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Ghana Statistical
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REBASING OF GHANA'S NATIONAL ACCOUNTS TO REFERENCE YEAR 2006

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This Information Paper is intended to inform and clarify conceptual and methodological changes and improvements in Ghana's national accounts statistics. Statistical estimates presented in the paper are based on new or revised official statistics compiled from the best available data. Comments and suggestions are welcome.

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INTRODUCTION

National accounts aggregates are compiled at current and constant prices. These aggregates at constant prices provide important indicators for measuring growth in the activity or economy. Constant price estimates use the price relatives of a particular year, referred to as the base year, to weight together the volume components. Each base year gives a different perspective resulting from those weights.

Rebasing of national accounts series means replacing the old base year used for compiling the constant price estimates to a new and more recent base year. In principle, a change of base year in the national accounts implies (a) changing the price and quantity base for the individual price and quantity relatives, and (b) updating the weights used in aggregating the individual quantity relatives into sub-indices. At the same time, it serves to reconcile the different estimates of gross domestic product (GDP) and provides the occasion for methodological and conceptual reviews and improvements.

The Ghana Statistical Service has rebased Ghana's national accounts series from the 1993 base year to 2006. Apart from the revaluation of national accounts estimates, the reconciliation of GDP estimates compiled using three independent approaches (output, expenditure and income) in the new base year is integral to the rebasing exercise.

JUSTIFICATION FOR REBASING THE NATIONAL ACCOUNTS

Changes in current price or nominal GDP reflect the changes in total value of goods and services produced in the economy. These changes result from two effects: (i) price effects or price changes; and (ii) quantity effect or changes in the volume of economic activity. The assessment of economic growth entails the removal or adjustment of the price effect, or equivalently, the compilation of GDP at constant prices, the changes of which are often referred to as real GDP growth.

Constant price GDP estimates are essentially volume indices, which measure changes in the volume of economic activity while maintaining relative prices constant. Over time, relative prices change. The changes in the prices of goods and services subsequent to the base year will result in relative base-year price weights becoming less representative over time. For this reason, it is necessary to periodically rebase the national accounts, that is, revalue constant price GDP estimates at a new base year.

In the case of Ghana, where over the past decade deliberate efforts have been made to advance the economy to middle income status, a review of the changes in the production structure and relative prices of products would reflect the achievements to date.

Apart from changes in the economy, there has been significant advancement in the methods that need to be adopted. First, the 1968 procedure for compiling the GDP (SNA68) was replaced with a new set of recommendations, the 1993 system of national accounts (SNA93) which almost all countries have now adopted. Secondly, new data sources that better describe current economic development experiences of the country are now available to support the requirements of the new methodology and adoption of a new reference period.

International recommendations demand that resulting changes be incorporated into the compilation procedures. Such a review is indeed long overdue. The last time one was conducted was in 1993. The current national accounts estimates are therefore based on a set of procedures—methodology and scope sources—that is 17 years old. They are compiled using the system of national accounts (SNA) methodology established in 1968 (SNA 68) and reflects the data requirements of the 1993 structure of the economy. Comparability of Ghana’s GDP estimates by sectors with that of other countries is almost impossible. Considering the significant changes that have taken place in the socio-economic landscape of the country as well as in the economic structure, it is desirable to rebase the country’s national accounts estimates.

CHANGES AND IMPROVEMENTS

Apart from rebasing and reconciliation of GDP estimates, methodological improvements, conceptual changes, data revisions and improvements as well as revisions/updating of statistical classifications were introduced during the rebasing exercise. In other words, the rebasing exercise underscores the significance of the national accounts in yielding a coherent and consistent set of national economic estimates. Hence, the subsequent revisions in the national accounts estimates during the rebasing exercise serve to better reflect the changing economic conditions in recent years.

The improvements and changes carried out in this rebasing exercise can be grouped in the following categories:

- (a) Change in conceptual treatment;
- (b) Change in methodology;
- (c) Improvements and revisions in data sources; and
- (d) Updating of classification.

(A) Change in conceptual treatment

Valuation of reforestation

The natural growth of non-cultivated biological resources – natural forests, fish stocks etc. - are regarded as economic assets, but growth of these resources is not under the direct control, responsibility and management of an institutional unit and thus, is not regarded as production. It is only the end product (i.e. when harvested) that is regarded as output.

However, deliberate cultivation of trees for timber is included in the national accounts as produced asset. The output from such economic activities takes long time to be realized. According to the SNA 93 compilation guidelines, when it takes a long time to produce a unit of output, it becomes necessary to recognize that output is being produced continuously and to record it as “work-in-progress” (paragraph 6.39). It therefore recommends that, whenever a process of production extends over two or more accounting periods, it is necessary to calculate the work-in-progress completed within each of the periods in order to be able to measure how much output is produced in each period.

The GSS has adopted the SNA’s recommended treatment for forest plantations in the rebasing exercise. The change in this conceptual treatment required comprehensive review and assessment of the underlying methodology and data sources. The GSS teamed up with the Forestry Commission to undertake this exercise. Forestry Commission was brought in because over the past decade, the Commission has embarked on a number of reforestation interventions to expand the nation’s forest estate within degraded forest reserves. Data on the area established for forest plantations and value have been made available by the Forestry Commission.

The values of the plantations established as well as their yearly incremental values (work-in-progress) have been computed based on the number of years that the trees would be matured for harvesting. This subsequently increased the value added estimate for the forestry subsector.

This conceptual and methodological improvement has enhanced the conformity of our national accounts to international standards and practice.

(B) Change in methodology

Wholesale and retail trade

The estimation of the performance and growth of the wholesale and retail trade industry has been based on the commodity flow approach. While these indirect indicators provide reasonable estimates, they could not provide a basis for the disaggregation of the sub-sector into wholesale

trade and retail trade. Again it was difficult to track the flow of domestically produced traded goods since there is no index of industrial production available.

The availability of data from VAT returns which includes classification of establishments by International Standard Industrial Classification (ISIC), has made it possible to sample establishments and assign appropriate weights computed from the 2004 supply and use table (SUT). Separate estimates and deflators have, therefore, been derived for wholesale trade; retail trade of goods excluding petroleum fuels; retail sale of petroleum products, and; sale and repair of vehicles.

The adoption of these indices as the basis for our estimation, in place of the proxy indicators based on commodity flow, has resulted in an upward revision in the nominal value-added of the wholesale and retail trade industry. In addition, the reconciliation on the basis of the 2004 SUT (which covered wholesale and retail trade in food crops) has resulted in a further upward revision in the nominal value-added estimate of the industry in the reference year.

Fisheries

The simple deflation of the total value of fish catch to arrive at constant price estimates has changed. In the rebasing, the different species of fish have been weighted by their value at 2006 prices. Volume of fish catch by species have been indexed and use as the indicator for constant price estimation. Price per tonne for the different fish species have also been indexed and use as the deflator. All these have been possible due to improvements in data reporting by the Fisheries Department.

Livestock

It was very difficult to estimate for livestock in the 1993 base year series because of non-availability of data. Baseline estimate was made for the activity but indicators for extrapolation were not available. Livestock was then grouped among crops in the 1993 series.

A livestock model has been used for estimating value added in livestock production in the rebased series. The estimates take into account both the supply of animals for slaughtering and the changes in herd sizes (stocks). The adoption of this model is in line with the methodology recommended by SNA '93 for estimating livestock output and value added.

Multiple indicators use as extrapolators

Mostly, single indicators have been used to make forward estimates for sub-sectors in the 1993 base year series. This may be appropriate for years closer to the base year. These indicators became less representative as changes in relative prices and weights occur over time.

Multiple indicators for extrapolation have been selected for all subsectors in the rebased series.

(C) Improvements and revisions in data sources

The revision of the national accounts estimates incorporated a lot of data from surveys conducted in periods in and around the reference year. The main ones are the 2003 national industrial census, the fifth round of the Ghana Living Standards Survey (GLSS 5) conducted in 2005/2006, and the 2007 small scale road and lake transport survey. All these surveys provided input-output details of different economic activities in recent times.

Data sources and coverage have been improved, paving way for more disaggregated national accounts. The use of VAT data (an important source of economic statistics worldwide), consolidated profit and loss accounts of the banking industry, outbound and inbound call volumes from the telecommunication companies etc. have improved the quality of data for national accounts estimation.

An important inclusion to the rebased series is the activities on crude oil extraction. The economic value of exploration and the development of the oil fields have been incorporated. Exploration activities have been treated as research and development while the development of the oil fields is part of construction. Both activities also form part of gross fixed capital formation.

The availability of income and social security data of about 28,000 establishments provided by the Social Security and National Insurance Trust (SSNIT) have made it possible to compile GDP by the income approach.

(D) Updating of classification

Components of the Services sector

The previous classification of the Services sector, which has been based on the earlier 1968 SNA, has been updated to bring it in line with the latest version of the International Standard Industrial Classification (ISIC) revision 4. The updated classification (Table 1) provides for more disaggregation of activities by purpose.

The updating of the Services sector classification will enhance the international comparability of the Services sector components in our national accounts.

The updating has impacted on the level of GDP, as a wider coverage of activities and more detailed data had been used to estimate for the disaggregated components.

Table 1: Comparison of SNA 68 and SNA 93 classification of Services sector

SNA 68 Classification		SNA 93 Classification with ISIC rev 4	
1	Wholesale and Retail Trade, restaurants and hotels	1	Wholesale and retail trade, repair of motor vehicles, motorcycles and household goods
		2	Hotels and Restaurants
2	Transport, Storage and Communications	3	Transport and Storage
		4	Information and communication
3	Finance, insurance, real estate and business services	5	Financial Intermediation
		6	Real Estate Services
		7	Business and other service activities
4	Government Services	8	Public Administration and Defence; Compulsory Social Security
		9	Education
		10	Health and Social Work
5	Community, social and personal services	11	Other Community, Social and Personal Service Activities
6	Producers of private on-profit services		

*Private consumption expenditure***Table 2: Comparison of SNA 68 and SNA 93 classification of PCE**

SNA 68 classification		SNA 93 classification	
1	Food and Beverages	1	Food and Non-Alcoholic Beverages
		2	Alcoholic Beverages and Tobacco
2	Clothing and Footwear	3	Clothing and Footwear
3	Rent and Utilities	4	Housing and Utilities
4	Furniture and Household Equipment	5	Furnishing, Household Equipment and Maintenance
5	Medical Services	6	Health
6	Transport and Communication	7	Transport
		8	Communication
7	Recreation and Education	9	Recreation and Culture
		10	Education
8	Other good and Services	11	Restaurants and Hotels
		12	Miscellaneous Goods and Services

The 1993 SNA's recommended Classification of Individual Consumption by Purpose (COICOP) has been used to classify private consumption expenditure (PCE) instead of the SNA 68 version.

The updated classification (Table 2) provides for the classification of more purposes (e.g. by its separate identification of the fast-growing communications segment), and re-classifies some PCE components.

The updating of the PCE classification, however, had no impact on the level and growth rate of overall PCE estimates.

CHANGES IN GDP ESTIMATES AFTER THE REBASING

The revisions arising from the rebasing exercise are not entirely due to the reconciliation of the GDP estimates and the revaluation of the national accounts to the new base year. As explained above, revisions arise also from the methodological and conceptual changes introduced as well as from improvements in data coverage and data sources.

The GDP estimates for 2006 from the rebasing is GH¢ 18,705.1 million against the published estimate based on the 1993 series of GH¢ 11,671.97 million. This translates into an increase of 60.3 percent in the level of the GDP due to the rebasing. The changes in nominal GDP resulted in corresponding changes in the per capita GDP. Box 1 gives a comparison of the GDP per capita for the new (2006 base year) and old (1993 base year) series.

Box 1: GDP per capita for new and old GDP series					
	GDP New Series				
	2006	2007	2008	2009	2010*
GDP (GH¢ million)	18,705	23,154	30,179	36,867	44,799
Cedi/dollar rate	0.92	0.94	1.07	1.42	1.42
GDP (\$ million)	20,331.61	24,632.39	28,204.30	25,962.98	31,548.40
Population estimate (million)	21.88	22.39	22.9	23.42	23.93
Per capita (GH¢)	854.89	1,034.14	1,317.84	1,574.19	1,872.07
Per capita (\$)	929.23	1,100.15	1,231.63	1,108.58	1,318.36
	GDP Old Series				
	2006	2007	2008	2009*	2010*
GDP (GH¢ million)	11,671.99	14,045.85	17,451.60	21,746.80	25,602.5
Cedi/dollar rate	0.92	0.94	1.07	1.42	1.42
GDP (\$ millions)	12,686.95	14,942.39	16,309.91	15,423.26	18,029.90
Population estimate (million)	21.88	22.39	22.9	23.42	23.93
Per capita (GH¢)	533.45	627.33	762.08	928.56	1,069.89
Per capita (\$)	579.84	667.37	712.22	658.55	753.44
<i>*Provisional</i>					

The methodological changes, incorporation of new data sources and the improvements of existing data sources affected the relative shares of sectors in the GDP. Agriculture, which had the largest share in the 1993 series, has been overtaken by Services. Industry still remains the least contributor to the GDP, and its share of GDP has been declining since 2006. On the other hand, the share of Services has been increasing since 2006 (Table 4).

Table 4: Percentage share of GDP (at basic prices) by sector

Year	Old Series			New Series		
	Agriculture	Industry	Services	Agriculture	Industry	Services
2006	38.8	28.3	32.9	30.4	20.8	48.8
2007	37.6	28.2	34.2	29.1	20.7	50.2
2008	37.0	28.3	34.7	31.0	20.4	48.6
2009	37.7	27.2	35.1	31.7	18.9	49.5
2010*	35.6	28.3	36.1	30.2	18.6	51.1

* Provisional

One of the important measures of economic performance, the real growth rate, was also affected. Comparison between the old and new growth rates is shown in Table 5. The rebased series had higher growth rates than the old series.

Table 5: Real GDP growth rates before and after rebasing

Year	Before rebasing				After rebasing			
	Agriculture	Industry	Services	GDP	Agriculture	Industry	Services	GDP
2007	2.5	5.1	10.0	5.7	-1.7	6.1	7.7	6.5
2008	6.0	8.1	9.3	7.2	7.4	15.1	8.0	8.4
2009	6.3	0.3	5.5	4.1	7.6	4.5	6.8	4.7
2010*	4.8	7.0	6.1	5.9	4.8	6.0	8.2	6.6

*Provisional

Estimating GDP by final expenditure approach

Estimating for the demand side of the economy has been re-introduced after its suspension in 2000 due to technical reasons. Private consumption expenditure (PCE) which was estimated as a residual in the old series, has been calculated directly in the rebased estimates.

Estimating GDP by income approach

Included in the rebasing exercise is the computation of GDP by adding together the income components of value added (primary income). Primary income is the kind of income derived

from factors of production (i.e. labour and capital, including financial and non-financial produced and non-produced capital) and government power to tax.

Primary income is generated in the production activity of resident producers and distributed mostly to other residents and partly to non-residents. GDP by income approach covers only the incomes generated within the domestic economy.

CONCLUSION

The successful completion of this rebasing exercise has improved the coherence and reliability of our GDP estimates in recent years and enhances its relevance to the underlying and changing economic conditions. The enhancements in the concepts, methodologies and data sources, has further strengthened our existing statistical framework that underpins the compilation of national accounts.

Appendix 1: Gross Domestic Product at 2006 Constant Prices (in millions of Ghana Cedis)

ACTIVITY	2006	2007	2008	2009	2010*
1. AGRICULTURE	5,415.0	5,322.0	5,716.1	6,148.1	6,445.2
1.1 Crops	3,793.7	3,742.6	4,064.5	4,479.4	4,703.4
<i>of which Cocoa</i>	537.2	493.2	509.1	534.5	559.1
1.2 Livestock	437.1	457.8	481.1	502.2	525.5
1.3 Forestry and Logging	736.0	705.9	682.4	706.3	733.2
1.4 Fishing	448.3	415.8	488.0	460.2	483.2
2. INDUSTRY	3,704.3	3,929.6	4,521.9	4,724.7	5,008.5
2.1 Mining and Quarrying	497.4	531.6	544.4	581.2	646.3
2.2 Manufacturing	1,823.5	1,801.3	1,868.0	1,843.6	1,882.3
2.3 Electricity	142.7	118.2	141.1	151.7	177.0
2.4 Water and Sewerage	224.4	227.0	228.9	246.4	250.8
2.5 Construction	1,016.3	1,251.6	1,739.5	1,901.9	2,052.1
3. SERVICES	8,690.4	9,358.3	10,106.0	10,791.3	11,680.1
3.1 Trade; Repair of Vehicles, Household Goods	1,140.7	1,202.6	1,316.9	1,347.1	1,470.1
3.2 Hotels and Restaurants	894.1	916.6	999.8	1,061.0	1,180.9
3.3 Transport and Storage	2,357.2	2,573.4	2,671.9	2,790.1	2,926.9
3.4 Information and communication	483.0	502.8	600.9	690.4	825.8
3.5 Banking and Insurance	472.9	559.8	620.1	677.9	768.1
3.6 Real estate services	391.4	400.8	410.4	420.3	430.3
3.7 Business and other service activities	522.5	542.7	532.8	524.5	575.4
3.8 Public Administration & Defence; Social Security	862.1	959.6	1,081.8	1,208.2	1,300.6
3.9 Education	655.0	720.5	814.3	914.9	979.9
3.10 Health And Social Work	249.8	259.3	270.8	311.8	337.4
3.11 Other Community, Social & Personal	661.6	720.3	786.3	845.1	884.8
Gross Domestic Product at basic prices	17,809.7	18,609.9	20,343.9	21,664.1	23,133.9
Net Indirect Taxes	895.4	1,303.4	1,248.3	933.8	960.0
Gross Domestic Product in Purchasers'	18,705.1	19,913.4	21,592.2	22,597.9	24,093.9
* Provisional					

Appendix 2: Gross Domestic Product in Current Prices (in millions of Ghana Cedis)

ACTIVITY	2006	2007	2008	2009	2010**
1. AGRICULTURE	5,415.0	6,319.8	8,875.0	11,379.1	13,036.7
1.1 Crops	3,793.7	4,408.8	6,435.0	8,425.3	9,421.5
o.w Cocoa	537.2	580.9	706.4	873.8	1,149.8
1.2 Livestock	437.1	501.0	606.5	729.1	873.1
1.3 Forestry and Logging	736.0	910.2	1,071.5	1,350.3	1,706.6
1.4 Fishing	448.3	499.8	762.0	874.4	1,035.5
2. INDUSTRY	3,704.3	4,513.5	5,854.5	6,775.7	8,042.5
2.1 Mining and Quarrying	497.4	601.6	693.2	740.0	822.9
2.2 Manufacturing	1,823.5	1,990.5	2,276.7	2,478.4	2,791.1
2.3 Electricity	142.7	130.0	155.2	166.9	276.4
2.4 Water and Sewerage	224.4	227.0	228.9	246.4	250.8
2.5 Construction	1,016.3	1,564.5	2,500.5	3,144.0	3,901.2
3. SERVICES	8,690.4	10,921.6	13,934.6	17,777.1	22,068.5
3.1 Trade; Repair Of Vehicles, Household Goods	1,140.7	1,334.9	1,710.3	2,046.9	2,524.2
3.2 Hotels and Restaurants	894.1	1,209.9	1,715.6	2,421.4	3,099.3
3.3 Transport and Storage	2,357.2	2,848.8	3,262.5	3,757.7	4,445.6
3.4 Information and communication	483.0	511.4	621.5	726.2	883.4
3.5 Financial Intermediation	472.9	738.9	1,088.7	1,547.2	2,173.8
3.6 Real estate services	391.4	415.2	493.2	665.2	796.9
3.7 Business and other service activities	522.5	602.4	691.9	797.0	1,023.0
3.8 Public Administration & Defence; Social	862.1	1,289.4	1,799.0	2,478.7	2,935.1
3.9 Education	655.0	855.9	1,131.8	1,505.6	1,909.4
3.10 Health And Social Work	249.8	308.0	380.9	513.2	649.7
3.11 Other Community, Social & Personal Service Activities	661.6	806.8	1,039.2	1,317.8	1,628.1
Gross Domestic Product at basic prices	17,809.7	21,754.9	28,664.1	35,931.9	43,147.7
Net Indirect Taxes	895.4	1,399.6	1,514.5	935.6	1,651.0
Gross Domestic Product in Purchasers' Value	18,705.1	23,154.4	30,178.6	36,867.4	44,798.7
* Provisional					

Appendix 3: Growth rates in real Gross Domestic Product

ACTIVITY	2007	2008	2009	2010*
1. AGRICULTURE	-1.7	7.4	7.6	4.8
1.1 Crops	-1.3	8.6	10.2	5.0
<i>of which Cocoa</i>	-8.2	3.2	5.0	4.6
1.2 Livestock	4.7	5.1	4.4	4.7
1.3 Forestry and Logging	-4.1	-3.3	3.5	3.8
1.4 Fishing	-7.2	17.4	-5.7	5.0
2. INDUSTRY	6.1	15.1	4.5	6.0
2.1 Mining and Quarrying	6.9	2.4	6.8	11.2
2.2 Manufacturing	-1.2	3.7	-1.3	2.1
2.3 Electricity	-17.2	19.4	7.5	16.7
2.4 Water and sewerage	1.2	0.8	7.7	1.8
2.5 Construction	23.1	39.0	9.3	7.9
3. SERVICES	7.7	8.0	6.8	8.2
3.1 Trade; Repair Of Vehicles, Household Goods	5.4	9.5	2.3	9.1
3.2 Hotels and Restaurants	2.5	9.1	6.1	11.3
3.3 Transport & Storage	9.2	3.8	4.4	4.9
3.4 Information and communication	4.1	19.5	14.9	19.6
3.5 Financial Intermediation	18.4	10.8	9.3	13.3
3.6 Real estate services	2.4	2.4	2.4	2.4
3.7 Business and other service activities	3.9	-1.8	-1.6	9.7
3.8 Public Administration & Defence; Social Security	11.3	12.7	11.7	7.6
3.9 Education	10.0	13.0	12.4	7.1
3.10 Health and Social Work	3.8	4.4	15.2	8.2
3.11 Other Community, Social & Personal Service Activities	8.9	9.2	7.5	4.7
Gross Domestic Product in Purchasers' Value	6.5	8.4	4.7	6.6

*Provisional