3. Inequality and Economic Outcomes in Sub-Saharan Africa

Sub-Saharan Africa has among the highest levels of inequality—both income and gender—in the world, even after accounting for the lower levels of per capita income in the region. With growing international evidence that such inequality can impede macroeconomic stability and growth (Box 3.1), this chapter considers factors behind high levels of inequality and how they differ from the experience in other parts of the world, and discusses policy options for reducing inequality and raising sustainable growth.

The main findings are:

- Income inequality is higher in sub-Saharan Africa than in other regions (the only exception is Latin America and the Caribbean). Gender inequality is also higher in sub-Saharan Africa than elsewhere.

- The last 15 years of high growth in sub-Saharan Africa have seen a small decline in the level of gender inequality, but income inequality has remained broadly unchanged.

- Interestingly, the relationship between income inequality and the per capita income level in sub-Saharan Africa is quite a bit different from much of the rest of the world. Inequality seems markedly higher at all levels of income in the region than elsewhere. And the findings do not point to gender inequality as being the main driver of this result.

- Further progress in reducing income and gender inequality could deliver significant growth dividends. The analysis suggests that annual economic growth in sub-Saharan African countries could be higher by close to 1 percentage point if inequality were reduced to the

levels observed in the fast-growing Association of Southeast Asian Nations (ASEAN), but with differences across subgroups:

  ◊ Compared with the ASEAN countries, in the region's low-income countries and fragile states, the drag on growth is stronger from infrastructure and educational attainment gaps and, to a lesser degree, from the prevailing higher gender inequality. This suggests that addressing infrastructure and human capital gaps remain the appropriate focus of policies to raise growth.

  ◊ In the region's middle-income countries, our findings suggest that there could be a growth dividend for policies directly aimed at reducing inequality. In this country group, we find that the growth payoff from reducing income and gender inequality to the levels observed in the ASEAN countries is higher than that of closing the infrastructure gap with this same group of countries.

  ◊ For the region's oil exporters, legal gender-related restrictions stand out as the most important factor explaining the growth differential with the ASEAN countries following improvements in infrastructure.

- While the high levels of income inequality in the region appear to be partly driven by the structural features of sub-Saharan African countries, such as the dependence of some of the countries on oil exports, the evidence also points to the importance of policies that influence the access of low-income households and women to opportunities in education and health.

- Carefully designed fiscal and financial sector policies and the removal of gender-based legal restrictions could reduce inequality. Fiscal policy should focus on redressing the regressivity of taxes and expenditures, while scaling up well-targeted expenditures on health care and

education. To enhance the efficiency of social spending, across-the-board subsidies should be replaced by targeted social transfer schemes. On the financial front, greater emphasis should be placed on complementing financial deepening with initiatives aimed at improving financial inclusion, including for women. Removal of legal restrictions on women's participation in economic activities would contribute to economic development and growth.

SUB-SAHARAN AFRICAN TRENDS IN INEQUALITY

Poverty on the Decline, but Income and Gender Inequality Persist

Sub-Saharan African poverty rates, income inequality, and gender inequality remain among the highest in the world. Although there has been some decline in poverty in the last 15 years, sub-Saharan Africa continues to have the world's highest poverty levels (Figure 3.1).[1] Alongside this, however, it has the second highest level of income inequality, after Latin America and the Caribbean (Figure 3.2).[2, 3] Within the region, income inequality is highest among middle-income and oil-exporting countries, such as South Africa and Angola. Sub-Saharan Africa also remains one of the regions with the highest gender inequality as measured by the United Nations' gender inequality index (GII), just behind the Middle East and North Africa, with very high levels observed in Niger, Chad, and Mali (Figure 3.3).[4]

The evolution of income inequality during the recent years of high growth in the region is not particularly encouraging. Overall, it appears to have remained broadly unchanged, although there is quite a bit of variation across country experiences (Figure 3.4).[5, 6] Countries such as Sierra Leone, Niger, and Lesotho experienced significant declines in income inequality. However, in one-third of countries for which data are available, such as Rwanda, Uganda and Ghana, growth episodes were associated with increases in income inequality as measured by the net Gini during 1995–2011. While the available data give an indication of the trends in the region, they should be interpreted carefully, since household surveys in sub-Saharan Africa are often not comparable.[7]

Gender inequality has also declined more slowly than in other regions, despite improvement in recent years thanks to shrinking gender gaps in education, improved health outcomes, and significant progress in eliminating restrictions on women's economic rights.

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[1] The World Bank has just released new poverty estimates based on 2011 purchasing power parities (Beegle and others, forthcoming). However, these have not been incorporated in this chapter. As a result, poverty rates referred to here may be subject to revision.

[2] The findings on the regional trends in inequality are broadly robust to the use of inequality estimates based on household survey data.

[3] Sala-i-Martin (2002) shows that poverty and inequality increased in sub-Saharan Africa between 1970 and 1998.

[4] The GII captures key dimensions of outcome- and opportunity-based gender inequality: the labor market (the gap between male and female labor force participation rates); education (the difference between secondary and higher education rates for men and women); empowerment (the share of female members of parliament); and health (the

maternal mortality ratio and adolescent fertility). The index ranges between 0 (equal) and 100 (unequal). Sub-Saharan Africa also scores high on gender inequality based on a gender development index that was recently put together by the United Nations Development Programme and focuses on gender gaps in health, education and income outcomes. The empirical analysis in the chapter is based on the GII because of its availability for a longer time series.

[5] A recent Pew Research Center survey (Kochhar 2015) suggests that most of the movement out of poverty in sub-Saharan Africa was to income levels just above the poverty line and few countries experienced a substantial expansion of the "middle class."

[6] Other studies, including Beegle and others (forthcoming) and Bhorat and others (2015), also note that on average, income inequality has not declined in the region over the last decades.

[7] The Standardized World Income Inequality Database (SWIID) used in this chapter incorporates a number of data sources to maximize the comparability and coverage across countries over time. Its disadvantage is that missing observations are generated via model-based multiple imputation estimates. However, the presented trends are broadly consistent with those using data of higher quality available for a smaller set of countries. Other measures of inequality, such as the ratio of the top 20 to the bottom 40 percentiles of the income distribution, also confirm that inequality, while having declined marginally, remains high in sub-Saharan Africa and Latin America and the Caribbean.

The high level of income inequality in sub-Saharan Africa begs the question of what roles, if any, the generally lower level of income and higher level of gender inequality might be playing. It appears, in fact, that factors well beyond these are actually at work, as described below.

- Considering the link between the income levels and income inequality, Simon Kuznets (1955) famously hypothesized an inverse "U" shaped relationship between the two variables, according to which levels of inequality are low at earlier stages of development; inequality

increases as countries industrialize and income rises rapidly; and inequality declines at higher income levels. What we observe in sub-Saharan Africa is in general markedly higher levels of income inequality at all levels of per capita income than in countries at similar income levels in other regions (Figure 3.5). By comparison, the successful growth performance of ASEAN countries has in part been attributed to these countries' lower initial levels of income inequality (Balakrishnan, Steinberg, and Syed 2013).

Figure 3.1. Selected Regions: Poverty Headcount Ratio
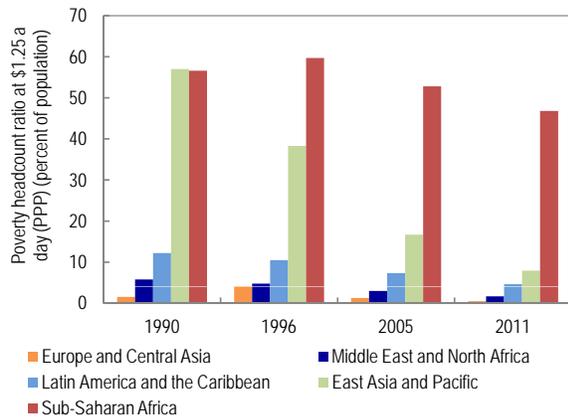
Source: World Bank, World Development Indicators database.

Note: The aggregate headcount index for a region is the population-weighted average of the headcount indices across the countries in that region. PPP = purchasing power parity.

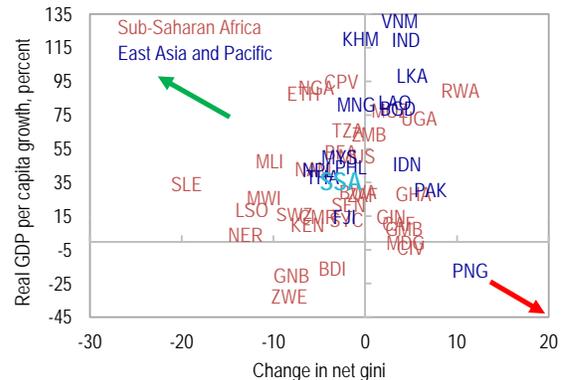Figure 3.2. Selected Regions: Gini Index of Net Income Inequality, 1980–2011
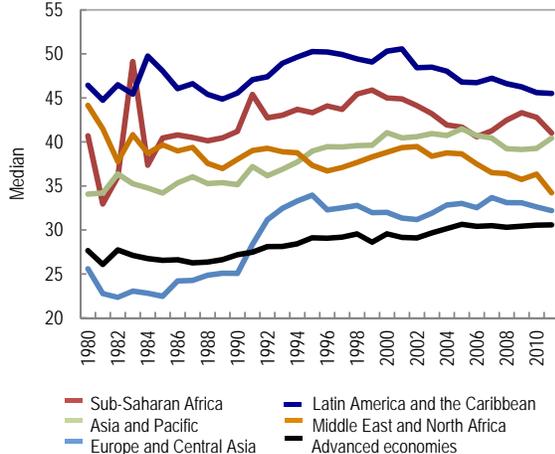
Source: Solt (2014).

Figure 3.3. Selected Regions: Gender Inequality Index, Average 1990–94, and 2010
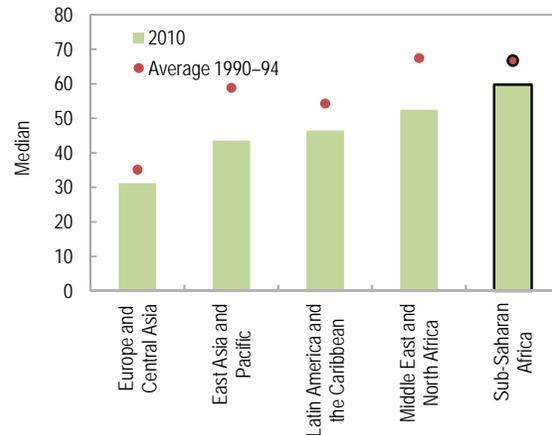
Sources: United Nations Development Programme; and Gonzales and others (forthcoming).

Figure 3.4. Selected Regions: Change in Gini Coefficient and Real GDP per Capita Growth, 1995–2011

Sources: World Bank, World Development Indicators database; and Solt (2014).

Note: Change is between 1995 (or next earliest available year) and 2011 (or latest available year). See page 78 for country acronyms. SSA = sub-Saharan Africa.

Figure 3.5. Sub-Saharan Africa: Kuznets Curve, Effects of GDP Per Capita on Gini Coefficient
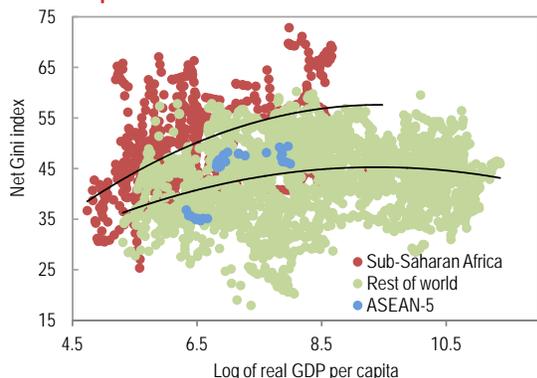
Sources: Solt (2014); and IMF staff calculations.
Note: The ASEAN-5 are Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Figure 3.6. Sub-Saharan Africa: Income Inequality and Gender Inequality, 1990–2010

Sources: Solt (2014); United Nations Development Programme; and Gonzales and others (forthcoming).

- Recent empirical work finds that at the global level gender inequality is an important source of income inequality, with gender gaps in education and health outcomes the main drivers of gender inequality in emerging markets and low-income countries (Gonzales and others forthcoming). However, despite both indicators being high compared with other regions, the association between overall gender inequality and income inequality appears much weaker in sub-Saharan Africa than elsewhere in the world, also pointing to other factors to account for income inequality in the region (Figure 3.6).

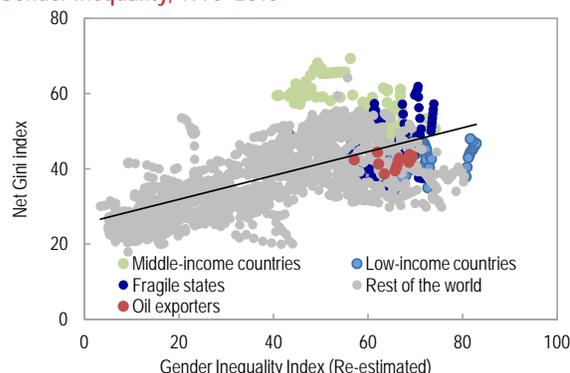Against this backdrop, the next two sections consider:

- Whether high levels of income and gender inequality have affected sub-Saharan Africa's growth performance compared to other regions.

- What might have been influencing the trends in income inequality in the region over the last two decades.

INEQUALITY AND GROWTH PERFORMANCE IN THE REGION

Reducing Inequality Can Boost Growth

This section empirically examines whether persistently high levels of inequality have had a bearing on the region's growth performance. An econometric analysis is conducted relating growth in GDP per capita in a sample of 115 advanced,

emerging market, and developing economies to various indicators of inequality as well as commonly used growth determinants.[8] These include initial income—as lower levels tend to be associated with higher growth as countries catch up—the initial level of infrastructure, years of schooling, and investment to GDP—capturing the quality of the capital and the labor force—inflation and indicators of institutional quality—proxying the quality of macroeconomic and political management—and terms-of-trade changes to reflect external shocks (see more details in Annex 3.1). Inequality is captured through various dimensions, including various measures of income inequality, the gender inequality index, and an index of gender-related legal restrictions.[9]

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[8] A key consideration was to include as many sub-Saharan African countries in the sample as possible. Given data availability, the model was estimated for the 1995–2014 period. To account for possible endogeneity of the inequality and investment variables, the estimations use two-step system generalized method of moments and initial levels of inequality for each five-year period. The regressions rely on non-overlapping five-year averages of the data to abstract from business cycle fluctuations in growth rates and deal with data gaps in certain years (for example, in the education and inequality measures).

[9] Recent empirical work has mainly focused on the effect of one dimension of inequality at a time on economic growth and has not specifically focused on the implications for sub-Saharan Africa (for example, Ostry, Berg, and Tsangarides 2014, Dabla-Norris and others 2015, and Gonzales and others forthcoming). It should be noted that the measures of income inequality capture inequality at the household level. The gender inequality index, on the other hand, captures a combination of intra- and interhousehold inequality to the extent that women are members of a household or that they head a household.

Finally, the analysis allows for testing whether the growth-inequality relationship varies between low-income, fragile, middle-income, and oil-exporting countries within sub-Saharan Africa.

Further refining the findings of Ostry, Berg, and Tsangarides (2014), Dabla-Norris and others (2015a), and Gonzales and others (forthcoming), the results show that high inequality has had a detrimental effect on growth performance primarily in low-income countries (Table 3.1). Indeed, as noted in recent studies, the growth-inequality link is likely to be nonlinear at different levels of development (Castello 2010), and previous empirical work tends to find a negative association between growth and income inequality only below a certain threshold of income per capita (Neves and Silva 2013). To account for this possible nonlinearity, we allow for the relationship to be different between low-income

Table 3.1. Growth, Income Inequality and Gender Inequality: Regression Results[1]

	(1)	(2)	(3)	(4)	(5)	(6)
Measures of Inequality						
Initial top 20 to bottom 40 income ratio	0.006					-0.188 ***
Initial top 20 to bottom 40 income ratio x LICs	-0.207 ***					
Initial income inequality (net Gini)		-0.009				
Initial income inequality (net Gini) x LICs		-0.030 ***				
Initial income share of middle class[2]			0.081 **			
Gender inequality (lagged)				-0.017		0.005
Gender inequality x LICs (lagged)				-0.029 ***		-0.020 **
Female legal equity (index)					0.256 **	0.296 **
Female legal equity (index) x LICs						
Other Control Variables						
Initial income per capita (log)	-1.234 ***	-1.347 ***	-1.081 ***	-1.746 ***	-1.184 ***	-1.608 ***
Fixed capital investment (% GDP)	0.134 *	0.184 ***	-0.014	0.093 *	0.113	0.028
Schooling (years)	0.119	0.068	0.159 *	0.045	0.102	0.154 *
Dependent population growth (%)	-0.356 **	-0.293 **	-0.539 ***	-0.224	-0.303 **	-0.286 **
Infrastructure index	0.238 *	0.194	0.270 *	0.294 *	0.241	0.334 **
High inflation dummy	-1.583 ***	-1.627 ***	-1.621 ***	-1.228 ***	-1.549 ***	-1.552 ***
Terms of trade (percent change)	0.068 **	0.076 ***	0.091 ***	0.098 ***	0.063 **	0.094 ***
Institutional quality (index)	0.047 ***	0.063 ***	0.040 **	0.080 ***	0.064 ***	0.054 ***
Constant	4.117 *	4.087 **	3.171	7.889 **	1.302	6.840
Number of instruments	15	15	14	15	14	17
Serial correlation (p-value)	0.071	0.025	0.202	0.209	0.167	0.274
Hansen test (p-value)	0.210	0.335	0.319	0.445	0.963	0.700
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time (period) fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	344	384	237	419	304	240
Number of countries	110	106	104	115	78	78

Source: IMF staff calculations.

Note: LIC = low-income country.

[1] The dependent variable is real GDP per capita growth, averaged over nonoverlapping five-year periods, for 1995–2014. The LIC group includes countries classified as low-income and lower-middle-income countries by the World Bank. The regressions are estimated using the robust two-step system generalized method of moments (GMM) estimator and include country and period effects. The symbols *, **, and *** indicate that the estimated coefficient is statistically significantly different from zero at the 10, 5, and 1 percent level, respectively. The p-values of the tests of second-order serial correlation and the Hansen test of overidentifying restrictions are reported. See Annex 3.1 for exact definitions of variables and sources of data reported.

[2] Income share of middle class is the percent share of income attributed to the third and fourth quintiles of the population.

countries and the other countries in the sample.[10, 11] The main results of the analysis are as follows:

- The negative association between growth and income inequality among low-income countries is robust to the measure of inequality, proxied by the Gini coefficient, the income gap between the top 20 percent and the poorest 40 percent segments of the population, or the income share of the middle class (as proxied by the 40th to 80th percentiles of population in the income distribution), as shown in Models 1 to 3 of Table 3.1. For example, a 1 percentage point reduction in the initial Gini coefficient in low-income countries is associated with a 0.15 percentage point cumulative increase in growth over a five-year period.

- Growth is also negatively associated with gender inequality in low-income countries and with gender-related legal restrictions for all countries, as shown in Models 4 to 6 of Table 3.1. A 1 percentage-point reduction in gender inequality in low-income countries is associated with higher cumulative growth over five years of 0.2 percentage point in low-income countries, a result in line with previous estimates (Amin and others 2015).[12]

- The finding that both inequality variables significantly affect growth suggests that gender inequality impacts growth through other channels than income inequality. For example, higher gender inequality may adversely impact educational attainment and hence growth. Similarly, other aspects of household income inequality that are unrelated to gender

inequality may be affecting growth, such as rural-urban income inequality.

- A growth decomposition analysis suggests that addressing high inequality could significantly affect growth in sub-Saharan Africa (Figure 3.7). Compared to a subgroup of ASEAN countries (Indonesia, Malaysia, the Philippines, Thailand and Vietnam) that have a strong track record in terms of growth, sub-Saharan Africa's average annual real GDP per capita growth has been about 1½ percentage points lower over the last decade. Weaker infrastructure, lower levels of investment in fixed and human capital, higher dependency ratios, and lower quality of institutions were key factors explaining this growth shortfall. But the contribution of inequality was also substantial. More precisely, reducing the three inequality indicators to the level currently observed in ASEAN countries could boost the region's average annual per capita GDP growth by 0.9 of a percentage point, roughly the same order of magnitude as the impact on annual per capita GDP growth from closing the infrastructure gap between the two regions.

Figure 3.7. Sub-Saharan Africa: Growth Differential with ASEAN Countries
(Percentage points)
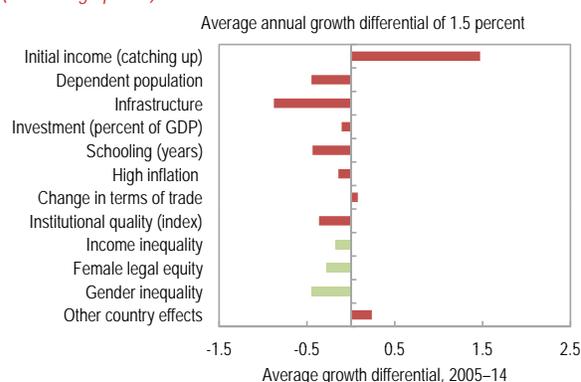
Sources: IMF, World Economic Outlook database; PRS Group; World Bank, World Development Indicators database; and IMF staff estimates.

Note: The estimated regression coefficients of model 6 in Table 3.1 are applied to the differences between the average values of the factors associated with growth for the last 10 years for sub-Saharan Africa and comparator (ASEAN-5) countries. Green bars represent the 3 inequality indicators included in the regression. A bar with a negative value denotes what share of the growth shortfall in sub-Saharan Africa is explained by a particular variable. The ASEAN-5 are Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

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[10] In the following, low-income countries refers to the group of low-income countries and lower-middle-income countries, as classified by the World Bank.

[11] The analysis uses interaction terms to capture nonlinearities in the inequality-growth nexus. However, the estimated effects of the income and gender inequality variables are broadly robust to limiting the sample only to developing countries and to reducing the number of control variables. The finding of significant effects of income and gender inequality after controlling for variables that may be interrelated with the inequality variables is consistent with Berg and Ostry (2011), and Ostry, Berg, and Tsangarides (2014).

[12] Many studies also rightly note the significance of the value added to the economy by women from family-related activities, which are not measured in GDP, and hence not captured here.

Some Variations across Countries

The impact of income and gender inequality on growth varies across subgroups in sub-Saharan Africa (Figure 3.8). Using the same approach as for the whole region, the growth decomposition analysis for the subgroups yields the following additional lessons:

- In low-income countries, low initial income compared with ASEAN countries contributes about 2½ percentage points of real GDP per capita growth. However, this catch-up effect is largely undone by weak infrastructure, lower human capital accumulation, and high

population dependency. Likewise, for fragile states, the lower quality of infrastructure and institutions explains the largest fraction of the growth differential. For both country groups, reducing gender inequality could boost annual GDP per capita growth by two-thirds of a percentage point, while the potential effects of a reduction in income inequality and legal gender-based restrictions are estimated to be smaller

- For middle-income countries—where infrastructure and educational attainment gaps tend to be smaller—and for oil-exporting countries,

Figure 3.8. Subgroups of Sub-Saharan Africa: Growth Differential with ASEAN Countries
(Percentage points)
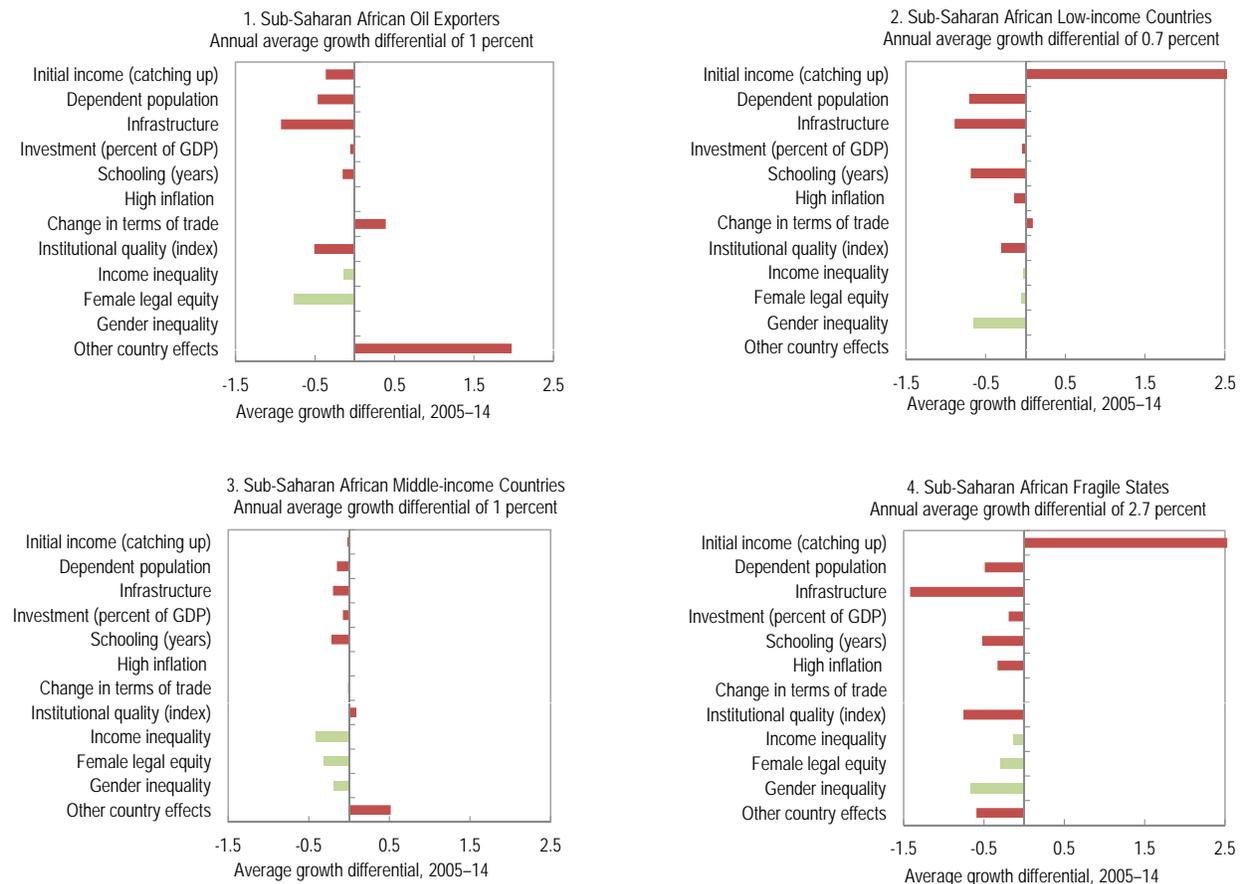
Sources: IMF, World Economic Outlook database; PRS Group; World Bank, World Development Indicators database; and IMF staff estimates.

Note: The estimated regression coefficients of model 6 in Table 3.1 are applied to the differences between the average values of the factors associated with growth for the last 10 years for sub-Saharan Africa and comparator (ASEAN) countries. Green bars represent the three inequality indicators included in the regression. A bar with a negative value denotes what share of the growth shortfall in sub-Saharan Africa is explained by a particular variable. The ASEAN-5 are Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

reducing income inequality to the levels observed in ASEAN countries is an important factor to raise growth. The growth payoff from removing legal gender-related restrictions also appears particularly strong for oil-exporting sub-Saharan African countries.[13]

WHAT DRIVES INCOME INEQUALITY?

With income inequality appearing to have had an adverse impact on growth in sub-Saharan African countries, it is important to understand the factors that may be driving income inequality in the region.

Taking Stock of Inequality of Opportunity

Studies have associated income inequality with inequality of opportunity, including across genders (Dabla-Norris and others 2015b; Gonzales and others forthcoming). In sub-Saharan Africa, these opportunities have generally improved but many countries are lagging behind countries of similar income in other regions.

- Overall educational attainment improved as progress has been made in raising male and female primary school enrollment since the turn of the century in the context of the Millennium Development Goals. Education inequality has declined, and health indicators generally improved. However, average educational attainment remains low compared with other regions (Figure 3.9). In addition, access to education and health care remains restricted for certain categories of the population due to insufficient resources to pay for these services, limited geographical access (especially in rural areas), legal restrictions, and social norms.

- Infrastructure gaps remain large. For instance, electricity production in other developing countries was nearly eight times sub-Saharan

Africa's average of 200 KWh per capita in 2010 (*Regional Economic Outlook: Sub-Saharan Africa,* October 2014). Limited access to basic infrastructure and utilities such as clean water and electricity, can divert time from education and productive activities in poor households, particularly in rural areas and for women (World Bank 2012).

- Financial inclusion has generally improved. The percentage of the population with an account at a financial institution has increased in recent years, but more so for men than for women. In some countries, such as Kenya, mobile-based money has overtaken access to traditional bank accounts, thereby contributing to reducing inequality in access to finance between income groups. However, gender gaps in access to mobile money are generally even higher than for traditional bank accounts. Gender gaps in financial access are similar to those in other regions but gaps across income groups are larger (Figure 3.10). Box 3.2 illustrates the effectiveness of lowering constraints on firms' access to finance to raise growth and reduce inequality in various countries of the region.

- Legal restrictions on women's economic activity remain the highest in the world (Figure 3.11). These legal restrictions discourage women from saving in a formal institution and borrowing for business activities, and are estimated to account for as much as 5 percentage points of the difference in labor market participation between men and women in some countries of the region (Hallward-Driemeier and Hasan 2013; Demirguc-Kunt and others 2013; Gonzales and others 2015).

The inequality of opportunity across genders highlighted above contrasts with the comparatively low gender gaps in female labor force participation. The gap between male and female labor force participation rates, which is used to proxy employment given scarce employment data in low-income countries, is on average 15 percentage points lower in sub-Saharan Africa than in the rest of the world. This mainly reflects the generally low female labor force participation gaps in low-income and fragile

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[13] The finding that the removal of gender-related restrictions affects growth positively in the oil-exporting countries may reflect correlation rather than causation given that oil-exporting countries can, if conditions are right, grow without much labor effort as oil and minerals are capital intensive. This would be the case if gender equality were correlated with other conditions, such as better property rights, or a greater integration with developed-country capital markets, that make it easier for foreign companies to exploit mineral reserves.
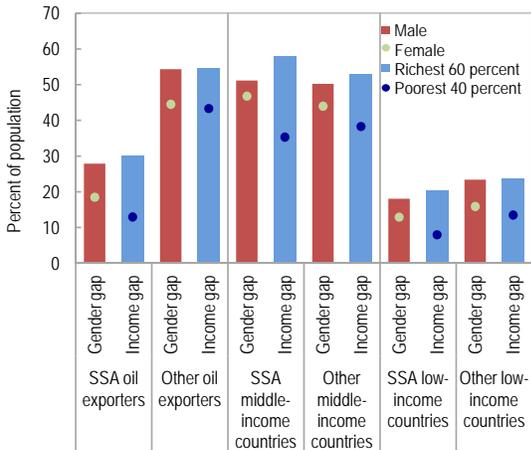
economies, where women have to work for subsistence, often in the low-productivity agricultural sector. At higher income levels, the gap increases, as women may face the trade-off between homemaking and joining the labor force (Figure 3.12). The poor ranking of low-income sub-Saharan African countries in terms of the gender inequality index, despite relatively low gender differences in labor force participation rates, suggests that other aspects of gender inequality in education, health, and empowerment play a substantial role.

Accounting for Income Inequality: Structural Features and Policies

To shed further light on the factors driving income inequality in the region, an empirical analysis is undertaken using a sample of 135 advanced, emerging, and developing countries over 1991–2010. The analysis assesses if changes in inequality can be explained by various country characteristics—demographic factors, various other dimensions of inequality, dependence on trade in natural resources, fiscal policy variables, including

Figure 3.9. Sub-Saharan Africa: Average Years of Schooling Completed Among People Age 25 and Above, 2010
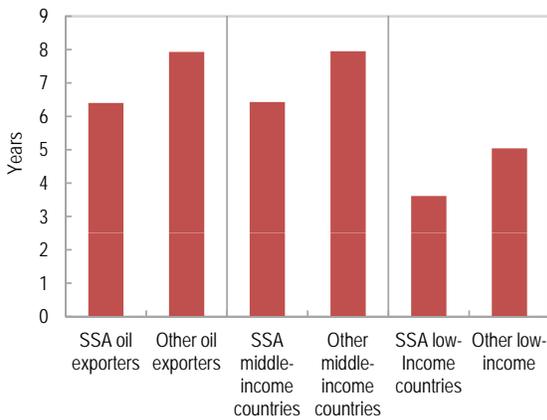
Source: Barro and Lee Education Attainment dataset.

Note: SSA = sub-Saharan Africa.

Figure 3.11. Sub-Saharan Africa: Legal Gender-Based Restrictions, 1990 and 2010
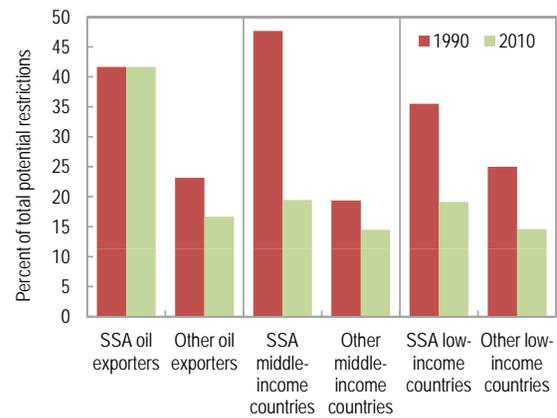
Sources: World Bank, Women, Business and the Law 2014; and Gonzales and others (2015).

Note: SSA = sub-Saharan Africa.

Figure 3.10. Sub-Saharan Africa: Account at a Financial Institution, 2014

Source: Findex 2014.
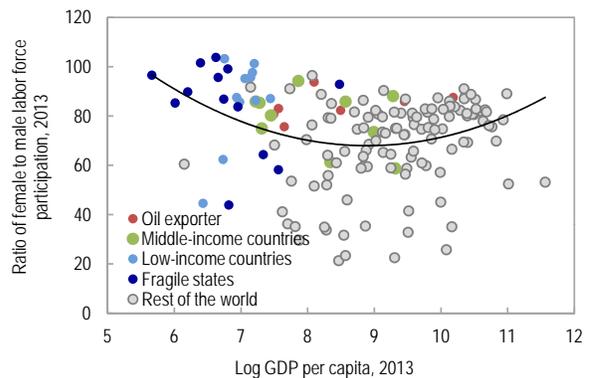
Note: SSA = sub-Saharan Africa.

Figure 3.12. Sub-Saharan Africa: Female Labor Force Participation and Development

Sources: IMF, World Economic Outlook database; and World Bank, World Development Indicators database.

the extent of redistribution and public spending on education spending, and other macroeconomic determinants identified in the literature (see Annexes 3.1 and 3.2 for further details)[14] The association between changes in inequality and each of these characteristics is examined in separate regressions, and is reported in separate lines in Table 3.2. The exercise is intended to provide broad evidence on the factors that are associated with changes in inequality rather than to articulate channels through which the various factors affect income inequality, not least because many of the variables are endogenous. The analysis for the most part relies on relating five-year changes in inequality to beginning-of-period values of drivers of inequality to mitigate such possible reverse causality. The regressions also control for the effect of the initial level of inequality.[15]

Among the wide range of factors analyzed, the following appear to be positively associated with reducing inequality: GDP per capita growth, private capital stock, education spending, the share of the working-age population, and fiscal redistribution, measured as the difference between market and net Gini. Conversely, higher beginning-of-period gender inequality tends to increase net income inequality. The results also support the existence of a convergence effect, whereby countries starting at a higher level of inequality tend to experience larger reductions in income inequality.

The effect of financial sector deepening does not seem to matter for inequality. This is in line with recent literature findings that at early stages of development, financial sector deepening can aggravate inequality by mainly benefiting higher-income groups that already have financial sector access (for example, Roine and others 2009). For

[14] The sample includes 469 observations of nonoverlapping five-yearly changes in inequality between 1991 and 2010. To disentangle the factors specific to low-income countries and sub-Saharan Africa and to account for the income dimension under high collinearity, interaction terms are included. Quantile regressions are used as their estimates are more efficient than those focusing on the mean, including binary models. This also allows for investigating the drivers of both increases and decreases in inequality over the sample period.

[15] The initial level of income per capita is not included as an additional explanatory variable in the regressions because it is highly correlated with the initial level of inequality.

Table 3.2. Various Regressions of Determinants of Change in Inequality (Net Gini)[1]

Explanatory variable (EV)	EV	EV*LIC	EV*SSA
Growth:			
1. GDP per capita growth	-0.1010 ***	0.0994	
2. GDP per capita growth	-0.0991 ***		0.3500 ***
Structural factors:			
3. Share of agriculture	0.0515 ***	-0.0544 ***	
4. Share of working-age population	-0.0585 *	-0.0084	
5. Education inequality	0.0168	-0.0113	
6. Education inequality	0.0240 **		-0.0349 ***
7. Gender inequality index	0.0301 **	-0.0150 *	
8. Gender inequality index	0.0308 ***		-0.0251 ***
9. Women's right to open bank account (dummy)	1.3330 *	-0.0213	
10. Women's right to open bank account (dummy)	1.4530 *		-0.6840
11. Change in share of natural resources exports[2]	-0.0275	0.0978 **	
12. Change in share of natural resources exports[2]	-0.0335		0.1060 ***
Fiscal policy:			
13. Fiscal redistribution	-0.0842 ***	-0.3280 **	
14. Education spending	-0.1830 *	-0.2000	
15. Education spending	-0.1400		-0.2060 **
Other macroeconomic factors:			
16. Financial depth (M2/GDP)	-0.0014	-0.0018	
17. Public capital stock	-0.0003	-0.0055	
18. Private capital stock	-0.0056 ***	-0.0051 *	
19. Trade openness	0.0008	0.0031	

Source: IMF staff calculations.

Note: LIC = low-income countries; SSA = sub-Saharan Africa.
[1] The table summarizes the findings from separate regressions, with the dependent variable being the change in net Gini. GDP per capita growth, education inequality, and the change in the share of natural resource exports are averaged over the period. All other variables are initial period observations. The results are based on quantile regressions, with the initial level of inequality included as an explanatory variable throughout. Interaction terms reflect development level and regional specificities. LIC is a dummy that takes a value of 1 for low- and lower-middle income countries as defined by the World Bank and 0 otherwise. SSA is a dummy that takes a value of 1 for sub-Saharan African countries and is 0 otherwise. The symbols *, **, and *** indicate that the estimated coefficient is statistically significantly different from zero at the 10, 5, and 1 percent level, respectively.
[2] Exports of agricultural raw materials, ores and metals, and fuel as a percentage of total merchandise exports.

the group of countries that achieved large reductions in inequality (not reported in Table 3.2), enhancing women's access to financial services seems to have played a role in reducing income inequality. One last noteworthy result is that the effects of some of the determinants of changes in income inequality appear, in some cases, to be different in sub-Saharan Africa.

The key takeaways for sub-Saharan Africa are as follows:

- In recent years, per capita income growth has not been sufficient to reduce income inequality in sub-Saharan Africa. Indeed, on average for the region and unlike elsewhere, higher GDP per capita growth appears to have been accompanied by higher inequality. Given the already high level of income inequality in the region, this is very concerning.

- The channels linking growth to inequality may be different than in other developing countries, given the importance of commodity price booms in driving growth in a number of sub-Saharan African countries. Indeed, increases in dependence on trade in natural resources, most notably oil, are found to be associated with increases in economic inequality over the same period. This is consistent with Buccellato and Alessandrini (2009), who find that when revenues from natural resources and their extraction process are controlled by a limited number of households, a greater dependence on trade in natural resources can raise income inequality.

- Other structural features of sub-Saharan African economies also appear to be associated with higher inequality. The region's continued high fertility rate limits the share of the working-age population, thereby postponing the expected "demographic dividend" in terms of lowering inequality. This underscores the importance of accelerating the demographic transition by raising investment in human capital (*Regional Economic Outlook: Sub-Saharan Africa*, April 2015).

- Fiscal policy can be used to lower inequality: redistribution (through taxes and transfers) and government education spending appear to be associated with larger reductions in inequality in sub-Saharan Africa than in other countries.

- Reduced gender inequality appears to be associated with subsequent reductions in economic inequality, although the effect is weaker than for other countries.

POLICIES TO REDUCE INEQUALITY

While the focus here is on policies that could contribute to reducing inequality in the region, it is important to emphasize that the link between these policy measures, reductions in inequality, and growth remains complicated. While the literature finds that redistribution in general does not impede growth, particular redistributive policies aimed at reducing income inequality can also create distortions and disincentives to participate in the labor force. The specific design of redistributive policies should therefore be mindful of these potential tradeoffs. The policy recommendations in this section are based on combining the analyses in the previous sections with the findings in the literature, but should not be considered comprehensive. For example, price stability has been shown to also have important distributional consequences (Bulir 2001), but this is not explored here.

Improving Fiscal Policy

As pointed out in the previous section, redistributive policies in the form of taxes and transfers can be highly relevant for reducing inequality in low-income countries. Moreover, Ostry, Berg and Tsangarides (2014) provide cross-country empirical evidence that these redistributive policies do not adversely impact growth.[16]

Tax systems in the region have become more progressive, but partly at the expense of exemptions. The region is increasingly relying on value-added tax (VAT) revenues (Figure 3.13). VAT is by

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[16] This finding is also confirmed when the redistribution variable is added as an additional explanatory variable as well as with an interaction term for sub-Saharan Africa in the growth regression analysis undertaken earlier in the chapter.

Figure 3.13. Sub-Saharan Africa: Tax Revenue, 1990–2011
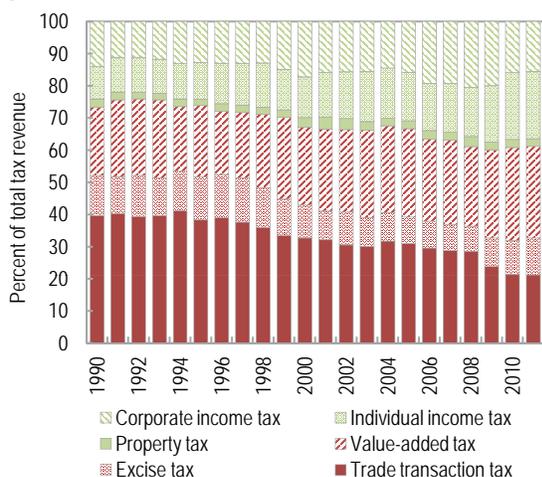
Source: IMF, Fiscal Affairs Department database.

nature a regressive tax, but this is mitigated in many countries by substantial recourse to VAT exemptions and reduced tax rates for basic goods.[17] However, this approach is a poorly targeted redistributive tool because most revenues foregone accrue to the better off. Even though the poor spend a large proportion on basic goods, the rich are likely to spend more in absolute terms (Keen 2013).

On the spending side, redistributive policies often remain highly untargeted. In particular, across-the-board fuel subsidies, meant to support the poorer segments of the population, tend to benefit mainly richer households (Arze del Granado, Coady, and Gillingham 2012). There is also evidence from household surveys that even health and education spending, usually considered "social expenditures," are mainly benefiting the well-off, instead of facilitating access to opportunities that are crucial to reduce inequality (Figure 3.14).

A more effective approach would be to focus on reaching the targeted populations via spending policies while reducing tax exemptions.

• The progressivity of specific tax measures should be assessed taking into account the distribution of the benefits of the additional expenditure

they finance. For instance, in some cases, a regressive tax may be the most efficient way to finance strongly progressive spending.

• Redistributive policies on the spending side should be implemented through more targeted tools. Some countries (for example, Burkina Faso, the Republic of Congo, Liberia, Malawi, Niger, Tanzania, Togo, and Madagascar) are currently conducting pilots to develop the institutional, implementation, and monitoring frameworks for targeted cash transfers. Spending on health care and education would also need to be better targeted to reduce their regressivity and possible gender bias.

Removal of Legal Restrictions

Removing legal gender-based restrictions in the region can boost growth and reduce inequality by stimulating female economic activity. Meanwhile, doing away with restrictions on ownership and inheritance of assets would provide women with access to collateral. This, together with removing restrictions for married women to open a bank account, would promote women's inclusion in the financial system and support entrepreneurship (Box 3.3). In middle-income countries, removing restrictions on women's rights to freely pursue a profession would facilitate and encourage their participation in formal-sector activity. However, by advocating for equal opportunities for women, this chapter does not render a judgment about countries' broadly accepted cultural and religious norms.

Facilitating Access to Financial Sector Services

The analysis in this chapter shows that financial sector deepening alone could aggravate inequality. Therefore, it should be accompanied with reforms aimed at facilitating access to financial services, including for women (Box 3.3). New technologies like mobile banking have the potential to facilitate access and should be complemented by other measures that reduce costs and enhance efficiency, such as establishing or strengthening credit and collateral registries, which reduce banks' information costs.

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[17] See, for example, Grown and Valodia (2010); and World Bank (2014).

Figure 3.14. Selected Sub-Saharan African Countries: Highest Education Level Attained
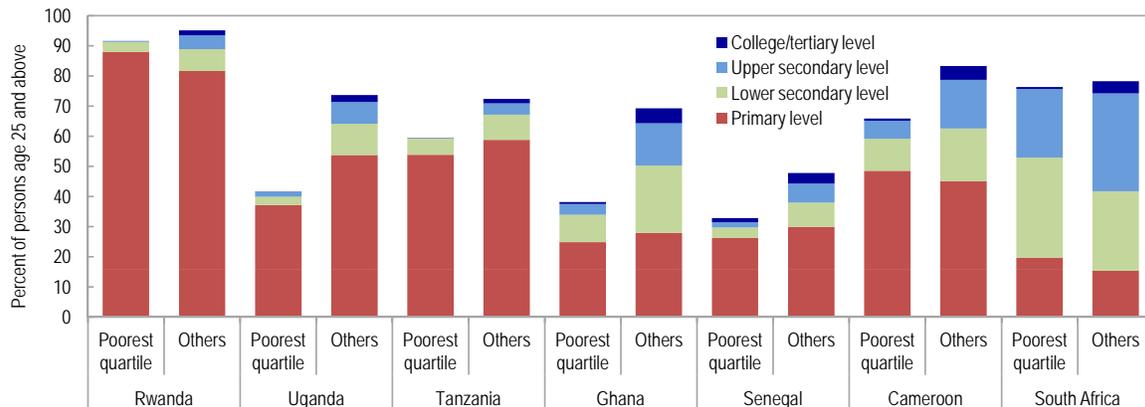
Source: Country household survey data.
Note: Countries are ordered from lowest to highest real GDP per capita in 2005 U.S. dollars. Survey years are as follows: Rwanda 2009; Uganda 2009; Tanzania 2009; Ghana 2005; Senegal 2005; Cameroon 2007; and South Africa 2013.

CONCLUSIONS

Despite some progress in reducing income and gender inequality in sub-Saharan Africa over the last 20 years, the region continues to be characterized by comparatively high levels of inequality. The analysis in this chapter highlights that addressing the high levels of inequality could yield important growth payoffs. Given that inequality varies from country to country, and in view of the multiple factors driving inequality, policies must be tailored to country-specific situations and take into account administrative capacity and potential trade-offs. In the context of efforts to achieve the Millennium Development Goals, good progress has been made in alleviating poverty as well as boosting male and female primary school enrollment. Building on this progress, sub-Saharan Africa should accentuate its efforts to reduce inequality in support of more rapid and inclusive development in the context of the post-2015 Sustainable Development Goals.

Carefully designed policies are key to continued progress in reducing inequality and enhancing inclusiveness in the region. Accordingly, fiscal policy should aim at making the tax system more progressive, removing regressive fuel subsidies, enhancing the progressivity of expenditures on health and education, and providing equal opportunities for women. By the same token, financial sector and labor market policies should be aimed at strengthening legal, regulatory, and institutional frameworks that support women's ability to participate fully and productively in economic activities.

Box 3.1. Why Care About Income and Gender Inequality?
Global Evidence and Macroeconomic Channels

At the global level, there is growing evidence that inequality of income and gender hampers growth:

- Lower net income inequality (measured by the Gini coefficient after taking into account the effects of taxes and redistributive government programs) has been robustly associated with faster growth and longer growth spells for a large number of advanced and developing countries (Berg and Ostry 2011; Ostry and others 2014). Other evidence suggests that income inequality holds back growth in low-income countries but encourages growth in high-income countries (Barro 2000).

- Increases in the income share of the richest 20 percent of the population have been associated with lower GDP growth for a large sample of advanced, emerging-market, and developing countries, while increases in the income share of the poorest 10 percent were associated with higher growth (Dabla-Norris and others 2015a).

- Gender gaps in economic participation have been shown to result in large GDP losses across countries of all income levels (Cuberes and Teigner 2015; Stotsky 2006).

The negative effects of income and gender inequality on growth work through various channels. Some of these channels may have a stronger impact at early stages of development and become less binding as economies develop.

Income Inequality

With imperfect credit markets, income inequality prevents an efficient allocation of resources by reducing low-income households' ability to make investments in education and physical capital. It also limits income mobility (Galor and Zeira 1993; Corak 2013).

High inequality of income and wealth can lead to socio-political instability and poor governance, which dis-courages private investment (Bardhan 2015).

Gender Inequality

Gender gaps in economic participation restrict the pool of talent in the labor market, yielding a less efficient allocation of resources and total factor productivity losses (Cuberes and Teigner 2015).

As women are more likely than men to invest a large proportion of their household income in the education of their children and grandchildren, closing the earnings gap between men and women could translate into higher expenditure on school enrollment for children (Duflo 2003; Heintz 2006; Miller 2008, Rubalcava and others 2004; Thomas 1990).

Box 3.2. Financial Inclusion, Growth, and Inequality in Sub-Saharan Africa

Accelerating financial deepening in many sub-Saharan African countries over the past two decades has not yet translated into broad-based use of financial services. To illustrate the impact of financial inclusion on growth, productivity, and inequality in the region, this box draws on the findings from an application of a recently developed micro-founded general equilibrium model by Dabla-Norris, Townsend, and Unsal (2015b) to quantify the effects of removing the most binding financial constraints to firms' financial inclusion for a set of countries and monetary unions (Kenya, Mozambique, Nigeria, Uganda, Zambia, the Central African Economic and Monetary Community (CEMAC) and the West African Economic and Monetary Union (WAEMU)).

Model Specification

The model allows for assessing the effects of relaxing three financial constraints on GDP, productivity, interest rate spreads, income inequality, the share of firms with access to credit, and the nonperforming loan ratio:

High collateral requirements due to imperfect enforceability of contracts. Poor legal, regulatory, and institutional frameworks that fail to adequately protect property and creditor rights result in higher collateral requirements and hence smaller collateral leverage ratios and overall bank lending.

High participation costs. These costs relate to factors such as physical distance to banks or automated teller machines (ATMs), the documentation required for opening or maintaining an account or applying for a loan, and the use of electronic payments and new technologies.
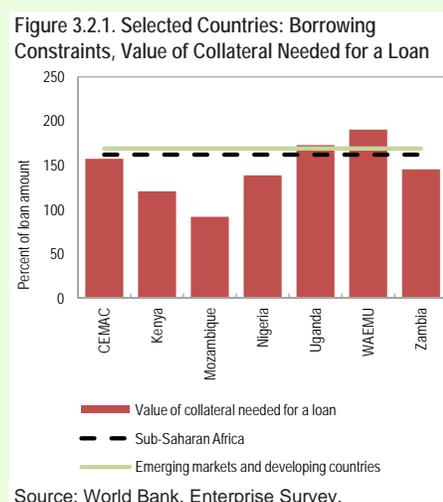
High intermediation costs. High intermediation costs often stem from a lack of public information on borrowers, for example through credit bureaus or credit registries. Also, limited bank competition can increase inefficiencies and raise intermediation costs.

The impact on growth and inequality of increased financial access operates through two different channels. First, by increasing the availability of credit, it facilitates firms' borrowing and investment, which in turn increases capital, output, and productivity, as firms can operate at a larger scale. This channel could increase inequality if credit is mainly reallocated to firms that are already in the financial system and that have relatively higher income. Second, lowering participation costs permits new firms to access the market, borrow and invest, and increase output. This channel may reduce inequality, as more businesses are able to access credit.

Model Findings

Lowering collateral constraints is the most effective way to boost growth and productivity, though its impact on inequality is less clear. The value of collateral needed for a loan is high in the region—on average above 160 percent of the value of the loan—with the exceptions of Kenya, Mozambique and Nigeria and broadly in line with the average for emerging market and developing economies (Figure 3.2.1). GDP increases from easing collateral requirements range between 8 and nearly 20 percentage points (Figure 3.2.2). Lowering borrowing constraints slightly increases inequality, with the exception of the cases of Uganda and Kenya (Figure 3.2.3).

Lowering participation costs would generally boost growth and productivity and reduce inequality. In the region, the percentage of firms with a bank loan or line of credit is low, with an average close to 25 percent, compared with nearly 35 percent on average

Figure 3.2.1. Selected Countries: Borrowing Constraints, Value of Collateral Needed for a Loan

Source: World Bank, Enterprise Survey.

(continued)

Box 3.2. *(continued)*

for emerging markets and developing countries (Figure 3.2.4). The increases in GDP are in general lower than when removing borrowing constraints (Figure 3.2.2). The reduction of participation costs leads to higher access to finance for firms previously excluded from the financial system, thereby reducing inequality (Figure 3.2.3).

Reducing intermediation costs results in a modest increase in growth and productivity and a slight deterioration in inequality. Intermediation costs are fairly high in the region, with the spread between the lending rate and the deposit rate close to 11 percent, against an average of 7½ percent for emerging and developing countries (Figure 3.2.5). Nonetheless, reducing these costs does not increase GDP by more than 3 percentage points for any country (Figure 3.2.2). Lower intermediation costs facilitate a more efficient allocation of capital, and thus result in total factor productivity improvements (Figure 3.2.6). The reason behind the inequality increase is that this measure benefits mostly highly leveraged firms.

Figure 3.2.4. Selected Countries: Access, Firms with a Bank Loan/Line of Credit
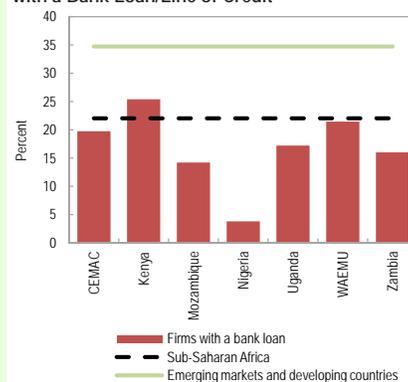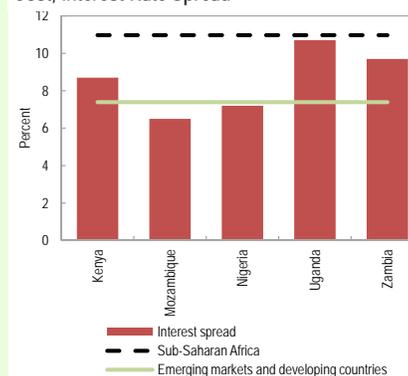
Source: World Bank, Enterprise Survey.

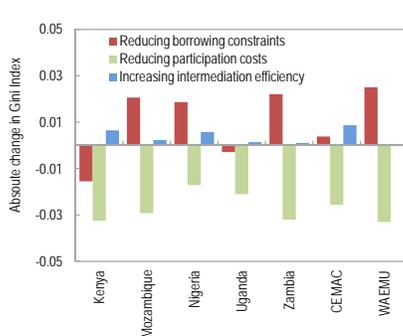Figure 3.2.2. Selected Countries: Growth Impact
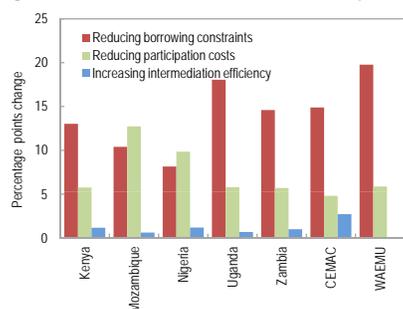
Sources: IMF country staff reports; Dabla-Norris and others (2015); and IMF staff calculations.

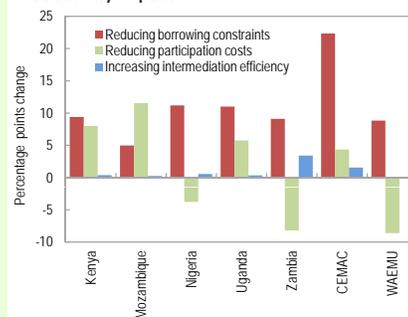Figure 3.2.5. Selected Countries: Intermediation Cost, Interest Rate Spread

Source: World Bank, Enterprise Survey.

Figure 3.2.3. Selected Countries: Inequality Impact

Sources: IMF country staff reports; Dabla-Norris and others (2015); and IMF staff calculations

Figure 3.2.6. Selected Countries: Total Factor Productivity Impact
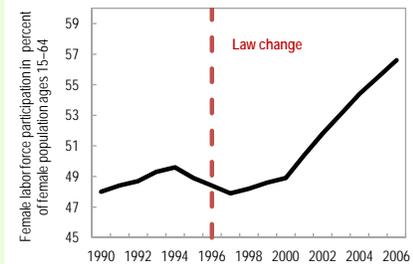
Sources: IMF country staff reports; Dabla-Norris and others (2015); and IMF staff calculations.

Box 3.3. Policies to Close Gender Gaps: Insights from Sub-Saharan African Countries

Creating equal opportunities for women to be economically active can boost development and growth outcomes and has positive side effects in terms of lowering fertility rates and improving intergenerational mobility. With 62 percent of economically active women working in agriculture in the region, addressing gender-based constraints in this sector could significantly boost productivity (AfDB 2015). Key policies measures have included:

- *Institutional and legal reforms to improve the opportunities for women, including access to finance.* In 1996 Namibia passed the "Married Persons Equality Act" which equalized property rights for married women and granted women the right to sign a contract, head a household, pursue a profession, open a bank account, and initiate legal proceedings without the husband's permission. Female labor force participation increased by almost 8 percentage points in the 10 years following the change (Figure 3.3.1) (Gonzales and others 2015). The right of women to own assets, if well enforced, would moderate gender-based discrimination and provide women with collateral to access finance, thus relaxing one main constraint to women's economic activity, including in the agricultural sector (AfDB 2015).

Figure 3.3.1. Namibia: Six Law Changes and Female Labor Force Participation

Sources: World Bank, Women, Business and the Law (2014); and Gonzales and others (2015).

- *Enhanced political empowerment.* In Rwanda, change in this area has taken two forms: (1) gender mainstreaming, which includes integrating a gender perspective into policies, activities, and budgets in all sectors; and (2) affirmative action that seeks to correct gender imbalances. The 2003 Constitution enshrined the principle of gender equality by establishing 30 percent quotas for women's representation in all decision-making structures. The 1999 Civil Code and the 2013 law governing land ensure women equality in terms of land ownership and inheritance. As a result, Rwanda was classified seventh (out of 136 countries) in the rankings of the World Economic Forum's 2014 Global Gender Gap Report and had among the lowest gender inequality index values in the region in 2010.

- *Improved access to health care and education, including training, to support the transition of women to the formal sector.* Evidence suggests that education reduces fertility rates and improves the opportunities for women to remain in the formal sector. In Malawi, a cash transfer program to current schoolgirls or recent dropouts conditional on staying in or returning to school decreased the probability of getting pregnant for recent dropouts by 30 percent (Baird and others 2009). In Liberia, training young women in business development and job skills increased employment rates for these women by about 50 percent (World Bank 2012). Targeted agricultural programs, including on the enhancement of farming techniques, would increase productivity in the sector, including for women (AfDB 2015).

- *A scaling up of infrastructure investment (water, electricity, and transport) to reduce transaction costs and free up women's time.* Roads can enable farmers to sell their agricultural produce faster. Electricity and access to water reduces the time allocated to collecting wood and searching for water. These improvements can increase productivity and provide women who are usually the primary persons in charge of these tasks in the household with time to seek more formal employment or prolong their education. Evidence from micro-surveys in Ghana suggests halving water-fetching time increases girls' school attendance by 2.4 percent on average, with larger effects in rural areas (Nauges and Strand 2013). Estimates from Ethiopia suggest that female farm managers spend almost nine hours less per week on agricultural work than their male peers due to domestic work (AfDB 2015).

Annex 3.1. Understanding Income and Gender Inequality in Sub-Saharan Africa

This annex provides further details on the empirical approach and data definitions and sources used in the empirical analyses on the growth effects of inequality and the drivers of income inequality. It also specifies the country coverage used in both sections.

Assessing the Growth Effects of Income and Gender Inequality

The empirical analysis on the growth effects of inequality is based on data spanning 25 years (1990–2014) from several commonly used macroeconomic databases. To mitigate the issue of data availability, the data in annual frequency was reduced to five (nonoverlapping) five-year periods. The sample covers 159 countries, including high-income countries, middle-income countries, and low-income countries. However, due to the paucity of data across inequality measures and growth determinants, the country coverage varies between models. This section briefly describes the variables used in the analysis.

Data

Real GDP per capita growth is measured by the average annual percent change in real per capita GDP over each of the five-year intervals. The main source of the data is the Penn World Tables 8.1 (PWT), augmented by the World Economic Outlook database for 2013 and 2014. Observations with average annual changes of ±20 percent or more over any five-year period are treated as extreme and thus excluded from the empirical analysis.

Measures of Income Inequality

The empirical analysis focuses on three measures of income inequality:

- *Initial income inequality* is the net Gini and is taken from the Standardized World Income Inequality Database (SWIID version 5.0). For each five-year period, the initial value represents the observation in the first year or, if unavailable, the latest available observation in the previous period. The empirical results are broadly similar if the traditional (market) Gini is used to measure income inequality.

- *Initial top-20-to-bottom-40 ratio* is an alternative measure of inequality, related to the Palma Index of Inequality. This measure of inequality gives more prominence to income distribution at the top 20 percent of the population relative to that at the bottom 40 percent of population. The source of the data is the World Bank's World Development Indicators (WDI) database, and is supplemented by the UNU-WIDER database. For each five-year period, the initial value represents the observation in the first year or, if unavailable, the latest available observation in the previous period.

- *Initial income share of middle class* is calculated by the sum of income shares of the third and fourth quintiles of population. Data sources are the same as the ones for the variable "initial top-20-to-bottom-40 ratio."

Measures of Gender Inequality

Gender inequality is captured by the gender inequality index (GII), calculated using the UN methodology, which covers the 1990–2010 period (details are reported in Gonzales and others forthcoming). The GII is averaged over each five-year period.

Female legal equity is the sum of six legal indicators (in 0–1 format) representing women's legal rights to earning and holding income and wealth, and ranges between 0 and 6, with higher values corresponding to more equitable legal rights for women. The six indicators included are: (1) unmarried women have equal property rights for immovable property; (2) married women have equal property rights on immovable property; (3) joint titling of property is the default for married couples; (4) married women can get a job or pursue a profession; (5) adult married women can open bank accounts; and (f) married women can sign contracts (without requiring permission from another family member). The data come from the World Bank's Women, Business and the Law (WBL) database.

Additional Variables

Initial income per capita (log) is the real GDP per capita in the first year in each five-year period. The source of the data is the PWT.

Fixed capital investment (percent of GDP) is the gross fixed capital formation, averaged over five-year periods. This data come primarily from the PWT, with some augmentation from the World Bank's WDI database where PWT data was missing.

Schooling (years) is the average years of schooling (in each five-year period) for the population aged 15 and above, and is taken from the Barro-Lee database.

Dependent population growth is the average annual percentage change in the nonworking-age population (under 15 or above 64). The source of the data is the UN Population database.

Infrastructure Index is constructed based on three key infrastructure indicators: (1) electricity consumption (KWh per capita) from the IEA; (2) access to water (percentage of population) from the WDI database; and (3) access to any type of phone (subscriptions per 100 persons) from the WDI database. The index is constructed using the first principal component of the log values of the three indicators. A higher value therefore corresponds to an overall greater level of infrastructure.

High inflation is a dummy variable with value 1 if average annual inflation in consumer prices over a given five-year period is more than 15 percent. It is used as a proxy for the quality of macroeconomic policies. The source of the data is the IMF's World Economic Outlook database.

Change in the terms of trade is the average annual change in the terms of trade over the five-year period, using data from the World Bank's WDI database (constant local currency units).

Institutional quality (index) is proxied by the political risk index from the International Country Risk Guide (ICRG). This index covers the quality of institutions on many dimensions, including government stability, bureaucracy quality, internal and external conflicts, corruption, law and order, and democratic accountability. A higher value of the index, which ranges between 0 and 100, implies better quality of institutions and hence lower risk.

Assessing the Determinants of Change in Income Inequality

The empirical work presented in this chapter on the determinants of inequality uses data spanning 20 years (1991–2010). Using a sample of 135 advanced, emerging, and developing countries and nonoverlapping five-yearly changes (maximum four observations per country), 469 observations for changes in inequality are considered.

Data

Change in net Gini is the difference of net Gini in levels over each five-year interval. In instances where a country does not have both an initial and an end value of Gini in a given period, there is a missing value. The net Gini data come from SWIID v5.0.

Initial inequality is the initial value of net Gini for a particular period.

Share of agriculture is the percentage share of the agriculture sector in total GDP, as published in the World Bank's WDI database. For each period, we take the value from the initial year.

Share of working-age population is the percentage of the working-age (15–64) population in the economy, as published in the UN Population database. For each period, we take the value from the initial year.

Education inequality is measured by education Gini, which is calculated by Castelló-Climent and Doménech (2014) from the latest education database by Barro and Lee.

Fiscal redistribution is defined as the difference between market Gini and net Gini, both of which are published by the SWIID. For each period, we take the value from the initial year.

Education spending is the percentage of public spending allocated to education, as published by the World Bank's WDI database. For each period, we take the value from the initial year.

Financial depth is defined as the ratio of broad money M2 to GDP, as published by the World Bank's WDI database. For each period, we take the value from the initial year.

Financial inclusion is proxied by a dummy variable reflecting the ability of women to open bank accounts. The data come from the World Bank's Women, Business and the Law (WBL) database.

Public capital stock is an estimate of general government capital stock, constructed based on general government investment flows (in 2005 dollar prices). The source of the data is the IMF's Investment and Capital Stock Database (IMF 2015e).

Private capital stock is an estimate of private capital stock, constructed based on private investment flows (in 2005 dollar prices). The source of the data is the IMF's Investment and Capital Stock Database (IMF 2015e). For each period, we take the value from the initial year.

Trade openness is defined as the sum of total exports and imports as a percentage of GDP. The underlying data are obtained from the latest World Economic Outlook database. For each period, we take the value from the initial year.

Change in natural resource exports is the share of exports of agricultural raw materials, ores and metals, and fuel as a percentage of total merchandise exports. The source of the data is the World Bank's WDI database.

Country Coverage

This section specifies the countries included in the empirical analyses in this chapter. Owing to data constraints, not all the countries are included in all the regressions.

High-Income Countries, as Defined by the World Bank

United States, United Kingdom, Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, Netherlands, Norway, Sweden, Switzerland, Canada, Japan, Finland, Greece, Iceland, Ireland, Malta, Portugal, Spain, Australia, New Zealand, Chile, Uruguay, Barbados, Trinidad and Tobago, Cyprus, Israel, Hong Kong SAR, China, Korea, Rep., Singapore, Russian Federation, Czech Republic, Slovak Republic, Estonia, Latvia, Lithuania, Croatia, Slovenia, and Poland.

Middle-Income Countries Are Those Defined by the World Bank as "Upper-Middle-Income Countries"

Turkey, South Africa, Argentina, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Panama, Peru, Venezuela RB, Belize, Jamaica, St. Lucia, Suriname, Iran Islamic Rep., Iraq, Jordan, Malaysia, Maldives, Thailand, Algeria, Angola, Botswana, Gabon, Mauritius, Seychelles, Namibia, Tunisia, Fiji, Marshall Islands, Azerbaijan, Belarus, Albania, Kazakhstan, Bulgaria, China, Turkmenistan, Serbia, Montenegro, Hungary, Macedonia FYR, Bosnia and Herzegovina, and Romania.

Low-Income Countries Are Those Defined by the World Bank as "Lower-Middle-Income" or "Low-Income" Countries

Bolivia, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Paraguay, Guyana, Syrian Arab Republic, Egypt Arab Rep., Yemen Rep., Afghanistan, Bangladesh, Bhutan, Cambodia, Sri Lanka, India, Indonesia, Lao PDR, Nepal, Pakistan, Philippines, Vietnam, Djibouti, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo Rep., Congo Dem. Rep., Benin, Ethiopia, The Gambia, Ghana, Guinea-Bissau, Guinea, Côte d'Ivoire, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Zimbabwe, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Uganda, Burkina Faso, Zambia, Papua New Guinea, Micronesia Fed. Sts., Armenia, Georgia, Kyrgyz Republic, Moldova, Tajikistan, Ukraine, Uzbekistan, and Mongolia.
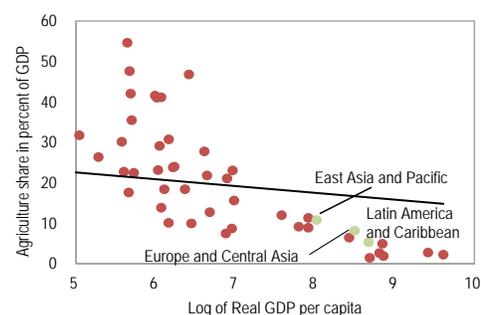
Annex 3.2. Drivers of Inequality

This annex provides a more detailed explanation of the empirical strategy in the chapter on the drivers of inequality. It highlights the channels, identified in the literature, through which the determinants of inequality are thought to drive inequality.

- *Initial level of inequality.* The effect of initial inequality on the change in inequality appears ambiguous. In "inequality traps," high initial inequality can exacerbate inequality in the absence of policy measures. By contrast, "inequality convergence toward medium levels" can also imply that higher initial inequality gives rise to a reduction in inequality (Benabou 1996 and Ravallion 2002).

- *Income and economic growth.* Previous empirical work testing the "Kuznets' curve" hypothesis that inequality initially worsens over the course of economic development, and then declines has yielded mixed results (Barro 2000). Our analysis includes the level of income, measured by GDP per capita into the specifications and allows for nonlinearity. Likewise, the effect of real GDP growth is ambiguous—in the context of a structural transformation, inequality may deteriorate with increased growth.

- *Sectoral contributions.* Closely linked to income levels is the share of the agricultural sector (Annex Figure 3.2.1), with particular relevance for sub-Saharan Africa where agriculture accounts for a significant share of GDP and employment in many countries. A higher share of the agricultural sector tends to be associated with lower poverty and inequality in the region (Christiansen, Demery, and Kuhl 2007).

- *Demographics.* A faster demographic transition can contribute to reducing inequality by reducing the number of children, particularly for low-income households, and allowing for greater female labor force participation and investment in human capital, adding benefits beyond the "demographic dividend" (Rosenzweig 1990; Soares 2005; Soares and Falcao 2008).

Annex Figure 3.2.1. Sub-Saharan Africa: Agriculture and Real GDP Per Capita, 2013

Sources: IMF, African Department database; and World Bank, World Development Indicators.

- *Natural resources.* As they are easily appropriable, natural resources can lead to a more unequal income distribution, in particular if they are directly exported instead of representing an intermediate good (Buccellato and Alessandrini 2009).

Likewise, in line with existing studies, we discuss the following policy measures:

- *Redistribution.* Fiscal redistribution is measured as the difference between the market and net Gini—it takes the form of taxes and transfers. It is expected to contribute to a reduction in inequality, particularly if it is progressive, targeted and well implemented (Ostry and others 2014).

- *Education spending* is used as a proxy for human capital. While the impact of education is ambiguous in principal (Dabla-Norris and others 2015a), particularly if access is an issue, spending to improve coverage and quality of delivery can foster equality of opportunity and reduce the skills premium. To cover as many low-income countries as possible, the level of government spending is used.

- *Investment.* Capital stocks are used as proxies for cumulative government and private sector investment. Regional disparities in infrastructure provision can lead to higher spatial inequality and a worsening

urban-rural divide. Access to water and electricity impact inequality as well (World Bank 2012). Infrastructure gaps remain high in sub-Saharan Africa and hinder the development of the private sector, including household enterprises.

• *Trade.* The impact of trade openness on inequality can go both ways (Dabla-Norris and others 2015a), depending on the extent of trade creation and trade diversion. In many low-income countries, the transfer of low-skilled operations from advanced economies (outsourcing) can create opportunities in the manufacturing and services sector, but the overall impact on inequality depends on the extent of the shift from the informal to the formal sector, as well as the wage disparities. Similarly, the closure of industries due to cheaper imports can worsen income inequality.

• *Financial development* can contribute to a worsening of inequality in the presence of financial frictions, causing mostly the rich to have access to financial services (Greenwood and Jovanovic 1990). However, over the course of financial development, greater *financial inclusion* can aid inequality reduction (Dabla-Norris and others 2015a).

• *Gender inequality* is expected to have an adverse impact on income inequality as it reduces the ability of one segment of the economy to fully contribute to growth and development (Elborgh-Woytek and others 2013).