

1. Revising GDP estimates in Sub-Saharan Africa: Lessons from Ghana

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Abstract

The upward revision of GDP in Ghana, announced in November 2010, attracted considerable attention in the media, in the development community, and from development scholars. This paper clarifies what caused this upward revision and discusses how the revision was handled. Many other countries have outdated base years and do not utilize data sources fully. They can learn from the Ghanaian experience and improve the accuracy of the most important metric for macroeconomic evaluations. This paper also offers a perspective on how the media and popular opinions are best managed in a careful and transparent process.

Key words: *National Income Accounting, Rebasement, Data Quality, Statistical Capacity*

Révision des estimations du PIB en Afrique subsaharienne : enseignements tirés au Ghana

Résumé

La révision à la hausse du PIB du Ghana, annoncée en novembre 2010, a suscité une attention considérable dans les médias et parmi les acteurs et chercheurs du développement. Le présent article apporte un éclairage sur les causes qui sous-tendent cette révision à la hausse et examine comment elle a été gérée. De nombreux autres pays s'appuient sur des années de base caduques et n'exploitent pas pleinement les sources de données. Ils peuvent tirer des enseignements de l'expérience ghanéenne et accroître la précision de l'indicateur le plus important des évaluations macro-économiques. L'article donne également son point de vue sur la meilleure manière de gérer les médias et l'opinion publique, avec prudence et transparence.

Mots clés : *comptabilité nationale, rebasement, qualité des données, capacité statistique*

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1.0 INTRODUCTION

In November 2010, the Ghana Statistical Service announced an upward revision of the country's total GDP by more than 60%.³ In current US dollars, GDP per capita rose from about \$550 to about \$1,100. The revision was widely discussed in the media and internet forums across Ghana (Moss 2010). Internationally, it was reported by news agencies such as Reuters (Kpodo 2010), and soon attracted comment from development scholars (Kenny and Sumner 2011) and the international financial community (Devarajan 2011). The revision is now official, and in the new world income tables, Ghana is recognized as a lower-middle-income country rather than a poor country as it had previously been classified (World Bank 2011). Ghana's example is important, as a similar GDP revision is pending in Nigeria (Ohuocha 2011).

This paper reviews some of the controversy that the revision caused in development circles and clarifies the reasons for the revision. Also, an explanation of how the process was handled by Ghana Statistical Service in collaboration with major national and international stakeholders is provided. Finally, the paper draws general lessons from the Ghanaian experience that may assist other statistical offices in Africa in conducting future GDP revisions through a careful and transparent process.

2.0 MEDIA REACTION

On November 5, 2010, the Ghana Statistical Service announced that the country's GDP for 2010 was 44.8 billion cedi, compared with the previous estimate of 25.6 billion cedi.⁴ This meant an increase in the income level of Ghana by about 60%. Ghana moved from being classified as a low-income to a middle-income country overnight (Ghana Statistical Service 2010).

On the Center of Global Development blog pages, African development expert, Todd Moss, observed: "Boy, we really don't know anything" (2010). Given this margin of error in the GDP estimate for Ghana (arguably, the most studied country on the continent), he raised doubt about economic statistics from other African countries. Adding further to the sense of bewilderment, the revision prompted the World Bank Chief Economist for Africa, Shantayanan Devarajan, to declare Africa a statistical tragedy (2011).

3 For 2006, 60% refers to the increase in the share in total "new" GDP. If the percentage change is measured as a share of the "old" GDP, the increase is closer to 100%.

4 Provisional estimates for 2010; the 60% revision in the press release refers to the base year of 2006.

The news was met with equal confusion in Ghana. According to the local media, the Resident Coordinator for the United Nations Development Programme dismissed the new classification as a statistical hypothesis, and contended that, in terms of its progress toward achievement of the Millennium Development Goals, Ghana should still be classified among the poorest countries in the world (*Enquirer* 2011).

The question of whether the upward revision of GDP was politically motivated might arise. During his 2008 campaign, John Atta Mills, the current president, promised to take Ghana to middle-income status by 2020. However, no evidence suggests that the revision was a result of political tampering. According to the World Bank, the revision was done according to global standards of national accounting. The World Bank also reported that the rebased national accounts followed a review of the underlying statistical methodology by International Monetary Fund (IMF) advisors. On July 1, 2011 the World Bank approved the revised estimates, and Ghana was officially reclassified as a low-middle-income country (World Bank 2011a).⁵

Upward revisions stemming from changes in outdated base years are common in developed countries such as the United States (Runkle 1998). In retrospect, what was surprising was about Ghana's GDP revision was that it was well-publicized, widely discussed, and conducted in a transparent manner. The 60% increase and the shift from a poor to a middle-income country are certainly remarkable, but not unique. A recent survey by Statistics South Africa found that a majority of Sub-Saharan African economies have base years that are more than a decade old,⁶ many of them older than Ghana's previous base year of 1993. Therefore, similar revisions in other countries may reasonably be expected in the near future. To explore this possibility, the causes of Ghana's revision are examined more closely.

3.0 WHAT CAUSED THE UPWARD REVISION?

In his keynote address to the IARIW-SSA conference on "Measuring National Income, Wealth, Poverty and Inequality in African Countries," Shantayanan Devarajan, World Bank Chief Economist for Africa, stated that the main cause for the revision was the upgrade from the 1968 version of the System of National Accounts (SNA) to the 1993 version (Devarajan 2011). This, is, however, only

5 A status it was granted simultaneously with Zambia.

6 The survey used the term, "base year" was used. The term, "benchmark year," is often used instead to distinguish it from "reference year" (which refers to the base for prices); "base year" refers to the base for volume estimates.

part of the story; the major increase in the estimates came from the inclusion of new data and a rebasing of sector weights' contribution to GDP, thereby taking account of structural changes in the Ghanaian economy since 1993.⁷

Before the revision, the Ghana Statistical Service had evidence that GDP was substantially underestimated. The collapse of many state-owned enterprises and the divestiture of others meant that the registry of businesses was out of date and that the national accounts failed to update the base year index to capture the output of new companies. Results of the 2003 National Industrial Census showed that published GDP estimates for the manufacturing sector were far lower than the estimates yielded by the Census,⁸ and lower than the numbers derived from value added tax (VAT) receipts. Additionally, many activities in the services sector (for example, community and personal services, recreation, media activities, professional services) were simply not covered. Finally, there was cause to suspect underestimation at the aggregate level. Ratios such as revenue/GDP, tax/GDP and expenditure/GDP were far higher for Ghana than for most sub-Saharan African countries, indicating that the GDP estimate was too low.

The changes implemented in the rebasing exercise can be grouped into: (a) change in conceptual treatment; (b) change in methodology; (c) improvements and revisions in data sources; and (d) updating classification. While the first two receive considerable attention in national accounting manuals and handbooks,⁹ for Ghana, it was the availability of new data that mattered.

The revision of the national accounts estimates incorporated a considerable amount of data from surveys conducted in and around the reference year, each of which provided recent input-output details for different economic activities. The main sources of new data are the 2003 National Industrial Census, the 2005/2006 Ghana Living Standards Survey (GLSS 5), and the small-scale 2007 road and lake transport survey.¹⁰ Thus, these new sources improved coverage, paving the way for more disaggregated national accounts. Furthermore, use of VAT data (an important source of economic statistics worldwide), consolidated profit and loss accounts from the banking industry, outbound and inbound call volumes from the telecommunica-

7 "Rebasing" refers to a change in the base year for volume estimates, which may cause changes in growth (depending on how the index number problem is handled). "Revision" implies that the estimates are upgraded with new data. In this case, both took place simultaneously.

8 Unpublished internally circulated calculations based on the 2003 Census.

9 As in the OECD handbook, *Measuring the Non-observed Economy*, Paris, France, 2002.

10 This transport survey was conducted expressly for the rebasing and has not been published.

tion companies, etc. contributed to improvement in the quality of data for national accounts estimation.

Classification of the services sector, which was based on the 1968 SNA, was brought in line with the 1993 SNA's recommendations, and revision 4 of the International Standard Industrial Classification was adopted. This update allowed for wider coverage of activities previously not taken into account. Rebasings also allowed for inclusion of preparatory activities involved in crude oil production (including the exploration and development of oil wells).

Table 1: Percentage share of GDP (at basic prices), by sector, 2006 to 2010

Year	Old series			New series (rebased)		
	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

Source: Table 4, Ghana Statistical Service (2010), *Information Paper on Economic Statistics: Rebasings of Ghana's National Accounts to Reference Year 2006*, November 10.

*Provisional

The revision meant not only overall expansion in all sectors of the economy, but a shift in the relative economic importance of the sectors (Table 1). In the old series, from 2006 to 2010, agriculture accounted for 35.6% to 38.8% of the economy, but in the new series, this sector accounted for 29.1% to 31.7%. The old series showed agriculture to be the largest sector of the economy in every year but one. By contrast, the new rebased accounts show the service sector to be dominant. This structural shift, which was emerging in the old accounts, is more visible in the new accounts. In retrospect, it is plausible that service sector growth has been strong, but that its contribution to economic growth was underreported in the old series.

The opposite dynamics emerge for the industry sector, which is less important in the new than the old series. Moreover, slow growth in this sector probably contributed more to the slow aggregate growth estimates than did correction of its weight.

Table 2: Comparison of value added, old and new estimates, 2006

Rebased (new) series		Old series	
New classification	Value added	Old classification	Value added
<i>Agriculture</i>			
Crop production (including cocoa)	3,793.70	Crops and livestock	2,371.62
Cocoa only	537.20	Cocoa production and marketing	842.19
Livestock production	437.10		
Forestry	736.00	Forestry and logging	432.20
Fishing	448.30	Fishing	511.66
Agriculture GDP	5,415.03		4,157.66
<i>Industry</i>			
Mining and quarrying	497.40	Mining and quarrying	594.85
Manufacturing	1,823.48	Manufacturing	988.59
Production and distribution of electricity	142.70	Production and distribution of electricity, gas and water	364.69
Water and sewerage	224.40		
Construction	1,016.30	Construction	1,082.52
Industry GDP	3,704.30		3,030.60
<i>Services</i>			
Trade; Repair of vehicles, household goods	1,140.70	Wholesale and retail trade; Hotels and restaurants	533.98
Hotels and restaurants	894.08		
Transport and storage	2,357.20	Transport, storage and communications	824.06
Information and communications	483.00		
Financial Intermediation	472.86	Finance, insurance, real estate	519.59
Real estate services	391.40		
Business and other service activities	522.53		
Public administration and defence; Social security	862.14	Government services	1,255.83
Education	654.96	Community, social and personal services	204.11

Rebased (new) series		Old series	
New classification	Value added	Old classification	Value added
Health and social work	249.84	Producers of private non-professional services	69.31
Other community, social and personal service activities	661.62	Other services	282.70
Services GDP	8,690.38		3,690.00

A direct comparison of the old and new sector estimates for each year is not possible, but the two price estimates for 2006 can be compared. Because the 2006 rebasing also meant a new nomenclature consistent with the methodology update, a sector-by-sector comparison is not possible. Nonetheless, Table 2 illustrates where the revision originated.

Most of the revision (72%) originated in the service sector; 10% was due to increases in the industry sector; and the remaining 18% came from the agriculture sector. The relatively minor share of the revision originating in the industry sector is, of course, a reflection of its small share of the economy. And while the estimate for manufacturing almost doubled, the estimates for construction, water and electricity, and mining and quarrying were largely unchanged. Within the agriculture sector, non-cocoa crop production accounted for most of the increase.

The major change in the new estimates is the increased role of services, particularly for Trade/Repair of vehicles, household goods; Hotels and restaurants; Transport and storage; and Information and communications. Value added in these sectors is now almost five times higher than in the old aggregation of Wholesale and retail trade/Hotels and restaurants and Transport, storage and communications. In fact, these two former sectors alone made up 50% of Ghana's total GDP increase. New data from the Industrial Census, VAT records, the Ghana Living Standards Survey, and other ad hoc surveys account for the classification of Ghana as a middle-income rather than a poor country.

4.0 THE REVISION PROCESS

The possibility that Ghana's GDP was underestimated has been an issue for some time. In 2004, a public debate arose about the estimate of per capita income. At that time, the World Bank reported the figure to be US\$380,

whereas President Kufuor stated that the correct figure was US\$600, and Finance Minister Wiredu put it closer to US\$1,000. President Kufuor stated that the Ghana Statistical Service lacked the resources to calculate these statistics (Ghanaian Chronicle 2005).

At the Ghana Statistical Service, work toward a rebasing of the national accounts had begun in 2002, when the IMF contracted one of its advisors to undertake the exercise. However, by 2006, the outcome was not conclusive, as large discrepancies existed between the results of the production, expenditure and income approaches used to compile GDP estimates. The IMF advisor cited lack of data as the cause of the discrepancies, and the IMF terminated the contract.

In 2007, a supply and use table with reference year 2004 was constructed to aid the building of a social accounting matrix for Ghana under the Transport Sector Programme Support sponsored by the Danish International Development Agency. The supply and use table employed all data that were available in 2006.

In 2008, the estimates from this supply and use table exercise were reviewed with newly available data (for example, for crude oil and reforestation) and updated to include 2006 as a reference year. A draft of rebased GDP estimates with 2006 as the base year was prepared. The IMF was invited to review the rebasing process. The IMF report endorsed the methodology used, but recommended further investigation of the estimates for some activities. All comments were incorporated, and in September, 2008, another request for review was made to the IMF. In 2009, an expert identified additional areas of concern and recommended further review. A final review by this expert in October, 2010 concluded that the rebasing work was complete. The rebasing and upward revision were announced in November, 2010.

Thus, the revision extended over a long period. Initial calculations and moves toward a rebased national accounts series were made as early as 2002, but at that time, the data needed for a complete revision were not available. President Kufuor's statements to the press in 2004 indicate that the political leadership and the bureaucracy were aware that the GDP estimates did not reflect economic realities in Ghana, but that they were dependent on: a) resources being made available for data collection, and b) experts from international organizations to give credibility to the new methods of estimation.

Although the revision was made official in November, 2010, news of the impending change had circulated among stakeholders before this date. In his

report to the IMF after the review of the rebased estimates, the IMF expert indicated the possibility of a substantial change in the GDP—information that was posted on the IMF website. The Ghana Statistical Service also prepared a paper for the Minister of Finance and Economic Planning on the need to rebase and on what the macroeconomic indicators would look like under the assumption of a 50% increase in GDP.

5.0 LESSONS FROM GHANA

What is the likelihood of similar GDP revisions in Sub-Saharan Africa in the immediate future? A recent survey of 48 countries (13 did not respond) found that 19 of them have a base year within the last decade (2001 or later) (Jerven 2011a; Jerven 2011b). According to the IMF Statistics Department, the international best practice is to rebase every fifth year, but only 7 countries (Burundi, Ghana, Malawi, Mauritius, Niger, Rwanda and Seychelles) have followed this recommendation. Most statisticians in national accounts agencies replied affirmatively to the question: “Do you think that GDP is underestimated today?” Out of 23 countries surveyed, only Lesotho and Namibia were satisfied that GDP estimates covered the whole economy; representatives from 18 countries responded that GDP was underestimated.

Media reports indicate that a revision on the scale of Ghana’s is underway in Nigeria (Oluoch 2011). However, as illustrated in Ghana, the road from official acknowledgement of underestimation to official World Bank approval of revised GDP estimates can be long. Moreover, it is essential that the process not be undertaken hastily, and that it be the result of independent evaluation and consultation. Similar endeavours in Liberia and Burundi have not succeeded in getting official endorsement from the World Bank or IMF data groups (Duncan 2011).¹¹

In conclusion, similar revisions should and will probably be undertaken across Sub-Saharan Africa in the immediate future. The case of Ghana is unique in that the revision was well-documented and widely discussed.

While Deverajan characterized the revision as a “Statistical Tragedy” (2011), it could be argued that the real tragedy is that the causes underlying the revision have been misunderstood and obscured in some discussions following the announcement. In fact, the revision is “good news,” particularly for Ghana.

11 Personal communication with the Institut de Statistiques et d’Études Économiques, Burundi, February, 2011.

The bad news is that it may confuse data users who depend on comparable income tables for Sub-Saharan Africa. A ranking of African economies by GDP levels cannot be taken at face value. Current income tables reflect an uneven application of statistical methods, data availability, and country level. The most recent country level estimates reported in international databases are, in large part, automatic data permutations, and the differences are as likely to reflect statistical methodology as economic reality.

Thus, the problem arising from this revision is comparability across time and geography. The addition of new information changed past growth dynamics in the Ghanaian dataset, but where and when this large increase in GDP occurred remains unresolved—challenging analyses lie ahead for economic historians (Jerven 2012). Economists must exercise caution in using series that have been spliced together (Jerven 2010a). When similar revisions took place in Tanzania, mistakes that were made were carried into statistical tables used by econometricians (Jerven 2011c). Similarly, comparisons of country-level per capita estimates are unlikely to be useful (Jerven 2010b); without knowledge of the methods and data underlying the estimates, such comparisons are misleading. Ghana points the way forward in GDP revisions.

The main lesson for other GDP revisions across Sub-Saharan Africa is that data matter more than methods. Complete and meaningful revisions can take place only when data availability is improved. Many countries can use consumption information from new household budget surveys and living standard surveys. Ideally, such data should be complemented by industrial and agricultural surveys. However, as demonstrated by Ghana, statistical offices can make good use of VAT receipts.

The priority in a revision is, of course, numerical validity—getting the new estimates right. But the validity of a new GDP estimate goes beyond accuracy to involve credibility of the numbers that are produced. In the case of Ghana, an open and transparent process fostered this outcome, particularly in explaining why the revision took place.

REFERENCES

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