

**“Running With Two Legs”  
Why Poverty Remains High in Tanzania and  
What To Do About It**

**by**

**Lars Osberg  
Dalhousie University**

**and**

**Amarakoon Bandara  
UNDP Tanzania**

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**DEPARTMENT OF ECONOMICS**

DALHOUSIE UNIVERSITY  
6214 University Avenue  
PO Box 15000  
Halifax, Nova Scotia, CANADA  
B3H 4R2

“RUNNING WITH TWO LEGS”  
WHY POVERTY REMAINS HIGH IN TANZANIA AND WHAT TO DO ABOUT IT

Lars Osberg and Amarakoon Bandara<sup>1</sup>

**May 25, 2011**

Abstract

Using growth incidence curves and pseudo-cohort analysis we show that Tanzania’s growth from 2001 to 2007 has not been pro-poor. The underlying reason appears to be the slow growth in agriculture, where most rural poor make a living. However, we argue that development of agriculture alone would not enable Tanzania to reduce poverty on a sustainable basis. Tanzania needs to emphasize both productivity improvements in small-scale agriculture which enable increased farm production and higher farm income, and growth in non-farm employment to provide the markets needed for increased agricultural output and to generate income directly.

JEL Classification: A10, D31, H20

Key Words: Poverty reduction, Agricultural productivity, Growth

Author’s email address: [lars.osberg@dal.ca](mailto:lars.osberg@dal.ca), [amarakoon.bandara@undp.org](mailto:amarakoon.bandara@undp.org)

## **1. Introduction**

Real GDP in Tanzania grew on average by 7 percent annually during 2001-2007, well above the average growth rate of most other Sub Saharan African countries. But this high rate of economic growth has not translated into a corresponding decline in poverty, which dropped by only two percentage points during this period. As a result, the ‘basic needs’ poverty rate remains very high at 33.6 per cent<sup>2</sup>. While the industry

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<sup>1</sup> McCulloch Professor of Economics, Dalhousie University, Nova Scotia, Canada and Economics Advisor, UNDP Tanzania, Dar es Salaam, Tanzania, respectively. The views expressed are those of the authors and do not necessarily represent those of their affiliations. We thank Heri Marco and Thadeus Mboghoina for assistance in compiling data for the research.

<sup>2</sup> Unless otherwise noted explicitly, this paper will use the HBS “basic needs” poverty line definition of expenditure poverty. This is set 37% above the cost of 2200 calories per adult equivalent per day – see

and services sectors became more dynamic with growth rates of 12.7 per cent and 9.6 per cent respectively over this period, their employment generation did not keep up with the need for jobs. Agriculture, on which the livelihood of the majority of rural poor depends, grew only by 4.5 per cent annually during the period 2001-2007, barely enough to raise the real per capita income of the rural poor

The objective of this study is to analyze why growth in national GDP has not translated into a corresponding reduction in poverty and why agricultural productivity and incomes remain low. Specifically, this paper asks:

- Is the lack of progress in poverty reduction just a brief interlude before the benefits of the current pattern of growth trickle down later?
- Is it solely a reflection of a failure of policy to allocate enough resources to agriculture, whose growth is usually considered to be pro-poor?
- Is there a bigger failure of policy design? Is a paradigm shift in development policy required for the economy to take-off to a higher growth path while also ensuring a significant reduction in poverty?
- How can Tanzania retain high growth while also making it pro-poor?

This paper defines poverty in income and expenditure terms, as occurring when a household's total command over goods and services is inadequate to meet their basic needs. Since households can gain access to goods and services either through their participation in economic markets or by non-market transfers of resources, there are really only two ways in which economic growth can benefit the poor:

- (1) if growth in GDP implies greater incomes for previously poor people, because what they have to sell (i.e. agricultural commodities or labour services,) commands better prices or can be sold in greater amounts or both;
- (2) if growth in GDP implies growth in tax revenue which finances increased government services or transfers received by the poor

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HBS2007; Appendix A. At 13,998 Tshs per adult equivalent per month, it was equivalent to US\$ 26.94 in PPP terms in 2007.

Historically, much of the reduction in poverty observed in rich OECD nations during the last century has relied on (2) – i.e. the “tax and spend” powers of government – either in the form of redistributive income transfers (like old age pensions) or income enhancing services (like public education). Most of this paper focuses, however, on the link between GDP growth and the market income of poor households. Section II gives an overview of growth pattern in Tanzania to highlight the unevenness of development. A comparison of GDP growth and household income per capita is provided in section III. Section IV discusses the growth incidence evidence available from HBS data. [Preliminary evidence from pseudo-cohorts and life cycle effects are also discussed in Appendix A.] The rather poor growth in income in Tanzanian small scale agriculture is analyzed in Section V. Policy implications are discussed in Section VI while Section VII concludes.

## II. Overview

In the course of economic development, agriculture<sup>3</sup> typically shrinks as a percentage of GDP relative to other sectors, because the growth rate of the primary sector typically lags behind that of industry and services<sup>4</sup>. Tanzania is no exception to the rule. During 2001-2007, agricultural output in Tanzania grew only by 4.5 % per year as against 9.4 % annual growth in industry<sup>5</sup> and 7.7 % in services<sup>6</sup> (Table 1). The mining and construction sub-sectors in the industrial sector grew more rapidly at 15.2 and 10.8 per cent, respectively. The end result is that in Tanzania, agriculture's share of GDP dropped from 30.6 % in 2001 to 26.2 % in 2007 (NBS 2008) (declining further to 25.6% in 2008 (Bank of Tanzania (2010))).

Reporting the growth rates of different sectors as in Table 1 does not, however, indicate the magnitude of each sector's contribution to aggregate growth. Mining in Tanzania has grown very rapidly, but from a very small base, as a percentage of GDP. Arguably, foreign owned mines in Tanzania comprise an enclave economy, with relatively few linkages to the local economy. In Tanzania, as in other nations, the capital intensive method of production and specialized technology of modern mining implies that one cannot expect locally purchased inputs to provide many backward linkages to local economic activity. Particularly for precious metals like gold, there is also not much possibility of forward linkages – once poured into ingots, local processing of mine output essentially ceases. Local hiring is a trivially small proportion of the labour force of a country of 40 million people - doubling the share of mining in total employment in between 2000 and 2006, still only brought it to 0.5 per cent 2006 (including employment in artisanal mining ILFS 2000/01 and 2006). Hence, because the mining

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<sup>3</sup> Including forestry and fishing as well as crops and livestock

<sup>4</sup> Another way to say the same thing is to note that the income elasticity of demand for primary commodities is less than that of services or manufactured goods.

<sup>5</sup> Industry includes mining and quarrying, manufacturing, electricity, gas, water supply and construction.

<sup>6</sup> Services include trade and repairs, hotels and restaurants, transport, communications, financial intermediation, real estate and business services, public administration, education and health,

sector has few linkages to local markets, the market-mediated impacts of GDP growth on the poor in Tanzania depend on the growth rate of GDP *excluding mining*.

As Table 1A indicates, including or excluding the Mining and Quarrying sector from measured GDP makes relatively little difference to measured aggregate growth in Tanzania. If the mining sector continues to expand, it will become a larger fraction of GDP and its rate of growth will make more difference in the future than it now does to economic growth, as measured by GDP. Nevertheless, the capital intensive nature and specialized technology of the mining sector are unlikely to change – which implies that mining is likely to remain an enclave within the wider Tanzanian economy.

However, while the labour market and local commodity demand impacts of mining in Tanzania are not likely to be a large percentage of aggregate national economic activity in the foreseeable future, this does not imply that the sector is necessarily irrelevant to poverty reduction – at least potentially. In Tanzania, as anywhere else in the world, the poverty reduction impact of the growth of resource extraction sectors depends primarily on what happens to the profits. In Tanzania, Barrick Gold Mines provides a concrete example.

Table 1: Comparison of sectoral growth

| <b>Sector</b>                        | Rate of growth<br>(%)<br>2001-2007 | Share of GDP<br>(%)<br>2001 | Share of GDP<br>(%)<br>2007 |
|--------------------------------------|------------------------------------|-----------------------------|-----------------------------|
| <i>Production method</i>             |                                    |                             |                             |
| <b>Agriculture</b>                   | 4.5                                | 30.6                        | 26.2                        |
| Crops                                | 4.8                                | 21.4                        | 18.6                        |
| <b>Industry and construction</b>     | 9.4                                | 18.0                        | 20.9                        |
| mining                               | 15.2                               | 1.8                         | 2.7                         |
| manufacturing                        | 8.2                                | 8.4                         | 9.2                         |
| construction                         | 10.8                               | 5.2                         | 6.5                         |
| <b>Services</b>                      | 7.7                                | 45.5                        | 47.3                        |
| Trade                                | 8.0                                | 13.0                        | 13.8                        |
| Real estate and business services    | 6.6                                | 10.3                        | 10.2                        |
| <i>Expenditure method</i>            |                                    |                             |                             |
| <b>Final consumption</b>             | 6.7                                | 86.8                        | 90.7                        |
| Households                           | 6.0                                | 75.0                        | 72.6                        |
| Government                           | 9.5                                | 11.8                        | 18.1                        |
| <b>Gross capital formation</b>       | 14.3                               | 17.4                        | 24.3                        |
| Gross fixed capital formation        | 14.5                               | 17.0                        | 24.0                        |
| agriculture                          | 6.0                                | 0.5                         | 0.4                         |
| mining                               | 12.6                               | 1.7                         | 2.1                         |
| manufacturing                        | 9.8                                | 2.8                         | 3.5                         |
| construction                         | 20.0                               | 5.3                         | 10.0                        |
| <b>Export of good and services</b>   | 11.4                               | 17.0                        | 20.1                        |
| <b>Imports of goods and services</b> | 15.6                               | 21.3                        | 35.1                        |

Source: National Accounts of Tanzania Mainland, 1998-2007

Table 1A  
The Impact of Mining on Aggregate Growth

|                                    | 2001<br>million Tshs | 2007<br>million Tshs | cumulative<br>growth | annual<br>average |
|------------------------------------|----------------------|----------------------|----------------------|-------------------|
| GDP at constant 2001 market prices | 9,100,274            | 13,801,849           | 51.7%                | 7.0%              |
| mining & quarrying                 | 159,979              | 377,487              | 136.0%               | 15.2%             |
| GDP - mining & quarrying           | 8,940,295            | 13,424,362           | 50.2%                | 6.8%              |

Barrick Gold Mines currently pays relatively little tax in Tanzania. Royalty payments amounted to an average \$37 per ounce in 2010<sup>7</sup> and Barrick is exempted from VAT on purchased inputs and has not paid corporate profits tax since coming to Tanzania.<sup>8</sup> However, in 2010 production of 716,000 ounces of gold, a world price over \$1,400 (US) and average production costs (including amortization and taxes) of \$725, meant that Barrick Gold had operating profits on its Tanzanian operations of approximately \$514 Million (US) in 2010<sup>9</sup>.

If corporate tax had been paid on those profits at the US federal corporate tax rate of 35%, the revenue would be roughly 225 Billion Tshs<sup>10</sup>. Tax revenue of this magnitude would have been more than sufficient to fund a universal pension for all

<sup>7</sup>All financial and production data on Barrick are taken from:  
[http://www.barrick.com/Theme/Barrick/files/docs\\_annualquarterly/2010/Q4-Year-End-Mine-Stats.pdf](http://www.barrick.com/Theme/Barrick/files/docs_annualquarterly/2010/Q4-Year-End-Mine-Stats.pdf)

<sup>8</sup> Tanzania has introduced a new law (The Mining Act 2010), that increases the rate of tax on minerals such as gold from 3 per cent to 4 per cent while also providing provision for the government to own a stake in future mining projects.

<sup>9</sup> In June 2011, the world price for gold was over \$1500 per ounce - \$1543 on June 2, 2011.

<sup>10</sup> Using the exchange rate of 1 \$ US = 1,250 Tshs prevalent in 2010

Tanzanians over 65 of 10,000 Tshs per month), and is about 80% of what such a pension paid at age 60 would cost<sup>11</sup>. The benefits of an old age pension would be widely shared. Because most elderly Tanzanians live in large extended families, most of the Tanzanians who would be moved out of poverty by an old age pension are in fact the younger members of the households which the elderly now live in. Hence, there would be significant impacts on poverty – a universal pension of 10,000 Tshs monthly paid at age 60 would, for example, cut 7.7 percentage points off the poverty rate (see Mboghoina and Osberg (2011:Table 4).)

Clearly, additional tax revenue of 225 Billion Tshs could be spent in any number of ways, some of which might have even larger anti-poverty impacts than an old age pension. This concrete example of government expenditure is chosen because: (a) it would have a large poverty-reducing impact; (b) it is not now happening, because government cannot now afford it; (c) the government of Tanzania could afford such a program, if the mining sector paid corporate tax at the US rate. The general point is that even if growth of the mining industry enclave in Tanzania is essentially irrelevant to market-mediated poverty reduction, such growth is potentially important to “tax and spend” poverty reduction – if the profits of the sector are taxed in Tanzania. Furthermore, it is worth noting that corporate profits typically are taxed in the country of origin of the parent firm, so the absence of corporate profits taxation in Tanzania simply means a transfer of tax revenue from Tanzania to the treasury of the government of the parent firm’s domicile<sup>12</sup>. Since resource extraction firms are motivated by the after-tax return to their share-holders and can be presumed not to

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<sup>11</sup>For more details see Mboghoina and Osberg (2011:Table 5) 10,000 Tshs per month was approximately equal to the food poverty line per adult equivalent in 2007

<sup>12</sup> When Barrick’s profits of 2010 are remitted to Canada, at the tax rates applicable in 2010, 18% federal and 12% Ontario taxation of corporate profits are payable. At these rates, the \$514 million profit in 2010 of Barrick from Tanzanian operations yields approximately \$154 million in tax revenue to those governments. [This substantially exceeds Canadian bilateral aid to Tanzania (\$80 Million in 2010, \$54 Million in 2009)]. Since tax treaties normally provide for reciprocal tax credit for foreign taxes paid, if corporate tax were payable in Tanzania, that revenue would flow to Tanzania, at the direct cost of Canadian governments. In general, the lack of corporate taxation in Tanzania of resource sector profits provides substantial revenue benefits to the government of the country of domicile of the parent firm.

care much about *which* government they pay taxes to, corporate tax regimes can be designed to minimize investment disincentives.

The non-mining sectors – agriculture, services, construction and manufacturing – generate tax revenue, local commodity demands and jobs, so their potential impact on poverty reduction is not just “tax and spend”. The remainder of this paper will focus on how growth in the household market incomes generated by these sector’s growth might be made more pro-poor.

Because most Tanzanians depend on agriculture for their livelihood, the growth rate of agricultural income is particularly crucial to poverty reduction, and sectoral growth is closely linked to the level of investment in each sector. Between 2001 and 2007, gross fixed capital formation in agriculture increased by only 6.0 per cent a year in contrast to construction (20%), mining (12.6%), and manufacturing (9.8%). .

From an institutional perspective, it is only recently that the private sector has regained its role in capital formation after nearly five years of public sector dominance in investment (figure 1). With low investments in the sector, agriculture retains a static technological base, one with limited potential for the rural poor who are dependent on agriculture to generate income.

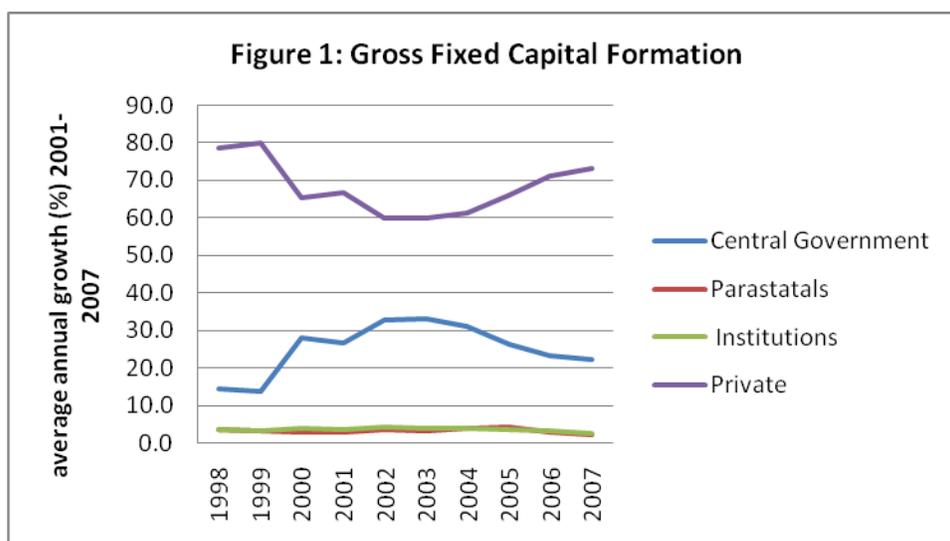
Despite agriculture’s declining share in GDP, the number of households dependent on agriculture appears to be growing steadily. For example, based on data for the distribution of employment for each sector from HBS (2001 and 2007) and assuming that it could be applied proportionately to the whole population, a linear extrapolation indicates that the number of people dependent on agriculture has grown by 3.7 per cent per annum since 2001. Apparently migration from agriculture to other sectors is constrained by limited employment opportunities in the fast growing sectors, trapping those who desire to migrate out of agriculture. The process seems to have

been complicated by a shift in investments from the private sector to the state sector since 1999, although there is a recovery from 2005 onwards (Table 2 and Figure 1).

Table 2: Gross Fixed Capital Formation

|                    | 2001 | 2007 | % growth (average annual)<br>2001-2007 |
|--------------------|------|------|--|
| Central Government | 26.7 | 22.1 | -2.9                                   |
| Parastatals        | 2.9  | 2.3  | -3.4                                   |
| Institutions       | 3.6  | 2.4  | -5.7                                   |
| Private            | 66.8 | 73.2 | 1.6                                    |

Source: National Accounts of Tanzania Mainland, 1998-2007



Source: National Accounts of Tanzania Mainland, 1998-2007

The Economic Survey also provides data on regional GDP. Although regional GDP figures are compiled from the national aggregates and only indicative at best as standard methodologies may not be applied in the computations, they also provide some useful information. The per capita growth in regions such as Kilimanjaro (20.9%), Tanga (12.9%), Ruvuma (11.8%), Mbeya (10.6%), and Morogoro (8.2%) over and above the national average growth indicates that there is some progress in regional distribution of wealth and poverty reduction in these regions over the 1998-2007 period. Several regions have however, experienced stagnation or a drop in per capita income. Since these represent declines from already low incomes, increasing poverty in these regions is very likely (Table 3).

**Table 3: Regional distribution of GDP per capita**

| <b>Region</b>  | <b>2001</b> | <b>2007</b> | <b>Average annual growth</b> |
|----------------|-------------|-------------|------------------------------|
| Dodoma         | 173118      | 193036.2    | 1.9                          |
| Arusha         | 310244      | 370567.8    | 3.2                          |
| Kilimanjaro    | 170021      | 383059.2    | 20.9                         |
| Tanga          | 213779      | 379457.2    | 12.9                         |
| Morogoro       | 229672      | 342117.1    | 8.2                          |
| Pwani          | 201984      | 238184.9    | 3.0                          |
| Dar es salaam  | 619987      | 676003.9    | 1.5                          |
| Lindi          | 206050      | 278415.8    | 5.9                          |
| Mtwara         | 295181      | 242765.8    | -3.0                         |
| Ruvuma         | 231140      | 394601.3    | 11.8                         |
| Iringa         | 276638      | 406215.8    | 7.8                          |
| Mbeya          | 225477      | 368929.6    | 10.6                         |
| Singida        | 204778      | 182288.2    | -1.8                         |
| Tabora         | 205246      | 245982.9    | 3.3                          |
| Rukwa          | 246928      | 320284.2    | 5.0                          |
| Kigoma         | 172868      | 237032.9    | 6.2                          |
| Shinyanga      | 257025      | 219589.5    | -2.4                         |
| Kagera         | 167588      | 219457.2    | 5.2                          |
| Mwanza         | 309083      | 330938.2    | 1.2                          |
| Mara           | 204052      | 295218.4    | 7.4                          |
| Manyara (2002) | 298117      | 345126.3    | 3.2                          |
| TANZANIA       | 258130      | 326271.1    | 4.4                          |
| MAINLAND       |             |             |                              |

Source: National Accounts of Tanzania Mainland, 1998-2007

### III: Comparison of GDP growth and Household Consumption per capita

As Deaton (2005) and others have emphasized, divergences between National Accounts and household survey based estimates of consumption are not unusual in international data. Per capita “Household Sector” consumption as reported in the national accounts often shows different rates of growth, and differing levels, compared to the average consumption expenditures which households report in household surveys. These differences can be explained (at least partially) by conceptual differences between the “Household Sector” in the System of National Accounts (SNA) and actual households in surveys and by methodological differences. Nevertheless, in Tanzania, the differences are particularly stark. Per capita “Household Sector” consumption as reported in the national accounts stood at Tsh. 21,810 per month in 2007 indicating a growth of 3.4 per cent per annum. In contrast, household consumption as per HBS 2007 stood only at Tsh 10,473 reflecting an average annual growth of 0.8 per cent during 2001-2007.

Computing the trend of real income growth requires estimation of both the trend in nominal incomes and the calculation of an accurate deflator for price inflation trends. Tanzania is certainly not the only country in which both calculations can be contested terrain. It is noteworthy, however, that even if some Tanzanian data sets diverge<sup>13</sup>, available subjective estimates of income growth broadly agree in noting a lack of progress in subjective perceptions of real income trends.

In 2007, the “Views of the People” survey of REPOA asked 4,986 randomly selected respondents in mainland Tanzania over age 25 the question: “What is your economic situation now compared to three years ago?” “Much worse” was the

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<sup>13</sup> In Tanzania, there are sometimes important differences in estimates derived from different statistical sources. For example, Table 5.4 of the Integrated Labour Force Survey of 2006 puts the percentage of mainland Tanzanians working in agriculture at 70.2%, while Table 44 of the Poverty and Human Development Report (2009) uses the Household Budget Survey of 2007 to put the number at 55.0%.

response of 26.7%, while 23.2% said “a little worse”. Since 26.0 % said their situation was “the same”, that left only 22.7% to say “a little better”. Less than 1% said their economic situation was “much better”. The Household Budget Survey of 2007 asked 10,452 household heads a similar question, albeit with a different reference period (“How do you compare the overall economic situation of the household with one year ago?”). It got broadly similar responses. “Much worse now” said 21.7%, while another 22.0% stated “A little worse now”. The most common answer (27.8%) was “same” while a quarter (25.1%) said “a little better now”. Only 1.8% thought their economic situation was “much better now”.

In short, roughly half the mainland Tanzania population says they are “much” or “a little” worse off, about a quarter say there has been no change in their economic condition and almost all of the remaining quarter of the population will only say that they are “a little” better off now, compared to the past<sup>14</sup>. This is not what one would expect, if household incomes were, in general, growing steadily at 7% per annum – i.e. the rate of growth of real GDP.

Meanwhile, SNA data indicate that compensation of employees grew at a healthy 9.4 per cent a year – but one has to remember that paid jobs with government, parastatals and other private employers comprise only 11.6% of the economically active. State sector dominance in resource use is confirmed by an annual growth of 11 per cent in government consumption. Even if one excludes recurrent education expenditure from government consumption expenditure, the story remains the same as education expenditure per capita grew by 6.6 per cent per annum during this period, much less than in other areas.<sup>15</sup>

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<sup>14</sup> Similar answers were obtained when the question concerned the economic situation of the community – 20.2% “much worse off”; 19.7% ‘a little worse now”; 29.3% “same” 24.4% “a little better now” and only 1.7% “much better now”.

<sup>15</sup> One can assume that education expenditure could be treated as those on human capital development and as such a part of capital expenditure. Education expenditure data are from UNData.

| Table 4: Per Capita Household consumption and compensation for employees |         |         |                |
|--|---------|---------|----------------|
|  | 2001    | 2007    | Average growth |
| Household consumption (annual)   | 207,592 | 261,723 | 3.4            |
| Government consumption (annual)  | 32,702  | 65,184  | 11.0           |
| Government Consumption exp on education                                  | 6449    | 6588    | 6.6            |
| Government Consumption excluding Education                               | 26,253  | 58,595  | 12.8           |
| Compensation of employees (annual)                                       | 43824.3 | 46053.9 | 9.4            |
| Household consumption: SNA (monthly)                                     | 17,299  | 21,810  | 3.4            |
| Household consumption: HBS (monthly)                                     | 9997    | 10473   | 0.8            |

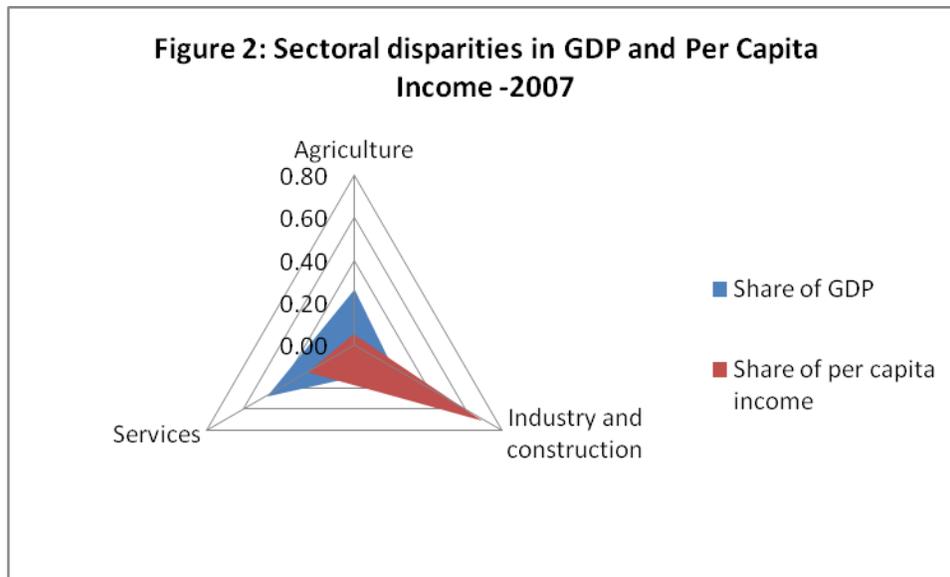
Source: National Accounts of Tanzania Mainland, 1998-2007 and HBS 2007

The huge gap in household consumption can be partly explained by differences in the price deflators used in the two scenarios. In fact the difference arising from the two price deflators alone account for 42 per cent of the gap.

With the linear approach adopted above to estimate the number of people dependent on agriculture, we can compute the per capita income of those dependent on agriculture to be Tsh (2001 prices) 10,719 against Tsh 8,507 for rural household as per HBS 2007. If one applies the same price deflator used in SNA this would increase to Tsh 11,561, a comparable figure for that under SNA.

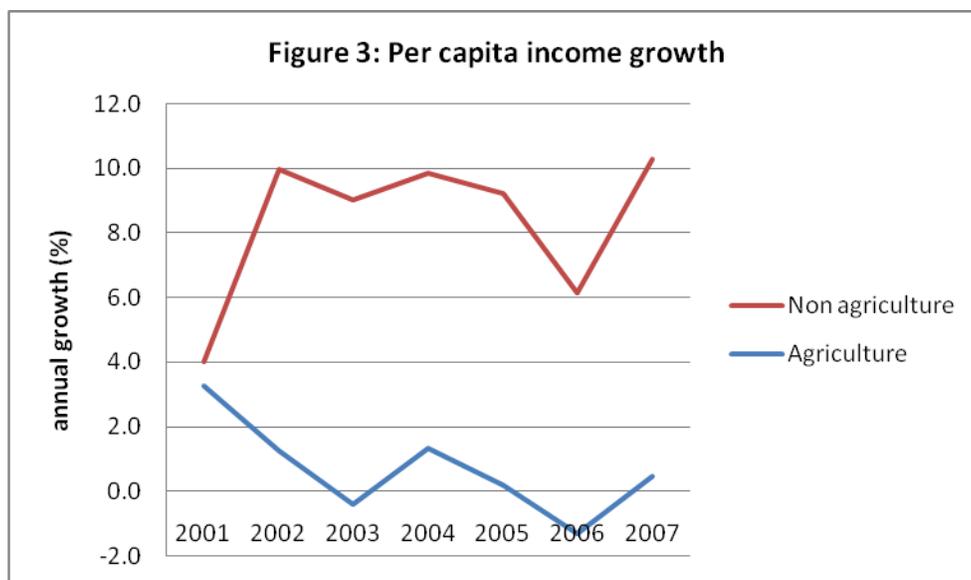
The differences between sectors in household consumption in Tanzania are not unusual. Incomes in traditional agriculture are typically lower than incomes in the expanding manufacturing and service sectors – indeed it is higher incomes in the non-agricultural sector which motivate labour mobility between sectors, and the long term

decline in percentage employed in agriculture which accompanies development. Put crudely, if life really was better on the farm, people would stay there – so when life does get better in the nonfarm sector, they leave. The problem in Tanzania is that non-agricultural sectors are not generating enough job growth and not attracting enough labour out of agriculture.



National Accounts of Tanzania Mainland, 1998-2007

Figure 2 shows the sectoral disparities in GDP and per capita income. Slow growth in agriculture has a dampening effect on overall growth and per capita income. Per capita income growth of this segment of the population was only 0.7 per cent per annum against 7.7 per cent in the non-agricultural sector. If growing non-agricultural sectors are not pulling enough excess labour out of agriculture, the growth in agricultural labour force, combined with relative stagnancy in agricultural output, will inevitably push people into poverty. (Figure 3). Average growth of roughly 4.5 per cent in agricultural output during 2001-2007 is highly inadequate to raise per capita income with a growing rural population. If one takes the relatively rich farmers out from this picture it is hardly surprising that the income of the bottom 40 per cent of the population did not change at all during the period as per HBS 2007.



Source: National Accounts of Tanzania Mainland, 1998-2007 and Bank of Tanzania Annual Report 2008

Between 2001 and 2007, marketed agricultural output increased only by 4.7 per cent.<sup>16</sup> Among the cash crops, only cotton (34.4%), and tobacco (56.4%) registered increases in volume during 2001-2007. While the volume of crops such as coffee (-2.3%), tea (-1.3%) and cashew nuts (-56.6%) in fact dropped during the period, production volume of sisal remained stagnant. The total share of the value of these cash crops in total value of agriculture and fishing increased only marginally from 5.1 per cent in 2001 to 7.7 per cent in 2007. Moreover, most cash crops experienced significant variations in prices and production volume. Despite increases in the volume of production (except sorghum), productivity of staple crops such as maize (0.5%), rice (10%), wheat (5.5%), cassava (39%) and sorghum (9.4%) also dropped as a result of deteriorating technology.

Low average productivity and low average incomes in agriculture can be seen equally well from two angles: (1) as the result of too little capital and other inputs for

<sup>16</sup> It is assumed that the monetary value of agricultural output represents the marketed agricultural output.

the available agricultural workforce OR (2) as the implication of too much farm labour for the amount of productive land, capital and other inputs available.

Tanzanian farms have, on average, few non-labour inputs. Access to electricity in rural Tanzania through the national grid is only 2.5 per cent according to the Household Budget Survey (HBS, 2007) hampering any prospect of value addition at the local level. It was only 2.0 per cent in 2000/01, indicating an annual increase of just over 3 per cent. Slow mechanization of the agricultural sector is also limiting the sector's progress. In Tanzania the initial thrust of mechanization of agriculture has dwindled over time. Tractors per 100 sq km of arable land in Tanzania dropped from 32 in 1961 to 23 in 2005, a trend also reflected in the HBS 2007, in a drop in tractors held by households from 0.2 per cent in 2000/01 to 0.1 per cent in 2007. Similar declines are seen in other agriculture related productive assets such as ploughs, and coffee pulping machines held by households, according to HBS 2007. The use of fertilizer, among other factors, plays a critical role in increasing agricultural productivity. However, fertilizer consumption in Tanzania remained low at 10.4 kg per hectare in 2005 (one tenth of what Thailand, a major producer of rice, uses in its farms).

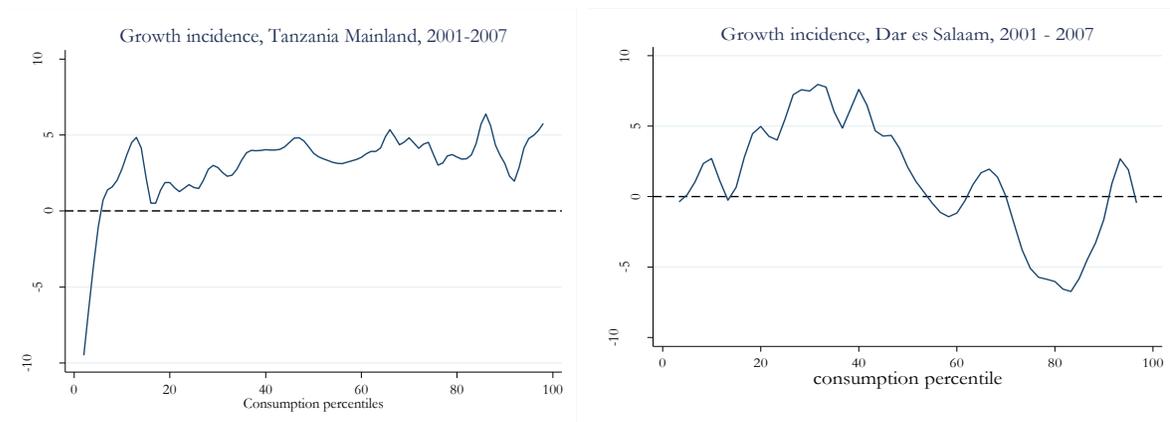
If more jobs had been available in non-agricultural employment, more people would have escaped poverty by leaving farming, and the productivity and incomes of the remaining workers would have been higher. The poor in rural Tanzania can escape poverty either by continuing to work in agriculture, increasing productivity and making more farm income OR by leaving the farm and making more income elsewhere. The fact that they were not able to choose either option in Tanzania between 2001 and 2007 indicates that the problem of pro-poor growth in Tanzania is about both insufficient creation of non-agricultural employment and inadequate growth of farm productivity.

#### IV Growth Incidence from HBS2001 and HBS2007 data

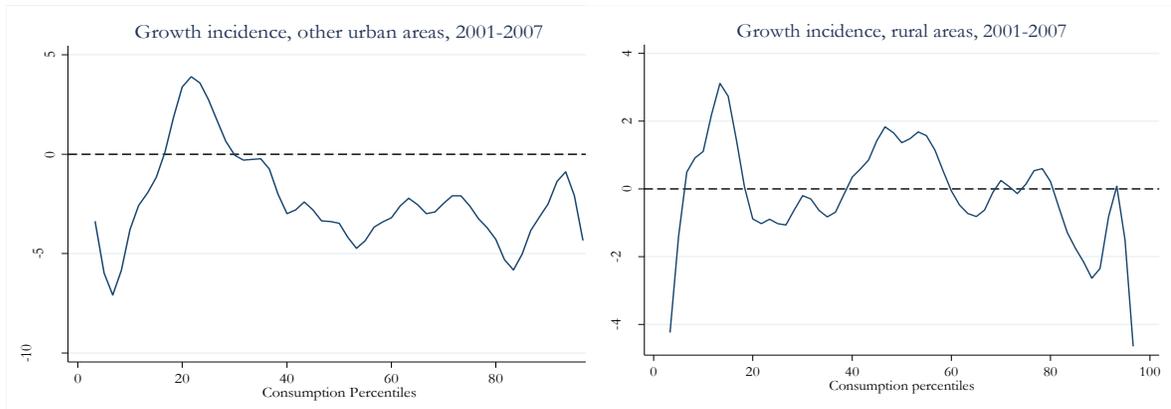
To this point, this paper has relied on aggregative national accounts data, but the same basic picture emerges from analysis of micro-data on household income and expenditures. A standard tool used in looking at the distributional incidence of growth is the “growth incidence” idea<sup>17</sup> – i.e. calculate the percentage change in expenditure at each percentile of the distribution of expenditure. Under this tool, growth could be considered “absolutely pro-poor” if the mean growth rate for the poor is greater than zero and “relatively pro-poor” if, in addition, the mean growth rate for the poor is at least as large as the growth rate in the overall mean. Hence, “absolute pro-poor growth” only requires that the poor be better off on average in absolute terms, while “relative pro-poor growth” requires the distributional shifts to be pro-poor as well (Hoogeveen and Ruhinduka (2009). Hoogeveen and Ruhinduka (2009:14-15) use HBS2001 and HBS2007 and note:

“The growth incidence curve for Tanzania mainland lies almost entirely above zero and is flat, ...

**Figure 4.0: Growth incidence curves for Tanzania**



<sup>17</sup> See Martin Ravallion (2004)



Source: Hoogeveen and Ruhinduka (2009) Figure 2.5

The growth incidence curve for rural areas is the most concerning as it hovers around the zero-growth line. For most people living in rural areas there has been no or only a negligible increase in consumption between 2001 and 2007 “

The virtue of the “Growth Incidence Curve” is that it shows in detail which parts of the distribution of consumption have shifted up, and which have not. But one has to be careful in interpretation because:

- (1) HBS2001 and HBS2007 are sampling from different populations – 20.74 % of the population are 6 years of age or less in HBS2007, and could therefore not possibly have been sampled in HBS2001.
- (2) there is constant ‘churning’ in relative incomes, as the economically fortunate move up the income hierarchy while others fall in relative position. Even if one were to look only at persons aged 7 or more in 2001, the changing rankings of individuals in the income distribution imply that, for example, the bottom 10% of 2007 are not necessarily all, or even mostly, the same people as the bottom 10% of 2001.

Appendix A therefore uses a “pseudo-cohort” approach, analyzing the growth of incomes by comparing the expenditures of birth cohorts in 2001 and 2007. It compares, for example, the total spending of 26 year olds in HBS2007 with the total spending of

the same birth cohort six years earlier (i.e. 20 year olds in HBS2001). However, this does not solve the problem of why poverty did not decline.

As per the pseudo cohort analysis, the year to year variability in mean expenditure is especially noticeable among the elderly. The increase in mean expenditure of the young, as they age from, for example, 8 to 14, largely reflects the rise in earnings power of their parents. Younger individuals experienced between 2001 and 2007 sharply increasing changes in average (or median) expenditure – at least in early life. However, further analysis show that this is limited to the non-farm sector. There appears to be no consistent increase in income with age for those Tanzanians who work in agriculture.

## V Income Growth in Small Scale Agriculture in Tanzania 2001 – 2007

Section IV and Appendix A use micro-data from HBS 2001 and HBS 2007. Such data are essential to measurement of the welfare implications for individual households of Tanzanian growth experience. But to design economic policy which encourages pro-poor Tanzanian growth one cannot simply generalize from the experience of individuals – growth is a macro-economic phenomenon, in which sectors of the economy interact, through markets, in a general equilibrium setting.

Specifically, although it is true that:

- (1) agricultural output has grown relatively slowly (4.1% per year, 2001-2009);
- (2) 74.2% of the poor in Tanzania are employed in agriculture<sup>18</sup> and
- (3) growth in agricultural incomes was much slower than growth in nonfarm incomes.

Nevertheless, one cannot reason from these observations to the conclusion that “pro-poor” growth in Tanzania is just a matter of transferring resources to agriculture so as to increase the rate of growth of the agricultural output of poor farmers. Although this is a necessary condition, it is not sufficient for sustaining high growth in the rural economy and reducing rural poverty. Tanzanian farmers cannot control the prices at which they sell their crops. While it is possible for an individual farmer to escape poverty by increasing their output, if all poor farmers were to increase their production and attempt to sell their increased output on local markets, prices would fall – indeed the inelastic nature of local demand implies that aggregate farm revenues would fall.

Binswanger-Mkhize and Gautam (2010) argue that the route out of rural poverty for Tanzania is increased agricultural productivity and export sales. The Kilimo Kwanza

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<sup>18</sup> “Agriculture” in this context means Farming, livestock, fishing and forestry – see PHDR 2009, Table 45, page 166; see also footnote 5 above.

initiative, as Tanzania's green revolution to transform its agriculture into a modern and commercial sector, could be used to raise agricultural productivity through enhanced investments, both public and private, in rural infrastructure such as roads, irrigation, inputs such as high yielding seed varieties, fertilizer, credit and technology. The Southern Agricultural Growth Corridor of Tanzania (SAGCOT), an initiative that envisages contributing to Kilimo Kwanza's vision, could be a step in the right direction if it benefits both commercial agriculture and rural communities. If increased Tanzanian agricultural output could be sold on international markets, either to neighbouring countries or overseas, without facing the same price inelasticity of demand, no decline in market prices would accompany the increase in marketed output.

However, full integration into world food markets comes with a strategic, and possibly political, price tag. At present, Tanzania is, on net, approximately self-sufficient in food production and thus relatively insulated from the variability of world markets<sup>19</sup>. The desired objective of greater integration of Tanzanian agriculture into global food markets is to offer domestic producers the opportunity to profit from international shortages – but this necessarily also implies that domestic consumers are more exposed to international variability in food prices. As Bryceson (1990, 1993) has emphasized, solving the “food security” problem has been central to the legitimacy of the state in Tanzania, in both colonial times and since Independence. Because so much of household income in Tanzania is spent on food, food price fluctuations are serious business, both economically and politically<sup>20</sup>. Tanzanian policy makers have therefore been cautious about full integration of local markets into global food crop markets.

In any event, whatever the policy stance of government on global food markets, large scale increases in agricultural exports cannot happen unless port capacity is

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<sup>19</sup> Minot (2011:21) examines the impact of world prices on local market prices during 2007-08 in eight local markets in Tanzania. Only in Arusha was there a significant relationship with the world price of maize. Four of eight local rice markets in Tanzania appeared to be linked to world rice markets – but only between 24% and 54% of changes in world prices are transmitted to Tanzanians.

<sup>20</sup> In HBS 2007 data, 63.7% of the total expenditure of the median household in Tanzania was spent on food – calculations by author.

expanded substantially and road transport links are improved (see Section VII below). Hence, if small farmers in Tanzania are to stay in agriculture and escape poverty, they must be able both to produce more output, and to sell it locally without substantial declines in price. The only way that can happen is if the local demand for agricultural output increases, which can only happen if the size and/or income of the non-farm population increases. Growth of the non-farm population depends in turn on the availability of non-farm employment.

In this context, and recognizing the infrastructure constraints to which it is subject, it is worth noting how well manufacturing has done in Tanzania. Despite continual interruptions in electricity supply and long delays in port shipments of inputs and exports, annual growth averaged 8.5% between 2001 and 2009 – over twice the growth rate in agriculture – which meant that manufacturing GDP grew from 29% to 41% of agricultural GDP. The problem for Tanzania’s poor is that manufacturing did not grow faster, did not generate more jobs (still only 2.6% of total employment in 2006) and did not enable more of the rural poor to leave the farm sector.

In Tanzania, the “two legs” of pro-poor growth are, therefore, (1) productivity improvements in small-scale agriculture which enable increased farm production and (2) growth in non-farm employment which generates income directly and provides the markets needed for increased agricultural output. Neither leg can, alone, be very effective in reducing poverty – indeed, decreased rural incomes, and increased rural poverty, will be the result if greater farm output just depresses agricultural prices more than proportionately to output increases.

## VI Policy Implications

Tanzania has made major strides in recent years in building many of the pre-conditions for sustained growth. The dramatic expansion of primary and secondary school enrolment has been, for example, an investment in human capital that will yield returns for decades to come – both in enabling farmers to improve their productivity over time and in enhancing the ability of urban workers to learn the new, and ever-changing, skills of their new jobs. This section does not devote much space to education, but that is not because we think it unimportant – the section is not intended as an exhaustive list of the pre-requisites of pro-poor growth, but as an illustration of some general strategic implications, in the Tanzanian context.

In thinking about policy for pro-poor growth, one can sometimes rely on micro-econometric evidence on the past successes obtained in field trials – e.g. of agricultural extension initiatives or input subsidies or crop insurance initiatives. This strand of development economics research is crucially important for assessing “what works” in the sense of specific types of micro-economic policy interventions<sup>21</sup>, within a given environmental, political and economic context. However, changing the context of micro decisions is what a choice of broad development strategy is all about – and rigorous experimental evidence on the implications of such broad strategic choices is not possible. Nor is such evidence feasibly available on the implications for pro-poor agricultural growth of two of the larger trends likely to affect profoundly the productivity of Tanzanian agriculture in the medium term future – global climate change and the cell-phone revolution in telecommunications.

Because global greenhouse gas emissions are trending into previously unobserved CO<sub>2</sub> concentrations, the resulting global climate change – in mean temperature, volatility of weather systems and precipitation patterns – is surrounded by

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<sup>21</sup> E.g. Mignouna et al (2010) examine the returns to Imazapyr resistant maize in Western Kenya.

enormous uncertainty. Survey articles on the implications for pro-poor growth therefore leave many unanswered questions. Ahmed et al (2009) offer, for example, a wide range of predicted impacts of climate change on poverty in Tanzania, surrounding a surprisingly small mean negative impact. However, the uncertainty of their estimates is exemplified by the fact that their Table 2 (which reports that the implications of the 22 available different global climate models) indicates that the standard deviation of annual average grains yield in Tanzania could increase by as much as 34.2% or decline by as much as 25.6%, depending on the assumed global climate model. Although Hertel and Rosch (2010) focus on agriculture as a primary means by which the impacts of climate change are transmitted to the poor, and as the sector at the forefront of climate change mitigation efforts in developing countries, the uncertainty in basic climatic prediction creates great uncertainty in agricultural prediction.

What policy implication for pro-poor development can be drawn? When faced with greater uncertainty, the purchase of more 'insurance' is often a rational response – and there are many possible 'insurance' options. Investing now in research on crop varieties with greater heat tolerance can, for example, be seen as having an insurance value against the risk that currently available crop varieties will suffer substantial future yield declines. Investing in rural road networks, built to a standard that can cope with torrential rains, may also yield greater returns than would be estimated with data on past climate patterns, if one can greater future volatility in rainfall amounts.

Predicting the impacts of the changes induced by cell-phone penetration throughout Tanzania faces a different sort of problem. There is an international literature on cell phone impacts on development<sup>22</sup>, but it necessarily describes past experiences when cell phones were possessed by a minority of the population and had the capabilities of the technology of five or ten years ago. As cell phones become

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<sup>22</sup> A useful annotated summary of many key articles is *Research on the Economic and Social Impact of Mobile Communications in Developing Countries* The GSMA Development Fund Top 20 - available at [http://mobileactive.org/files/gsma\\_development\\_fund\\_top\\_20.pdf](http://mobileactive.org/files/gsma_development_fund_top_20.pdf)

commonplace in Tanzania and as the technology develops qualitatively new capabilities, this literature becomes suggestive, rather than predictive. Fundamentally, however, the cell-phone revolution already offers the potential of bringing to previously isolated rural areas, quite suddenly, immediate, low-cost banking and payments services, crop price information, buyer/seller matching for crop sales and input purchases, and possible co-ordination of community bulk orders for inputs and crop transport. As new technology enables greater bandwidth, the possibilities increase for a whole new range of impacts – e.g. video delivery of agricultural extension services (such as diagnosis of outbreaks of crop disease, or advice on soil enrichment). The implications for agricultural productivity could well be profound.

Government obviously has a role to play in telecommunications, since it sets the regulatory and legal framework within which the private sector operators compete. Public policy decisions on issues as diverse as cross-network call charges or the taxation of cell-phone financial transactions or deposit insurance will affect whether this technology achieves its full potential. Nevertheless, sometimes “getting out of the way” is also a good general attitude, given the difficulties of predicting development implications. Ten years ago, for example, few analysts predicted that banking by cell-phone would be either possible or popular – and the range of applications for the technology of ten years in the future is similarly hard to predict. Since the private sector has the technological expertise and the market driven incentive to innovate, governments need to consult closely to evolve the most effective strategies of regulation and co-ordination for pro-poor growth.

Facilitating the optimal development of cell-phone technology for agricultural productivity enhancement does require intelligent policy design, but because the private sector is building the infrastructure (profitably), it does not absorb a great deal of government cash. It is, therefore, quite unlike a policy of fertilizer and pesticide price subsidization in its budgetary implications. Indeed, input subsidy programs face the dilemma that they are policy failures if very few farmers actually use the vouchers for

subsidized inputs, but the greater the “success” of the program in signing up new participants, the greater the financial cost to government – both initially and in the long term<sup>23</sup>.

If subsidized inputs are all imported and the subsidy is less than the tariff, then input subsidies can be seen as tariff cuts, with limited efficiency costs. Otherwise, one has to ask what public policy purpose is served by subsidizing particular inputs, in the long term. If the intention is to demonstrate the benefits of technology adoption by making it cheaper for innovative farmers to switch crops or cultivation practices, subsidies may be buying a demonstration effect, which accelerates the adoption of more efficient production methods. But farmers know their fields better than anyone else, and once the demonstration effect has shown the impacts of input use, farmers can figure out if it really does pay off, and what combination of inputs is optimal. However, although it is hard to make an economic case for year after year long term subsidies to particular inputs, such programs do acquire a set of vested interests, and a political constituency of support, that may be difficult to disappoint.

If growth of agricultural productivity and of non-farm employment are the two legs of pro-poor growth, the road network is the sinew that ties them together<sup>24</sup>. Maintaining close urban-rural links is important for both commodity movements and labour mobility. If nonfarm employment were to grow rapidly, labour would move

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<sup>23</sup> Grepperud and Wiig (2011) compare liberalization of the maize trade and fertilizer subsidies and conclude: “Fertilizer subsidies promotes cash crop production and a more land intensive production pattern in agriculture, while a maize trade liberalization stimulates food crops and a more land extensive agriculture. Fertilizer subsidies are found to imply far more expansive effects than a trade liberalization does. Only minor differences are identified between the two policy reforms as concerning their impact on the balance of trade, distribution and the environment.” Remarkably, their CGE model concentrates on the soil fertility impacts of agricultural policy choices. The labor and product market interactions between agricultural and non-agricultural sectors are not modeled in a way that can enable calculation of poverty impacts.

<sup>24</sup> This conceptualization of inter-sector linkages as a “necessary but not sufficient” condition for growth implies that one cannot estimate the importance of rural roads by cross-country regressions which use an agricultural production function approach (e.g. Block, 2010), because this assumes away the inter-sectoral linkage problem.

between sectors in an aggregate sense, but it is often not accurate to see this as permanent moves – i.e. “leaving home and never coming back”. Although some such mobility obviously exists, “back and forth” mobility – sometimes seasonal, sometimes of longer periods and sometimes of dependent family members (e.g. children who are sent to live with relatives) – is more common.

An accessible network of all-weather roads to facilitate the linkages between urban and rural Tanzania is therefore important for rural poverty reduction because:

- Labour intensive methods, both during the construction phase and in ongoing maintenance, can generate rural income to decrease poverty directly. If timed to occur during the hungry period prior to the rains, when rural workers would otherwise be seasonally idle, the social opportunity cost of labour time is nil and the benefits are considerable in health and well-being – and therefore in later agricultural productivity, given the poor nutritional status of many rural Tanzanians<sup>25</sup>. There is substantial international experience (e.g. in India) with the delivery of poor relief through local public road works.
- Accessible roads, combined with the availability of cell phone technology, can drastically increase the degree of effective village level competition in crop-buying, as well as decreasing the cost of transportation. Added together, these influences narrow the margin between farm gate and urban retail prices, with benefits for poverty reduction at each end.
- Roads move people, as well as commodities, enabling greater off-farm employment, both seasonally and long term. Off-farm earnings are often what makes the difference between poor and non-poor rural households.<sup>26</sup> The easier the movement of people between rural and

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<sup>25</sup> As PHDR 2009(page 148) notes “Large numbers of people are unable to live up to their productive potential due to inadequate caloric intake.”

<sup>26</sup> See, for example, PHDR 2009 Table 47

urban Tanzania, the easier it also is to maintain the family ties which underpin the remittance of urban earnings to the rural poor.

- Rural roads have insurance value for people and for policy makers. In the event of local food shortage, they enable rapid delivery of food relief. In the event of civil disturbances, the rapid arrival of police is possible. The insurance value of a road network may make policy options with political and social risks (like greater integration into global food markets) feasible.

Recently, Binswanger-Mkhize and Gautam (2010) have argued that greater export orientation can offer the markets that Tanzanian farmers need, if improvements in their productivity are not just to imply lower prices for their crops. In a world of structural trends to higher food prices, the prospect of those higher world prices enabling fuller utilization of Tanzania's agricultural potential is attractive. However, integration into world food markets also implies greater exposure to international food price volatility. Better rural roads which enable rapid reaction to local food security problems may help create the political base needed to support future policy shifts to greater market integration into global markets, but local roads are not enough. Canadian and American farmers would not, for example, have become wealthy if their crops had only been able to reach North American buyers – better port facilities and road connections with neighboring countries are essential pre-conditions for the development of export markets.

- Better port facilities are essential for greater integration into world agricultural markets and the improvement in real farm gate prices which that could potentially imply.

If Tanzanian farmers become more prosperous in future years, they will have the income to enable investment in greater capital intensity of production – instead of the

stagnancy observed between 2001 and 2007.<sup>27</sup> But when tractors are used to till the soil instead of jembes, average incomes in agriculture are much higher but far fewer farm workers are needed. The dilemma for poverty reduction is that displaced farm workers need jobs, and it is not an advance if the rural poor just move to cities to become the urban poor.

The growth of urban industry has many preconditions, but in Tanzania the currently obvious binding constraint on growth of manufacturing employment is electricity. Both high costs and uncertain supplies of electric energy make the expansion of urban industry, and the growth of nonfarm employment, that much less likely. Large scale projects (like full development of the hydro potential of Ruvuma) take many years to plan and implement, so there is an advantage to technologies that can be implemented quickly, in relatively small increments. In other countries, the intermittent nature of solar and wind power would be a major drawback. But because brown-outs and rotating denial of service are so common now, essentially all additions to the electricity grid in Tanzania replace service denial<sup>28</sup>. This, together with the large relative importance of hydro power in the mix of Tanesco power generation, implies that intermittency of supply is far less important.<sup>29</sup>

- Additional electricity generating capacity, and expansion of the national grid are essential requirements for growth of nonfarm employment.

In a country like Tanzania, where there are essentially no public social assistance or social insurance transfer programs, people have to depend on themselves and their own family's resources for their livelihood – household income is what a family can produce themselves or get from the sale of their productive labour power or other

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<sup>27</sup> See PHDR 2009 Table 41, page 163

<sup>28</sup> Because most power is hydro electric, any momentary surplus of generating capacity is also easily stored for future use.

<sup>29</sup> The use of renewable energy sources like solar or wind in Tanzania can also potentially be funded from abroad, through either or both the market for carbon offset credits and the compensation mechanisms envisaged in the Copenhagen Accord and Kyoto Pact.

services. This paper has advocated a “two leg” strategy to increase local demand – but some households have very little to sell, and therefore cannot expect to benefit much from the improvements to labour and commodity markets which are the focus of most of this paper.

Thus far in this paper, the criterion used for poverty reduction has also been the poverty rate. But the international literature on poverty has recognized for a long time that the depth of poverty matters and that although some poor people can be moved out of poverty by improvements in their earnings, many of the poor have market incomes that are far below the poverty line.

At the very bottom of the income distribution – in Tanzania as in any market economy – one finds the street orphans, the unattached frail old, and the physically and mentally disabled. Those people who are unattached to families and who cannot earn much income on their own are typically very poor in market incomes and have already maximized whatever they can get from private charity. Because they have nothing much to sell, the very poorest have no reasonable prospect of ever being moved out of poverty by market mediated growth. If they are to escape poverty, or even have their poverty gap reduced to a significant degree, there is no real alternative to the “tax and spend” role of government.

“Tax and Spend” is also what governments do when they build schools, roads, port facilities and electricity grids – or provide the police services that protect property rights. This implies that the revenue raising capacity of the United Republic of Tanzania is crucial to its supply of the human capital and infrastructure pre-requisites for pro-poor growth – as well as for the transfer payments which the very poorest inevitably have to depend on. Mining in Tanzania has grown rapidly in total output in recent years, but tax revenue remains very small – despite dramatically increased prices and profits.

- If growth in mining output is to benefit poor Tanzanians, negotiation of a fairer division of profits from the mining sector, and an increase in tax revenue from mining operations, is a crucial ingredient.

## VII Conclusions

We analyzed growth incidence curves and pseudo-cohorts to show that Tanzania's growth has not been pro-poor. The underlying reason appears to be the slow growth in agriculture on which most rural poor make a living. The fact that agriculture is the main livelihood many people and contributes to a quarter of GDP, the development of agriculture is essential for poverty reduction in Tanzania. However, we argue that development of agriculture alone would not enable Tanzania to make a dent in poverty on a sustainable basis. For effective poverty reduction Tanzania needs to focus on both productivity improvements in small-scale agriculture which enable increased farm production and higher farm income, and growth in non-farm employment which generates income directly and provides the markets needed for increased agricultural output.

This paper began with four questions – what are our tentative answers?

1. Is the lack of progress in poverty reduction in Tanzania just a brief interlude before the benefits of the current pattern of growth trickle down at a later stage?
  - a. Probably not. If the tax revenue from mining sector growth continues to be miniscule, growth of the mining enclave will remain irrelevant to poverty reduction. If *Kilimo Kwanza* is interpreted to mean focussing only on growth in agricultural output, this paper has argued that it is like trying to run with one leg.

2. Is it a reflection of a failure of policy to allocate enough resources to agriculture, whose growth is usually considered to be pro-poor?
  - a. Partially yes. When most of the poor now get their incomes from agriculture, it is clear that higher prices or greater output for Tanzanian farmers has to be important for poverty reduction. However, this paper has emphasized the fact that pro-poor growth which reduces agricultural poverty has to also generate sufficient nonfarm employment to absorb the labour displaced by improved agricultural productivity.
  
3. Is there a bigger failure of policy design? Is a paradigm shift in development policy required for the economy to take-off to a higher growth path while also ensuring a significant reduction in poverty?
  - a. Probably yes. Official documents like the 2005 *NATIONAL STRATEGY FOR GROWTH AND REDUCTION OF POVERTY (NSGRP)* outline many worthwhile objectives, some of which (e.g. increasing the growth of the manufacturing sector, repairing rural roads) duplicate goals emphasized here. But official documents do not mention the importance of increasing tax revenue from the mining sector and there is relatively little discussion of the reallocation of labour and population necessary for pro-poor growth. A sharper focus on the need for job creation in the nonfarm sectors of the economy is essential.
  
4. How can Tanzania retain high growth while also making it pro-poor?
  - a. While one could argue that agriculture is a driver of growth in Tanzania (as it contributes to one quarter of GDP and provides employment to the majority), it could equally argue that it is a poverty trap in its current state. A productivity drive could make it a driver of growth and make it pro-poor as most poor live in rural areas and depend on agriculture – but only if agricultural prices do not decline. Greater demand is essential if greater agricultural output is to be absorbed. While development of the

agriculture should be a priority, a faster economic growth is usually generated in sectors such as industry and services, where the private sector could play an important role. We have identified infrastructure bottlenecks as a key issue that needs to be addressed urgently. But other issues such as efficient institutions, logistics and a quality labour force are equally important in retaining pro-poor high growth.

## Appendix A

### Pseudo-cohorts and the life cycle growth of income

Both HBS2001 and HBS2007 were cross-sectional surveys, but each drew different samples from the Tanzanian population. Respondents aged, for example, 20 in HBS2001 were a random sample of Tanzanian 20 year olds in 2001. Most of the 20 year olds of 2001 survived and formed the population of 26 year olds from which HBS2007 drew a different sample of respondents.<sup>30</sup> Because both samples were drawn from the same underlying population, one can compare the two samples and ask, for example: “In the lived experience of individuals, how much did incomes go up, on average, between 2001 and 2007? What is the percentage increase in expenditure, comparing a cohort of a particular age in 2007 with the same cohort, 6 years younger, in 2001?”

The age/earnings relationship can be compared to an escalator which is always taking people up, but also always stays in the same place. It is quite possible for the earnings of all individuals to increase even if the average wages of people of all ages remains constant – which implies a need to supplement the discussion of average income trends in Section 3 above with some analysis of cohort-specific trends.

Furthermore, the “Human Capital” perspective on earnings argues that if early investments in skill formation come at the cost of depressed early earnings, the return on those investments comes in the form of higher wages later in life. This implies that wages will typically increase with age.

To calculate the ‘typical’ return to work experience, we compare the population of (for example) 26 year olds in 2007 with the population of 20 year olds in 2001. To ensure our results are robust, we compare two measures of central tendency – the median and the mean – and two measures of resources – per capita household expenditures and per adult equivalent household expenditures. (Both measures depend

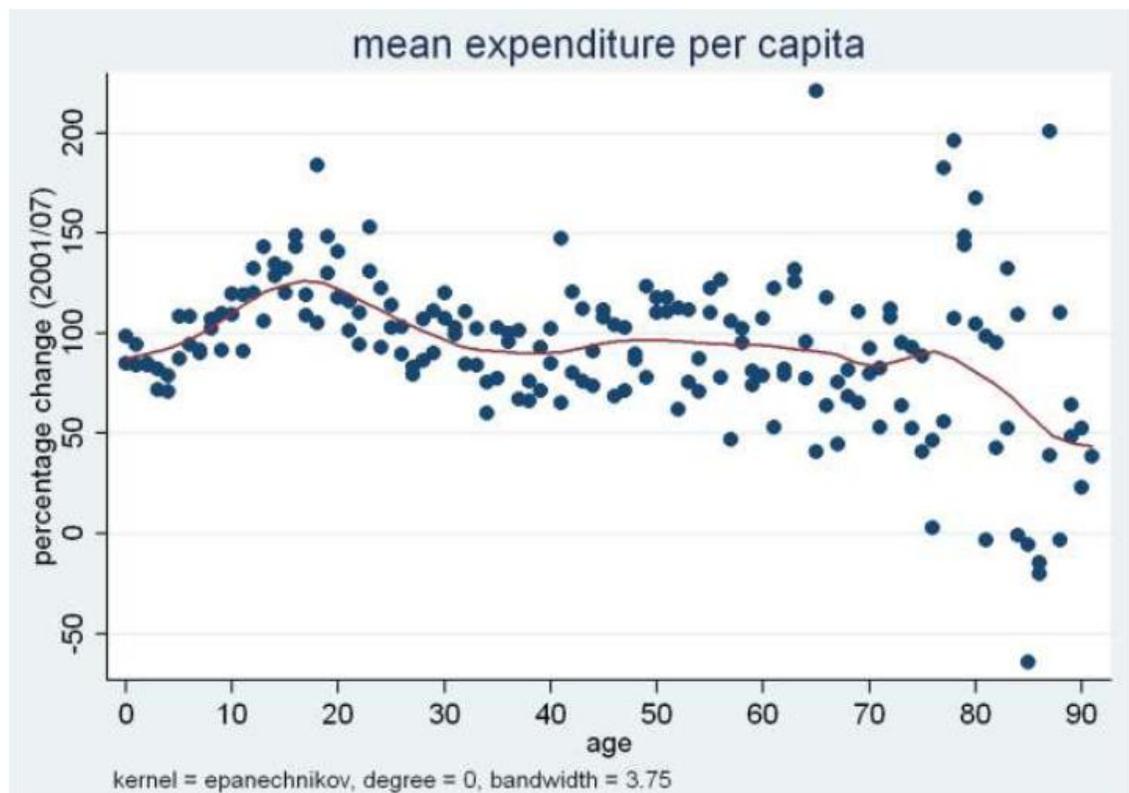
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<sup>30</sup> In countries with larger flows of international migration than Tanzania, the possibility of differences between the characteristics of emigrants and immigrants might also be empirically important.

on an assumption of equal sharing within the household if they are to have welfare significance.)

Figure 5 below plots the percentage change in nominal expenditures by single year of age in 2001 and fits a kernel density function to the data. The year to year variability in mean expenditure is especially noticeable among the elderly, and although the human eye is naturally drawn to the scatter of points among Tanzanians over 65, this is a bit misleading – people over 65 were only about 4% of the sample in HBS2007. Because the HBS collects data on household level expenditures, the increase in mean expenditure of the young, as they age from, for example, 8 to 14, largely reflects the rise in earnings power of their parents.

Figure 5



Figures 6 and 7 are therefore restricted to those aged under 65 in 2001 – Figure 6 presents the mean and Figure 7 presents the median of per capita household expenditure.

Figure 6

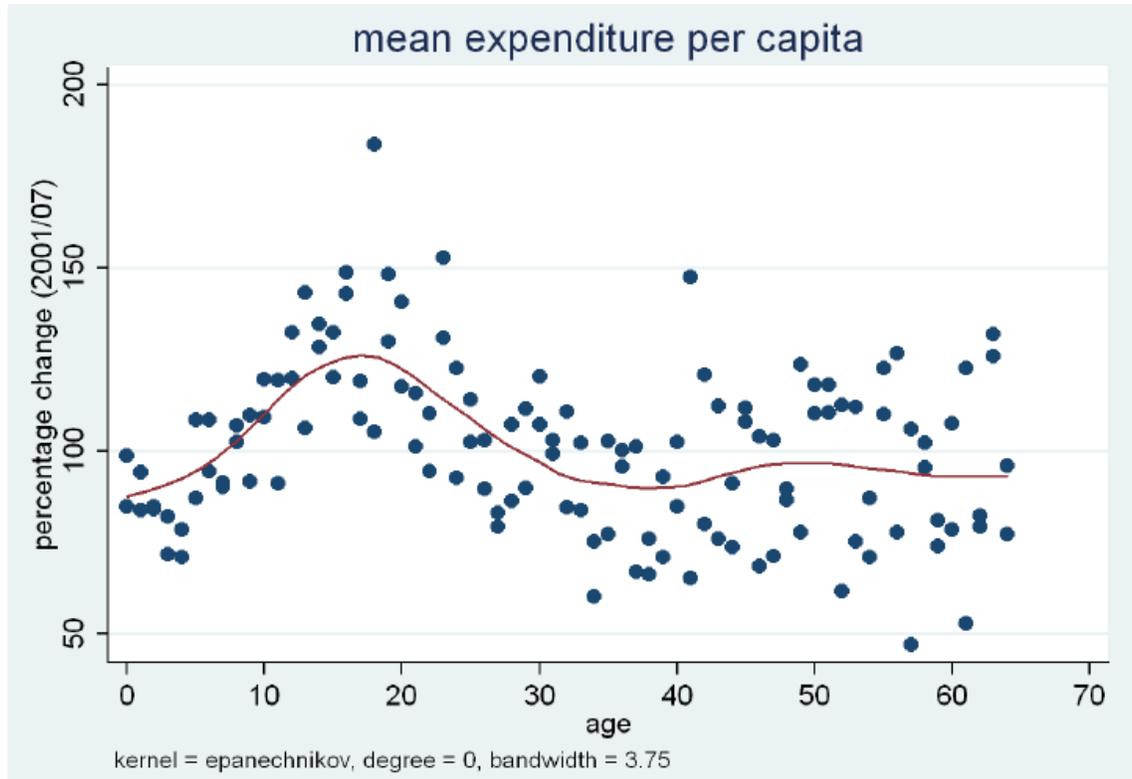
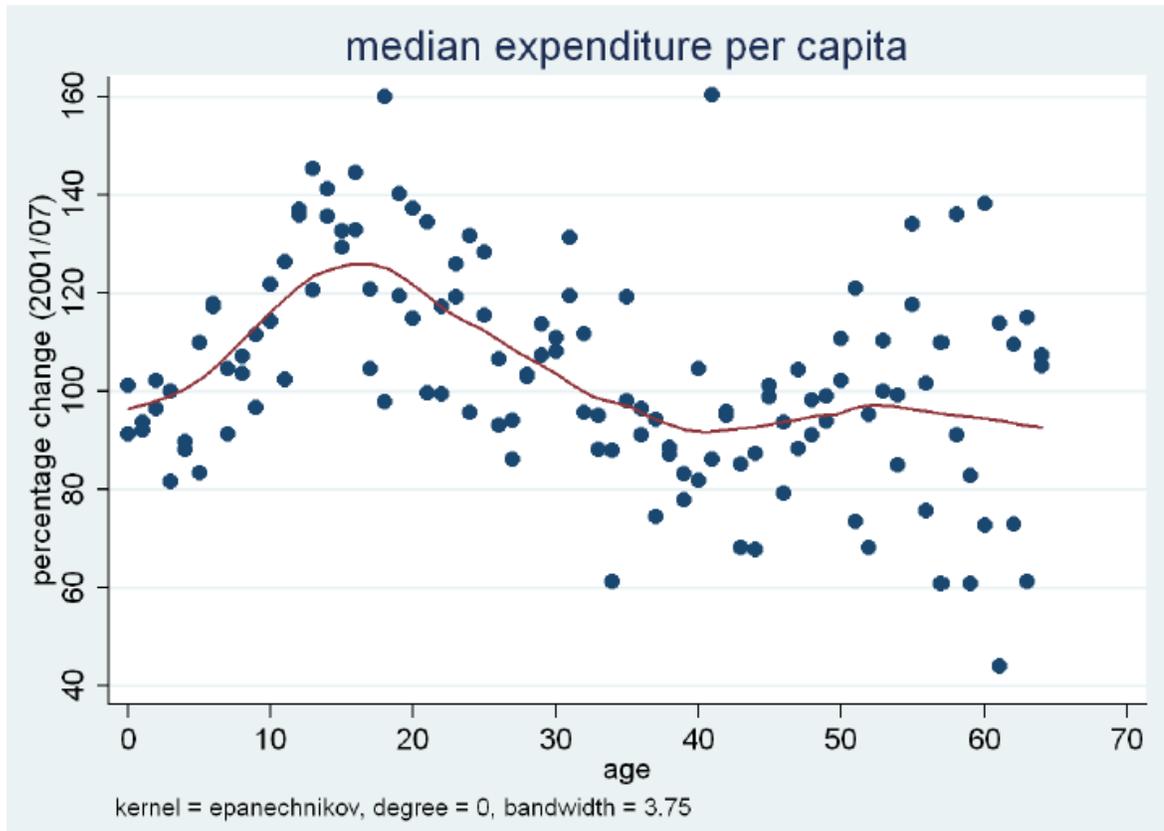


Figure  
7



Figures 5 to 7 are really included here just to show that the general pattern of percentage increase in expenditures is robust to alternative measurement choices. Figure 8 is really a better indicator of the lived experience of trends in living standards among the Tanzanian population, because it uses the median<sup>31</sup> percentage increase and because it adjusts for age and demographic composition of the household by calculating expenditure per adult equivalent.

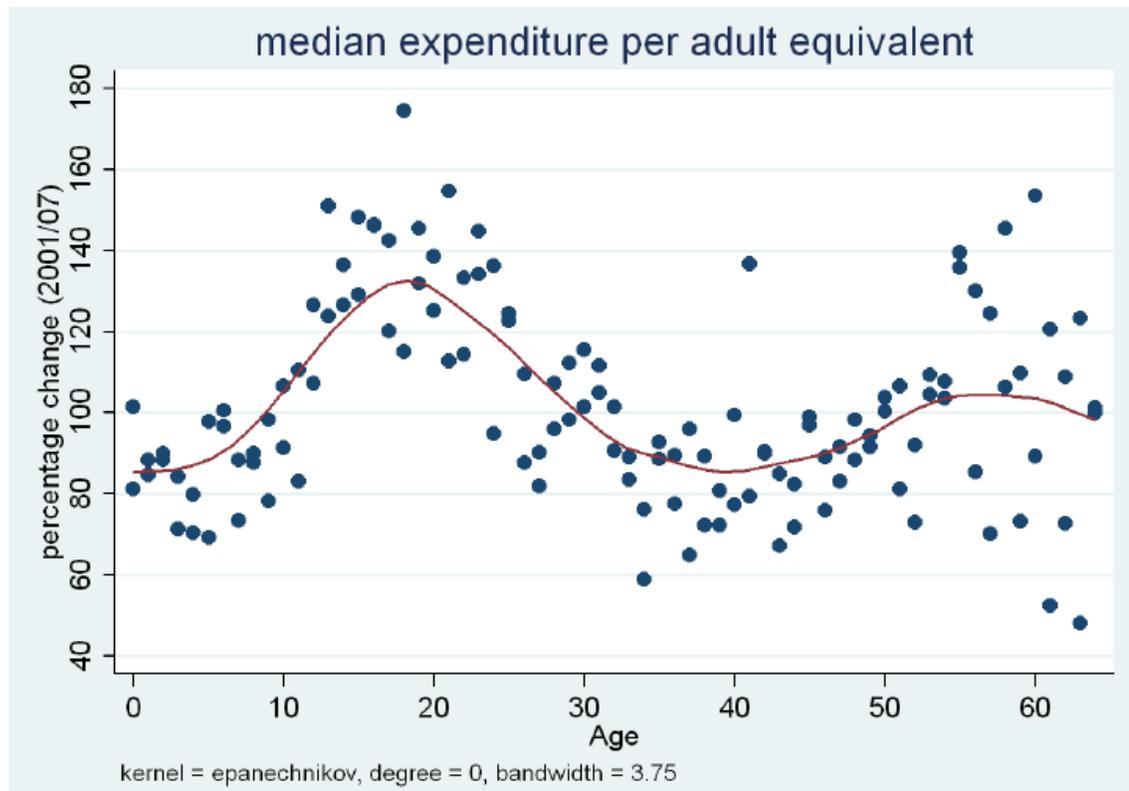
Figures 5 to 8 are reported in nominal terms. To convert nominal expenditure changes to real changes one must subtract the increase of the consumer price index

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<sup>31</sup> Median expenditure is less subject to sampling variability than the mean and is a better indicator of the central tendency of a distribution, when the distribution is skewed, as it is in this case.

between 2001 and 2007 – which the National Bureau of Statistics estimated to be 40.7%.

Figure 8



Thus far, the picture painted by the “synthetic cohort” methodology is one in which younger individuals experienced between 2001 and 2007 sharply increasing changes in average (or median) expenditure – at least in early life. However, Figures 9 and 10 show that this is limited to the non-farm sector. There appears to be no consistent increase in income with age for those Tanzanians who work in agriculture.

Figure 9

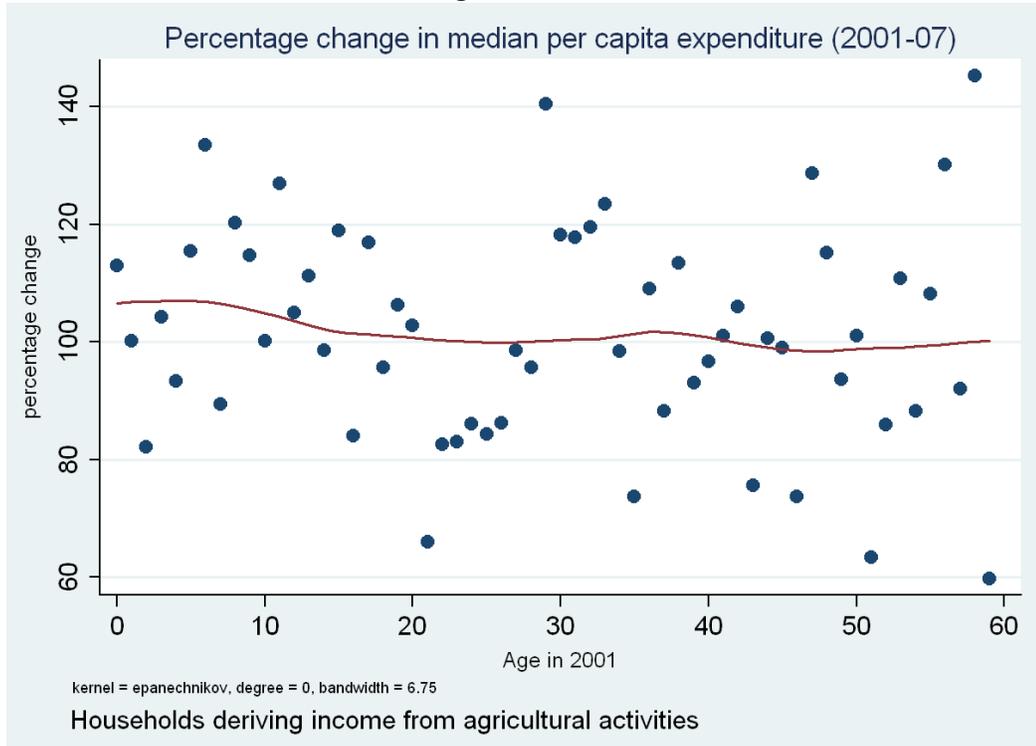
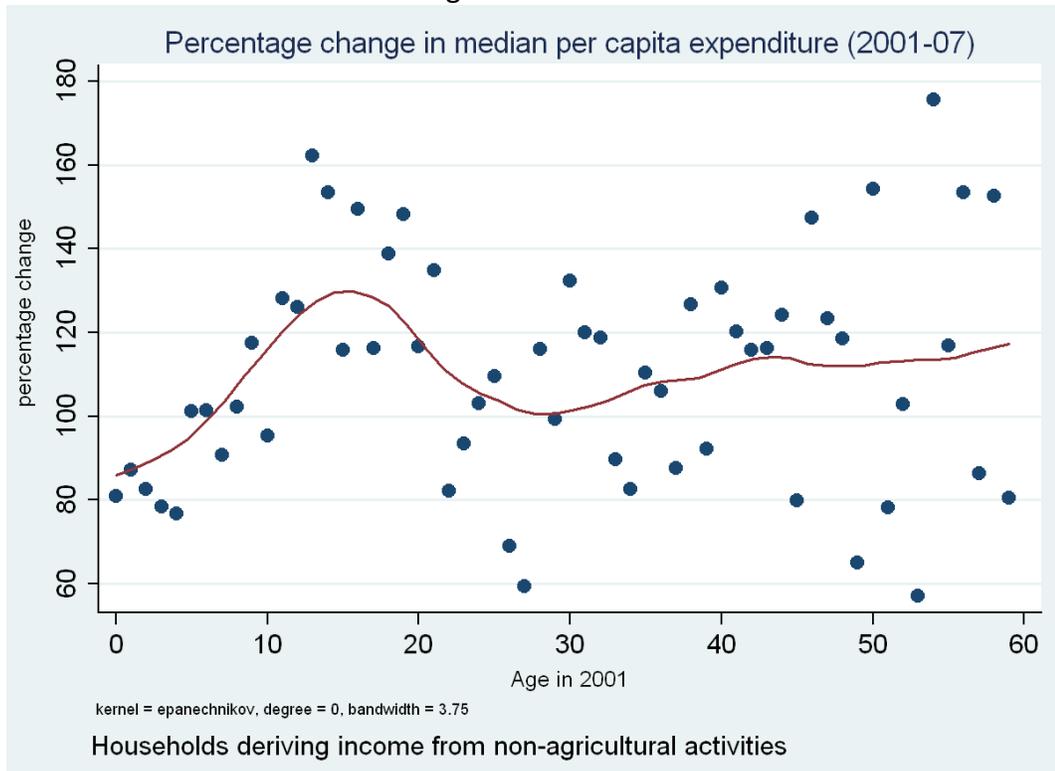


Figure 10



## References

Syud Amer Ahmed, Noah S. Diffenbaugh, Thomas W. Hertel, David B. Lobell, Navin Ramankutty, Ana R. Rios and Pedram Rowhani (2009) *Climate Volatility and Poverty Vulnerability in Tanzania*, Policy Research Working Paper 5117, The World Bank Development Research Group, Agricultural and Rural Development Team, November 2009

Hans P. Binswanger-Mkhize and Madhur Gautam (2010) *Towards an Internationally Competitive Tanzanian Agriculture* A World Bank Draft Report, March 22, 2010, Dar es Salaam

---

Steven Block (2010) *THE DECLINE AND RISE OF AGRICULTURAL PRODUCTIVITY IN SUB-SAHARAN AFRICA SINCE 1961* Working Paper 16481 NATIONAL BUREAU OF ECONOMIC RESEARCH October 2010 <http://www.nber.org/papers/w16481>

Deborah Bryceson (1990) *Food Insecurity and the Social Division of Labour in Tanzania, 1919-1985*. London: Macmillan, 1990

\_\_\_\_\_ (1993) *Liberalizing Tanzania's Food Trade: Public & Private Faces of Urban Marketing Policy 1939-1988*. London: James Currey, 1993;

Angus Deaton (2005) *Measuring poverty in a growing world (or measuring growth in a poor world)* The review of economics and statistics 2005 vol:87 iss:1 pg:1

Sverre Grepperud, Henrik Wiig and Finn Roar Aune (2011) ***Maize Trade Liberalization vs. Fertilizer Subsidies in Tanzania: A CGE Model Analysis with Endogenous Soil Fertility*** Research Department of Statistics Norway Discussion Paper 249. Forthcoming in *Politics and Economics in Africa* NOVA Science: New York

Thomas W. Hertel and Stephanie D. Rosch (2010) *Climate Change, Agriculture and Poverty* Policy Research Working Paper 5468 The World Bank Development Research Group Agriculture and Rural Development Team, November 2010

Johannes Hoogeveen and Remidius Ruhinduka (2009) *Poverty Reduction in Tanzania since 2001 Good intentions, few results* Paper Prepared for the Research and Analysis Working Group May 2009

Jorgen Levin and Robert Mhamba (undated) *Economic Growth, sectoral linkages and poverty reduction in Tanzania* Department of Economics Örebro University

---

Thadeus Mboghoina and Lars Osberg (2010) *The Hunger of Old Women: How sensitive are poverty measures?* Research on Poverty Alleviation (REPOA), PO Box 33223, Dar es Salaam, Tanzania

Thadeus Mboghoina and Lars Osberg (2011) *Social Protection of the Elderly in Tanzania: Current Status and Future Possibilities* Research on Poverty Alleviation (REPOA), Special Paper 10/5 PO Box 33223, Dar es Salaam, Tanzania

D. B. Mignouna, K.D.S. Mutabazi, E. M. Senkondo and V. M. Manyong (2010) *CONTRIBUTIONS OF AGRICULTURAL IMPROVED TECHNOLOGIES TO RURAL POVERTY ALLEVIATION IN DEVELOPING COUNTRIES: CASE OF IMAZAPYR-RESISTANT MAIZE IN WESTERN KENYA* Department of Agricultural Economics and Agribusiness, Sokoine University of Agriculture (SUA), Morogoro, Tanzania.

Nicholas Minot (2011) *Transmission of World Food Price Changes to Markets in Sub-Saharan Africa* IFPRI Discussion Paper 01059 January 2011

Martin Ravallion (2004) *Pro-Poor Growth: A Primer* World Bank Policy Research Working Paper 3242, March 2004 Development Research Group, World Bank

United Republic of Tanzania (2007a) *Analytical Report for Integrated Labour Force Survey (ILFS) 2006* National Bureau of Statistics, November 2007 Dar es Salaam

United Republic of Tanzania (2007a) *Annual Report 2008/09*, Bank of Tanzania, June 2010 Dar es Salaam

United Republic of Tanzania (2007b) *Poverty and Human Development Report 2007* Research and Analysis Working Group, MKUKUTA Monitoring System, Ministry of Planning Economy and Development, December 2007, Dar es Salaam, Tanzania

United Republic of Tanzania (2008) *Household Budget Survey 2007* National Bureau of Statistics, Dar es Salaam, Tanzania

United Republic of Tanzania (2008) *National Accounts of Tanzania Mainland 1998-2007*, National Bureau of Statistics, Dar es Salaam, Tanzania

United Republic of Tanzania (2009) *Poverty and Human Development Report 2009* Research and Analysis Working Group, MKUKUTA Monitoring System, Ministry of Planning Economy and Development, December 2009, Dar es Salaam, Tanzania

