ECONOMIC TRANSFORMATION IN TANZANIA: VICIOUS OR VIRTUOUS CIRCLE?

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List of Abbreviations and Acronyms

ESRF	Economic and Social Research Foundation
GDP	Gross Domestic Product
PRSP	Poverty Reduction Strategy Paper
UNCTAD	United Nations Conference on Trade and Development
ILFS	Integrated Labour Force Survey
NBS	National Bureau of Statistics
FYDP	Five Year Development Plan

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Abstract

This paper explores the concept of economic transformation and investigates its relevance to present-day policy debates in Tanzania. This paper, therefore, is conceptual in nature and starts by taking a critical look at a homemade definition of economic transformation. It then presents a brief literature review of the concept of economic transformation and its relation to growth by making a distinction between successful and failed transformations. More specifically, it argues that historical experiences show that there is not a unique process of transformation, but rather a variety of contrastive pathways depending on whether or not they lead to the cumulative convergence or divergence of productivities across the different sectors of the economy.

The paper employs a simple framework to show the arithmetic of the decomposition of the growth of GDP, of the labour force and of labour productivity across productive sectors of the economy: in particular, agriculture, on the one hand, and industry and services, on the other. This framework is then used to show that processes of growth can differ markedly between sectors of the economy depending on the extent to which the growth in production is driven by productivity growth or by the growth in employment, or some combination of both. We argue, in particular, that it is possible for an economy to be characterised by the co-existence of diverging growth dynamics between different sectors (or sub-sectors) of the economy. Specifically, we argue that some sectors – for instance, parts of agriculture and of the informal economy – come to act as sponges to absorb surplus labour, while other sectors are characterised by jobless growth, thus leading to processes of cumulative divergence rather than convergence between productivities across sectors. This point, we argue, is particularly relevant to understand ongoing processes of economic transformation in Tanzania.

These processes, we further argue, have implications for population dynamics within an economy, not only with respect to the relative growth rates between urban and rural areas, but also to differences in the respective age and sex compositions of their labour forces. Finally, we argue that the evolution in the respective shares of agriculture and non-agriculture in GDP and, by implication, in output per head, does not only depend on the relative growth rates in real terms of these aggregates, but also on relative price movements between sectors of the economy. These relative price changes cannot be ignored when assessing the success of failure of transformative processes.

Introduction

In the 2000s, policy discourses on the macroeconomics of development in Tanzania tended to focus quite narrowly on the growth- poverty nexus. The usual argument was that the adoption of certain core macroeconomic policies (the so-called 'fundamentals' of low inflation, trade openness, market liberalization, sound financial policies and good governance) would induce economic growth, which, in turn, would lead to poverty reduction. More specifically, this argument stated that if GDP *per capita* grows significantly and if inequality as measured by the GINI coefficient derived from successive household budget surveys does not worsen significantly, it follows that the incidence of (absolute) poverty must fall. Given this premise, which had become a mantra in the international development industry, policy analysis then boiled down to monitoring the correlation between economic growth and changes in income consumption inequality, on the one hand, and the incidence of poverty, on the other. When this presumed relation failed to hold – as it did in Tanzania – a policy paradox was said to exist.

The problem with this approach, however, was that it makes a heroic jump from the growth in GDP per capita to the reduction in incidence of poverty without much specification of the actual mechanisms that supposedly link them together. It appeared, therefore, as if per capita GDP growth directly translates itself into improved standards of living of working people, regardless of the mechanisms through which these transmissions are supposed to take place. Growth is defined purely in terms of the quantitative expansion of output without much consideration for its character or content. Within this type of reasoning, therefore, there is little mention of how standards of living of the majority of working people – poor and non-poor alike – depend on how output growth divides between productivity growth and employment growth, on the composition of this growth across productive sectors in the economy, and, in turn, on how and to what extent productivity growth translates into the growth in labour earnings on which the large majority of the working population depends. Nor is there much, if any, discussion of how growth-induced changes in relative prices between broad categories of commodities may provoke favourable or adverse changes in the standards of living of working people and, by implication, in the incidence of poverty. In other words, the character of accumulation and the ways in which it shapes the structure of output and of relative prices, the employment relation and the productivity-labour earning nexus, including related modalities of social protection, is somehow left out of the equation.

More recently, however, the policy focus in Tanzania has turned towards the challenge

of economic transformation, which brings concerns with the nature of production and employment, and with the development of productive capabilities back into the centre of the policy arena. This recent shift in Tanzania towards greater policy concern with socioeconomic transformation is a welcome development, but it also appears to go together with putting matters of poverty and of human development on the backburner. The implicit assumption appears to be that the twin motors of economic transformation and economic growth will lead to human development and the reduction in poverty. This paper argues, however, that this cannot be taken for granted since whether or not economic transformation engenders human development depends upon the nature of the process of transformation.

The aim of this paper is to provide food for thought for policy analysis, not by drawing firm conclusions from available data, but rather by using theoretical reflections to question assumptions that appear to be taken for granted, explicitly or implicitly, in shaping economic policies, or to address analytical silences in policy analysis – issues that matter, but tend to be left out of the picture. This paper, therefore, is essentially conceptual rather than empirical in nature, featuring theoretical reflections rather than empirical explorations, although, whenever appropriate, empirical data will be used to clarify conceptual points. A parallel paper (Wuyts and Kilama, 2014) presents an empirical analysis of the trajectory of growth and economic transformation of the Tanzanian economy since the policy reforms of the 1980s.

This paper is structured as follows. Section 1 deals with a homemade definition of economic transformation in Tanzania: how it is defined and how it is put to use for planning purposes to outline a scenario of the future trajectory of the Tanzanian economy. Section 2 presents a brief review of the concept of economic transformation and highlights the contrast between successful and failed transformations. Section 3 deals with the arithmetic of the decomposition of GDP, labour force and labour productivity across the productive sectors of the economy: agriculture, on the one hand, and industry and services, on the other. It shows that what matters for aggregate productivity is not just productivities within each of the sectors, but also the distribution of the labour force between these sectors. Section 4 then contrasts distinctive pathways of economic transformation depending upon whether or not they lead to the cumulative convergence or divergence of productivities across the different sectors of the economy.

Section 5 presents some brief reflections on the challenges population dynamics (its growth, its changing structure and its distribution across the rural/urban divide) pose for economic transformation. Section 6 presents an analysis of the importance of relative price movements between sectors of the economy and the potentialities or limitations this can impose on successful transformation. Finally, section 7 draws some lessons from the analysis presented in this paper. It argues that it cannot be taken for granted that economic transformation and

human development will inevitably go hand in hand. Whether or not they do, this paper argues, depends on the extent to which economic transformation is successful in propelling a virtuous circle of cumulative convergence of productivities across sectors of the economy.

I. Economic transformation: a homemade definition

We start with a homemade definition of economic transformation, which reads as follows: Socio-economic transformation is commonly defined as a process in which an increasing proportion of economic output and employment are generated by sectors other than agriculture. This process of transformation connotes the shift from agriculture-based societies to urban, industrial and/or service-based economies with sustained high GDP growth rates. GDP growth rates combined with a reduction in the population growth rate – resulting from improvements in educational access and quality – increases GDP per capita, which, in turn reduces poverty. [*P. Mpango, Repoa brief No 37, January 2013: p. 1]*

This 'definition' is interesting because it *is a definition turned into an argument*:

- It is a definition insofar it equates economic transformation with the shift in the composition of output and employment away from agriculture towards industry and services: the shift from an agriculture-based to an industry/services-based economy.

- It turns into an argument, however, insofar it also further states that this shift in the composition of output leads to sustained high GDP growth rates, which, in turn, combined with a reduction in population growth due to increased access and quality of education will increase GDP *per capita,* thus – it is argued – reducing the incidence poverty.

In the first part of this definition, therefore, socio-economic transformation is essentially defined as a process of structural change characterized by quantitative changes in the sectoral composition of output and employment across agriculture, industry and services, and by the falling share of agriculture therein, in particular. The second part links these processes of changes with broader socioeconomic changes in the economy and society in a rather strictly causal fashion.

It is this definition that is then used to define a strategy, which entails that Tanzania should achieve middle-income status by 2025, on the basis of which forward projections are made, as follows:

- GNI (gross national income) annual average growth rate of 8% over 15 years, equivalent to GNI *per capita* growth rate of 5%, assuming population growth remains around 3% (Mpango, 2013).

- Using the sector shares of GDP a 'typical' middle-income country as blueprint, yields the following projected changes in sectoral composition:

    - The share of agriculture will need to decline from 27.8% in 2000 to 20.7% in 2025,
    - and, more dramatically, the share of employment in agriculture needs to drop from 74.6% in 2010 to 41.2% ,
    - while the share of manufacturing in GDP will have to rise about twofold: from 9.8% in 2010 to 17.8% by 2025.

- o The growth rate in agriculture will need to increase from 4.4% in the 2000 to 2010 period to 6% per annum through to 2025,
- o while manufacturing will have to increase from 8.2% in to 2000 to 2010 period to 13% per annum up to 2025 (Mpango, 2013: p. 2)

To achieve these targets, Mpango puts forward a set of interrelated premises that concern the nature of of the processes of change that effect economic transformation in Tanzania, the most important of which include the following:

a. Economic transformation will enhance growth and thus reduce poverty, particularly if the quality of growth is assured in terms of distributional patterns, sectoral composition and sustainability of growth over time. Since most of the poor reside in agriculture, triggering innovative strategies to raise agricultural productivity (by formulating the right set of agricultural and land policies, leveraging private sector investment and developing public-private partnerships) will have the greatest impact on reducing poverty (Mpango, 2013: p. 3);

b. Increased productivity in agriculture will increase production and generate excess labour supply, both fuelling agro-processing and leading to a sharp expansion in the manufacturing sector (*ibid: 2)*

c. Increased activities in the downstream nodes of value chains will create employment and growth in the industrial sector (ibid: p. 2);

d. Reviewing labour laws for flexibility… and developing a high propensity to save rather than to consume (ibid: p. 3 and 4)

Each of these premises about the processes and mechanisms of change contains strong assumptions. Most of these assumptions are plausible, but they cannot necessarily be taken for granted. These premises also contain analytical silences – issues that matter, but are left unaddressed. In this paper, we seek to explore and question some of these assumptions and identify and address important analytical silences through theoretical reflections on the concept of economic transformation and on its relation to economic growth and human development.

A caveat is necessary here. Mpango's focus is on policy formulation based on forward projections using the 'typical' middle-income country as a blueprint, and, hence, Mpango makes little or no reference to lessons that could be drawn from the socioeconomic transformations – positive or negative – that already took place under the impulse of economic reforms and a high rate of growth of the economy in the last 15 years. This is problematic since processes of change are invariably context-specific and path-dependent and, hence, cannot necessarily be depicted with reference to a stylised blueprint. In this paper, we are not concerned with the empirical analysis of past processes of economic transformation in Tanzania since we dealt with these issues in a different but related paper (Wuyts & Kilama, 2014), but we shall nevertheless cross-reference to some of the key premises developed in this parallel paper to enable us to put assumptions and silences into context.

II. The concept of economic transformation

The question of economic transformation is as old as development economics. Indeed, the central concern of the pioneers in development thinking was, as Kurt Martin put it: "always with changes in the social and economic structure of mostly poor, agrarian, colonial or ex-colonial societies", changes which were thought of as "bound to have a particular direction, namely industrialization, and should lead to continuing domestic growth in the productivity of these economies in terms of rising income per head" (1991: 28). Furthermore, "although such economic growth was not confused with social welfare, it was thought that – depending on the pattern of growth – this growth should permit the alleviation and eventual elimination of mass poverty" (*ibid*). In this respect, "much thought was given by the first generation of development economists to the 'employment problem' in developing countries; and there was a wide consensus in favour of development planning" *(ibid*).

In this classical tradition of development economics, therefore, the main concern was not with economic growth *per sé* – nor for that matter with the nexus between economic growth and poverty – but instead with the nexus between economic transformation, growth and employment creation as a means to secure rising standards of living and the eventual elimination of generalized poverty in developing countries. Since the 1980s, however, with the resurgence of neoclassical economics in development thinking, the concern with economic transformation largely disappeared from policy agenda and the focus shifted first towards propelling economic growth through market liberalisation under the structural adjustment programmes, and, subsequently, from the late 1990s onwards, towards the nexus between growth and poverty reduction within the PRSP framework. Growth was on the agenda – both analytical and policy-oriented – but its connection with the challenge of economic transformation was hardly discussed.

More recently, analytical attention has shifted again to a concern with the question of economic transformation. This renewed attention in the old concerns of early development thinking, however, is not to do with a simple reassertion of past ideas, but rather with drawing lessons from the novel insights that can be gained from looking at the diversity of development experiences that have taken place since the 1950s. Indeed, the developing world now is no longer what it was then inasmuch as the initial greater homogeneity has now given way to enormous diversity in development experiences across continents and countries within a continuum ranging from spectacular economic successes at one extreme to equally spectacular economic failures at the other.

According to Timmer and Akkus (2008; see also Timmer, 2009), there are four relentless and interrelated processes that define structural transformation:

- firstly, "a declining share of agriculture in GDP and employment";
- secondly, "migration from rural to urban areas and a rapid process of urbanization";
- thirdly, "the rise of a modern industrial and service economy";
- and fourthly, "a demographic transition from high rates of births and deaths (common in backward rural areas) to low rates of births and deaths (associated with better health standards in urban areas)" (p. 4).

The key to the process of structural transformation, therefore, lies in the interrelations between agriculture, on the one hand, and industry and services, on the other. More specifically, as Timmer and Akkus argued: "the process *involves a successful structural transformation* where agriculture through higher productivity, provides food, labour, and even savings to the process of urbanization and industrialisation" (p.3-4). But, "unless the non-agricultural economy is growing, there is little long-run hope for agriculture", while, "at the same time, the historical record is very clear on the important role that agriculture itself plays in stimulating growth in the non-agricultural sector" (p.5). Macmillan *et.al.* (2013: p. 1) make a similar point when they argue that: "the countries that managed to pull out of poverty, and get richer are those that are able to diversify away from agriculture and other traditional products"; and that: "the speed with which this structural transformation takes place is the key factor that differentiates successful countries from unsuccessful ones".

Successful transformation ensures that economic growth forms part of a virtuous circle of cumulative causation that accentuates productivity and income convergences between the agriculture and non-agriculture. In contrast, however, failed transformation consists of a process where the process of economic growth engenders a vicious circle of cumulative causation that accentuates divergences rather than convergences between these elements. Whether or not growth goes hand in hand with economic transformation, therefore, does not only depend on the rate of growth, but also on the pattern of growth.

Growth is not explicitly mentioned in the definition of structural transformation, but an important conclusion that follows from this renewed interest in economic transformation is that the successful transformation from a largely agrarian-based economy to a modern economy in which output and employment in industry and services eclipse (and transform) agricultural production and employment requires as well as fuels sustained economic growth. In this respect, Gore (2013: p. 383) argued that: " at the macro level, economic growth, structural change, productive upgrading are driven by a rapid pace of capital accumulation, which occurs when increased domestic savings, investment, and exports are linked together in a virtuous circle of cumulative causation (see Akyuz, Chang, and Kozul-Wright, 1998)".

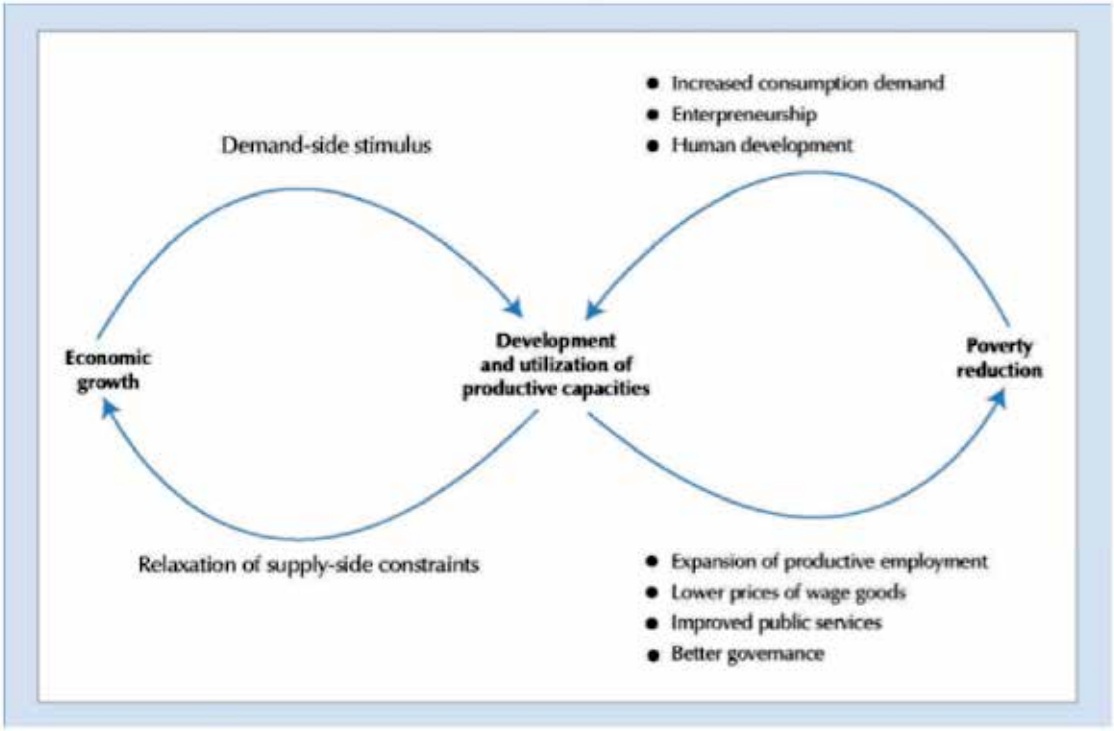
Growth, therefore, is a necessary condition for successful transformation. The reverse, however, is not true: economic growth in itself does not necessarily engender successful transformation. Indeed, as Timmer and Akkus argued: "a country might experience rapid growth, but fail to have an equally rapid structural transformation, in which case both the pattern and the commensurate transformation fail to hold (2008: p. 5). The lesson is that growth is a necessary but not sufficient condition for effective economic transformation.

A corollary of this lesson is that it is not sufficient to judge success or failure in economic development merely by looking at the relation between the rate of GDP growth and poverty reduction. Indeed, a distinction must be made between the process of *economic growth*, on the one hand, and that of *the rate of growth*, on the other. The former entails complex processes of economic and social change characterised by the conjunction of quantitative expansion and qualitative transformation. In contrast, the narrower concept of the *rate of growth* only abstracts one aspect of this complex process – its dimension of quantitative expansion. It is important, then, not to confuse the process of economic growth with the rate of growth abstracted from it, or worse still, to collapse the former into the latter. Indeed, similar growth rates can be reflective of very different processes of qualitative change and, hence, it involves quite a leap of faith to assume that only the quantitative dimension is all that matters in assessing the impact of economic growth on the incidence of

poverty, or, more generally, on human development. Instead, economic development is essentially characterised by processes of *transformative growth*, which requires us to look not only at its *rate of expansion*, but also at its *direction of transformation and change*.

In figure 1, UNCTAD (2006: chart 11, p. 79) provides an interesting schematic to depict the broader context of the growth-poverty nexus by placing the development and utilization of productive capacities as its mediating link.

Figure 1: The relation between economic growth, productive capacities and poverty reduction



This development and utilisation of productive capacities has both macro and micro dimensions. At the macro-level, in a context of a largely agrarian developing economy characterized by the prevalence of generalised poverty, the structural transformation of the economy lies at the heart of the process of developing productive capabilities in the economy. Moreover, these processes of changes do not only involve quantitative changes in the composition of output and employment, but also qualitative changes in the nature of production, employment and social provisioning. In the next section, we focus on the importance of quantitative changes in composition of output and employment across the key sectors of the economy – agriculture, industry and services.

III. The arithmetic of sector growth rates and shares

Typically, at the early stages of structural transformation, the share of agriculture in the total labour force will be much higher than its share in GDP. Conversely, of course, the shares of industry and services in the total labour force will be much less than their corresponding shares in GDP. The key to understanding the difference between successful and failed economic transformation lies in what happens to these respective shares in output and employment during the process of transformation. Do these gaps persist or grow larger or do they close?

At first sight, this might seem a rather overly simple – if not simplistic – way to pose the question of successful versus failed economic transformation. And, of course, it is true that the mere movements in these shares cannot possibly capture the complexity of a major process of socioeconomic development and change in all its dimensions. The point it, however, that the movements in these shares point at broad processes of what happens to how people work and secure livelihoods in the context of development and change. In a developing economy, the standards of living of the large majority of people in society largely depend on their productive employment and the incomes they derive from it. Shares in GDP represent flows of incomes to sectors; shares in the labour force represents how employment is distributed across sectors. Growing divergence over time between these shares signal differences in nominal productivity across sectors and, hence, differences in average incomes derived from these activities. For example, as is the case in Tanzania, if the share of agriculture in GDP falls over time, but the share of agriculture in the labour force remains stubbornly high, nominal productivity (as measured by value added per person in the labour force) in agriculture, on the one hand, and in industry/services, on the other, will increasingly diverge. The growing gap between these shares over time, therefore, not only impose serious limitation on effective poverty reduction and human development, but can also constitute a fundamental cause of deep political tensions within society.

Before we proceed with the analysis of different pathways of structural transformation, it is helpful first to clarify the arithmetic of the decomposition of the levels and the growth rates of GDP and of employment across the productive sectors of an economy. For convenience of exposition, given our focus on the falling share of agriculture, we shall confine the analysis by distinguishing between two sectors only – agriculture and non-agriculture (industry and services).

Two further caveats are necessary here. The first concerns the distinction between labour force and employment. The second pertains to whether to use nominal or real GDP when looking at processes of structural transformation.

The first caveat concerns the distinction between labour force and employment. When dealing with sector shares it is customary to use shares of the total labour force, a convention we shall also use in this section. We shall thus define productivity as output (GDP) per person in the labour force, for the economy as a whole and for each of the sectors. The total labour force equals employment *plus* unemployment and, hence, a better measure of productivity would be output per person employed. In the absence of any regular system of unemployment benefits, however, few of those without a regular job can afford to be 'unemployed', but instead will be driven into other

occupations, mostly characterised by low productivity activities involving 'self-employment' or casual work. The boundary between labour force and unemployment is, therefore, by no means clear-cut. This has implications, however, for the way in which we define sectors. We shall return to this issue further in this paper when dealing with the question of the informal sector and the phenomenon of 'disguised unemployment'.

The second caveat concerns nominal versus real GDP when dealing with sector shares and growth rates. In this respect, the following distinction needs to be made:

- When dealing with growth rates of GDP it is customary and, in most (but not all) cases, preferable to derive growth rates of *real* GDP: that is, of GDP *at constant prices*.

- When dealing with sector shares of GDP, however, it is more sensible to use shares of nominal GDP: that is, of GDP *at current prices*. Indeed, sector shares in nominal GDP reflect actual flows of value added and, hence, of domestic income to the different sectors of the economy.

The evolution of sector shares in nominal GDP does not necessarily match that of sector shares in real GDP due to relative price movements between the different sectors in the economy. This is particularly important when looking at broad processes of economic transformation where differential growth rates in output and in productivity often go hand in hand with major changes in relative prices between productive sectors of the economy. Changes in sector shares of nominal GDP result from *either* differential rates of growth in real output between sectors *or* movements in relative prices between sectors over time, while changes in sector shares of real GDP (measured as GDP at constant prices) only reflect differential growth rates in real output across different sector. In the absence of major relative price changes, therefore, the sector shares in nominal and in real GDP will mirror each other's movements.

Box 1 presents the basic arithmetic of the decomposition of the levels and growth rates of output, labour force, and productivity across sectors, which can be applied to either nominal or real aggregates. The complications that arise from changes in relative prices will be dealt with further on in this paper.

Box 1: The arithmetic of sector growth rates and shares

Variable	Equations with levels	Equations with growth rates
Y = GDP (output)	$Y = Y_a + Y_n \qquad (1)$ where, a = agriculture; and, n = non-agriculture = industry + services	$\dot{Y} = \frac{\Delta Y}{Y} = \frac{\Delta Y_a + \Delta Y_n}{Y}$ $= \frac{\Delta Y_a}{Y_a} \cdot \frac{Y_a}{Y} + \frac{\Delta Y_n}{Y_n} \cdot \frac{Y_n}{Y}$ Let, $\alpha_y = \frac{Y_a}{Y};\ \eta_y = \frac{Y_n}{Y};$ Respectively, the shares in GDP of agriculture and non-agriculture. And, $\dot{Y}_a = \frac{\Delta Y_a}{Y_a};\ \dot{Y}_n = \frac{\Delta Y_n}{Y_n}$ As GDP growth rates of agriculture and of non-agriculture, respectively. Which yields, $\dot{Y} = \alpha_y \cdot \dot{Y}_a + \eta_y \cdot \dot{Y}_n \qquad (1')$
L = labour force	$L = L_a + L_n \qquad (2)$	Analogously, let: $\alpha_l = \frac{L_a}{L};\ \eta_l = \frac{L_n}{L};$ As shares in the total labour force of agriculture and non-agriculture. Then, $\dot{L} = \alpha_l \cdot \dot{L}_a + \eta_l \cdot \dot{L}_n \qquad (2')$ where, $\dot{L}_a$ and $\dot{L}_n$ are the corresponding growth rates of the labour force for both sectors.

Π = output / head	$\Pi = \frac{Y}{L} = \frac{Y_a + Y_n}{L}$ $= \frac{Y_a}{L_a} \cdot \frac{L_a}{L} + \frac{Y_n}{L_n} \cdot \frac{L_n}{L}$ which yields, $\Pi = \alpha_l \cdot \Pi_a + \eta_l \cdot \Pi_n \quad (3)$ where Π_a and Π_n denote output per head of agriculture and non-agriculture, respectively.	In first approximation, the (discrete) growth rate of a ratio of two terms equals the difference of the growth rates of its terms. Hence, using equations 1′ and 2′, it follows that: $\dot{\Pi} = \dot{Y} - \dot{L}$ $= \left(\alpha_y \cdot \dot{Y}_a + \eta_y \cdot \dot{Y}_n\right) - \left(\alpha_l \cdot \dot{L}_a + \eta_l \cdot \dot{L}_n\right)$ Grouping terms by sector yields: $\dot{\Pi} = \left(\alpha_y \cdot \dot{Y}_a - \alpha_l \cdot \dot{L}_a\right) + \left(\eta_y \cdot \dot{Y}_n - \eta_l \cdot \dot{L}_n\right)$ $= \alpha_l \cdot \left(\frac{\alpha_y}{\alpha_l} \cdot \dot{Y}_a - \dot{L}_a\right) + \eta_l \cdot \left(\frac{\eta_y}{\eta_l} \cdot \dot{Y}_n - \dot{L}_n\right)$ $\alpha = \frac{\alpha_y}{\alpha_l}; \quad \eta = \frac{\eta_y}{\eta_l};$ The ratios of the share in GDP to the share in labour force for agriculture and non-agriculture, respectively. It follows that: $\dot{\Pi} = \alpha_l \cdot \left(\alpha \cdot \dot{Y}_a - \dot{L}_a\right) + \eta_l \cdot \left(\eta \cdot \dot{Y}_n - \dot{L}_n\right) \quad (3')$

Of particular importance to our argument in this paper are the equations concerning the decomposition of the aggregate level of productivity (as measured by nominal GDP per person in the labour force) and of its growth rate. Equation 3, which reads as follows:

$$\Pi = \alpha_l \cdot \Pi_a + \eta_l \cdot \Pi_n \quad (3)$$

tells us that aggregate productivity is the weighted mean of sector productivities, with the weights being determined by the respective sector shares in the total labour force. This result is straightforward and easy to grasp, but nevertheless it makes the important point that aggregate productivity does not only depend on sector productivities but also on the distribution of labour between sectors. Aggregate productivity of two economies with the same sector productivities will differ depending on their respective distributions of labour across both sectors. Or, as Macmillan *et. al.* (2013: p. 1) put it: "when labor and other resources move from less productive to more productive activities, the economy grows even if there is no productivity growth *within* sectors".

Equation 3 shows, however, that the growth in aggregate productivity cannot just be depicted as the weighted average of sector growth rates with weights determined by the respective sector shares in the total labour force. This will only hold if the sector shares of agriculture are the same: that is, if $\alpha = 1$ (which also implies that $\eta = 1$). But in the context of a developing economy, sector shares in GDP will differ from those in the labour force and, hence, to derive the contribution of

agriculture to aggregate productivity growth, the higher share of agriculture in the labour force must be adjusted for its lower share in GDP to derive the impact of the growth of agricultural GDP on aggregate productivity.

The implications of equation 3 can best be illustrated with a simple numerical example.

Assume that, $\dot{Y}_a = 0.04;\ \dot{L}_a = 0.025;\ \alpha_y = 0.24;\ \text{and}\ \alpha_l = 0.7$

In other words, agricultural GDP grows at 4% and the agricultural labour force at 2.5%, and, furthermore, the share of agriculture in GDP is 24%, while the share of agriculture in the labour force is 70%. This depicts a situation similar to recent experience in Tanzania.

It follows that the growth of agricultural productivity (as measured by GDP per person in the labour force) equals (0.04 – 0.025) = 0.015 (or 1.5%). But to calculate the contribution of agriculture to the growth in aggregate productivity, we need to correct for the substantial difference in the shares of agriculture in GDP and in the labour force.

Equation 3 tells us that:

$$\dot{\Pi} = \alpha_l \cdot \left(\alpha \cdot \dot{Y}_a - \dot{L}_a\right) + \eta_l \cdot \left(\eta \cdot \dot{Y}_n - \dot{L}_n\right) \quad (3')$$

In this equation, the contribution of agriculture to the growth in aggregate productivity is given by the first term on the right-hand side of this equation. This contribution of agriculture yields the following result:

$$\alpha_l \cdot \left(\alpha \cdot \dot{Y}_a - \dot{L}_a\right) = 0.70\ \left(\frac{0.24}{0.70} x\ 0.04 - 0.025\right) = -0.0079$$

This shows that the contribution of agriculture to this decomposition of the growth rate of aggregate productivity is actually negative (- 0.8%), notwithstanding positive productivity growth within agriculture. This may sound counterintuitive, but the reason is that, while agriculture GDP has a higher growth rate than its labour force, the weight of agriculture in GDP is much smaller than its weight in the labour force.
In fact, agriculture would have to grow at 7.3% to keep its contribution to the growth of aggregate productivity equal to zero – that is, to break even.

The reverse applies to non-agriculture, where its higher share in GDP relatively to its share in the labour force has an amplifying effect on its contribution to the growth of aggregate productivity. Hence, even if productivity within agriculture remains constant, and, hence, its output grows at the same rate as its labour force, its contribution to the growth of aggregate productivity is nevertheless positive since labour is added to the more productive sectors in the economy.

Macmillan *et.al.* (2013: pp. 8-9) use a different decomposition method which allows them to separate changes in overall productivity into two components: (1) the '*within*' component, which captures the effect of productivity growth within each sector, and (2) the '*across*' component which captures the effect of labour reallocations across different sectors of the economy (as a result of changing sector shares of labour across sectors). They refer to this latter component as the "*structural change term*" (p. 9). This leads them to the conclusion similar to ours, as follows:

The decomposition … clarifies how partial analyses of productive performance within individual

sectors (e.g. manufacturing) can be misleading when there are large differences in labor productivities across economic activities. In particular, a high rate of productivity growth within an industry can have quite ambiguous implications for overall economic performance if the industry's share of employment shrinks rather than expands. If the displaced labour ends up in activities with lower productivities, economy-wide growth will suffer and may even turn negative. (p. 9)

IV. Sector productivities: cumulative convergence or divergence?

The growth in GDP for the economy as a whole, or, alternatively, for each of the sectors of the economy, can be expressed as follows:
GDP growth = labour productivity growth + labour force growth

Where labour productivity is defined as the output per person in the labour force. What this simple equation shows is that GDP grows because either labour productivity grows, or employment grows, or some combination of both. GDP growth and employment growth, therefore, do not necessarily go hand in hand.

As demonstrated in box 1, this equation can also be used to depict the growth rates for each of the sectors of the economy: agriculture, industry and services. Changes in shares in GDP depend on differential growth rates in both labour productivity and labour force, but, in contrast, changes in labour force shares only depend on differential growth rates of the labour force between sectors. This explains why sector shares in output and in employment may converge or diverge depending on the prevailing types of growth within each sector. What matters are not only the respective rates of expansion of output in each of the sector, but also their different rates of labour absorption?

This distinction allows us to distinguish between two opposite (extreme) types of growth processes:

- *Pure labour intensive growth*: in which (sector) GDP growth is wholly accounted for by employment growth with constant productivity of labour;

  Note: *Perverse labour intensive growth* depicts a situation where employment growth goes at the expense of falling labour productivity: the gain in the former partly or wholly offsets the fall in the latter.

- *Jobless output growth:* in which (sector) GDP growth is wholly accounted for by the growth in labour productivity without employment growth.

  Note: *Labour-shedding growth* depicts a situation where labour productivity growth goes at the expense of falling employment: the gain in the former partly or wholly offsets the fall in the latter.

Using a simple simulation model, Timmer and Akkus (2009) argue that the key to successful transformation lies in rapid growth of employment in the non-agricultural sectors of the economy. In other words, successful transformation requires a labour-intensive path of industrial and service growth, which they refer to as Lewis-type growth.

Briefly put, Lewis assumed that productivity in industry and in services was higher than in agriculture, but that the growth in output in industry and services was mainly driven by employment growth, which is the case of pure labour intensive growth described above. In fact, Timmer and Akkus (2009) base their simulation on the strict assumption that the growth of output in industry and services is exclusively driven by employment growth. Central to the Lewis model was the assumption of the

prevalence of an unlimited supply of labour from agriculture. More technically, Lewis assumed that the marginal productivity of labour was equal to zero in agriculture, and, hence, the withdrawal of labour would not affect agricultural output adversely. Labour would flow from agriculture in response to the demand for labour from industry (and services) at a wage determined by the prevailing subsistence level in agriculture from which labour is drawn.

An important corollary of this argument is that it assumes that the absorption of labour in agriculture is supply-driven and, hence, depends on the growth of the labour force in agriculture, but in industry and services it is demand-driven. In other words, agriculture acts as a sponge inasmuch as it absorbs the available labour force through various mechanisms of income sharing (which may be highly unequal), while industry and services get the wage labour they demand, given the unlimited supply of labour from agriculture.

Finally, given these assumptions, the withdrawal of labour from agriculture would lead to rising average productivity in agriculture (notwithstanding zero marginal productivity of labour in agriculture), thus setting in motion the process of convergence in productivity between agriculture, on the one hand, and industry and services, on the other.

Timmer and Akkus (2009) summarize this path as follows:

No country has actually managed a growth path with quite that much labor intensity, although the East Asian experience comes closest. The structural transformation is extremely rapid with this path, and the *absolute* number of workers is already declining after 20 years of rapid growth (p.8).

Macmillan *et. al.* (2013: p. 1) similarly argued that: "…, the bulk of the difference between Asia's recent growth, on the one hand, and Latin America's and Africa's growth, on the other, can be explained by the variation in the contribution of structural change to overall labor productivity".

The opposite extreme occurs when the growth in output in industry and services is exclusively driven by productivity growth. Consequently, both these sectors do not absorb any new workers at all, and - as Timmer and Akkus (2009) conclude – the entire increase in the labour force remains in agriculture (p.8). Not surprisingly, this case is characterised by cumulative divergence of productivities between sectors. This pattern, they argue, is closer to the African experience.

The simulation exercises of Timmer and Akkus (2009) succinctly illustrate that successful economic transformation – as distinct from failed economic transformation – requires rapid employment growth outside agriculture. In other words, jobless growth outside agriculture does not close the gap between the shares of agriculture in GDP and in the labour force, and, hence, leads to a process of cumulative divergence in sector productivities. In fact, as shown in the previous section, positive productivity growth in agriculture does not mean that its contribution to the growth in aggregate productivity is also positive. This is an important point, not only conceptually, but also in terms of its policy relevance.

There are, however, some analytical flaws in Tiimmer and Akkus' argument that need to be addressed further.

First, while their assumptions concerning Lewis-type growth and transformation (depicting the East-Asia experience) are reasonably well specified, Timmer and Akkus remain rather vague about the assumptions underlying the other extreme (depicting the African experience), apart from the

assumption that the growth in output in industry and services is exclusively driven by productivity growth, and, hence, characterized by jobless growth. But why would this be the case? In particular, which conditions in agriculture might account for this difference in the growth path outside agriculture?

In this respect, Karshenas (2001) is more insightful. In his comparison between Africa and Asian economies, Karshenas shows that the *relative productivity ratio* between agriculture and non-agriculture – that is, the ratio of agricultural (nominal) productivity to (nominal) productivity in non-agriculture – is consistently higher in Asia than in Africa, which implies that the discrepancies between shares in output and in the labour force are lower in Asia than in Africa. He argued that the roots of this difference lies in the fact that, in Africa, agricultural production is predominantly labour-constrained, while in Asia, it is land-constrained. The hypothesis of unlimited supply of labour, therefore, is relevant to Asia, but not to Africa (a point of which Arthur Lewis was well aware). Land scarcity in Asia produced a class of landless labourers, whose reservation wage to work outside agriculture is well below the average product of labour in agriculture. In Africa, however, the labour-constrained nature of agricultural production means that the reservation wage to work outside agriculture is closer to the average productivity in agriculture. In other words, the supply of labour power from agriculture to non-agriculture is cheaper – relatively to the average productivity in agriculture – than in Africa, thus favouring labour-intensive accumulation outside agriculture. This is an important point, although it should not lead us to conclude that there is an unlimited supply of land in Africa, particularly not under present-day conditions where land alienation in favour of commercial farming or mining has become so much more prevalent.

Furthermore, Macmillan *et.al.* (2013) argued that whether or not globalisation favours successful structural economic change depends on the "*manner* in which countries integrate into the global economy" (p. 1). More specifically, "in several cases, most notably China, India, and some other Asian countries – globalisation's promise has been fulfilled", but "in many other cases – in Latin America and Sub-Saharan Africa – globalisation appears not to have fostered the desirable kind of structural change" (pp. 1-2). On the contrary, "labor has moved *in the wrong direction,* from more productive to less productive activities, including, most notably, informality".

This brings us to our second point. Timmer and Akkus assume that in the case of jobless growth outside agriculture (the African variant), the entire growth in the labour force will be absorbed in agriculture. This assumption is unwarranted and does not apply in practice. There is, in fact, considerable migration of labour from rural to urban areas that does not find its way in the employment of regular jobs. Arthur Lewis [1954] foresaw this problem and explained it as follows:

Another sector to which it [= surplus labour] applies is the whole range of casual jobs – the workers on the docks, the young men who rush forward to carry your bag as you appear, the jobbing gardener and the like. These occupations usually have a multiple of the number they need, each of them earning small sums from occasional employment; frequently their number could be halved without reducing output in this sector. Petty retail trading is also exactly of this type; it is enormously expanded in overpopulated countries (quoted from Debraj Ray, 1998: 356).

This is what Joan Robinson referred to as 'disguised unemployment', a condition in which a worker for want of a regular job (either because they have been rendered unemployed or they cannot find work) engages in a range of low-productivity activities to make ends meet (Eatwell, 2011: p. 176). Moreover, "she went on to argue that the disguised unemployed would typically have a

marginal propensity to consume equal to one", which implied that "any diversion of demand from 'the general run of industries' to the products of the disguised unemployed would be offset by the extra demand that their expenditures add to the system', and, hence, "the potential scale of disguised unemployment is independent from the level of effective demand for the products of the general run of industries' (*ibid*).

In the African context, much (but not all) of the growth in informal sector employment consists of this type of disguised unemployment and, hence, provides an alternative sponge to absorb the shortfall between increase in the labour force outside agriculture and the supply of regular jobs. As Rizzo and Wuyts (2014) argued, the concept of the informal sector is a case of misplaced aggregation since it lumps together a variety of activities: some involving a variety of small- and medium-scale productive enterprises that operate outside formal arrangements along with what could properly be called activities that characterise disguised unemployment.

Macmillan *et.al.* (2013) make a similar point, as follows:

In economies that do not exhibit large inter-sectoral productivity gaps or high and persistent unemployment, labor displacement would not have important implications for economy-wide productivity. In developing economies, on the other hand, the prospect that the displaced workers would end up in even lower-productivity activities (services, informality) cannot be ruled out (p.2).

In such instances, therefore, labour moves in the wrong direction, away from higher productivity activities. This problem – Macmillan *et.al.* (2013: p.2) argue – is accentuated in countries with a revealed comparative advantage in primary products: more specifically, "the larger the share of natural resources in exports, the smaller the scope of productivity-enhancing structural change". The reason is that these 'enclave' sectors typically operate with high productivity and, hence, cannot absorb the surplus labour from agriculture (p.2). However, Norway's performance can be taken as a refutation of this supposedly general model that resource-intensive development inevitably leads to 'enclave' sectors and, hence, reduces the scope for broad-based productivity-enhancing change (Cappelen & Mjøset, 2013: p. 47).

Norway is a particularly illuminating example since it had a long history of resource-based development (first forestry and hydropower, and, more recently, petroleum) that "included integrating natural resource-based industries with the rest of the economy through various linkages" (p. 45). In Norway, "active industrial policies have been an important element in the creation of these linkages, and, hence, "there is really no reason why resource extraction per se cannot lead to the development of a manufacturing sector that is characterized by learning, spillovers, and the scale economies that are usually considered the core of a modern knowledge economy (p.68). It is, however, the case that a majority (but not all) of countries that relied on resource-based development fell prey of the resource-curse. What the case of Norway demonstrates, however, is that this general model, while widely prevalent, is not inevitable.

This problem of intersectoral productivity gaps coupled with disguised unemployment is, however, not only confined to outside agriculture. As, for example, Rune Skarstein (2005) argued, agricultural transformations in Tanzania after economic reforms were characterized by the dual phenomena of '*subsistence fallback*' and '*income diversification*', which he considered to be two sides of the same coin, reflecting the failure of broad-based small-scale commercial agricultural development and the prevalence of jobless growth for regular employment outside agriculture.

The point we seek to make, therefore, is that, in the absence of rapid growth of regular jobs outside agriculture, the growth of the labour force is not merely confined to agriculture only, but also swells the ranks of the informal sector. In other words, there are two sponges that absorb surplus labour: agriculture and the informal sector. Available data make it difficult to assess the extent of this labour absorption, but some indication can be gleaned by looking at the breakdown of the labour force by type of employment, as shown in table 1.

Table 1: Currently employed persons by employment status

Employment status	Share of total labour force (%)
Work on own farm or shamba	67.5
Unpaid family helper (agriculture)	7.9
Unpaid family helper (non-agriculture)	3.5
Self-employed (non-agriculture) with employees	1.8
Self-employed (non-agriculture) without employees	9.1
Paid employee	10.5

Source: ILFS 2006, Table 5.7: p. 38

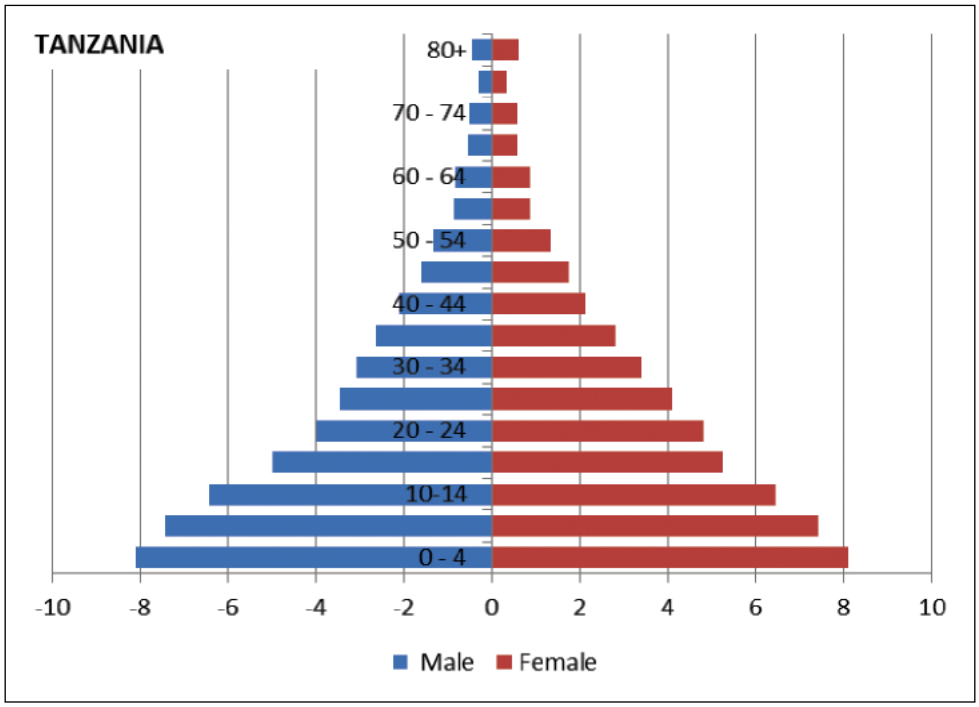
If these data are to be believed, then Tanzania should be seen as a rapidly growing economy with nearly 90% of its labour force in self-employment – a remarkable achievement. See, however, Rizzo and Wuyts (2014) about the problems involved in the definition of so-called 'self-employment'. What the table illustrates, however, is that the assumption that, in the African context, jobless growth - to be interpreted as the growth of regular jobs – prevails outside agriculture is indeed a plausible assumption to make.

Third, and finally, Timmer and Akkus (2009) made their simulations by using real GDP growth and, hence, shares of real GDP. This is acceptable inasmuch as it allows them to focus on the key point they seek to establish, but it also means that they ignore the importance of relative price changes between the production sectors of an economy, which impact on how shares in nominal GDP evolve over time. We return to this point below. But first, we shall make a short digression to deal with the importance of population growth and composition across sectors.

V. Population dynamics and economic transformation

Population dynamics play an important role in the process of economic transition, not only in terms of the rate of population growth, but also its age and sex distribution. The growth rate of the population of mainland Tanzania was 2.7% *per annum* (NBS 2013): the higher the rate of growth of population, the younger the population structure, as is shown, for example, in the case of Tanzania in Figure 2.

Figure 2: Population pyramid for mainland Tanzania



Source: NBS 2013 Population and Housing Census (authors' own graph)

The implication of this population structure is, of course, that it makes the challenge to absorb the growth of the labour force particularly acute. Population growth fuels the growth of the labour force, which requires the rapid growth in productive employment. In Tanzania, for example, at present, approximately 700,000 potential workers join the labour force each year (FYDP 2011/12 – 2015/16 (2012: p. 51).

But the process of economic transformation also accounts for the changing distribution of population across the rural/urban divide and of the labour force across different sectors.

The growth in population can be depicted by the following equation:

Population growth = birth rate – death rate + rate of net inflow from migration

The differential between the birth rate and the death rate equals the natural increase in population

resulting from the prevailing patters of fertility and mortality. But fertility and mortality regimes differ between rural and urban areas in developing countries: rural population growth is generally higher than urban population growth, as is also the case in Tanzania. Hence, it is best to consider them separately.

For convenience, assume that the rate of net inflow of migrants abroad is zero. Hence, for sake of exposition, assume that all migration is internal, mainly rural to urban.

$$\text{Population growth}_{rural} = \text{birth rate}_{rural} - \text{death rate}_{rural} + \text{rate of net inflow from migration}_{rural}$$

and,

$$\text{Population growth}_{urban} = \text{birth rate}_{urban} - \text{death rate}_{urban} + \text{rate of net inflow from migration}_{urban}$$

Most commonly,

$\text{birth rate}_{rural} > \text{birth rate}_{urban;}$;

$\text{death rate}_{rural} > \text{death rate}_{urban}$

And, furthermore,

$\text{rate of in-migration}_{rural} < 0$

$\text{rate of in-migration}_{urban} > 0$

Note, however, these rates have opposite signs, but are not the same. It is indeed the case that the outflow of people from the rural areas equals the inflow of people in the urban areas, but, when expressed as rates, they differ because the denominators differ.

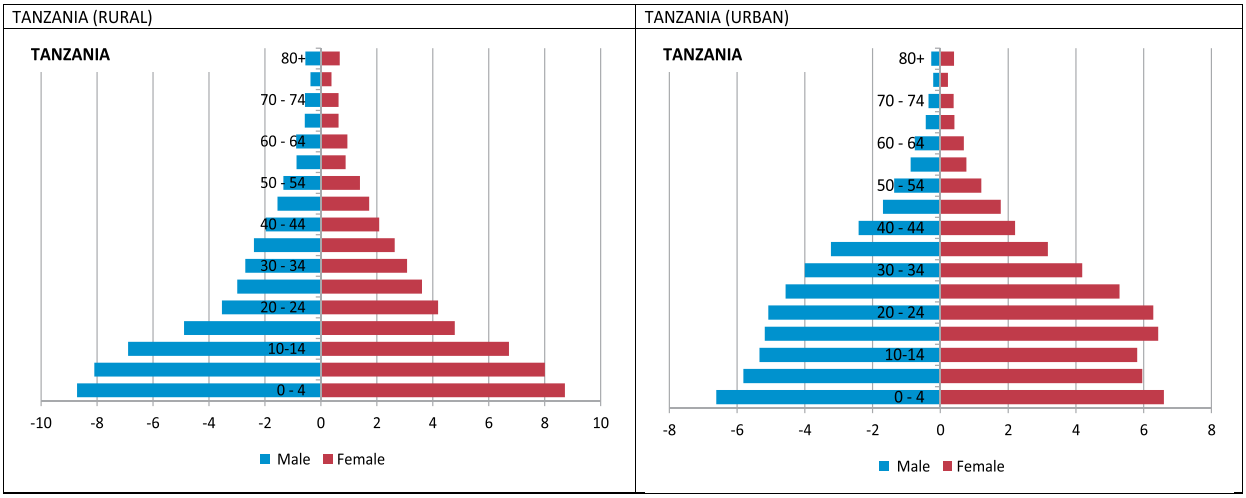
A simple numerical example may illustrate this point. Assume that the population equals 50 million, of which 40 million lives in rural areas and 10 million in urban areas. Assume, furthermore, that the rate of net outflow of people from rural areas equals 1% per annum and there is no international net migration. The following situation then pertains:

	Population	**Migrants**	**Rate of migration**
Rural	40,000,000	- 400,000	- 1%
Urban	10,000,000	400,000	+ 4%
Total	50,000,000	0	0%

What this shows is that it takes quite a bit of urban pulling (in terms of employment growth) to make a dent in rural population growth, particularly if the rate of natural increase of the population in rural areas is high.

But migration is not just a question of total numbers and rates, what matters also is that the sex and age composition of migrants is generally not the same as that of the population out of which they migrate. The pattern of outmigration from rural areas, therefore, will alter the sex ratios and the age structures of both the urban and rural areas. Figure 3, for example, shows the impact of migration on the age and sex distribution of the rural and urban populations.

Figure 3: Rural versus Urban population pyramids (mainland Tanzania)



Source: NBS 2013 Population and Housing Census (authors' own graph)

Figure 3 (in comparison with Figure 2) shows how the rural population pyramid narrows down significantly for the age cohorts that typically correspond to people of working age, while conversely, the urban pyramid shows significant bulging for these age cohorts. The blow-up in the middle of the urban pyramid is much more visible that the corresponding squeeze in the rural pyramid. The reason is that, as explained above, given that the rural population is much larger than the urban population, the flow of migrants will constitute a much smaller percentage of the rural population than that of the urban population. The sex ratios are not very different, but the sex ratio for the urban population it is nevertheless more slanted towards women within the younger age cohorts of people of working age. What this shows is that migratory flows can have important consequences for labour force dynamics – not just in terms of its growth, but also its age and sex composition across rural and urban areas, and, by implication, for the challenges this poses to absorb labour (particularly, newcomers to the labour force) in the productive sectors in the economy.

VI. Employment, wages and relative prices

Central to the analysis of this paper has been the question whether sector productivities converge or diverge over time in the process of economic transformation. In this context – as pointed out earlier – it is nominal productivities that matter here. The change in nominal productivity of a sector over time results *either* from differential rates of growth of real productivity between different sectors, *or*, from movements in relative prices between sectors. Other things being equal, for example, a rise or fall in agricultural prices relatively to prices in industry and services will lead to a rise or fall in the its nominal productivity relatively to that of the other sectors. To see this, it is helpful to look at the V-ratio – the relative productivity ratio – of an economy (Karshenas, 2001), the decomposition of which allows us to bring relative prices explicitly into the picture.

Box 2 defines the V-ratio and its decomposition between nominal and real productivities across sectors, which highlights the importance of relative prices.

Box 2 The V-ratio: the relative productivity ratio*

The V-ratio *(using nominal GDP)*

The *V-ratio* – the relative productivity ratio – is defined as follows (using the notation from Box 1):

$$V = \frac{Y_a / L_a}{Y_n / L_n} = \frac{\Pi_a}{\Pi_n} \quad (4) \qquad (V \geq 0)$$

The relation between sector shares in GDP and in the labour force to relative productivity can be derived as follows:

$$V = \frac{Y_a / L_a}{Y_n / L_n} = \frac{\frac{Y_a}{Y} / \frac{L_a}{L}}{\frac{Y_n}{Y} / \frac{L_n}{L}} = \frac{\alpha}{\eta} \quad (5)$$

Let, $Y_a = Y_a^* \cdot P_a$

$Y_n = Y_n^* \cdot P_n$

where, Y_a^* „ Y_n^* refer to real output (GDP) and P_a and P_n to prices in both sectors.

Rate of change in V-ratio

$$\dot{V} = \dot{\Pi}_a - \dot{\Pi}_n \qquad (4')$$

or, alternatively,

$$\dot{V} = \dot{\alpha} - \dot{\eta} \qquad (5')$$

The V-ratio *(using real GDP)*	**Rate of change in the V-ratio**
It follows that: $$V = \frac{\frac{Y_a^* \cdot P_a}{L_a}}{\frac{Y_n^* \cdot P_n}{L_n}} = \left(\frac{Y_a^* / L_a}{Y_n^* / L_n}\right) \cdot \frac{P_a}{P_n} = \left(\frac{\Pi_a^*}{\Pi_n^*}\right) \cdot T = \quad (6)$$ where, $Y_a^* / L_a = \Pi_a^*$ and $Y_n^* / L_n = \Pi_n^*$ refer to *real* labour productivity in agriculture and non-agriculture, respectively; and T is the relative price ratio (terms of trade) between agriculture and non-agriculture. $$V = \frac{\alpha^*}{\eta^*} \cdot T \quad (7)$$ α* and η* are the ratios of the share in *real* GDP to the share in labour force for agriculture and non-agriculture, respectively.	$$\dot{V} = \dot{\Pi}_a^* - \dot{\Pi}_n^* + \dot{T} \qquad (6')$$ or, alternatively, $$\dot{V} = \dot{\alpha} - \dot{\eta} + \dot{T} \qquad (7')$$

* *This table is based on Karshenas (2001: p. 318)*

As depicted in equation 4, the V-ratio is defined as the ratio of value-added per person in the labour force in agriculture to that in non-agriculture, *both expressed at current prices*. With the exception of city-states (which rely exclusively on imports to supply their needs for agricultural commodities), this ratio is always greater than 0, but generally less than 1, particularly in the context of developing countries, meaning that nominal productivity in agriculture tends to be well below nominal productivity in industry or services. Equation 4' shows that the V-ratio will rise if nominal labour productivity in agriculture grows at a faster rate that nominal labour productivity in non-agriculture. This is precisely what happens in the hypothetical case of Lewis-type economic transformation, discussed earlier in this paper.

Equation 5 establishes the relation between the V-ratio and sector shares in output and in the labour force. It tells us that the V-ratio can also be depicted as the ratio of the ratios of the share in GDP to the share in the labour force for agriculture (numerator) and non-agriculture (denominator). The more sector shares in GDP converge with their respective shares in the labour force, therefore, the closer the V-ratio will be to 1 (= complete convergence).

In economics, however, it is preferable to work with real rather than nominal labour productivity, particularly when looking at change over time. The bottom left panel in Box 2 establishes the relation between the V-ratio – the ratio of nominal productivities – and the corresponding ratio of real productivities, taking explicit account of the relative price ratio between both sectors. It shows that the V-ratio is equal to the ratio on real productivities – agriculture to non-agriculture – multiplied by the terms of trade between agriculture and non-agriculture. The 'terms of trade' is a relative price ratio, defined as the ratio of the price (index) of agricultural production over the price (index) of non-agricultural production. Equation 7 provides an alternative formulation of this relation, using sector shares in real GDP, rather than sector shares in nominal GDP.

Finally, equation 6' shows that a change in the V-ratio must be the result, *either*, of differential growth rates in real labour productivity (measured as real output per person in the labour force)

between agriculture and non-agriculture, *or* of the movement of relative prices between both sectors, or some combination of both these processes at work. Equation 7' restates the same point using relative changes in ratios of sector shares and in the terms of trade. Timmer and Akkus (2009) ignore this relative price effect since their simulations are solely confined to sector decomposition in terms of shares and growth rates of real GDP only.

But relative price effects between broad sectors of the economy cannot be ignored, particularly not when the focus of our analysis concerns major economic transformations. Economic transformations inevitably involve major relative price changes in the economy. In the case of Tanzania, for example, it would be difficult to make any meaningful projections of the future trajectory of the economy without taking explicit account not only of the changes in real output (and real exports) as a result of the projected large increase in the future production of gas, but also of the major relative price changes this will bring in its wake, particularly since it concerns a highly capital-intensive production sector with limited direct employment effects.

But it is not only changes in the external terms of trade that matter. Changes, in the internal terms of trade between agriculture and non-agriculture can have equally important effects on the economy. Changes in the relative price of food are particularly important here, a point that is, however, often ignored or overlooked. This point goes back to Kalecki (1954; 1963) who argued that economic growth should not go at the expense of inflation of prices of necessities – food in particular – since it will harm the poor disproportionally. Kalecki's argument had to do with how economic growth could impact adversely on the standards of living of working people, particularly the poor. One implication, as Krisnaji (1992: 96) showed in the case of India, is that: "other things remaining the same, rising cereal prices depress the demand for manufactures'. Indeed, in the context of a low-income country, the strong negative real income effect of rise in the price of basic staples will lead to adverse changes in the real distribution of incomes, particularly for the working poor, and thus, given Engel's law, depress the domestic demand for manufactured consumer goods (wage goods, in particular).

This point has important consequences for economic policy. Indeed, it implies that, as Rakshit (2009: p. 39) argued: "the behaviour of the general price level may not constitute a good indicator for policy formulation". More specifically, in the analysis of adjustment mechanisms it is the output gaps (the gap between demand and supply) in the two sectors (agriculture and non-agriculture) *separately*, and not the total output gap that matters for framing policies (*ibid)*. The reason is that economic adjustment mechanisms operate differently across both sectors: in agriculture, it is mainly prices that clear the market while in industry (and services) it is mainly quantities (i.e. changes in capacity utilization) that do so. The implication is that overall inflation can involve quite different movements in relative prices due to this differential nature in adjustment processes. The differential nature of these adjustment mechanisms in agriculture and non-agriculture entails "the possibility of the simultaneous operation of demand and supply constraints within the economy, the first in the non-agricultural sector and the second in the primary sector" (*ibid:* p. 38). This follows from the fact that price inflation in agriculture – food, in particular – can lead to decreased capacity utilization coupled with cost-push inflation in non-agriculture, primarily because the demand for food is relatively price and income inelastic (*ibid)*.

A final argument we seek to develop in this section is that relative price changes between agriculture and non-agriculture can also have a major impact on the viability of labour-intensive production outside agriculture. In other words, we argue that growth-induced inflation in the relative price

of necessities – and of food in particular – in a developing economy does not only affect the standards of living of the poor, but it also affects the viability of labour intensive production based on wage labour.

To see this point, it is useful to start with a point made by Alice Amsden (1997: p. 125) about the trade-off between lowering real wages and raising productivity. Amsden was discussing the challenges that newly industrialising countries like Korea and Taiwan faced in developing a textile industry when confronted with the competition of the then well-established Japanese textile industry (where, notwithstanding higher wages, unit labour cost was lower because labour productivity was considerably higher). She drew a distinction between two feasible alternative strategies: lowering real wages (a policy pursued under structural adjustment) or raising productivity by investment in fixed capital and what she called 'subsidized learning', which she identified as the East Asia model.

For convenience, Amsden assumed that labour is the only input since her argument focused on labour intensive production. Analytically, then, her argument is based on the premise – which she takes to be a definition – that unit labour cost equals the ratio of the real wage to labour productivity (also expressed in real terms):

Unit labour cost = real wage / labour productivity

This definition, however, is incorrect (Wuyts, 2001: pp. 419-424). Indeed, unit labour cost equals the share of the nominal wage in nominal output produced by the worker, which does not equal the ratio of the real wage to labour productivity because these two latter measures do not have the same deflator. The *real* wage is a measure of standard of living and is obtained by deflating the nominal wage by the index of prices of wage goods (= consumer price index of basic necessities). In contrast, real productivity is the nominal output per worker deflated by the price of the output. A relative price term is, therefore, omitted from this definition.

What Amsden overlooks is the distinction between the two sides of wages: wages as a source of income and wages as a cost of production. To the worker what matters most is the standard of living that his or her wage can afford. A rise in the real wage implies an increase in the standard of living a worker can afford; a fall in the real wage decreases the standard of living. Given the nominal wage, therefore, the real wage depends on the prices of necessities. To the employer, in contrast, wages are a cost of production paid out of the value added produced. The relevant measure here is the product wage which is obtained by deflating the nominal wage by the price of output. It represents the quantity of output that a worker could buy with his or her own wage. Given the level of labour productivity, an increase in the product wage squeezes profits; conversely, a fall in the product wage leads to an increase in profits.

Consequently, the correct definition of unit labour cost is that it equals the ratio of the product wage (and not the real wage) to labour productivity:

Unit labour cost = product wage / labour productivity

Or, alternatively,

Unit labour cost = (real wage / labour productivity) x (consumer price index / output price)

Amsden did not take account of this relative price term when using the real wage instead. More recently, J.A. Ocampo, C. Rada and L. Taylor (2009: pp. 130-136) employ the same definition of unit labour cost to make a similar point as Amsden did, and, hence, make the same error. But this relative price term cannot be ignored because the real wage and the product wage do not necessarily move in unison. Indeed, if the prices of necessities, food in particular, rise faster than the output price, it follows that, for the same nominal wage, the evolution of real wages will diverge from that of the product wage as a result of the inflation differential between both sets of prices (Wuyts, 2001; Bhaduri, 2006: pp. 90-91). Amsden ignores this possibility completely and thus overlooks that inflation in the price of necessities relative to other prices can erode the viability of the growth of labour intensive production. This point is nothing new. In fact, it goes back to Marx who never failed to distinguish clearly between the value of labour power as a commodity, on the one hand, and the value produced by labour power in the process of production, on the other. The point made here is just a variation on this theme. Box 3, based on Wuyts (2001) gives a graphical representation of the argument presented above.

*Box 3: Real wage, product wage and the cost of living **

Let Y = value of output of commodity Y, W = the nominal wage bill, L = labour employed, P_c = the consumer price index (for wage goods), and P_y = price of the commodity Y. Furthermore, define $p_c = P_c / P_y$: the relative price of consumer goods to the price of output. Furthermore, define the real wage, product wage and labour input per unit of real output, and unit wage costs as follows:

Real wage rate = $w_r = \frac{W/L}{P_c}$

Product wage = $w_y = \frac{W/L}{P_y}$

Unit wage costs = $\frac{W}{Y}$

Labour input per unit of real output = $l_y = \frac{L}{Y/P_y}$ (the inverse a real labour productivity)

From which it follows that:

$$\frac{W}{Y} = w_y \cdot l_y \quad (8)$$

and, hence,

$$w_y = \frac{W/L}{l_y} \quad (8')$$

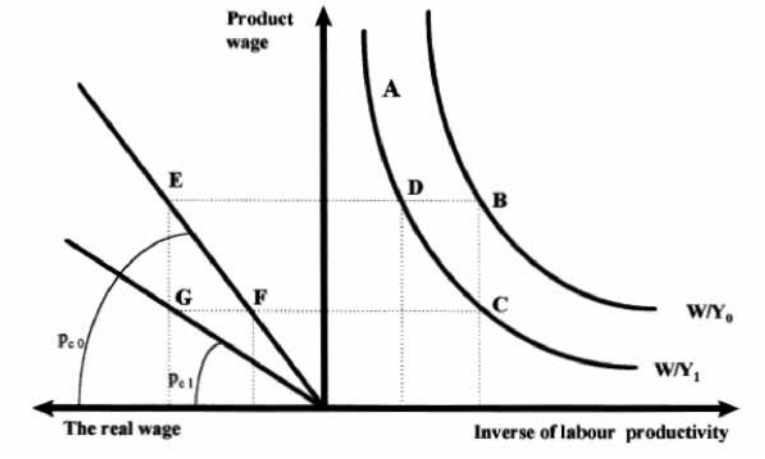
Furthermore, note that:

$$w_y = w_r \cdot p_c \quad (9)$$

Substituting equation 9 into equation 8, therefore, yields an alternative expression of unit wage costs, which explicitly features the relative price ratio as one of its multiplicative factors:

$$\frac{W}{Y} = w_r \cdot l_y \cdot p_c \quad (10)$$

These derivations allow us to give a graphical representation of the interrelations between the (inverse of) labour productivity and the product wage, the product wage and the real wage.

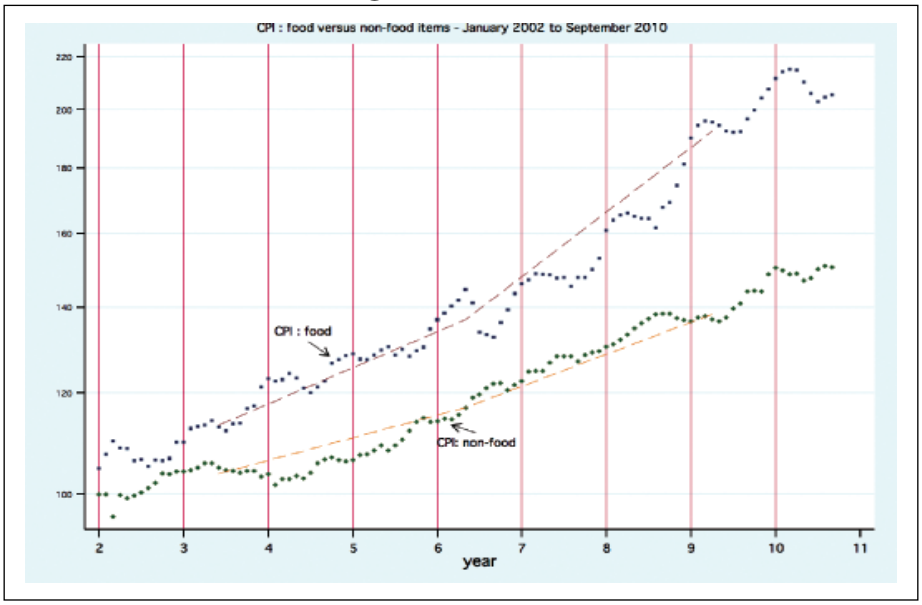


The panel on the left depict equation 9: the relation between the real wage (on the horizontal axis) and the product wage (on the vertical axis. The slopes of the lines give the ratio of the relative price of consumer goods to the output price of commodity Y. The panel on the right depicts equation 8': the relation between the product wage and the inverse of labour productivity, holding unit wage costs constant. Along each curve, therefore, unit wage costs are held constant.

Starting in point B, wage costs can be reduced through three distinct mechanisms: (1) by raising labour productivity (from B to D); (2) by lowering real wages (from E to F, and, hence, from B to C); and (3) by lowering the cost of wage goods, leaving real wages constant (from E to G, and, hence, from B to C).

In the context of economic transformation, changes in relative prices cannot be ignored. Consider, for example, what happens if the price of foodstuff rises much faster than other prices in the economy, as was the case in Tanzania in recent years, as shown in Figure 4, when food prices towards the end of the decade rose at 12% per annum, on average, while non-food prices rose at 5.5% per annum.

Figure 4: CPI for food and non-food items: January 2002 to September 2010 (logarithmic scale)



Source: http://www.nbs.go.tz/index.php?option=com_phocadownload&view=category&id=138:summary-cpi&Itemid=106

If nominal wages adjust upwards to keep the real wage constant, the product wage will rise and, hence, unit wage cost will rise as well. If this leads to a squeeze on profits, particularly in labour intensive production, employment may fall or its growth will be stunted. Alternatively, if the nominal wage does not adjust to the rising cost of wage goods, the product wage and unit wage costs remain the same, but the real wage will fall. Adjustment takes place at the expense of falling real wages, which may thus lead to an increase in the incidence of poverty. What often actually happens is a combination of both these processes at work, with real wages (partly) protected in the formal sector (restraining its potential for employment expansion) while falling in the informal sector, which then becomes a dumping ground for the working poor.

The implication of this point is that the cost of living in general, and the price of food in particular, matters a great deal, not only in terms of its effects on poverty, but also in terms of its effect of the viability of labour intensive production. In the plenary session of the Repoa 17th Annual Research Workshop 2012, for example, Professor Li Xiaoyun put this point clearly when he argued that: "Tanzania has an abundance of natural resources, but it does not have 'cheap labour'". The point is not that real wages are high in Tanzania, but rather that product wages tend to be high (relatively to the price of output) given the relatively high cost of living in Tanzania.

VII. Economic transformation in Tanzania: from vicious to virtuous circle?

This paper took a closer look at the concept of economic transformation as commonly defined in economic literature. This concluding section seeks to draw some lessons from this analysis in the light of the current policy discussions on present-day challenges of economic transformation in Tanzania.

An important conclusion from our analysis is that economic growth matters, not just its *rate of expansion*, but also its direction of transformation and change. But the key to successful transformation lies in the patterns of growth it engenders: whether or not growth goes together with the rapid expansion of (wage) employment outside agriculture and with the rise of agricultural productivity, thus propelling a process of gradual convergence of sector productivities within the economy.

Economic transformation is nothing new in Tanzania. Economies transform in the process of growth (and crisis), sometimes slowly, sometimes rapidly, but whether such transformations are successful or not is a different matter. Wuyts and Kilama (2014), for example, present some stylised facts about the changing nature of patterns of accumulation and economic transformation in Tanzania since the economic reforms of the 1980s. What their analysis shows is that, while Tanzania was successful in raising the rate of growth of the economy from the late 1990s onwards, coupled with an increased share of domestic savings, investment, and exports in GDP, this growth process did not engender, however, a process of successful transformation. Instead, while the share of agriculture in GDP fell consistently, its share in employment remained consistently high. And, similarly, the growth in wage employment outside agriculture remained stunted, while the ranks of so-called 'self-employment' in the informal sector swelled in size.

The implication of this point is that the present-day challenge of economic transformation does not start with a clean slate. Instead, the real challenge lies in turning this vicious circle of economic transformation into a virtuous one. In this respect, it is not sufficient to project a future scenario of economic transformation in Tanzania merely on the basis of a blueprint of the typical middle-income country, but it also requires drawing lessons from the shortcomings of past processes of transformation in Tanzania.

For example, Mpango (2013) postulated that "Increased productivity in agriculture will increase production and generate excess labour supply, both fuelling agro-processing and leading to a sharp expansion in the manufacturing sector", and, that "increased activities in the downstream nodes of value chains will create employment and growth in the industrial sector". Both these statements, however, contain strong assumptions, which warrant further investigation in the light of Tanzania's past experiences. What if causality works the other way around: that is, that labour productivity in agriculture remains persistently low because agriculture acts as a refuge sector of excess labour due to what Rune Skarstein (2005) referred to as the dual phenomena of '*subsistence fallback*' and '*income diversification*' within agriculture. Moreover, as Kilama (2013) showed in her comparative analysis of cashew production in Tanzania and Vietnam, while Vietnam succeeded through effective industrial policies to link cashew production with downstream agro-

processing, Tanzania cashew production stagnated while nearly exclusively relying on the export of raw cashew. Raising productivity through selective interventions in agriculture, therefore, may accentuate rather than alleviate the problem of excess labour without effective growth of wage employment outside agriculture.

If the available labour force data are to be believed, Tanzania witnessed a high rate of growth with a labour force, 90% of which is self-employed, either working on own family farms, or within the informal sector. The near identification of the informal sector with self-employment, however, hides the fact that this sector lumps together quite diverging forms of activities, some of which are functioning small- and medium enterprises relying on various forms of wage labour, while others concern the coping strategies of the disguised unemployed. This poses the dual task of raising productivity and developing productive capacities in the viable or potentially viable enterprises within informal production, on the one hand, and the gradual absorption of the excess labour through the expansion of wage labour outside agriculture, on the other.

Looking at the East Asia experience, a key feature of these economies was that effective economic transformation invariably went hand in hand with rising standards in education (basic education as well as targeted higher level technical education), with the development of skills through learning by doing, and, more broadly, with the development of productive capacities at enterprise level and in public employment (Lee, 2013; Thoburn; 2013). In contrast, jobless growth constitutes a major impediment to raising standards in education, in skill formation and in capacity building. This might explain why one of the most peculiar adverse features of Tanzania's socioeconomic development in recent years is that high economic growth went together with falling standards of education. Numbers enrolled in education increased, but the quality of education fell dramatically (Sumra & Katabaro, 2014). Together with the widespread prevalence of disguised unemployment within the informal sector as well as within agriculture, this is probably one of the most devastating consequences of jobless growth.

Finally, the analysis in this paper showed that relative prices of basic necessities (wage goods) – and the relative price of food, in particular – matter a great deal for the viability of the rapid expansion of labour-intensive production outside agriculture. This relation is often overlooked, particularly when economic policies are slanted in favour of export production. Raising productivity in the domestic production of wage goods, however, is an important means to avoid that the pursuit of greater competitiveness of labour-intensive production (including, for export production) does not go at the expense of declining or stagnating real wages.

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