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Users and Producers of African Income: Measuring the Progress of African Economies

Morten Jerven



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School for International Studies
Simon Fraser University
Suite 7200 - 515 West Hastings Street
Vancouver, BC Canada V6B 5K3

Users and Producers of African Income: Measuring the Progress of African Economies

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Abstract:

This article traces how African incomes have been measured through history. There has been a conflict of aims between producers and users of the national income estimates. Politicians and international organisations wish income measures to reflect current political and economic priorities and achievements. Thus, the importance given to markets, the state and peasants in the estimates varies through time and space. Meanwhile, statisticians aim to produce a measure that best reflects the economy given the available data and definitions at any time. Scholars would prefer a measure that is consistent through time and space, so as to analyze and compare ‘progress’, but they cannot agree on how ‘progress’ is best defined. The result is not an objective measure, but rather an expression of development priorities determined by changes in the political economy. The article provides a much needed study of the ability of the statistical offices to independently and regularly provide income statistics. These data are of crucial importance, as they enter the public domain in policy evaluations, political debates and assessments of progress towards lofty goals such as the Millennium Development Goals.

About the author:

Morten Jerven is an economic historian (PhD, LSE 2008) and Assistant Professor of International Studies at Simon Fraser University. His current research, funded by the Social Sciences and Humanities Research Council of Canada, aims to assess the quality of growth data in 11 African countries and to construct a reliable basis to evaluate and interpret long term economic change. Jerven has published in *African Affairs*, the *Journal of International Development*, the *Journal of Development Studies* and the *Journal of South African Studies*.

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Users and Producers of African Income: Measuring the Progress of African Economies¹

When African economies receive popular attention it is usually related to their relative poverty. These debates revolve around a concept of national income. This measure is treated as a consistent entity and assumed to contain the same amount of information through space and time. ‘National income’, however, is not an absolute, but rather a result of a practical measuring process, subject to decisions and to the implications of scarce resources regarding its definition and method of data collection. This historical investigation of national accounting in African economies shows that both theory and practice underlying the measurement of national income has changed over time, and that this has important implications for using it as evidence for historical and social analysis. It will be shown that the changes in measurement methods reflected change in political priorities, currents in the academic community and physical constraints at the statistical office.

This article offers a qualitative interpretation of these changes in African national income estimates through history. It highlights that national income statistics should not be considered as ‘facts’, but rather as ‘products’. Their production has been determined by changes in the political economy. There was an obvious change from colonial to post-colonial income estimation in terms of accountability and appreciation of African peasant contribution to national income, as contrasted with the colonial emphasis on measuring the white settler economy and the balance of payments. There were interesting contrasts in the post-colonial accounting across Africa as well. There were markedly different approaches to the relative importance, and therefore the value of the market versus the state, and peasant/subsistence vs. modern commercial agriculture. Finally, external donors and scholars have influenced how the emphasis in the measurement of African

¹ Earlier versions of the article were presented in 2009 at the London School of Economics, African Anthropology Seminar and at the School of Oriental and African Studies, African History Seminar and in 2010 at London School of Economics, Development Studies Institute and at the School for International Studies, Simon Fraser University. I wish to thank participants for helpful comments. The research for this paper has been funded by Simon Fraser University, Endowed Research Fellowship and the President's Research Start-up Grant, Erasmus Mundus ‘Outgoing Mobility’, the Norway Bank Fund for Economic Research, the Economic History Association Exploratory Grant and the Radwan Travel and Discovery Fund and Social Sciences and Humanities Research Council of Canada, Standard Research Grant.

incomes has changed. Thus studying the changes in operational definition of ‘national income’ is a useful lens through which we can see the patterns of an intellectual history of what constitutes African progress.

The discourse on African economic development and economic history has been dominated by scholars more concerned with the quantity than the quality of data. Any data are of course said to be better than none, but beyond a certain point this ceases to be true.² Despite well known quality issues econometricians use all data available to examine economic progress. A leading economic historian using quantitative methods Jeffrey Williamson once rhetorically asked: ‘Have you ever met a cliometrician who throws data away?’ and was referring to the scholars that use econometric methods in economic history.³ This is where the issue stands in the current development economics paradigm – it is the availability of data sets for econometric tests that matters.⁴ With more advanced statistical and econometric techniques available it is perceived that ‘the weakness of the available data represents a major constraint on the potential of empirical growth research. Perhaps the main obstacle to understanding growth is the small number of countries in the world’.⁵ That does not look like an agenda for future researchers. Rather the key must be to explore the limits to our understanding of economic growth through examining the available evidence, and exploring whether Ward was correct in his classic statement that ‘many of the explanations advanced for differences in growth performance are far more impressive than the data which they purport to explain’.⁶

² Morten Jerven, ‘The relativity of poverty and income: how reliable are African economic statistics?’, *African Affairs*, 109: 434 (2010), pp. 77-96; See also Morten Jerven, ‘Random growth in Africa? Lessons from an evaluation of the growth evidence on Botswana, Kenya, Tanzania and Zambia, 1965–1995’, *Journal of Development Studies*, 46: 2 (2010), pp. 274-294.

³ Jeffrey G. Williamson, ‘Institutional influences on poverty in the nineteenth century: a quantitative comparative study: discussion’, *Journal of Economic History*, 43:1 (1983), pp. 56-60.

⁴ For a discussion of the implications of the lack of economic data on African economies after 1960, see Morten Jerven, *African Growth Recurring: An Economic History Perspective on African Growth Episodes, 1690–2010*, Simons Papers in Security and Development, No. 4, 2010, School for International Studies, Simon Fraser University, Vancouver.

⁵ Steven N. Durlauf, Paul A. Johnson and Jonathan R.W. Temple, ‘Growth Econometrics’, in Philippe Aghion and Steven Durlauf (eds.), *Handbook of Economic Growth* (Amsterdam: Elsevier, 2004), pp. 559. For a critique of the economic growth literature on Africa, see Morten Jerven, ‘The Quest for the African Dummy: Explaining African Post-Colonial Economic Performance Revisited’, *Journal of International Development* (2009, Wiley InterScience online, <http://onlinelibrary.wiley.com/doi/10.1002/jid.1603/pdf>).

⁶ Michael Ward, ‘Review of the measurement of real product’, *The Economic Journal*, 81:324 (1971), p. 977.

Statisticians at the Kenyan central statistical office approach the issue pragmatically as: ‘It is possible to use a number of criteria in order to assess the progress of the economy, but the usual measure of the rate of economic development is the estimate of Gross Domestic Product. Estimates of domestic product are not; however, among those statistics which are a definite measure to which there can be only one precise measure comparable to the number to the number of oranges in a bag. It is in fact an aggregation of numerous data which vary substantially in order of precision’.⁷ In other words, the aggregate, in this article generically referred to as national income, is not an absolute, but a result of pragmatic decisions at the statistical offices subject to data availability, financial resources and political instructions. The quote also points towards the importance of looking carefully at the individual components that enters this composite measure.

The article proceeds with a review of the early debates on the value of initiating national income statistics for African countries, before examining some early colonial estimates and the changes and nuances in post-colonial accounting. Issues of post-structural adjustment revisions and the informal economy are dealt with. Finally, the article concludes with some advice for the data users and suggests that there are issues of transparency in data production that may render issues of historical and contemporary analysis of African economic progress meaningless. The article is based on official documents relating to national accounting, published by colonial authorities, and official publications made by national statistical offices. It is further informed by interviews and visits to the national statistical offices of Botswana, Zambia, Tanzania, Kenya, Ghana and Nigeria in the period 2006 to 2010.

Recently, Stephen Ellis called for the writing of histories of contemporary Africa. It was anticipated that writing history of contemporary Africa would be complicated because ‘it is unlikely that historians seeking to write the history of Africa since independence will enjoy the same quality of documents as their colleagues studying the colonial period’.⁸ ‘A useful archive does not just contain large numbers of documents but is also classified, catalogued and generally maintained, all of which requires money that, for many types of state activity, has been in short supply since the onset of a financial crisis in so many African countries, sometimes twenty or

⁷ Republic of Kenya, *Economic Survey 1967* (Nairobi, 1968), p. 2.

⁸ Stephen Ellis, ‘Writing histories of contemporary Africa’, *Journal of African History*, 43:1 (2002), p. 12.

more years ago'.⁹ These anticipations were to some extent confirmed when studying the documentation of the post-colonial estimates. What William Easterly referred to as the 'lost decades' in terms of economic performance, were indeed 'lost' in the sense that statistical offices only documented their own activities in a limited manner.¹⁰ Thus this article uses different examples from different countries in an attempt to coherently account for the history of national income estimation in Africa.

Measuring African Income: The Pioneers

In early exchanges regarding the value of national accounting in Africa and other developing areas that ensued in the early 1950s one of the pioneers of development economics, Dudley Seers, was considerably pessimistic concerning the rewards of instituting national accounting for the purpose of international comparisons of income and economic development: 'In the hands of authorities, such international comparisons may yield correlations which throw light on the circumstances of economic progress, and they tell us something about relative inefficiencies and standards of living, but they are very widely abused. Do they not on the whole mislead more than they instruct, causing a net reduction in human knowledge?'¹¹

As we know very well today, these warnings were not heeded and national income estimates were prepared in African countries following the Second World War. In theory this was done according to the universal United Nations Standard of National Accounts, in practice the local application did vary considerably. In 1945, the only African country to publish national accounts was South Africa. Southern and Northern Rhodesia followed suit from 1949, while by 1958, Ghana, Kenya, Uganda and the Congo all published annual estimates. National income was estimated for Nigeria in 1951, but the next estimates were not made until 1960.

The first estimates made for colony of Southern Rhodesia and the British protectorates of Northern Rhodesia, and Nyasaland were characteristic of colonial accounting in that they did not

⁹ Ibid., p. 13.

¹⁰ William Easterly, 'The Lost Decades: Explaining Developing Countries' Stagnation in spite of policy reform 1980–1998', *Journal of Economic Growth*, 6:2 (2001), pp. 135-157.

¹¹ Dudley Seers, 'The role of national income estimates in the statistical policy of an under-developed area', *The Review of Economic Studies*, 20:3 (1952-53), p. 160.

initially include an estimate of the value added by ‘African’ producers. From 1949 onwards ‘a nominal figure of £5 million for African subsistence income was included in the value of national income of Northern Rhodesia’.¹² The same amount was reported unchanged in the accounts between 1949 and 1953, thus *de facto* assuming that the value of total food production from African producers was decreasing quite rapidly (when population growth and inflation are taken into consideration). The first estimates ignored the ‘subsistence’ product altogether while the later estimates acknowledged it, with a marginalized role in the accounts. Meanwhile, there was also a vigorous contemporary scholarly debate concerning this general issue which is explored below.

The central problem in all national income accounting is to decide which economic activities and actors should and/or can be included in the official accounts. This is often referred to as the ‘production boundary’. Since the application of the United Nations Standard of National Accounts there has been a discussion of where one should draw this line. For western economies this famously means that housewives’ efforts are not accounted for. With a specific reference to African economies Brian van Arkadie noted ‘The existence of a large amount of “subsistence” activity (or, at least economic activity which does not result in a recorded marketed transaction) makes Pigou’s famous quip about the national accounting consequences of marrying your cook much more than a mere curiosity’.¹³ In all economies there is a distinction between recorded and unrecorded economic activity. In ‘developed’ economies the latter can be summed up as comprising illegitimate economic activity and economic activity within the family household. In most African economies the unrecorded economy is so large and therefore economically important that to leave it as ‘unrecorded’ is unsatisfactory. Its inclusion in the national accounts has been constrained by the availability of data and has therefore resulted in different innovative accounting practices at the individual statistical offices.

Seers wittily referred to this ‘subsistence output’ as the ‘well-known morass which those estimating national income of underdeveloped areas either skirt, rush across or die in’.¹⁴

¹² Federation of Rhodesia and Nyasaland, *Monthly Digest of Statistics* (Salisbury, 1955).

¹³ Brian van Arkadie, ‘National accounting and development planning: a review of some issues’, *Development and Change*, 4:2 (1972-73), p. 15.

¹⁴ Seers, ‘Role of national income estimates’.

Reporting on the ongoing efforts in Kenya, Wood offered a short and more accurate comment as to why neither of the terms commonly used for this part of the economy are appropriate:

There is no satisfactory name for this sector. The non-monetary sector is used in this paper because that is what it is called in the Kenyan National Accounts. The name is misleading since money is widely used in this sector. Other names which have been used to designate this sector are: the subsistence sector, although the standard of living is usually above the subsistence level; and the traditional sector, although social, economic and political institutions and behaviour are probably changing as rapidly in parts of this sector as they are elsewhere in the country'.¹⁵

In the settling phase of national accounting there was no agreement upon how to integrate this sector into the national accounts, or indeed whether it was worth doing so. In line with a general optimism regarding the prospects for rapid growth in Africa Ady commented that it was 'strange that some countries in Africa should be planning to devote so many of their scarce statistical resources to the more accurate measurement of this diminishing component'.¹⁶ A lot of the pessimism regarding national accounting, particularly about accounting for small-scale production was matched by optimism regarding the future growth and 'modernization' of these countries. 'The fundamental difficulty is the same as for international comparison: in a few years an underdeveloped country may have changed so much that for the purposes of the underlying assumptions in economic analysis it can no longer be considered the same country'.¹⁷

Others objected to the idea of measuring incomes and comparing income across countries on a completely different basis. Consistent with 'substantivism' Herbert Frankel held that some economic behaviour of Africans cannot be adequately explained by concepts drawn from market economics. To him some societies had so different concepts of income and welfare governed by specific rules and laws that international comparisons of it would be meaningless. The concept of income or wealth would vary from culture to culture to such an extent that the efforts to maximize it could not be compared across cultures. Indeed, Frankel compared the maximization of income to that of maximizing a game of chess. A game of chess is governed by

¹⁵ G.D. Wood Jr., 'Problems of comparisons in Africa with special regard to Kenya', *Review of Income and Wealth*, 19:1 (1973), pp. 105-116.

¹⁶ P. Ady, 'Uses of national accounts in Africa', in L.H. Samuels (ed.), *African Studies in Income and Wealth* (London, Bowes & Bowes, 1963), p. 62.

¹⁷ Seers, 'Role of national income estimates'.

specific rules and these rules set the aim of the game, and as such the game cannot be maximised.¹⁸

Similar views were expressed by economists pioneering national accounting in the colonies. In a report on an experiment of preparing income estimates for Nyasaland, Northern Rhodesia and Jamaica in 1941 Phyllis Deane noted that ‘when working out national income tables for Central Africa (as compared to Jamaica) it soon became clear that a more comprehensive and direct knowledge of the social and economic structure of Central African peoples was essential if a satisfactory framework was to evolve. It was therefore felt necessary to discard the formal tables and envisage a new system and thereby ‘[abandon] the income classification according to profits, interest, rents, wages and salaries, and substitute a classification according to nationality’.¹⁹ Thus in the final accounts there were separate contributions allotted to Europeans, Africans and Asians. In the colonial accounts for Rhodesia a division remained in the accounts as ‘normal’ versus ‘African’ output. A similar accounting classification was used by the apartheid regime in South Africa, where there were different estimates made for the ‘Bantu Homelands’ and the ‘Black States’.²⁰

Prest and Stewart who prepared income estimates for Nigeria in 1951 also noted problems with the application of ‘Western’ concepts: ‘For a start, the distinction between production and living, the distinction between working and not working, is something reasonably tangible in the ‘West’; it is often nebulous in Nigeria’.²¹ Prest and Stewart ended up accounting for transactions within Nigerian households as market transactions, arguing that the extended household in Africa had to be interpreted differently than the Western household. A striking diversion from conventional methods was that intra-household services were included in the estimates, even evaluating the value of the service of procreation, as provided by wives to husbands. Data on bride wealth was used as a proxy for the market values for this intra-household service. Okigbo who prepared estimates for 1950-1957 discarded this approach, and

¹⁸ S. Herbert Frankel, ‘Psychic and accounting concepts of income and welfare’, *Oxford Economic Papers*, 4:1 (1952), pp. 1-17.

¹⁹ Phyllis Deane, *The Measurement of Colonial National Income: An Experiment* (Cambridge, 1948), p. 127.

²⁰ Republic of South Africa, *National Accounts of the Black States* (Pretoria, 1980).

²¹ A. R. Prest and I. G. Stewart, *The National Income of Nigeria*, Colonial Office, Colonial Research Studies No. 11. (London, HMSO, 1953).

favoured a less inclusive approach than that taken by Prest and Stewart.²² Eke, who reviewed the two estimation methods noted that ‘this excursion by Prest could easily be dismissed as ludicrous, but it is much more serious than that’.²³ Eke argued that it was a fundamental misconception that national accounts could fully capture all processes that contribute to the welfare of human beings.

Writing generally on the use of national accounts in Africa in 1963, Ady summed up the value of the resulting GDP estimates to date:

We must conclude, therefore, that with the data available, estimates of domestic production in the rural sector are likely to be very “soft” figures. Does this render national accounts valueless in Africa? The usual aggregates are certainly valueless, at present, for certain purposes: welfare comparisons using per capita income, for example, are obviously nonsensical when income estimates themselves are in part derived by multiplying up per capita averages of doubtful accuracy by population estimates equally subject to error.

To illustrate the malleable nature of the resulting figures, he added that ‘there is at least one African country whose per capita income figures were revised upwards by 75 per cent in recent years’.²⁴

These early debates are worth recalling. Some of the current data quality concerns were predicted by the pioneers. There was a wide divergence in opinions and in practical application of methods in individual estimates. Development optimism misled many to think that the rapid change would rule out the importance of accounting properly for the contribution of small-scale and rural activities. Lewis viewed economic growth as entailing ‘the slow penetration and eventual absorption of the subsistence sector by the capitalist sector’.²⁵ This view of development and economic growth justifies the ignorance concerning the ‘subsistence’ sector since it is conceived as a static sector, waiting to be integrated and absorbed by the modern, urban capitalist sector. There are however many scholars who emphasise the capitalistic and dynamic activities of the actors in the rural sector, and would counter that there is no such thing

²² P. N. C. Okigbo, *Nigerian National Accounts, 1950-57* (Enugu, Government Printer, 1962).

²³ I. I. U. Eke, ‘The Nigerian National Accounts - A Critical Appraisal’, *Nigerian Journal of Economic and Social Studies* 8 (1966), p. 334.

²⁴ Ady, ‘Uses of national accounts in Africa’, p. 55.

²⁵ W.A. Lewis, ‘Economic development with unlimited supplies of labour’, *Manchester School* 20 (1954), 139-91.

as a ‘subsistence’ farmer.²⁶ So this perspective could be turned around and one could rather expect and understand development as something that grows out of the unrecorded parts of the economy. Unrecorded can unfortunately also mean ignored, as it is mostly aggregate data that inform new policies, and which are used to judge whether previous policies were successful.

Crucially, in most African economies at independence, the conditions for the unlimited supply of labour were generally not satisfied. The basic premise in arguably the most influential development economics model was that marginal productivity of labour in the rural sector is zero. To make this assumption is equal to be saying that growth solely arises as a result of modern sector expansion. However, land was generally abundant and labour was generally scarce in Africa, thus we would not expect marginal labour productivity to be zero in Africa, rather in a labour scarce situation return to labour could be high.²⁷ Writing on the lack of data about development in Nigeria in 1966, Stolper concluded: ‘The absence of a Malthusian problem makes it illegitimate to neglect the so-called subsistence sector and to assume that any increase in output by “modern” sectors is a net addition to total product’.²⁸ Yet, as we have seen these were the assumptions that were made.

It is worth emphasising that these rudimentary estimates are the very ones that we still rely on today. When we are comparing economic change from the 1950s and 1960s, to evaluate economic progress in sub-Saharan Africa, it is these estimates that provide the benchmark for comparison. In retrospect it is easy to lament that the statistics that were really needed in the 1960s (as expressed by Stolper) are the ones that we are lacking today as well. Economic change was not expected to originate from the ‘informal’, ‘traditional’ or ‘subsistence’ sectors, and therefore our ability to judge whether progress was originating from and/or was transforming these sectors is correspondingly constrained today.

²⁶ Polly Hill, *Development Economics on Trial* (Cambridge University Press, Cambridge, 1986).

²⁷ Gareth Austin, ‘Resources, techniques and strategies south of the Sahara: revising the factor endowments perspective on African economic development, 1500-2000’, *Economic History Review*, 61:3 (2008), pp. 587–624.

²⁸ W. F. Stolper, *Planning without Facts. Lessons in Resource Allocation From Nigeria’s Development* (Harvard University Press, Cambridge, Mass., 1966), p. 21.

Independence: Measuring for Development

Just at the turn to official recording in newly independent African countries Deane reviewed some new official estimates while national accounting was in its trial phase in Africa and commented that ‘what was once the happy hunting ground of the independent research worker has become the routine reoccupation of official statisticians and international Civil Servants’. This might explain why there has been less scholarly attention to the subject, as it might have been assumed to be a task of standardization rather than a fruitful area for research. However, according to Deane ‘The fact is, however, that African national-income publications are as heterogeneous under the official stamp as they ever were when privately produced’.²⁹

Independence meant new priorities and new statistical needs. Before independence in former Northern Rhodesia, now Zambia, national accounts were prepared by the Central Statistical Office (CSO) in Salisbury. At the beginning of 1964 this responsibility was transferred to the CSO in Lusaka, where the national accounts for 1964 onwards were prepared. ‘Economic Planning was an important task for the Government and the need for statistical information had therefore increased considerably’.³⁰ With the new economic and political conditions there was a need to revise the data for the level of private consumption and other categories of expenditure. Essentially this meant estimating the magnitude of total production as compared to monetary demand. In other words the national accounts had to be based on the ‘production approach’ rather than the ‘income approach’ adopted in colonial period. This implied an upward revision compared to earlier years as non-monetary activities such as production for own consumption and smaller-scale transactions were included in the new national income estimates. An earlier neglected part of the population was now seen as economically and politically, and therefore statistically, important.

Despite these aims of a new basis for the accounts, the available basic statistics were not sufficient. The estimates of agriculture in the first national account reports for Zambia covered

²⁹ P. Deane, Review of three publications: *Domestic income and product in Kenya. A description of sources and methods with revised calculations from 1954-1958* (Nairobi, East African Statistical Department, 1959); *The national income of the Sudan, 1955-1956*, by C. H. Harvie and J. G. Kleve (Khartoum, 1959); and *Comptes Économiques Togo, 1956-1957-1958*, by G. Le Hégarat (Paris, 1961) in *The Economic Journal*, 71:283 (1961), pp. 630-631.

³⁰ Republic of Zambia, *National Accounts 1964-1967* (Lusaka), p. 37.

commercial farming (non-African) and officially registered sales from African farms, while ‘African subsistence farming and hunting is estimated mainly in accordance with information given by the FAO about per capita consumption of different kinds of commodity’.³¹ A similar ambitious intent was evident in Tanzania. The Central Bureau of Statistics in Dar es Salaam attempted to include 40 agricultural products, 15 livestock products and producers of government services in the estimates for agriculture. The Central Bureau of Statistics in Dar es Salaam acknowledged that despite the importance of agriculture to the national economy, ‘the available information on crop acreage, output etc. is very meagre’, except in the case of the export crops.³² In Tanzania data on production for own consumption from the Household Budget Survey were first available in 1969. The survey was based on a sample of 824 households spread throughout the country. For the all other years consumption was assumed to grow with the rural population, the growth rate of which was simply assumed to be 2.825 percent.

This assumption of proportional agricultural growth to rural population growth was made in many African countries. In one of the very few empirical studies of African national income statistics ever conducted, Blades noted that for the growth estimates of subsistence agriculture that ‘the basic assumption is that output grows at the same rate as the rural population’, thus assuming a 1-to-1 labour productivity in the rural sector.³³ Note that since rural population growth was slower than total population growth this introduces a bias towards decreasing GDP per capita output in the measurement methods. These estimates are not very sensitive to climatic variations or other factors assumed to affect agricultural productivity., though some ad-hoc adjustment in the annual data was made in exceptional years: ‘In Zambia and Uganda annual variations around the trend are estimated on the basis of “eye-estimates” made by agricultural experts in the main production areas’.³⁴

The data basis in Tanzania might seem meagre, but it compares favourably with other countries. In Zambia, a pilot Household Budget Survey was first undertaken in 1972/73, whereas

³¹ Republic of Zambia, *National Accounts 1964-1967* (Lusaka), p. 37.

³² United Republic of Tanzania, *National Accounts of Tanzania 1966-68* (Dar es Salaam), p. 2.

³³ Derek Blades, ‘What do we know about levels and growth of output in developing countries? A critical analysis with special reference to Africa’, in R.C.O. Mathews (ed.), *Economic Growth and Resources: Proceedings of the Fifth World Congress, International Economic Association, Tokyo, Vol. 2, Trends and factors* (New York: St. Martin’s Press, 1980), pp. 68–75.

³⁴ Blades ‘What do we know about levels and growth of output in developing countries?’, p. 69.

in Botswana a Rural Budget Survey was available first in 1973/74, and provided the only survey data for agricultural production until a new survey was undertaken in 1986/1987.³⁵ In Kenya the estimates of agricultural output are based on an annual Integrated Rural Survey (IRS) and an annual Census of Large Farms. The first IRS was undertaken in 1974/75, it is not clear what source of information on small farms was used before this date.³⁶ In Nigeria, agricultural surveys have been conducted on a regular basis since the 1950s, but these had a very small sampling frame, and covered a irregular geographical area. In fact, Helleiner notes agricultural surveys that in the surveys conducted during 1955-60 'no one area was covered more than once' and 'in no one year were areas in more than one region covered'.³⁷

The importance given to peasants in political speeches was matched by ambitions in national account blueprints. But in both cases there were serious shortcomings when it came to practical application. Nyerere in a speech in 1973 said 'If real development is to take place, the people have to be involved'.³⁸ In Zambia, Kaunda voiced a similar concern, 'Our emphasis must be among those thousands of farm units which we must help emerge from strict subsistence level into a living relationship with the rest of the economy'.³⁹ Nevertheless, 'real people' at the 'subsistence' level tended to remain unrecorded in the national income statistics, and similarly ignored in national development plans. Nyerere was seemingly sceptical to the value of the national income measures for development targets: 'To measure a country's wealth by its gross national product is to measure things, not satisfactions'.⁴⁰ Ten years after independence Nyerere was addressing the progress made and then went on to a discussion of the validity of the descriptive statistics:

Our total wealth has certainly gone up, although really comparable figures are rather difficult to give. Thus it was estimated – though without much precision – that at the time of independence the national income per head was something like Shs 380 per year. Since that time a new and more reliable basis for such calculations have been worked out and, on that basis, plus the fact that the population in 1961 was larger than we thought a

³⁵ Morten Jerven, 'Accounting for the African growth miracle: the official evidence, Botswana 1965-1995', *Journal of Southern African Studies*, 36:1 (2010), pp. 73 - 94.

³⁶ Republic of Kenya, *Sources and Methods Used for the National Accounts of Kenya* (Nairobi, 1977).

³⁷ G. K. Helleiner, *Peasant agriculture, government and economic growth in Nigeria* (Homewood, III, 1966), p. 392.

³⁸ Julius Kambarage Nyerere, *Freedom and Development* (Dar es Salaam, Oxford University Press, 1973).

³⁹ Kenneth David Kaunda, *Towards Complete Independence* (Lusaka, Zambia Information Services, 1969).

⁴⁰ From a speech by Julius Kambarage Nyerere, 'The Rational Choice'. given on 2 January 1973 in Khartoum.

better figure for 1961 is probably between 460 and 490 Shs. Certainly that is the figure we must think of when comparing with the present position, where the national income is calculated to be approximately Shs 670 a year.⁴¹

The quote reflects the importance given to the estimates. A low-income estimate at independence certainly would put the first 10 years of progress in a favourable light. But of greater importance for Nyerere and Tanzanians was the point that before independence the contribution and size of the population and their economic activities were underestimated. Peacock and Dosser did actually create national accounts for Tanzania 1952-54, which were inclusive of activities in 'subsistence' economy such as hut building.⁴² But the colonial estimates and first official data of the 1960s did not include this data. In the revised 1966 estimates, construction and rents in the subsistence' sector were included and together with other changes this increased national income estimates by 25 percent and capital formation by 11 percent.⁴³

A final notable change in African economies, particularly in Zambia and Tanzania in the 1970s, was a centralization of the economy and the growing power of the parastatal companies. In both Zambia and Tanzania this was paralleled by an emphasis on socialism, but also in other so-called 'capitalist' countries the state was deeply involved in the economy: conducting trade, marketing and transporting agricultural crops (both for food and for exports), and being directly or indirectly involved in manufacturing and construction activity through newly formed development corporations. This also eased economic recording. In Tanzania in the 1970s the data used for the national accounts on trade, finance and industry sectors were largely drawn from the parastatal enterprises, while data on crops were largely drawn from state marketing boards. This might be interpreted as a choice of convenience, but in the case of Tanzania, there was a correspondence between legitimate and recorded economic activity. Marketing of commodities outside state or parastatal channels was illegal and could as such not be thought of as a contribution to the national income.

Economic growth and the expansion of the state soon gave way to decline, and in the 1980 and 1990s economic collapse redefined the task of development. The convenient data

⁴¹ Julius Kambarage Nyerere, *Tanzania ten years after independence: report* (Dar es Salaam: Ministry of Information and Broadcasting, 1971).

⁴² Alan T. Peacock and Douglas G.M. Dosser, *The National Income of Tanganyika, 1952-54* (London, 1958).

⁴³ Arkadie, 'National accounting and development planning', p. 19.

sources became increasingly obsolete as ‘parallel’, ‘black’ and ‘informal’ markets thrived. The new challenge was to account for this ‘informal’ economy in the midst of a collapsing formal economy in which the statistical offices were firmly embedded.

‘The Lost Decades’

In the Zambia statistical office in Lusaka, the national account reports and any other publications relating to the accounting methodology and most other relevant reports cease to be available after 1973. Beyond that just an annex report to the 1973-1978 estimates was obtainable. This means that very little is known about the estimates and their procedures in the 1980s. In 2007, on my visit to the Central Statistical Office in Lusaka, neither the national accountants nor the persons responsible for library/data dissemination functions were able to clarify whether this was an issue of the reports having gone missing or never having been published.⁴⁴

A similar problem was observed in Ghana, where the Ghanaian Statistical Services ceased publishing its annual Economic Survey in 1985 due to lack of funding and qualified personnel. It attempted to re-instate this document as a regular source of economic information for Ghana in 2005, but the document has not been published since. In Kenya, the only available document containing a description of methods and sources for the national accounts was published in 1977. At the Central Bureau of Statistics in Nairobi in 2007, I was assured that this publication contains ‘everything you need to know’ about national accounting in post-colonial Kenya, although many important changes, such as an informal sector survey, have been implemented since.⁴⁵

It is indicative of the economic development trajectory that what has been referred to as ‘the lost decades’ were indeed lost in national accounting terms.⁴⁶ The loss of institutional memory means the statistical office is unable to account for the estimation procedures for a decade or more. Finally, the gaps in accounting documentation show how the lack of economic resources and state finances hinders efficient economic planning.

⁴⁴ Interview with Litia Simbangala, Statistician, National Accounts branch, Central Statistical Office, Zambia (March 2007, Lusaka).

⁴⁵ Interview with Collins M. Omondi, Statistician, Central Bureau of Statistics, Kenya (April 2007, Nairobi).

⁴⁶ Easterly, ‘The Lost Decades’.

In Zambia librarians at both the University Library Special Collection, which functions as a legal repository of official documents, and at the National Archives, with the same legal rights, lamented this fact. Publications for the 1960s and early 1970s were present and catalogued, but after that there was a gap in the deposits. It was explained that while the libraries had the legal right to the documents, finance of transports and acquisition was not provided for on either side. The librarian in each place explained that the documents would have to be collected by them personally, and understandably this had not happened.⁴⁷ The onset of economic crisis and the ensuing structural adjustment had serious ramifications for the provision of national income estimates.

This situation also damaged the credibility of the national statistical offices as sources of information. In Ghana and Nigeria the statistical offices both underwent name changes (from Central Bureau of Statistics to Ghanaian Statistical Services and from Federal Office of Statistics to National Bureau of Statistics), and in both cases this was a deliberate move to improve credibility, assert independence from the politics and to distance themselves from previous controversy.⁴⁸

Among users in academic and policy circles there has been a decisive shift in preferred use of data sources. Journal articles and monographs published on African economies in the 1960s, 1970s and 1980s would invariably refer extensively to official documents and make use of national accounts, economic surveys and data from statistical abstracts to support their analysis. In recent decades these data sources have gone entirely missing. In part this is due to availability and accessibility. Major competitors such as *Penn World Tables* and *World Development Indicators* have become preferred source of social and economic statistics. The product remains the same: the World Bank is reporting the official data as submitted to them by national statistical offices, with only minor modifications. Undoubtedly, the brand name of ‘World Bank’ is better than the ‘National Bureau of Statistics’ but the ingredients in the final ‘product’ are the same.

⁴⁷ This information was conveyed to me in two independent conversations, at the University Library, Lusaka and the National Archives, Lusaka during February 2007.

⁴⁸ Interviews with Prof. Nsowah-Nuamah at ISSER, Legon, Ghana, 15 February 2010 and with O.F. Nwaboku at NBS, Abuja, Nigeria, 23 February 2010.

Adjusting to Structural Adjustment

A Zambian report on a national income estimate revision for new series based in 1994 starts by stating the obvious: ‘Inflation rates of more than 200 percent in the early 1990s had adverse effects on the provision of macroeconomic statistics’.⁴⁹ Creating meaningful data on year-to-year real economic growth in such circumstances is complicated. Furthermore, Structural Adjustment entailed massive change in the structure of production and ‘the break up of the former large parastatals meant that previous sources of data were not available’.⁵⁰ A revision and a rebasing were overdue as the accounts were still based in 1977 prices and these benchmarks were ‘becoming inadequate, and over time provided less accurate estimates’.⁵¹ The previous estimates had largely ‘excluded [the] informal sector and therefore impaired the value of GDP estimates over time, in all sectors except agriculture’.⁵²

After incorporating the informal sector activity in the total GDP, the formal sector share was estimated at 58 percent in terms of value added with a corresponding share 42 percent for the informal economy. To this estimate the statistical office gave the following warning ‘We wish to caution that including the informal sector activity in the Zambia National Accounts may tend to exaggerate the GDP of the nation, relative to other countries or even to the previous estimates which mostly excluded it. It must also be recognised that it will be difficult to up-date the sector relation based on indicators in the absence of surveys to monitor the activity in the future’.⁵³

In Tanzania the report accompanying the new constant price series at 1992 prices held that ‘strong efforts were made to determine what is the story behind the figures, whether the data applies to what is experienced as happening in the industry. This has not been emphasised earlier’.⁵⁴ Structural changes, especially in the later part of the 1980s, were not reflected in the available statistics, resulting in an under-estimation of value added. ‘Estimates of the size of this

⁴⁹ Republic of Zambia, *National Accounts Statistics GDP Revision of Benchmark 1994 Estimates* (Lusaka).

⁵⁰ Zambia, *GDP Revision of Benchmark 1994*.

⁵¹ Zambia, *GDP Revision of Benchmark 1994*.

⁵² Zambia, *GDP Revision of Benchmark 1994*.

⁵³ Zambia, *GDP Revision of Benchmark 1994*.

⁵⁴ United Republic of Tanzania, *Report on the Revised National Accounts of Tanzania 1987-96* (Dar es Salaam), p. 1.

deficiency ranged from 30 percent to as much 200 percent of GDP'.⁵⁵ The new level estimates were reached by incorporating all available data into the accounts, including the results of new surveys of the transport, trade and construction undertaken as part of the project. In the previous estimation methods of 1976 the 'private sector was under covered – sometimes not covered at all – and the growing informal sector was not generally accounted for'.⁵⁶ A time series was developed by extrapolating these data on trends backwards. The assumptions were changed: the informal economy was expected to increase when the formal sector was in decline, rather than move with it.

This question is analogous to the issues related to the 'subsistence' or 'traditional' output raised in the 1950s. The 'discovery' of the 'informal sector' is usually credited to the ILO in the 1972 and Hart in 1973,⁵⁷ but there is still an unresolved scholarly question regarding the productive potential of this sector.⁵⁸ Is the 'informal' an independent source of economic growth, is it dependent on the 'formal' economy for demand and supply, or is it a parasitic sector, profiting from the demise of the formal sector? Rather than raw data that can be used to test these relationships, the facts that are available in the national account statistics are expressions of assumed relationships, and the assumptions that are made in the production of the figures are not transparent for the data user.

In the late 1990s both Zambia and Tanzania underwent a massive upward re-appraisal of the national income following structural adjustment. Both countries had followed a path of state led development from the late 1960s until the crisis in the 1980s. During this period as a matter of convenience and ideology, data on trade, services and crop production (through the state marketing boards) were collected by the parastatal companies, which were assumed to represent the whole economy. When those state agencies were unable to offer an acceptable price, economic actors turned to informal and parallel operators, and thus the national income estimates

⁵⁵ Tanzania, *Revised National Accounts of Tanzania 1987-96*, p. 1.

⁵⁶ Tanzania, *Revised National Accounts of Tanzania 1987-96*, p. 1.

⁵⁷ International Labour Organisation, 'Employment, Incomes and Equality: A Strategy for Increasing Production Employment in Kenya' (Geneva, 1972) and K. Hart, 'Informal Income Opportunities and Urban Employment in Ghana', *The Journal of Modern African Studies*, 11:1 (1973), pp. 61-89.

⁵⁸ For recent reviews of the informal sector literature see King, K. 'Africa's Informal Economies: Thirty Years On', *SAIS Review*, 11:1 (2001) and K. Hart, 'On the informal economy: the political history of an ethnographic concept', CEB Working Paper No. 09/042, Centre Emile Bernheim (2009) and Kate Meagher, *Identity Economics. Social Networks and the Informal Economy in Nigeria* (London, 2010).

recorded a massive decline in the late 1970s and early 1980s. It is impossible to correctly gauge the movement and/or the size of this unrecorded component. As noted, Zambia and Tanzania have revised their economies to include 'informal' sector estimates, but much as with the inclusion of the 'subsistence' economy in the 1960s, the national accountants are not able to measure economic change. This is potentially misleading, as scholars approach per capita estimates and wish to compare income across countries as well as across time.

Conclusion: Measuring the Progress of African Economies

A recurring theme in this article has been the changing importance and character of the unrecorded element in the national income accounts. In the 1960s development economists were not convinced of the importance of measuring the small scale peasant production, perceiving it to be a diminishing component in rapidly changing economies. Currently, it is rather the lack of change and the continued importance of this 'subsistence' sector in African economies that is lamented. Precisely because of the lack of information about this sector it is hard to interpret what structural change has in fact happened since independence. Similar debates relate to the measurement of the 'informal' economy today. The statistical evidence would imply that there has been a growth in the informal sector, especially in small-scale manufacturing and services, but whether the growth is a result of increased statistical coverage itself or a structural change is a very interesting as well as a pressing question to pursue.

When baseline and/or growth estimates for these largely unrecorded sectors are made at the statistical offices, recourse is often made to population estimates, assuming a per capita value for certain activities, or using estimates of population growth as a proxy for unmeasured economic change.⁵⁹ This means that the population data, substituting for labour market data that

⁵⁹ For a review of these different estimation methods and their growth implications, see Morten Jerven, 'Random growth in Africa? Lessons from an evaluation of the growth evidence on Botswana, Kenya, Tanzania and Zambia, 1965–1995', *Journal of Development Studies*, 46:2 (2010), pp. 274–294.

often are lacking, are of great importance for the estimates.⁶⁰ However, according to Bondestam (1973:10), the implementation of these important population censuses has been sporadic.

During the 20 years after the Second World War 21 countries made one complete and 28 countries made two or more complete population counts, together covering some 80% of the total African population. Between 1950 and 1971, 11 countries conducted three censuses, 20 countries two, and 6 countries had one census only. If we concentrate on the last years, we find that between 1965 and 1971 less than half of the African countries made complete enumerations of their populations. The obvious difficulties in carrying out censuses are further illustrated by the fact that out of 21 listed with plans to carry out censuses in 1970 only 5 succeeded in doing so.⁶¹

The censuses that have been implemented have also been of poor quality and have been subject to political contestation, as the case of Nigeria and the controversy surrounding the population censuses and the political importance of the relative population size in the North and the South illustrates very well.⁶² The uncertainty surrounding the population size estimates leaves the per capita measures of income malleable, and the population growth between censuses should not be taken at face value but rather as a matter of interpretation, dependent on the quality and coverage of the censuses.

Is national income accounting a problem primarily for scholars, or does it have practical implications? Undoubtedly, these statistics are pertinent to contemporary political debates. In Ghana in 2004, a public debate arose regarding the estimate of per capita income. At the time the World Bank reported the accepted figure to be 380 USD per capita. President Kufuor claimed that the correct figure was rather 600 USD, while Finance Minister Wiredu claimed the figure to be closer to 1000 USD. Kufuor stated that the Statistical Services in Ghana did not have sufficient resources to calculate these particular figures.⁶³ When I visited Ghana Statistical Services (GSS) in February 2010, the revised estimates were still to be published. A conversation with the

⁶⁰John Sender, Christopher Cramer and Carlos Oya, *Unequal prospects: disparities in the quantity and quality of labour supply in sub-Saharan Africa*. Working Paper, World Bank Social Protection Discussion Paper Series; No. 0525 (2005).

⁶¹Lars Bondestam, *Some Notes on African Statistics: Collection. Reliability and Interpretation*, Uppsala: Research Report No. 18. (1973), p. 10.

⁶²Morten Jerven, 'Controversy, facts and assumptions: population growth and agricultural productivity in Nigeria, 1911-2006', Paper presented at the African Economic History Workshop, London School of Economics, April 2010 (Unpublished).

⁶³*The Ghanaian Chronicle*, 'Ghana: Conundrums', 17 August 2005.

Director of Economic and Industrial Statistics Group revealed how the revision was dealt with.⁶⁴ The current data in Ghana, based on 1993 prices, and calculated according to the 1968 Standard of National Accounts, are severe under-estimates. According to Director of Economic and Industrial Statistics, the current VAT receipts alone are higher than the total income estimates reached using the prevailing methods, and the 1993 benchmark used data only on fixed telephone lines in the estimates, thus not taking account of the revolution in mobile telephone communication. In April 2010, the GSS convened a meeting with stakeholders to announce the future upward revision of the estimates. It was expected that Ghanaian economists would be pleased with these news, as it had been a long standing complaint that the GSS data were underestimates. Commercial Banks had likewise commented that the GSS data did not match their estimates of business in Ghana. The political reception is likely to be mixed. The Director of Economic and Industrial Statistics noted that although by some indicators an upward revision is good news, this is not true across the board. It will be harder to get access to financial aid, and some targets like developmental spending measured as a ratio to GDP would be harder to reach.

Such an upward revision is likely to occur across the African continent as benchmarks are updated, the 1993 Standard of National Accounts is implemented and coverage of new economic activity in formal and informal markets is properly measured. The ad-hoc upward revisions may give an illusory impression of recent growth. There is no agreed upon method to deal with these re-visions. The national income accountants in Ghana and Nigeria had both had visits by IMF representatives who recommended substantial upward revisions of the national income estimates. In both cases the IMF representatives had recommended that the increase be ‘spliced’ in backwards, thus creating an illusory acceleration of economic growth in the recent years.⁶⁵ Essentially this means that instead of adding a 60 percent increase in a single year, the increase is divided in parts, and added to the estimates for earlier years.⁶⁶

⁶⁴ Interview with Magnus Ebo Duncan, ISSER, Legon, Ghana, 21 February 2010.

⁶⁵ Interviews conducted at GSS in Accra, Ghana, 15-17 February 2010 and at NBS in Abuja, Nigeria, 21-23 February 2010.

⁶⁶ For a demonstration of the growth effects of such methods, see Morten Jerven, ‘Accounting for the African growth miracle: the official evidence, Botswana 1965-1995’, *Journal of Southern African Studies*, 36:1 (2010), pp. 73-94.

Is there a substantial data quality variation between countries? There are differences in assumptions and methods. Currently the most important difference is whether there has been a substantial revision regarding the informal sector, the inclusion of which is provided for in the 1993 Standard of National Accounts. The more recent the benchmark year, the better the level estimates. It is hard to generalize about the quality of the growth data, where methods of extrapolation, ‘splicing’ and harmonization of older time series are done in ad-hoc and undocumented fashion. An important issue not dealt with in this paper is the effect of violent conflict (Sierra Leone, Angola, Mozambique, Somalia, Ethiopia, DRC, etc.) on statistical agencies. In these countries data collection will have been significantly distorted, and this is an important issue that has only recently received attention. The recently published *Human Security Report* reviews some of these problems in assessing both the negative effects of war and the benefits of conflict resolution and peacekeeping operations.⁶⁷

What might be done to improve the accuracy of national accounts data? As the term ‘garbage in–garbage out’ indicates, the national income estimates will not be better than the basic data that are available to the national statistical offices. Thus investment in data collection that ensures the timely and regular collection of data is the key to future improvement of the estimates. As has been discussed here, such funding has been insufficient and irregular. At the Federal Office of Statistics in Nigeria, officials lamented this situation and said that ideally, the office could rely on funding from the government rather than from international donors. Thus, this article reiterates the call for more investment in the upstream data collection, made in this journal almost two decades ago by Paul Mosley.⁶⁸

The title of this article, ‘Users and Producers’ is inspired by the name chosen for seminars organized by the Federal Office of Statistics in Nigeria in the 1980s and 1990s, which aimed to provide a consultation between the data providers and the data users. In the first workshop held in 1982, the director of the Federal Office of Statistics spoke of the lack of authority and legitimacy of his own institution:

⁶⁷ Human Security Report Project. ‘Shrinking Costs of War’, Part II in the *Human Security Report 2009* (forthcoming). Vancouver: HSRP, 2010.

⁶⁸ Paul Mosley, ‘Policy Making without Facts: A Note on the Assessment of Structural Adjustment Policies in Nigeria, 1985-1990’, *African Affairs*, 91:363 (1992), pp. 227-240.

There has been a noticeable concentration on diagonal relationships in the way we are operating to the utter neglect of horizontal relationship. This situation has led to unhealthy relationship among the statistical collecting agencies and some loss of credibility in the statistics published. Furthermore, priorities in statistical work are sometimes determined by the request for statistics from various United Nations Agencies. It has been found that the requests for statistics often made by the UN agencies have gone a long way in distorting the statistical programmes where they exist and have sometimes conditioned the shifting of the priority base. It often happens that these requests are tied to some benefits like loans for projects or other aids for development programmes. It is expected that the existence of a statistical policy-making body would regulate the involvement of statistical offices in this respect and help in establishing and stabilizing the statistical priorities.⁶⁹

These concerns echo those voiced at statistical offices the author visited in sub-Saharan Africa in the period 2007-2010. The producers of statistics are constrained by lack of funding and are not able to function fully as independent fact providers. The importance of the ability of the statistical offices to independently and regularly provide statistics that enter the public domain in policy evaluations, political debates and assessments of progress towards lofty goals such as the Millennium Development Goals cannot be stressed strongly enough.

The situation is not hopeless. For analysis there are other data available, especially given development of satellite imagery and increased monetization – and also given the proliferation of budget household surveys. These can be used as invaluable checks on aggregate national income accounts statistics. For countries with multiple Demographic and Health Survey datasets, for example, time series on birth weights could be constructed – and possibly used to revise income estimates, or at least to shed light on trends that seem counter to health patterns. Pioneering such efforts, Alwyn Young is constructing real measures of consumption to account for increased welfare in the post-colonial period, while Alex Moradi has been compiling datasets on people's heights for African countries in the colonial period.⁷⁰ The latter method, referred to as anthropometry, utilizes data on heights to measure health and nutrition levels for the population, and can be a useful alternative or check on income measures. Other innovative suggestions come from Henderson et al., who have used satellite data on light emissions to space to measure

⁶⁹ Federal Office of Statistics, *Production and Uses of Statistics in Nigeria. Discussion and Summaries of Proceedings of a National Workshop, February 22-24, 1982*, ed. O. O. Ajayi (1983), p. 11.

⁷⁰ Alwyn Young, 'The African Growth Miracle,' LSE Working Paper (2009); Alex Moradi, 'Towards an Objective Account of Nutrition and Health in Colonial Kenya: A Study of Stature in African Army Recruits and Civilians, 1880-1980', *Journal of Economic History*, 69:3 (2009), pp. 720-755.

growth, and Miguel et al., who use rainfall data to correct for measurement problems.⁷¹ A recent surge in research on the issues of data quality and measurements in Africa will hopefully provide better tools for data users and better resources for data producers in the future.

Despite the appearance of alternative measures the national income data remain a measure with unique importance for economic development, policy evaluation and political debates. It is therefore not sufficient to dismiss the data as unreliable. As long as they are available, they will be used. The recently published *The Political Economic of Growth in Africa 1960-2000* is an excellent example of research that is oblivious to the quality of the economic growth data.⁷² In these two volumes with almost exclusively quantitative analysis, the issue of data quality is not touched upon, leaving the validity of the analysis shrouded in uncertainty. With the discussion in this article I aim to provide some essential context and facts for the challenge of interpreting official statistics in Africa. What are the implications for data users? Awareness that the data are produced with scarce resources at the individual statistical offices is one important step forward. This article also points to the limits on the type of questions the available data can answer. Finally, it shows how the priorities of powerful stakeholders in the development process have shaped the way progress is measured in African economies.

⁷¹ J. V. Henderson, A. Storeygard and D. N. Weil, 'Measuring Growth from Outer Space', NBER Working Paper 15199 (Oslo, 2009); E. Miguel, S. Shanker and S. Ernest, 'Economic Shocks and Civil Conflict: An Instrumental Variables Approach', *Journal of Political Economy*, 112:4 (2004), pp. 725-753.

⁷² B.J. Ndulu, S. A. O Connell, J. P. Azam, R. H. Bates, A. K. Fosu, J. W. Gunning and D. Njinkeu (eds.), *The Political Economic of Growth in Africa 1960-2000: An Analytic Survey and The Political Economic of Growth in Africa 1960-2000: Case Studies* (Cambridge, Cambridge University Press, 2008).