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How Solid Is Economic Growth in the East African Community?

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African Department

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Abstract

Is rapid economic growth experienced by the East African Community during the past decade built on solid foundations? To gain some clues, we use a variety of newly-collected and existing data sources to analyze the structural transformation of output and exports, as well as indicators of their quality and sophistication. The move from agriculture to a wide range of other sectors—bodes well for continued growth, as do gradual improvements in quality. Yet, no clear winners on the production side seem to have emerged, to embed a durable comparative advantage in international markets. These observations may instill a note of caution against projecting rapid growth into the distant future.

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I. INTRODUCTION

The East African Community (EAC) countries' economic growth performance during the past decade has been impressive:¹ at 6.2 percent, the EAC's (unweighted) average growth rate in 2004–13 is in the top one-fifth of the distribution of 10-year growth rate episodes experienced by all countries worldwide since 1960. Such performance is even more remarkable taking into account that the past decade encompasses the global economic and financial crisis that began in 2007. Will this prove to be an isolated episode, with growth returning to lower levels in the years ahead, or is strong growth going to persist?

Prediction is very difficult, especially if it's about the future, as physicist Nils Bohr famously remarked. The economics profession's ability to forecast economic growth beyond the next year or so is particularly weak; and it is abysmal at forecasting turning points in the economic cycle (Loungani and Juhn, 2012). This said, informed guesses about medium term economic growth are simply indispensable to policymaking. For example, economic growth is perhaps the most important determinant of whether a country's fiscal policy is sustainable, and growth slowdowns have caused many public debt crises in the past (Easterly, 1991). Thus, while it would be unrealistic to expect to come to firm conclusions regarding the likely persistence of strong growth in the EAC, it is necessary to attempt to glean some clues from the nature of the recent growth in order to inform one's views on future growth in the region.

Previous work (McAuliffe, Saxena, and Yabara, 2012) has gauged the sustainability of the EAC's growth "acceleration" using an econometric model applied to total GDP growth for a panel of countries, finding that prospects for sustained growth in the region are good if macroeconomic stability is maintained, and further progress is made in deepening the financial sectors and improving the business climate, infrastructure, and human capital.

The present paper takes a complementary approach by looking at more disaggregated information on the sources of growth in the past in order to help inform judgments about the sustainability of growth in the future. In particular, we analyze changes in the composition of output and exports by economic sector, and various indicators of improvements in the quality of goods produced and exported by countries in the region. The extent to which developments in the EAC countries seem to reflect a move toward more modern economic processes and outputs could be interpreted as an indicator of whether growth is likely to be longer lasting. While we believe the information reported in this paper provides some clues as to the future evolution of output in the region, many other factors likely to affect future growth are not analyzed here. For example, the analysis presented in this paper relies on past growth and thus does not take into account the implications of possible exploitation of recent natural resource finds in the region.

¹ The East African Community member countries are Burundi, Kenya, Rwanda, Tanzania, and Uganda. For a general introduction to the EAC and its regional integration process, see Davoodi, ed. (2012).

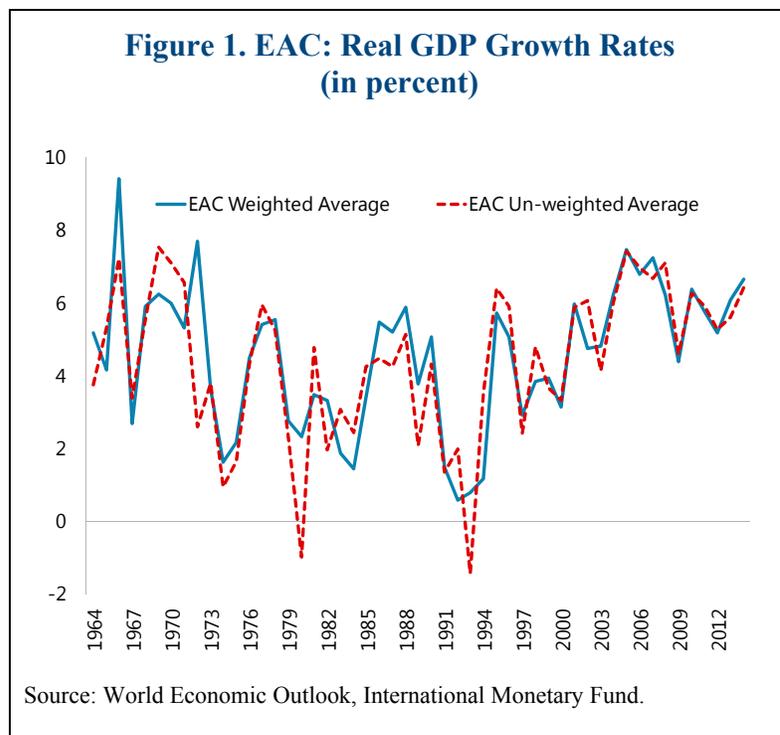
The remainder of the paper is structured as follows. In the next section, to motivate our analysis, we validate the information from official statistics on GDP by showing that other indicators corroborate the evidence of rapid economic growth; and we document that economic growth at a pace experienced in the EAC over the last decade is a relatively rare event. In Section III, we report our main findings obtained by analyzing a host of data sources on the detailed composition of output and exports: we document the structural transformation of the economies, and the improving diversification and quality of their output and exports. Section IV distills the main patterns identified and concludes.

II. OVERALL GROWTH PERFORMANCE AND REVERSION TO THE MEAN

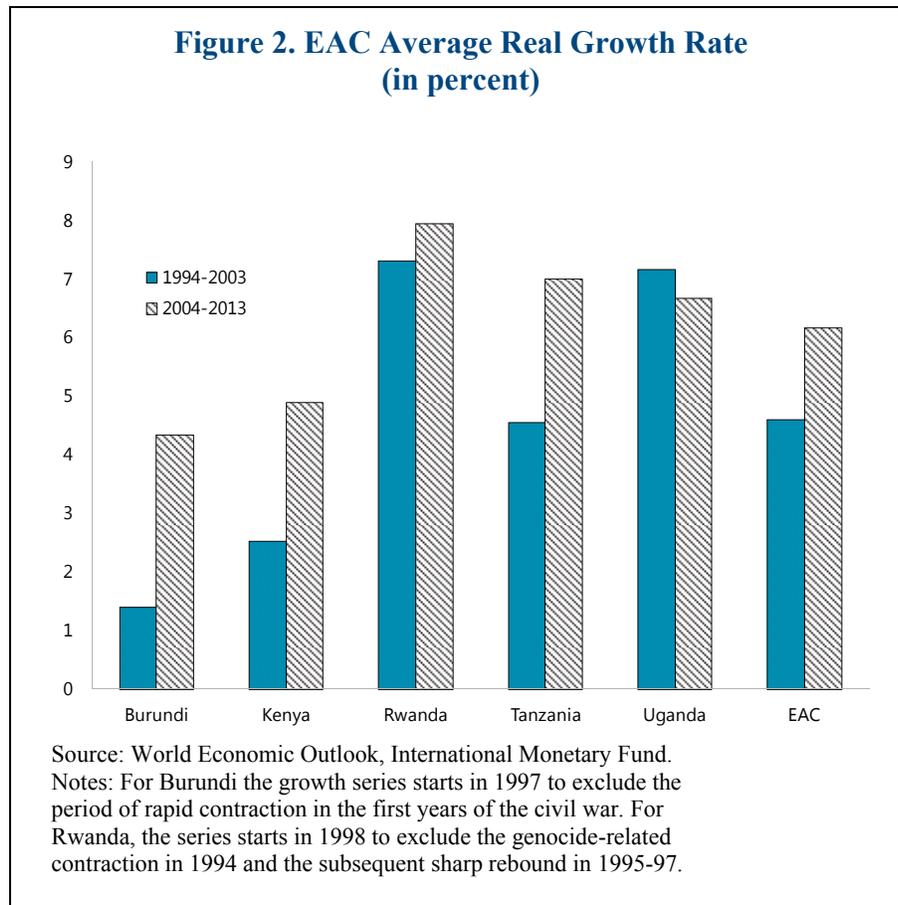
In view of potential concerns about the quality of the GDP data, we present corroborating evidence that the growth observed in the EAC during the past decade was indeed strong. We then calculate the likelihood that such growth would persist, based on past empirical regularities using overall GDP growth data from a worldwide sample.

Economic growth during the past decade was strong and corroborated by other indicators

During the past decade and indeed since the year 2000, economic growth in the EAC (average for the five countries) was consistently strong, and considerably above that experienced in previous decades (Figure 1).

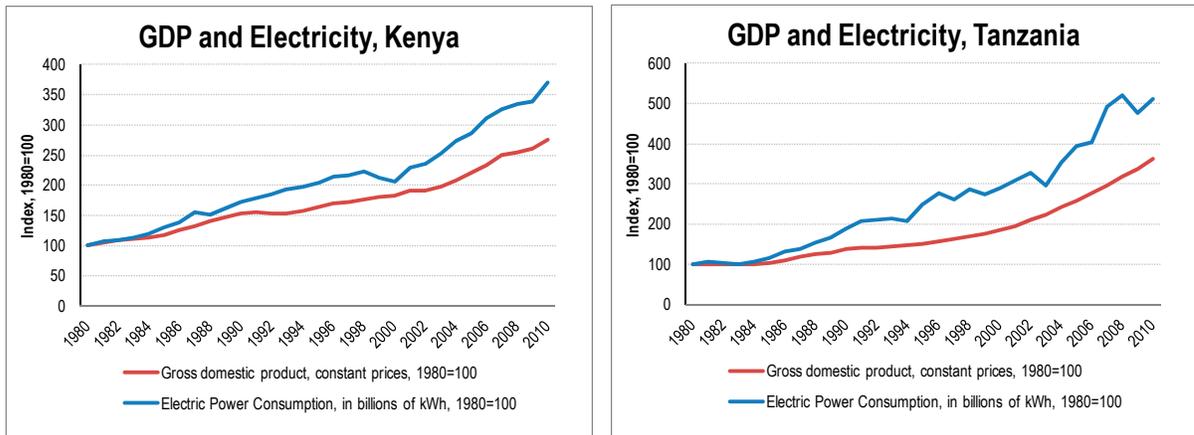


Indeed, all five EAC member countries displayed average real growth of 4 percent or higher, in most cases substantially above that of the previous decade (Figure 2).



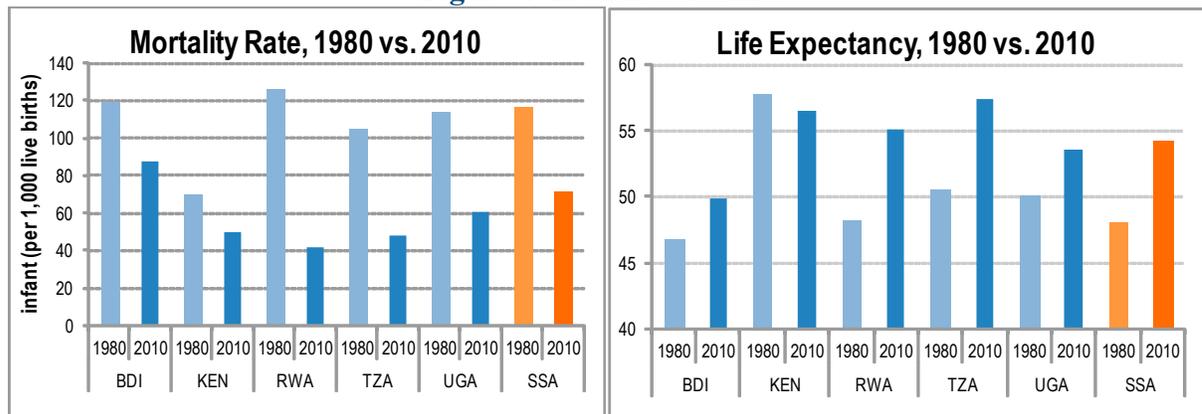
To validate the information from official statistics on output growth, it is helpful to consider developments in the correlates of production, consumption, and economic development, such as consumption of electricity, the mortality rate, credit, and fiscal revenues (Easterly, 1999). On the whole, these corroborate the overall picture of healthy economic growth. For example, electricity consumption (available as a long time series for Kenya and Tanzania) is estimated to have grown rapidly over the past decades, with an acceleration during the past ten years (Figure 3). Health outcomes such as infant mortality rates and life expectancy improved considerably in most countries in the region (Figure 4). And both credit and revenues expressed in domestic currency at constant prices rose rapidly (Figure 5).

Figure 3. Electricity Consumption



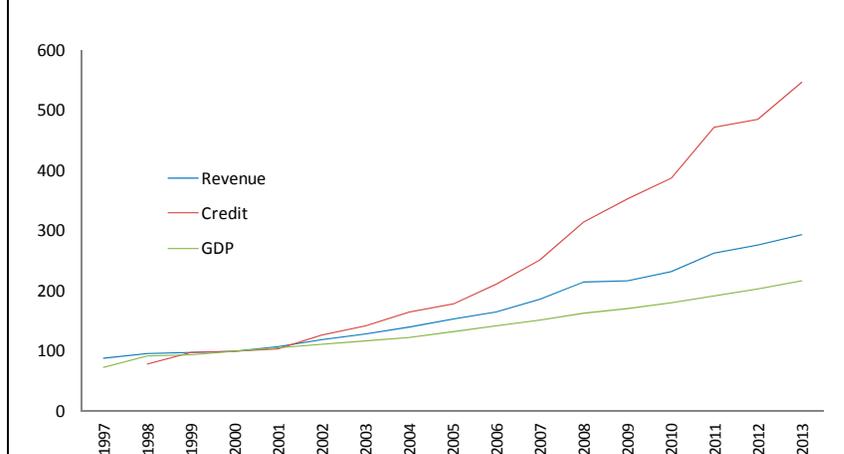
Sources: World Economic Outlook, International Monetary Fund; World Development Indicators, World Bank.

Figure 4. Health Outcomes



Source: World Development Indicators, World Bank.

Figure 5. EAC: Fiscal Revenues and Private Sector Credit (Year 2000=100)



Sources: Country authorities and IMF staff calculations.

Notes: The chart reports fiscal revenues, credit to the private sector, and GDP, all in domestic currency in constant prices. Each variable is set to 100 in the year 2000.

Economic growth averaging more than 6 percent over a decade is a rare event

The EAC countries' economic growth performance over the past decade is a relatively rare event by historical standards, when considering a large sample of growth episodes worldwide. Consider the frequency distribution of all 10-year growth rate episodes experienced by all countries worldwide since 1950: this has a mean of 3.8 percent and a standard deviation of 2.6 percent (Figure 6, blue line). Thus, at 6.2 percent, the (unweighted) average real GDP growth rate experienced by the EAC countries in 2004–13 is within the top one-fifth percent of the worldwide distribution of all decade-long growth episodes since 1950.

Based on purely historical statistical patterns, sustaining such strong performance for the next decade would be a challenge. Indeed, previous studies have shown that the correlation of a given country's growth rate in a given decade with the next is low, ranging between 0.1–0.3 (Easterly and others, 1993; Pritchett and Summers, 2013; Ho and Mauro, 2014). In that vein, it is possible to simulate the distribution of economic growth episodes over the next decade for a country or region that experienced 6.2 percent growth over the past decade, as follows.

Estimating a regression of decade-long economic growth on the previous decade's economic growth for a panel of 162 countries over 1960–2010 (with decade fixed effects ϑ_t to control for fluctuations in average world growth):²

$$g_{i,t,t+10} = \mu + \beta * g_{i,t-10,t} + \vartheta_t + \varepsilon_{it}, \quad \text{where } \varepsilon \sim N(0, \sigma^2)$$

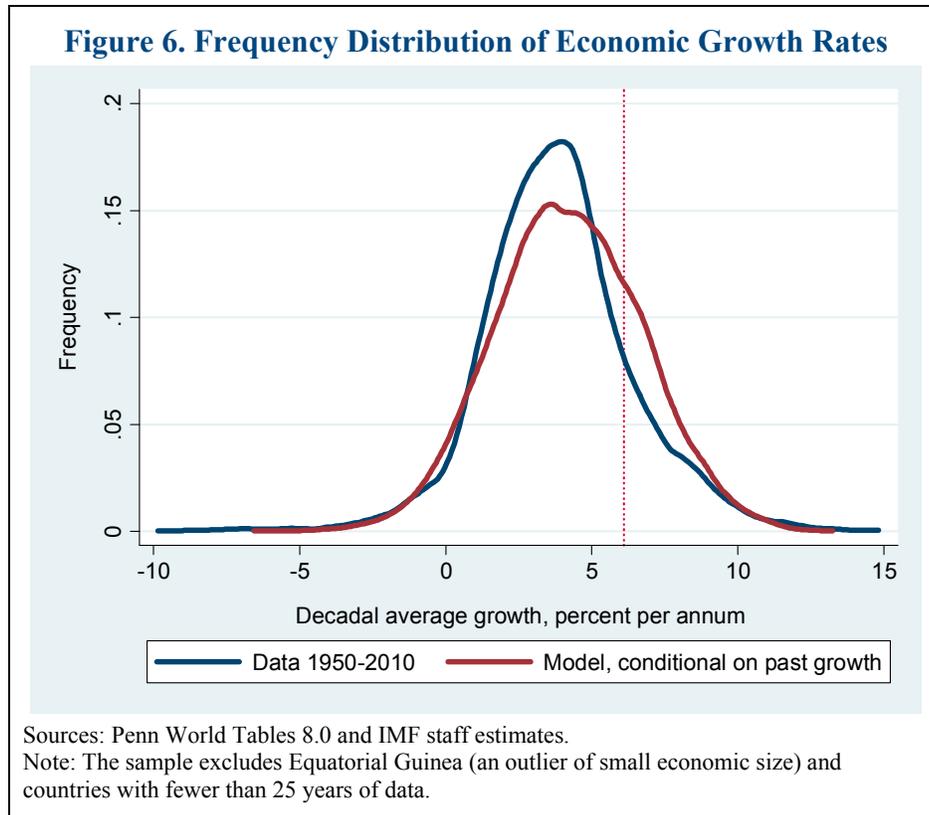
The regression yields $\beta = 0.23$, $\mu = 2.8$, and $\sigma = 2.54$.³ Using the estimated coefficients and simulating the distribution of growth rates over the decade ahead by plugging in the past decade's average growth rate for the EAC region, $g_{2002-2012} = 6.2$, one obtains the red line in Figure 6:

$$g_{2014-2023} = 2.8 + 0.23 * g_{2004-2013} + \varepsilon = 4.2 + \varepsilon, \quad \text{where } \varepsilon \sim N(0, 2.54^2)$$

In that case, an average growth rate of 6.2 percent would be in the top 23 percent of the distribution. In other words, taking into account the estimated historical patterns in the extent to which countries' growth performance correlates across decades, there is a little less than a one in four chance of another decade of growth above 6 percent for the EAC. In the remainder of the paper, we look at various aspects of the composition of past growth to glean clues about whether it is likely to be long lasting.

² Data on real GDP growth from the Penn World Table version 8.0.

³ The standard deviation is obtained from the RMSE of the above regression.



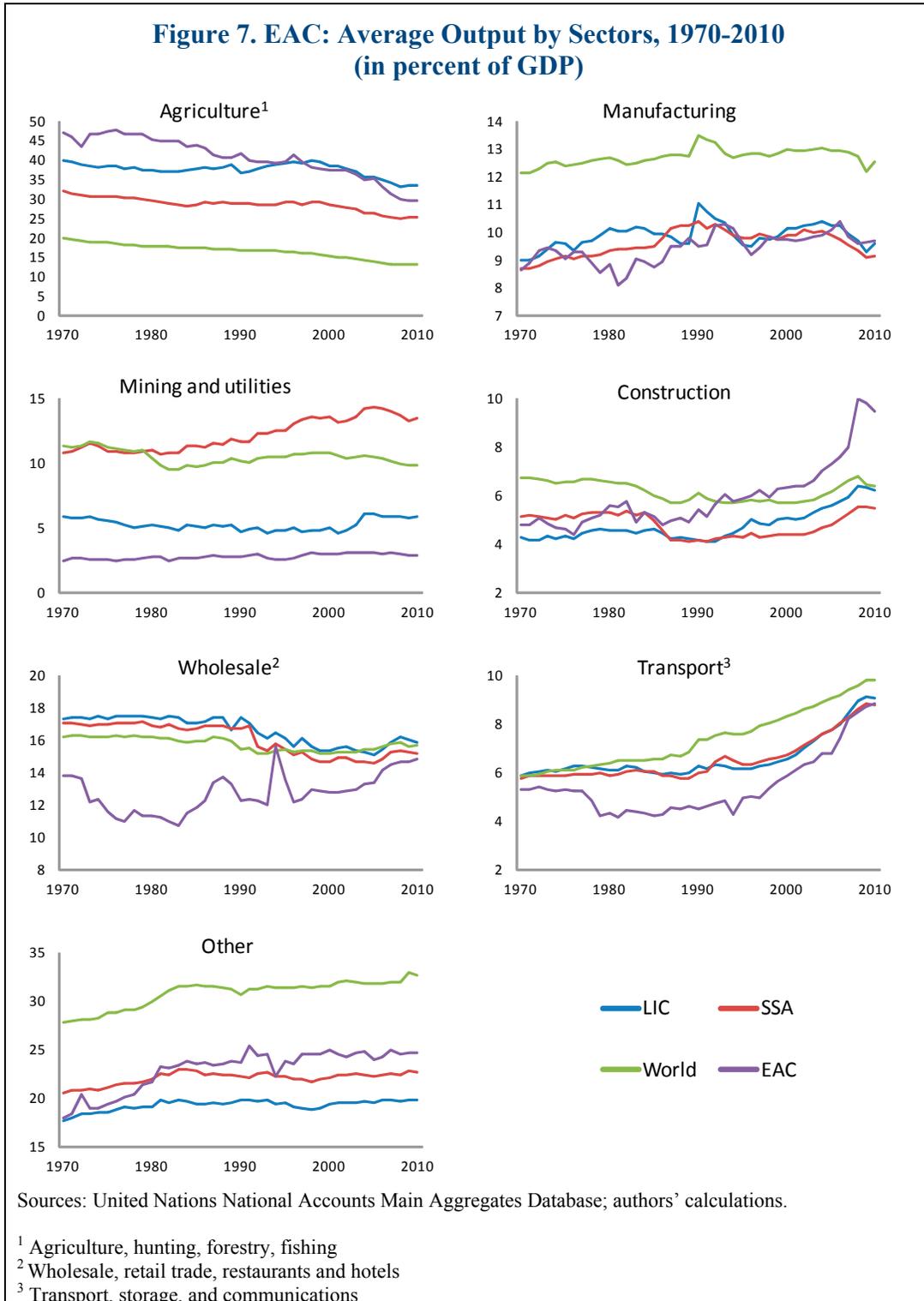
III. STRUCTURAL TRANSFORMATION, DIVERSIFICATION, AND RISING SOPHISTICATION

To analyze the nature of past economic growth performance, in this section, we track the structural transformation and increasing diversification of output and exports by reporting developments in their composition by sector; we then show the evolution of various indicators of the sophistication and quality of output and exports.

Declining trend in agriculture's output share is reflected in gains by several other sectors

Considering the composition of output since 1970, drawing on United Nations data for seven broad economic sectors (agriculture; manufacturing; construction; wholesale trade; transportation; mining and utilities; and other), a trend decline in the share of agriculture is apparent in the EAC: such share declined from almost one half of output (unweighted average) in 1970 to about a third in 2010. As in many other instances of structural transformation, a decline in the share of agriculture implies gains in productivity, other things equal, given that agriculture tends to have lower value-added than the secondary and tertiary sectors. The decline in the share of agriculture in the EAC was steeper than in the rest of Sub-Saharan Africa or in low-income countries worldwide (Figure 7). The most pronounced gains in shares were observed in transportation and construction, with a more visible acceleration since the 1990s in the EAC than in comparator groups; the increase in the share

of manufacturing is limited, and less pronounced than in other groups; the increase in mining, a relatively small sector in the EAC, is barely visible.⁴

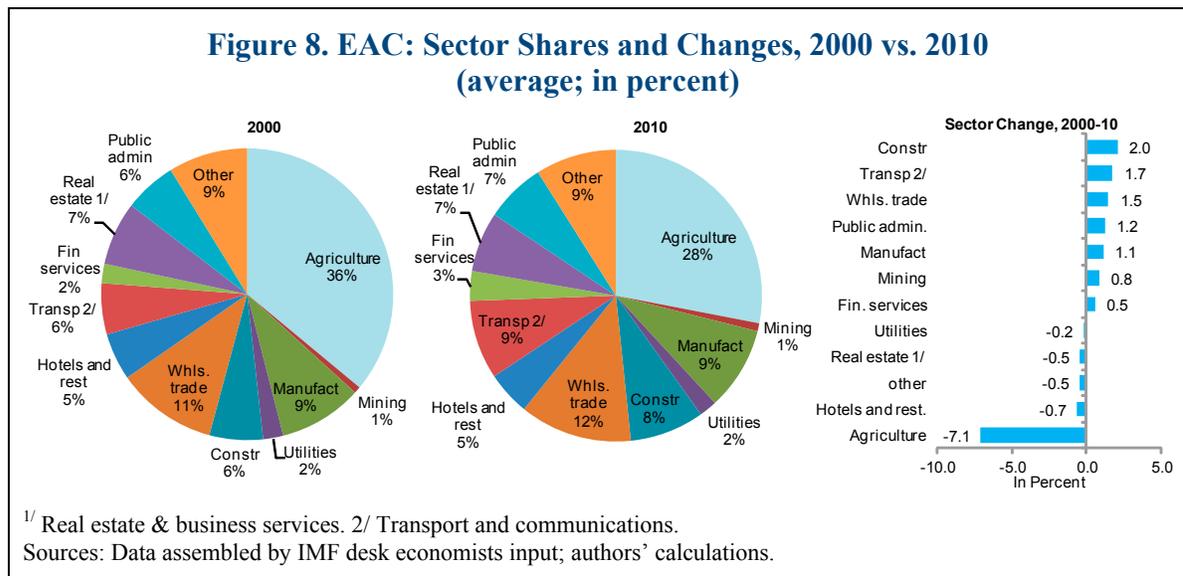


⁴ Thus, although some commentators have argued that natural resources have been a critical factor underlying strong growth in recent years in at least parts of Africa, this has clearly not been the case for the EAC.

Considering the period since 2000—characterized by rapid growth and accelerated structural transformation—in greater detail, we draw on a more refined sectoral decomposition of output from a database assembled by IMF staff.⁵ The data cover 2000–11 for 12 sectors (agriculture; mining; manufacturing; utilities; construction; wholesale trade; hotels and restaurants; transport and communications; financial services; real estate and business services; public administration; and other). Figure 8 compares 2000 and 2011 for the EAC unweighted average. Similar charts for individual countries are reported in Appendix Figure A1.

The decline in the share of agriculture was mirrored by relatively evenly distributed gains in a broad range of other sectors. The biggest winners were construction, transport and communications, wholesale trade, and public administration. The shares of manufacturing, mining and utilities displayed smaller changes.

Analyzing the composition of output by sector over the past decade shows that economic growth has been generally broad based: all sectors experienced positive growth rates on average during the period, ranging from 3.2 percent in agriculture to 10.8 percent in transport and communications. The share of agriculture in total output declined from 36 percent in the year 2000 to 28 percent in 2010. This decline is mirrored by small gains in shares by several other sectors—especially subcomponents of the service sector (Figure 8).

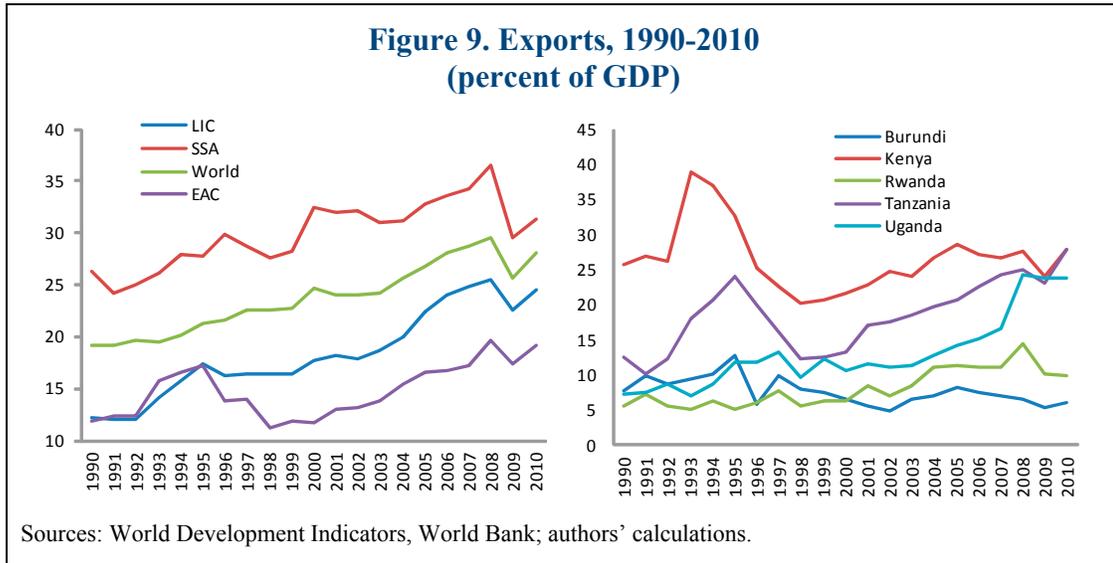


Exports are rising as a share of GDP and are becoming more geographically diversified

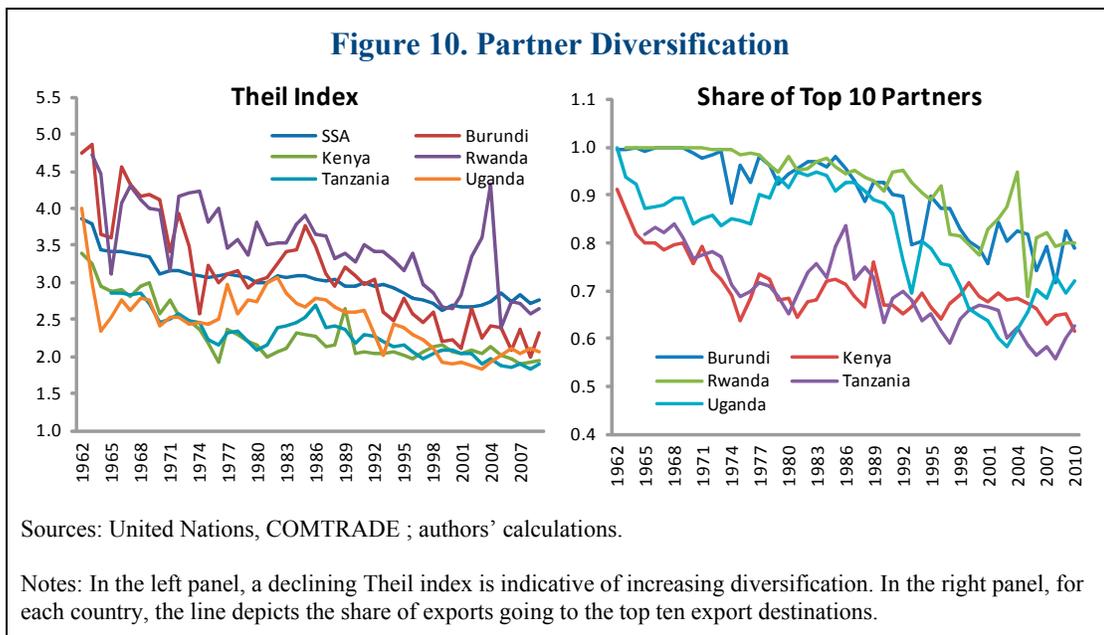
Evidence on the increasing role of exports in GDP in the EAC is similar to the trend observed elsewhere and is consistent with the economies becoming more internationally integrated and thus more modern in terms of their production processes and outputs. Exports as a share of GDP in the EAC rose from 12 percent in 1990 to 19 percent in 2010, but the

⁵ An effort coordinated by N. Gigineishvili. See Data Appendix for sources and methodology.

increase was particularly pronounced in Tanzania and Uganda, and to a lesser extent in Kenya and Rwanda.

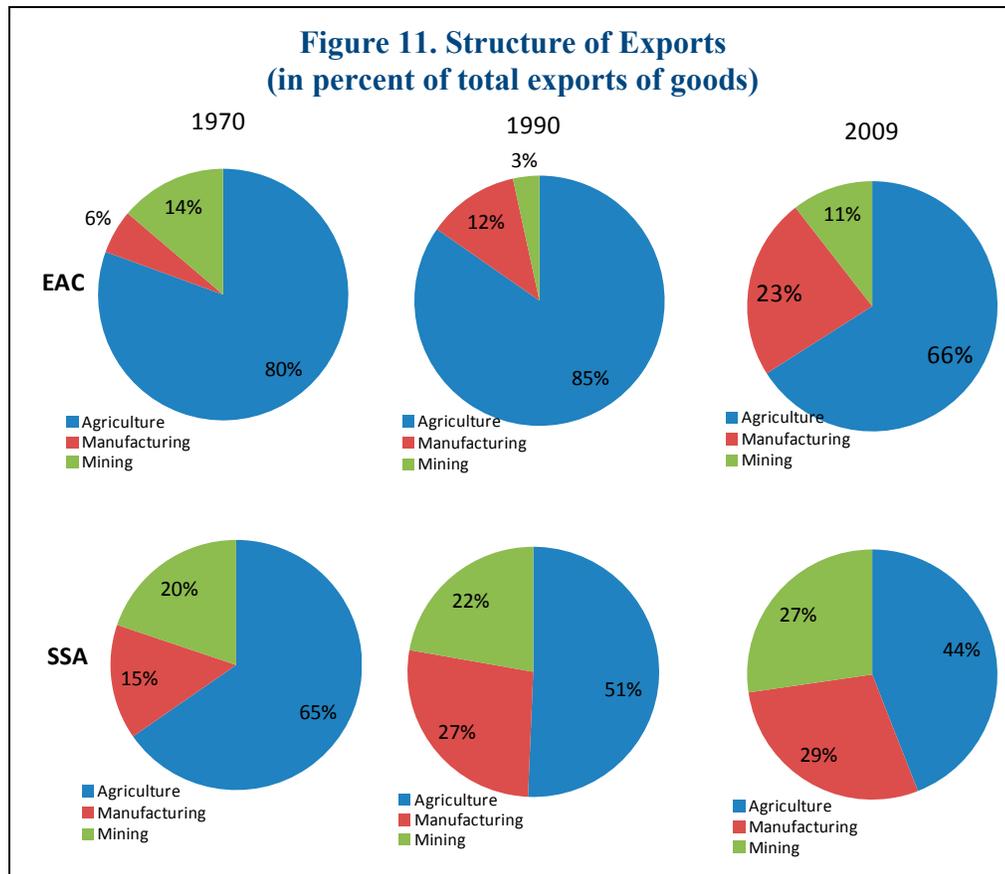


Exports have also become more diversified by geographic destination, as evidenced by the declining Theil index (a widely used measure of diversification—the lower the index, the higher diversification; for the definition and method of calculation, see Appendix) computed with the shares of trade partner countries in total exports and the declining share of the top ten destination countries in total exports (Figure 10).

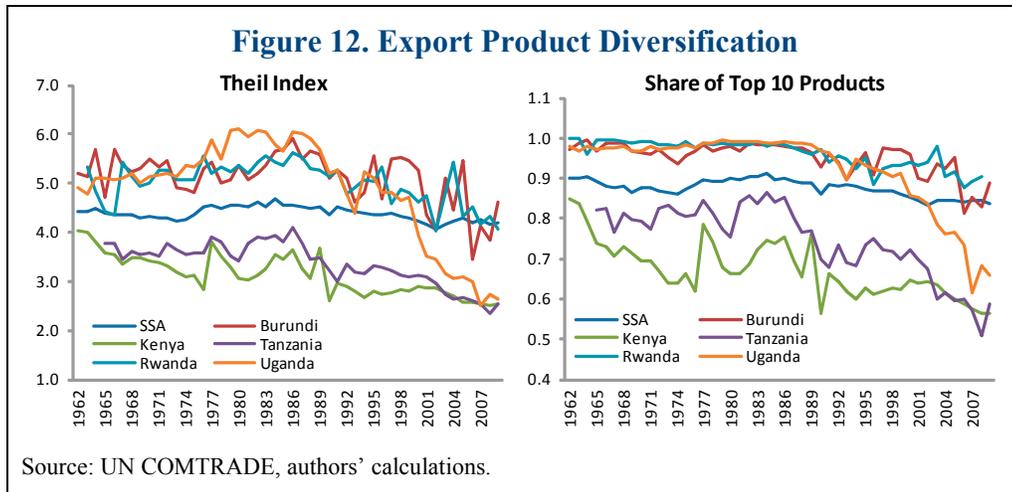


Exports Products Have Become More Diversified

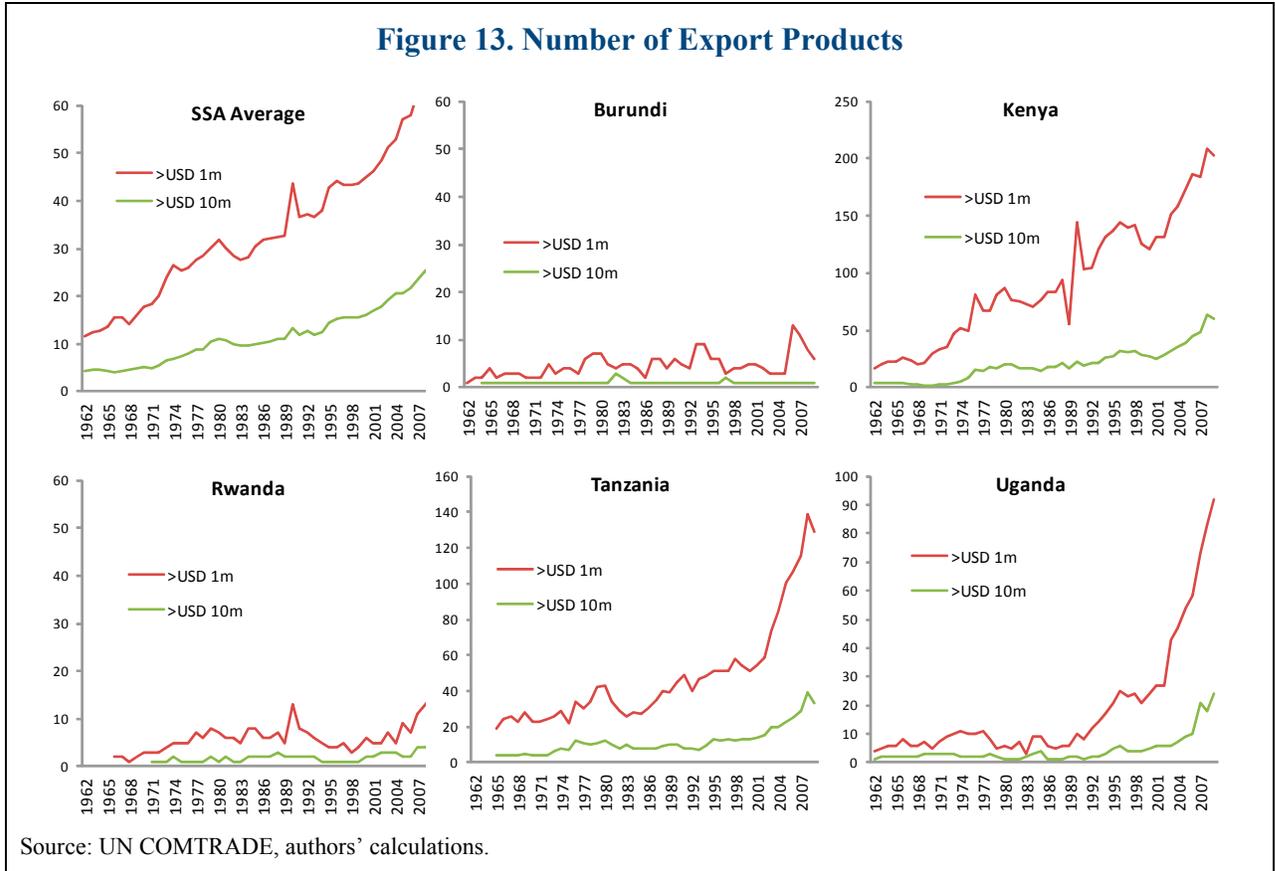
Reflecting rapid growth and structural transformation of the EAC economies, exports have also expanded in a wide range of goods and services outside the traditional agricultural sector. The share of agriculture in exports fell from 4/5 of all exports in the 1970s-90s to 2/3 in 2010, with mirroring gains in manufacturing. (Figure 11 for the EAC unweighted average; Appendix Figure A2 provides individual country information)



Considering data since the early 1960s, exported products have become more diversified in all EAC countries at a more rapid pace than for the Sub-Saharan average, with a steeper trend since the early 1990s. The Theil index shows that by mid-2000s export products were at least as diversified in each EAC country as in the average country in Sub-Saharan Africa, with Kenya and Tanzania being substantially ahead of their peers (Figure 12). The results are confirmed using alternative measures of diversification, such as the share of the top ten products in total exports of goods.

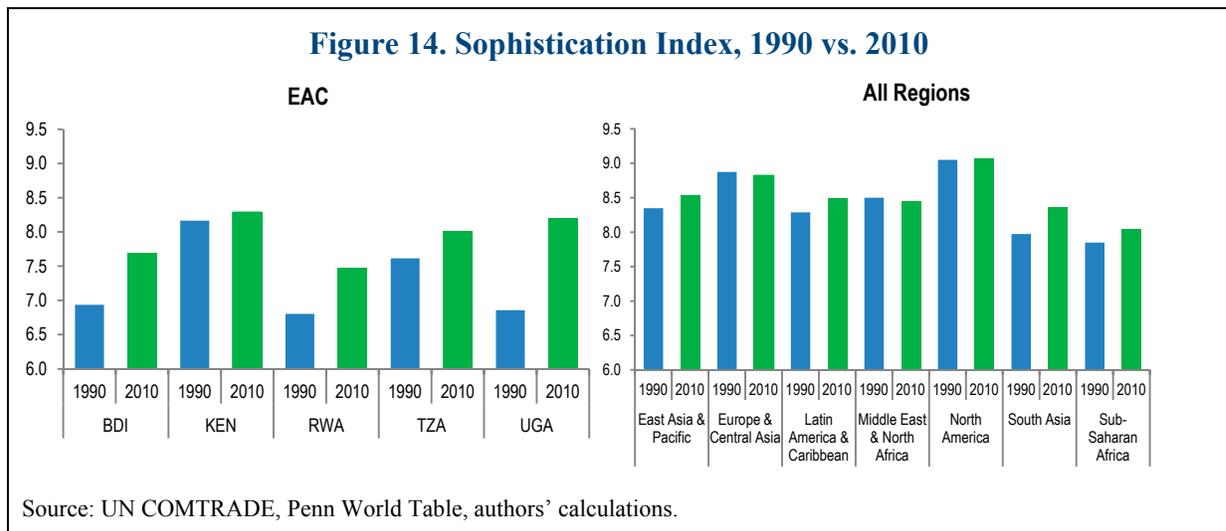


The sheer number of export products has also increased substantially, especially since the early 1990s, and especially in manufacturing: the number of distinct products exported by Uganda, for example, rose from about one hundred in 1980 to more than five hundred in 2010, with more than three hundred products in manufacturing. To minimize potential bias from a large number of small exports, the same analysis has been undertaken for the distinct products for which export revenues exceed US\$1 million (or US\$10 million). As shown in Figure 13, the results confirm that that the increase in the number of products has been sizable, particularly in the larger economies (Kenya, Tanzania, and Uganda).



The sophistication of export products has increased

The EAC countries have generally moved toward exporting more “sophisticated” products, defined as those predominantly produced by advanced economies. Specifically, a “sophistication” index is calculated from COMTRADE data at the 4-digit SITC level, using a method similar to Hausmann and others (2007). The construction of the index proceeds in two steps. The first step is to construct a “productivity” index for each product (worldwide) each year, by considering the weighted average of per capita GDP of the countries that export it, with the weights being given by the share of the given product in each country’s total exports. Intuitively, more productive or more sophisticated products worldwide are those that feature more prominently in the export structure of more advanced economies. The second step is to compute a country’s sophistication index in each given year as the weighted average of the “productivity” index of its exports, where the weights are the value shares of the products in the country’s total exports. As shown in Figure 14, the sophistication index of each of the EAC countries rose visibly between 1990 and 2010. Indeed, the gains for most EAC countries were noticeably greater than the average for sub-Saharan Africa and other regions. The smallest gain was experienced by Kenya, which started out with the highest sophistication index within the EAC in 1990. In the other four countries, “convergence” clearly seems to have been at play. At the end of the period, not only Kenya but also Uganda were slightly above the sub-Saharan average, and Tanzania was close to it.

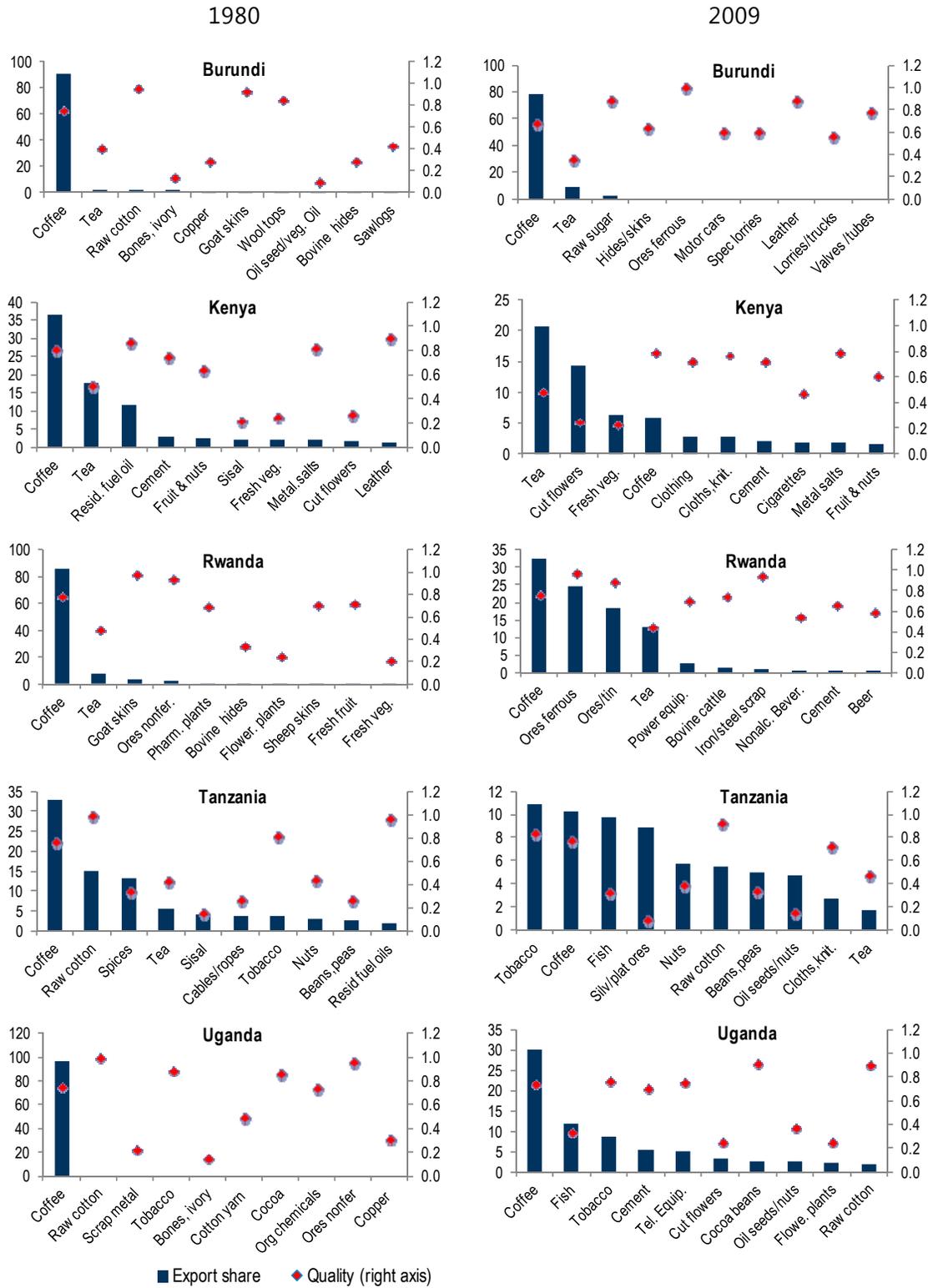


The Quality of Individual Items Being Exported Has Improved

Summary measures of the quality of exports (calculated by Henn and others, 2013, see Appendix) within each export category also indicate a trend toward improved quality for each of the EAC countries. For each category of items exported by a given country, quality is measured as the ratio of the value of such items exported by the country in question to the average value of such item exported by all other countries. The results are reported in Figure 15, where the red diamonds represent the quality of a given export category by the country in question (right hand side scale, as a ratio of the quality of the same category for all

other countries), and the blue bars represent the share of the same goods export category in the country's total exports (in percent, on the left hand side scale). For example, in 2009, Burundi's coffee was considered to be of a relatively high quality (0.8, on a scale from 0 to 1) and coffee represented 80 percent of Burundi's goods exports as estimated in the database. Focusing on changes in the quality of the various export items, there is no clear rising trend, perhaps not too surprising given that most of the products are primary commodities or goods that involve limited processing. It is also worth recalling that the quality is measured relative to trading partners, suggesting that the countries in the region are broadly keeping pace with their competitors. Focusing on the shares of the top ten products in total exports and on a more positive note, the figures reveal greater diversification in 2009 than in 1980, consistent with previous results on diversification using a different data source and methodology.

Figure 15. Quality of Top 10 products (four-digit level)



Note: Gold is not included in the export products here.

Source: UN COMTRADE and authors' calculations.

IV. SUMMARY AND CONCLUSIONS

In this paper, we have reported several stylized facts about economic growth experienced by the EAC member countries. The pace of overall economic growth as well as the associated structural transformation of the economies accelerated during the past decade. Both output and exports have become more diversified: the share of agriculture has fallen substantially; the gains in share have been broadly distributed, with the largest gains going to construction, transportation, and wholesale trade; manufacturing and mining posted modest gains. Rapid growth has thus not been driven by a narrow range of products (as might have been the case with natural resources in some other low-income developing countries). Moreover, the sophistication and quality of items exported by the EAC countries have improved over time, and more noticeably during the past decade than previously.

When attempting a possible interpretation of these facts, the picture that seems to emerge is that recent diversification and structural transformation bode well for continued economic growth. Yet, the kind of growth observed seems to be one in which consumer and investment demands for more sophisticated goods and services are beginning to be met, as one would expect as per capita incomes rise in the region. There do not yet seem to be any clear winners on the production side that are likely to embed a clear and durable comparative advantage in international markets, particularly beyond the region. Nor are there major quality improvements vis-à-vis competitor countries, where progress is also being made. These observations may instill a further note of caution against projecting continued rapid growth into the distant future.

As emphasized in the introduction, one cannot expect definitive answers about future growth. To the extent that the observations reported above can provide valuable clues, they are consistent with the view that, going forward, economic growth is likely to remain healthy but to slow down to a more moderate pace than during the past decade, consistent with the statistical pattern for “reversion to the mean” reported in Section II of this paper.

APPENDIX

Methodology and Data

Sectoral Output Database

The new IMF in-house database was compiled using information on the sectoral composition of GDP provided by the country authorities to IMF country desks. The dataset contains value added series in constant prices for 12 economy-wide sectors in Sub-Saharan Africa for the period of 2000–2011. The 12 sectors are: agriculture (including forestry and fishing); mining and quarrying; manufacturing; utilities (electricity and water); construction; trade and repairs; hotels and restaurants; transportation and communication; financial intermediation; real estate and business activities; public administration; and other. FISIM and net taxes are excluded. The share of each sector is calculated as a ratio of the value added of a given sector to the sum of all 12 sectors. For some countries, data were not available for all 12 sectors.

Measure of Diversification of Export Products/Partners

The main export data we use is from UN Comtrade database, using the SITC1 classification of products at the four-digit level. The time period covers 1962 to 2010.

The Theil index of export diversification may be expressed as follows:

$$T = \frac{1}{n} \sum_{k=1}^n \frac{x_k}{\mu} \ln \left(\frac{x_k}{\mu} \right), \text{ where } \mu = \frac{1}{n} \sum_{k=1}^n x_k$$

For the export product level Theil index, x_k is the export value of product k and n is the number of products; μ is therefore the products' average dollar value. For the partner level Theil index, x_k is the export value to partner k and n is the number of partners for each exporter.

Measure of Sophistication of Export Products

To measure the sophistication of a country's export products, we use an approach developed by Hausmann and others (2007), which we summarize here for ease of reference. The first step is to construct a "productivity" index for each product (worldwide) each year, by considering the weighted average of the per capita GDP of the countries that export it, with the weights being given by the share of the given product in each country's total exports. Specifically, the productivity level associated with product k may be expressed as follows:

$$PROD_k = \sum_j Y_j \frac{(x_{jk}/X_j)}{\sum_j (x_{jk}/X_j)}$$

where Y_j denotes per capita GDP of country j and X_j denotes total exports by country j . The numerator of the weight is the value-share of export k in total exports by country j . The denominator of the weight is the sum-total of the value shares of export k by all countries. Intuitively, more productive or more sophisticated products worldwide are those that feature

more prominently in the export structure of more advanced economies. The second step is to compute a country's sophistication index in each given year as the weighted average of the "productivity" index of its export products, where the weights are the value shares of each product in the country's total exports. The sophistication of country j 's export basket, $EXPY_j$, may thus be expressed as follows:

$$EXPY_j = \frac{1}{N} \sum_{l=1}^N \left(\frac{x_{jl}}{X_j} \right) PROD_l$$

where export products are indexed as $l=1 \dots N$.

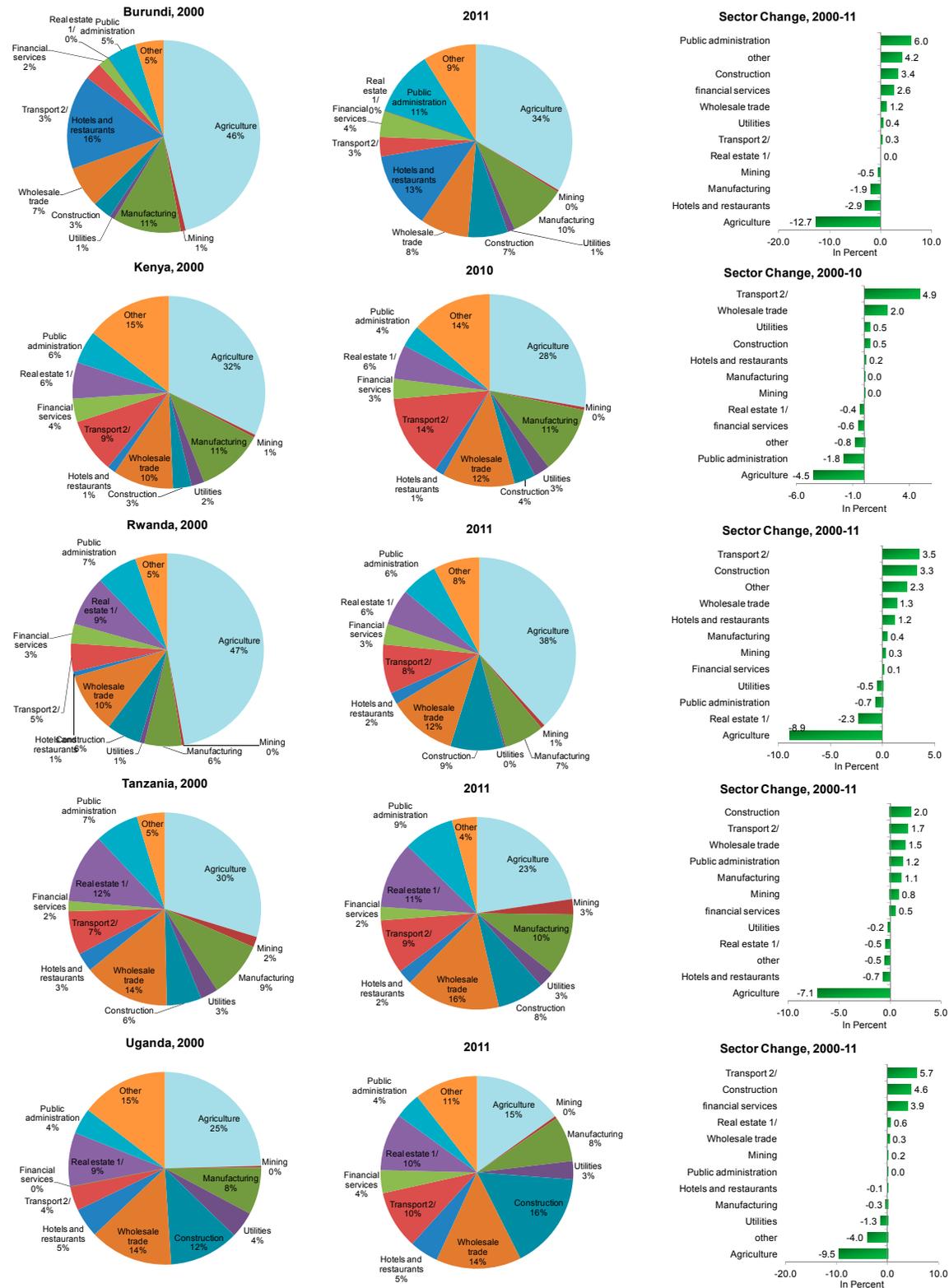
Measure of Quality of Export Products

Export quality is measured using a unit value, or trade price, which is defined as a ratio of value of exports over quantity of exports for any given product category. Quality index data were obtained from Henn et al (2013), who using UN Comtrade data calculate quality by adjusting unit values for differences in production costs and for the selection bias stemming from relative distance between exporter and importer countries:

$$Quality\ estimate_{mxt} = \zeta_1' \ln p_{mxt} + \zeta_2' \ln y_{xt} + \zeta_3' \ln Dist_{mx}$$

Where subscripts m , x , and t denote importer, exporter, and time period; p_{mxt} is trade price; y_{xt} is exporter income per capita, and $Dist_{mx}$ is the distance between importer and exporter. Coefficients ζ are estimated separately using the methodology by Hallak and Schott (2011). To enable cross-product comparisons, all quality estimates are first normalized by their 90th percentile in the relevant product-year combination. The quality estimates are then aggregated, using current trade values as weights, to higher level sectors and to country-level totals. The normalization to the 90th percentile is repeated at each level of aggregation.

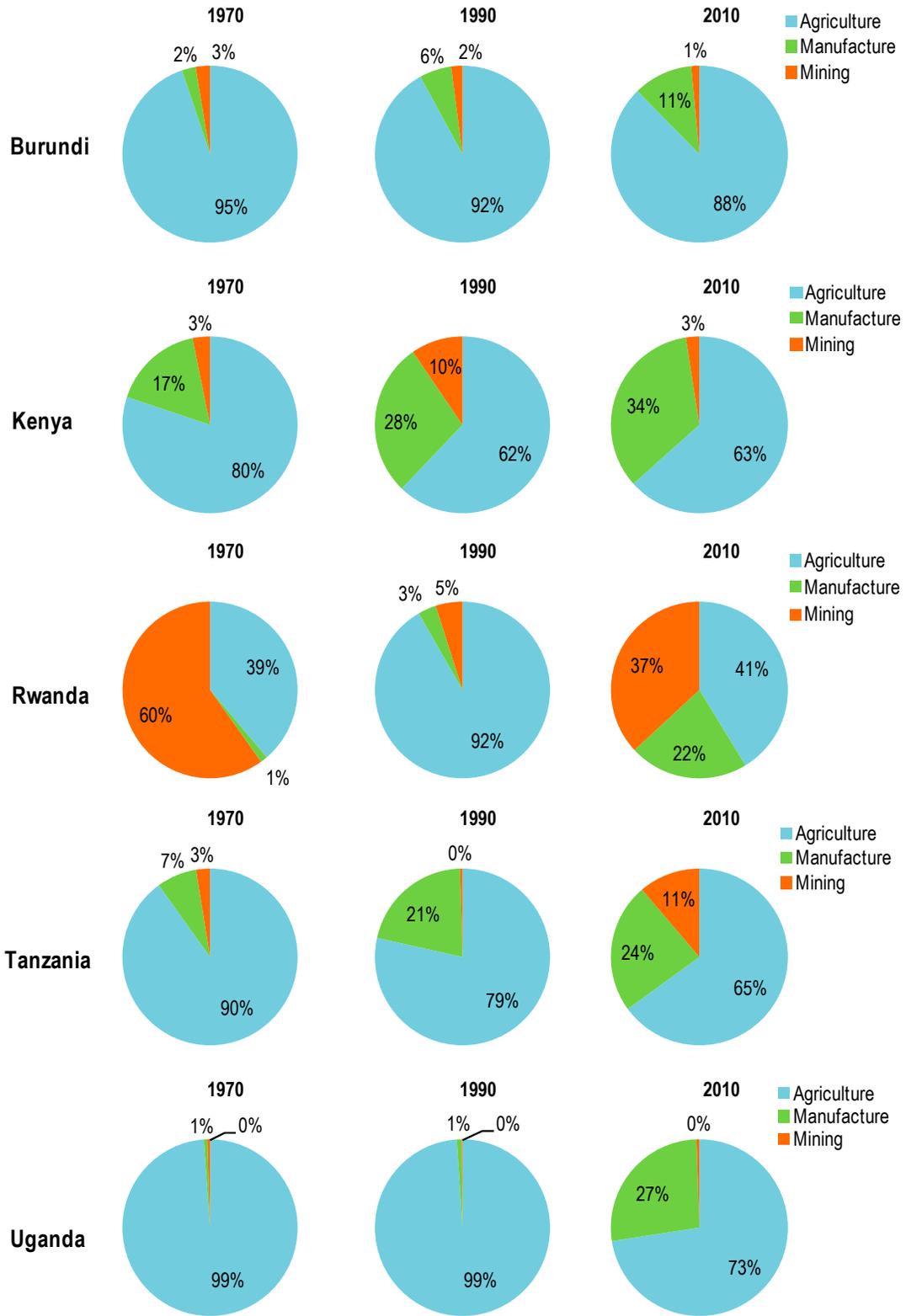
Figure A1. Changes in Composition of Output by Sector, Individual Countries



^{1/} Real estate & business services. 2/ Transport and communications.

Sources: IMF desk economists; authors calculations.

Figure A2. Changes in Sectoral Structure of Exports, Individual Countries.



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