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Competition, Competitiveness and Growth in Sub-Saharan Africa

by Reda Cherif, Sandesh Dhungana, Xiangming Fang, Jesus Gonzalez-Garcia,
Miguel Mendes, Yuanchen Yang, Mustafa Yenice, and Jung Eun Yoon

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I N T E R N A T I O N A L M O N E T A R Y F U N D

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African Department

Competition, Competitiveness and Growth in Sub-Saharan Africa

Prepared by Reda Cherif, Sandesh Dhungana, Xiangming Fang, Jesus Gonzalez-Garcia, Miguel Mendes, Yuanchen Yang, Mustafa Yenice, and Jung Eun Yoon*

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Abstract

Does greater product market competition improve external competitiveness and growth? This paper examines this question by using country- and firm-level data for a sample of 39 sub-Saharan African countries over 2000–17, as well as other emerging market economies and developing countries, and finds that an improvement in domestic competition is associated with a significant increase in real GDP per capita growth rate, achieved mainly through an improvement in export competitiveness and productivity growth. Price levels, including of essential items, are also generally lowered with an increase in competition. Moreover, at the firm-level, evidence shows that greater competition—proxied through a decline in corporate market power—is associated with an increase in firm’s investment and the labor’s share in output. These effects are more pronounced in the manufacturing sector and among domestic firms compared to foreign firms.

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I. INTRODUCTION

Competition among firms is generally deemed an essential driving force of market economies. It ensures an efficient allocation of resources as factors are allocated to their best use, and generates firm dynamics that boost innovation, productivity growth, and external competitiveness—translating into macroeconomic gains.² Moreover, by limiting unfair pricing, discriminatory practices, and rent extraction, competition is seen to have significant welfare, employment generation, and distributional implications as well.

The expected benefits of competition are, however, more likely to accrue in the absence of market distortions. Where market distortions exist—whether in advanced economies or low-income countries—it is often argued that competition, especially from foreign entrants, can hurt the domestic industry and create dominant firms that end up stifling competition and harming consumer welfare. Such concerns generally lead to trade and other regulatory barriers that restrict the entry of private firms in domestic markets. Nevertheless, many of these fears can be mitigated by implementing an appropriate policy framework that encompasses the opening of the market along with a strong competition law and enforcement agency. By and large, existing evidence shows that competition and a well-crafted competition policy framework can help to improve welfare and other macroeconomic outcomes (Dutz and Hayri 1999; UNCTAD 2004; Aghion and Griffith 2005; OECD 2014).

Despite the advantages of competition, markets are often characterized by anticompetitive practices and structures, especially in developing countries. Sub-Saharan Africa is no exception—monopolies, especially state-owned, are widely prevalent, and single operators hold large market shares in key sectors in many countries. The lack of competition has significant potential costs, hurting the poor through higher prices of essential items and undermining external competitiveness and economic growth.³ Although the issue of declining competition and rising corporate market power has received much attention in recent years in the context of advanced and emerging market economies (Autor and others 2017; De Loecker and Eeckhout 2018; De Loecker and others 2018; IMF 2019a), a systematic analysis for emerging market economies and developing countries, and in particular for sub-Saharan Africa, remains lacking.

Against this background, this paper aims to broaden the understanding of the state of product market competition in sub-Saharan Africa by bringing together country and firm-level data from several sources to explore the following key questions. How has product market competition in sub-Saharan Africa evolved over the years and how does it compare to other regions? What are the macroeconomic implications of competition for external competitiveness, economic growth, and consumer welfare? How does competition affect firm behavior and performance to generate observed macroeconomic outcomes? What role

² The dynamic efficiency gains conferred by competition are based on the Schumpeterian “creative destruction” hypothesis, which postulates that competition drives innovation and constant change, leading the least productive firms to exit the market and the most productive firms to survive (Schumpeter 1942). To reap the dynamic benefits of competition, however, firms must be able to enter, upgrade, and exit easily.

³ World Bank (2016), for example, estimates that retail prices of essential food items are at least 24 percent higher in African cities than in other major cities around the world, while cement prices are, on average, about 183 percent higher than world prices.

does macroeconomic policy, including competition policy, play in promoting competition in the region?

The analysis, based on a sample of 39 sub-Saharan African countries covering the period 2000–17, shows that competition in the region remains generally low relative to the rest of the world. Specifically, country-level indicators show that, on average, sub-Saharan Africa lags advanced and emerging market economies in both domestic and foreign competition, though it is on par with other developing economies. Specifically, more than 70 percent of the countries in the region fall in the bottom half of countries globally in terms of domestic and foreign competition indicators. The low level of domestic competition is related to the market dominance of a few large firms, the absence or weak enforcement of competition policies, structural and regulatory barriers to entry, and the distortive effects of tax regimes. Meanwhile, foreign competition is mainly impeded by high trade barriers, which may also indirectly affect domestic competition by restricting access to intermediate inputs.

Firm-level indicators of competition—such as markups and profitability—provide deeper insights into sectoral market structures and suggest that markups and profitability are generally higher in sub-Saharan African countries compared to other emerging market economies and developing economies.⁴ Both profitability and markups in the region vary considerably across sectors and country groups but tend to be higher in the services sectors (such as hotels and restaurants, information and communications, and transportation), and among oil exporters relative to other country groups. In general, there is a strong association between the number of competitors faced by a firm and its markup and profitability, suggesting that reducing barriers to business entry could play an important role in boosting competition and improving market dynamics.

The empirical analysis shows that sub-Saharan Africa has much to gain from promoting competition. Moving from the median value of the competition intensity index for sub-Saharan African countries to the top quartile of the global distribution is associated with an average increase in the real GDP per capita growth rate of about 1 percentage point, achieved mainly through an improvement in export competitiveness and productivity growth. Also, an international comparison of price levels suggests that prices, including of essential items, are on average about 20 percent higher in sub-Saharan African countries than in other emerging market and developing economies. Higher competition can help to significantly lower prices of consumer and intermediate goods, thereby improving welfare and competitiveness.

The analysis of firm-level analysis shows that firm behavior responds to market structure, generating the observed macroeconomic patterns. Specifically, a decline in firm markups is significantly associated with an increase in investment and exports, productivity growth, and labor's share of output. The effects of market power are more pronounced in the

⁴ While several variables, most notably market shares, have been used in previous studies as an indicator of competition, this paper uses profitability and markup measures given limited firm-level data availability for sub-Saharan African countries, which makes it difficult to compute market shares. In principle, differences in profitability and markup—which broadly speaking capture the divergence between the product price and the cost of production—could be reflecting differences in the return to capital and in productivity, thus the empirical analysis presented below attempts to control for these factors. The paper also analyzes the persistence of profits and markups, as in competitive markets, the process of firm entry and exit should imply a mean-reverting behavior of these variables.

manufacturing sector relative to services, and stronger for domestic firms relative to majority foreign-owned firms.

The rest of the paper is organized as follows. Section II presents the general framework for the empirical analysis. Section III introduces the data used in the empirical analysis. Section IV presents some stylized facts pertaining to product market competition in sub-Saharan Africa. Section V analyzes the macroeconomic implications of greater competition, while Section VI delves into the firm-level effects. Section VII explores ways to help improve competition in the sub-Saharan African region. Section VIII concludes.

II. FRAMEWORK FOR THE EMPIRICAL ANALYSIS

The idea that competition is an important driving force of market economies that affects economic growth can be traced back to Adam Smith's *Wealth of Nations*, penned more than two centuries ago.⁵ Since then, a voluminous body of literature has examined the effect of competition on economic growth and welfare. Theoretically, the relationship is ambiguous: rivalry among firms can encourage innovation and boost productivity growth, but it can also stifle innovation and growth by limiting the expected returns for firms from innovating (Aghion and Griffith 2005). Also, it may be the case that open and competitive systems can also enable firms in dominant positions to entrench themselves and work toward closing the system and impeding growth (Rajan and Zingales 2004).

Cross-country empirical studies, however, generally indicate a strong positive relationship between competition and growth resulting from a more efficient allocation of resources and increased investment, innovation, productivity, and export competitiveness (OECD 2014; Goodwin and Pierola Castro 2015). Competition is also observed to have important welfare and distributional implications by lowering prices for consumers and downstream producers, generating income and employment opportunities, and reducing discriminatory practices (Begazo and Nyman 2016). The empirical analysis using country level data presented below focus on the effects of competition in domestic markets on the growth of per capita GDP and the channels for those effects. Also, cross country data is used to evaluate the relationship of domestic competition and the price level of comparable consumption baskets in different countries in order to assess the effects on consumer welfare of different levels of economic competition in domestic markets.

Obviously, the effects of competition in domestic markets at the aggregate level are the result of effects that materialize at the firm level. Therefore, any assessment at the aggregate level should be corroborated with a firm-level analysis. The empirical analysis using micro data presented below is similar to other studies—as De Loecker and others 2018 and IMF 2019—but focuses on the relationship of corporate market power and investment, exports, productivity and labor shares in emerging and developing countries, and in particular in sub-Saharan Africa. These groups of countries have not been studied in previous literature.

⁵ See, for example, Smith (1776), Book II, Chapter II, p. 329, para. 106.

III. DATA

To assess the competitiveness and growth implications of product market competition in sub-Saharan Africa, country and firm-level data is compiled from various sources, as described below.

A. Country-level Competition Data

Global Competitiveness Index (GCI). The main macro-level indicators of competition are obtained from the World Economic Forum’s Global Competitiveness Index (GCI) and include overall competition, domestic competition, and foreign competition. These indicators—based on macroeconomic data, as well as responses to surveys provided by business leaders—are available annually over 2006–17 for 44 sub-Saharan African countries (Table 1). The level of competition is measured on a range of 1 (low) to 7 (best). Domestic and foreign competition are further disaggregated into several factors such as the intensity of local competition, effectiveness of anti-monopoly policy, ease of doing business, etc. (Table 2).⁶ For the regression analysis, the indicator capturing the intensity of local competition is used as the main variable to capture the market structure and extent of competition faced by the firms.⁷

Bertelsmann Stiftung Transformation Index (BTI). The Bertelsmann Stiftung Transformation Index is another source of country-level competition information included in this paper for robustness purposes. Two subcomponents of BTI: market-based competition and anti-monopoly policy, which range between 0 and 10 (best), are considered here. The scores of BTI are mainly based on opinion surveys among country experts and are available every two years over 2006-18 for 36 sub-Saharan African countries (listed in Table 3).

B. Firm-level Competition Data

Firm profitability and markups are common indicators to assess the level of competition faced by firms. For profitability, the Lerner Index—defined as the price-marginal cost difference relative to price $(P-MC)/P$ —is often used as a proxy, while markups—theoretically defined as the price to marginal cost ratio (P/MC) —are generally proxied in recent literature following De Loecker and Warzynski (DLW, 2012).⁸ Specifically, based on the firm’s cost minimization problem (first-order condition), DLW show that a firm’s markup (μ) can be expressed as:

$$\mu = \frac{P}{MC} = \frac{\beta_k}{\alpha_k} \quad (1)$$

where β_k is the output elasticity of any input k and α_k is the expenditure share of the same input in sales. Following DLW, α_k is approximated by the expenditure share of variable

⁶ The GCI has been revised since 2018. Data for the new GCI 4.0 version is available for 2018 only and is not included in the analysis as it is not comparable to earlier data.

⁷ The sample used in the regression analysis covers 25 sub-Saharan African countries and ends in 2014 due to the lack of data availability for the control variables included in the estimations.

⁸ In theory, under perfect competition, a firm’s price and marginal cost are equalized. Thus, the differential between price and marginal cost could be interpreted as the ability of a firm to influence the market.

inputs in sales and β_k is approximated by the output elasticity of variable costs. The former is firm specific while the latter is usually assumed to be the same across firms in the same industry (DLW; Diez and others 2019). Thus, for a firm j in industry i , taking the log of firm markup yields the following equation:

$$\ln(\mu_{ij}) = \ln(\beta_i) - \ln(\alpha_j) \quad (2)$$

To construct empirical measures of firm profitability and markup, two data sources are used: the World Bank's Enterprise Survey and the Orbis database.

World Bank Enterprise Survey (WBES). The WBES collects information from a representative sample of firms by conducting face-to-face interviews, and focuses on formal firms in the manufacturing and services sectors with 5 or more employees. The survey provides information on a broad set of aspects and several variables of the firms including size, ownership, sector, geographic region, financial information, and information about the business environment in which firms operate. The WBES data is mostly cross-sectional and interviews may not be repeated with the same firms over the years.

The WBES data used in the paper comprises 39 sub-Saharan African countries over 2006–18, listed in Table 4. For comparative purposes, data for other 89 emerging market economies and developing countries are also used. For the empirical analysis all variables from the WBES are trimmed at the top and bottom percentiles to remove extreme values, and no sector with less than 100 observations is included in the regression analysis to ensure a sufficiently representative sample. After cleaning up the data, about 41,000 and 10,000 firm-level observations—mostly pertaining to the manufacturing sector—are obtained for sub-Saharan Africa and other emerging market economies and developing countries, respectively (Table 5).

To construct measures of firm profitability and markup using the WBES data, some approximations are made considering data availability. Firm profitability is constructed as the difference between annual sales (proxy for revenue) and the cost of variable inputs to annual sales, as follows:⁹

$$\frac{\text{Sales} - \text{Labor Costs} - \text{Materials and intermediate inputs}}{\text{Sales}}$$

To proxy firm markup given in equation (2), $\ln(1/\alpha_j)$ is used, which is constructed as the log ratio of annual sales to variable costs (that is, the sum of labor cost and the cost of raw materials and intermediate goods).¹⁰

⁹ The Lerner index is often proxied in the literature using the ratio of Earnings Before Interest and Taxes (EBIT) to operating revenue (IMF, 2019). The WBES, however, does not provide data on the EBIT.

¹⁰ To compute markups as defined in equation (2), longitudinal information is required to estimate output elasticities, β_i , which is lacking in WBES data. However, under the assumption that output elasticities to variable inputs are similar across countries in the sample, including industry-specific effects in the estimation precludes the need to include these elasticities

Orbis Bureau van Dijk (Moody’s Analytics). The Orbis dataset provides harmonized cross-country financial information for both privately held and publicly listed firms. The information is usually gathered from local companies that collect information from corporate registers. The raw data obtained from Orbis requires intensive cleaning. The cleaning procedures include dropping duplicate values, reporting mistakes, and data that was not assigned to a specific industry. Cleaning data also involves quality checks to identify outliers and aberrant observations. Filters are applied to the annual growth rates of some variables such as sales, operating revenue, and the number of employees to eliminate extreme observations. Finally, variables are scaled to allow cross-country comparability. Data for 28 sub-Saharan African countries over 2000-17 (with gaps for some countries) are obtained from the Orbis database (Table 6). About 73 percent of the firms for sub-Saharan Africa pertain to three countries: South Africa, Nigeria and Mauritius. To ensure that the regression results are representative for a broad group of countries, the sub-Saharan African data is complemented with data for 53 other emerging economies and developing countries. About 30 percent of the observations in the emerging markets and developing countries sample and 40 percent of the observations in the sub-Saharan Africa sample belong to the manufacturing sector, while the rest are dominated by the services sector (Table 7).

The construction of the variables using the Orbis database is mainly based on Díez and others (2019). To compute markups, two approaches are used. In the first approach, markups are obtained as the ratio of operating Revenue (OR) to the cost of goods sold (COGS), which includes direct labor and materials costs. This measure, shown below, is similar to the measure computed using WBES data and allows direct comparisons of the indicators between the two databases:

$$\frac{\text{Operating Revenue} - \text{Costs of Goods Sold}}{\text{Operating Revenue}}$$

The second approach involves estimating output elasticities for different sectors.¹¹ Using the available panel data for firms in several sectors, output elasticities (the β 's in equation 1) are estimated without assuming that sectoral technologies are the same across countries. To estimate the β 's, the control function approach of Olley and Pakes (1996) is applied, following the methodology of DLW and Díez and others (2019). This methodology assumes that for each firm i , the production function is represented by a Cobb-Douglas model as follows:

$$y_{it} = \beta v_{it} + \alpha k_{it} + w_{it} + \varepsilon_{it} \quad (3)$$

where y_{it} is output, v_{it} is variable input, k_{it} is the stock of capital and w_{it} is productivity. For each industry in the NACE Rev. 2 classification (see Eurostat 2008), a two-step approach to estimate β is followed. In the first step, output is estimated based on variable inputs and fixed capital (and their squares and interaction terms) and the residuals obtained from this

in the regressions. Moreover, even if the output elasticity for specific sectors is assumed to vary across countries, the country-fixed effects included in the regressions would help to absorb those variations.

¹¹ This approach is applied to construct markups for the regression analysis based on Orbis data.

estimation are interpreted as productivity. In the second step, productivity is assumed to follow a Markov process and is obtained using a GMM estimation of equation (3) assuming moment conditions consistent with intuitive assumptions about the timing of investment decisions (see Diez and others 2019 for more details).

C. Other Data

Product market liberalization. To assess the pace of product market reforms in sub-Saharan countries, data is obtained from Alesina and others (forthcoming). The sample provides annual information over 1973-2014 for 14 sub-Saharan African countries (Burkina Faso, Cameroon, Côte D'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Uganda and Zimbabwe), which account for about 80 percent of the region's output. This database covers information on reforms pertaining to different sectors such as trade, the current and capital accounts, telecommunications and electricity, agriculture, and financial liberalization.

Competition policy framework. To analyze the state of anti-trust frameworks across sub-Saharan African countries, data is gathered from two sources: the World Bank–African Competition Forum (WB-ACF), and an IMF desk survey of country authorities. The WB-ACF data is based on surveys for 36 countries jointly administered by the World Bank and the African Competition Forum over 2010–15 (World Bank 2016). The survey provides cross-sectional information on several aspects of competition including the existence and enforcement of competition laws, price control regulations, and the degree of independence, annual budgets and staff size of the competition authorities. The IMF data is based on a survey of competition authorities designed specifically for this paper. The survey was conducted in May–June 2019 and elicited response from 37 jurisdictions, including 29 separate jurisdictions and one regional body.

Other variables. Additional macroeconomic variables necessary for the empirical analysis are collected from various sources such as the IMF's World Economic Outlook, the World Development Indicators, etc. (see Table 8).¹²

IV. STYLIZED FACTS

A. Country-level Competition Indicators

Based on the World Economic Forum's product market competition indicator, overall competition in the region is, on average, significantly lower than in advanced and emerging market economies but similar to that observed in the rest of developing countries (Figure 1). More than 40 percent of the countries in sub-Saharan Africa are in the bottom quartile of the global distribution of the competition index, while more than 70 percent are below the world median (Figure 2).¹³ These patterns are also observed in other available country-level

¹² See Table 9 for a list of non-sub Saharan African countries included in the country and firm-level empirical analysis.

¹³ The methodology to compute the World Economic Forum's product market competition index was revised in 2018. The revised index, while not strictly comparable to earlier years, portrays a similar picture for sub-Saharan Africa relative to other countries in terms of domestic and foreign competition (Figure 4).

competition indicators such as the Bertelsmann Stiftung Transformation Index, which shows a notable difference between sub-Saharan Africa and other countries in terms of market competition (Figure 3).¹⁴

The low level of competition in most sub-Saharan African countries can be attributed to low levels of both domestic and foreign competition. The weak domestic competition environment mainly stems from the market dominance of a few firms, lack of effective competition policies, structural and regulatory barriers to entry, and the distortive effects of prevalent fiscal regimes (Figure 5). Low foreign competition is to a large extent driven by trade barriers, which have declined significantly over the last two decades but remain relatively high (Figure 6). Trade barriers—both tariff and non-tariff related—tend to limit direct competition from foreign firms but could also indirectly affect domestic competition by restricting the availability of inputs (or by making them more expensive).

A look across the different country groups in the region shows considerable heterogeneity in the state of competition across markets. Non-resource intensive countries generally have the most competition-prone market structures, while oil exporters have the least, probably reflecting the structure of these economies, with limited diversification, significant import protection, and the prevalence of a few large firms in the extractive industry (Figure 7, panel 1). Domestic competition, however, appears to have increased over the last decade in all country groups, with non-resource-intensive countries recording the largest improvement, mainly due to an improvement in the ease of doing business. Across subregions, competition is significantly lower in central Africa, while it is the highest across southern African countries (Figure 7, panel 2).

B. Firm-Level Competition Indicators

Firm-level competition indicators—such as profitability and markups—corroborate the country-level indicators and show that the extent of competition faced by firms in the region is indeed limited.¹⁵ These indicators are not readily available for sub-Saharan Africa but they are constructed for the purpose of this paper using detailed information obtained from two data sources: the World Bank Enterprise Survey, which provides mostly cross-sectional information on over 10,000 firms in 39 sub-Saharan African countries during 2006–18; and the Orbis database, which provides time-series information on about 500 firms in 18 sub-Saharan African countries during 2000–17, resulting in nearly 9,000 firm-level observations.¹⁶

Based on these datasets, average firm profitability in sub-Saharan African countries is significantly higher (10–20 percent) compared to other emerging market economies and

¹⁴ The World Economic Forum's competition indicator is based on both subjective (opinion surveys of business executives) and objective (tariff rates, number of regulatory procedures, etc.) components. The Bertelsmann Stiftung Transformation Index is based on opinion surveys of country experts.

¹⁵ While in absolute terms the markup and profitability measures may not necessarily reflect the extent of market competition under fairly general assumptions such as similar technologies, a comparison across firms and countries could inform on differences in market power.

¹⁶ The number of firms covered in both databases varies considerably across countries, but more than 90 percent of the firms in the WBES and 50 percent of the firms in the Orbis database belong to the manufacturing sector.

developing countries (Figure 8).¹⁷ Firm markups are also about 11 percent higher in sub-Saharan African countries relative to other countries at a similar level of development, thereby implying a lower degree of competition in the region.¹⁸

The derived firm profitability and markup measures are positively associated with each other by construction, but also with other measures of market concentration, such as the number of competitors faced by firms.¹⁹ Countries characterized by a higher share of firms reporting fewer competitors tend to record higher average firm profitability and markups—suggesting that removing barriers to entry and encouraging more firms to enter the market could bolster competition and reduce corporate market power (Figure 9). Notably, for a given share of firms reporting few competitors, profitability and markups across sub-Saharan African countries tend to be higher than in other emerging market economies and developing countries, indicating a relatively higher degree of corporate market power in the region.

A look across country groups within sub-Saharan Africa shows average firm markups and profitability are higher among oil-exporting countries by about 16 and 8 percent, respectively, relative to other countries (Table 10). Similarly, central African countries tend to have significantly higher markups and profitability (by about 8 percent and 18 percent, respectively) compared to other regions within sub-Saharan Africa.²⁰ The higher markups among oil exporters and in central African countries are consistent with Figure 3 above, which shows a relatively low level of product market competition at the macro level on these countries.

In terms of the dynamics of markups, the lack of consistent firm-level time-series data for most sub-Saharan African countries makes it difficult to draw definitive conclusions; however, the available information suggests an increase in markups in some countries, including the region's two largest economies: Nigeria and South Africa (Figure 10). These trends are consistent with other studies (Aghion, Braun, and Fedderke 2008; Fedderke, Obikili, and Viegli 2018; De Loecker and Eeckhout 2018), which also document rising firm markups in these countries and globally. More generally, the analysis shows that markups are highly persistent in sub-Saharan Africa, with the half-life of markups being almost twice as

¹⁷ Firm profitability is often captured by an empirical measure of the Lerner index—the ratio of operating earnings to sales (IMF 2019a). Given the limited availability of data on operating earnings in the WBES for sub-Saharan African firms, profitability is defined as the difference between firm sales and the cost of inputs to firm sales, and using Orbis data, it is measured as operating revenue to the cost of goods and services.

¹⁸ Theoretically, markup is defined as the price to marginal cost ratio. However, given the unavailability of data on marginal costs, the following proxies are used here: 1) the log of the ratio of sales to the cost of inputs when considering the WBES data; and 2) the log ratio of revenue turnover to costs when considering the Orbis database. With these definitions, markup values (profits) higher than 1 (0) can be considered as indicators of market power, as they suggest a divergence between prices and costs.

¹⁹ While market share (that is, firm sales to total industry sales in a given period) is a commonly used measure of market concentration, given the lack of data on the entire size of the market, in particular in the informal segment, it is not the preferred measure for the analysis here. Nevertheless, market shares calculated as a check with the databases mentioned are strongly positively correlated with both firm markups and profitability.

²⁰ In addition to average markup, markup dispersion within sectors is also significantly higher among the oil exporters, as well as in central African countries. As noted by Lerner (1934), markup dispersion could lead to a misallocation of resources resulting in efficiency losses.

long in countries in the region than in other emerging market economies and developing countries.²¹

Evaluating the behavior of markups across the different types of firms in the region indicates that majority state-owned and foreign-owned firms tend to have higher markups than other firms, especially in the manufacturing sector. By contrast, small firms tend to have lower markups than medium and large firms (Figure 11). These patterns are consistent with those for other emerging market and developing economies—but it is worth noting that the share of mostly state-owned firms in the sample for sub-Saharan Africa is almost double that for other emerging market economies and developing countries.

C. Competition across Sectors

The macro and firm-level competition indicators presented above suggest generally low levels of competition in sub-Saharan Africa, but are all sectors equally anticompetitive across countries? To answer this question, the computed firm profitability and markup measures are aggregated across sectors to gauge the degree of sectoral competition in the region. The results show considerable variation across sectors in sub-Saharan Africa, with both profitability and markups being the highest in the nontradable sectors, such as hotels and restaurants, wholesale and retail trade, and construction, based on the WBES database, and in other services, information and communications, financial intermediation, and transportation, based on the Orbis database, which has larger coverage of firms in the services sector (Tables 11–12). On average, markups tend to be lower in the manufacturing sector, especially among textile and leather producers.

Comparing the profitability and markup measures for countries in sub-Saharan Africa with those for other emerging market and developing economies indicates that competition is weaker in the region across nearly all sectors, with the average difference in markups equivalent to about 7 percent (Figure 12). In general, however, there is a strong positive correlation (about 0.9) between sectoral markups in sub-Saharan African countries and other countries, suggesting that the pattern of sectoral competition tends to be similar across countries.²²

Sectoral markups are also generally positively correlated across country groups within sub-Saharan Africa, except for central African countries, which tend to have higher markups in most manufacturing industries along with the services sector (Table 13). On average, commodity exporters—both oil and other—also tend to have higher markups in the manufacturing sector than the non-resource-intensive countries.

²¹ The half-life of firm markups—obtained by estimating an autoregression (AR(1)) model of markups, while controlling for different firm, industry, and country-level characteristics and year effects—is about 1 year for the sub-Saharan African sample compared to 0.5 years for other emerging market economies and developing countries.

²² While higher returns to capital resulting in higher profitability may be expected in low-income countries relative to advanced economies given their low level of capital endowment, the relatively higher markups in most sub-Saharan African countries compared to other developing economies with similar capital endowment structure suggest that the high level of profitability/markups cannot be fully attributed to higher returns to capital. More generally, the equality between returns to capital and the marginal product of capital relies on the assumption of perfect competition in capital markets (Caselli and Feyrer 2007), which generally does not hold in low-income countries.

V. COMPETITION AND MACROECONOMIC PERFORMANCE

Does the low level of competition prevalent across sub-Saharan Africa affect macroeconomic performance? This section presents different models using country level data to evaluate the effects of competition in domestic markets on the growth of per capita GDP and the most important channels for those effects, as investment, non-commodity exports and productivity growth. Given the importance of the influence of competition on productivity growth, a closer look is taken on the influence of competition in domestic markets on innovation and technological advancement.

A. Growth

What are the macroeconomic implications of domestic market competition? Competition can stimulate economic growth by ensuring an efficient allocation of resources, encouraging investment, boosting innovation and productivity, and promoting exports. Also, competition can also have important welfare and distributional implications through its effects on prices and output. To analyze the effect of competition on economic growth and its determinants (such as investment, exports, productivity), regressions of the following form are estimated:

$$Macro_{i,t} = \beta Com_{i,t} + \gamma X_{i,t} + \alpha_i + \alpha_t + \varepsilon_{it} \quad (4)$$

where the dependent variable $Macro_{i,t}$ represents alternative macroeconomic indicators for country i at time t (such as real GDP per capita growth rate, the share of private investment in GDP, non-oil exports in percent of GDP, and indicators of innovation and technological readiness). $Com_{i,t}$ is the indicator of the intensity of local competition obtained from the World Economic Forum with values ranging between 1 (low) and 7 (high). $X_{i,t}$ is a vector of control variables selected according to the specification used that includes lagged (log) real GDP per capita, share of investment in output, trade openness, change in terms of trade, years of schooling, trading partner growth, institutional quality, and public debt in percent of GDP. α_i and α_t are country and year-fixed effects, respectively and ε_{it} is the random error term. The model is estimated using ordinary least squares (OLS) and standard errors are clustered at the country level.

The positive relationship between competition and growth is borne out by data used in this paper. Equation (4) is estimated for the world sample, which includes advanced, emerging market, and developing economies (depending on data availability), as well as for samples comprising emerging market economies and developing countries (EMEDEV) and sub-Saharan African (SSA) countries only. The results show that competition is positively associated with higher economic growth in both the world and EMEDEV samples—with the estimated coefficient being statistically significant at the 1 percent level for the world sample and at the 5 percent level for the EMEDEV sample (Table 14). Based on these results, an increase in the competition intensity index from the median level for sub-Saharan African countries to the top quartile of the global distribution implies an average increase in the real GDP per capita growth rate of about 1 percentage point (Figure 13). The impact is

economically relevant as the average real GDP per capita growth rate in PPP terms in sub-Saharan Africa after 2010 has been 1 percent.²³ Restricting the sample to sub-Saharan African countries (cols. 3 and 6), the coefficient of competition remains positive but loses statistical significance (p-value: 0.2).²⁴ The results are robust to addressing potential endogeneity concerns by using the instrumental variable-two stage least squares (IV-2SLS) methodology with two types of instruments: (i) the first two lagged values of the competition index; and (ii) a regional competition index that is the average of the competition indices for the nearby countries in the region (Table 15).

B. Channels of Transmission

What are some of the channels through which competition lifts economic growth? Analyzing the effect of competition on private investment, non-oil exports and labor productivity, the results show a positive but statistically weak association of the local competition intensity index and investment (percent of GDP) but a strongly positive association with exports (percent of GDP) and labor productivity growth. Specifically, an improvement in the competition index from the median value for sub-Saharan Africa to the top quartile of the global distribution is associated with an increase in exports by 1.7 percent of GDP and labor productivity growth by about 1 percentage point (Table 16). The improvement in export competitiveness could be a result of a boost in productivity as competition encourages high-productivity firms to enter the export market (the ‘self-selection effect’) and/or makes the existing exporting firms more productive to compete with other firms (the ‘learning-by-doing’ effect; Wagner 2012). Innovation and technological advancement could partly explain the increase in productivity as competition could induce firms to invest in research and development, new management practices, and better technology to improve competitiveness (Holmes and Schmitz 2010). The results reported in Table 17 support this assertion and show that competition is strongly positively association with greater innovation and technological readiness across countries.²⁵

C. Welfare

To analyze the effect of competition on welfare, comparable data on international prices for different items is obtained from the World Bank’s International Comparison Program (ICP)—only cross-country data for the year 2011 is used—and the following regression is estimated:

$$P_i = \rho Com_i + \theta X_i + \alpha_1 EM_i + \alpha_2 DC_i + \alpha_3 SSA_i + \mu_i \quad (5)$$

²³ Several emerging market and developing economies in the sample, such as Colombia, Mauritius, and Morocco, have achieved a sustained increase in the competition intensity index over the last decade equivalent to an increase from the median level for sub-Saharan African countries to the top quartile of the world distribution.

²⁴ These results of sub-Saharan Africa should be interpreted with caution given the limited sample size for the region, which covers a period with few observed changes in competition indicators.

²⁵ Competition could also impact economic growth through some other channels. For example, studies indicate that inadequate access to finance has been a chronic impediment to growth in sub-Saharan Africa (IMF 2018), while available evidence suggests that competition in the banking sector is strongly associated with financial inclusion and access (Mengistu and Perez-Saiz 2018).

where P_i represents an internationally comparable price of a product or service (such as food, health, education, etc.) or the aggregate individual consumption basket for country i ; Com_i is the local competition intensity indicator, with values ranging between 1 (low) and 7 (high); X is a vector of control variables including (log) real GDP per capita, logistical efficiency, trade openness, and foreign direct investment (FDI) in percent of GDP; EME , DEV and SSA are dummy variables taking the value of one if country i is an emerging market economy, a developing country, or a sub-Saharan African country, respectively, and zero otherwise (advanced countries are taken as the reference category); and μ is a random error term. Equation (5) is estimated using OLS with robust standard errors. For comparative purposes, the equation is first estimated without including the competition index but controlling for other macro-structural characteristics.

The results indicate that the prices of most products and services—including food, utilities, furniture, health services, communication, education, as well as machinery and equipment—are on average significantly higher in sub-Saharan Africa than in other emerging market economies and developing countries (Table 18). It is worth noting that prices in sub-Saharan Africa tend to be higher for food, clothing, and health services, items that tend to carry a larger weight in the consumption basket of low-income households (Figure 14). Prices for intermediate inputs used in production—such as utilities and machinery and equipment—are also significantly higher in the region relative to other emerging market and developing economies (Table 19).

Looking at price levels across the different regions in sub-Saharan Africa it is apparent that, on average, east Africa has the lowest prices for goods, followed by west Africa, though prices of most services (such as health, communications, restaurants and hotels, as well as utilities) are not statistically different among the regions (Table 20). Accounting explicitly for foreign competition by including measures of trade openness and foreign direct investment in the regressions shows that greater foreign competition also helps to lower prices. The higher price levels in the services sector are consistent with the higher firm markups across regions in the services sector reported above. Differentiating between sub-Saharan Africa countries based on their exchange rate regime, such that CFA franc zone countries are considered relative to the non-CFA franc zone countries, the results show no statistically significant difference in the price levels in most cases, except for some nontradable sectors such as health services, communication, and recreation (Table 21).

Increasing competition may help to lower prices as indicated by the strongly negative relationship between the local competition intensity index and prices of most goods and services, thereby improving welfare and the external competitiveness of economies. Specifically, moving from the median level of the competition index for sub-Saharan Africa to the top quartile of the global distribution is, on average, associated with about an 8 and 14 percent reduction in the prices of food items and health services, respectively, and a 10 percent decline in the price of the overall individual consumption basket (Figure 15).

Finally, some important points are worth noting. While domestic competition indicators explain a large part of the average price differential between sub-Saharan Africa and other emerging market and developing economies, they do not fully account for it. This suggests that other macro-structural factors may also play a role in pushing up the price levels across sub-Saharan African countries.²⁶ Also, greater trade openness and FDI are strongly negatively associated with price levels across countries and including these variables in the estimations lowers the price difference between sub-Saharan Africa and other countries but the differential is not eliminated in most cases, indicating again that other macro-structural factors may also be at play in pushing prices higher in the region.

VI. FIRM DYNAMICS AND COMPETITION

To estimate the effect of competition on the behavior of firms along several dimensions as investment, export orientation, labor share and productivity, a baseline regression with the following explanatory variables is estimated. Indicator of competition intensity: the markup, as described above, the variable of interest; firm specific controls as size (number of employees in logs); direct exports²⁷ (share of direct exports in sales); dummy variables indicating whether foreign and private ownership of firms is greater than 50 percent; age (number of years since establishment); and a dummy variable for the number of competitors (equal to one if the number of competitors facing the firm is less than five and zero otherwise); macroeconomic controls: the log of real GDP per capita in PPP terms (from Penn World Table 9.0), and industry, country and year fixed effects.

In these regressions, investment, exports and labor shares are normalized by value added (sales minus cost of materials and intermediate inputs) and log transformed (except exports, given some zero observations), and two indicators of productivity are used: labor productivity and total factor productivity. Benchmark regressions are restricted to industries with at least 100 observations to avoid small sample bias and estimated for a sample of emerging and developing economies including sub-Saharan Africa; for comparisons, a sample comprising sub-Saharan African countries is also estimated (Table 22).

A. Investment

Investment is measured with the purchase of equipment reported by firms to sales. A standard definition used in the literature the investment rate, which is investment as a ratio of the stock of fixed capital in the previous period, but WBES does not offer firm-level time series and the variable available to proxy the stock of capital (cost to re-purchase its machinery) has limited coverage, especially in SSA. The estimation results indicate that higher firm markups are associated with lower investment with an elasticity of about 0.5–0.7, and it is highly statistically significant across both samples. This result is robust to alternative specifications (such as scaling by sales instead of value added and including additional

²⁶ While countries in sub-Saharan Africa tend to have large informal markets, including available indicators of the size of the informal market in the estimations (such as the share of firms competing against unregistered/informal firms in the country; or the share of informal employment in total employment) does not alter the results significantly.

²⁷ Except for regressions (3) and (4) in Table 22 where exports are the dependent variable and where we exclude this variable.

control variables). Among other factors, private ownership appears to matter with majority private-owned firms investing more relative to public firms while larger and older firms tend to invest less, and there is no strong evidence that foreign ownership or exporting status matter for investment.

B. Exports

We measure exports as the share of exports to firm's value added, to represent both export orientation and the ability to compete in international markets. The value of exports is backed out from WBES using the share of direct exports in sales. As a sizable share of firms (about 30 percent) in the sample do not export, a Tobit regression is also estimated to verify robustness of the results. The results for the benchmark specification show that higher markups are associated with significantly lower exports in both samples. Also, the results suggest that firms facing fewer competitors and older firms export less, while larger firms and foreign firms tend to export more.

C. Labor Shares

The dependent variable measuring labor share is labor cost to value added. The effect of markups on labor share is negative and significant across samples, with an elasticity of about one, suggesting that competition can have significant distributional consequences. More specifically, the results suggest that increased competition leading to lower market power and markups is associated with higher shares of labor in total value added. Also, the results show that older, exporting, and foreign owned firms tend to have lower labor shares.

In summary, firm level evidence supports the country-level results and show that lower market power and markups are statistically significantly associated with higher firm investment and exports in emerging market economies and developing countries including sub-Saharan Africa. Using WBES data—and controlling for firm characteristics, as well as country and year-fixed effects—the results show that a 1 percent decline in markups is associated with an increase in investment and exports of about 0.7 percent and 0.2 percent of the firm's value added, respectively (Figure 16). Notably, the labor share is also significantly associated with firm markups, with a 1 percent decline in markup implying a one percentage point in the share of output that is remunerated to labor.

Restricting the sample to sub-Saharan African countries portrays a similar picture and indicates a strong negative association between firm markup and investment, exports, and labor shares. Including an additional indicator of competition in the regressions such as the number of competitors faced by the firm, shows also that, on average, firms facing fewer competitors have lower exports, labor shares, and investment though the association is statistically significant for exports only. The largely cross-sectional nature of the WBES data does not allow testing for the association between firm markup and productivity growth.

It is important to note that the Orbis data also captures the time dimension of firm behavior, allowing for a more refined measurement of markups and assessing their impact on

productivity growth.²⁸ Controlling for fixed and time-varying firm-, industry-, and country-level characteristics, the results show that a 1 percent decline in markups is associated with a 1–1.4 percent increase in firm’s investment to value added ratio and about a 1 percent increase in the share of labor in a firm’s output in emerging market and developing economies including in sub-Saharan Africa (Figure 16)

D. Productivity

Estimation results using Orbis data, presented in Table 23, show that lower markups are significantly associated with higher labor and total factor productivity growth, with a 1 percent decline in markups implying a 0.8 percentage point increase in the rate of productivity growth.²⁹

In summary, the findings from firm-level data echo the results of earlier studies, which show—mostly in the context of advanced economies—that firms with higher markups and greater market power tend to have lower investment, productivity growth, and labor shares (Nickell 1996; Autor and others 2017; Gutiérrez and Philippon 2017; IMF 2019a). While at the same time, the findings do not support the view that stronger competition discourages innovation. Also, the results suggest that the association between markups and investment, labor share, and productivity growth is nearly twice as strong in the manufacturing sector as in the services sector—implying that weak competition in the manufacturing sector may have a greater impact on economic growth compared to the services sector. Differentiating firms based on their ownership structure does not show any statistically significant difference in their response to market power (publicly or privately owned firms), however, for a given increase in markups, domestically owned firms have significantly lower investment and labor shares compared to their foreign counterparts.

VII. HOW TO BOOST COMPETITION IN DOMESTIC MARKETS?

Given the benefits of competition, how can it be strengthened, in particular in sub-Saharan Africa? Several factors are important, most notably enforcement of a strong competition policy framework that encompasses, among other things, product market liberalization, the adoption of an adequate competition law, an independent enforcement body, and competition advocacy. Other policies—notably, trade, fiscal, and structural—that facilitate business activity and reduce barriers to entry also play a critical role in stimulating competition.

A. Product Market Liberalization

The liberalization of product markets typically includes a transfer of production from state-owned enterprises (SOEs) to private firms, elimination of price controls, and developing regulatory bodies to facilitate private sector activity. Prior to the 1980s, most sub-Saharan African economies were state led with SOEs largely dominating domestic markets. Product

²⁸ Following De Loecker and Warzynski (2012), the markups based on Orbis data used for the regression analysis are constructed as the log ratio of the output elasticity of inputs to the expenditure share of inputs in sales.

²⁹ While labor share in output is positively associated with competition, this does not necessarily imply an increase in unit labor costs due to an improvement in productivity growth, as well as a general decline in price levels.

market reforms were initiated as part of a broader set of structural reforms that included trade policy liberalization in the early 1980s followed by current account and financial liberalization in the 1990s (Figure 17). Product market liberalization (notably in three key sectors: telecommunications, electricity, and agriculture) followed soon after in the late 1990s and encompassed a shift from public to private ownership, development of independent regulatory bodies, and the elimination (or reduction) of price controls.³⁰

Existing evidence suggests that such reforms have generally helped to boost productivity and growth in developing economies, including in sub-Saharan Africa (Ostry, Prati, and Spilimbergo 2009; Robinson, Gaertner, and Papageorgiou 2011). The reform momentum, however, appears to have slowed down over the last decade, with SOEs still dominating markets in many sub-Saharan African countries, especially in the utilities and transportation sectors (McKinsey Global Institute 2016; Sibiya and others 2018).³¹ According to the OECD–World Bank Product Market Regulations database, some sub-Saharan African countries (Kenya, Senegal, South Africa) are among the most restrictive in terms of allowing entry into the network and services sectors, while price controls are also widely prevalent—for instance, about two-thirds of the sub-Saharan African countries surveyed by the World Bank (2016) reported the existence of regulations that allow for price controls. In this context, pursuing further product market reforms, especially in the network and services sector, reducing regulatory and structural barriers to firm entry and exit, and improving the overall investment climate could catalyze private sector development and boost competition and growth.³² Although the small size of domestic markets and the large fixed costs associated with some sectors (especially utilities, telecommunications, and transportation) imply that natural monopolies may arise, unbundling the components such that those more amenable to competition are separated and opened for competition could help to improve economic outcomes.³³

B. Competition Policies

An adequate competition policy framework is essential to derive the expected developmental benefits from product market reforms and protect consumer welfare. Enforcement of a robust competition policy framework comprises the development of antitrust laws, setting up independent and well-functioning institutions, and judicial support. The results of the survey conducted for this paper show that there has been significant progress in the adoption of antitrust laws since the 2000s in sub-Saharan Africa, with the number of countries with a competition law more than doubling from 12 in 2000 to 31 by 2019 (Figure 18).³⁴ In general,

³⁰ The structural reforms index is obtained from Alesina and others (forthcoming) and is available for 14 economies in sub-Saharan Africa: Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Uganda, and Zimbabwe.

³¹ The slowdown in the product market reform momentum is evident from the limited improvement in the overall competition indicator, as noted in Figure 1.

³² Further reforms in the network sector could, for example, include liberalizing the telecommunications and wholesale electricity markets and fully unbundling electricity generation, transmission, and distribution. Some electricity unbundling reforms have already been introduced in Ethiopia, Ghana, Kenya, and Nigeria.

³³ For example, in the electricity sector, transmission and distribution tend to be the noncompetitive components, but generation and retailing are more amenable to competition (OECD 2001). Studies show that when such reforms induce competition, industry performance is significantly improved (Zhang, Parker, and Kirkpatrick 2008).

³⁴ These statistics are based on an IMF desk survey of competition authorities in member countries in the region.

these laws are based on those of advanced economies—typically covering merger control, collusive practices, and the abuse of dominance issues—and have been operationalized by setting up competition agencies. Also, most countries have a competition law or unified legal framework to deal with competition issues, and the wide gap between the setting up of legal frameworks and the dates of effective implementation: on average, a lag of about 6 years is reported. Also, only in 32 percent of the cases, implementation of anti-trust frameworks occurred in tandem with the legal setup, and in at least three cases, it took more than a decade for the legal framework to be implemented.

Despite this progress in the adoption of competition laws and the establishment of competition agencies, notable improvements in domestic market competition have not been witnessed in most countries as noted previously. One reason for this disconnect is that well-functioning antitrust frameworks require not only a sound legal setup, but also independent regulatory bodies, adequate financial resources, and suitably qualified staff to pursue anticompetition investigations. Viewed against these benchmarks, antitrust frameworks in the region present a mixed picture. According to World Bank (2016), about one-third of the countries in the region with a competition law have competition agencies that fall under the purview of another government body, potentially undermining their independence. The financial resources allocated to competition agencies are often limited, with few reporting any self-financing from penalties.³⁵ The availability of technical staff also varies—while the Competition Commission of South Africa (CCSA) has more than 130 technical staff, about one-third of the surveyed countries reported employing fewer than 10 staff members. On average, agencies in the region report investigating two cases a year, with the clear exception of Kenya and South Africa, which investigate about 500 cases a year.³⁶

The variation in the competition policy frameworks in the region is reflected in the perception-based indicators of the effectiveness of antitrust enforcement. For example, based on the World Economic Forum’s effectiveness of anti-monopoly policy index, Kenya and South Africa are among the best performers in the region, while oil exporters lag behind. It is also striking that in the region’s oil exporters, the perceived effectiveness of antitrust frameworks has declined during the last decade, highlighting the need for persistent efforts to maintain a robust antitrust framework (Figure 19).³⁷ More generally, adopting a competition law is not a panacea, and proper enforcement of the law needs to be ensured to foster private investment and enterprise development.

In enforcing competition laws, the regional dimension is becoming increasingly important. The small size of domestic markets in most sub-Saharan African countries implies that large

³⁵ Both World Bank (2016) and the IMF country desk survey conducted for this paper also show that there is a significant variation in the annual budgets of competition agencies in sub-Saharan Africa, ranging from less than 0.001 percent of GDP to 0.06 percent of GDP. In 2017–18, the CCSA had the largest budget, of \$22 million in nominal terms (0.01 percent of GDP), followed by Kenya (\$6 million). Relative to its economic size, Seychelles Fair Trading Commission had the largest budget.

³⁶ The CCSA is the most active antitrust authority in the region. In 2017–18 alone, it prohibited 12 mergers, levied about 0.01 percent of GDP in penalties, and finalized 193 enforcement cases (CCSA Annual Report 2017–18). The increase in markups and market concentration in South Africa, however, suggests that more needs to be done to stimulate competition and check anticompetitive practices.

³⁷ In some cases, the reversals correspond to the onset of conflict, which weakened the general institutional and fiscal capacity in the affected countries.

firms may operate in multiple jurisdictions to reap economies of scale, or a few large firms across countries may form cartels to limit foreign competition in their jurisdictions and exploit consumers. A case in point is that of the cement industry, where nine regional firms produce more than 50 percent of the cement, and anticompetitive practices have regional dimensions (World Bank 2016).³⁸ Limiting such regional anticompetitive behavior requires cross-country cooperation. Some agencies have initiated bilateral cooperation, including informal information sharing and signing memoranda of understanding, such as between Kenya and South Africa and among Malawi, Tanzania, and Zambia (World Bank 2016). In addition, supranational competition authorities for blocs like the Common Market for Eastern and Southern Africa (COMESA) and the West African Economic and Monetary Union (WAEMU) have started operating regional merger control regimes and facilitating investigative actions at a regional level. Nevertheless, further regional cooperation remains necessary to tackle the growing challenges from pan-regional monopolies and cartels, especially in view of greater expected trade and investment flows in the context of the African Continental Free Trade Agreement (AfCFTA).

C. Complementary Policies

Competition policies are essential but may not be enough to increase competition without complementary macroeconomic policies, notably trade, foreign investment, and fiscal policies. In the context of sub-Saharan Africa, several studies show that trade barriers—both tariff and nontariff—hurt overall competition and competitiveness (World Bank 2012; Cadot and others 2015). The African Continental Free Trade Agreement (AfCFTA), which aims to boost regional trade and economic integration, is thus likely to help improve economic competition across the region. The agreement envisions the elimination of tariffs on most goods, the liberalization of trade of key services, and the reduction of nontariff obstacles to international trade. These reforms that are expected to stimulate trade and growth in the region (IMF 2019b). In pursuing regional integration, however, the mutually reinforcing relationship among trade, investment, and competition policies should be considered: trade and investment liberalization stimulate competition, but an effective competition policy framework is needed to ensure that gains from foreign competition are realized and markets are not taken over by a few large firms engaging in unfair trading practices.

Competition is also influenced by government interventions and fiscal policies. For example, preferential tax treatment to selected firms or the selective implementation of policies can hamper competition by creating an uneven playing field. Public procurement policies that benefit certain firms—whether state or privately owned—can also hurt competition and entrench the dominant position of large firms.³⁹ Also, inefficient customs administrations

³⁸ The CCSA investigated and fined the four largest cement producers in 2008 for colluding to segment markets across countries (See CCSA Annual Report 2009–10).

³⁹ Collusive practices can infiltrate public procurement systems even if the process does not deliberately favor certain undertakings. In 2012, for example, the Zambian Competition and Consumer Protection Commission investigated irregularities in bids for a government subsidy program, alleging that two firms divided their bids to avoid competing against each other (World Bank 2016). Based on the investigations, the commission levied sanctions and the government broadened the tender process. This case illustrates the need for competition authorities to work closely with public procurement agencies to make procurement processes competition-friendly and to remain vigilant of platforms allowing competitor contact.

can adversely impact trade and foreign competition. Fiscal policies and public procurement systems thus need to be carefully designed, and customs administration systems need to be strengthened and modernized so as not to undermine competition. In cases where certain firms or sectors need to be subsidized for the provision of a public good, the costs and benefits of the incentives at play should be clearly analyzed, including their effects on economic competition.

VIII. CONCLUSION

Product market competition in sub-Saharan Africa is low relative to the rest of the world. Country-level data suggest that more than 70 percent of countries in the region are below the global median in terms competition indicators. Firm markups—directly calculated using enterprise data—corroborate the macro-level observations and suggest that, on average, markups in sub-Saharan African countries are higher than in other emerging market economies and developing countries, especially in the services sectors. In addition, a comparison of the price levels of internationally comparable products and services indicates that prices in the region are relatively higher than in other regions at a similar level of development, which can at least partly be attributed to low product market competition.

The empirical analysis suggests that an increase in competition can help to improve economic growth and welfare through increased productivity, export competitiveness and lower consumer prices. These findings are supported by firm-level evidence, which shows that market structure significantly affects firms' behavior and performance, which ultimately shapes macroeconomic outcomes. Specifically, a decline in markups is significantly associated with an increase in firm investment, exports, productivity growth, and labor's share in output. These effects are more pronounced in the manufacturing sector relative to services and tend to be stronger for domestic firms relative to foreign-owned firms.

These results remark the need to strengthen product market competition in sub-Saharan Africa. Although product market reforms were undertaken in several countries in the region in the late 1990s and early 2000s and helped to boost competition and conferred growth gains, the reform momentum has stalled in recent years. Thus, despite the almost three-fold increase in the number of countries that have enacted competition laws since 2000, progress on the ground remains limited.

As several factors affect competition, a holistic approach that encompasses the following key elements is needed to stimulate competition in the region: a) product market reforms that reduce structural and regulatory barriers to private sector participation in the goods and services markets and improve the ease of doing business; b) an effective competition policy framework, which includes an adequate competition law along with an independent, adequately funded, and staffed enforcement agency; c) complementary trade and foreign direct investment policies that bolster foreign competition and improve access to intermediate inputs; and d) carefully designed fiscal policies and procurement systems that do not distort competition by benefiting a few market players.

These policies are individually important and also mutually reinforcing. For example, trade and investment liberalization help to stimulate competition, but an effective competition

policy framework is essential to ensure that gains from foreign competition are realized by the whole economy and a few large firms do not dominate markets and implement unfair trading practices. In the same vein, development policies aimed at the advancement of certain sectors deemed as essential to boosting productivity and growth should not give way to a decline in competition and an increase in corporate market power that would impose costs on the rest of the economy and offset the potential effects of the original policies. Furthermore, in the current context of increasing regional trade and integration, cooperation among national competition authorities needs to be strengthened to tackle any anticompetitive practices of large pan-regional firms. More generally, countries need to maintain a stable and sound macroeconomic and institutional environment to attract private investment and ensure that policies to stimulate competition have traction.

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TABLES

Table 1. Sub-Saharan Africa: Country Coverage of the WEF Competition Index

Country	Years	Country	Years	Country	Years
Angola	2010–14	Guinea	2013–14	Senegal	2007–14
Botswana	2006–14	Kenya	2006–14	Sierra Leone	2012–14
Burkina Faso	2006–14	Liberia	2012–13	South Africa	2006–14
Cameroon	2006–14	Madagascar	2006–14	Tanzania	2006–14
Côte d'Ivoire	2008–14	Malawi	2008–14	Uganda	2006–14
Ethiopia	2006–14	Mali	2006–14	Zambia	2007–14
Gabon	2012–14	Mozambique	2006–14	Zimbabwe	2006–14
Gambia, The	2006–14	Namibia	2006–14		
Ghana	2008–14	Nigeria	2006–14		

Source: World Economic Forum.

Table 2. Components of the World Economic Forum's Competition Index

Competition	
Domestic Competition	Foreign Competition
Intensity of local competition	Prevalence of trade barriers
Effectiveness of anti-monopoly policy	Trade tariffs
Extent of market dominance	Prevalence of foreign ownership
Effect of taxation on incentives to invest	Business impact of rules on FDI
Total tax rate	Burden of customs procedures
Number of procedures required to start a business	Imports as a percentage of GDP
Time required to start a business	
Agricultural policy costs	

Source: World Economic Forum, 2018, Methodology and Computation of the Global Competitiveness Index 2017–18.

Table 3. Sub-Saharan Africa: Country Coverage of the BTI

Country	Years	Country	Years	Country	Years
Angola	2006–18	Ethiopia	2006–18	Niger	2006–18
Benin	2006–18	Ghana	2006–18	Nigeria	2006–18
Botswana	2006–18	Guinea	2006–18	Rwanda	2006–18
Burkina Faso	2006–18	Kenya	2006–18	Senegal	2006–18
Burundi	2006–18	Lesotho	2006–18	Sierra Leone	2006–18
Côte d'Ivoire	2006–18	Liberia	2006–18	South Africa	2006–18
Cameroon	2006–18	Madagascar	2006–18	South Sudan	2006–18
Central African Republic	2006–18	Malawi	2006–18	Tanzania	2006–18
Chad	2006–18	Mali	2006–18	Togo	2006–18
Congo, Dem. Rep.	2006–18	Mauritius	2006–18	Uganda	2006–18
Congo, Rep.	2006–18	Mozambique	2006–18	Zambia	2006–18
Eritrea	2006–18	Namibia	2006–18	Zimbabwe	2006–18

Source: Bertelsmann Stiftung Foundation.

Note: Data available every two years.

Table 4. Sub-Saharan Africa: Country Coverage of the WBES

Country	Years	Obs.	Country	Years	Obs.	Country	Years	Obs.
Angola	2006, 2010	238	Eswatini	2006, 2016	111	Namibia	2006, 2014	114
Benin	2009, 2016	82	Gambia, The	2006, 2018	92	Niger	2009, 2017	46
Botswana	2006, 2010	155	Ghana	2007, 2013	472	Nigeria	2007, 2014	1355
Burkina Faso	2009	36	Guinea	2006, 2016	140	Rwanda	2006, 2011	90
Burundi	2006, 2014	147	Guinea-Bissau	2006	47	Senegal	2007, 2014	401
Cabo Verde	2009	43	Kenya	2007, 2013, 2018	892	Sierra Leone	2017	56
Cameroon	2009, 2016	149	Lesotho	2016	61	South Africa	2007	677
Central African Republic	2011	15	Liberia	2017	61	South Sudan	2014	59
Chad	2009, 2018	96	Madagascar	2009, 2013	320	Tanzania	2006, 2013	385
Congo, Dem. Rep.	2006, 2010, 2013	344	Malawi	2009, 2014	136	Togo	2009, 2016	45
Côte d'Ivoire	2009, 2016	157	Mali	2007, 2010, 2016	385	Uganda	2006, 2013	386
Eritrea	2009	28	Mauritius	2009	100	Zambia	2007, 2013	540
Ethiopia	2011, 2015	387	Mozambique	2007, 2018	522	Zimbabwe	2011, 2016	609

Source: World Bank Enterprise Survey.

Table 5. Industry Coverage of the WBES

Industry Classification	Emerging Market Economics and Developing Countries	Sub-Saharan Africa
<u>Manufacture of:</u>		
Manufacture of basic metals	1253	168
Chemicals and chemical products	3633	550
Coke, refined petroleum products and nuclear fuel	79	20
Electrical machinery and apparatus n.e.c.	1386	94
Fabricated metal products, except machinery and equipment	3143	906
Food products and beverages	7777	2693
Furniture; manufacturing n.e.c.	1481	1175
Machinery and equipment n.e.c.	2380	196
Medical, precision and optical instruments, watches and clocks	211	7
Motor vehicles, trailers and semi-trailers	865	51
Other non-metallic mineral products	2965	450
Other transport equipment	140	20
Paper and paper products	612	111
Radio, television and communication equipment and apparatus	239	17
Rubber and plastics products	2780	333
Textiles	3340	331
Tobacco products	156	16
Wearing apparel; dressing and dyeing of fur	4506	1478
Wood, wood products, except furniture	1038	445
Luggage, handbags, footwear, etc; tanning/ dressing leather	1111	182
<u>Others</u>		
Publishing, printing and reproduction of recorded media	1077	547
Recycling	99	9
Construction	161	42
Hotels and restaurants	140	32
Retail trade, except of motor vehicles and motorcycles;	372	43
Sale, maintenance and repair of motor vehicles	83	16
Wholesale trade and commission trade, except of motor	174	47
Total	41201	9979

Source: World Bank Enterprise Survey.

Table 6. Sub-Saharan Africa: Country Coverage of the Orbis

Country	Years	Obs.	Country	Years	Obs.
Benin	2011–16	4	Mauritius	2001–17	984
Botswana	2001–17	154	Mozambique	2003–16	31
Burkina Faso	2009–17	10	Namibia	2000–17	62
Cameroon	2014–16	3	Nigeria	2001–17	1334
Cape Verde	2006–16	35	Rwanda	2010–17	12
Côte d'Ivoire	2003–17	263	Senegal	2009–17	23
Ethiopia	2011–15	4	Seychelles	2014–17	8
Gabon	2001–17	12	South Africa	2000–17	3432
Gambia	2014–15	2	Swaziland	2003–17	18
Ghana	2000–17	246	Togo	2011–17	11
Kenya	2000–17	430	Uganda	2003–17	45
Liberia	2004–11	8	Republic of Congo	2002–17	94
Malawi	2001–17	63	Zambia	2002–17	147
Mali	2012–16	5	Zimbabwe	2000–17	389

Source: Orbis Bureau van Dijk.

Note: Data shows gaps for some countries.

Table 7. Industry Coverage of the Orbis

Industry Classification	Emerging Market	Sub-Saharan
	Economies and Developing Countries	Africa
Agriculture, hunting, forestry	38994	273
Construction	184291	164
Electricity, gas and water supply	33345	143
Financial intermediation	122691	315
Hotels and restaurants	41219	249
Manufacturing	573862	3385
Mining and quarrying	26556	317
Other services	24694	158
Real estate, renting, and business activities	285924	602
Transport and storage	89038	260
Information and communication	35333	637
Wholesale/retail trade; repair of	668317	1326

Source: Orbis database.

Table 8. Variable Definitions and Data Sources

Variable	Description	Sources
Antitrust frameworks data	Data on anti-trust frameworks	World Bank (2016)
Competition frameworks in SSA	Data on competition frameworks	IMF, AFR survey
Enterprise Survey data	Diverse firm level data	World Bank
General gov. gross debt to GDP	In percent	IMF, WEO database
Global Competitiveness Index	Scores	World Economic Forum
Inflation rate	In percent	IMF, WEO database
Institutional quality	Score	ICRG
Market liberalization data	Scores	Alesina, et al (2019)
Orbis data	Diverse firm level data	ORBIS Bureau van Dijk
Population	Millions	World Bank, WDI
Private investment	In percent of GDP	IMF, WEO database
Real GDP	In billions of national currency	IMF, WEO database
Real GDP growth in trading partners	In percent	IMF, WEO database
Real GDP, PPP	In billions of international dollars	IMF, WEO database
Real price of investment goods	Index	PWT 9.0
Share of investment in GDP	In percent	World Bank, WDI
Share of population in working age	In percent	World Bank, WDI
Terms of trade	Index	IMF, WEO database
Trade openness	In percent	World Bank, WDI
Transformation Index	Scores	Bertelsmann Stiftung Foundation
Years of schooling	Years	World Bank, WDI

Table 9. List of Non-Sub-Saharan African Countries

Country	Database	Country	Database	Country	Database
Afghanistan	BTI, WBES	Guatemala	WEF, BTI, WBES, Orbis	Paraguay	WEF, BTI, WBES, Orbis
Albania	WEF, BTI, WBES, Orbis	Guyana	WBES	Peru	WEF, BTI, WBES, Orbis
Algeria	WEF, BTI, Orbis	Haiti	WEF, BTI	Philippines	WEF, BTI, WBES
Antigua and Barbuda	WBES	Honduras	WEF, BTI, WBES, Orbis	Poland	WEF, BTI, WBES
Argentina	WEF, BTI, WBES	Hong Kong SAR	WEF	Portugal	WEF
Armenia	WEF, BTI, WBES, Orbis	Hungary	WEF, BTI, WBES	Qatar	WEF, BTI
Australia	WEF	Iceland	WEF	Romania	WEF, BTI, WBES, Orbis
Austria	WEF	India	WEF, BTI, WBES	Russia	WEF, BTI, WBES
Azerbaijan	WEF, BTI, WBES, Orbis	Indonesia	WEF, BTI, WBES, Orbis	Samoa	WBES
Bahamas, The	WBES	Iran	WEF, BTI, Orbis	Saudi Arabia	WEF, BTI
Bahrain	WEF, BTI	Iraq	BTI, WBES, Orbis	Serbia	WEF, BTI, WBES, Orbis
Bangladesh	WEF, BTI, WBES, Orbis	Ireland	WEF	Singapore	WEF, BTI
Barbados	WBES	Israel	WEF	Slovak Republic	WEF, BTI
Belarus	BTI, WBES	Italy	WEF	Slovenia	WEF, BTI
Belgium	WEF	Jamaica	WEF, BTI, WBES, Orbis	Solomon Islands	WBES
Belize	WBES	Japan	WEF	Somalia	BTI
Bhutan	BTI, WBES, Orbis	Jordan	WEF, BTI, WBES, Orbis	Spain	WEF
Bolivia	BTI, WBES, Orbis	Kazakhstan	WEF, BTI, WBES, Orbis	Sri Lanka	WEF, BTI, WBES, Orbis
Bosnia and Herzegovina	BTI, WBES, Orbis	Korea	WEF, BTI	St. Kitts and Nevis	WBES
Brazil	WEF, BTI, WBES, Orbis	Kosovo	BTI, WBES, Orbis	St. Lucia	WBES
Brunei Darussalam	WEF	Kuwait	WEF, BTI	St. Vincent and the Grenadines	WBES
Bulgaria	WEF, BTI, WBES, Orbis	Kyrgyz Republic	BTI, WBES, Orbis	Sudan	BTI, WBES, Orbis
Cambodia	BTI, WBES, Orbis	Lao P.D.R.	BTI, WBES, Orbis	Suriname	WEF, WBES
Canada	WEF	Latvia	WEF, BTI	Sweden	WEF
Chile	WEF, BTI, WBES	Lebanon	WEF, BTI, WBES, Orbis	Switzerland	WEF
China	WEF, BTI, WBES	Libya	BTI	Syria	WEF, BTI
Colombia	WEF, BTI, WBES, Orbis	Lithuania	BTI	Taiwan Province of China	BTI, Orbis
Costa Rica	WEF, BTI, WBES, Orbis	Luxembourg	WEF	Tajikistan	BTI, WBES
Croatia	WEF, BTI, WBES	Malaysia	WEF, BTI, WBES	Thailand	WEF, BTI, WBES, Orbis
Cyprus	WEF	Malta	WEF	Timor-Leste, Dem. Rep. of	WBES
Czech Republic	BTI	Mauritania	BTI, WBES	Tonga	WBES
Denmark	WEF	Mexico	WEF, BTI, WBES, Orbis	Trinidad and Tobago	WEF, WBES
Djibouti	WBES	Micronesia, Fed. States of	WBES	Tunisia	WEF, BTI, WBES, Orbis
Dominica	WBES	Moldova	WEF, BTI, WBES, Orbis	Turkey	WEF, BTI, WBES, Orbis
Dominican Republic	WEF, BTI, WBES, Orbis	Mongolia	BTI, WBES, Orbis	Turkmenistan	BTI
Ecuador	WEF, BTI, WBES, Orbis	Montenegro, Rep. of	BTI, WBES	Ukraine	WEF, BTI, WBES
Egypt	WEF, BTI, WBES, Orbis	Morocco	WEF, BTI, WBES, Orbis	United Arab Emirates	WEF, BTI
El Salvador	WEF, BTI, WBES, Orbis	Myanmar	WEF, BTI, WBES, Orbis	United Kingdom	WEF
Estonia	WEF, BTI	Nepal	BTI, WBES, Orbis	United States	WEF
Fiji	WBES	Netherlands	WEF	Uruguay	WEF, BTI, WBES
Finland	WEF	New Zealand	WEF	Uzbekistan	BTI, WBES, Orbis
France	WEF	Nicaragua	WEF, BTI, WBES, Orbis	Vanuatu	WBES
FYR Macedonia	BTI, WBES, Orbis	Norway	WEF	Venezuela	WEF, BTI, WBES, Orbis
Georgia	BTI, WBES, Orbis	Oman	WEF, BTI	Vietnam	WEF, BTI, WBES, Orbis
Germany	WEF	Pakistan	WEF, BTI, WBES	Yemen	WEF, BTI, WBES, Orbis
Greece	WEF	Panama	WEF, BTI, WBES		
Grenada	WBES	Papua New Guinea	BTI, WBES, Orbis		

Source: Author's compilation.

Table 10. Sub-Saharan Africa: Firm Markup and Profitability

	By Resource Intensity	
	Markup	Profitability
Oil exporters	0.82	0.51
Other resource-intensive	0.69	0.45
Non-resource-intensive	0.64	0.42
	By Region	
	Markup	Profitability
Central Africa	0.82	0.51
East Africa	0.66	0.44
Southern Africa	0.62	0.43
West Africa	0.65	0.42
EMEDEV excl. SSA	0.57	0.39

Source: IMF staff estimates based on the World Bank Enterprise Survey.

Note: Profitability is defined as the difference between revenue and the cost of inputs relative to revenue.

Markup is defined as the log ratio of sales to the cost of inputs. EMEDEV = Emerging market economies and developing countries; SSA = sub-Saharan Africa.

Table 11. Sub-Saharan Africa: Average Sectoral Profitability and Markup Based on WBES

	Profitability	Markup
Hotels and restaurants	0.62	1.17
Wholesale trade, except of motor vehicles	0.56	1.03
Retail trade, excl. motor vehicles/cycles	0.54	1.00
Construction	0.52	0.98
Manuf. of food products and beverages	0.48	0.77
Manuf. of motor vehicles/trailers	0.48	0.76
Manuf. of electrical machinery/apparatus n.e.c.	0.48	0.76
Manuf. of basic metals	0.47	0.75
Manuf. of other non-metallic mineral products	0.47	0.74
Manuf. of chemicals/chemical products	0.47	0.73
Manuf. of rubber and plastics products	0.46	0.72
Publishing, printing	0.46	0.71
Manuf. of wood/wood products	0.46	0.71
Manuf. of furniture; manufacturing n.e.c.	0.44	0.67
Manuf. of fabricated metal products	0.44	0.66
Manuf. of wearing apparel; dressing/dyeing	0.44	0.66
Manuf. of machinery and equipment n.e.c.	0.43	0.64
Manuf. of leather products	0.42	0.63
Manuf. of textiles	0.41	0.59
Manuf. of paper and paper products	0.39	0.57
Average	0.47	0.76

Source: IMF staff estimates based on the World Bank Enterprise Survey.

Notes: Profitability is defined as the ratio of the difference between sales and cost of labor, raw materials and intermediate inputs to sales. Markup is defined as log ratio of sales to cost of labor, raw materials and intermediate inputs.

Table 12. Sub-Saharan Africa: Average Sectoral Profitability and Markup Based on Orbis

	Profitability Markup	
	Profitability	Markup
Hotels and restaurants	0.63	1.17
Other services	0.57	1.12
Information and communication	0.58	1.03
Financial intermediation	0.55	0.91
Transport and storage	0.44	0.67
Real estate, renting and business activities	0.41	0.63
Mining and quarrying	0.35	0.51
Agriculture, hunting and forestry	0.36	0.49
Manufacturing	0.36	0.48
Electricity, gas and water supply	0.33	0.43
Construction	0.27	0.34
Wholesale/retail trade; repair of motor vehicles and motorcycles	0.27	0.34

Source: IMF staff estimates based on the Orbis database.

Table 13. Sub-Saharan Africa: Average Sectoral Markup by Country Group

Industry	Oil Exporters	Other Resource-Intensive	Non-Resource-Intensive	Central	East	Southern	West
Manf. of food products and beverages							
Manf. of tobacco products							
Manf. of textiles							
Manf. of wearing apparel; dressing/dyeing of fur							
Leather tanning/dressing; leather products							
Manf. of wood/wood products							
Manf. of paper and paper products							
Publishing, printing and reproduction of recorded media							
Manf. of coke, refined petroleum products, nuclear fuel							
Manf. of chemicals and chemical products							
Manf. of rubber and plastics products							
Manf. of other non-metallic mineral products							
Manf. of basic metals							
Manf. of fabricated metal products							
Manf. of machinery and equipment n.e.c.							
Manf. of electrical machinery and apparatus n.e.c.							
Manf. of radio, television, communication equipment							
Manf. of medical, precision, optical instruments, watches							
Manf. of motor vehicles, trailers and semi-trailers							
Manf. of other transport equipment							
Manf. of furniture; manufacturing n.e.c.							
Recycling							
Construction							
Sale, maintenance, repair of motor vehicles							
Wholesale trade, excl. motor vehicles							
Retail trade, excl. motor vehicles							
Hotels and restaurants							

Markup legend

- < 0.5
- 0.5-1.0
- >1.0
- No data

Source: IMF staff estimates based on World Bank Enterprise Survey.

Notes: Markup is defined as log ratio of sales to cost of labor, raw materials, and intermediate inputs.

Table 14. Competition and Real GDP Per Capita Growth

	Real GDP Per Capita Growth					
	World	EMDEs	SSA	World	EMDEs	SSA
	(1)	(2)	(3)	(4)	(5)	(6)
Local competition	1.500*** (0.529)	1.510** (0.628)	1.035 (0.809)	1.353*** (0.502)	1.268** (0.593)	0.233 (0.589)
Real GDP per capita (lag)	-14.122*** (1.947)	-14.516*** (2.363)	-15.803*** (6.102)	-17.050*** (2.084)	-17.053*** (2.425)	-18.910*** (5.839)
Investment	14.997*** (3.495)	14.432*** (4.069)	4.270 (3.853)	12.025*** (3.138)	11.549*** (3.345)	8.364** (3.332)
Years of schooling	-0.073 (0.756)	-0.440 (1.050)	-0.311 (2.252)	-0.337 (0.745)	-0.764 (1.031)	-1.514 (1.906)
Trade openness	0.918 (1.054)	0.845 (1.273)	0.975 (2.457)	2.130* (1.189)	2.390* (1.387)	2.145 (1.685)
Terms of trade change	0.012 (0.010)	0.022* (0.011)	0.012 (0.014)	0.009 (0.011)	0.018 (0.012)	0.026* (0.013)
Trading partner growth	0.472*** (0.158)	0.337* (0.175)	-0.038 (0.209)	0.512*** (0.152)	0.402** (0.154)	-0.157 (0.263)
Institutional quality	1.712*** (0.646)	0.915 (0.828)	3.530* (1.714)	1.202** (0.600)	1.018 (0.739)	2.989* (1.529)
Public debt				-0.053*** (0.018)	-0.084*** (0.022)	-0.152*** (0.029)
Price of capital formation				0.634 (2.437)	0.598 (3.309)	7.718** (3.101)
Country/Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	971	678	179	963	670	179
R-squared	0.610	0.560	0.515	0.627	0.586	0.619
No. of Countries	121	88	25	120	87	25

Source: IMF staff estimates.

Note: Dependent variable is real GDP growth per capita (in PPP terms). Competition is the WEF's Index of Intensity of Local Competition, ranging from 1 to 7 (best). Investment, trade openness, and public debt in percent of GDP. Terms of trade change in percent. All specifications include constant, country and fixed year effects. Clustered standard errors at country level in parenthesis. ***, ** and * denote statistical significance at the 1, 5, and 10 percent levels, respectively. EMDEs = Emerging markets economics and developing countries; SSA = sub-Saharan Africa.

Table 15. Competition and Real GDP Per Capita Growth: IV-2SLS

	Lagged Values of Local Competition Intensity Index						Regional Average of Local Competition Intensity Index					
	World	EMDEs	SSA	World	EMDEs	SSA	World	EMDEs	SSA	World	EMDEs	SSA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Local competition	1.978* (1.063)	2.646** (1.311)	3.337** (1.652)	2.058** (1.038)	2.583** (1.291)	1.161 (1.751)	11.624** (5.303)	11.532 (7.933)	6.814 (4.254)	10.648** (5.242)	10.187 (7.496)	6.025 (4.112)
Real GDP per capita (lag)	-20.468*** (2.887)	-20.313*** (3.996)	-25.294*** (6.840)	-24.998*** (3.179)	-25.270*** (4.043)	-27.093*** (6.789)	-20.197*** (4.269)	-18.655*** (4.697)	-19.227** (7.771)	-21.609*** (4.037)	-19.871*** (4.189)	-20.499*** (7.589)
Investment	16.307*** (4.618)	15.891*** (5.074)	10.250* (5.426)	13.729*** (4.078)	13.402*** (4.454)	12.566*** (4.379)	12.535** (5.339)	13.750** (6.399)	2.676 (5.082)	10.512** (5.201)	11.636* (6.091)	3.485 (4.523)
Years of schooling	-0.234 (1.072)	-0.457 (1.541)	-0.247 (2.702)	-0.618 (1.051)	-0.985 (1.506)	-0.688 (2.103)	-0.387 (0.718)	-0.280 (0.869)	-0.809 (2.530)	-0.561 (0.696)	-0.540 (0.880)	-0.760 (2.228)
Trade openness	0.323 (1.419)	-0.651 (1.604)	-0.809 (3.297)	1.674 (1.332)	1.350 (1.533)	1.677 (2.380)	-3.231 (2.799)	-2.824 (3.435)	0.516 (3.165)	-2.089 (2.837)	-1.362 (3.554)	2.022 (2.383)
Terms of trade change	0.011 (0.013)	0.019 (0.015)	-0.006 (0.018)	0.002 (0.012)	0.008 (0.014)	-0.007 (0.015)	-0.007 (0.017)	-0.002 (0.024)	-0.001 (0.020)	-0.009 (0.016)	-0.003 (0.022)	0.000 (0.017)
Trading partner growth	0.365** (0.158)	0.373** (0.189)	0.065 (0.241)	0.421*** (0.155)	0.499*** (0.162)	0.014 (0.278)	0.475** (0.194)	0.225 (0.248)	-0.099 (0.248)	0.527*** (0.186)	0.309 (0.230)	-0.144 (0.255)
Institutional quality	1.360* (0.741)	-0.352 (1.043)	2.127 (2.484)	0.766 (0.702)	-0.415 (0.958)	0.742 (1.900)	0.281 (1.257)	-1.205 (2.069)	2.837 (2.326)	0.125 (1.168)	-0.896 (1.958)	2.250 (2.158)
Public debt				-0.068*** (0.025)	-0.109*** (0.037)	-0.204*** (0.063)				-0.033 (0.023)	-0.054 (0.040)	-0.105** (0.042)
Country/Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	739	512	131	733	506	131	971	678	179	963	670	179
No. of Countries	118	85	23	117	84	23	121	88	25	120	87	25

Source: IMF staff estimates

Note: Dependent variable is real GDP growth per capita (in PPP terms). Competition WEF's Index of Intensity of Local Competition, ranging from 1 to 7 (best). Investment, trade openness, and public debt in percent of GDP. Terms of trade change in percent. Columns 1-6 are estimated using the first two lags of local competition as instruments; Columns 7-12 use regional average local competition score as instrument. All specifications include a constant, and country and fixed year effects. Statistics in parentheses denote clustered standard errors at country level. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 16. Competition, Investment, Exports and Productivity

	Investment			Non-Oil Exports			Labor Productivity Growth		
	World	EMDEs	SSA	World	EMDEs	SSA	World	EMDEs	SSA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local competition	0.213 (0.772)	0.160 (0.983)	3.304* (1.859)	1.598* (0.832)	1.186 (0.884)	2.704* (1.544)	0.916** (0.452)	1.090* (0.556)	1.200 (0.934)
Real GDP per capita (lag)	4.726 (3.386)	2.552 (4.329)	-9.634 (12.182)	-8.410* (4.968)	-7.959 (6.164)	0.376 (4.461)	-1.156 (5.378)	5.413 (7.569)	22.420** (9.265)
Terms of trade change	0.018 (0.016)	0.019 (0.017)	0.038 (0.031)	-0.013 (0.013)	-0.014 (0.014)	0.009 (0.022)			
Trade openness	-1.423 (2.177)	-0.659 (2.628)	4.200 (5.162)				0.818 (1.273)	0.468 (1.534)	4.725 (2.933)
Growth (lag)	0.247*** (0.050)	0.193*** (0.049)	0.147 (0.087)						
Real interest rate	-0.066 (0.062)	-0.059 (0.070)	0.100 (0.066)						
Institutional quality	-0.220 (0.779)	-1.502 (0.917)	4.010* (2.288)	0.474*** (0.177)	0.576*** (0.201)	0.339 (0.225)	0.010 (0.559)	0.261 (0.862)	4.735* (2.311)
Trading partner growth				-7.097** (3.282)	-5.080* (2.817)	-12.863*** (3.498)			
REER (log)				-0.674 (1.261)	-0.840 (1.366)	0.099 (2.369)			
Investment							11.835*** (3.852)	13.039*** (4.594)	8.073* (4.429)
Years of schooling							0.108 (0.508)	-0.106 (0.740)	1.929 (1.989)
Country/Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,069	748	190	1,354	935	238	989	683	180
R-squared	0.738	0.738	0.762	0.965	0.935	0.935	0.510	0.494	0.516
No. of Countries	104	76	23	125	90	25	122	88	25

Source: IMF staff estimates.

Note: Dependent variable is share of investment to GDP in cols. 1-3, non-oil exports to GDP in cols. 4-6, and labor productivity growth in cols. 7-9. Competition is the World Economic Forum's Intensity of Local Competition index that ranges from 1 to 7 (best). All specifications include a constant, and country and fixed year effects. Statistics in parentheses denote clustered standard errors at country level. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. EMDEs = Emerging markets economics and developing countries; SSA = sub-Saharan Africa.

Table 17. Competition and Innovation

	Innovation			Technological Readiness		
	World	EMDEs	SSA	World	EMDEs	SSA
	(1)	(2)	(3)	(4)	(5)	(6)
Local competition	0.168*** (0.040)	0.181*** (0.048)	0.108 (0.086)	0.166*** (0.051)	0.200*** (0.054)	0.134** (0.054)
Real GDP per capita (lag)	-0.076 (0.153)	0.018 (0.200)	0.483* (0.242)	0.046 (0.212)	0.220 (0.242)	0.252 (0.300)
Trade openness	-0.060 (0.072)	-0.065 (0.090)	0.090 (0.210)	0.100 (0.113)	-0.004 (0.125)	0.003 (0.137)
Investment	0.004* (0.003)	0.004 (0.003)	0.001 (0.005)	-0.006 (0.004)	-0.006 (0.004)	-0.006 (0.004)
Institutional quality	0.018 (0.047)	0.059 (0.060)	0.055 (0.135)	-0.101* (0.060)	-0.102 (0.071)	0.121 (0.148)
Country/Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,264	868	233	1,232	858	233
R-squared	0.968	0.862	0.806	0.968	0.915	0.876
No. of Countries	123	87	25	120	86	25

Source: IMF staff estimates

Note: Dependent variable is the World Economic Forum's innovation index in cols. 1-3, and technological readiness index in cols. 4-6. Competition is the World Economic Forum's Intensity of Local Competition index that ranges from 1 to 7 (best). All specifications include a constant, and country and fixed year effects. Statistics in parentheses denote clustered standard errors at country level. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. EMDEs = Emerging markets economics and developing countries; SSA = sub-Saharan Africa.

Table 18. Competition and Price Levels

	Food & Beverages	Alcohol & Tobacco	Clothes & Footwear	Utilities (Water & Electricity)	Furniture	Health	Transport	Communication
Real GDP per capita (log)	0.145***	0.153***	0.214***	0.281***	0.186***	0.299***	0.049	0.163***
Emerging market	-0.307***	-0.248**	-0.202	-0.607***	-0.214***	-0.370***	-0.485***	-0.216
Developing excl. SSA	-0.330***	-0.431***	-0.333***	-0.657***	-0.316***	-0.318**	-0.649***	-0.470***
Sub-saharan Africa	-0.056	-0.179	-0.450***	-0.110	-0.168*	-0.024	-0.599***	-0.094
Logistical index	-0.033	0.095	-0.065	0.195	-0.048	0.344***	-0.018	-0.059
Constant	3.525***	2.908***	2.917***	1.289**	2.988***	0.420	4.436***	3.339***
Observations	141	141	141	141	141	141	141	141
R-squared	0.585	0.588	0.514	0.663	0.616	0.683	0.588	0.337
	Recreation	Education	Hotels	Miscellaneous Goods & Services	Construction	Household Consumption	Individual Consumption	Machinery & Equipment
Real GDP per capita (log)	0.172***	0.352***	0.230***	0.190***	0.073	0.151***	0.186***	-0.002
Emerging market	-0.374***	-0.693***	-0.341***	-0.362***	-0.633***	-0.395***	-0.413***	-0.053
Emerging	-0.441***	-0.637***	-0.331***	-0.450***	-0.648***	-0.485***	-0.469***	-0.096**
Sub-saharan Africa	-0.224*	-0.031	0.006	-0.431***	-0.692***	-0.296***	-0.238**	0.017
Logistical index	-0.013	0.431***	0.002	0.071	0.100	0.021	0.048	-0.034
Constant	2.988***	-0.142	2.376***	2.493***	3.974***	3.200***	2.736***	4.799***
Observations	141	141	141	141	141	141	141	141
R-squared	0.592	0.733	0.562	0.769	0.516	0.696	0.737	0.147

Source: IMF staff estimates.

Notes: Dependent variable is log of internationally comparable prices of respective items. Emerging market, developing country, and sub-Saharan Africa are (mutually exclusive) dummy variables with advanced country as the base category. All specifications include a constant. Robust standard errors are computed. ***, **, * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 19. Internationally Comparable Price Levels Across Regions

	Food & Beverages		Alcohol & Tobacco		Clothes & Footwear		Furniture		Utilities		Miscellaneous Goods & Services		Machinery & Equipment	
Local competition	-0.082**	-0.086**	0.008	0.009	-0.294***	-0.306***	-0.129***	-0.137***	0.042	0.034	-0.074	-0.082*	-0.058**	-0.062**
Real GDP per capita (log)	0.165***	0.163***	0.176***	0.169***	0.240***	0.237***	0.199***	0.197***	0.295***	0.291***	0.218***	0.217***	0.008	0.007
Emerging market	-0.320***	-0.306***	-0.209***	-0.203**	-0.279**	-0.242**	-0.230***	-0.204***	-0.588***	-0.559***	-0.359***	-0.338***	-0.072*	-0.061
Developing country	-0.344***	-0.330***	-0.399***	-0.403***	-0.392***	-0.351***	-0.346***	-0.318***	-0.665***	-0.635***	-0.459***	-0.435***	-0.114**	-0.103**
Sub-Saharan Africa	-0.107	-0.086	-0.090	-0.088	-0.581***	-0.525***	-0.203**	-0.164**	-0.024	0.019	-0.418***	-0.385***	-0.003	0.013
Logistics index	0.046	0.077	0.159*	0.174*	0.109	0.186*	0.064	0.119**	0.275***	0.337***	0.183***	0.227***	0.003	0.026
Trade openness	-0.001***	-0.001***	-0.000	-0.001	-0.001**	-0.002***	-0.001**	-0.001***	-0.001***	-0.002***	-0.001***	-0.001***	-0.000**	-0.001**
FDI to GDP		-0.002**		-0.001		-0.005***		-0.003***		-0.004		-0.003**		-0.001**
Constant	3.570***	3.511***	2.453***	2.457***	3.768***	3.605***	3.228***	3.115***	0.778	0.652	2.331***	2.233**		
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.658	0.669	0.656	0.667	0.599	0.615	0.690	0.711	0.753	0.762	0.823	0.830	0.202	0.224
	Health services		Transport		Communication		Recreation		Restaurants & Hotels		Individual Consumption		Household Consumption	
Local competition	-0.145*	-0.156**	-0.107*	-0.111*	-0.155**	-0.170**	-0.138***	-0.148***	-0.144***	-0.152***	-0.106***	-0.115***	-0.120***	-0.127***
Real GDP per capita (log)	0.326***	0.324***	0.069*	0.066	0.211***	0.213***	0.224***	0.222***	0.283***	0.284***	0.208***	0.207***	0.171***	0.169***
Emerging market	-0.390***	-0.355***	-0.496***	-0.482***	-0.257*	-0.219	-0.408***	-0.376***	-0.387***	-0.365***	-0.427***	-0.402***	-0.416***	-0.393***
Developing country	-0.319***	-0.281**	-0.687***	-0.675***	-0.503***	-0.452***	-0.469***	-0.433***	-0.357***	-0.329***	-0.491***	-0.463***	-0.509***	-0.485***
Sub-Saharan Africa	-0.057	-0.004	-0.612***	-0.592***	-0.215	-0.152	-0.252***	-0.204**	-0.044	-0.009	-0.260***	-0.222***	-0.336***	-0.302***
Logistics index	0.486***	0.560***	0.062	0.093	0.026	0.104	0.091	0.156**	0.083	0.129	0.163***	0.216***	0.132**	0.180***
Trade openness	-0.001**	-0.002***	-0.001	-0.001*	-0.001*	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***
FDI to GDP		-0.005**		-0.002		-0.005**		-0.004***		-0.003**		-0.003**		-0.003**
Constant	0.553	0.399	4.581***	4.529***	3.521***	3.329***	3.010***	2.868***	2.486***	2.377***	2.791***	2.680**		
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.711	0.720	0.625	0.634	0.402	0.416	0.692	0.710	0.641	0.647	0.799	0.812	0.756	0.770

Source: IMF staff estimates.

Notes: Dependent variable is internationally comparable price of the respective items. Emerging market, developing country, sub-Saharan Africa are (mutually exclusive) dummy variables with advanced country as the base category. All specifications include a constant. Robust standard errors are computed. ***, **, * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 20. Internationally Comparable Price Levels Across Regions in Sub-Saharan Africa

	Food & Beverages		Alcohol & Tobacco		Clothes & Footwear		Furniture		Utilities		Miscellaneous Goods & Services		Machinery & Equipment	
Local competition	-0.076*	-0.079*	0.011	0.014	-0.284***	-0.294***	-0.109**	-0.115**	0.064	0.057	-0.055	-0.061	-0.063**	-0.066**
Real GDP per capita (log)	0.155***	0.153***	0.168***	0.161***	0.227***	0.223***	0.177***	0.174***	0.270***	0.266***	0.196***	0.195***	0.010	0.008
Emerging market	-0.325***	-0.309***	-0.212***	-0.207**	-0.285***	-0.247**	-0.239***	-0.212***	-0.599***	-0.568***	-0.369***	-0.346***	-0.072	-0.061
Developing country	-0.348***	-0.332***	-0.401***	-0.406***	-0.395***	-0.354***	-0.350***	-0.321***	-0.670***	-0.639***	-0.464***	-0.438***	-0.116**	-0.104**
East Africa	-0.236***	-0.217**	-0.047	-0.050	-0.669***	-0.620***	-0.311***	-0.277**	-0.151	-0.113	-0.542***	-0.512***	-0.024	-0.010
West Africa	-0.048	-0.026	-0.199*	-0.200*	-0.600***	-0.541***	-0.280***	-0.239**	-0.103	-0.057	-0.478***	-0.442***	0.036	0.053
Central Africa	-0.023	0.009	-0.086	-0.078	-0.481***	-0.404**	-0.016	0.039	0.176	0.238	-0.234	-0.188	-0.036	-0.014
Southern Africa	-0.068	-0.046	-0.011	-0.004	-0.505***	-0.451***	-0.077	-0.038	0.119	0.163	-0.294***	-0.262***	-0.006	0.010
Logistics index	0.049	0.082	0.165*	0.178*	0.114	0.192*	0.070	0.126**	0.282***	0.347***	0.189***	0.235***	0.004	0.028
Trade openness	-0.001***	-0.001***	-0.000	-0.000	-0.001**	-0.002**	-0.001***	-0.001***	-0.001***	-0.002**	-0.001***	-0.001***	-0.000**	-0.001**
FDI to GDP		-0.002**	-0.001	-0.001	-0.005***	-0.005***	-0.004***	-0.004***	-0.004	-0.004	-0.003**	-0.003**	-0.001**	-0.001**
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.676	0.688	0.661	0.673	0.602	0.619	0.708	0.732	0.758	0.767	0.833	0.840	0.212	0.234
	Health services		Transport		Communication		Recreation		Restaurants & Hotels		Individual Consumption		Household Consumption	
Local competition	-0.113	-0.123	-0.105*	-0.107*	-0.119	-0.134*	-0.124**	-0.134***	-0.124**	-0.132**	-0.098**	-0.105***	-0.112***	-0.118***
Real GDP per capita (log)	0.300***	0.297***	0.056	0.052	0.217***	0.219***	0.213***	0.211***	0.258***	0.258***	0.193***	0.191***	0.154***	0.152***
Emerging market	-0.401***	-0.364***	-0.502***	-0.489***	-0.252*	-0.211	-0.412***	-0.380***	-0.399***	-0.374***	-0.434***	-0.408***	-0.423***	-0.400***
Developing country	-0.322***	-0.282**	-0.692***	-0.682***	-0.488***	-0.433***	-0.470***	-0.433***	-0.364***	-0.333***	-0.496***	-0.467***	-0.515***	-0.490***
East Africa	-0.198	-0.151	-0.600***	-0.586***	-0.261	-0.199	-0.368***	-0.324***	-0.284*	-0.249	-0.367***	-0.334***	-0.454***	-0.424***
West Africa	-0.146	-0.090	-0.730***	-0.713***	-0.173	-0.101	-0.229**	-0.177	-0.006	0.035	-0.268***	-0.228***	-0.346***	-0.310***
Central Africa	0.236	0.311	-0.619***	-0.593***	0.145	0.233*	-0.107	-0.039	0.175	0.227	-0.171	-0.118	-0.255**	-0.207*
Southern Africa	0.064	0.117	-0.473***	-0.455***	-0.416***	-0.356***	-0.221***	-0.174**	0.081	0.116	-0.168*	-0.131	-0.222***	-0.188**
Logistics index	0.489***	0.566***	0.073	0.102	-0.000	0.083	0.091	0.159**	0.091	0.141	0.170***	0.223***	0.141**	0.190***
Trade openness	-0.001**	-0.002***	-0.001	-0.001*	-0.001**	-0.002**	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***
FDI to GDP		-0.005**	-0.002	-0.002	-0.005**	-0.005**	-0.004***	-0.004***	-0.003**	-0.003**	-0.003***	-0.003***	-0.003***	-0.003***
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.719	0.729	0.632	0.641	0.420	0.436	0.701	0.721	0.670	0.678	0.805	0.818	0.765	0.779

Source: IMF staff estimates.

Notes: Dependent variable is internationally comparable price of the respective items. Emerging market, developing country, and sub-Saharan African regions are (mutually exclusive) dummy variables with advanced country as the base category. All specifications include a constant. Robust standard errors are computed. ***, **, * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 21. Internationally Comparable Price Levels: CFA vs Non-CFA Franc Zone

	Food & Beverages		Alcohol & Tobacco		Clothes & Footwear		Furniture		Utilities		Miscellaneous Goods & Services		Machinery & Equipment	
Local competition	-0.080**	-0.084**	0.007	0.009	-0.290***	-0.302***	-0.126***	-0.134***	0.046	0.037	-0.072	-0.080	-0.058**	-0.062**
Real GDP per capita (log)	0.169***	0.167***	0.175***	0.169***	0.248***	0.246***	0.206***	0.204***	0.302***	0.299***	0.223***	0.222***	0.008	0.007
Emerging market	-0.319***	-0.305***	-0.209***	-0.203**	-0.277**	-0.240**	-0.228***	-0.202***	-0.587***	-0.557***	-0.359***	-0.337***	-0.072*	-0.061
Developing country	-0.343***	-0.329***	-0.399***	-0.403***	-0.391***	-0.350***	-0.345***	-0.316***	-0.664***	-0.633***	-0.459***	-0.434***	-0.114**	-0.103**
Sub-Saharan Africa	-0.126*	-0.106	-0.089	-0.085	-0.621***	-0.565***	-0.237**	-0.198**	-0.059	-0.015	-0.441***	-0.408***	-0.001	0.015
CFA franc zone	0.077	0.077	-0.007	-0.009	-0.007	-0.009	0.134*	0.135*	0.136	0.138	0.154	0.156	-0.006	-0.005
Logistics index	0.039	0.070	0.160*	0.175*	0.160*	0.175*	0.052	0.107*	0.262**	0.326***	0.070	0.116	0.004	0.027
Trade openness	-0.001***	-0.001***	-0.000	-0.000	-0.000	-0.000	-0.001***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***	-0.000**	-0.001**
FDI to GDP		-0.002**	-0.001	-0.001	-0.001	-0.001	-0.004***	-0.004***	-0.004	-0.004	-0.003**	-0.003**	-0.001**	-0.001**
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.661	0.672	0.656	0.667	0.656	0.667	0.696	0.718	0.755	0.763	0.646	0.652	0.202	0.225
	Health services		Transport		Communication		Recreation		Restaurants & Hotels		Individual Consumption		Household Consumption	
Local competition	-0.140*	-0.151*	-0.107*	-0.110*	-0.146**	-0.161**	-0.134**	-0.144***	-0.140**	-0.149***	-0.104***	-0.112***	-0.118***	-0.125***
Real GDP per capita (log)	0.337***	0.335***	0.070*	0.067	0.229***	0.232***	0.233***	0.232***	0.292***	0.292***	0.213***	0.211***	0.175***	0.173***
Emerging market	-0.388***	-0.353***	-0.496***	-0.482***	-0.254*	-0.214	-0.406***	-0.374***	-0.386***	-0.363***	-0.426***	-0.401***	-0.415***	-0.392***
Developing country	-0.318***	-0.279**	-0.687***	-0.675***	-0.501***	-0.449***	-0.468***	-0.431***	-0.356***	-0.327***	-0.490***	-0.462***	-0.509***	-0.484***
Sub-Saharan Africa	-0.110	-0.057	-0.614***	-0.594***	-0.302**	-0.239*	-0.296***	-0.248***	-0.083	-0.047	-0.283***	-0.245***	-0.356***	-0.322***
CA franc zone	0.208*	0.211*	0.007	0.008	0.346***	0.350***	0.175**	0.177**	0.154	0.156	0.088	0.090	0.078	0.079
Logistics index	0.468***	0.542***	0.062	0.093	-0.005	0.075	0.076	0.141*	0.070	0.116	0.155***	0.208***	0.125**	0.174***
Trade openness	-0.001**	-0.002***	-0.001	-0.001*	-0.001*	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.001***	-0.001***
FDI to GDP		-0.005**	-0.002	-0.002	-0.005**	-0.005**	-0.004***	-0.004***	-0.003**	-0.003**	-0.003***	-0.003***	-0.003***	-0.003***
Observations	122	121	122	121	122	121	122	121	122	121	122	121	122	121
R-squared	0.714	0.724	0.625	0.634	0.422	0.437	0.699	0.718	0.646	0.652	0.801	0.813	0.758	0.772

Source: IMF staff estimates.

Notes: Dependent variable is internationally comparable price of the respective items. Emerging market, developing country, sub-Saharan Africa are (mutually exclusive) dummy variables with advanced country as the base category. CFA franc zone is a dummy variable, which equals to one if the country is part of the CFA franc zone and zero otherwise. All specifications include a constant. Robust standard errors are computed. ***, **, * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

Table 22. Competition and Firm Behavior. World Bank Enterprise Survey Data

	Investment		Exports		Labor Share	
	EMDEs	SSA	EMDEs	SSA	EMDEs	SSA
	(1)	(2)	(3)	(4)	(5)	(6)
Markup	-0.724*** (0.031)	-0.539*** (0.081)	-0.168*** (0.008)	-0.053*** (0.010)	-1.236*** (0.010)	-1.311*** (0.028)
Log real GDP per capita (PPP)	0.335 (0.221)	0.107 (0.385)	-0.114* (0.059)	-0.043 (0.043)	0.125** (0.049)	0.223** (0.088)
No. of competitors	-0.015 (0.027)	0.026 (0.062)	-0.124*** (0.006)	-0.027*** (0.008)	-0.011 (0.008)	0.003 (0.018)
Size (in logs)	-0.193*** (0.010)	-0.116*** (0.031)	0.142*** (0.003)	0.078*** (0.005)	-0.000 (0.000)	-0.000 (0.000)
Direct exports (in pct. of sales)	-0.041 (0.052)	-0.527*** (0.199)			-0.156*** (0.016)	-0.078 (0.064)
Foreign ownership	-0.060 (0.046)	0.062 (0.096)	0.264*** (0.019)	0.113*** (0.020)	-0.127*** (0.016)	-0.173*** (0.033)
Private ownership	0.196** (0.083)	0.477** (0.228)	-0.068*** (0.026)	-0.051** (0.021)	-0.012 (0.023)	0.000 (0.054)
Age	-0.004*** (0.001)	-0.006** (0.002)	-0.002*** (0.000)	-0.001 (0.000)	-0.001*** (0.000)	-0.001 (0.001)
Constant	-4.134** (1.964)	-3.645 (3.312)	0.840* (0.495)	0.243 (0.372)	-1.868*** (0.437)	-2.167*** (0.762)
Observations	17,933	3,598	41,956	8,110	41,956	8,110
R-squared	0.117	0.068	0.158	0.164	0.408	0.407
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Source: IMF staff estimates.

Notes: Dependent variable in cols. (1)-(2) is log of equipment purchase to value added; in cols. (3)-(4) is log of exports to value added; in cols. (5)-(6) is log of labor cost to value added. Markup is log of sales to cost of inputs. No. of competitors is a binary variable equal to one if the no. of competitors reported by the firm is less than 5 and zero otherwise. Foreign and private ownership are binary variables equal to one if foreign and private ownership of the firm is greater than 50 percent, respectively, and zero otherwise. All specifications include log real GDP per capita, a constant, and industry, year, and country fixed effects. Statistics in parentheses are robust standard errors. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. EMEDEV=Emerging market economics and developing countries; SSA=Sub-Saharan Africa.

Table 23. Emerging and Developing Countries: Competition and Firm Behavior. Orbis Data

	Investment			Labor Share			Labor Productivity Growth			Total Factor Productivity Growth		
	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Markup	-1.275*** (0.094)	-1.313*** (0.095)	-1.421*** (0.129)	-0.580*** (0.037)	-0.587*** (0.037)	-0.687*** (0.083)	-0.829*** (0.080)	-0.841*** (0.081)	-0.828*** (0.155)	-0.832*** (0.015)	-0.827*** (0.015)	-0.728*** (0.020)
Firm size	0.136*** (0.037)	0.141*** (0.039)	0.156*** (0.048)	0.151*** (0.022)	0.161*** (0.022)	0.066* (0.037)	0.447*** (0.039)	0.473*** (0.043)	0.335*** (0.051)	0.007** (0.003)	0.007** (0.003)	0.004 (0.004)
Age	-0.049** (0.020)	-0.050** (0.020)	-0.047** (0.020)	0.125*** (0.009)	0.122*** (0.009)	0.110*** (0.011)	0.043*** (0.015)	0.042*** (0.015)	0.040*** (0.015)	-0.021** (0.009)	-0.021** (0.009)	-0.025*** (0.008)
Log Real GDP per capita	0.834*** (0.267)	0.854*** (0.272)	0.837*** (0.280)	-0.187 (0.146)	-0.103 (0.149)	0.225 (0.161)	-0.092 (0.211)	-0.060 (0.218)	-0.209 (0.246)	0.156*** (0.039)	0.155*** (0.039)	0.175*** (0.038)
Domestic ownership	0.066 (0.785)	0.070 (0.783)	0.122 (0.778)	-0.095 (0.536)	-0.087 (0.536)	-0.047 (0.542)	-0.130 (0.205)	-0.121 (0.205)	-0.201 (0.213)	-0.015 (0.041)	-0.007 (0.043)	0.006 (0.039)
Real GDP growth			0.014*** (0.005)			-0.006** (0.003)			-0.002 (0.004)			-0.001* (0.001)
Trade openness			-0.004 (0.003)			-0.008*** (0.002)			-0.001 (0.002)			-0.000 (0.000)
Institutional quality			-0.073 (0.077)			-0.045 (0.051)			0.148** (0.075)			-0.026** (0.011)
Labor productivity (lag)							-0.051** (0.023)	-0.047** (0.024)	-0.076** (0.037)			
Total factor productivity (lag)										-0.063*** (0.011)	-0.063*** (0.012)	-0.014 (0.016)
Observations	19,422	19,018	9,913	33,563	32,951	13,206	12,736	12,477	5,433	105,760	101,353	73,095
R-squared	0.048	0.048	0.073	0.107	0.108	0.110	0.122	0.124	0.115	0.358	0.356	0.356
No. of firms	7,769	7,637	3,051	11,296	11,124	3,529	5,281	5,200	1,932	68,368	64,491	52,542
Firm/country/year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other macro control variables	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Source: IMF staff estimates.

Notes: Dependent variable is (log) investment to value added in cols. (1)-(3), (log) share of labor in value added in cols. (4)-(6), labor productivity growth in cols. (7)-(9), and total factor productivity growth in cols. (10)-(12). Lagged values of markup and firm-level characteristics are used in cols. (7)-(12) to mitigate potential reverse causality concerns. Clustered standard errors at the firm level are reported in parentheses. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 24. Sub-Saharan Africa: Competition and Firm Behavior. Orbis Data

	Investment			Labor Share			Labor Productivity Growth			Total Factor Productivity Growth		
	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector	All firms	Excl. financial sector	Excl. financial sector
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Markup	-0.844*** (0.19)	-1.077*** (0.27)	-1.037*** (0.27)	-0.699*** (0.14)	-0.848*** (0.20)	-0.865*** (0.21)	-0.304 (0.21)	-0.317 (0.20)	-0.333 (0.20)	-0.659*** (0.05)	-0.562*** (0.07)	-0.562*** (0.08)
Age	-0.0235 (0.02)	-0.0282 (0.03)	-0.0255 (0.03)	0.106*** (0.02)	0.0799*** (0.02)	0.0769*** (0.02)	0.0557*** (0.01)	0.0442*** (0.01)	0.0403** (0.01)	-0.0383*** (0.00)	-0.0345*** (0.01)	-0.0430*** (0.01)
Log real GDP per capita	0.554 (0.48)	0.762 (0.60)	0.778 (0.80)	0.307 (0.30)	1.034* (0.40)	0.579 (0.42)	-0.517 (0.61)	-0.246 (0.55)	0.0258 (0.54)	0.0436 (0.07)	0.00669 (0.12)	0.22 (0.22)
Firm size		0.275*** (0.07)	0.265*** (0.07)		0.0909 (0.06)	0.0999 (0.06)		0.261* (0.11)	0.263* (0.10)		0.0165 (0.01)	0.0186 (0.01)
Real GDP growth			0.0126 (0.01)			-0.0175* (0.01)			-0.0111 (0.01)			-0.00996* (0.00)
Trade openness			-0.00563 (0.01)			-0.00399 (0.01)			-0.00542 (0.01)			0.00112 (0.00)
Institutional quality			0.0245 (0.19)			0.113 (0.12)			-0.0938 (0.16)			-0.0817 (0.05)
Labor productivity (lag)							-0.186** (0.07)	-0.172* (0.07)	-0.165* (0.07)			
Total factor productivity (lag)										-0.0116 (0.04)	-0.0509 (0.08)	-0.0604 (0.08)
Observations	3,192	1,923	1,879	4,105	2,376	2,320	1,123	1,123	1,104	4,496	2,209	2,159
R-squared	0.037	0.072	0.074	0.076	0.069	0.077	0.147	0.158	0.157	0.288	0.27	0.282
Firm/country/year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other macro control variables	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes

Source: IMF staff estimates.

Notes: Dependent variable is (log) investment to value added in cols. (1)-(3), (log) share of labor in value added in cols. (4)-(6), labor productivity growth in cols. (7)-(9), and total factor productivity growth in cols. (10)-(12). Lagged values of markup and firm-level characteristics are used in cols. (7)-(12) to mitigate potential reverse causality concerns. Clustered standard errors at the firm level are reported in parentheses. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 25. Sub-Saharan Africa: Competition and Firm Behavior. Orbis Data

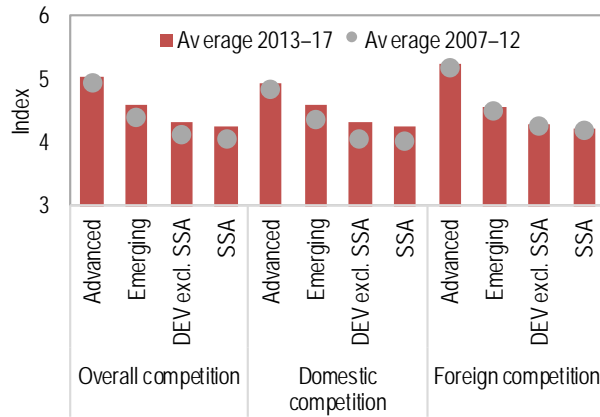
	Investment		Labor Share		Labor productivity		Total Factor Productivity	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Markup	-2.353*** (0.19)	-2.420*** (0.21)	-1.017*** (0.13)	-1.196*** (0.18)	-1.381*** (0.19)	-1.556*** (0.23)	-0.648*** (0.03)	-0.614*** (0.03)
Firm size	0.170* (0.07)	0.174* (0.07)	0.0755 (0.05)	0.0338 (0.06)	0.371*** (0.07)	0.349*** (0.07)	0.00938* (0.00)	0.00764 (0.00)
Age	-0.868 (0.57)	-1.148 (1.55)	-0.417 (0.44)	-0.726 (0.72)	-0.0276 (0.11)	-0.39 (1.02)	0.038 (0.03)	-0.0737 (0.17)
Log Real GDP per capita	58.93 (40.12)	94.06 (116.00)	-25.21 (32.17)	12.43 (9.28)	1.36 (7.23)	20.68 (66.40)	-3.298 (1.68)	3.855 (10.59)
Domestic ownership	-0.203 (0.75)	-0.199 (0.74)	0.584 (0.81)	0.569 (0.82)	0.536*** (0.06)	0.530*** (0.06)	0.0927** (0.03)	0.0893** (0.03)
Real GDP growth		-0.468 (0.89)		0.738 (0.75)		-0.006 (0.17)		0.0207 (0.01)
Trade openness		-0.688 (0.95)		0.0516 (0.10)		-0.261 (0.76)		-0.0425 (0.05)
Institutional quality		19.74 (16.29)		29.52 (30.92)		-1.34 (3.70)		0.0203 (0.45)
Labor productivity (lag)					-0.044 (0.04)	-0.0253 (0.05)		-0.0594** (0.05)
Total factor productivity (lag)							-0.0229	-0.0249
Observations	6253	5389	8460	6821	3582	2970	24719	23036
R-squared	0.111	0.118	0.17	0.174	0.122	0.122	0.336	0.359
Firm/country/year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry x Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: IMF staff estimates.

Notes: Dependent variable is (log) investment to value added in cols. (1)-(2), (log) share of labor in value added in cols. (3)-(4), labor productivity growth in cols. (5)-(6), and total factor productivity growth in cols. (7)-(8). Sample is restricted to manufacturing firms in the Orbis database. Lagged values of markup and firm-level characteristics are used in cols. (5)-(8) to mitigate potential reverse causality concerns. Clustered standard errors at the firm level are reported in parentheses. ***, ** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

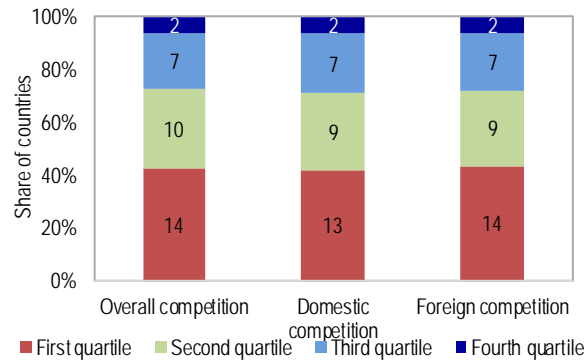
FIGURES

Figure 1. Selected Groups of Countries: Product Market Competition, 2007–17



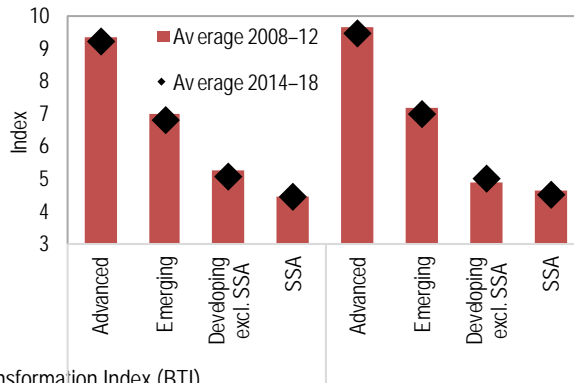
Source: World Economic Forum, Global Competitiveness Index.
 Note: Index ranges from 1 to 7, with higher values indicating greater competition; DEV = Developing countries; SSA = sub-Saharan Africa.

Figure 2. Sub-Saharan Africa: Comparison with Quartiles of Global Distribution, 2007–17



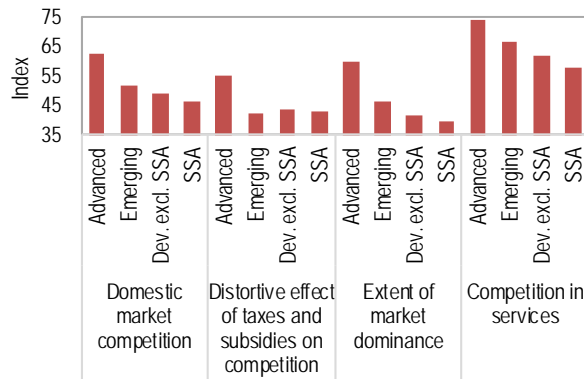
Source: World Economic Forum, Global Competitiveness Index.
 Note: Figures in the bars indicate the number of countries in a specific quartile.

Figure 3. Selected Groups of Countries: Competition Indicators (BTI), 2008–18



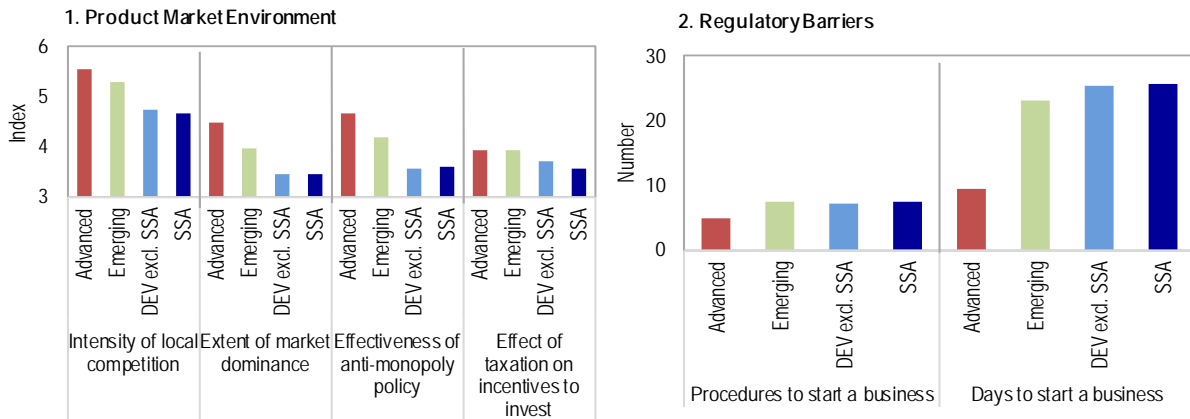
Source: Bertelsmann Stiftung Transformation Index (BTI).
 Note: Higher values indicate greater competition. The difference between the average in sub-Saharan Africa and advanced and emerging market economies is statistically significant in both periods. DEV = Developing countries; SSA = sub-Saharan Africa.

Figure 4. Selected Groups of Countries: Revised WEF Competition Indicators, 2018



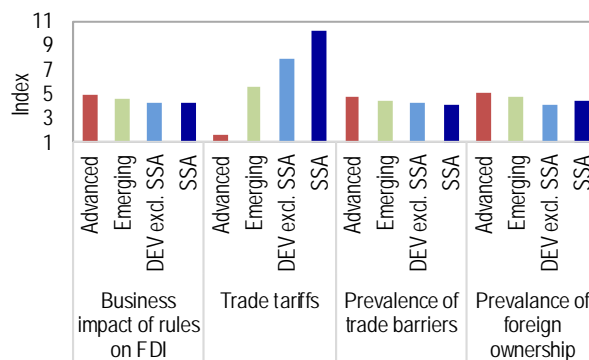
Source: World Economic Forum. Global Competitiveness Index 4.0.
 Note: Higher values indicate greater competition. DEV = Developing countries; SSA = sub-Saharan Africa.

Figure 5. Selected Groups of Countries: Domestic Competition Indicators, 2013–17



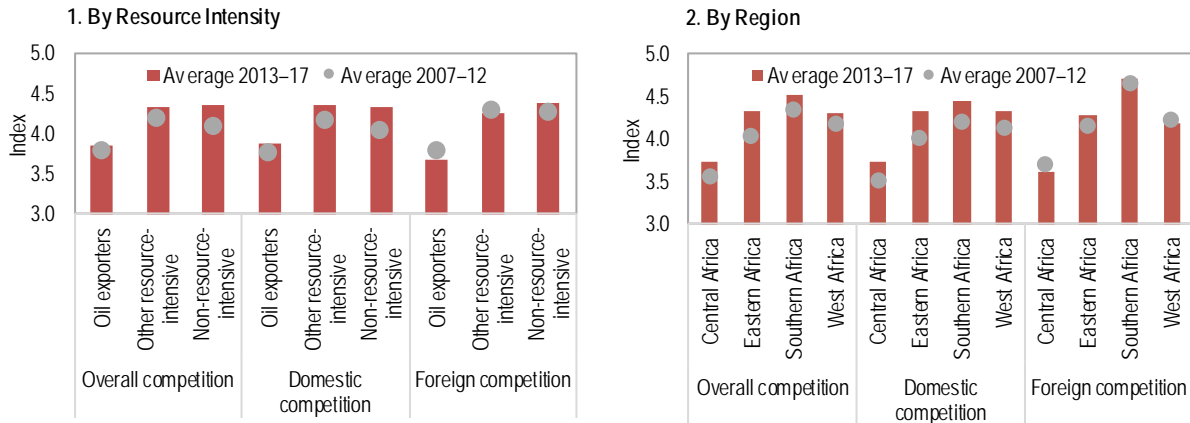
Source: World Economic Forum, Global Competitiveness Index.
 Note: In panel 1 index ranges from 1 to 7, with higher values indicating better performance. In panel 2 higher values indicate low ease of doing business. DEV = Developing countries; SSA = sub-Saharan Africa.

Figure 6. Selected Groups of Countries: Foreign Competition Indicators, 2013–17



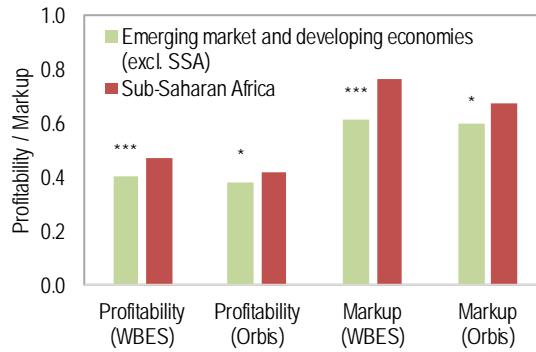
Source: World Economic Forum, Global Competitiveness Index.
 Note: Higher values indicate low business impact of rules on FDI, high prevalence of foreign ownership, low non-tariff trade barriers, and higher trade tariffs. DEV = Developing countries; SSA = sub-Saharan Africa.

Figure 7. Sub-Saharan Africa: Product Market Competition, 2007–17



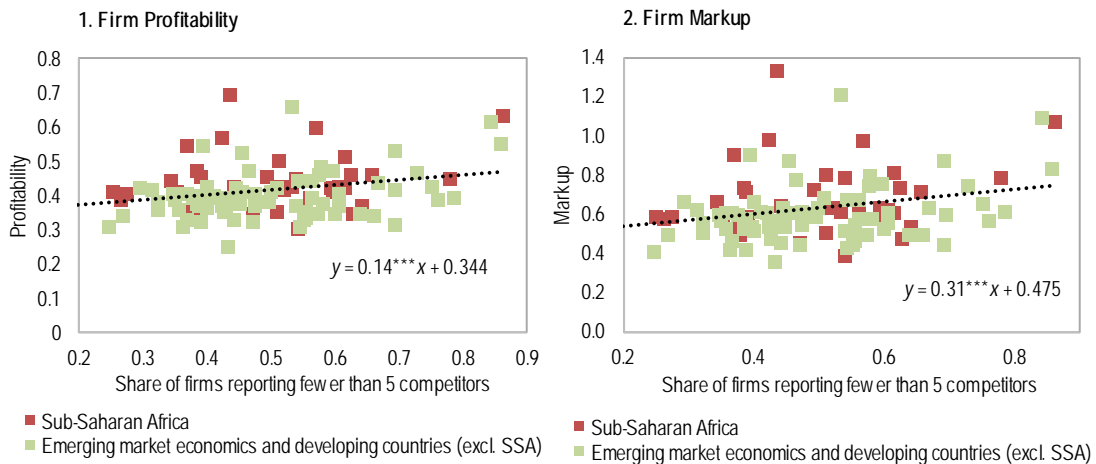
Source: World Economic Forum, Global Competitiveness Index.
 Note: Index ranges from 1 to 7, with higher values indicating greater competition.

Figure 8. Selected Groups of Countries: Firm-Level Competition Indicators



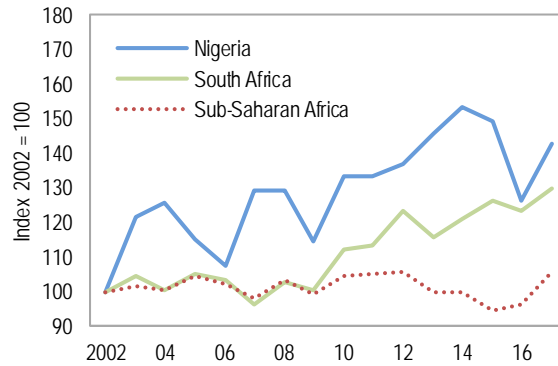
Sources: IMF staff estimates based on the World Bank Enterprise Survey (WBES) and Orbis databases.
 Notes: Profitability is defined as the difference between revenue and the cost of inputs relative to revenue. Markup is defined as the log ratio of sales to the cost of inputs using the WBES database, and as the log ratio of revenue turnover to costs using the Orbis database.
 *** and * indicate statistically significant difference in the mean values between the two groups at the 1 and 10 percent levels, respectively. SSA = sub-Saharan Africa.

Figure 9. Selected Groups of Countries: Competition Indicators and Number of Competitors



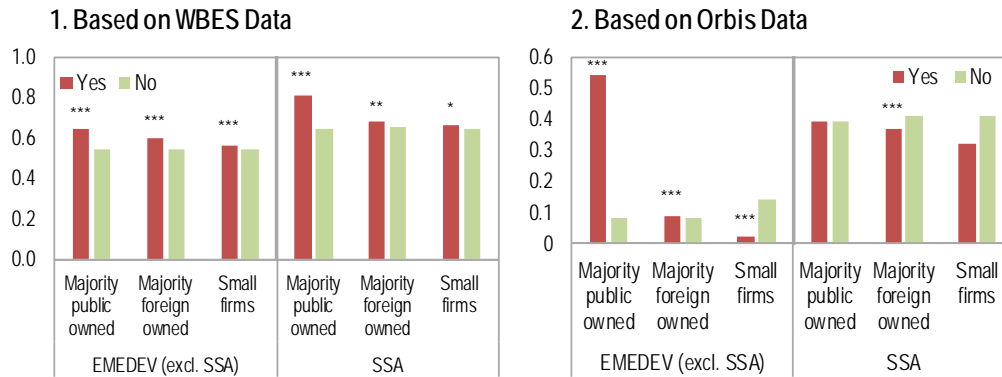
Source: IMF staff estimates based on World Bank Enterprise Survey data.

Figure 10. Sub-Saharan Africa: Firm Markups, 2002–17



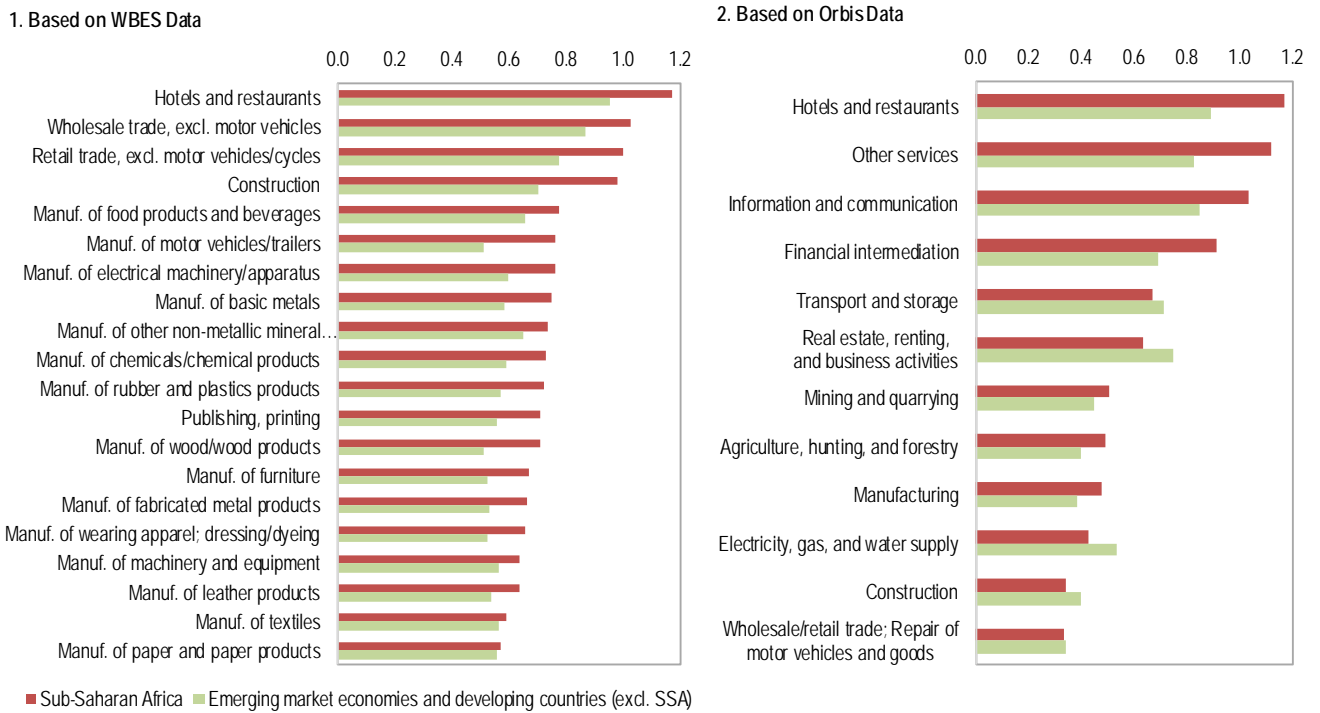
Source: IMF staff estimates based on the Orbis database.
 Note: The series show averages over all firms for each year.

Figure 11. Selected Groups of Countries: Markup by Firm type



Source: IMF staff estimates.
 Notes: Markup is defined as log ratio of sales to cost in panel 1. and as the log ratio of turnover to costs in panel 2. Small firms are defined as those with number of employees less than 20. Majority public and foreign owned firms are defined as those with public and foreign ownership of more than 50 percent, respectively. ***,** and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively. EMEDEV (excl. SSA) = Emerging markets economics and developing countries excluding sub-Saharan Africa.

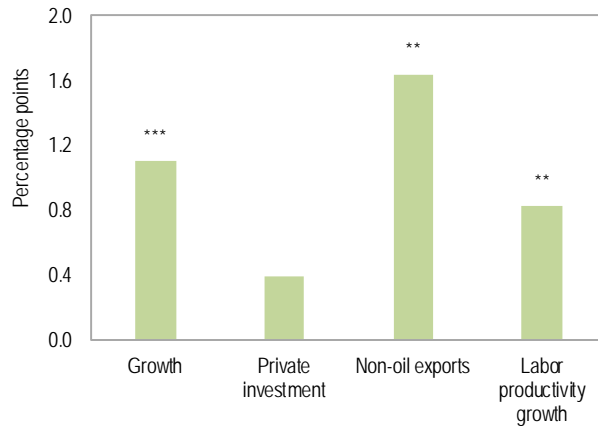
Figure 12. Selected Groups of Countries: Firm Markups by Sector



Source: IMF staff estimates.

Notes: Markup is defined as the log of the ratio of sales to cost in panel 1 and the log of the ratio of revenue turnover to costs in panel 2. Manuf. = Manufacturing; WBES = World Bank Enterprise Survey; SSA = sub-Saharan Africa.

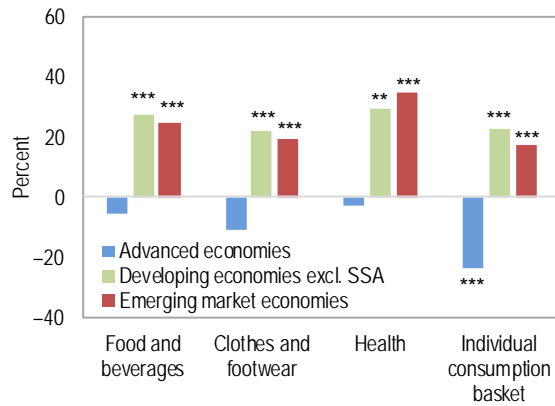
Figure 13. Sub-Saharan Africa: Competition and Macroeconomic Performance



Source: IMF staff estimates.

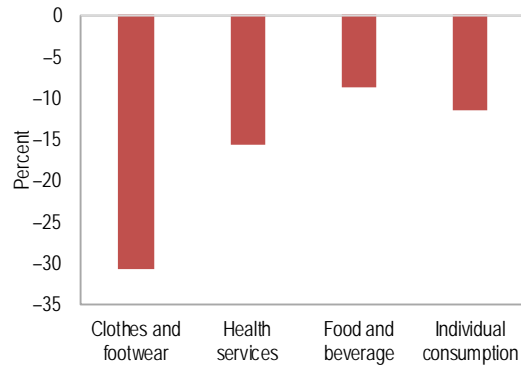
Note: Statistics are based on the regressions results reported in Annex Table 2.13 (col. 1), Annex Table 2.15 (cols. 1, 4, and 7), and represent the change in the respective macroeconomic variables for an increase in the World Economic Forum's local competition intensity index from the median for sub-Saharan African countries to the top decile of the global distribution. ***, ** and * indicate statistical significance at the 1 and 5 percent levels, respectively.

Figure 14. Sub-Saharan Africa: Price Differentials with Other Country Groups



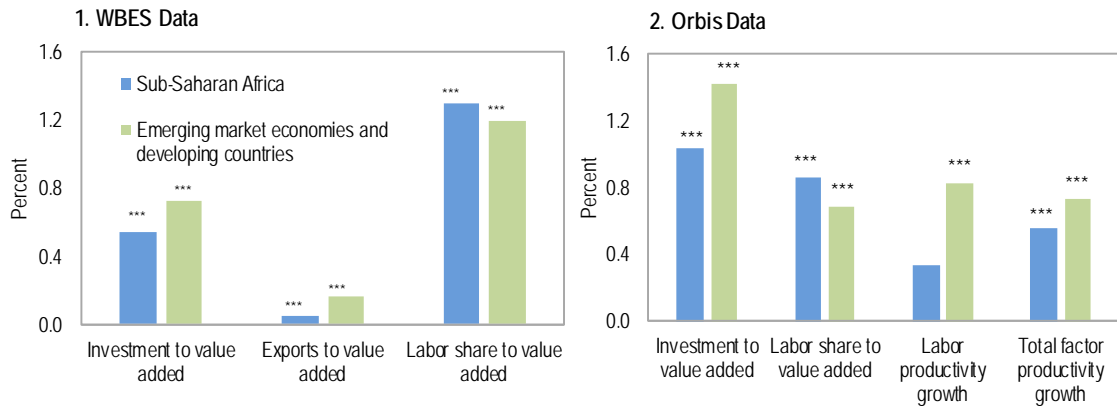
Sources: IMF staff calculations based on World Bank, International Comparison Program data..
 Note: The bars show the average difference in price levels between sub-Saharan Africa and other country groups. ***, ** denote statistically significant differences at 1 and 5 percent levels, respectively. SSA = sub-Saharan Africa.

Figure 15. Sub-Saharan Africa: Impact of Increased Local Competition on Prices



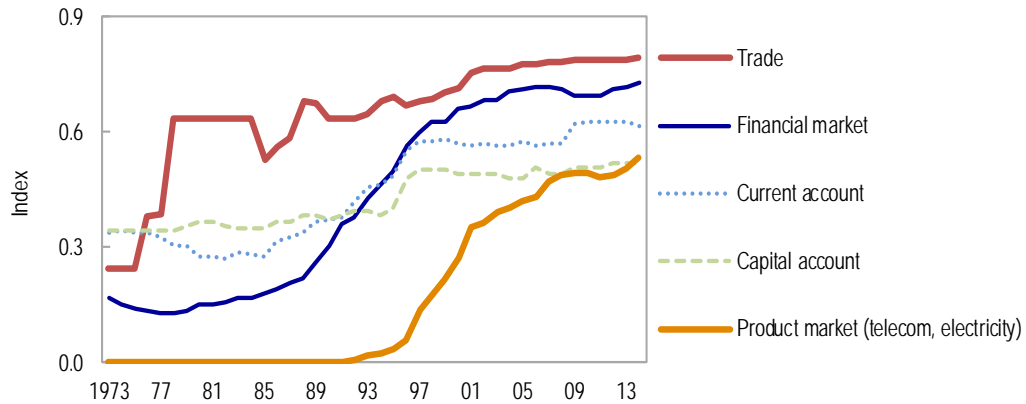
Source: IMF staff calculations, based on data from the World Bank International Comparison Program.
 Note: The bars show the effect of an increase in the indicator of local competition intensity from the median in sub-Saharan Africa to the top decile of the world distribution.

Figure 16. Estimated Impact of Markups on Firm Performance



Source: IMF staff estimates.
 Notes: Bars show the estimated impact of a 1 percent decline in firm markups, defined as the log of the ratio of sales to cost in panel 1 and the log of output elasticity to input relative to the expenditure share of the input in sales in panel 2. Emerging market economies and developing countries include sub-Saharan Africa. *** indicates statistical significance at the 1 percent level. WBES = World Bank Enterprise Survey.

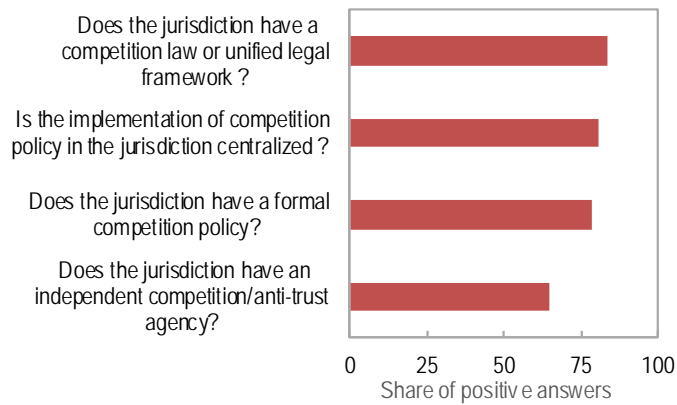
Figure 17. Sub-Saharan Africa: Structural Reforms, 1973–2014



Source: Alesina and others, forthcoming.

Notes: Average across 14 countries for which data is available. Higher values indicate greater liberalization.

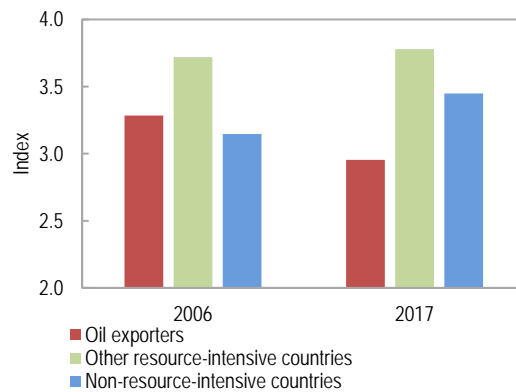
Figure 18. Sub-Saharan Africa: Competition Frameworks



Source: IMF staff estimates.

Note: The scores denote the percentage of respondent authorities who answered yes to the question. Total respondents equal to 37.

Figure 19. Sub-Saharan Africa: Anti-Monopoly Enforcement



Source: World Economic Forum.

Note: Index ranges from 1 to 7, with higher values indicating more comprehensive anti-monopoly policy enforcement.