume indicator from manufacturing. Constant price estimates of exports and imports are mostly deflated using average prices paid to farmers. This approach is consistent with the derivation of the previous 2009 BM estimates.

19. The nominal estimates are obtained by reflating the extrapolated constant price estimates with different price indices depending on the crop and its use. For example, the BM estimate for intermediate demand for maize is extrapolated by the volume index of maize meal produced by grain millers and reflated using the average of the CPI plus the average prices paid to farmers and a rural market price index. This is necessary because unlike other crops that are solely intended for final household consumption, a significant proportion of grain goes to manufacturing. As such, KNBS cannot simply use the CPI index for maize. Alternatively, HFCE for certain crops that can be purchased directly from farmers or from retail outlets are reflated using the average of the CPI index and rural market prices' indices. However, there are other crops such as beans where the CPI is the sole price index used.

20. The use of consumer price indices (CPI) implies that the annual purchaser prices and producer prices (PPI) move synchronously. The KNBS started collecting farm gate prices in 2019 in response to observations that had been made regarding exaggeration of output for some crops that started around 2014 and continued deteriorating thereafter. Farm gate price indices have been compiled and backcasted using prices collected from rural markets. These indices are used to monitor movement of CPI (used for reflation), to ensure the problem experienced previously does not recur. The plan is to integrate farm gate prices going forward as the series become longer. Previously, reflation was done using CPI without validating suitability.

21. For own account crop production, the KNBS used information from the KIHBS to develop the 2016 benchmark estimate of own account crop production. Estimates of the volume of vegetables and fruits for the non-benchmark year are derived by applying the annual growth rate in the population to the benchmark volume estimate of vegetables and fruits. This is then reflated using the movement in CPI estimates of vegetables and fruits to derive nominal values. For all other own account production of crops, the procedure either uses the quantities from the MOA or the trend in the quantities from MOA as indicators to extrapolate the own account crop production volumes and then reflated with the movement in CPI food components to obtain the current price (CP) estimates. This procedure is consistent with the previous compilation approach. The large revisions are almost entirely due to the overstated price indices used in the calculation of the nominal estimates in the previous compilation.

22. The table below shows the difference in output, intermediate consumption and GVA at current and constant prices for agriculture-crops. Agriculture output at current prices was revised downwards by 34.7 percent in 2016. The revisions were lower in the back period than the current period.

Table 4. Kenya: Agriculture Output at Current Prices[1]

	2014	2015	2016	2017	2018
Current estimates					
Output at basic prices	905,830	1,120,527	1,283,508	1,536,943	1,603,422
Intermediate consumption	164,989	200,502	221,553	259,138	262,985
Value added, gross	740,841	920,025	1,061,955	1,277,805	1,340,437
Previous estimates					
Output at basic prices	1,298,259	1,700,195	1,982,337	2,670,379	2,857,539
Intermediate consumption	231,915	253,819	281,795	344,829	391,367
Value added, gross	1,066,344	1,446,376	1,700,542	2,325,549	2,466,172
% difference					
Output at basic prices	-30.2	-34.1	-35.3	-42.4	-43.9
Intermediate consumption	-28.9	-21.0	-21.4	-24.9	-32.8
Value added, gross	-30.5	-36.4	-37.6	-45.1	-45.6

Revisions to Crop Volumes

23. HFCE in constant prices for non-benchmark years are derived from crop production volumes obtained from the MOA. The MOA revises their estimates on a continuous basis. The KNBS had not incorporated these revisions to the source data. The KNBS used the occasion of this comprehensive revision project to incorporate these revised estimates. Revised estimates for maize (2012, 2015, 2017), beans (2012–2015), wheat (2016, 2017), tobacco (2012–2020), tea (2019), rice (2018) were incorporated into the 2009–2019 time series. Also, new data from the Horticulture Department of Agriculture (HCDA) was obtained for cut flowers. These changes to quantities resulted in revisions to constant price estimates of HFCE, own account production and for some IC that are extrapolated using MOA data.[2]

Table 5. Kenya: Revisions to Volume Estimates

Maize (Million Bags)	2014	2015	2016	2017	2018	2019	2020
Previous MOA Estimates	33.7	45.1	37.8	39.5	44.6	44.0	44.4
Revised MOA Estimates	33.7	42.1	37.8	36.4	44.6	44.0	44.6
Beans (Million Bags)	2014	2015	2016	2017	2018	2019	2020
Previous MOA Estimates	3.6	4.4	8.1	9.4	9.3	9.3	9.9
Revised MOA Estimates	6.4	8.5	8.1	9.4	9.3	9.8	10.1
Rice-Marketed Prodn (Million shillings)	2014	2015	2016	2017	2018	2019	2020
Previous MOA Estimates	2,656	2,322	1,637	1,418	1,673	2,389	2,514
Revised MOA Estimates	2,656	2,322	1,637	1,418	1,929	2,389	2,572
Potatoes (Million Tonnes)	2014	2015	2016	2017	2018	2019	2020
Previous Estimates- Production in 'Million tonnes	1.6	1.8	1.6	1.9	2.0	2.4	2.4
Million Tonnes-Revised Estimates	1.6	1.9	1.9	1.9	1.9	2.2	2.2
New indicator - Volume Index	87.8	105.1	100.0	105.0	102.5	118.7	118.7

The figures below show the total revision to the volume of crops for the years 2012 to 2019 as

[1] Note – these represent work-in-progress estimates available at the time of the mission. These estimates do not necessarily reflect the final estimates that will be released by KNBS.

[2] For most crops, IC is extrapolated with constant price estimates from various manufacturing activities.

well as the main crops which contributed to the revision. For a complete review of the constant price output of crops please see Annex I.

Figure 3.1. Constant Price Output of Crops (% Growth Rate)

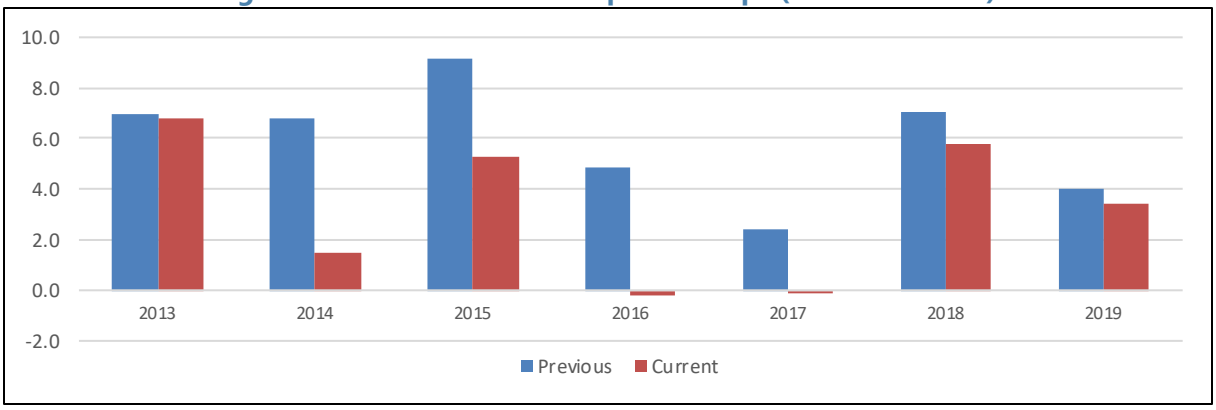
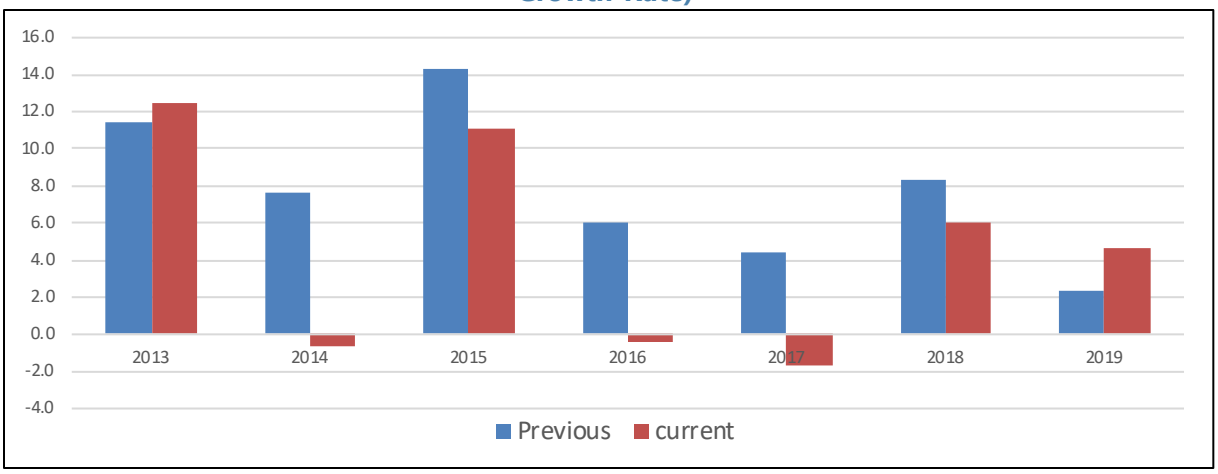


Figure 3.2. Constant Price Output of for Maize, Beans, Potatoes, Tea and Cut Flowers (% Growth Rate)



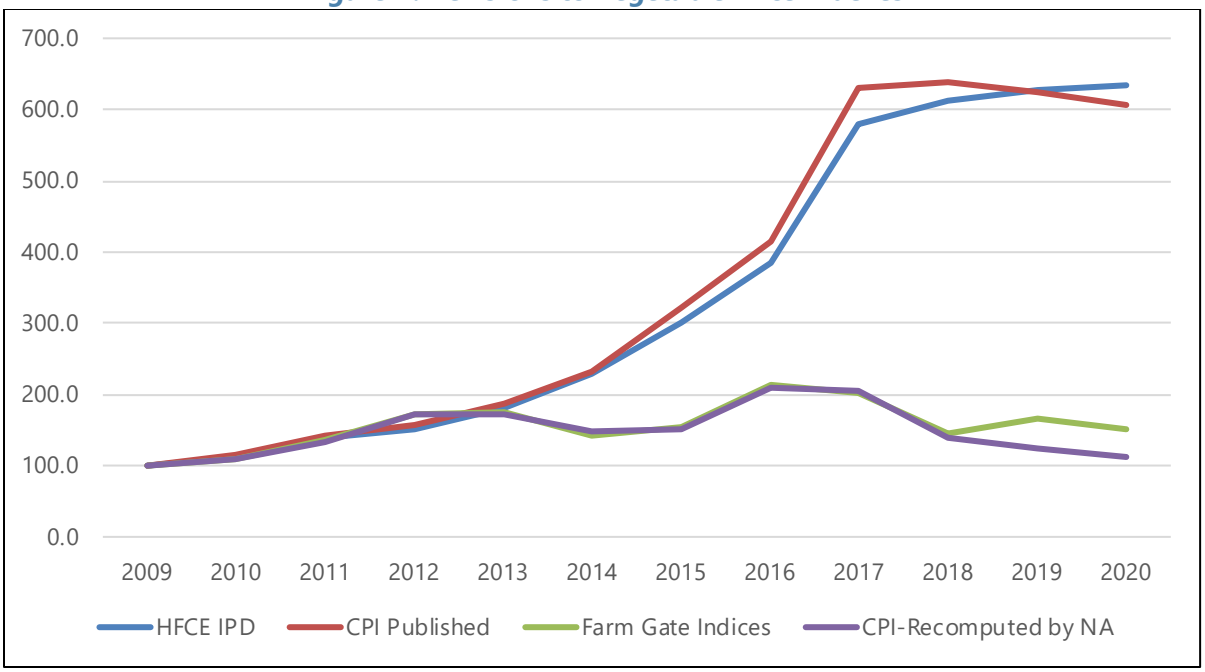
Nominal Crop Estimates

24. Movements in the CPI are used to estimate the basic price of crops in the non-benchmark years. In 2019 a significant downward revision was made to some of the food components of the CPI for the period 2014 to 2019. Movements to these components were used to reflate specific crops. These revisions were not yet incorporated into the calculation of crop production. The KNBS used the occasion of the comprehensive revision to incorporate the revised price estimates. Given the revisions to crop prices were downwards it resulted in a significant downward revision in nominal crop production starting in 2014 through to 2019.

25. The graph below for 2009=100, shows the growth rate of the previous estimates of the HFCE implicit price deflator and vegetables prices to the revised prices (market and farm gate prices) for vegetables. The previous CPI for vegetables had grown over 600 percent from 2009–2019, whereas the recalculated CPI for vegetables grew by 12 percent over the same period. Consequently, previous estimates were significantly overestimated. This also impacted

HFCE since food represents an important expenditure of households.

Figure 4. Revisions to Vegetable Price Indexes



26. The table below shows the methodology KNBS has adopted to derive non benchmark estimates of crops. As noted previously, the BM estimates derived from demand for agriculture crops is extrapolated for each demand component by a volume or constant price indicator and then reflated with an appropriate price or set of price indices. For example, to derive the constant price estimates of beans, the KNBS uses the following procedure. The 2016 BM constant price estimates for IC are extrapolated with quantities of beans and leguminous vegetables using information obtained from the MOA; the indicator for HFCE and seeds is the trend of quantities produced excluding any produce sold to marketing boards; and intermediate demand by restaurants is calculated by applying one percent to the constant price estimates of HFCE. Similarly, constant price estimate of own account bean production is extrapolated with the same indicator used for HFCE. Once all the uses have been extrapolated, various price indices are used to reflate the volume estimates to obtain current price bean estimates.

Example 1. Methodology to Drive Nominal Estimates of Beans

Table 6. Kenya: Methodology for Beans

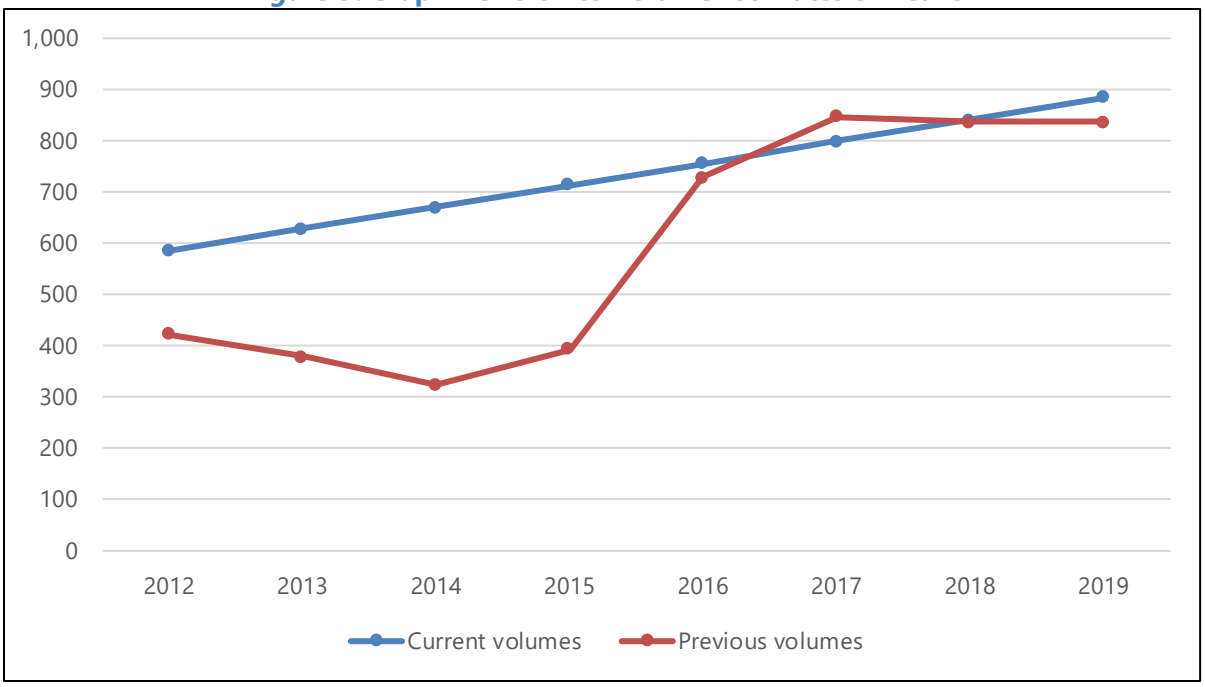
			Current				Previous		
Beans	Number	Source	**2015**	**2016**	**2017**		**2015**	**2016**	**2017**
Constant price Methodology									
Intermediate consumption									
Intermediate consumption (excluding restaurants)	1		16,381	15,610.0	18,115.3		7,979	10,659	10,499
Extrapolator for IC excl restaurants	2	Total production of beans and other leguminous crops (million bags)	9	8.1	9.4	Output at constant prices of processed and preserved fruits and vegetables	19,310	25,796	25,409
Constant price estimates of restaurants	3		324	371.0	337.2				
Volume extrapolator	4	1 % of household acquisitions							
Constant price estimates for seeds	5		14,323	15,179	16,034		8,012	13,652	14,867
Volume extrapolator for seeds	6	Trend of quantity produced excluding marketing boards ('000 tonnes) at purchaser's prices	713	756	799	Total output at constant prices excluding seeds	68,485	116,695	127,082
HFCE Const price estimates	7		32,387	37,105	33,717		31,667	58,831	68,272
HFCE extrapolator	8	MoA	713	756	799	MoA	392	729	846
Constant price estimates for exports	9		11,747	13,173	7,340		8,960	10,274	5,452
Constant price estimates for imports	10		7,711	5,611	11,342		6,129	4,309	8,898
Constant price estimates for Own accounts	11		27,425	29,063	30,701		19,562	36,343	42,176
Constant price extrapolation for Own accounts	12	Trend of quantity produced excluding marketing boards ('000 tonnes) at purchaser's prices	713	756	799	Trend of production excluding marketing boards	440	817	948
Total constant prices incl own account			**102,587**	**110,501**	**106,244**		**76,180**	**129,759**	**141,266**

Table 6. Kenya: Methodology for Beans (concluded)

Prices									
Price for IC	13	Rural market prices	98	100.0	97.7	Rural market prices	115.9	113.3	136.0
Prices for Restaurant	14								
Prices for seeds	15	Average of (CPI, leguminous crops and rural market prices)	93	100.0	108.5	Average of (CPI, leguminous crops and rural market prices)	137.0	141.4	160.7
Prices for HFCE	16	Cpi Beans, grams, peas	90	100.0	112.2	Cpi Beans, grams, peas	142.6	149.5	169.3
Prices for exports	17	Average of (CPI, leguminous crops and rural market prices)	93	100.0	108.5	Average of (CPI, leguminous crops and rural market prices)	137.0	141.4	160.7
Prices for imports	18	Average of (CPI, leguminous crops and rural market prices)	93	100.0	108.5	Average of (CPI, leguminous crops and rural market prices)	137.0	141.4	160.7
Prices for own account	19	Cpi Beans, grams, peas	90	100.0	112.2	CPI, beans, peas, grams	158.0	169.5	185.4
Nominal estimates									
Nominal estimates for IC	20		16,084	15,610	17,701		9,249	12,073	14,279
Nominal estimates for restaurant	21								
Nominal estimates for seeds	22		13,286	15,179	17,397		10,975	19,303	23,893
Nominal estimates for HFCE	23		29,228	37,105	37,844		45,167	87,970	115,618
Nominal estimates for exports	24		10,897	13,173	7,964		12,274	14,527	8,761
Nominal estimates for imports	25		7,153	5,611	12,306		8,396	6,093	14,299
Nominal estimates for own account	26		24,750	29,063	34,459		30,918	61,608	78,201
Total nominal estimates for beans			**87,091**	**104,519**	**103,060**		**100,187**	**189,389**	**226,453**

27. The mission noted that the volume indicator used to extrapolate HFCE, own account production and seeds was revised significantly upward for the years 2012 to 2015. The revisions are attributable to the revised estimates received from the MOA. The graph below reflects the revisions to the volume estimates.

Figure 5. Graph Revision to Volume Estimates of Beans



Example 2. Methodology to Derive Nominal Estimates of Potatoes

28. The same procedure as outlined for beans is used for potatoes, however different indicators are used to extrapolate the BM demand components. In addition, to reflate the constant price estimates to current prices, different prices indices are used. Although, the volume indicators had been revised from the previous BM estimates, the main contributor for the revisions to the nominal estimates of potatoes was the incorporation of revised prices which were previously overestimated.

Table 7. Kenya: Methodology Current Potatoes

			Current				Previous		
Potatoes	Number	Source	**2015**	**2016**	**2017**	Source	**2015**	**2016**	**2017**
Constant price Methodology IC									
IC (excluding restaurants)	1		4,227	4,600	4,531		82.6	110.3	108.7
Extrapolator for IC excl restaurants	2	Output at constant prices of manufacture of processed and preserved fruits and vegetables	30,665	33,369	32,868	Extrapolated at purchaser's prices using Output at constant prices, processing of preserved fruits and vegetables	19,310.3	25,796.1	25,409.2
Constant price estimates of restaurants	3		10,326	9,838	10,323		1,090.2	955.9	1,211.1
Volume extrapolator	4	Volume index of potato production in million bags	105	100.0	105.0	1 % of HFCE			
Constant price estimates for seeds	5		28,809	27,543	28,908		9,384.4	8,385.0	10,299.8
Volume extrapolator for seeds	6	Volume index of potato production in million bags	105	100.0	105.0	Average of CPI root crops and rural market prices			
HFCE Const price estimates	7		103,257	98,378.7	103,227.7		109,017.7	95,590.0	121,110.5
HFCE extrapolator	8	Volume index of potato production in million bags	105	100.0	105.0	Production in '000 tonnes at purchaser's prices	180,303.6	160,591.0	197,930.6
Constant price estimates for exports	9		174	181.4	502.2		104.3	110.5	246.8
Constant price estimates for imports	10		328	94.3	156.8		109.3	47.6	46.7
Constant price estimates for Own accounts	11		47,178	44,910.1	47,145.1		16,705.9	16,708.5	16,711.0
Constant price extrapolation for Own accounts	12	Volume index of potato production in million bags	105	100.0	105.0	Trend of production in '000 tonnes excluding marketing boards	93,183.8	93,198.0	93,212.1

Table 7. Kenya: Methodology Current Potatoes (concluded)

Total constant prices			193,971	140,542	194,636		136,385	121,860	149,688
Prices									
Prices for IC	13	CPI Root crops	80	100.0	112.0	Simple average	218.6	251.8	300.8
Prices for Restaurant	14	CPI Root crops	80	100.0	112.0				
Prices for seeds	15	CPI Root crops	80	100.0	112.0	Simple average	218.6	251.8	300.8
Prices for HFCE	16	CPI Root crops	80	100.0	112.0	CPI, root crops	308.3	376.8	438.8
Prices for exports	17	CPI Root crops	80	100.0	112.0	Simple average	218.6	251.8	300.8
Prices for imports	18	CPI Root crops	80	100.0	112.0	Simple average	218.6	251.8	300.8
Prices for own account	19	CPI Root crops	80	100.0	112.0	CPI, root crops	308.3	376.8	438.8
Nominal estimates									
Nominal estimates for IC	20		3,384	4,600	5,074		181	278	327
Nominal estimates for restaurant	21		8,265	9,838	11,561		3,362	3,602	5,315
Nominal estimates for seeds	22		23,059	27,543	32,374		20,516	21,112	30,985
Nominal estimates for HFCE	23		82,649	98,379	115,607		336,151	360,171	531,476
Nominal estimates for exports	24		140	181	562		228	278	742
Nominal estimates for imports	25		263	94	176		239	120	141
Nominal estimates for own account	26		37,763	37,763	52,799		51,512	62,955	73,334
Total nominal estimates for beans			155,260	178,304	217,977		411,949	448,396	642,180

Recommendation:

- The mission recommends that KNBS include tables (like the ones above) in the revision report that detail the data sources, methods, and calculations that KNBS uses to estimate current and constant price estimates of crop production for Kenya's largest crops.

Manufacturing

29. The mission reviewed the revised estimates of manufacturing output. The mission noted that nominal manufacturing output and value added was revised upward over the entire time-period for overall manufacturing and its various sub-sectors. The KNBS noted that the upward revisions were a result of the incorporation of data from the 2018 Census of Industrial Production (CIP) which provided detailed information for mining, manufacturing, electricity supply, water, and construction. In addition to the CIP data, KNBS used data from MSMEs, corporate tax information for 2016 and KIHBS to estimate the manufacturing activity by households. Revisions to constant price manufacturing output and value added were minimal.

Table 8. Kenya: Output, IC for Food, Beverages, and Tobacco

	Year	2012	2014	2016	2017	2018	2019
Food	Output - previous	634,041	748,230	901,605	987,291	1,061,633	1,100,536
	Output - current	635,645	778,727	899,851	981,304	1,031,780	1,063,428
	IC - previous	503,230	599,937	722,835	801,964	861,856	901,884
	IC-current	457,751	562,896	634,215	681,751	714,835	735,740
	Volumes -previous	476,176	560,508	603,098	604,693	652,097	658,652
	Volumes -current	714,790	852,894	899,851	908,346	963,821	980,432
Beverage	Output - previous	108,919	126,737	168,357	176,712	196,948	224,064
	Output - current	121,679	132,340	180,043	185,746	200,249	215,661
	IC - previous	62,531	75,080	93,045	97,089	118,815	137,977
	IC-current	61,186	59,387	81,428	87,993	93,114	104,484
	Volumes -previous	83,760	91,871	110,269	111,052	119,858	130,643
	Volumes -current	156,671	146,593	180,043	180,472	187,858	197,037
Tobacco	Output - previous	19,201	19,643	18,061	17,318	17,464	16,944
	Output - current	14,523	15,673	18,964	18,492	18,108	18,157
	IC - previous	11,559	12,925	15,325	15,322	15,604	16,322
	IC-current	13,980	11,864	10,783	10,495	10,694	12,401
	Volumes -previous	15,522	15,561	13,513	13,022	11,770	11,814
	Volumes -current	15,974	16,801	18,964	18,452	17,997	17,949

Recommendations:

- Given that the KNBS has incorporated several new data sources in the compilation of the revised estimates for manufacturing output and valued added it is recommended that they include a table (shown below) in the revision report comparing the previous data sources with the revised data sources.

Proposed Data Source Table

Previous Estimates		Revised Estimates	
Data Sources	Reference Year Availability	Data Sources	Reference Year Availability

- The KNBS should include a table/chart in revisions report comparing manufacturing output with related economic indicators such as exports, and the number of manufacturing firms recorded on the business register to demonstrate the quality of the new estimates to users.

Electricity Supply

30. The mission reviewed the revised estimates of electricity generation, steam production, transmission, and distribution. Electricity generation output and value added were generally revised upwards in both current and constant prices. The mission noted that the KNBS updated its methodology to estimate electricity generation and supply. Previously, the KNBS combined the four activities and produced an aggregate estimate of output electricity generation and supply. The KNBS indicated that they now produce a separate estimate of output and value added for electricity generation, steam production, transmission, and distribution. This has resulted in increased precision in the estimates.

Generation of Electricity

31. The mission noted that the generation of electricity is undertaken by Kenya Electricity Generation Company (KenGen) and Independent Power Producers (IPP) and the requisite data is obtained from KenGen's financial statement while the Kenya Power financial statement includes data for independent power producers. Gross output is based on sale of fuel and non-fuel to electricity distributors. Output of electricity from fuel and non-fuel are extrapolated by generation of electricity in Giga Watt Hour (GWH) for fuel and non-fuel and reflated using the producer price index for electricity. Intermediate consumption is based on relevant expenditure components (costs of fuel, steam, water and plant operation and maintenance) from annual financial statement and deflated by an IC deflator.

Steam Production

32. Steam is utilized to generate electricity from geothermal plants. Data on the sale of steam and intermediate consumption is derived from the financial statement of Geothermal Development Corporation (GDC). Output and intermediate consumption are deflated using a producer price index for electricity and by an IC deflator.

Electricity Transmission

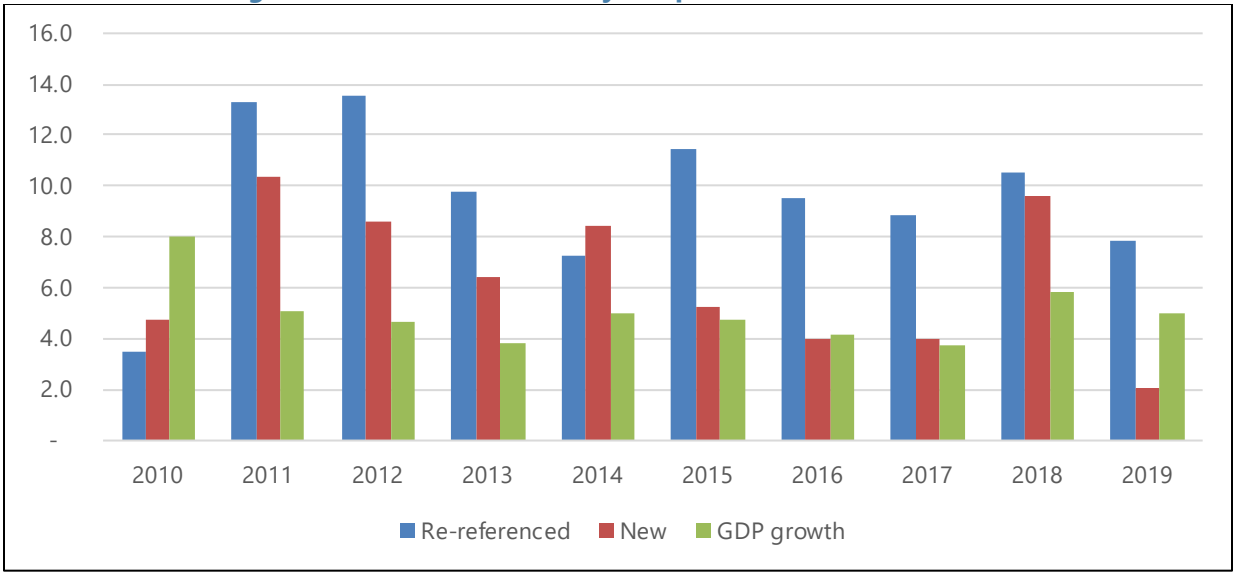
33. This activity is carried out by Kenya Electricity Transmission Company (KETRACO) and the requisite data is sourced from the company's annual financial statement. Gross output is based on wheeling revenue while intermediate consumption is derived from the

relevant expenditure components (e.g., maintenance costs, office expenses, transport) from the financial statements.

Electricity Distribution

34. The data used to compute output and intermediate consumption is sourced from annual financial statement of Kenya Power. Gross output is derived as a margin (sale of electricity *less* cost of power purchased for resale) while intermediate consumption is derived from the relevant expenditure components (e.g., maintenance costs, office expenses, consultancy) contained in the annual financial statement. Intermediate consumption at constant prices is computed by using an IC deflator.

Figure 6. Growth of Electricity Output and Growth of GDP



35. Table 9 compares the revised estimates with the previous estimates.

Table 9. Kenya: VA for Electricity Supply Components

Value added	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*
Generation	28,781	32,220	55,751	58,293	59,731	68,444	64,854	70,649
Steam production	5,640	5,351	5,851	7,618	7,272	7,529	7,655	6,422
Transmission	79	36	223	527	788	1,153	1,496	1,739
Distribution	19,697	22,700	25,635	39,173	54,224	58,476	65,787	62,798
Total VA	54,196	60,306	87,460	105,611	122,016	135,602	139,792	141,607
Total VA - Previous	48,194	53,901	55,190	89,358	131,617	141,255	154,339	163,643
Percentage share								
Generation	53.1	53.4	63.7	55.2	49	50.5	46.4	49.9
Steam production	10.4	8.9	6.7	7.2	6	5.6	5.5	4.5
Transmission	0.1	0.1	0.3	0.5	0.6	0.9	1.1	1.2
Distribution	36.3	37.6	29.3	37.1	44.4	43.1	47.1	44.3
Total VA	100	100	100	100	100	100	100	100

36. The mission noted that the share of VA of electricity distribution was equivalent to

electricity generation. One would assume the GVA from distribution to be considerably smaller than that of generation. The mission reviewed the methodology and found electricity distribution output and intermediate consumption required small adjustments which the KNBS incorporated. The adjustment entailed removal of fuel cost recoveries from revenue of Kenya Power.

Recommendation:

- The KNBS should include a table in the revision report comparing the previous data sources used to compile electricity generation etc. with the revised data sources.

Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles

37. The mission reviewed the revised estimates of wholesale and retail trade; repair of motor vehicles and motorcycles. The mission noted that wholesale and retail trade were revised upward over the entire time- period. The KNBS noted that retail and wholesale output is estimated by applying trade margins to a detailed set of domestically produced or imported products. The KNBS noted that the trade margins were calculated using information from a study on wholesale and retail trade margins conducted in 2019. The survey collected information on the percentage markup for the sale of motor vehicles, motor vehicles parts, and on products sold by wholesalers and retailers. Output derived from the trade margins is cross checked with sales turnover from administrative records to verify the robustness of the estimates. The survey results indicated that the retail and wholesale margins tended to be higher for most products than originally estimated with a few exceptions. The exceptions included retail trade margins for sugar and molasses, wearing apparel and footwear which were revised downward from 40 percent, 65 percent and 70 percent to 15 percent, 30 percent, and 30 percent, respectively. Similarly, wholesale margins of hardwood and softwood and stone, sand and clay were revised downward from 70 percent and 42 percent to 25 percent and 10 percent, respectively.

Table 10. Kenya: Trade Margins (Ratios) for 2016 from the Survey on Margins

		Wholesale previous	Wholesale current	Retail previous	Retail current
0111-1	Maize	5.0%	10.0%	15.0%	25.0%
0111-2	Wheat		10.0%		25.0%
0113-1	Potatoes and other root crops	8.0%	10.0%	18.0%	10.0%
0113-2	Vegetables	8.0%	10.0%	3.6%	10.0%
0121	Fruit and nuts; spice crops	8.0%	10.0%	25.0%	10.0%
0146-2	Eggs	4.0%	10.0%	22.0%	20.0%
0220-1	Hardwood and soft wood	70.0%	25.0%	0.0%	
0810	Stone, sand and clay	42.0%	10.0%		
1072	Sugar and molasses	10.0%	5.0%	40.0%	15.0%
1400	Wearing apparel	12.0%	12.0%	65.0%	30.0%
2023	Soaps, detergents, cleaning preparations, toiletries	15.0%	10.0%	25.0%	24.0%

38. The intermediate consumption to output ratio was revised upward from the previous 2009 BM. Nonetheless, the GVA (current prices) for wholesale and retail trade was revised upwards by 50 million Ksh in 2016 due to increased margins (output). IC at constant

prices is extrapolated by output at constant prices and reflated using the IC deflator as was the case with the previous estimates.

Table 11. Kenya: IC/Output Ratios for Wholesale and Retail Trade

Wholesale and retail trade	2009	2013	2014	2015	2016	2017	2018	2019
IC/O – previous	0.480	0.445	0.441	0.436	0.439	0.424	0.421	0.417
IC/O – current	0.515	0.522	0.529	0.534	0.538	0.521	0.534	0.539

Recommendations:

- It is recommended that KNBS include a section in the revision report summarizing the special study that was used to develop the revised trade margins. This description should include information related to the sample size, the industries covered and whether margins from online sales were considered.

Telecommunications

39. The mission reviewed revised estimates of telecommunications. Telecommunication activity includes a suite of services, such as fixed telephone, mobile phone, satellite TV, and mobile money transfer. Estimates of the telecommunication industry's output and value added were revised upwards by 76.4 percent in 2016. The large upward revision is due to increased coverage of providers and range of services provided by telecommunication companies. Additionally, previous estimates were reported on a fiscal year basis, with this revision, the KNBS converted estimates to a calendar basis. Estimates of output and intermediate consumption are compiled separately for services from financial reports of the telecommunication companies, tax information, and the report of the Communications Authority (CA). Key output and input indicators are obtained from revenue and expenditure items in financial statements. Revenues from voice, messaging, mobile money, and data are used to indicate movements in output.

40. The mission observed the upward revision was due to improved coverage (in terms of companies and services) in the BM year. Financial statements from all companies were included, where previous estimates relied on activity of the largest telecommunication provider. The mission evaluated the Communications Authority (CA) of Kenya report[3] and noted that it contains all telecommunication companies' revenue from all services including communication through phone calls, messaging, video, internet, and mobile money transactions. The mission confirmed that activity of mobile money was not allocated to financial services but rather appropriately considered as an auxiliary activity in the telecommunication industry. The mission also reviewed the output compared to other indicators and noted fees and commissions are moving in the same direction as the value of mobile money transactions. Also, one IC component for mobile money is fees and commissions paid by the telecommunication company to agents who facilitate the transaction. These fees appropriately classified as either primary output of households or auxiliary activities of financial institutions and other non-financial establishments,

[3] https://ca.go.ke/wp-content/uploads/2021/05/Annual-Report-for-Financial-Year-2019-2020.pdf.

such as retailers. Table 12 compares the revised estimates with previously published estimates.

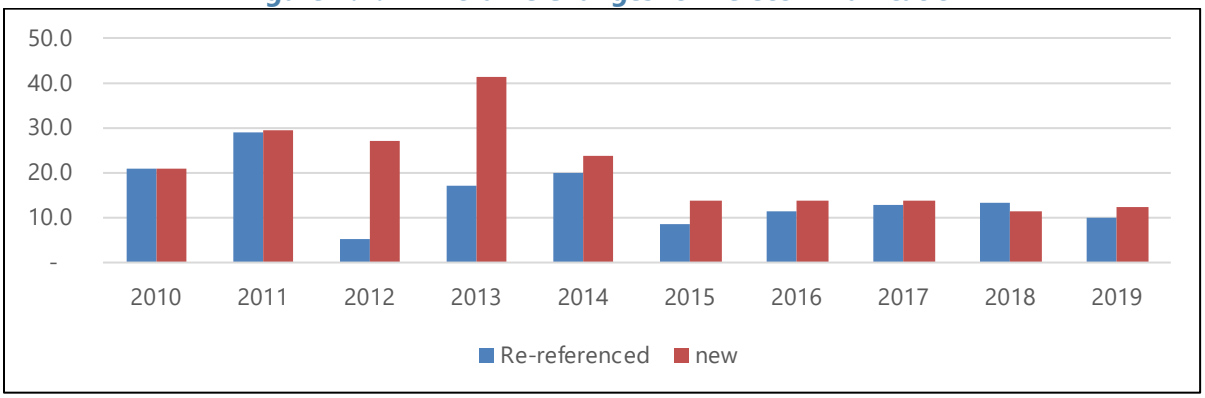
Table 12. Kenya: Output and VA Previous and Current – Need Output at Constant Prices

Output at current prices	2014	2015	2016	2017	2018	2019
Output – previous	161,671	172,931	191,567	205,729	229,191	249,631
Output – current	250,273	273,306	313,180	346,915	392,376	434,465
VA at constant prices						
VA – previous	139,623	149,969	164,798	182,984	203,713	221,552
VA – current	151,743	167,577	184,834	201,957	220,615	241,894

Table 13. Kenya: Number of Mobile Money Agents and Transactions and Value of Transactions

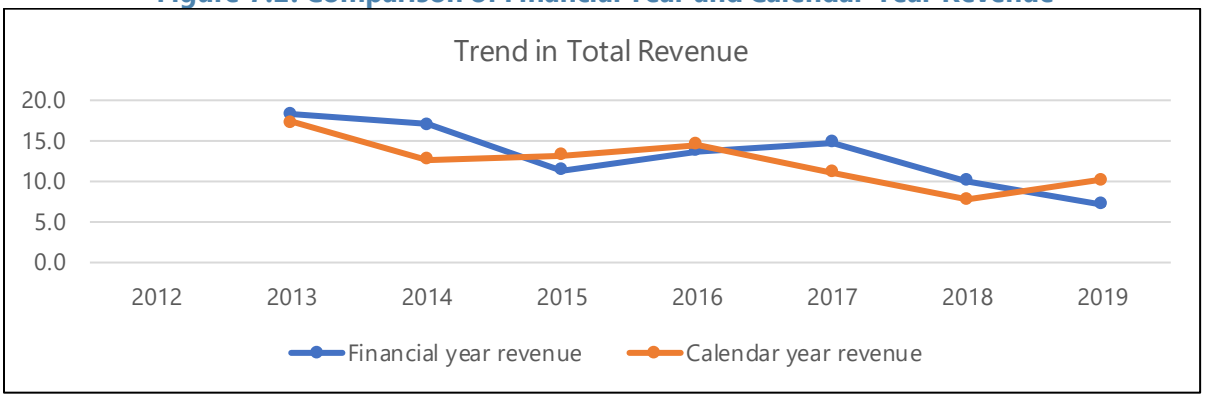
	2016	2017	2018	2019	2020
Number of agents	161,970	165,802	200,654	221,425	251,099
Value of transactions (Billions)	3,356	3,638	3,984	4,346	5,214
Number of transactions (Millions)	1,526	1,543	1,740	1,839	1,863

Figure 7.1. VA Volume Changes for Telecommunication



The chart below shows the growth rates in calendarized total revenue for telecommunications. Generally, the growth rate in total revenue aligns reasonably well with the trend in constant prices in Figure 7.1.

Figure 7.2. Comparison of Financial Year and Calendar Year Revenue



Recommendation:

- The mission recommends KNBS includes a section in its revision report outlining new data sources used to estimate output and value added for the telecommunication industry by service provided. This should include a table which identifies the number of providers and services provided by previous estimates as compared to revised estimates, shown below:

Table 14. Kenya: Telecommunication Services

Coverage	Previous Estimates	Revised Estimates
Number of Telecommunication providers		
Services (listed by type)		

Transportation and Storage

41. The mission reviewed the revised estimates for land transportation. The mission observed that the upward revision throughout 2009–2019 was due to the incorporation of administrative data acquired from the National Transportation Safety Authority (NTSA) and data obtained from a special transportation study conducted in 2019. The special transportation study covered all modes of road transport for both passenger and freight. In the case of passenger road transport, the following modes are covered; boda bodas (motorcycles and bicycles); matatu, minibuses and buses; taxis; and tuktuks (a light three-wheeled passenger vehicle). In addition, the study also collected information on the number of trips, number of passengers, average distance travelled, and fares charged by type of transport. The study also collected information on expenses such as labor, repair and maintenance, fuel and lubricants, spare parts, tyres etc. This information with the stock of vehicles (benchmark based on inspected vehicles) by mode was used to estimate the nominal output of transportation services in 2019. The administrative data obtained from the NTSA included the number of newly registered and inspected transportation vehicles (Kenya requires all passenger and freight vehicles be inspected on annually for licensing to provide transportation services). The vehicle registration data was used to retropolate the 2019 BM back through time. These extrapolated volume estimates are then reflated with weighted CPI fares and transportation inputs (fuels-light diesel, maintenance, and spare parts).

42. Input structure was derived using the (IC/Output) ratio obtained from income tax records and data from the Integrated Survey of Services (ISS). The new data sources resulted in an upward revision to both nominal and constant price GVA by over 50 percent.

Table 15. Kenya: Transport and Storage

Transportation - Previous	2009	2014	2015	2016	2017	2018	2019
Output at basic prices	480,033	893,141	956,867	1,012,051	1,092,259	1,248,602	1,399,449
Intermediate consumption	274,260	430,684	446,380	446,222	491,056	525,397	568,867
Value added, gross	205,774	462,457	510,488	565,829	601,203	723,205	830,582
Transportation - Current							
Output at basic prices	646,944	1,269,634	1,400,439	1,545,806	1,688,689	1,907,201	2,120,504
Intermediate consumption	360,136	521,069	581,809	651,177	712,579	761,474	815,791
Value added, gross	286,807	748,564	818,629	894,629	976,111	1,145,727	1,304,712
Difference							
Output at basic prices	166,910	376,492	443,571	533,755	596,431	658,599	721,054

Table 15. Kenya: Transport and Storage (concluded)

Intermediate consumption	85,877	90,385	135,430	204,955	221,523	236,077	246,924
Value added, gross	81,034	286,107	308,142	328,800	374,908	422,522	474,130

Recommendation:

- The KNBS should include a section in the revision report describing the new data sources used to estimates passenger transportation services. They should confront these estimates with fuel sales, gasoline imports, and tourist arrivals to demonstrate the quality and coherence of the new estimates to users.

Financial and Insurance Services

43. The benchmark estimates of financial services were reviewed, and support was provided to enhance the measurement of nominal and constant price estimates of Financial Intermediation Services Indirectly Measured (FISIM) including explicit services charges. The value of FISIM is calculated by applying the midpoint between the effective interest rate on loans and deposits to all interest earning assets and liabilities, even though some assets such as debt securities are service free. Total FISIM output is then allocated to Households and Government based on a break-down of the stocks of loans and deposits provided by the Central Bank. FISIM consumed by corporations (intermediate consumption) is not allocated to each activity rather the total FISIM is subtracted from the sum of GVA by economic activity to derive total GVA at basic prices. In addition, the KNBS does not estimate exports or imports of FISIM. Constant price estimates of FISIM are estimated by extrapolating the benchmark estimates using the deflated stock of loans and deposits.

44. As a check on the results, the mission obtained the net interest incomes reported on the income statements of all deposit taking institutions and compared them to the FISIM estimates calculated using the mid-point of interest rates on loans and deposits. The estimates were similar with the exception of 2019.

45. The mission confirmed that the Central Bank of Kenya (CBK) has no market activities and should be considered as a non-market producer in the national accounts. The annual output for the CBK was obtained by KNBS from the income and expenditure statements for the CBK. KNBS appropriately derives the output for CBK as the sum of costs - compensation of employees plus intermediate consumption and consumption of fixed capital.

Insurance

46. The mission reviewed the revised estimates of insurance services. The mission found that the revised upward revisions were primarily due to improved coverage of the additional auxiliary services offered by Kenyan insurance companies. In current prices the cost of service for insurance was estimated appropriately using data on premiums, premium supplements, and claims incurred from the Insurance Regulatory Authority. However, the mission noted that the constant price estimates for insurance could be improved, in that, the constant price estimates are derived by deflating the CP estimates for life insurance component using CPI services while

non-life insurance is deflated using CPI motor vehicles. Alternate methods were discussed.

Recommendations:

- The mission recommends KNBS restrict its calculation of FISIM to intermediated loans and deposits and remove government securities from its calculations.
- The mission recommends the KNBS NA research agenda includes examining the weighted average of actual lending and borrowing rates to calculate the reference rate. Data is readily available from commercial banks' and saving and credit societies' profit and loss accounts.
- The mission recommends the KNBS NA research agenda includes examining the possibility of allocating FISIM consumed by non-financial corporations by economic activity using information from lenders and depositors or an allocation based on shares of output as a second-best alternative.
- The mission recommends the KNBS NA research agenda includes the development of estimates of exports and imports of FISIM.
- The mission recommends the KNBS NA research agenda investigates alternative volume measure for insurance output such as number of policies or value of policies enforced.

General Government Including Health and Education

47. The mission reviewed revised estimates for public administration including Education and Health. The methodology adopted by KNBS to derive the output of general government is appropriate. The final consumption expenditures for general government are obtained from the government's chart of account for total COE plus other expenses, together with an estimate of FISIM consumed by government. An adjustment is made for consumption of fixed capital of government based on consumption of fixed capital derived using perpetual inventory method. A split by broad economic activity (Public Administration, Health and Education) is made based on nature of the government departments making the expenditure.

48. The mission observed that the 2016 benchmark introduced several enhancements to the final consumption expenditures for general government. Part of the upward revisions to general government are due to enhanced data source especially for public corporations and a reclassification of public corporations that manage the construction sector from construction to the government sector.

49. The mission noted that there were upward revisions throughout the 2009–2019 time period for Education. The revisions stem from additional data sources and improved current prices and constant price methodology. Previously, the BM output of education services was derived as a sum of cost and extrapolated using school enrolment. In the revision, the KNBS adopted a sum of cost approach to estimate the nominal output of government supplied education services (as recommended by the *2008 SNA*) for each year. Methodological improvements to the constant price estimates of education services were incorporated by deflating the IC, COE, CFC, and the other expense component separately. Nominal estimates of Private education were also reworked by incorporating new data from the KIHBS, MSMES and

from the ISS for IC.

Table 16. Kenya: Summary of the Revisions to Public Administration, Education, and Health

Current Output	2015	2016	2017	2018	2019
Public admin	615,900.7	668,980.9	741,536.2	820,348.3	900,701.4
Education	462,101.5	499,239.7	538,764.4	589,978.8	633,576.2
Health	230,084.7	258,314.9	285,628.9	300,119.8	319,921.6
Current IC					
Public admin	232,423.7	258,442.5	298,078.2	326,688.0	351,084.5
Education	146,413.3	159,520.7	171,178.1	187,727.3	199,853.4
Health	93,827.1	101,432.6	109,775.9	111,273.9	120,487.6
Constant Output					
Public admin	632,025.3	668,980.9	716,398.3	767,778.8	821,991.7
Education	487,186.1	499,239.7	533,462.0	567,648.2	591,932.7
Health	241,466.4	258,314.9	273,970.8	277,941.1	292,280.5
Constant IC					
Public admin	244,453.3	258,442.5	290,062.7	307,966.6	316,651.9
Education	152,628.2	159,520.7	165,708.1	175,992.9	181,568.8
Health	98,154.4	101,432.6	106,982.5	101,869.9	105,218.2

Table 17. Kenya: Previous Estimates

Current Output	2015	2016	2017	2018	2019
Public admin	481,680.1	520,587.5	621,478.4	678,111.4	741,189.4
Education	537,607.6	561,142.9	608,709.9	701,012.9	761,971.8
Health	185,697.8	210,344.9	236,832.3	264,119.2	295,949.1
Current IC					
Public admin	231,132.3	244,177.3	341,261.6	381,644.4	395,201.0
Education	229,479.6	251,630.1	282,156.7	315,851.3	343,736.3
Health	77,675.2	90,569.6	111,378.4	130,626.3	143,394.7
Constant Output					
Public admin	302,961.7	331,305.3	350,796.2	377,933.4	406,757.8
Education	436,351.2	459,801.3	472,604.7	503,497.4	532,392.1
Health	130,603.4	141,088.0	147,634.6	154,643.8	161,854.8
Constant IC	*2014*	*2015*	*2016*	*2017*	*2018*
Public admin	155,361.2	164,638.5	176,313.8	193,446.8	209,572.2
Education	154,809.1	163,461.2	160,882.2	173,662.3	184,838.1
Health	57,858.8	64,882.1	68,158.2	72,350.8	74,102.2

Taxes on Products

50. The mission reviewed the sources and methods for deriving taxes on products. Data on import duties and import excise taxes were available from the detailed trade dataset from the custom authorities. The taxes were aggregated to SUT products based on concordance tables used for the trade data. In addition, data on domestic excise by product were available. For non-

deductible VAT, the total tax collected was derived from the product flow and was allocated to SUT products based on the known tax rates for each product (that is either 16.0 percent or zero) multiplied by the taxable demand estimated from the SUT itself. The average rate applicable to each product was less than the prescribed rate of 16.0 percent, rather the effective rate was slightly above 14 percent for products on which VAT is charged. This is consistent with the observation that some sales will not be captured within the VAT system, leading to what is known as the 'tax gap.'

51. Although, the methodology for allocating the tax on products is reasonable, in order to be consistent with the GFS, the mission recommends that the actual tax collected from the public accounts should be used as a benchmark rather than being derived through the product flow calculation and the trade records.

52. The table below provides a comparison of the tax collected and the tax reported by the general government including the implied tax derived from the product flow and custom records. In terms of VAT, the differences are significant, and the NA estimates are greater by over 20 percent. Similarly, a large difference is reported with the VAT collected by the government and the one implied from the SUT.

Table 18. Kenya: Taxes on Products from GFS and National Accounts Estimates at Current Prices

National Accounts	2012	2013	2014	2015	2016	2017	2018
VAT	260,170.	286,450.	311,567.	345,303.	377,623.	422,827.	467,279.
Import duties	52,954.2	61,345.7	68,985.3	79,827.4	83,438.8	87,424.1	101,025.
excise taxes	43,443.4	48,827.0	53,887.2	62,644.8	76,856.4	83,438.9	85,640.9
Total	356,567.	396,623.	434,439.	487,775.	537,918.	593,690.	653,946.
GFS taxes							
VAT	180,651	208,773	246,158	274,449	314,124	348,081	385,636
Import duties	54,681	62,602	70,801	76,843	84,791	91,814	100,280
excise taxes	50,222	60,683	72,068	65,360	72,463	83,771	88,898
Total	285,554	332,058	389,027	416,652	471,377	523,666	574,814
Difference							
VAT	79,519	77,677	65,409	70,854	63,500	74,746	81,644
Import duties	-1,727	-1,256	-1,816	2,985	-1,352	-4,390	746
excise taxes	-6,779	-11,856	-18,181	-2,715	4,394	-332	-3,257
Total	71,014	64,565	45,412	71,123	66,541	70,024	79,133
% difference							
VAT	45.1%	42.0%	28.1%	27.3%	22.0%	22.0%	22.9%
Import duties	-3.3%	-2.2%	-2.7%	4.0%	-1.7%	-4.9%	0.8%
excise taxes	-8.6%	-13.8%	-17.8%	-2.3%	3.1%	-0.2%	-1.9%
Total	23.1%	19.7%	11.3%	15.8%	13.1%	11.8%	12.8%

Recommendations:

- Consider replacing the current estimate of tax on products with tax data directly from the

public accounts to avoid any discrepancies with the GFS current deficit/surplus account.

- Alternatively, provide users with a reconciliation table and explanation of differences between NA and GFS estimates of taxes on products.
- Review with GFS data providers the public administrative data from the Ministry of Finance.

Construction

53. The mission reviewed the revisions and methodology for the construction activity. The mission noted that the methodology employed by KNBS is appropriate given the data availability. The methodology for the output and GVA of construction services has not changed with the 2016 BM, however updated volumes of construction inputs with refined weights and improved construction price indices introduced revisions to both the current and constant price estimates. The upward revision was mainly attributable to new BM data coupled with improved data from the CIP and updated construction price indices.

54. KNBS compiles construction output by activity–residential dwellings including traditional structures, non-residential structures, special construction, and civil engineering. A critical aspect of the methodology is estimating the total value of materials used in construction activity. This comprises two components: material inputs produced domestically and imported material. The KNBS includes all material inputs when calculating construction activity. Some activity is used by households for repairs and renovations. The KNBS should adjust estimates of construction material to account for construction material consumed by households.

Table 19. Kenya: Nominal Construction Output

	2012	2013	2014	2015	2016	2017	2018	2019
Previous	513,390	582,896	683,376	804,219	826,006	1,036,308	1,104,968	1,197,296
Current	557,677	624,078	763,662	881,854	957,493	1,074,221	1,229,130	1,366,986

Recommendation:

- The mission recommends that in the future, when data become available, the KNBS adjust total output of construction to exclude construction material consumed by households.

Real Estate Activities

55. The mission reviewed the upward revisions associated with real estate activities. The mission noted that the improvements to housing services were introduced with the 2016 BM estimate by incorporating information from the KIHBS and the 2019 Kenya Population and Housing Census. These improvements resulted in significant revision to the 2016 benchmark. The KIHBS included two questions regarding housing services: the first asked respondents how much rent they would be able to obtain if they rented their own dwelling and the second; solicited from renters asked for the actual rent paid. These questions provided information for imputed rentals needed for owner occupied dwellings and the actual rents paid. The population census collected information by type of dwellings based on the materials used to construct the home. With this information, KNBS stratified dwellings based on the construction materials used for both rentals and owner-occupied dwellings. This stratification is useful to identify quality characteristics of the dwellings, however for owner-occupied dwelling the actual space – number

of rooms etc. is required. The benchmark outputs were estimated for the rented and owner-occupied dwellings using the number of households from the Kenyan Population and Household Census and the actual rents paid by households from the KIHBS. The benchmark output at constant prices is extrapolated using intercensal population growth and then reflated using the CPI for rentals to obtain the current prices. The IC was derived from tax records and the same ratio is applied to both owner-occupied dwellings and actual rent.

Table 20. Kenya: Revisions to Nominal Real Estate (Previous Series and Current)

	2012	2013	2014	2015	2016	2017	2018	2019
Previous	384,519	420,365	467,885	531,735	601,937	655,078	710,326	767,280
Current	486,711	528,409	589,301	677,327	774,891	864,898	962,638	1,035,989

Recommendations:

- For future research, the KNBS should develop estimates of total space/rooms rented to refine their estimates of imputed and actual rental income as well as consider differentiating the IC for owner-occupiers from actual renters.

D. GDP by Expenditure Approach (GDP-E)

56. The mission reviewed sources and methods used for compiling annual estimates of GDP-E. The estimates are available in CP and KP. The mission noted the methods adopted for compiling the CP estimates of GDP-E and KP series broadly follow methods used for the GDP-P constant price series. Notably, levels of each component series in 2016 is obtained from the 2016 SUT and annual estimates are compiled by extrapolating 2016 estimates using various indicators.

Household Final Consumption Expenditure (HFCE)

57. The mission noted that there were upward revisions to the nominal estimates of HFCE from 2009–2016 followed by significant downward revisions from 2017–2019. The BM estimates for 2016 were obtained from the KIHBS for HFCE and own account. The basic approach to obtain estimates for the intervening years before the BM and after is to extrapolate the BM HFCE constant price estimate with related volume indicators for each product. Once the domestic constant price estimates are obtained, they are reflated with an appropriate purchaser's price index such as the CPI by expenditure category. The supply of each imported product is then allocated to different final users (businesses, households, government), to derive total demand.

58. The mission noted there were significant revisions to HFCE. Table 23 shows current and previous estimates of HFCE for nominal and constant prices. The mission reviewed revisions to HFCE for food and non-alcoholic beverages, transportation, real estate, and other services; and noted the revisions aligned with revisions stemming from GDP by production approach.

Table 21. Kenya: HFCE by COICOP Current – Previous

Current estimates	2015	2016	2017	2018	2019
Food and non-alcoholic beverages	1,995,076	2,228,350	2,650,556	2,764,495	3,083,488
Alcoholic beverages and tobacco	243,151	269,759	273,844	300,844	320,262
Clothing and footwear	102,975	128,351	141,253	161,159	168,685

Table 21. Kenya: HFCE by COICOP Current – Previous (concluded)

Housing, water and fuels	**745,289**	**813,638**	**904,844**	**1,024,219**	**1,149,156**
Transport	683,617	763,036	859,177	978,050	1,069,332
Education	231,948	254,394	260,388	283,461	313,907
Goods not included elsewhere	327,181	338,064	358,127	394,590	416,436
Services not included elsewhere	958,005	1,075,524	1,220,416	1,354,743	1,472,094
Direct purchases in Kenya	-160,056	-162,377	-181,786	-187,266	-193,939
Total	5,127,186	5,708,739	6,486,820	7,074,296	7,799,421
Previous estimates	**2015**	**2016**	**2017**	**2018**	**2019**
Food and non-alcoholic beverages	2,584,807	2,921,924	3,777,806	4,081,366	4,465,885
Alcoholic beverages and tobacco	191,295	237,977	240,430	273,797	309,259
Clothing and footwear	139,544	148,324	201,513	235,642	278,105
Housing, water and fuels	595,955	631,857	698,569	786,970	834,284
Transport	401,021	414,553	439,010	491,548	550,843
Education	261,940	298,631	323,144	367,127	395,303
Goods not included elsewhere	318,978	308,783	337,889	368,766	403,438
Services not included elsewhere	581,234	685,382	768,650	847,501	931,103
Direct purchases in Kenya	-167,428	-163,642	-183,048	-188,784	-195,985
Total	4,907,347	5,483,791	6,603,963	7,263,933	7,972,234
Difference	**2015**	**2016**	**2017**	**2018**	**2019**
Food and non-alcoholic beverages	-589,731	-693,574	-1,127,250	-1,316,871	-1,382,396
Alcoholic beverages and tobacco	51,855	31,782	33,414	27,047	11,003
Clothing and footwear	-36,570	-19,973	-60,261	-74,483	-109,421
Housing, water and fuels	149,334	181,780	206,275	237,249	314,873
Transport	282,596	348,483	420,168	486,503	518,489
Education	-29,992	-44,237	-62,757	-83,667	-81,397
Goods not included elsewhere	8,203	29,281	20,239	25,824	12,998
Services not included elsewhere	376,771	390,142	451,766	507,243	540,991
Direct purchases in Kenya	7,372	1,265	1,263	1,519	2,047
Total	219,839	224,949	-117,143	-189,637	-172,813

Recommendation:

- The mission recommends the KNBS includes a detailed breakdown of revisions to household final consumption expenditure in the revisions report. This should be accompanied by an explanation of how the revisions to crop production, telecommunication services, financial services, and transportation services impacted the composition of household spending.

General Government Final Consumption Expenditure (GGFCE)

59. The mission reviewed the sources and methods for general government. Revisions to general government final consumption expenditure were consistent with the revisions to public administration and education. KNBS estimates compensation of employees plus intermediate purchases, including an estimate of CFC by function of government, using information taken directly from the government accounts**,** but aligned to the definitions of GFCE used for the 2016 SUT. KNBS also includes an estimate of replacement cost CFC.

Non-Profit Institutions Serving Households (NPISH) Final Consumption Expenditure

60. The mission reviewed source data and methodology used to derive NPISH

expenditures. The current estimates are based on data from the NPISH association which provides partial information of the revenue and expense for activities where NPISH activities are notable – medical, food, children care etc. The mission noted KNBS does not derive an estimate of CFC for NPISH. Constant price estimates follow the same procedure as outlined for the GDP-P.

Gross Capital Formation

61. The mission reviewed the revision to GFCF. There were upward revisions throughout the period for residential dwellings, ICT equipment and other machinery and equipment. There was also a reclassification between other structures and custom structures. Lastly, mineral exploration and evaluation has declined in line with the decline in petroleum production and prices. The construction estimates as noted previously, are based on an input cost model which takes account of the total value of inputs used to produce construction output. These estimates were used in the estimation of GFCF and output for construction activity in BM year (2016). Merchandise Imports (capital goods) were used to estimate gross fixed capital formation of machinery and equipment in the benchmark year and for annual estimates. Capital goods are identified based on a correspondence table between the HS and the UN's Broad Economic Categories classification (BEC). No measurement of acquisition less disposal of valuables is made.

Table 22. Kenya: Gross Fixed Capital Formation

	2015	*2016*	*2017*	*2018*	*2019*
Previous					
Dwellings	257,322	270,289	340,606	323,230	339,987
Buildings other than dwellings	245,175	261,494	340,899	359,333	375,677
Other structures	180,304	166,104	181,949	245,743	276,553
Transport equipment	302,856	175,507	219,477	205,237	230,530
ICT equipment	73,407	79,052	93,806	79,094	82,383
Other machinery and equipment	251,648	232,368	259,475	259,062	256,323
Animals	10,438	11,870	10,870	13,623	15,012
Cultivated plants, crops	6,616	6,988	7,373	7,256	7,891
Intellectual property products	30,601	34,493	38,429	43,138	47,514
Total	1,358,366	1,238,164	1,492,884	1,535,716	1,631,871
New series					
	2015	2016	2017	2018	2019
Dwellings	371,357	401,847	438,881	494,867	544,310
Buildings other than dwellings	122,422	134,091	144,429	162,595	178,415
Other structures	289,581	294,859	379,869	440,469	501,586
Transport equipment	356,295	208,995	257,057	242,356	273,876
ICT equipment	89,348	95,086	108,159	88,819	95,563
Other machinery and equipment	265,979	246,330	270,681	270,322	259,317
Animals	14,356	17,498	8,741	13,624	8,728
Cultivated plants, crops	7,866	8,269	8,922	9,615	10,001
Intellectual property products	49,685	28,409	26,017	17,655	9,615
Total	1,566,889	1,435,384	1,642,756	1,740,321	1,881,412
Difference					
Dwellings	114,035	131,558	98,275	171,638	204,323
Buildings other than dwellings	-122,753	-127,403	-196,469	-196,738	-197,262
Other structures	109,278	128,755	197,920	194,725	225,033
Transport equipment	53,439	33,488	37,580	37,118	43,347

Table 22. Kenya: Gross Fixed Capital Formation (concluded)

ICT equipment	15,942	16,034	14,353	9,725	13,180
Other machinery and equipment	14,331	13,962	11,206	11,260	2,994
Animals	3,919	5,628	-2,129	1	-6,284
Cultivated plants, crops	1,250	1,281	1,549	2,359	2,110
Intellectual property products	19,084	-6,083	-12,413	-25,483	-37,899
Total	208,523	197,220	149,872	204,605	249,541

62. The mission also reviewed the revisions to changes in inventories. Changes in inventories is the value of the entries into inventories less the value of withdrawals less the value of any recurrent losses of goods held as inventories. Changes in inventories is only estimated for a few products. The revisions to inventories are mainly due to revised estimates for petroleum products. Changes in livestock numbers, are also included as part of inventories. KNBS does not attempt to remove any holding gains from the stocks.

Table 23. Kenya: Revisions to Changes in Inventories

	2009	2014	2015	2016	2017	2018	2019
Chan in inv. previous	23,702	-24,203	-9,406	43,910	61,415	59,999	63,117
Chan in inv. Current	23,702	64,225	939	-3,381	65,198	26,116	38,859
Difference	0	88,428	10,345	-47,291	3,782	-33,883	-24,257

Trade in Goods and Services

63. The mission reviewed the revisions to trade in goods and services. The current method is based on data from the Balance of Payments for goods and services. The trade compilers differentiate between trade with neighboring countries and with others. The former is then assumed to be informal trade and the latter as formal. KNBS obtains and uses the total for the product flow. KNBS has reconciled the National Accounts estimates with the Balance of Payments estimates.

Table 24. Kenya: Imports Current and Previous

	2013	2014	2015	2016	2017	2018	2019
Imports previous	1,575,731	1,782,945	1,734,755	1,641,478	1,973,102	2,042,985	2,081,480
Imports current	1,589,254	1,811,923	1,781,628	1,601,531	1,928,714	2,004,523	2,042,077
Difference	13,523	28,977	46,873	-39,947	-44,388	-38,462	-39,403

Statistical Discrepancy (SD)

64. The mission noted that the statistical discrepancy (SD) had switched signs and was much larger in the earlier revision period. The current price estimates of GDP are presented with a statistical discrepancy (SD), that is, the difference between GDP-P and GDP-E. This estimate may be considered as a measure of the quality of the estimates of GDP. In general terms it is desirable for the SD to be both small and unbiased. The SD should vary equally between positive and negative values.

Table 25. Kenya: Statistical Discrepancy

	2009	2015	2016	2017	2018	2019
Discrepancy previous	50.8	-211,896.4	-68,728.5	-215,715.6	-321,424.4	-351,889.4
Discrepancy current	125,018.9	-6,750.3	0.9	-49,583.3	42,186.4	9,149.8
Difference	124,968.2	205,146.1	68,729.4	166,132.3	363,610.8	361,039.1
As percentage of GDP production						
Discrepancy previous	0.0	-3.4	-1.0	-2.6	-3.6	-3.6
Discrepancy current	3.8	-0.1	0.0	-0.6	0.5	0.1
Difference	3.8	3.3	1.0	2.1	4.1	3.7

E. Officials Met During the Mission

Name	Institution
Mr. Macdonald Obudho	Director General, KNBS
Mr. Collins Omondi	Director Macroeconomic Statistics, KNBS
Mr. Benjamin Muchiri	Senior Manager, KNBS
Mr. Hiram Mbatia	Manager, National Accounts
Mr. Justin Yano Rutto	National Accounts Statistics Officer, KNBS
Mr. James Abuga	National Accounts Statistics Officer, KNBS
Ms. Lensa Apondi	National Accounts Statistics Officer, KNBS
Mr. Oliver Mukolwe	National Accounts Statistics Officer, KNBS
Ms. Doris Syombua	National Accounts Statistics Officer, KNBS

Annex I. Constant Price Crop Output Previous and Current Estimates

Maize								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	114,124.2	120,313.2	118,575.9	146,952.5	139,672.1	120,823.1	152,575.5	158,994.3
Current	135,009.5	140,693.6	140,045.4	167,282.9	155,783.1	148,469.2	172,951.6	167,255.6
Previous growth rates		5.4	-1.4	23.9	-5.0	-13.5	26.3	4.2
Current growth rates		4.2	-0.5	19.4	-6.9	-4.7	16.5	-3.3
Other cereals	2012	2013	2014	2015	2016	2017	2018	2019
Previous	19,810.5	18,327.7	26,080.3	26,886.7	27,976.0	27,965.9	35,046.6	51,625.9
Current	22,443.3	25,355.1	26,651.3	25,981.6	15,670.3	28,385.1	39,023.2	54,981.8
Previous growth rates		-7.5	42.3	3.1	4.1	0.0	25.3	47.3
Current growth rates		13.0	5.1	-2.5	-39.7	81.1	37.5	40.9
Wheat								
Previous								
Current	8,001.3	9,505.4	13,749.6	10,769.8	12,441.3	9,971.9	14,949.2	13,749.6
Current growth rates		18.8	44.7	-21.7	15.5	-19.8	49.9	-8.0
Beans								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	81,339.7	81,197.7	72,412.5	93,277.7	130,347.3	141,949.2	143,675.4	140,457.1
Current	87,337.5	98,978.3	96,821.3	102,587.5	110,501.2	106,244.2	111,927.7	123,404.4
Previous growth rates		-0.2	-10.8	28.8	39.7	8.9	1.2	-2.2
Current growth rates		13.3	-2.2	6.0	7.7	-3.9	5.3	10.3
Rice								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	4,373.0	4,490.2	5,023.8	5,364.2	5,084.4	4,640.3	5,982.3	7,623.9
Current	2,896.8	3,109.4	3,475.9	3,818.8	3,469.6	2,969.8	3,806.1	4,828.4
Previous growth rates		2.7	11.9	6.8	-5.2	-8.7	28.9	27.4
Current growth rates		7.3	11.8	9.9	-9.1	-14.4	28.2	26.9
Potatoes								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	61,052.8	84,549.3	119,582.8	136,385.1	121,860.2	149,687.8	153,716.6	169,678.9
Current	134,972.9	167,920.1	163,072.3	193,971.1	185,451.6	194,636.4	189,973.7	219,110.1
Previous growth rates		38.5	41.4	14.1	-10.6	22.8	2.7	10.4
Current growth rates		24.4	-2.9	18.9	-4.4	5.0	-2.4	15.3
Vegetables								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	146,018.9	149,704.1	154,271.4	158,381.8	161,846.0	166,202.8	171,979.1	176,754.7
Current	328,678.4	333,851.9	342,213.7	347,322.2	349,671.5	356,418.8	368,418.5	375,166.6
Previous growth rates		2.5	3.1	2.7	2.2	2.7	3.5	2.8
Current growth rates		1.6	2.5	1.5	0.7	1.9	3.4	1.8
Sugar cane, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	18,192.8	20,228.0	20,674.8	21,860.8	23,344.5	15,320.2	16,916.1	14,440.9
Current	27,216.4	31,856.1	31,036.2	34,378.6	34,378.6	22,919.1	25,306.5	21,009.2
Previous growth rates		11.2	2.2	5.7	6.8	-34.4	10.4	-14.6
Current growth rates		17.0	-2.6	10.8	0.0	-33.3	10.4	-17.0
cut flowers, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	35,182.8	35,463.4	38,871.2	42,159.7	43,534.5	51,466.7	49,560.9	50,341.4
Current	43,166.0	46,378.6	49,917.0	44,374.3	47,304.9	43,158.0	46,790.7	44,711.7
		2,013.0	2,014.0	2,015.0	2,016.0	2,017.0	2,018.0	2,019.0
Previous growth rates		0.8	9.6	8.5	3.3	18.2	-3.7	1.6
Current growth rates		7.4	7.6	-11.1	6.6	-8.8	8.4	-4.4

Other perennial crops (wattle, khat), constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	5,694.8	4,042.8	3,057.8	3,079.5	4,480.6	4,357.8	2,618.0	2,466.3
Current	12,587.3	9,666.1	8,066.7	8,169.9	10,472.0	10,466.8	7,693.9	7,533.4
		-29.0	-24.4	0.7	45.5	-2.7	-39.9	-5.8
		-23.2	-16.5	1.3	28.2	-0.1	-26.5	-2.1
Tea, not processed, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	64,767.9	75,795.8	78,018.9	69,966.7	82,902.7	77,091.1	86,403.6	80,417.0
Current	66,417.2	71,367.2	72,382.7	71,998.6	79,078.3	75,910.1	81,241.4	76,429.9
		17.0	2.9	-10.3	18.5	-7.0	12.1	-6.9
		7.5	1.4	-0.5	9.8	-4.0	7.0	-5.9
coffee, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	6,599.9	5,705.0	7,084.8	5,958.1	6,599.9	5,544.6	5,277.9	4,822.2
Current	12,855.4	14,854.0	16,749.9	14,232.4	13,315.3	10,567.8	13,372.2	9,753.2
		-13.6	24.2	-15.9	10.8	-16.0	-4.8	-8.6
		15.5	12.8	-15.0	-6.4	-20.6	26.5	-27.1
Fruit and nuts; spice crops, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	94,190.2	96,935.2	99,798.8	102,219.5	105,273.0	108,311.5	111,625.7	114,717.8
Current	213,882.6	218,805.1	225,910.1	228,791.5	233,479.5	240,253.7	247,740.5	251,289.4
		2.9	3.0	2.4	3.0	2.9	3.1	2.8
		2.3	3.2	1.3	2.0	2.9	3.1	1.4
Other non-perennial crops, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	2,599.7	2,679.3	2,700.0	2,800.5	2,836.7	2,860.4	2,866.6	2,952.1
Current	6,625.5	6,885.0	7,001.9	7,092.1	7,503.7	7,722.5	7,709.2	7,842.7
		3.1	0.8	3.7	1.3	0.8	0.2	3.0
		3.9	1.7	1.3	5.8	2.9	-0.2	1.7
Fibre crops (sisal, cotton), constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	1,649.7	1,682.2	1,398.6	1,565.8	1,038.0	1,327.2	1,386.6	1,572.7
Current	5,544.4	5,419.3	4,647.8	5,161.2	4,888.5	4,426.8	4,626.3	5,289.8
		2.0	-16.9	12.0	-33.7	27.9	4.5	13.4
		-2.3	-14.2	11.0	-5.3	-9.4	4.5	14.3
Tobacco, constant prices								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	1,533.3	1,513.0	2,975.4	2,581.3	2,549.0	2,539.5	2,572.8	3,414.0
Current	7,148.8	6,280.0	7,123.5	6,878.0	6,514.9	6,514.9	6,608.0	6,119.9
		-1.3	96.7	-13.2	-1.3	-0.4	1.3	32.7
		-12.2	13.4	-3.4	-5.3	0.0	1.4	-7.4
Total crop output								
	2012	2013	2014	2015	2016	2017	2018	2019
Previous	657,130.2	702,626.7	750,527.1	819,440.1	859,344.9	880,088.1	942,203.6	980,279.3
Current	1,114,783.4	1,190,925.1	1,208,865.4	1,272,810.6	1,269,924.3	1,269,035.0	1,342,138.5	1,388,475.6
		2,013.0	2,014.0	2,015.0	2,016.0	2,017.0	2,018.0	2,019.0
	Previous	6.9	6.8	9.2	4.9	2.4	7.1	4.0
	Current	6.8	1.5	5.3	-0.2	-0.1	5.8	3.5

Annex II. FISIM Calculation Before Adjustment

Current Prices		*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*
Government	cp	14,439	22,592	22,927	32,006	38,213	48,602	55,139	56,815
Households	cp	63,647	71,873	87,050	105,003	122,719	139,060	152,698	151,532
Unallocated	cp	114,003	124,335	144,826	167,189	182,540	178,539	181,944	199,214
FISIM Total	cp	192,088	218,800	254,803	304,198	343,472	366,202	389,782	407,561
Fees and Commissions	cp	48,490	55,151	64,999	64,212	63,802	71,681	74,881	88,435
Rentals	cp	617	698	821	815	810	918	953	1,109
Constant prices									
Government	kp	18,397	27,235	25,882	33,982	38,213	45,762	51,404	51,057
Households	kp	81,095	86,643	98,267	111,484	122,719	129,928	138,034	130,320
Unallocated	kp	145,256	149,885	163,487	177,507	182,540	167,489	167,074	175,678
FISIM Total	kp	244,748	263,762	287,635	322,972	343,472	343,179	356,513	357,055
Fees and Commissions	kp	53,813	60,055	68,335	65,470	63,802	69,785	70,976	82,181
Rentals	kp	795	841	932	859	810	872	857	986

Annex III. FISIM Calculation After Adjustment

Current Prices		*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*
Government	cp	5,672	5,510	6,408	7,292	10,474	11,312	9,883	8,907
Households	cp	72,415	82,243	100,077	122,872	160,810	186,593	197,557	193,544
Unallocated	cp	133,340	148,895	180,962	216,100	260,609	241,384	215,414	226,631
FISIM Total	cp	211,427	236,649	287,448	346,264	431,893	439,289	422,854	429,082
Fees and Commissions	cp	48,490	55,151	64,999	86,855	96,346	117,568	119,464	124,323
Rentals	cp	405	458	539	729	810	995	1,007	1,035
Constant prices									
Government	kp	7,856	7,850	8,545	9,171	10,474	11,501	12,291	12,682
Households	kp	110,906	124,329	138,261	151,668	160,810	168,144	175,830	184,353
Unallocated	kp	182,298	205,688	231,442	260,075	260,609	245,063	254,198	300,314
FISIM Total	kp	301,060	337,867	378,248	420,914	431,893	424,708	442,319	497,350
Fees and Commissions	kp	53,813	60,055	68,335	88,557	96,346	114,458	113,234	115,530
Rentals	kp	522	552	612	768	810	945	905	920