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African growth miracle or statistical tragedy?

Interpreting trends in the data over the past two decades

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Abstract: This paper reviews the current problems of national accounting in Sub-Saharan Africa. With the current uneven application of methods and availability of data, any ranking of countries according to gross domestic product levels is misleading. It is increasingly acknowledged that the problems associated with national accounts in Africa may have caused growth to be underestimated, and there are concerns that gross domestic product does not capture or cohere with concurrent trends on poverty and wealth from other surveys. It is argued that this varies from country to country, and that in some countries current wealth is underestimated, whereas in others recent growth is overestimated.

Keywords: economic growth, national income accounting, Sub-Saharan Africa
JEL classification: E01, N17

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1 Introduction

The paper discusses three problems in the African growth and income data. First, many countries are using outdated base years for their accounts, and this means that in many economies gross domestic product (GDP) levels are currently grossly understated. Second, there are some economies that have recently updated their base years. These upward revisions, such as the one in Ghana (Jerven and Ebo Duncan 2012), are adding to the recent very high growth rates reported for Sub-Saharan Africa (SSA). Finally, the paper discusses the problem of the underlying uneven availability of data. It is shown that while some GDP estimates are aggregated on reasonable bases, many are guesstimates. Consequently this paper suggests that (i) statistical capacity-building efforts should not be guided by this uneven application of methods and (ii) that datasets disseminated by institutions such as the World Bank should contain information that alerts the user about this level of unreliability of the estimates.

The paper uses data from a recent survey of methods and data for GDP estimation in African economies (Jerven 2013a; AfDB 2013; IMF 2013). Data collected from national statistical offices are compared with those available from the World Bank database. The paper also reviews the recently suggested alternative measures, such as taking asset or consumption data from household budget data, or asset information from similar surveys. It is argued that there is a discord between GDP production figures, survey-based income data and the alternative measures such as those using asset data, and that these measures seem to be telling us quite different stories about economic development in Africa during the past decade or two. It is shown that this question is better approached on a country by country basis, and this paper makes the first systematic effort of mapping the countries where recent growth is overstated and those where recent GDP levels are currently understated.

The paper is organized as follows. First, the paper reviews the debate on the 'African growth miracle' and the 'African statistical tragedy'. Second, it lays out the current landscape of economic statistics in SSA. In the third section the paper puts forward the author's own argument, i.e., that published accounts, with a few exceptions, are underestimating GDP levels. This has implications for the current growth evidence. Most importantly, current and recent economic growth has been overstated for most African economies. One way of reconciling the conflicting evidence on wealth, expenditures and production growth is that most African economies currently are richer than we are led to believe by the GDP estimates. The continent is growing at a slower rate than we are told by the same evidence. Finally, in the concluding remarks, the study sketches out the implications of the knowledge problem for data users, data disseminators and data producers. The knowledge problem in African development statistics has been well documented—particularly with regard to GDP data.[1] The central contribution here is to evaluate the effect of the known measurement problem in GDP which could be remedied by scholars using alternative methods, and how the problems in measuring economic growth also affect studies on poverty reduction and income inequality.

2 Between the African growth miracle and the African statistical tragedy

Is Africa rising? According to most available datasets GDP growth rates are on the rise in most African economies, and have been rising since the mid-1990s (McKay 2013). But these official datasets have been demonstrated to be invalid and unreliable (Jerven 2013a). Young (2012: 698) constructs an alternative set of accounts based on asset data for a sample of 29 SSAn countries, and finds that 'that real household consumption in SSA is growing between 3.4 and 3.7 per cent

[1] See Jerven (2014a, 2013a).

per year, that is, three and a half to four times the 0.9-1.1 per cent reported in international data sources'. But Young's sample is biased in that it is based on demographic health surveys (DHS), which are conducted only in countries that were relatively peaceful.[2] The most important shortcoming of Young's analysis is that assets are not a perfect proxy for expansion in income, production or expenditures. Flows are different from stocks. Nevertheless, his investigation is still very useful in that it draws our attention to three very important issues.

First of all, it makes clear that the national accounts may have missed something. This is extremely likely. As the author has shown in a recent book, most national accounts are compiled on a very meagre data basis (Jerven 2013a). In many countries the benchmark or base years for national accounts are so out of date that they do not capture much real information on the large informal sector. And more specifically, they miss information on food production, and urban and rural small- and medium-sized enterprises. Indeed, in many countries the coverage of what we would call the formal sector is also patchy. This is caused by outdated benchmark shares, obsolete business registers, incomplete recording of the external sector and a simple dearth of regular primary data for national accounts compilers (Jerven 2013b). Thus, it is abundantly clear that the data sources currently available to most national accounting departments in SSAn economies do not capture economic growth properly, and furthermore that the published GDP per capita level estimates are not adequate reflections of living standards.

Second, it reminds us that, put simply, different measures may show different things—yet it requires a strong theoretical rationale in order to argue that one proxy should substitute for the real measure of economic activity. As Johnston and Abreu (2013) and Harttgen et al. (2013) argue, replacing income growth with asset accumulation and consumption of basics such as education, health and clean water not only introduces measurement problems on its own, but also creates a new composite measure which may have a different interpretation than what the GDP provides. This is true of the whole spectre of alternative measures that has been suggested. Miguel et al. (2004) suggest rainfall in response to measurement problems in the African data, because as they put it: 'Unfortunately, we are aware of no work that quantifies the extent of measurement error in African national income data or determines whether measurement errors are classical (i.e., white noise) at all, although the claim is often made that these errors are likely to be large' (2004: 740). They therefore decide on the use of rainfall data as an instrumental variable in order to 'control' for measurement error.[3] In their subsequent analysis they use only the variation in economic growth that correlates with or can be explained by variations in rainfall. The objective was to pick up growth that relates to food production and therefore living standards. What Miguel et al. did not know was that statistical offices do use rainfall data when estimating growth in the agricultural sector (sometimes for ad hoc adjustments, as well as in crop forecast data, which are often used as the final data). Thus in effect, when Miguel et al. use rainfall to control for measurement errors, they are redoing the same exercise that was done to create the agricultural production series in the first place.

Using rainfall to strip the data of measurement error is a scholarly solution to a knowledge problem. While it may yield some insights for scholars looking into particular trends and cause and effect relationships, it does very little to remedy the governance problem of unreliable

[2] For a description of the demographic health surveys and the data used, see Young (2012: 733-6). See also Ncube and Shimeles (2013) for a study that uses DHS data to measure the size of the middle class.

[3] There is an unstated assumption that there is no measurement error in rainfall data. For northern Ghana, Dietz et al. (2004: 163) note that 'The reliability of rainfall data can be regarded as rather questionable. Bad recording and mistakes made while copying data from one level to the next can cause problems of interpretation. Changes in personnel can cause gaps in reliability and care. Higher level "corrections" of lower level data can sometimes be very confusing'.

economic statistics. It circumvents the issue of survey and administrative data entirely. A similar problem pertains to the well-advertised use of luminosity data to measure economic growth from outer space (Henderson et al. 2012; Chen and Nordhaus 2010). Ignoring for a moment the problem that these three proxies (assets, rainfall and luminosity)[4] do not provide a coherent, uniform or predictable correction to the national accounts data,[5] the luminosity data will only serve as a short-term correction to measurement problems in scholarly contexts. Today, in reports published by the UN and its agencies, countries of the world are routinely rated and ranked according to income and growth and correlates such as poverty, health, education and others. It is unlikely that luminosity can serve the same purpose, and even more unlikely that central banks and executive powers target policies that will achieve more light. Moreover, those who are interested in long-term trends of economic growth of the past, face the impossibility of catching up with the light already emitted into space;[6] digging into the archives to unearth and interpret administrative data would yield better returns (Jerven 2014b, 2011e, 2010c).[7]

The third issue raised by these competing proxies for national income is the inherent difficulty of not only measuring, but actually comparing economic activity across time and space (Jerven 2012a). The question that appears when you are counting numbers of assets or using binary values such as yes or no access to clean water or literate/illiterate are the same that pertain to the use of literacy and life expectancy in the human development index (HDI) (Ravallion 2010). Johnston and Abreu (2013) furthermore argue that these assets have particular interpretation in different geographical contexts. They concur with Harttgen et al.'s (2013) basic critique. The accumulation of assets such as cars, fridges and mobile phones is not appropriate for intertemporal comparisons of welfare. Problems arise from changes in relative prices over time. One would hasten to add that real GDP numbers and PPP-adjusted GDP data are riddled with the very same problems. And precisely herein lay the parts of the puzzle. To make their general point, Harttgen et al. (2013: 5) mention the example of mobile phones. Mobile phones, they say, are not suitable for measuring gains in living standards because 'preferences for certain assets might rise over time as assets become more prevalent and part of the "normal" living conditions', and moreover 'changing relative prices can lead to a demand shift favouring some assets at the expense of other household expenditures. Again mobile phones are probably the best example of an asset whose relative price has declined dramatically over recent years' (Harttgen et al. 2013). The critique put forward by Harttgen et al. makes perfect theoretical sense, yet it misses the practical point. One of the reasons that GDP levels are underestimated is that they have failed to include changes like the increased usage of mobile phones.

Young (2012) suggests the use of asset data as a proxy for national income data, because the published national accounts may have missed something. In the case of Ghana we now have it confirmed that the old estimates between 1993 and 2010 had missed more than 18 billion Ghana cedi. The new GDP estimates for 2010 showed 44.8 billion Ghana cedi, compared to the old estimates of 25.6 billion cedi.

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[4] A fourth alternative is the use of anthropometrics; see, for instance, Moradi and Baten (2005).

[5] According to Henderson et al. (2012) 'Growth is more likely to be underestimated in the world development indicators (WDI) for countries with low measured income growth rates, and overestimated in the WDI for some countries showing very high growth rates. But there is a lot of variation across countries in the adjustment'.

[6] Annual data are available back to 1992.

[7] This would mean travelling faster than the speed of light, and were this possible, it would make the travel into space to gather light data redundant as it would also, if Einstein is right, enable us to travel in time which would considerably ease the collection of historical data.

Until 2010, the Ghanaian economy was measured by the Ghana Statistical Services using a template devised in the 1990s, and real price estimates were published in 1993 prices (Jerven and Ebo Duncan 2012). As documented at the Ghana Statistical Service, work towards a rebasing of the national accounts began in 2002, but it was not until 2010 that the rebasing to a new benchmark year to 2006 was completed (Jerven and Ebo Duncan 2012).[8] When the estimates were ready it became clear that the outdated 1993 series had underestimated the size of the economy.

Table 1: GDP in Ghana according to the new (2006) and the old GDP (1993) series

	2006	2007	2008	2009	2010*
	GDP, new series				
GDP GH¢ million	18,705	23,154	30,197	36,867	44,799
Cedi/dollar rate	0.92	0.94	1.07	1.42	1.42
GDP (US$ million)	20331.61	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	1,574.18	1,872.07
Per capita (US$)	929.23	1,005.15	1,231.63	1,108.58	1318.36
	GDP, old series				
GDP GH¢ million	11,671.99	14,045.85	17,451.60	21,746.80	25,602.5
Cedi/dollar rate	0.92	0.94	1.07	1.42	1.42
GDP (US$ million)	12,686.95	14,942.39	16309.91	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	1069.89
Per capita (US$)	579.84	667.31	712.22	658.55	753.44

Note: *Provisional estimates.

Source: Ghana Statistical Services (2010).

Most of the revision (72 per cent) originated in the service sector; 10 per cent was due to increases in the industry sector; and the remaining 18 per cent 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 remained largely unchanged. Within the agriculture sector, non-cocoa crop production accounted for most of the increase (Jerven and Ebo Duncan 2012: 19).

Why was the large economic activity of the service sector missing? In part it was due to the fact that data sources had not picked up the large growth, for instance, in the communications sector, because they did not include data on mobile phones. The old estimates, again because of obsolete data sources, had not captured the growth in private education services. In total, increases in the industrial classification categories (wholesale and retail trade; hotels and restaurants and transport, storage and communications) alone made up 50 per cent of Ghana's total GDP increase. Thus, the DHS data on Ghana would have captured some of these heightened living standards directly as a yes to the question of whether one had telephone or whether one attended school.

Does this mean that GDP levels have always been underestimated in Ghana? Or does the underestimation concern only recent growth? Unfortunately, the author had no access to the

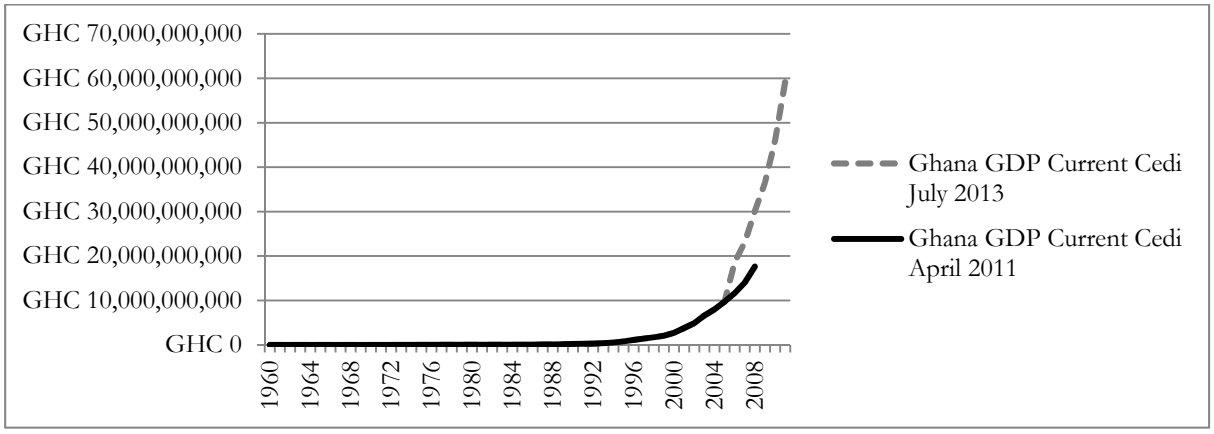
[8] 'Rebasing' refers to a change in the base year for volume estimates, which may cause variations in growth (depending on how the index number problem is handled). 'Revision' implies that the estimates are upgraded with new data. In this case, both took place simultaneously.

material used to compile the 1993 estimates but it is unlikely that definitions or methods could have made a large difference. Most of the increase came from new data sources that uncovered new economic activity previously unaccounted for. If this had been a simple matter of new 'definitions' as in upgrading from the 1968 United Nations Standard of National Accounts to the 1993 United Nations Standard of National Accounts, one could, depending on data availability, extrapolate those new definitions backwards.[9]

When European countries revised their System of National Accounts (SNA) from 1968 to 1993, it generally entailed a quantitative change upwards of between 1 to 7 per cent, and the average upward revision of 15 European countries was 2.9 per cent. It is thus clear that we are talking of areas of the economy where no data had previously existed, and this complicates backward extrapolation. When changes were made to the national accounts in the USA and Canada, historical data were used to adjust the timeseries back to 1960, whereas many Western European countries revised accounts back to the 1970s (UNECE 2000: 210-1). In Ghana the new GDP series has not been backdated. Thus we only have data on the 'new' Ghanaian economy between 2006 and 2012. The World Development Indicators (WDI) published a series on the 1975 base year (it is not clear why the series was not updated to the 1993 base year) until 2012 when the series was updated.

The problem is that the new series goes back only to 2006. For an illustration, this is how Ghana looked according to the series published in World Bank Data until 2012 (black) and from 2013 (grey). This is in current prices, but shows how the revision radically changed Ghana's post-2006 growth story. Note that there is a perfect overlap between the two series from 2005 back to 1960. As Figure 1 clearly shows, there is a pronounced acceleration in the post-2006 economy based on the new series, which did not exist in the old series.

Figure 1: Ghana GDP, new and old series as published by WDI (current cedi)



Source: WDI (2013) and WDI (2011).

[9] The change of base years also coincided with a change in the System of National Accounts (SNA). Shantayanan Devarajan (2013), World Bank Chief Economist for Africa, stated that the main cause for the revision was the upgrade from the 1968 version of the SNA to the 1993 version, but this is not correct. The main change comes from the addition of new data on missing sectors and activities; these may have been covered by previous methods and definitions, but which had simply gone missing because of lack of data. For a general introduction to this, see Jerven (2014a, 2010b 2010c) and for particular applications to the GDP timeseries of Botswana, Kenya and Tanzania, see Jerven (2010d, 2011b and 2011d), respectively.

3 How much do we know about income and growth in SSA?

In his book, *Poor Numbers*, the author attempted to survey the status of GDP statistics of all countries in SSA, and in particular to collect information on the methods and data used to compile national accounts. One of the main objectives was to see if Ghana was a truly exceptional case, or whether there were other similar cases. The table compiled in 2011, containing information on 37 countries, showed that only ten of these had a base year that was less than ten years old (Jerven 2013a: 24-5). Further, seven countries had a base year that was more than two decades old (1990 or older), and only six countries (Burundi, Ghana, Mauritius, Niger, Rwanda and Seychelles) had followed the advice of the IMF to work with a base year that was five years or newer (2006 or newer).[10]

In response to this survey, the African Development Bank (AfDB) commissioned a study which was published in 2013 and provided information on the same variables.[11] The AfDB, hoping to get a response from all 54 member countries, received input from 44 member states.[12] In the survey of base years, the AfDB report results from only 34 countries (as compared to 37 in Jerven 2013), and observes: 'the base years now being used for constant price estimates in 34 countries. Only nine (Cape Verde, Egypt, Ethiopia, Djibouti, Guinea, Malawi, São Tomé & Príncipe, Togo, and Zimbabwe) have a base year that meets the five-year rule (i.e., 2007 or later). Nineteen countries have base years that are at least ten years old, and eight (Benin, Central African Republic, Comoros, Congo Republic, Madagascar, Mali, Nigeria, and Sudan) use base years that are more than 20 years old'.

A second report that set out to replicate the collection of some metadata on GDP statistics in response to the attention to the importance of base years in *Poor Numbers* was published in the IMF's 2013 'Regional Economic Outlook: Sub-Saharan Africa' in May (IMF 2013: 6). According to their survey of 45 countries, summarized in a table, only four countries (Cape Verde, Malawi, Mauritius and South Sudan) met the so-called five-year rule (with base year from 2007 or newer).[13] Recall that Jerven (2013a) found in 2011 that seven countries met this criterion of a base years of 2006 or later. If, for the sake of comparison, we consider the base years 2006 or later to constitute adherence to the five-year rule, which would thus include Ghana among others, according to the IMF, 11 countries fall within this range in 2013. How come IMF and AfDB differ so widely in their information? The two institutions agree upon the base year of Cape Verde and Malawi as being recent, but the AfDB either did not get information on Mauritius or missed it in their count. Egypt and Djibouti are not included in the IMF table, whereas the countries that AfDB reports as having a base year from within the last five years include: Ethiopia (whose base year according to IMF is 2000); Guinea (whose base year according to IMF is 2003); São Tomé & Príncipe (base year 1996 according to IMF); Togo (base year 2000 according to IMF) and finally also Zimbabwe (base year 2000 according to IMF).

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[10] Only Mauritius had a base year from 2007, the rest were from 2006, so by the time the book and survey were published (2013), these, according to the strict IMF criterion, were out of date.

[11] The introduction of the report observes: 'But are Africa's statistics as bad as they are being portrayed by some critics?'. To answer this question, the AfDB (2013: 6) decided in March 2013 to undertake a survey to assess the reliability of GDP data, including the availability of survey data, price indices, and base years for constant price GDP'.

[12] Contrary to Jerven (2013a) and IMF (2013), the AfDB (2013) report also covers North Africa. The non-responding countries in the AfDB survey were Angola, Burundi, Eritrea, Gabon, The Gambia, Liberia, Libya, Sierra Leone, Somalia, South Africa and South Sudan.

[13] Cape Verde and Malawi have updated their base years since the research for *Poor Numbers*. There was no information on South Sudan, because they had not yet made their first estimates.

Oddly enough, the IMF report concludes (2013: 4) that their 'median base year is around the year 2000, which, although now 13 years later, is more recent than had been suggested by Jerven (2013)'. In Jerven's *Poor Numbers,* the author purposefully did not report a mean or median year, because he was not sure if it was a useful statistic. The samples reported in *Poor Numbers* and the AfDB are both positively biased. There are no responses from countries that are in greater economic and political distress, which, all things being equal, can be expected to affect the timeliness of economic statistics negatively. For the record, in Jerven's 34 country sample the mean and the median base year is 1999 and 2001, so contrary to the IMF report, Jerven's book paints a similar, if not more positive, picture compared to the data reported in the IMF table.[14] Meanwhile, the AfDB (2013: 5) concludes that: 'Overall, the situation with regard to GDP is not nearly as bad as has recently been suggested'. It is not clear what this conclusion is based on, but the same report's executive summary notes that (2013: 5):

> A country's GDP estimates are only as good as the data on which they are based. Although industrial production is believed to be rising sharply in most countries, nearly one-fifth of the respondent countries had not conducted an industry survey since 2000. Even fewer countries conduct regular surveys or censuses of agriculture, despite its criticality to the food security situation in the continent. What is equally surprising is that Algeria, the Democratic Republic of the Congo, and Nigeria, which are three very large countries, have not carried out a population census in the last 20 years. On the other hand, almost all the 44 respondent countries have carried out at least one household survey of income/expenditure since 2000, more than two-thirds have conducted a household labour force survey, and half have undertaken one or more special surveys focusing on the informal sector.

This summary mirrors the picture painted in *Poor Numbers*, where the main trend since the 1990s was observed to be a low priority for industrial and agricultural statistics, and a high priority for household budget surveys. It should be noted, however, that the AfDB draws an overly bleak picture of the population census-taking in Africa. Nigeria did conduct a population census in 2006 (as noted in Jerven 2013a: 56-61).

Despite these discrepancies and disagreements on the number of countries applying recent, updated GDP estimates, both reports confirm that they are outnumbered by the countries that still use very out-dated base years. The AfDB reports that 19 countries have base years older than ten years, including eight with base years more than 20 years old. IMF's larger sample lists 28 countries with base years more than 10 years old, while 13 countries are still using base years more than 20 years old. Table 2 reports the information on the base years in the IMF report.[15]

[14] In fact according to mean and median base year it is identical. The median is 2001 in the IMF table as well.

[15] According to information submitted to the author, Burundi has a base year from 2006, not 1996 as reported in Table 2. Furthermore, according to information from UNECA, Madagascar has a base year from 1995, and the statistical office is currently preparing for SNA 2008 (and presumably a rebasing) for 2016. For Mali, 1997 is reported as the base year (compared to 1987 as reported here) based on information submitted to the author from Mali. The provenance of the information in the IMF and AfDB reports is not detailed in their surveys, whereas how all the data was retrieved for *Poor Numbers* is described in Jerven (2013a: 123-37).

Table 2: Base years and planned revision in SSA

Country	Base year	Planned revision	Years btw revisions
Angola	1987	2002 (2013)	15
Burundi	1996	2005 (n/a)	10
Benin	1985	1999 (2014)	14
Burkina Faso	2006		
Botswana	2006		10 (1996-2006)
Central African Republic	1985	2005 (2014)	20
Côte d'Ivoire	1996		
Cameroon	2000		
Democratic Republic of the Congo	1987	2002 (2014)	15
Republic of the Congo	1990	2005 (2013)	15
Comoros	1999	2007 (2013)	17
Cape Verde	2007		28 (1980-2007)
Eritrea	2004	Not compiled after 2005	
Ethiopia	2000/01	2010/11 (2013)	10
Gabon	2001		
Ghana	2006		13 (1993-2006)
Guinea	2003	2006 (2013)	3
Gambia	2004		28 (1976/77-2004)
Guinea-Bissau	2005		19
Equatorial Guinea	1985	2007 (2013)	22
Kenya	2001	2009 (2013)	8
Liberia	1992	2008 (2015)	16
Lesotho	2004	2013 (2015/16)	10
Madagascar	1984		
Mali	1987	1997 (2013)	10
Mozambique	2003	2009 (2013)	6
Mauritius	2007	2012 (2015)	5
Malawi	2009	2014	5 (2002-07)
Namibia	2004	2009(2013)	6
Niger	2006		19
Nigeria	1990	2010 (2013)	not known
Rwanda	2006	2011 (2013)	5
Senegal	1999	2010 (2014)	11
Sierra Leone	2006		5 (2001-06)
South Sudan	2009		
Sao Tome and Principe	1996	2008 (na)	12
Swaziland	1985	2011 (2014)	
Seychelles	2006		
Chad	1995	2005(2014)	10
Togo	2000		22
Tanzania	2001	2007	6
Uganda	2002	2009/10 (2013)	8
South Africa	2005	2010 (2014)	5
Zambia	1994	2011 (2013)	
Zimbabwe	1990		

Source: IMF (2013: 21).

The argument about the number of countries having a five-year old base year, or the calculation of means and medians based on surveys conducted in different years will only produce conclusions of temporal validity. Moreover, it follows from basic probability that if a group of 54 countries randomly update their base year every 20 years or so, then in any given year a handful of countries will have a base year dating within the past five years. It is worthwhile noting from

this table that there are some countries where GDP may give a fair approximation of economic activity in the country.[16] But it is perhaps more important to point out that in the case of the biggest countries (DRC, Nigeria and Sudan), nearly a quarter of a century has lapsed since there was a benchmark study of the size of the economy.[17] This alone adds a serious caveat to the 'Africa rising' debate, particularly if one wants to generate a population weighted number.[18]

While Ghana's upward revision was uncommonly large, there have been other recent revisions that make considerable adjustments to GDP levels (see Kiregyera 2013: 13 on the impact of rebasing GDP in African countries). A GDP revision is underway in Nigeria (Jerven 2013b; Kale 2013). It may be as large as the one experienced in Ghana, and once again such revisions will upset what we thought we knew about income and growth in Africa. McKay (2013: i51) summarizes the pattern as follows: 'But from the early to mid-1990s on there is a significant reversal: aggregate per capita GDP rose by 31 per cent between 1994 and 2010, an average of 1.7 per cent a year'. An increase in the aggregate GDP of 31 per cent is not that much, if we keep these other revisions in mind.

The good news is that after decades of neglect, economic statistics seem to be improving in some countries, but it is important to remember that the base years and methods in use are just a symptom of the problem. Final estimates of growth and income are no better than the primary data on which they are based. As the AfDB survey notes (2013: 5) '… one-fifth of the respondent countries had not conducted an industry survey since 2000. Even fewer countries conduct regular surveys or censuses of agriculture, despite its criticality to the food security situation in the continent'.

4 Interpreting the growth evidence for the past two decades

Recent growth is overestimated. First of all, there are vibrant economies such as Ghana, but also others where recent growth shows improvement because of a recent large upward revision in GDP levels, so that the smoothened series across the 2000s shows an exaggerated acceleration in growth. Second, for economies with outdated base years, the GDP level is probably underestimated. This has two effects. One is obvious: when the base is too low, growth estimates are too high. One of the key advantages of an exhaustive GDP estimate is to avoid 'statistical growth', that is, growth arising from the addition of previously unmeasured parts of the economy. The second effect is generated by the statisticians and consultants who add to the GDP measure to make it more exhaustive, by revising current and previous GDP estimates upwards as they go along. A couple of issues are in play here. When it is obvious that GDP is underestimated, it makes sense to 'add' some growth to the estimates to have a more representative GDP. It may also be in the interest of the statistical office to pre-empt a large future upward revision (particularly as some data sources will become available before the revision is complete, as in the case of Nigeria and Ghana) by gradually increasing recent and previous GDP estimates. A conflict exists between the two aims: reliability versus validity. Validity refers to the accuracy of the GDP estimate, or its exhaustiveness. Efforts to improve validity may cause problems for data users, who are interested in a reliable measure of economic growth, but not necessarily a correct level of GDP. According to Heston (1994: 37) 'Often

[16] Based on the evidence here and in the book *Poor Numbers*, it appears that this is true for South Africa, Tanzania, Rwanda, Namibia, Mauritius and Kenya.

[17] Sudan is missing from the IMF table, and it was not possible to retrieve information on this country for *Poor Numbers*. AfDB lists it among the countries with a base year which is two decades or older.

[18] Angola is another of the fast growers, with a base year from 1987.

officials, who use national accounts for growth purposes and who also evaluate work programmes of statistical offices, may resist improvements in level estimates of output because it will introduce breaks in national accounts series. Perhaps this is a straw person, but I have been told this is not a trivial obstacle to improvements in some countries'.[19]

For countries that have lately undertaken a GDP revision or are currently doing so, recent economic growth is probably overstated. For countries that are yet to undertake a GDP revision, there is also an effect that biases the growth estimates upwards, because the size of the economy, as currently measured, is too small. Thus, economic growth (measured as economic change in proportion to the size of the economy) is also biased upward. For example, US$10 of US$100 is 10 per cent, whereas US$10 of US$200 is 5 per cent. In addition, if there is US$100 of unrecorded activity, there is a high probability that what appears as 'economic growth' might just be previously unrecorded economic activity.

Much of the recent economic growth is not based on observed or recorded economic change, but rather, simply occurs from assumption: there is some growth in the formally recorded sector, and GDP estimates are adjusted to capture growth in the unrecorded sectors. A good example of how unreliable economic growth can be is given by South Sudan. According to the 2012 *Regional Economic Outlook* (IMF 2013), the economy projected to grow the quickest in 2013 was South Sudan at 69.62 per cent. And the economy projected to grow the slowest in 2012 was again South Sudan, this time at -54.98 per cent. It may be tempting to write this off as the miscalculations of the world's youngest statistical office, but these data are probably more or less correct, not, of course, to the decimal point, and may be 5 to 10 per cent off either way. But economic growth in the case of South Sudan depends on the flow of petroleum, hindered in 2012, but projected to flow freely in 2013.

South Sudan is an extreme example. But by and large, growth data are driven by changes in the very narrow external sector, and there is little or no information on economic growth in the informal sector. Take the example of Ghana. There was some information on previously unrecorded economic activities in some of the survey data used to update the base year in 2006 but after 2006 there is no information on the informal sector. Economic growth in the currently very vast and important small-scale service sectors is primarily derived from VAT data, but this, by definition, does not include the informal sector.[20] The situation is similar elsewhere. Changes and revisions to the GDP base year will cause big jumps and ad hoc improvement, but GDP growth calculations require reliable annual data, and data availability which means that changes in national accounts are driven by changes in the formal and often external sector. Thus when observers say (e.g., Lipton 2012) that growth is mainly driven by mining, and that it does not reflect changes in labour productivity or agricultural yields, they are mostly right as far as published national accounts are concerned.[21]

This is where alternative data sources, proxies and triangulation that use poverty data and household budget survey data to make sense of the national accounts data are important. One cannot, as Sala-i-Martin and Pinkovskiy did (2010), derive trends in poverty rates from the national accounts data. The database is too weak. There are country level data on poverty that would allow some analysis of these trends, but there are better sources on country level numbers,

[19] For studies of recent efforts of rebasing GDP in Liberia and Zimbabwe, see Ebo Duncan (2013) and Nyoni (2013).

[20] According to a peer review of the Ghana revision commissioned by the AfDB, the informal sector is not included in the new GDP numbers, and growth is entirely driven by the formal sector.

[21] And the data on agriculture are also weak (Jerven 2014c). For an overview of current statistical challenges, see Jerven (2014d).

as in McKay (2013: i71) who notes: 'It is not straightforward though to use the evidence discussed here to draw conclusions about aggregate changes in monetary poverty in SSA; the periods covered differ from country to country, the underlying surveys and the poverty lines are not comparable'. It is important to add that according to Carr-Hill (2013) the survey data are biased and miss millions of the poor as a matter of design. Currently we do not know enough about aggregate monetary poverty to assert elasticity between economic growth and poverty. One way of making sense of the discrepancies between national accounts and other indicators such as assets indices and luminosity is to acknowledge that national accounts systems have missed something. This means that some economies are richer than the data lead us to believe, but also that some of the data seem to indicate that certain economies are growing faster than they actually are.

5 Concluding remarks

What has been described here is a considerable knowledge problem. There are currently serious difficulties in the regular collection of economic statistics. Our current estimates are doubly biased. We know less about the economies that are poorer, and less about the populations that are poor in those poor economies. This knowledge problem is in striking contrast with the demand for numbers in the development community.

Perhaps the most visible public commitment to results-based and evidence-driven policy was the adaptation of the Millennium Development Goals in 2000 when UN members pledged to commit policy and funds towards reaching eight goals, measured by 18 targets and 48 indicators. In retrospective, it was strikingly naïve to assert this extent of measurability without a systematic understanding of how data can and should be generated by weak statistical systems. While funds have been available for statistical offices, the tendency has been to divert resources and manpower from economic statistics towards social statistics. Moreover, these are ad hoc funds, and reward data collection on donor funded projects, detracting from the statistical offices' regular responsibilities to analyse and disseminate. In practice, many statistical offices have been a data collection agency for hire, rather than an entity which provides the objective information needed in the day-to-day politics of the state.

What should be done about this? It is crucial for data users to question one's evidence. In the macro analysis of growth and poverty, the distance between the observed and the observer has grown since the 1990s, as analysts have increasingly made use of downloadable datasets to test econometric models. Data disseminators need to label their data correctly. A great deal of the information that is sold as data is indeed only weak guesses and projections. The biggest challenge is investing in better data for the future. A new agenda is needed for developmental data in SSA, which places local demand, incentives and applicability at the centre.

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