

Zambia 74381 Economic Brief

Recent Economic Developments and the State of Basic Human Opportunities for Children



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Contents

Foreword	v
Acknowledgments	vi
Executive summary	vii
Section 1 Recent economic developments and medium-term prospects	I
Recent developments in the global and Sub-Saharan economies	1
Recent economic developments in Zambia	2
Section 2 The state of basic human opportunities for children in Zambia	II
Inequality in Zambia	11
From inequality to equity	13
Summary of main findings and conclusion	27
Annex A How is the Human Opportunity Index calculated? A simple example	31
Annex B Three key properties of the Human Opportunity Index	32
Annex C Estimating the Human Opportunity Index from household survey data	33
Annex D Shapley Decomposition of the D-Index—An example	34
Annex E Opportunities and circumstances for Zambian children	35
Notes	36
References	38
Boxes	
2.1 The concept of equality of opportunity	13
2.2 The Human Opportunity Index	15
2.3 The dissimilarity index	18
2.4 What is the Opportunities Benefit Incidence Analysis?	27
Figures	
1.1 Sub-Saharan Africa continues robust growth	1
1.2 Industrial metal prices, January–September 2012	2
1.3 Ratio of gross disposable national income to gross domestic product in Zambia, 2000–12	3
1.4 Net savings and “genuine” savings, 2000–10	5
1.5 Recent comovement in domestic revenue (2003 prices) and copper prices, 2004–12	6

1.6	International reserves and current account balance, 2003–12	6
2.1	Consumption growth incidence curves for urban and rural areas, 2006–10	11
2.2	Inequality in Zambia and the world	12
2.3	Coverage and the Human Opportunity Index for school attendance of children ages 10–14 in Zambia and selected Latin American and Sub-Saharan countries	16
2.4	Coverage and the Human Opportunity Index for finishing primary school on time in Zambia and selected Latin American and Sub-Saharan countries	16
2.5	Coverage and the Human Opportunity Index for access to safe water on site in Zambia and selected Latin American and Sub-Saharan countries	17
2.6	Coverage and the Human Opportunity Index for access to improved sanitation in Zambia and selected Latin American and Sub-Saharan countries	17
2.7	Coverage and the Human Opportunity Index for access to electricity in Zambia and selected Latin American and Sub-Saharan countries	17
2.8	Coverage and the Human Opportunity Index for some key opportunities in Zambia, 2010	19
2.9	Change in the Human Opportunity Index and decomposition of changes, 2006–10	20
2.10	Average annual change in the Human Opportunity Index for Sub-Saharan countries	21
2.11	Contribution of circumstances to overall inequality of opportunity, 2010	23
2.12	A snapshot of the vulnerability profile	24
2.13	Relationship between poverty and human opportunity	25
2.14	Poverty and inequality of opportunity (rank correlation)	26
2.15	Distribution of gross and net unitary benefits from public education, by quintiles of probability	28

Tables

1.1	GDP growth, by main sectors, 2003–12	3
1.2	GDP growth for comparator countries, 2003–12	4
1.3	Summary of central government finances, 2008–12	4
1.4	Proposed use of the sovereign bond proceeds	5
1.5	Selected balance of payments indicators, 2008–12	7
1.6	GDP growth projections, by main sectors, 2012–14	8
D1	D-Index based on circumstance set	34
E1	Opportunities and their definitions	36
E2	Circumstances and their definitions	36

Foreword

With this first Zambia Economic Brief, the World Bank is launching a series of short economic updates that will be produced twice a year. Each brief will include two sections: the Bank's assessment of recent economic developments and outlook in the short to medium term; and its analysis on a specific development topic or theme. We expect these briefs to support evidence-based policy debate in the country, strengthen public demand for good policies and outcomes, and inform government policies and programs.

In this brief, section 1 reports on Zambia's continued robust growth, fiscal outcomes, and capital inflows at the end of 2012 against the backdrop of performance of other Sub-Saharan and global economies. It stresses the need for the government to spend borrowed and own resources more prudently. While acknowledging continuing strong prospects for growth, the analysis highlights considerable downside risks emanating from global uncertainties.

Section 2 covers basic human opportunities for children in Zambia. The opportunities approach is premised on the notion that predetermined circumstances such as

gender, ethnicity, place of birth, and family origins should not determine people's economic, social, and political success. A person should not have fewer opportunities in life just because she is a girl or born in a rural area. This is the core principle behind the concept of equality of opportunity—and it is also the framework adopted in this report for Zambia. The analysis shows the extent to which basic opportunities for education, health, and infrastructure services in Zambia are influenced by circumstances in which children find themselves. We hope that this new approach will stimulate debate on inequalities in access to basic services, and help the government in its quest to attain a better Zambia for all.

The second brief to be produced in June 2013 will cover the specific development topic of jobs.



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The report was edited and laid out by a team at Communications Development Incorporated, led by Bruce Ross-Larson.

Executive summary

Zambia's economy continued its strong growth in 2012, estimated at 7.3 percent, just above the 6.8 percent in 2011. Zambia has grown faster than most of its peers, including both mineral-producing and nonmineral-producing countries.

Growth has been broad-based, led by strong performance in agriculture, manufacturing, and services, even as mining output contracted for the second year despite a new mine. The decline in global copper prices contributed to the slight contraction in mining. Agricultural growth has been accompanied by increased diversification of production, with a higher share of nonmaize crops—such as wheat, barley, sorghum, and soybean—partly in response to uncertainty about the government's maize-buying program. Construction growth accelerated in recent years in response to increased demand coming from rising urban incomes and a marked pick up in investment in mining and roads. Growth in transport services is also a response to strong growth in demand from other sectors of the economy.

Zambia's recent fiscal policy has been expansionary. After grants, the country's average overall balance over 2010–12 was –3.5 percent of GDP. This policy is sustainable from a debt sustainability point of view. However, it needs to be matched to the country's capacity to prepare and implement high-return projects and spend more efficiently. There is also a need to develop fiscal buffers to smoothen spending across shocks. The last point is gaining importance, with the share of mining revenues in government finances

increasing and thus increasing exposure to copper price changes.

Capital inflows to Zambia have remained resilient despite global slowdown, with net foreign direct investment (FDI) and portfolio investments growing steadily, from \$350 million in 2009 to an estimated \$991 million in 2012. FDI inflows continue to be directed mainly at the mining sector, with manufacturing, communications, and financial institutions also contributing to recent FDI growth. Gross international reserves are at a level of about 3 months of prospective imports. The government aims, rightly, to further increase the reserve coverage, mainly to guard against terms of trade shocks.

Prospects for strong growth but considerable downside risks

Medium-term prospects for Zambia's economic growth remain strong but are subject to considerable downside risks emanating from global uncertainties. GDP growth is expected to average more than 7 percent over the 2013–14 forecast horizon, making Zambia one of fastest growing Sub-Saharan economies. Underpinning the projected growth over the medium term are favorable external and domestic developments. Despite the ongoing slowdown in China's economy (Zambia's largest trading partner), international metal and mineral prices (including that of copper) are expected to remain fairly high over the medium term. As a result, the strong FDI flows to the mining sector of recent years are expected to continue.

Agriculture prospects are good assuming that government policy in the sector will improve, with the Farmer Input Support Programme becoming more efficient, which is expected to enhance agricultural productivity. They will also be helped by the proposed scaling up of extension services, irrigation, and research. Accompanying the mining and agricultural growth is growth in transport, storage, and construction.

Aggregate demand is expected to continue supporting growth. Fiscal policy is expected to remain expansionary, contributing to higher growth prospects. In addition, recent real wage increases (for both the public and private sectors) will support household consumption, the largest contributor to aggregate demand. Household domestic spending should also benefit from a stable macroeconomic environment (average inflation expected at 6–7 percent), lower real interest rates, and increased access to consumer credit.

Domestic investment is also expected to continue to support growth. The latest Bank of Zambia quarterly survey of business opinion and expectations forecasts that business confidence will remain high through 2013, with firms investing in construction and machinery.

The expected pickup in the global economic environment, as well as in some of Zambia's major trading partners such as the European Union and South Africa, should increase demand for Zambia's exports—both traditional (such as copper) and non-traditional (such as sugar and beef)—as well as tourism services. Demand should be supported by growth in Sub-Saharan Africa, expected at 6.2 percent in 2013, excluding South Africa.

Although Zambia's growth prospects are fairly robust over the forecast horizon, significant headwinds could lead to weaker-than-envisaged real GDP growth over 2013–14. The source of risks lies abroad in continued tensions in global financial markets, slower growth in emerging economies, and increases in oil prices—and at home in persistent perceptions of an uncertain policy environment and adverse weather-related shocks.

Poverty and inequality

Despite Zambia's robust economic growth over 2000–10, there was very little progress

on reducing poverty, particularly in the latter half of the decade—for two main reasons. First, the growth—driven by industries such as mining, construction, financial services, and tourism—did very little to create new jobs and expand economic opportunities beyond the small part of the country's labor force already employed in these industries. Second, the urban-centered growth also failed to generate enough spillovers for the roughly two-thirds of Zambian people who live in rural areas, depend on agriculture, and have seen their incomes stagnate over the last decade.

Such growth led to an increasing disparity between rural and urban areas. Annual consumption growth of different wealth quintiles was less than 1 percent for most of the rural population between 2006 and 2010, whereas growth in urban areas was about 2 percent for the first four quintiles and much higher for the wealthiest quintile. There are also sharp disparities among the country's nine provinces. In fact, inequality between rural and urban areas and among provinces accounts for more than three-quarters of the observed inequality in the country.

The concentration of economic growth in particular sectors and regions over a sustained period also manifests itself in Zambia's persistently high inequality. The Gini coefficient for consumption in Zambia was 52 in 2010 and has generally remained above 50 for much of the last decade, making Zambia one of the most unequal countries not only in Sub-Saharan Africa but also in the world. The richest quintile of the population in Zambia accounts for 57 percent of consumption, compared with 4 percent for the poorest quintile.

Basic human opportunities for children in Zambia

Analyzing the opportunities for children in Zambia can better illuminate the nature and causes of inequality of outcomes among adults. Opportunities for children can also be reliable predictors of economic mobility across generations and over time. If access to economic opportunities (such as jobs, credit, land, wages, and financial assets) is correlated with the circumstances of an individual (such as parental socioeconomic status and location of residence), as it appears to be in

Zambia, then it reinforces the link between children's circumstances and their opportunities in life, in turn perpetuating economic inequality between groups with different circumstances over generations. For policy makers interested in closing gaps in outcomes between subgroups of the population in Zambia, a comprehensive analysis of these opportunities can provide a useful blueprint on which efforts to level the playing field can be based.

One of the primary findings here is that opportunities for children in Zambia vary widely across different types of goods and services. But in general none of the opportunities is close to universal in their coverage. Some, such as school attendance for children under age 16, are available to most Zambian children in the age bracket. But still roughly 20 percent of children remain excluded. Only about half of children start and finish primary school on time, with sizable inequalities attributable to circumstances children have no control over. And the quality of education is low. Of Zambian children in grade 6 who took the regional standardized tests designed to monitor educational quality, 44 percent had proficiency below basic reading skills, and 67 percent did not possess even the basic numeracy skills.

The picture is bleaker for opportunities in health and infrastructure, where coverage is lower and there are large variations in the inequalities based on children's circumstances. Full immunization, exclusive breastfeeding until the child is 6 months old, and growing up through childhood without being scarred by chronic malnutrition are some opportunities critical for a healthy start to a productive life. But roughly half of Zambian children are deprived of these opportunities. Coverage of opportunities on access to clean drinking water, adequate sanitation, and electricity is also extremely low, with coverage depending substantially on the socioeconomic status of the household in which the child is born and the location of residence.

The analysis also reveals household's socioeconomic status, urban-rural residence, and the province of birth as the strongest drivers of inequality across broad opportunities. The regional aspect is particularly interesting because the distribution of

opportunities across the regions in Zambia closely mirrors the spatial distribution of poverty, implying that poorer regions have lower access to opportunities. In addition, the poorest regions in Zambia are also the regions where children's circumstances play the strongest role in determining their access to these opportunities. This depresses prospects of economic mobility in the poorer provinces and may result in the further entrenchment of poverty and the propagation of the spatial inequalities observed in Zambia today.

Current patterns of public spending, at least in the education sector, are distributed such that they benefit children fairly uniformly, irrespective of their circumstances. But this seeming progressivity is achieved not necessarily because larger shares of public expenditures are being targeted to children with the lower probabilities of having access to these opportunities, but because the private costs borne by families of children from the top end of the distribution are significantly higher. Given that roughly a fifth of children who should be in school are not currently enrolled in Zambia, there seems to be more the government could do in realigning expenditures.

Realigning expenditures in education and health to prioritize the poor and the underserved and ensuring that the amount spent is effective will enhance the desired results even with the same resource envelope. The government already allocates the bulk of spending in education on primary school enrollment, for example. Yet as the opportunity-benefit incidence analysis shows, there is significant room to target children whose circumstances make their likelihoods of having access to this opportunity lower. This has to go with necessary changes to the institutional setup of service delivery to provide proper incentives to the service provider and voice and accountability to the end user, critical to ensuring that quality of the services delivered—in education or health—is of minimum acceptable standards.

With the largest driver of unequal access to opportunities in Zambia as the province of birth, investments in the lagging regions need to be scaled up, particularly for infrastructure services such as drinking water,

sanitation and electricity where access is highly concentrated in certain urban pockets within particular provinces.

Finally, policy makers also need to recognize that children of certain circumstances are vulnerable to deprivations in multiple dimensions simultaneously. For example, Zambian children living in rural areas and with household heads who did not finish

primary school are much more likely to not finish primary school themselves, to suffer from acute malnutrition, or to have access to sanitation facilities. The presence of multiple deprivations points to the need for policy programs in different sectors (health and education, for example) to closely coordinate to achieve better efficiency and the best results.

SECTION I

Recent economic developments and medium-term prospects

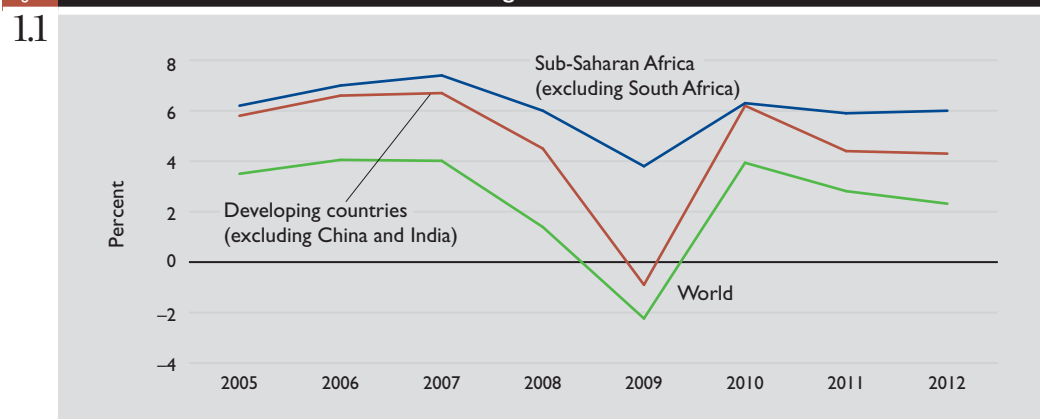
Recent developments in the global and Sub-Saharan economies

After several months of deceleration in the first half of 2012, the global recovery started picking up again, with global industrial production rising at a seasonally adjusted annualized rate of 0.9 percent in the three months to August. Activity remains strongest in developing countries, with a 5.4 percent annualized pace of growth in the three months to August (4.5 percent excluding China). Growth in Sub-Saharan Africa remains robust amid the turbulence in high-income countries. Indeed, a third of the region's countries (including Zambia) will be growing at or above 6 percent in 2012, with some of the fastest growing buoyed by new mineral exports (iron ore in Sierra Leone, oil and uranium in Niger), a return to peace (Côte d'Ivoire), and robust growth in the nonmineral sector (Ethiopia; figure 1.1).

But global trade is lagging behind the recovery. In the three months to August, import demand was still contracting in Germany, Japan, and the United States. Given that recoveries in global trade tend to lag behind those of industrial production, global trade should rebound by the fourth quarter if the recovery in industrial production is sustained. Sub-Saharan data through June show that exports contracted, largely in response to a slowdown in large developing economies (such as China), an important destination for Sub-Saharan Africa's exports of metals and minerals.

In line with the recent growth in global industrial production, base metals strengthened in September, after several months of decline. The World Bank's metal and minerals index was up 5.8 percent in September, with strong price increases in such key base metals as copper (7.6 percent), aluminum

Figure 1.1 Sub-Saharan Africa continues robust growth



Source: World Bank 2012a.

(11.9 percent), zinc (10.5 percent), and nickel (9.9 percent). Some of the increases could be due to speculative investments following recent monetary stimulus measures in G3 economies (the United States, European Union, and Japan), but the increases more likely reflect the moderate strengthening in global economic activity (figure 1.2).

The financial market has continued to show signs of stabilization, with the gains observed through August sustained in September. The reduced uncertainty in financial markets and increased liquidity boosted gross capital flows to developing countries by \$40 billion in September, with bond flows posting a record \$32 billion. Unprecedented investor demand allowed frontier-market borrowers to tap the international bond market, with Zambia issuing an inaugural international bond, successfully raising \$750 million. Although foreign direct investment (FDI) data are lagging, FDI flows, which are less sensitive to changing market sentiments than short-term capital flows, likely picked up in the third quarter. In Sub-Saharan Africa FDI inflows are likely to remain resilient, coming in at around \$31 billion in 2012 (similar to the \$32.5 billion in 2011; World Bank 2012a).

Recent economic developments in Zambia

Zambia's economy continued its strong growth in 2012, at 7.3 percent, just above the 6.8 percent in 2011. Growth has been broad-based, led by strong performance in agriculture, manufacturing, and services, even as mining output contracted for the second

year despite a new mine (Luashya-Muliashi; table 1.1). A combination of prolonged trade union negotiations and the decline in global prices contributed to the slight contraction. Agricultural growth has been accompanied by increased diversification of production, with a higher share of nonmaize crops—such as wheat, barley, sorghum, and soybean—partly in response to uncertainty about the government's maize-buying program. Construction growth accelerated in recent years in response to increased demand coming from rising urban incomes and a marked pick up in investment in mining and roads. Growth in transport services is also a response to strong growth in demand from other sectors of the economy. Telecommunication services continue to grow, due both to an expanding customer base and rising share of services in the consumption bundle.

Looking at Zambia's largely foreign-owned and -operated mining enterprises, it is meaningful to monitor gross national disposable income (GNI)—which excludes payments to foreign labor and capital employed in Zambia—as a measure of contribution to national wealth. Figure 1.3 shows Zambia's GNI as a ratio of GDP. This ratio has fluctuated in the low 90s during normal economic times and shrunk considerably in uncertain times. Over 2009–11 it averaged about 93 percent, so about 7 percentage points of GDP were not available as national disposable income.

Zambia is among Sub-Saharan Africa's fastest growing countries, with projected growth of 7.3 percent in 2012, well above

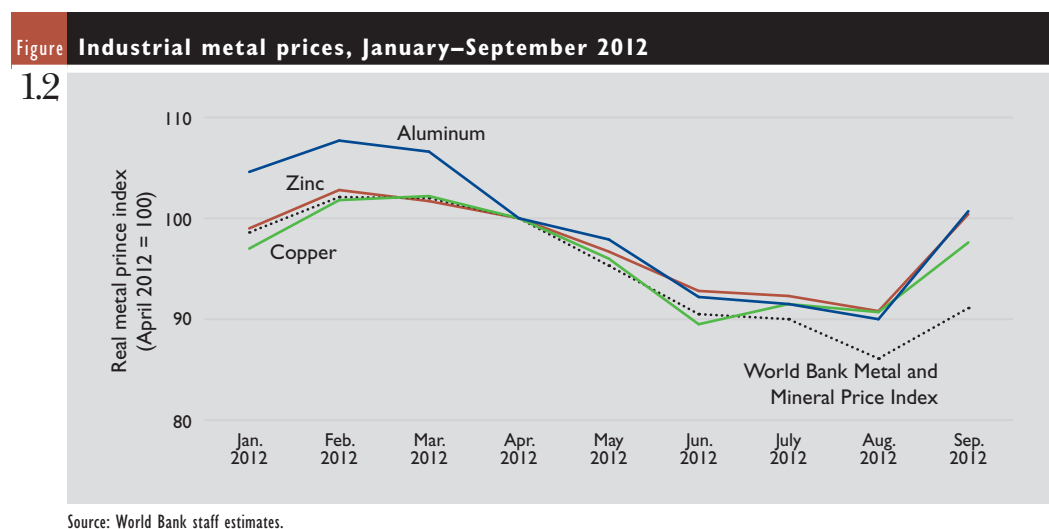


Table GDP growth by main sectors, 2003–12

1.1

(constant price = 1994; percentage change from previous year, unless otherwise indicated)

Indicator	2003–08	2009	2010	2011	2012 (preliminary)	Contribution to GDP growth 2012 (preliminary; percentage points)
Primary sector	3.8	12.4	10.2	2.2	4.1	0.9
Agriculture, forestry, and fishing	2.3	7.2	6.6	8.0	7.1	0.9
Mining and quarrying	6.5	20.3	15.2	–5.2	–0.3	0.0
Secondary sector	9.1	6.2	6.5	8.5	11.2	2.7
Manufacturing	4.3	2.2	4.2	8.0	11.2	1.0
Electricity, gas, and water	2.4	6.8	7.4	8.2	2.3	0.1
Construction	17.7	9.5	8.1	8.9	13.0	1.6
Tertiary sector ^a	5.9	3.9	6.6	7.8	6.8	3.7
Wholesale and retail	3.4	2.3	4.2	7.5	8.9	0.7
Restaurants, bars, and hotels	9.3	–13.4	10.2	7.9	2.1	0.1
Transport, storage, and communications	13.2	7.6	14.9	13.7	11.3	1.2
Financial institutions and insurance	4.5	5.2	6.0	4.9	6.0	0.4
Real estate and business services	3.4	2.8	3.0	2.9	2.9	0.2
GDP	5.7	6.4	7.6	6.8	7.3	7.3
GDP, minus mining	5.6	5.2	6.8	8.2	8.0	
GNI	4.7	13.8	1.9	7.2	6.1	
Memorandum items						
GDP at current market prices (billions of kwacha)	36,364	64,616	77,667	93,345	105,256	
GNI at market prices (billions of kwacha)	32,858	62,503	71,128	85,760	97,344	
Nominal GDP per capita (U.S. dollars)	743	990	1,221	1,414	1,445	
Nominal GNI per capita (U.S. dollars)	671	958	1,118	1,299	1,336	

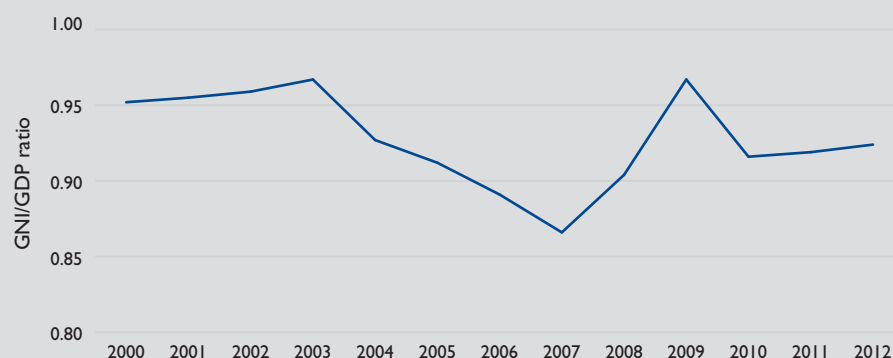
Note: Blank cells are not applicable.

a. Includes community, social, and personal services and others.

Source: Zambian authorities, IMF, and World Bank staff estimates.

Figure Ratio of gross national disposable income to gross domestic product in Zambia, 2000–12

1.3



Source: World Bank staff estimates.

the region's 4.8 percent, at almost the same pace as in 2011. Excluding South Africa, the region is expected to grow at 6 percent in 2012. In the recent past Zambia has grown faster than all its peers, including both mineral-producing and nonmineral-producing countries (table 1.2). Moreover, it is surrounded mostly by countries on a steady and moderately high growth path, which

is conducive to steady growth in regional demand for its exports.

Central government finances—growing public investment

In recent years the share of mining revenue in central government finances in Zambia has grown, while the share of foreign grants declined (table 1.3). Over 2008–11

Table GDP growth for comparator countries, 2003–12**1.2**

(percentage change from previous year)

Country and region	2003–08	2009	2010	2011	2012 ^f
Zambia	5.7	6.4	7.6	6.8	7.3
Angola	15.0	2.4	3.4	3.4	8.1
Botswana	4.5	–4.9	7.0	5.1	5.5
Congo, Dem. Rep.	6.1	2.8	7.2	7.0	7.2
Ghana	6.3	4.7	6.6	14.4	7.2
Kenya	4.8	2.6	5.8	4.4	5.0
Malawi	5.9	7.6	7.1	5.0	4.5
Mozambique	7.5	6.3	6.8	7.1	6.7
Rwanda	7.5	4.1	7.2	8.6	7.4
Tanzania	7.2	6.0	7.0	6.4	8.0
Uganda	7.9	7.2	5.2	6.7	4.0
Zimbabwe	–9.1	5.7	9.0	5.0	2.5
Sub-Saharan Africa	5.8	2.0	5.0	4.7	4.8

f = forecast.

Source: World Bank Global Economic Prospects.

mining revenues averaged around 2.6 percent of GDP, a sharp increase from the previous range of 1.0–1.4 percent over 2003–08. Despite a decline in mining output, mining revenues are expected to be 3.8 percent of GDP in 2012, partly due to an increase in royalty rates. The government is making efforts to further rationalize the fiscal regime and

improve mining tax compliance while keeping the regime predictable. To that end, the 2013 budget proposes changing the treatment of capital expenditure for tax purposes and better monitoring minerals being produced and exported. Mining revenues are expected to continue growing in the medium term, as carryover losses of mining companies

Table Summary of central government finances, 2008–12**1.3**

(percent of GDP)

	2008	2009	2010	2011	2012 (preliminary)
Revenue	23.0	18.9	19.6	21.7	21.5
Tax	17.6	14.6	16.4	19.3	17.9
Nontax	1.3	1.4	1.4	1.6	2.0
Grants	4.1	2.9	1.8	0.8	1.6
Expenditure	23.9	21.3	22.6	23.9	25.8
Recurrent	20.4	17.9	19.4	19.7	19.8
Out of which interest payments	1.7	1.6	1.8	1.2	1.8
Out of which employee compensation	8.2	8.2	8.1	7.9	9.0
Out of which FISP	0.9	1.2	2.4	1.0	0.5
Out of which FRA	0.8	0.9	0.8	1.8	1.2
Capital	3.5	3.4	3.2	4.2	6.1
Overall balance (including grants) ^a	–1.5	–2.4	–3.1	–3.9	–4.3
Financing	1.5	2.4	3.1	3.9	4.3
External (net)	0.5	–0.1	0.3	1.7	3.8
Domestic (net)	1.1	2.5	2.7	2.3	0.5
Memorandum items					
Primary balance	0.2	–0.8	–1.3	–2.7	–2.5
Mining revenues	1.9	1.0	1.9	5.5	3.8
Stock of net external debt	9.4	10.0	9.1	10.2	13.3
Stock of net domestic debt	10.5	12.1	12.9	9.9	10.5

FISP = Farmer Input Support Programme; FRA = Food Reserve Agency.

a. Reflects carryover budgetary releases not included in expenditures.

Source: Ministry of Finance and IMF estimates.

are exhausted and tax compliance is strengthened. Nonmining revenues could also grow given their fairly low current levels.¹

Zambia's stock of public debt is fairly low, allowing plenty of headroom to borrow. At the end of 2011 Zambia's gross public debt was about 28 percent of GDP, 11.6 percentage points of it external debt.² Most of the external debt is concessional and from multilateral institutions. But between July 2011 and September 2012 the country borrowed about \$1.25 billion from nonconcessional sources alone,³ including the recent issue of a \$750 million sovereign bond. These borrowings are not expected to affect Zambia's debt outlook as long as the proceeds are used for high-return projects. There are some concerns on that count, as discussed later.

Zambia is using its growing resource envelope mostly to ramp up public investment. As a result, its capital budget has risen from 3.2 percent of GDP in 2010 to 6.1 percent in 2012. The 2013 capital budget is planned at a similar level, with the bulk of the resources to be spent on transport and energy infrastructure. Most of the proceeds of the sovereign

bond are proposed to finance infrastructure projects (table 1.4).

Infrastructure spending allows using the resource windfall for building national wealth, but Zambia could do better on that score. National net savings, conventionally a measure of change in national wealth, needs to be adjusted for mineral depletion. As an approximation, we could subtract the depletion of mineral wealth and add investment in human capital (Ley 2011). On this measure of "genuine" savings, Zambia has not been performing as well as its neighbors, Botswana and Namibia (figure 1.4). In fact, despite the commodity price boom, Zambia's average adjusted savings was negative over 2000–10, indicating a net depletion of "genuine" national wealth.

The ramping up of resources for public investment also needs to be matched with the selection of high-return projects and efficient implementation. That would not only support the current growth trajectory but also develop long-run competitiveness and productive capacity. It would also keep the debt outlook on a sustainable long-term path. The 2013 Budget Address acknowledges that project

Table Proposed use of the sovereign bond proceeds

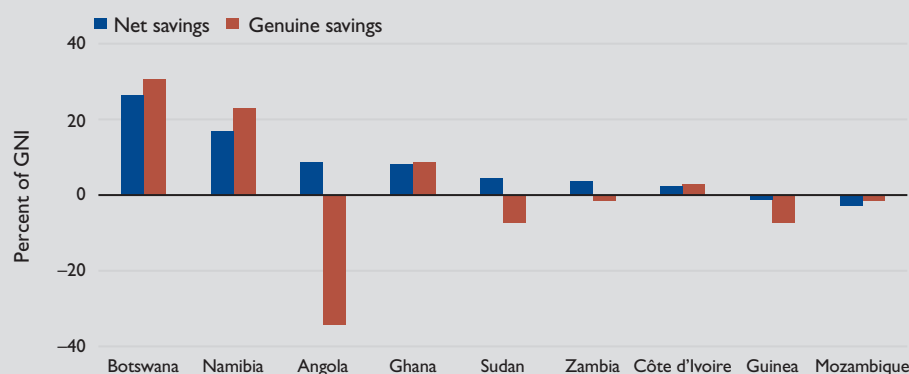
1.4

	Billions of kwacha	Millions of U.S. dollars	Percent of GDP
Energy (generation and transmission)	1,275	255.0	1.2
Transport (road and rail)	2,150	430.0	2.0
Rehabilitation of central hospitals	145	29.0	0.1
Access to finance (SME credit line)	100	20.0	0.1
Fees and transaction costs (actual)	7	1.4	0.0
Discount premium (actual)	73	14.6	0.1
Total	3,750	750.0	3.6

Source: Ministry of Finance 2012.

Figure Net savings and "genuine" savings, 2000–10

1.4



Source: World Bank 2012a.

appraisal is weak and promises to “institutionalize a rigorous appraisal system for screening investment projects in order to ensure that borrowed funds are only applied to infrastructure projects that directly and demonstrably contribute to the nation’s economic growth” (Ministry of Finance 2012). The government should also extend such appraisal to projects financed from domestic revenues, given the opportunity cost of these resources. This is especially relevant for road projects financed largely from domestic resources.

Zambia’s recent fiscal policy has been expansionary. After grants, the country’s average overall balance over 2010–12 was –3.5 percent of GDP. This policy is sustainable from a debt sustainability point of view. However, slower expansion of expenditure would allow time to strengthen the country’s capacity to prepare and appraise projects and spend more efficiently. Currently, there are large unspent balances from budget releases

in government accounts. A slower expansion would also support the development of fiscal buffers to smoothen spending across shocks. The last point is gaining importance, with the share of mining revenues in government finances increasing and thus increasing exposure to copper price changes. Recent revenue trends show that domestic revenues move with copper prices (figure 1.5).

External sector

For the first time since 2008 the external current account is estimated to end in a deficit of about \$674 million in 2012 (figure 1.6). While declining copper exports were more than made up by rising nontraditional exports, imports grew fast due to the growth in mining investments, intermediate inputs, and consumer durables.

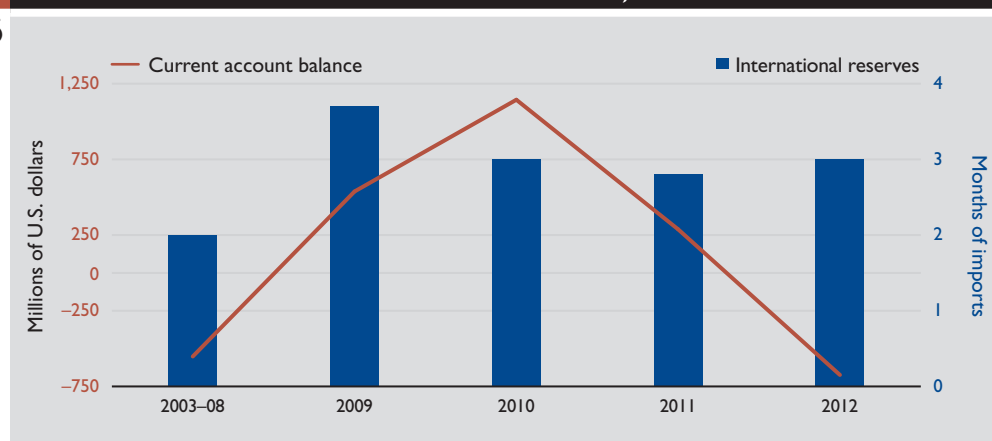
Capital inflows to Zambia have remained resilient despite global slowdown, with net FDI and portfolio investments growing

Figure 1.5 Recent comovement in domestic revenue (2003 prices) and copper prices, 2004–12



Source: World Bank staff estimates.

Figure 1.6 International reserves and current account balance, 2003–12



Source: Zambian authorities and IMF estimates.

Table Selected balance of payments indicators, 2008–12**1.5**

(millions of U.S. dollars, unless otherwise indicated)

	2008	2009	2010	2011 (preliminary)	2012 (projected)
Current account	-1,050	538	1,144	289	-674
Trade balance	404	906	2,704	2,277	1,351
Exports	4,959	4,319	7,414	8,731	9,445
Out of which copper	3,684	3,179	5,768	6,663	6,461
Out of which nontraditional exports	876	900	1,190	1,608	2,379
Imports	-4,554	-3,413	-4,710	-6,454	-8,094
Services (net)	-615	-465	-629	-808	-825
Income (net)	-1,399	-419	-1,363	-1,562	-1,514
Current transfers (net)	560	516	432	382	314
Capital and financial account	1,046	-155	-1,152	-539	1,438
Capital account	230	237	150	151	223
Financial account	816	-392	-1,302	-690	1,215
Out of which FDI and portfolio investments	933	350	708	889	991
Overall balance	13	540	83	208	764
Financing: change in NIR (minus indicates an increase)	-13	-540	-83	-208	-764
Memorandum items					
Current account (percent of GDP)	-5.6	6.1	8.0	1.5	-3.4
Gross international reserves	976	1,758	1,897	2,167	2,590
in months of prospective imports cover	2.8	3.7	3.0	2.8	3.0

FDI = foreign direct investment; NIR = net international reserves.

Note: Overall balance includes errors and omissions.

Source: Zambian authorities and IMF staff estimates.

steadily, from \$350 million in 2009 to an estimated \$991 million in 2012 (table 1.5). FDI inflows continue to be directed mainly at the mining sector, with manufacturing, communications, and financial institutions also contributing to recent FDI growth. Despite the current account deficit, and aided by the sovereign bond, gross international reserves grew about \$282 million in 2012, staying at about 3 months of prospective imports. The government aims to further increase the reserve coverage, mainly to guard against terms of trade shocks.

Medium-term growth prospects in Zambia

Medium-term prospects for Zambia's economic growth remain strong but are subject to considerable downside risks emanating from global uncertainties. GDP growth is expected to average more than 7 percent over the 2013–14 forecast horizon, making Zambia one of fastest growing Sub-Saharan economies (table 1.6). Underpinning the projected growth over the medium term are favorable external and domestic developments. Despite the ongoing slowdown in China's economy (Zambia's largest trading partner), international metal and

mineral prices (including that of copper) are expected to remain fairly high over the medium term. Premised on the expected soft landing of China, copper prices are expected to recover from \$7,900 per metric ton in 2012 to \$8,500 in 2013 before falling back to \$8,000 in 2014. As a result, the strong FDI flows to the mining sector of recent years are expected to continue, supporting the expansion of existing mines (Kansanshi, Lumwana, and Konkola) and the construction of new mines (such as the First Quantum Trident mine and smelter project).

Agriculture prospects are good assuming that government policy in the sector improves, with the Farmer Input Support Programme becoming more efficient, which is expected to enhance agricultural productivity. This will also be helped by scaling up extension services, irrigation, and research.

Although the construction of new mines will require increases in imports, the net export contribution to GDP is expected to remain positive. Significant FDI inflows and high copper prices over the forecast horizon are also expected to provide support to the kwacha, thus helping to maintain macroeconomic stability.

Table 1.6 GDP growth projections, by main sectors, 2012–14

(constant price = 1994; percentage change from previous year, unless otherwise indicated)

	2012 (preliminary)	2013 (projected)	2014 (projected)
Primary sector	4.1	9.2	11.8
Agriculture, forestry, and fishing	7.1	7.3	7.4
Mining and quarrying	–0.3	14.3	18.0
Secondary sector	11.2	19.0	18.5
Manufacturing	11.2	6.7	6.1
Electricity, gas, and water	2.3	4.0	4.5
Construction	13.0	12.0	11.0
Tertiary sector	6.8	7.5	7.5
Wholesale and retail	8.9	4.8	4.9
Restaurants, bars, and hotels	2.1	5.0	4.0
Transport, storage, and communications	11.3	10.5	10.6
Financial institutions and insurance	6.0	4.9	6.0
Real estate and business services	2.9	3.0	3.0
GDP	7.3	7.8	8.1
GDP, minus mining	8.0	7.2	7.2
<i>Memorandum item</i>			
GDP at current market prices (billions of kwacha)	105,256	120,149	136,525

Source: Zambian authorities and World Bank staff estimates.

Aggregate demand is expected to continue supporting growth. Fiscal policy is expected to remain expansionary, contributing to higher growth prospects. In addition, recent real wage increases (for both the public and private sectors) will support household consumption, the largest contributor to aggregate demand. Household domestic spending should also benefit from a stable macroeconomic environment (average inflation expected at 6–7 percent), lower real interest rates, and increased access to consumer credit. Indeed, with rising incomes, the increase in personal loans is expected to continue over 2013–14 (the share of personal loans in total loans has increased from 40 percent in 2010 to 50 percent in 2012).

Domestic investment is also expected to continue to support growth. The latest Bank of Zambia quarterly survey of business opinion and expectations forecasts that business confidence will remain high through 2013, with firms investing in construction and machinery. Indeed, the opening of new mines is expected to have backward linkages to the services sector, with real estate activity around the mining receiving a boost. The multifacility economic zone should help boost both domestic and foreign investment to the nonextractive sectors.

The expected pickup in the global economic environment, as well as in some of Zambia's major trading partners such as the European Union and South Africa, should increase demand for Zambia's exports—both traditional (such as copper) and non-traditional (such as sugar and beef)—as well as tourism services. Demand should be supported by growth in Sub-Saharan Africa, expected at 6.2 percent in 2013, excluding South Africa.

Risks to Zambia's economic growth

Despite Zambia's fairly robust growth prospects over the forecast horizon, significant headwinds could lead to weaker-than-envisaged real GDP growth over 2013–14.

Ongoing strong policy intervention in Europe (the European Central Bank's bond buying program, plans for a fiscal and banking union) will keep tensions in global financial markets at bay. But this is not guaranteed, as financial markets remain susceptible to changing market sentiments. If the Eurozone crisis worsens significantly, shutting out some of the large economies from international capital markets, GDP growth in Zambia could fall by some 3.3 percentage points. And there are risks emanating from other countries. For instance, steeper than planned fiscal consolidation in the United

States could unravel sentiments in global financial markets. That could weaken global demand with implications for industrial production, thus reducing demand for industrial metals such as copper.

Weaker demand from high-income countries such as China, which accounts for more than half of Zambia's exports, remains pertinent for Zambia. Indeed, China has already shown signs of slowing growth, with GDP growth falling from 9.2 percent in 2011 to 7.7 percent in 2012. Despite these lower growth rates, Chinese demand will remain healthy for Zambia's exports. But if China is unable to land softly, and much weaker growth rates persist over the forecast horizon, this could significantly dampen its demand for metals, thus leading to a much steeper fall in prices including that of copper and the concomitant decrease in mining sector activity. And significantly weaker copper prices could lead to a steep depreciation of the kwacha, higher imported inflation, and macroeconomic instability.

Another commodity-related headwind from the global economy is the risk of soaring oil prices, given that crude oil (and fertilizer) accounts for some 15 percent of Zambia's import bill and remains an important driver

of consumer prices (inflation) and business costs. Although global demand is expected to pick up, the main driver of a potential hike in oil prices would be supply side-related concerns (such as further escalation of tensions in the Middle East). Indeed, if global crude prices were to climb back to the highs of about \$130 per barrel in mid-2011 from a projected \$107 per barrel, Zambia's current account balance and GDP growth could deteriorate by a further 0.7 and 0.2 percentage points, respectively.

On the domestic front an uncertain policy environment could lead to weaker than expected investments, thus reducing GDP growth. The latest Bank of Zambia business survey noted that some investors have adopted a wait-and-see attitude and considered uncertain government policy an impediment to continuing investor confidence. Another domestic risk is that, given the low levels of irrigation, particularly among small-scale farmers, agricultural output is most susceptible to adverse weather conditions, potentially reducing the sector's contribution to GDP growth. Indeed, in the 2011/12 farming season poor rainfall in some of the maize-growing provinces contributed to the 6.7 percent decline in Zambia's maize output.

SECTION 2

The state of basic human opportunities for children in Zambia

Inequality in Zambia

Despite Zambia's robust economic growth over 2000–10, there was very little progress on reducing poverty, particularly in the latter half of the decade—for two main reasons. First, the growth—driven by industries such as mining, construction, financial services, and tourism—did very little to create new jobs and expand economic opportunities beyond the small part of the country's labor force already employed in these industries. Second, the urban-centered growth also failed to generate enough spillovers for the roughly two-thirds of Zambian people who live in rural areas, depend on agriculture, and have seen their incomes stagnate over the last decade.

Such growth led to an increasing disparity between rural and urban areas. Annual consumption growth of different wealth percentiles was less than 1 percent for most

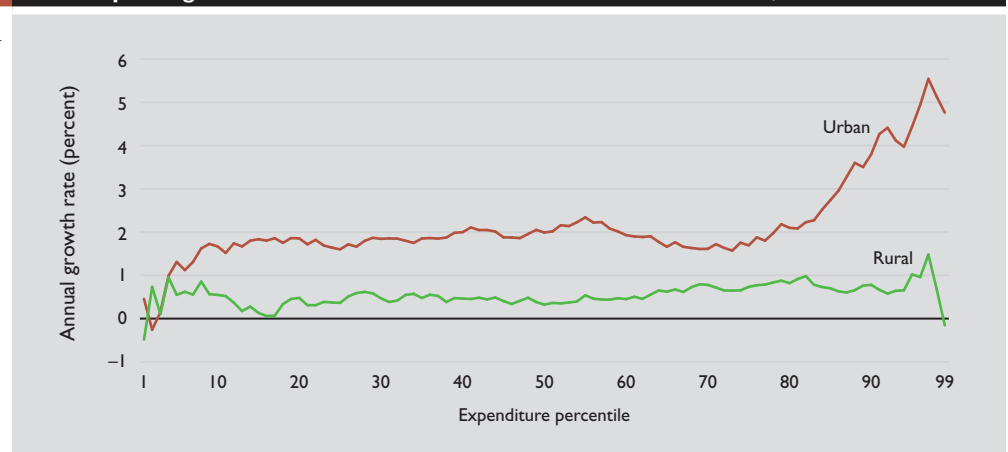
of the rural population between 2006 and 2010, whereas growth in urban areas was about 2 percent for the first 80 percent and much higher for the wealthiest 20 percent (figure 2.1).

The concentration of economic growth in particular sectors and regions over a sustained period also manifests itself in Zambia's persistently high inequality. The Gini coefficient for consumption in Zambia was 52 in 2010 and has generally remained above 50 for much of the last decade, making Zambia one of the most unequal countries not only in Sub-Saharan Africa but also in the world (figure 2.2). The richest quintile of the population in Zambia accounts for 57 percent of consumption, compared with 4 percent for the poorest quintile (World Bank 2012c).

Inequality in Zambia also has substantial geographic dimensions: there are sharp

Figure 2.1 Consumption growth incidence curves for urban and rural areas, 2006–10

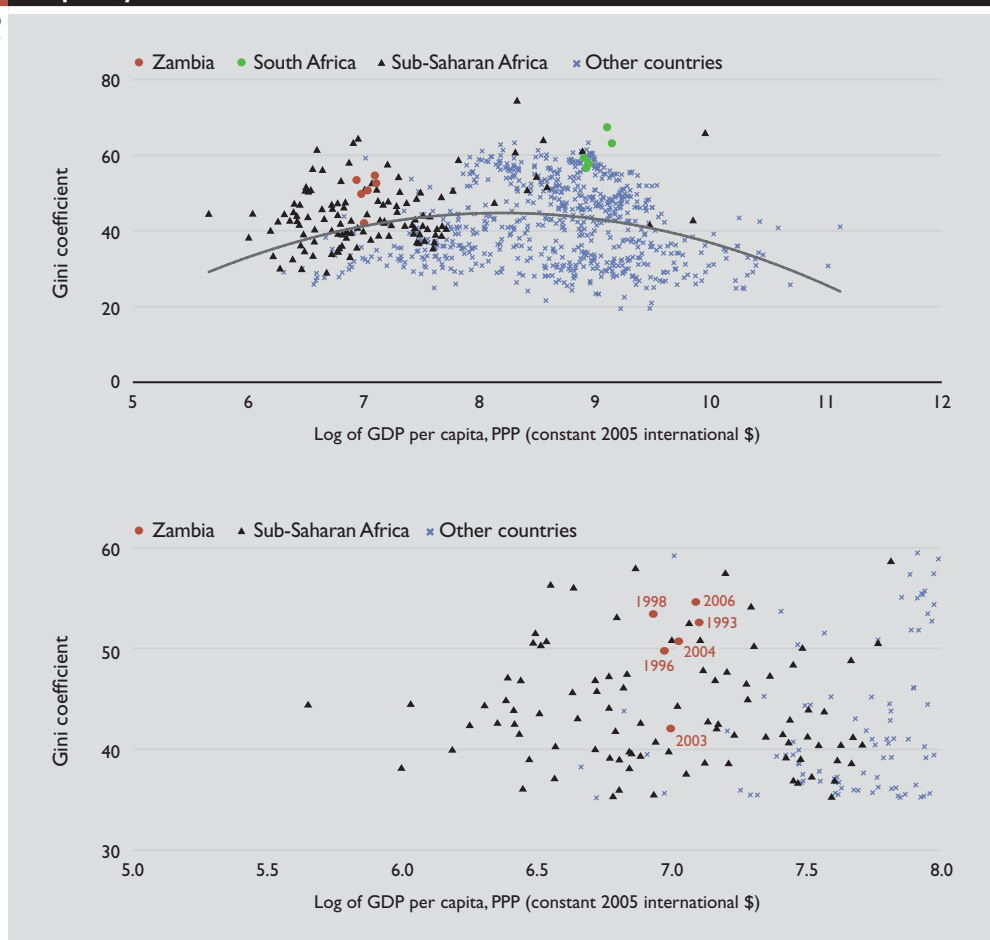
2.1



Note: Data for 2006 are imputed values and not directly measured values.
Source: World Bank 2012c.

Figure 2.2 Inequality in Zambia and the world

2.2



Note: The Gini coefficient is a measure of inequality, with a score of 100 indicating perfect inequality, and a score of 0, perfect equality.
Source: World Bank 2011.

disparities between urban and rural areas and among the country's nine provinces. In fact, inequality between rural and urban areas and among provinces accounts for more than three-quarters of the observed inequality in the country (World Bank 2012c).¹ This suggests that the rural areas as well as entire regions may be lagging and generally not benefiting from the growth in other parts of the country.

Zambia also displays a staggering aggregate wage inequality. In 2010 the Gini coefficient on labor market income was 88 (World Bank 2012c).² Wage inequality in the labor market is explained partly by gender and rural or urban location; education contributes substantially to wage inequality in urban areas. The government's expenditure policy is not very effective in reducing inequality in income or access to services. Social transfers are a very small part of government spending. The overall incidence of public spending on education and health is neither progressive

nor pro-poor.³ The benefits of the agricultural input subsidy program are somewhat progressive but suffer from targeting problems: the largest benefits accrue to farmers in the middle-income quintiles.

This section is premised on the notion that policies to boost the human capital development of children and youth promote growth and reduce inequality in the long run. The link between human capital and economic growth has been well established in the rich cross-country empirical literature. For example, Barro (2001) finds growth to be positively related to the average years of school attainment of adult males at the secondary and higher levels. While "quantity" of schooling is important, the quality of schooling as measured by internationally comparable test scores is even more so—scores on science tests have a particularly strong positive relationship with growth (Barro 2001). Several recent studies have shown an important effect of health on economic growth

(see Grimm 2011 for an overview).⁴ Research indicates that a healthy population can drive economic growth and social development but is not an automatic by-product of economic development. Similarly, at the individual level, good health is an important determinant of economic productivity.⁵

For inequality, the analysis here focuses on a slightly different variable—the *inequality of opportunity*—than inequality of income or consumption. The notion driving this focus is that the inequality from predetermined circumstances such as gender, ethnicity, birthplace, or parental wealth in determining people’s economic, social, and political success is different from the inequality from differential efforts, life choices, or innate talents and thus should have a different effect on growth in comparison to the latter. Emerging evidence suggests that the inequality of opportunity adversely affects growth and development.⁶

The analysis delves deeper into how opportunities for human development differ across children born and growing in different circumstances. The 2013 Budget Speech puts forth a vision for “Delivering Inclusive Development and Social Justice,” with a focus on expanding opportunities for all and ensuring the equitable distribution of the tangible benefits of development. This analysis puts forth a compelling case for policy to equalize opportunities for human development across children in all circumstances.

From inequality to equity

High inequality polarizes political and economic discourse in any country, as the notion of the inequality requiring active policy intervention rarely finds consensus. Some argue that individuals cannot—and indeed should not—be rewarded equally irrespective of their efforts, choices in life (whether to pursue higher education, for example), or innate talents. If a person works harder than another, it is only fair that she gets suitably compensated; the same for someone who is more talented than another. But there is much broader agreement that predetermined circumstances such as gender, ethnicity, birthplace, or family origins should not determine people’s economic, social, and political success. A person should not have fewer opportunities in life just because she is a girl or just because she is born in a certain province. That is the core principle behind equality of opportunity, and the framework adopted here (box 2.1).⁷

Analyzing such opportunities for children in Zambia can better illuminate the nature and causes of inequality of outcomes observed among adults. Opportunities among children can also be reliable predictors of economic mobility across generations and over time. If access to economic opportunities (such as jobs, credit, land, wages, and financial assets) is correlated with the circumstances of an individual (such as parental socioeconomic status and location of residence), as it appears to be in Zambia,

Box The concept of equality of opportunity

2.1

While social scientists and philosophers before the 1970s dealt mostly with the fairness of outcomes, several authors have since delved into fairness of process, equality of resources, and equality of opportunity for welfare. Sen (1979, 2001) has been deeply influential in arguing for an equitable distribution of “capabilities,” which essentially amount to a person’s ability and effort to convert resources into outcomes they can enjoy. Roemer (1998) formalized an equality of opportunity principle, arguing that opportunities should be independent of circumstances and outcomes should depend only on effort and innate ability. Most agree that policy should work to ensure this independence.

How does the concept of equality of opportunity translate to measurable objectives for countries? Defining and measuring “opportunities” can be subjective and contextual. But most societies can agree on a basic set of goods and services, such as safe water, adequate sanitation, nutrition, and primary schooling, that conform to a minimalist notion of “opportunities” for citizens. And most societies can agree that equality of opportunities should be a goal to aspire toward when opportunities are defined as access to minimal set of basic goods.

The World Bank’s focus on equity is well articulated in *World Development Report 2006: Equity and Development* (2005), which argues that inequality of opportunity sustains extreme deprivation, results in wasted human potential, and weakens prospects for overall prosperity. Regardless of the choices a society makes about how to universalize opportunities, countries need a systematic way to measure progress toward providing opportunities to all citizens, beyond commonly used measures of overall coverage of goods or services.

then it reinforces the link between children's circumstances and their opportunities in life, in turn perpetuating economic inequality between groups with different circumstances over generations. For policy makers interested in closing gaps in outcomes between subgroups of the population in Zambia, a comprehensive analysis of these opportunities can provide a useful blueprint on which efforts to level the playing field can be based.

Until recently, framing the debate in such terms had not been possible in developing countries without an intuitive measure of equality of opportunity among children (something akin to the Gini) that could be readily applied to the data available. Techniques such as the Human Opportunity Index (HOI) and their application in Latin America and Caribbean over the last decade have filled some of that gap. This analysis uses some of these techniques to better understand inequality in Zambia.

This analysis of opportunities in Zambia focuses exclusively on opportunities provided to an individual in childhood. For a child, opportunities are synonymous with access to (and use of) basic goods or services, such as basic education, health, safe water, and sanitation, while “individual effort” is mostly irrelevant, because the family, society, or government (and not the child) are responsible for ensuring whether the child will have access to them. The focus on children also has implications for public policy. Academic research has found interventions that equalize opportunities earlier in life to be significantly more cost-effective and successful than those attempted later in life.⁸

Key questions

The analysis poses four key questions on equality of opportunities among Zambian children:

- What is the status of Zambian children's access to basic opportunities (education, health, water, sanitation, and so on) in terms of coverage and distribution among children of different circumstances?
- How has access to these opportunities changed over time in Zambia, and to what extent are the changes attributable to changes in the scale and equalization of coverage?

- What circumstances shape the inequality of opportunity in Zambia, and consequently what are the most vulnerable groups among children?
- How has the government's expenditure policy responded to existing inequalities of opportunity in education—that is, how progressive are current spending patterns from the point of view of opportunities?⁹

Opportunities among children are measured here by the HOI, the coverage rate of a particular basic service adjusted by how equitably the service is distributed among groups differentiated by circumstances. In discounting inequitable access, the HOI reflects the extent to which personal circumstances that children cannot be held accountable for affect their basic opportunities. So two societies with the same coverage rate for a service can have different HOIs if people's access to that opportunity in one is determined to a greater extent by their gender, race, family background, or other personal circumstance beyond their control and considered an unjust source of exclusion (box 2.2; Barros and others 2009; Barros, Vega, and Saavedra 2010).

A girl (let's call her Mwewa) born in a remote village in the province of Luapula to a single, uneducated mother earning 4,000 kwacha a month and with four other siblings ought to have an equal shot at becoming a doctor or an engineer as a boy with one sibling (let's call him Melu), born in a two-parent household in Lusaka earning at the highest end of the distribution. Mwewa's odds should not be shaped before she is even born, never mind before she has made any conscientious choice. The HOI provides a unique representation of how equal Mwewa and Melu's opportunities are to realize their potentials. It also measures progress toward universal coverage of these basic opportunities and the fairness of allocating access to those opportunities in a single indicator (Barros and others 2009; Barros, Vega, and Saavedra 2010). Overall, the HOI brings equity to the forefront of policy making with an operational measure to track progress.

Opportunities and circumstances for Zambian children

The opportunities considered are those that enable Zambian children to realize their

The academic literature offers several ways to measure inequality of opportunity—among them is the Human Opportunity Index (HOI), a scalar measure easily computable from the typical data available in developing countries. Developed by World Bank staff and external researchers (see Barros and others 2009), the HOI is an intuitive measure of a society's progress toward equitable provision of opportunities for all children. It has been used in two regional reports in Latin America, a study (in draft) for 20 Sub-Saharan countries, and numerous studies conducted (or in progress) for countries around the world. The focus of most studies has been children, with some applications to labor markets.

The HOI measures in a single indicator the coverage rate of a particular service, adjusted by how equitably the service is distributed among groups differentiated by circumstance. The construction of the HOI involves aggregating circumstance-specific coverage rates in a scalar measure that increases with overall coverage and decreases with the differences in coverage among groups with different sets of circumstances. The index runs from 0 to 100. A society with universal coverage in a particular opportunity (say, primary school enrollment) would score 100. But a society with an average primary enrollment of 50 percent that is unequally distributed in favor of children of certain circumstances (say, urban children) will have an HOI below 50, with the exact value depending on how unequal enrollment is among children of different circumstances (see annex A). The measure also has a number of desirable and intuitive properties (see annex B).

All results are subject to the caveat that the HOI is estimated for a specified list of circumstances, which could change if this list were to change. But the HOI for any opportunity cannot be higher if more circumstances are added to the existing list. Thus if a society wants to measure equality of opportunity with reference to a larger number of circumstances (and groups) than we have considered, the measure of the HOI we provide will serve as an upper bound to the “true” HOI that would take all circumstances into account. To compute the HOI for a certain opportunity for the children of a country, household survey data are essential, with information at the individual (child) and household level. Computing the HOI for a particular opportunity when the number of circumstances is large requires an econometric exercise, which involves predicting the HOI from observed access to opportunities and circumstances among children.

productive potential directly, by enhancing their human capital, and indirectly, by accessing infrastructural amenities that help ensure decent quality of life and facilitate accumulation of human capital (see annex D). We consider three broad opportunities: the opportunity to receive adequate education, the opportunity to receive a healthy start in the first few years of life, and the opportunity to grow up in a household under conditions adequate to provide a safe, stable, and a stimulating childhood.

For education we consider school attendance for children ages 7–13 and ages 14–16. Under the education system in Zambia, children are expected to be enrolled in lower and middle basic education (grades 1–7) between the ages of 7 and 13 and in upper basic between the ages of 14 and 16. Since the education system is designed for children to start formal schooling at age 7, another opportunity considered is to start basic education on time. To more reliably measure the quality of education, data on finishing primary school on time and acquiring basic competency in reading and numeracy by the time the child is in grade 6 are used.¹⁰

For health we include indicators that capture whether a child has been fully immunized by 24 months of age and whether the

child is underweight or stunted. There is growing evidence that nutritional deprivation in early life has persistent long-term effects into adulthood.¹¹ The World Health Organization recommends that children be exclusively breastfed for the first six months of their lives to ensure optimal growth and development. And whether a child was breastfed exclusively for six months is one of the opportunities relating to a healthy start in life. However, breastfeeding alone does not guarantee children healthy development: evidence from across the world shows that most growth faltering occurs between the ages of 6 and 24 months, when children are transitioning to the family diet and are also most vulnerable to diseases. We also use whether there is at least one bednet in the household as an essential opportunity for children, because bednets are one of the most effective preventive measures against malaria.¹²

Infrastructure-related services include access to safe water on site, improved sanitation, electricity, telecommunications and living in households that are not overcrowded—all critical for a safe, stable, and a stimulating childhood. Access to safe water, for example, is known to reduce considerably the risk of waterborne diseases, the leading cause of illness and

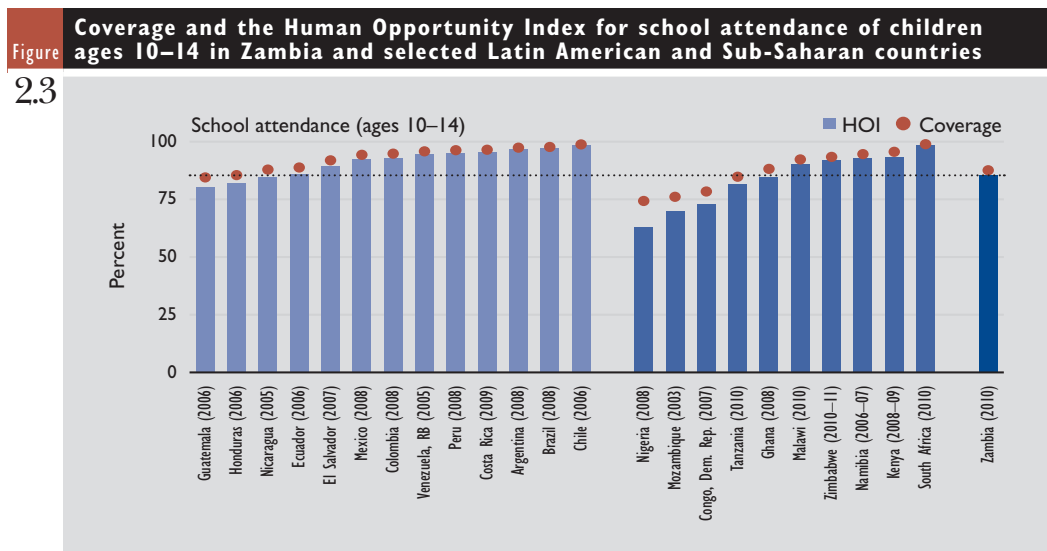
undernourishment in children, in turn affecting their education and earning potential.¹³ Improved sanitation significantly lowers the risk of illness. Access to electricity enables nighttime reading, is a healthier source of energy than fuel, and opens access to other opportunities, such as sources of information (radio, television, and the Internet). Access to telecommunications enhances the ability to communicate and even the access to critical services such as health care and education. Overcrowding has been found to have detrimental effects on child care, mental health, and social relationships at home.¹⁴

The following circumstances are taken into account in calculating the HOI for Zambia: gender of the child, total number of

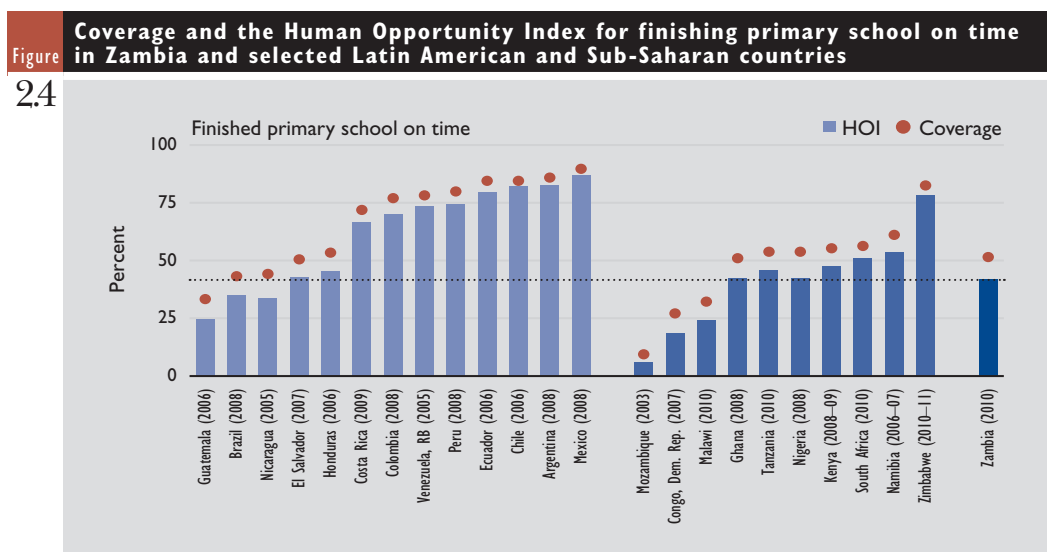
children ages 0–16 in the household, whether the parents are alive, level of education of the household head, gender of the household head, location of the household, and socio-economic status of the household measured by the household's expenditure. Location is divided into urban and rural on the one hand and the nine provinces on the other.

What is the status of Zambian children's access to basic opportunities?

It is illustrative to compare Zambian children with peers in other developing countries in Sub-Saharan Africa and Latin America. However, comparing Zambia with countries in other regions is limited because of the sparse coverage of similar analysis outside these two regions. Figures 2.3–2.7 plot the coverage

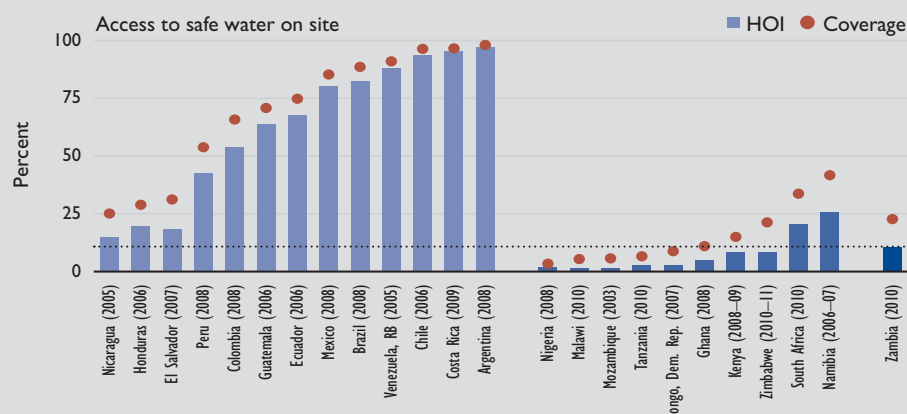


Source: Authors' calculations based on various national household surveys in the Latin American countries and Demographic and Health Surveys for Sub-Saharan countries.



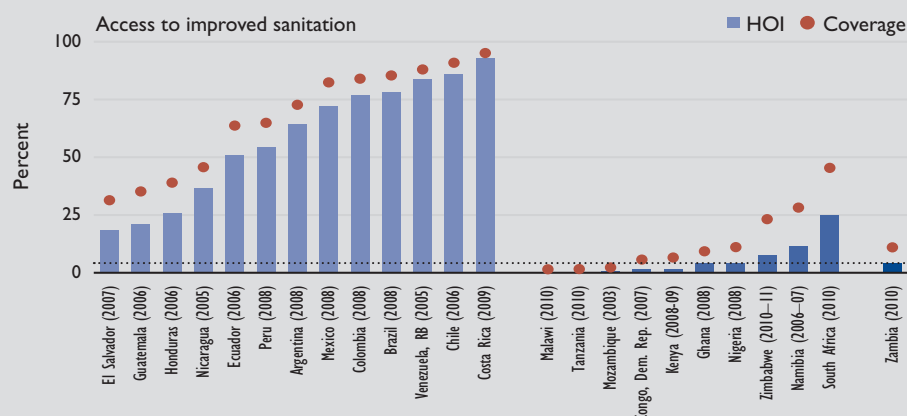
Source: Authors' calculations based on various national household surveys in the Latin American countries and Demographic and Health Surveys for Sub-Saharan countries.

Figure 2.5 Coverage and the Human Opportunity Index for access to safe water on site in Zambia and selected Latin American and Sub-Saharan countries



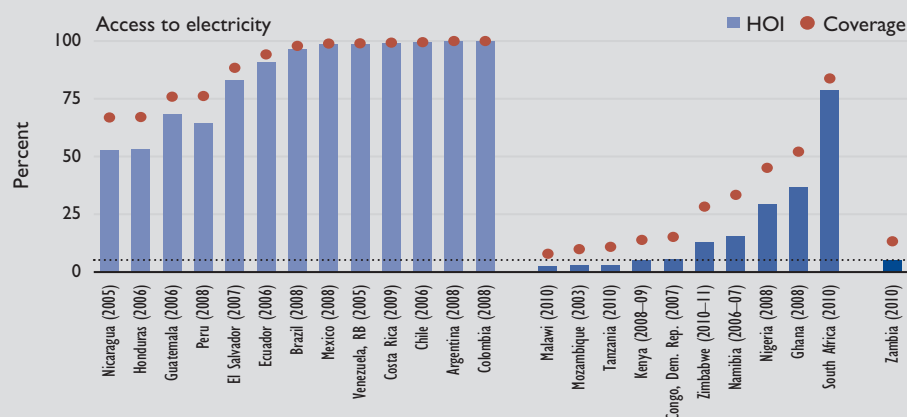
Source: Authors' calculations based on various national household surveys in the Latin American countries and Demographic and Health Surveys for Sub-Saharan countries.

Figure 2.6 Coverage and the Human Opportunity Index for access to improved sanitation in Zambia and selected Latin American and Sub-Saharan countries



Source: Authors' calculations based on various national household surveys in the Latin American countries and Demographic and Health Surveys for Sub-Saharan countries.

Figure 2.7 Coverage and the Human Opportunity Index for access to electricity in Zambia and selected Latin American and Sub-Saharan countries



Source: Authors' calculations based on various national household surveys in the Latin American countries and Demographic and Health Surveys for Sub-Saharan countries.

(distance of dots from the axis) and the HOI (height of the bars) for five opportunities: school attendance of children ages 10–14, whether children finished primary school on time, access to safe water on site, access to improved sanitation, and access to electricity. Note that the HOI is essentially the coverage adjusted for the inequality in coverage based on the circumstances. In other words, the higher the inequality—or the dissimilarity index (box 2.3)—the higher the penalty due to this inequality and thus for any given coverage rate the higher the gap between coverage and the HOI. So the distance between the dot (coverage) and the bar (HOI) measures the underlying inequality.

Among the five opportunities, Zambia does best in the opportunity related to school attendance for children ages 10–14 (see figure 2.3).¹⁵ The coverage and the HOI are above 85 percent. But at best this is on par with some of the poorest Latin American countries. Even among the African economies included in the comparison, Zambia does better than Nigeria and is comparable with Ghana but has a lower HOI than Kenya, Namibia, South Africa, and Zimbabwe.

For finishing primary school on time Zambia appears to do better than many African countries but again lags behind Kenya, Namibia, South Africa, and Zimbabwe (see figure 2.4). It is significantly behind most Latin American countries.

Two things become apparent when looking at opportunities for access to safe water on site, improved sanitation, and electricity. First, the gap between coverage and the HOI generally widens not just for Zambia but also for most other countries, suggesting greater inequalities in access to these opportunities based on circumstances. Second, most chosen African comparator countries lag considerably behind most Latin American countries in provision of these opportunities. Even within Africa, Zambia appears to be behind Namibia and South Africa in access to safe

water on site (see figure 2.5), Namibia, South Africa, and Zimbabwe in access to improved sanitation (see figure 2.6), and Ghana, Namibia, Nigeria, South Africa, and Zimbabwe in access to electricity (see figure 2.7).

Note that, for the five opportunities for the international comparisons, only the lowest common set of circumstances (gender, family structure, socioeconomic status of parents, and location) was used to ensure comparability. We can now analyze Zambia more closely. Below, we use not only the broader set of circumstances (see table E2 in annex E) but also an expanded list of opportunities (figure 2.8).

This analysis reinforces what was already apparent through international comparisons: the state of human opportunities for Zambian children is fairly dire. Of the 20 opportunities analyzed here, roughly three-quarters have an HOI below 50 percent. School attendance—an opportunity that appears to be fairly well provided throughout Africa—falls well short of universal in Zambia. Note, however, that the inequality of opportunity based on circumstances for these indicators is fairly low, suggesting that the low coverage and not the inequality of coverage may be the driver of the low HOI. The same is not true for other measures of education. The average gap between coverage and the HOI for the remaining opportunities in education—starting primary school on time, finishing primary school on time, and obtaining basic competency in reading and numeracy—is roughly 8 percent and the average D-Index is close to 15 percent, suggesting a fair degree of correlation between access to these opportunities and individual child circumstances.

The gap between the HOIs for basic enrollment and other measures of education quality reflects perhaps a deeper malaise in the Zambian public school system. A 2007 Public Expenditure Tracking Study found that 20 percent of teachers in Zambia were

Box 2.3 The dissimilarity index

2.3

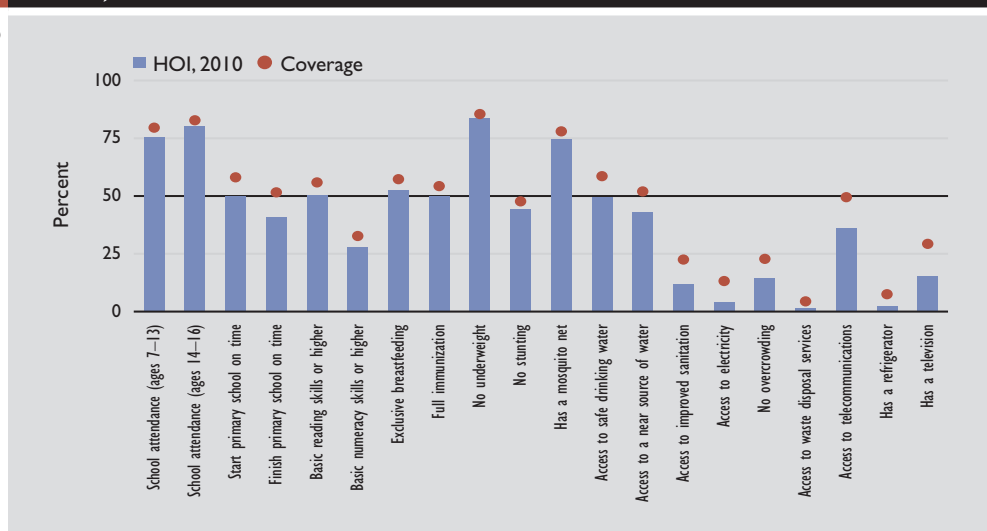
The dissimilarity index (D-Index) is the measure of inequality of opportunity used in this analysis. Intuitively, the D-Index shows the share of available opportunities that needs to be “reallocated” across circumstance groups in order to achieve equality of opportunity for a given coverage rate. A D-Index above 5 percent is usually considered problematic for policy-making purposes.

The D-Index (D) is also related to the human opportunity index (HOI) and the coverage (C) in the following manner:

$$HOI = C(1 - D)$$

Figure Coverage and the Human Opportunity Index for some key opportunities in Zambia, 2010

2.8



Source: Authors' calculations based on Central Statistical Office (2010).

absent on any given school day at the time of announced school visits. In other countries unannounced school visits—where absenteeism would be expected to be higher—reveal absence rates from 11 percent in Peru to 27 percent in Uganda (World Bank 2012b). This suggests that Zambia is among countries with the highest rates of teacher absenteeism. Teacher input is not the only input into the quality of education, but it is an important one.

Opportunities for health and nutrition appear to be universally low in Zambia and have a high degree of inequality of access based on circumstances that children are born into. The HOI for exclusive breastfeeding and full immunization are 53 and 50 percent, respectively. Although the underweight indicator is fairly high in level of outcome, only 48 percent of Zambian children escape chronic malnutrition or stunting. The HOI for mosquito nets is similarly high at 75 percent but far from universal, suggesting that many children live in households that are systematically unable to protect their young ones against malaria, at least by adequately providing mosquito nets within the household. The D-Index for opportunities for health ranges from 2.1 percent for the underweight indicator to 8.4 percent for full immunization, suggesting again a fairly high degree of circumstance-dependent access.

The situation is far worse when we consider opportunities for access to infrastructure and basic household amenities such as drinking

water, sanitation, electricity, and telecommunications. The access to these opportunities is extremely low, and inequalities extremely high, as evidenced by a D-Index that varies between 15 percent (access to safe water on site) to 69 percent (access to electricity). Only half of Zambian children grow up close to safe drinking water—defined as having a protected well, a borehole, rainwater, protected spring, or piped water within a kilometer of the home—with almost a fifth of these opportunities inequitably allocated (D-Index of 19.2 percent). Access to electricity is similarly limited, with only 13 percent of children living in households that use electricity at all for lighting or cooking. And a high D-Index of 69 percent suggests that the access to this opportunity is heavily influenced by the child's circumstances, resulting in a low HOI of 4.2 percent.

How has Zambian children's access to opportunities changed over time?

The HOIs for Zambia are well short of universal coverage in many cases and generally on par or behind even the poorest Latin American countries, a region marked by high overall inequality. But has been any progress in the HOIs over time? Comparing the HOI in 2006 with that in 2010, based on two Living Conditions Monitoring Surveys in these years, shows limited progress in Zambia. However, there has been astonishing progress in the opportunity related to access to telecommunications: the HOI rose

more than 6 percent a year over 2006–10. There has also been decent progress on starting and finishing primary school on time as well as on access to safe water on site with the HOIs increasing annually by 2.1, 1.1, 1.9, and 1.8 percent, respectively. But progress on basic opportunities for school enrollment has stalled. A similarly slow pace of growth appears to have afflicted the opportunity to escape childhood without being physically stunted by poor nutrition. Opportunities for full immunization and access to electricity have actually been reversed, with the HOI declining at 1.0 percent and 0.1 percent a year, respectively.

Changes in the HOI can be decomposed into a composition effect, scale effect, and equalization effect. A composition effect refers to the change in the distribution of circumstances that can result from broad demographic changes, economic growth, or social progress. A scale effect refers to proportional or parallel changes in coverage rates for all groups, perhaps as a result of broad-based public policy. And an equalization effect signifies a change in the coverage rate for the vulnerable groups for a given overall coverage, indicating the equity trend in society, perhaps as a result of targeted policies.

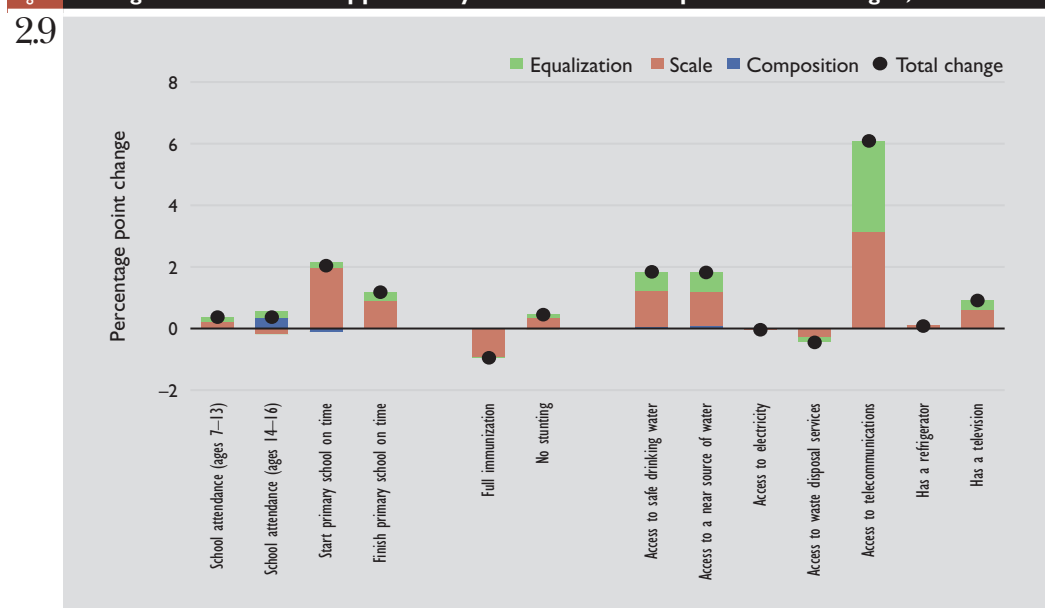
For the largest changes in the HOI for Zambia, the gains were driven by the scale effect (figure 2.9). But for opportunities of improved water and particularly

telecommunications, an appreciable gain was also driven by the equalization effect, with opportunities improving more than proportionately for the weaker circumstance groups. The composition effect was small in most cases, highlighting the slow-moving changes in the relative circumstances of children.

How does Zambia's progress compare with that in other countries in the region? Figure 2.10 compares the average annual percentage point change in the HOI for six opportunities in Zambia with 15 other Sub-Saharan countries.¹⁶ Despite seemingly low rate of progress, Zambia comes out in the top half of the Sub-Saharan countries included in the analysis on the expansion of education-related opportunities. On child stunting the sluggish growth of roughly 0.4 percentage points a year still places Zambia sixth among the comparator countries.

Zambia appears to be doing poorly relative to other Sub-Saharan countries on access to basic sanitation, full immunization, and access to electricity, ranking 10th, 15th, and 16th. On full immunization the provision of the opportunity actually appears to be shrinking at roughly a percentage point a year. Similarly, access to electricity—an opportunity measured by whether households are able to use electricity for cooking or lighting—appears to be declining, if at a slower pace. Progress on access to improved

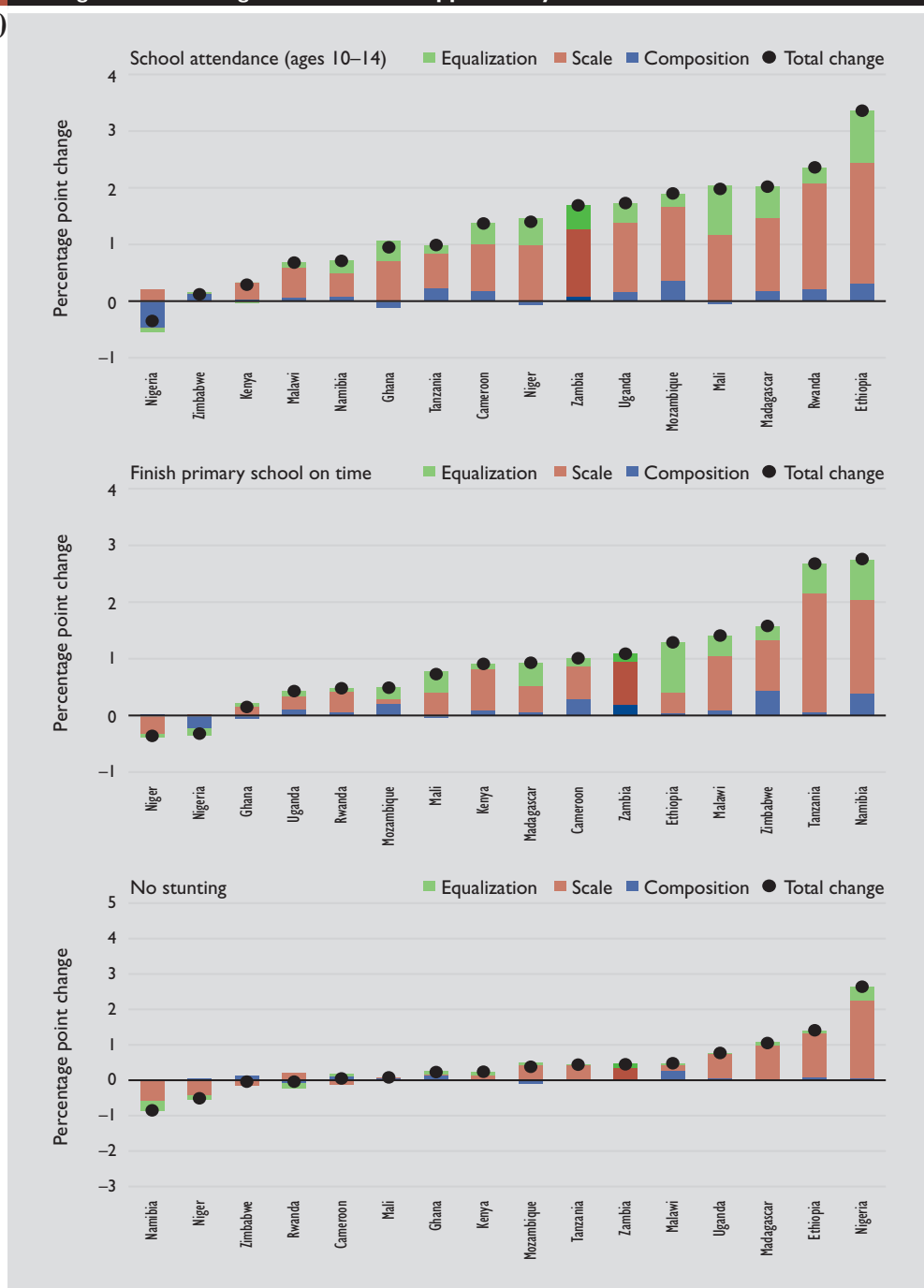
Figure 2.9 Change in the Human Opportunity Index and decomposition of changes, 2006–10



Source: Authors' calculations based on Central Statistical Office (2006, 2010).

Figure Average annual change in the Human Opportunity Index for Sub-Saharan countries

2.10



(continued)

sanitation, however, appears extremely slow, with rates that imply a percentage point improvement every three years.

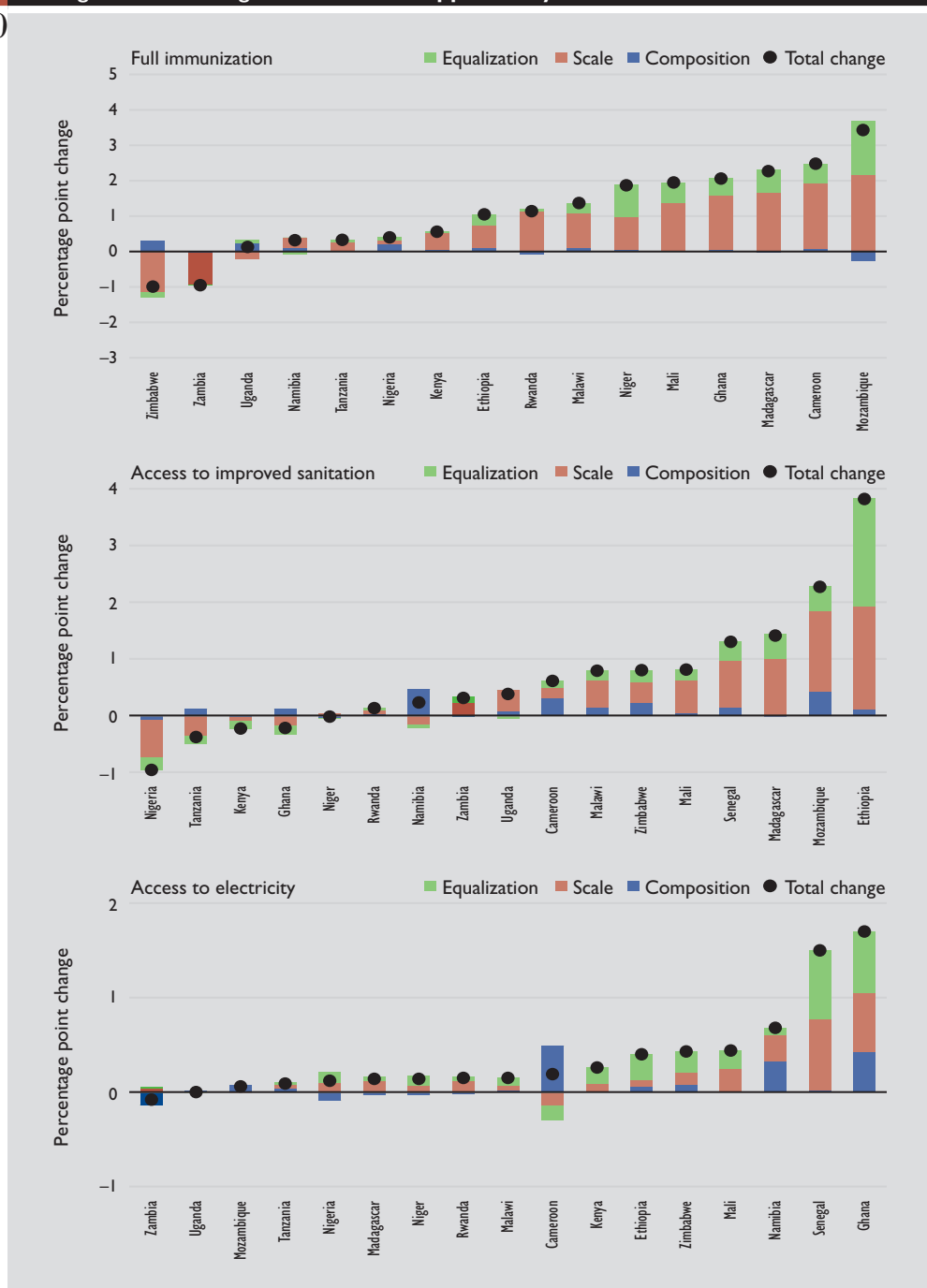
What circumstances shape inequality of opportunity?

Figure 2.11 decomposes the contribution of each circumstance to the overall D-Index. The connected blue dots correspond to the total D-Index for each opportunity and the colored bars denote the shares attributable

to each of the circumstances. For example, for the opportunity to have the basic numeracy skills or higher by the time the child is assessed in the sixth grade, the overall D-Index is 14 percent of which almost 42 percent is explained by socioeconomic status—measured by the household's per capita expenditure. Together with urban-rural location, region, and education of the household head, the household's socioeconomic status explains roughly 80 percent of the total

Figure Average annual change in the Human Opportunity Index for Sub-Saharan countries

2.10



Note: The surveys are for different years across countries. The average years are 1997 and 2007 and the average period between two survey years for any one country is nine years. For Zambia, the survey years are 1996 and 2007. Average annual change in HOI (in percentage points) is considered to make the changes comparable across countries and independent of the base period HOI. Source: Authors' calculations based on Demographic and Health Surveys for African countries.

Source: Authors' calculations based on Demographic and Health Surveys.

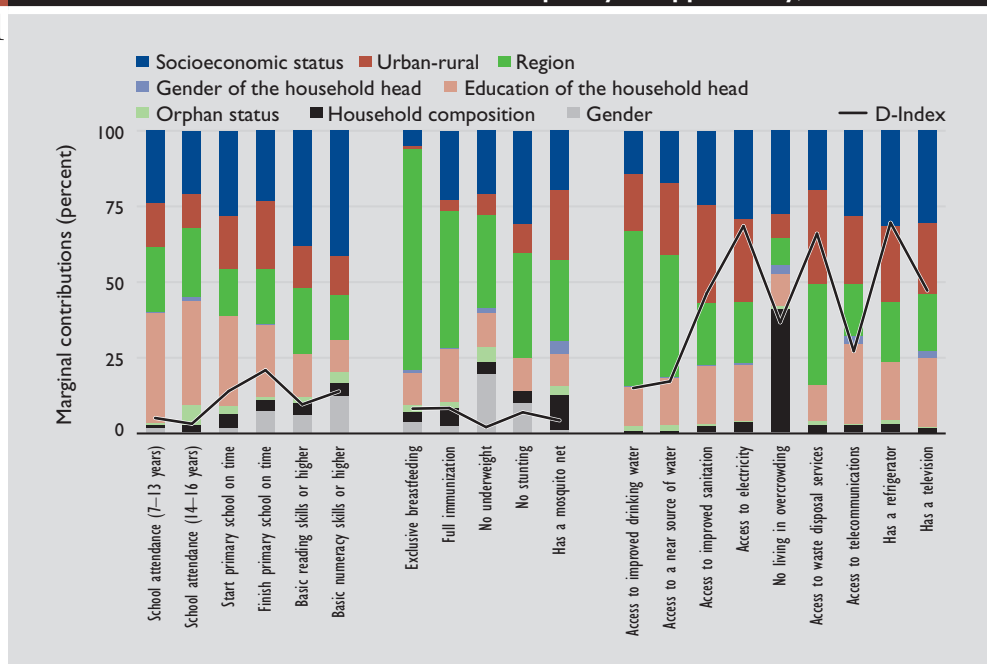
inequality in the opportunity related to basic numeracy skills. Note also that the gender of the child emerges as a nontrivial contributor of the inequality—particularly for education opportunities of finishing primary school on time and attaining basic reading and numeracy skills.

The socioeconomic status of households, whether they reside in rural or urban areas,

and the province they live in appear to be some of the strongest drivers of inequality across a broad range of opportunities in Zambia. The role of regions is particularly prominent for health- and infrastructure-related amenities such as exclusive breastfeeding, full immunization, stunting, access to safe water on site, and access to improved sanitation. Urban-rural residence explains

Figure 2.11 Contribution of circumstances to overall inequality of opportunity, 2010

2.11



Source: Authors' calculations based on Central Statistical Office (2010).

the largest share of inequality in the access to improved sanitation, expected with amenities such as flush toilets being urban phenomena. However, the fact that other circumstances like education of the household head, region of residence, and household's socioeconomic status also contribute to the inequality suggests that there may be significant inequalities within urban and rural areas as well.

Finally, the methodology underlying the analysis so far offers another way of looking at the importance of circumstances on the inequality of opportunities in each of these opportunities. For every opportunity a circumstance-based profile of vulnerability for children can be constructed based on their predicted probabilities of accessing particular opportunities. These profiles allow us to identify who the underserved are, what their characteristics are, and how this compares with those who have better than average access.

Figure 2.12 presents a snapshot of the vulnerability profiles for selected opportunities. For each opportunity the comparisons are between children in the lowest quintile (bottom 20 percent) based on their chances of accessing a service and those in the highest quintile (top 20 percent).

Take the opportunity of finishing primary school on time. Of children least likely to

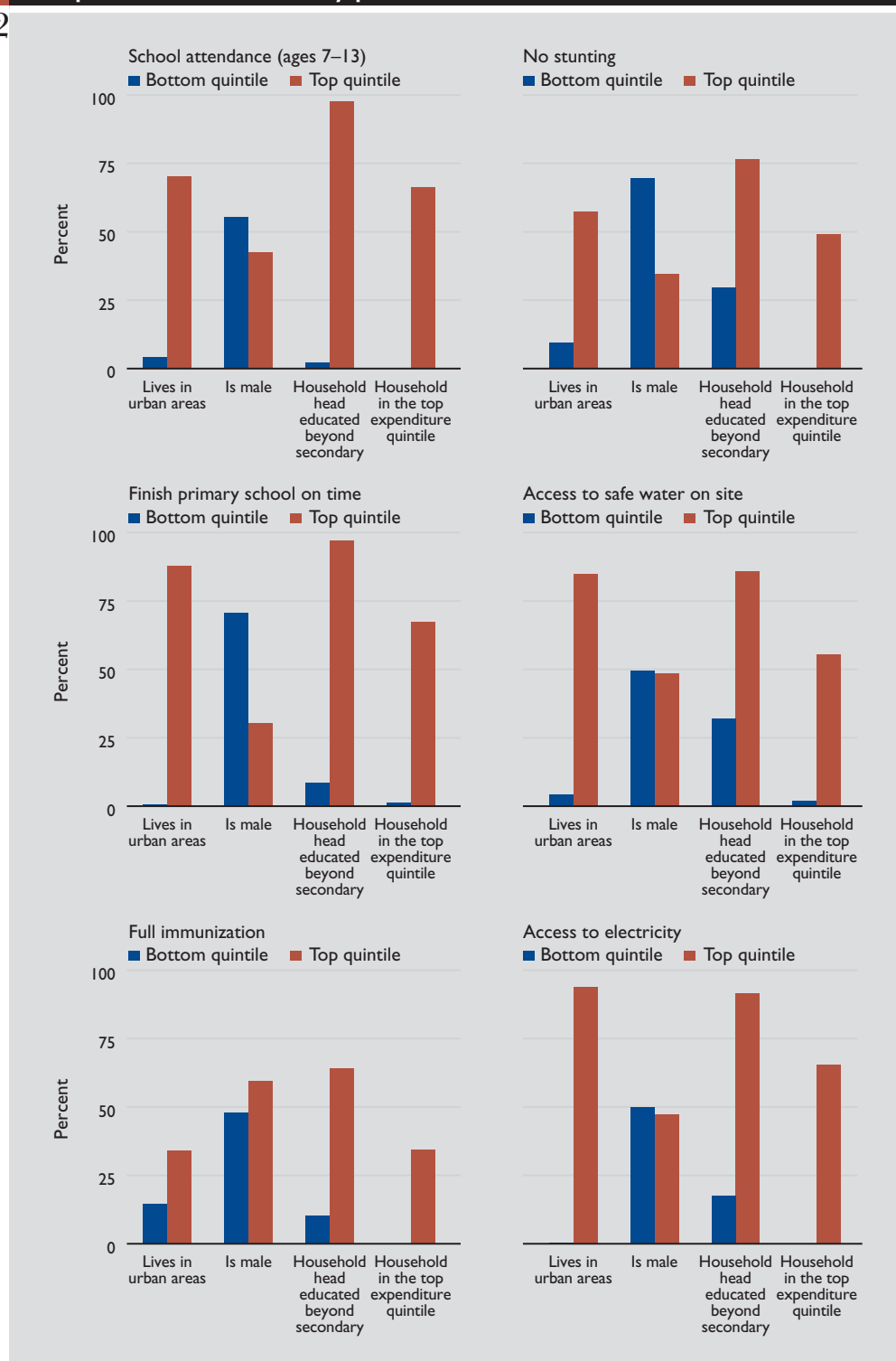
finish primary school on time (probabilities of completion in the bottom 20 percent), almost all live in rural areas; about 70 percent are males; only 10 percent are led by heads with educational attainments beyond secondary level; only 1 percent are in a household in the top expenditure quintile in the country. Similar patterns emerge for mostly all opportunities presented here: children living in urban areas, with household heads educated beyond the basic primary level, and with expenditure levels placing them in the higher echelons of Zambia's socioeconomic fabric appear to have better probabilities of accessing a broad range of opportunities.¹⁷

Geography of exclusion

Inequality in Zambia has sharp regional dimensions. There are significant disparities between provinces such as Luapula (relatively isolated and lagging behind the rest of the country) and Lusaka (benefiting from rapid growth in construction, transportation, and various service sectors as well as the overwhelming presence of the public sector). The difference in poverty rates between these two provinces is one way of summarizing the disparity: about 80 percent of the population in Luapula is poor, compared with 34.3 percent in Lusaka. The north-eastern provinces together with the western province are the

Figure 2.12 A snapshot of the vulnerability profile

2.12



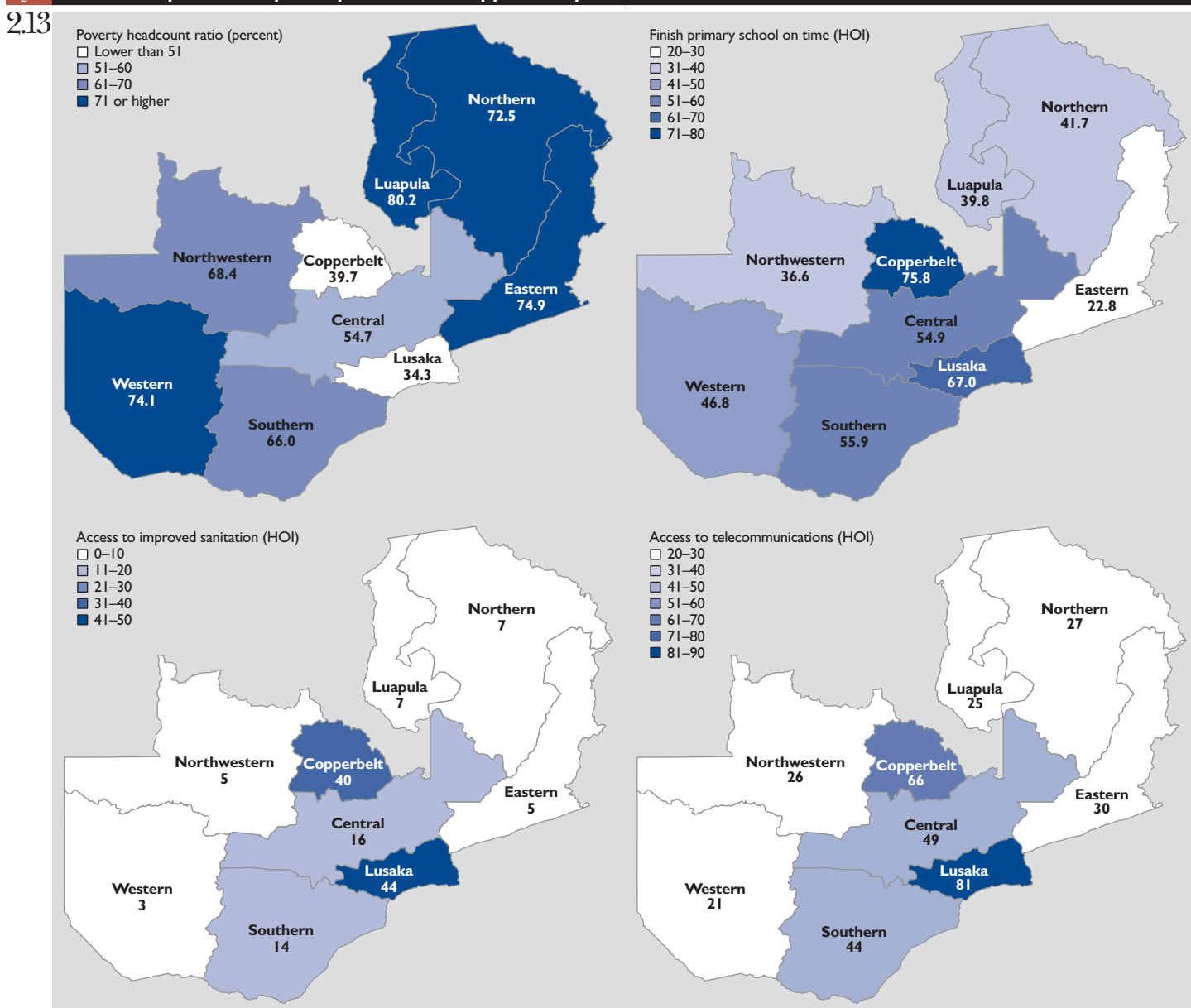
Source: Authors' calculations based on Central Statistical Office (2010).

poorest in the country, while the more centrally located provinces, particularly Lusaka and Copperbelt, are the better off ones.

What is the geographic distribution of opportunities in Zambia? Does it broadly mimic the concentration of economic activities? Or are even the most excluded provinces

able to provide some basic opportunities to children who live there? Figure 2.13 juxtaposes the HOIs for selected opportunities against the underlying poverty rate for each of the provinces in Zambia. The darker shade indicates higher poverty (in the map showing poverty), while darker shades in the

Figure 2.13 Relationship between poverty and human opportunity



Note: The map for poverty headcount ratio is obtained from World Bank (2012c). The other charts plot the Human Opportunity Index (HOI) for the respective opportunities calculated for each region. The lighter the shade of the color the lower the poverty rate and the HOI for all the maps. For the HOI the higher the number the better the access to the opportunities.
Source: Authors' calculations based on Central Statistical Office (2010).

HOI maps denote better opportunities. It becomes obvious from the maps that opportunities are better provided in regions that are already relatively more affluent.

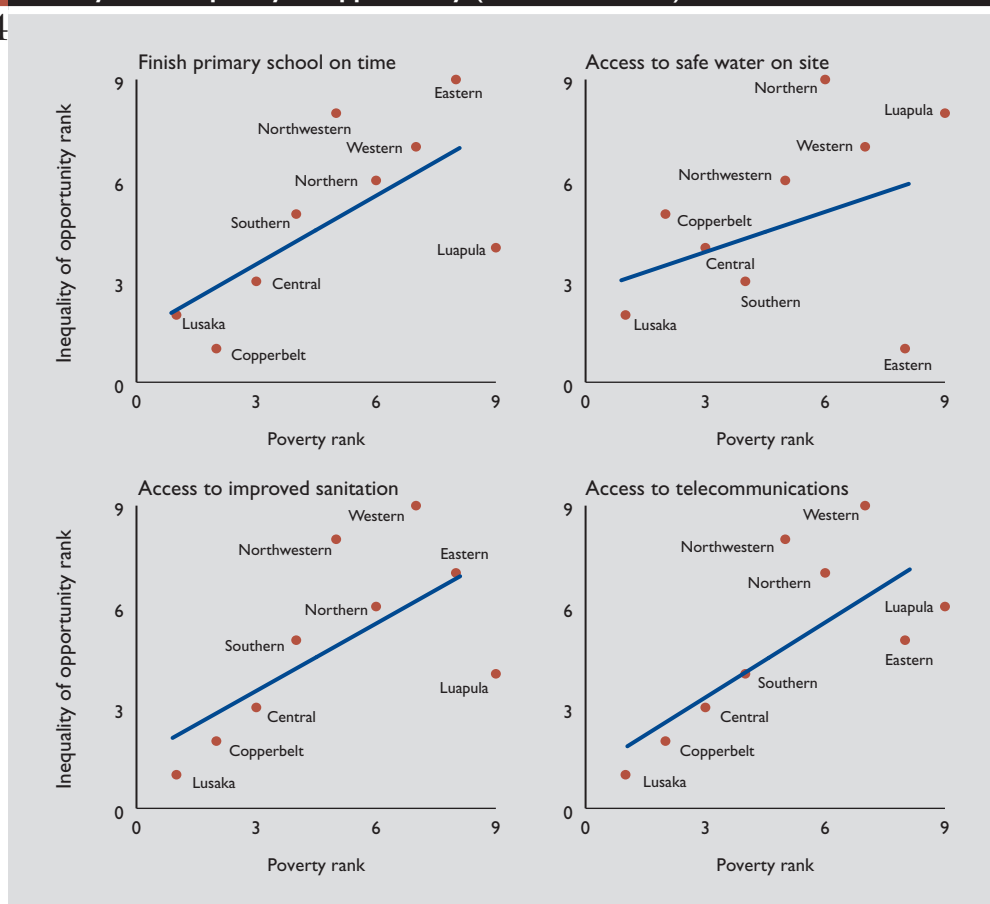
Given the close relationship between actual coverage of these opportunities and the HOI, that poorer areas have worse opportunities is hardly saying anything new, because access to services is commonly poorer in less well-off regions in Zambia and many other parts of the world. Some may even argue that the general exclusion and poorer penetration of some of these basic services is the very reason some of these

regions are poor in the first place. But the original question can be nuanced a bit to ask the following: Are the poorer regions also the regions with higher inequality of opportunities? Or, in other words, do circumstances that children have no control over matter more in poorer provinces compared with the relatively better off ones?

Evidence suggests that this is precisely so for Zambia. Figure 2.14 plots the inequality of opportunity rank for the nine provinces against their respective poverty rank for four opportunities. The results show a strong (rank) association between poverty

Figure 2.14 Poverty and inequality of opportunity (rank correlation)

2.14



Source: The poverty ranks of the provinces are based on 2010 headcount poverty rates obtained from the most recent poverty assessment, while the opportunity ranks are based on authors' calculations.

and inequality of opportunity. The implications are stark. First, the juxtaposition of the map on regional poverty with several maps on the distribution of opportunities reveals that poorer regions have worse opportunities for children. Second, and perhaps the more debilitating finding, the poorer regions are also the regions with higher inequality of opportunity. Since inequality of opportunity is in many ways a direct measure of the extent to which one's chances in life are determined by circumstances one has little control over, this implies that the prospects of economic mobility in Zambia are lower precisely in the provinces where one might think they are needed most. This in turn has serious consequences for the entrenchment of poverty in certain regions and propagation of regional inequality countrywide.

Government expenditures: redressing or reinforcing inequality of opportunities?

How does the Zambian government's expenditure policy address existing inequalities of

opportunities in the education sector? The focus is on the indicators related to school enrollment of children ages 9–13 and ages 14–16. The tool is a slight variant of the benefit incidence analyses—the Opportunities Benefit Incidence Analysis (box 2.4). If the circumstances that children are born into already make them likely to have access to a particular opportunity, then to what extent are public expenditures relevant to those opportunities redressing or reinforcing these likelihoods? An education system backed by a progressive expenditure regime would channel a greater share of the resources to children with circumstances that make them least likely to attend school. This analysis helps answer the question of how progressive or regressive the education expenditures in Zambia are from the perspective of opportunities.

Zambia spends 3.6 percent of GDP on education, low compared with most Sub-Saharan countries (de Kemp and Ndakala 2012). Public expenditure rose significantly

The Opportunities Benefit Incidence Analysis presents an incidence analysis of public expenditure on any particular government service—such as education—along the distribution of opportunities, instead of the distribution of income or expenditure as typical of benefit incidence analyses. This yields two main advantages over the traditional benefit incidence analyses. First, it facilitates the analysis of the allocation of public resources to education against a concept of vulnerability related directly to education as opposed to being mediated through variables such as income or expenditure. Second, it accommodates analysis along multiple dimensions—all the circumstances that determine the access to education-related opportunities, for example—as opposed to the unidimensional analysis that characterizes traditional benefit incidence analyses.

between 2006 and 2009, but in 2010 allocation to education declined 18 percent due to lower domestic and external allocations to the sector. The largest share of education spending goes to the primary education level. The Opportunities Benefit Incidence Analysis requires expenditure data on education broken down by subsector and administrative data on the number of children enrolled at each level for all nine provinces. The analysis involves comparing three broad categories of education spending per beneficiary: the monetized benefits accruing to children attending public schools at the specific age bracket (the “gross unitary public transfer”), the private out-of-pocket household spending incurred to put children in school (the “unitary private spending”), and the difference between the two (the “net unitary benefit”).

The top panels of figure 2.15 plot the gross and net unitary benefits of Zambian government expenditure on education for children in basic education for children classified into five groups based on their likelihood of attending school at each level. If the relevant metric is the gross unitary benefit, then the spending on education for both age categories seems more or less uniform: there are no indications that public spending accrues more to children whose circumstances already make them more or less likely to attend school at this age. But children with circumstances that make them more likely to attend also live in households that can afford out-of-pocket expenses to send their children to school. So if one looks at net unitary benefit—the difference between what the public spends on any particular quintile and what the households privately spend—if anything, the public expenditures appear to be skewed toward children whose circumstances make them less likely to attend schools. This is somewhat consistent with the spending pattern of a country that may be looking to

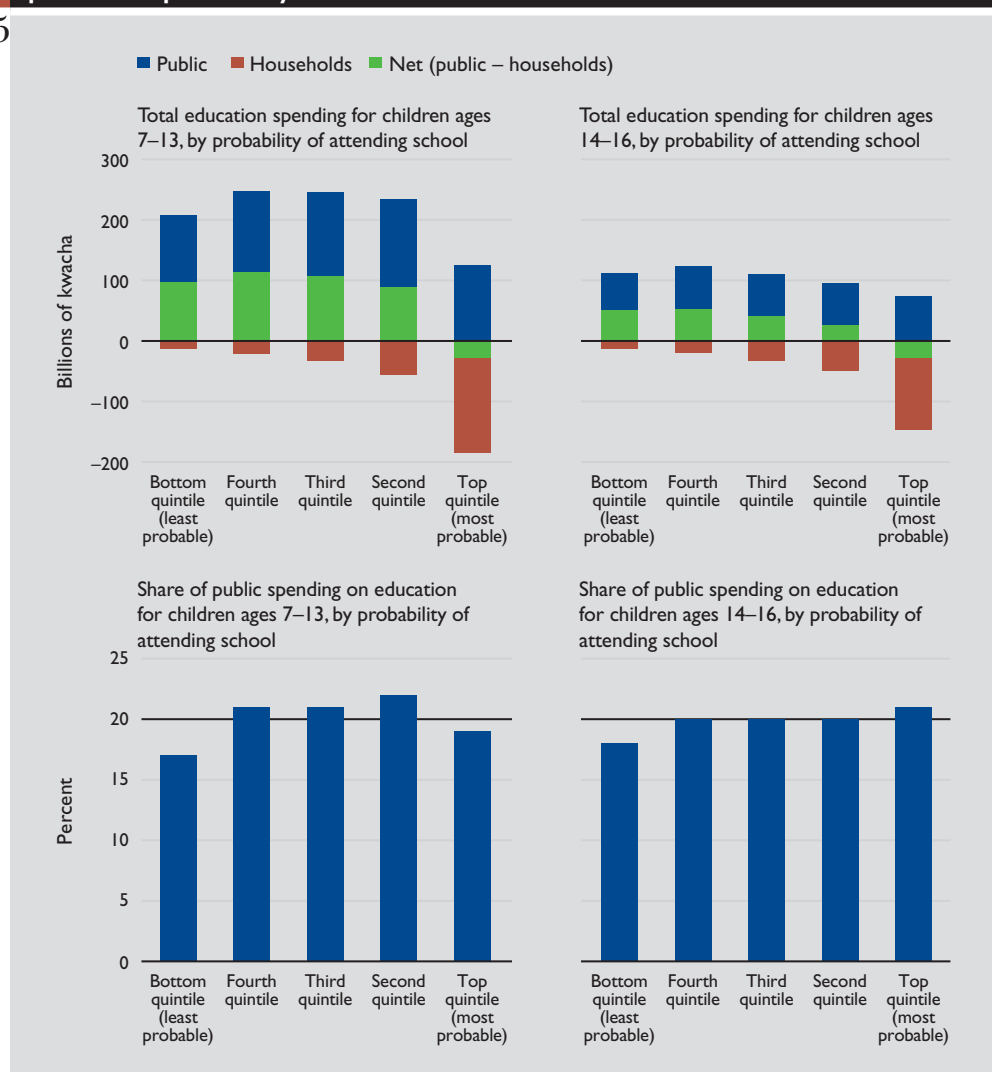
universalize school attendance. Yet note that the progressivity is achieved not because of larger public transfers toward children whose circumstances worsen their chances of attending school but because of larger out-of-pocket contributions at the top of the distribution.

The bottom panels in figure 2.15 further crystallize this point. For each quintile of the probability of attending school, the comparison here is between the share of children in that group—always 20 percent—and the share of the total public expenditure accruing to that group. Looking at the figures, broadly the distribution appears uniform, suggesting very little distortion. But it could be argued, especially with enrollment in basic education far from universal, that the pattern of spending need not necessarily be equitable to ensure better equity of outcomes. In other words there is perhaps further space for the government to realign expenditure in education so that a larger share is directed toward children with circumstances that make their likelihood of attending lower.

Summary of main findings and conclusion

There is broad consensus that granting access to basic goods and services to every individual is fundamental in building a just society and fostering economic and social development. Basic opportunities refer to goods and services necessary to give children a decent start in life, such as primary schooling, nutrition, safe water, and adequate sanitation. Whether a person is born a boy or a girl, in Lusaka or Luapula, or to an educated and well-off parent or otherwise should not be relevant to reaching his or her full potential: ideally, only the person’s effort, innate talent, choices in life, and, to an extent, sheer luck would be the influencing forces.

Figure 2.15 Distribution of gross and net unitary benefits from public education, by quintiles of probability



Source: Authors' calculations based on Central Statistical Office (2010).

One of the primary findings here is that opportunities for children in Zambia vary widely across different types of goods and services. But in general none of the opportunities is close to universal in their coverage. Some, such as school attendance for children under age 16, are available to most Zambian children in the age bracket. But still roughly 20 percent of children remain excluded. Only about half of children start and finish primary school on time, with sizable inequalities attributable to circumstances children have no control over. And the quality of education is low. Of Zambian children in grade 6 who took the regional standardized tests designed to monitor educational quality, 44 percent had proficiency below basic reading skills, and 67 percent did not possess even the basic numeracy skills.

The picture is bleaker for opportunities in health and infrastructure where coverage is lower and there are large variations in the inequalities based on children's circumstances. Full immunization, exclusive breastfeeding until the child is 6 months old, and growing up through childhood without being scarred by chronic malnutrition are some opportunities critical for a healthy start to a productive life. But roughly half of Zambia's children are deprived of these opportunities. Coverage of opportunities on access to clean drinking water, adequate sanitation, and electricity is also extremely low, with coverage depending substantially on the socioeconomic status of the household in which the child is born and the location of residence.

In international comparisons Zambia's best performance is on school enrollment,

but even that is barely on par with some of the poorest Latin American countries. Comparisons with Sub-Saharan countries are slightly more favorable, but that is perhaps more informative about the overall state of opportunities in the region than about Zambia. Trends show variable rates of improvements with astounding progress on the access to telecommunications, modest but commendable progress on starting and finishing primary school on time and having access to drinking water, sluggish improvements in the opportunities for access to improved sanitation and the opportunity to escape acute malnutrition, and actual reversals in the opportunities for full immunization and access to electricity.

The analysis also reveals household's socioeconomic status, urban-rural residence, and the province of birth as the strongest drivers of inequality across broad opportunities. The regional aspect is particularly interesting because the distribution of opportunities across the regions in Zambia closely mirrors the spatial distribution of poverty, implying that poorer regions have lower access to opportunities. In addition, a close positive relationship is found between poverty and inequality of opportunity in Zambia—the poorest regions in Zambia are also the regions where children's circumstances play the strongest role in determining their access to these opportunities. This depresses prospects of economic mobility in the poorer provinces and may result in the further entrenchment of poverty and the propagation of the spatial inequalities observed in Zambia today.

The analysis also covers the role of the Zambian government, particularly through its expenditure policy in addressing the observed inequality of opportunity in the education sector. Current patterns of spending, at least in the education sector, are distributed such that they benefit children fairly uniformly, irrespective of their circumstances. But this seeming progressivity is achieved not necessarily because larger shares of public expenditures are being targeted to children with the lower probabilities of having access to these opportunities, but because the private costs borne by families of children from the top end of the distribution are significantly higher. Given that roughly a fifth of children who should be in school

are not currently enrolled in Zambia, there seems to be more the government could do in realigning expenditures.

While the attempt here has been to lay out a comprehensive diagnostic description of the distribution of basic opportunities in Zambia, this discussion should ideally also speak to what this implies for policy. What kind of sectoral policies in education, health, drinking water, and other economic services can be used to enhance opportunities for all children in the country? Are there tradeoffs between policies that aim to improve population-level access versus policies that target those that are underserved on account of their circumstances? If yes, where should policy makers place a greater emphasis?

The analysis demonstrates the HOI to be a powerful measure to track a society's progress on equitable distribution of basic opportunities. Together with a robust data-gathering and monitoring and evaluation system, it can help improve the targeting and efficacy of social policy. Making use of it, several Latin American countries, including Brazil and Peru, have already confronted their inherent inequalities with well-targeted social policies, with positive initial results. If equity is a legitimate social goal, then the evidence presented here on the inextricable link between circumstances and opportunities suggests the possibility for similar social policy interventions in Zambia.

With the largest driver of unequal access to opportunities in Zambia as the province of birth, investments in the lagging regions need to be scaled up, particularly for infrastructure services such as drinking water, sanitation, and electricity where access is highly concentrated in certain urban pockets within particular provinces. But in addition to these resources, there may be lessons that provinces can learn from each other. Consider the Eastern and Western provinces. The level of poverty in these regions is comparable, but significantly more children in the Western province are finishing primary school on time than are children in the Eastern province. But the opposite is true for improved access to drinking water, where children in the Eastern province have much better access to drinking water.

For many other opportunities, particularly those for education and health,

resources are often neither necessary nor enough to scale up the opportunities, despite Zambia's spending much less on education and health than other Sub-Saharan economies. Realigning expenditures to prioritize the poor and the underserved and ensuring that the amount spent is effective will enhance the desired results even with the same resource envelope. The government already allocates the bulk of spending in education on primary school enrollment, for example. Yet as the opportunity-benefit incidence analysis shows, there is significant room to target children whose circumstances make their likelihoods of having access to this opportunity lower. This has to go with necessary tweaks to the institutional setup of service delivery to provide proper incentives to the service provider and voice

and accountability to the end user, critical to ensuring that quality of the services delivered—in education or health—is of minimum acceptable standards.

Finally, policy makers also need to recognize that children of certain circumstances are vulnerable to deprivations in multiple dimensions simultaneously. For example, Zambian children living in rural areas and with household heads who did not finish primary school are much more likely to not finish primary school themselves, to suffer from acute malnutrition, or to have poor access to sanitation facilities. The presence of multiple deprivations points to the need for policies in different sectors (health and education, for example) to closely coordinate to achieve better efficiency and the best results.

ANNEX A

How is the Human Opportunity Index calculated? A simple example

Consider two societies A and B, in which half the population lives in rural areas and the other half in urban areas. Now consider a basic opportunity such as access to primary education. Say half of children go to school in both the societies. Looking at the overall coverage, both these societies will appear similarly placed. But suppose that in society A no rural child attends a school, while in society B half of both rural and urban children attend school. The HOI discounts the coverage rate of 50 percent by imposing a “penalty” when access is more unequal based on circumstances such as location. The penalty can be interpreted as the share of the

total number of opportunities that need to be redistributed to ensure equitable access based on the equality of opportunity principle. For society A this will constitute “reallocating” 25 percent of total enrollments from urban children to rural children, with a penalty of 25 percent and an HOI, which is the coverage minus the penalty, of 25 percent. For society B there is no inequality based on location, and the penalty is zero. This implies that the HOI is 50 percent, or equal to the coverage. Therefore, society B is more equal than society A based on equality of opportunity, even though average enrollment rate is the same in both societies.

ANNEX B

Three key properties of the Human Opportunity Index

There are three key properties of the HOI. First, the HOI is sensitive to scale—if access improves for all groups by, say, a factor of k (additively or multiplicatively), then the HOI changes by the same factor k . Second, it rewards Pareto improvement—if coverage rate improves for one circumstance group without decreasing coverage rates for the remaining groups, the HOI will rise. Third, the measure will always improve if access changes so that the more vulnerable groups (groups with coverage rates lower than the overall coverage rate) have higher access. An important caveat: this measure is sensitive to the set of

circumstances chosen for analysis. But this is mitigated by an additional property that is highly desirable given that it is often impossible to identify all relevant circumstances for any population and opportunity: the HOI will not be higher if more circumstances are added to the existing set of circumstances in the analysis. This implies that the computed inequality serves as a lower bound to the “actual” inequality where all circumstances of interest could be included in the analysis.

Source: Barros, Molinas Vega, and Saavedra 2010.

ANNEX C

Estimating the Human Opportunity Index from household survey data

To construct the HOI, we need to obtain the conditional probabilities of access to opportunities for each child based on their circumstances. And to do so, one can estimate a logistic model, linear in the parameters β , where the event I corresponds to accessing the opportunity (such as access to clean water), and x the set of circumstances (such as gender of the child and education and gender of the household head). We fit the logistic regression using survey data:

$$\ln \left[\frac{P[I=1|X=(x_1, \dots, x_m)]}{1 - P[I=1|X=(x_1, \dots, x_m)]} \right] = \sum_{k=1}^m x_k \beta_k.$$

where x_k denotes the row vector of variables representing the k -dimension of circumstances. Thus, $x = (x_1, \dots, x_m)$ and $b' = (b_1, \dots, b_m)$ is a corresponding column vector of parameters. From the estimation of this logistic regression one obtains estimates of the parameters $\{\beta_k\}$ to be denoted by $\{\hat{\beta}_{k,n}\}$, where n denotes the sample size. Given the estimated coefficients, one can obtain for each individual in the sample his/her predicted probability of access to the opportunity in consideration:

$$\hat{p}_{i,n} = \frac{\text{Exp}(x_i \hat{\beta}_n)}{1 + \text{Exp}(x_i \hat{\beta}_n)}.$$

The overall coverage rate (C), the D-Index (D), the penalty (P), and the HOI

are estimated using the predicted probability \hat{p} and sampling weights (w):

$$C = \sum_{i=1}^n w_i \hat{p}_{i,n};$$

$$D = \frac{1}{2C} \sum_{i=1}^n w_i |\hat{p}_{i,n} - C|;$$

$$P = C * D; \text{ and}$$

$$\text{HOI} = C - P.$$

An important caveat to the logistic estimation model is that the list of regressors does not include any interaction terms between circumstances (such as between parental education and location). Given the number of circumstances we have (all are dummy variables), limited sample sizes, and the large number of countries and opportunities for which these regressions have to be run, including interactions would lead to intractable problems in at least some of the cases. The interaction terms are thus omitted, even though translating the exact definition of D-Index to the logistic regression model would require including these terms. If the interactions were included, it would result in a higher D-Index (and a lower HOI), just as it would happen if more circumstances were added. This in turn implies that the estimated D-Index for all countries and opportunities is the lower bound of inequality of opportunities (and the estimated HOI is the upper bound) for a given set of circumstances.

Source: Barros, Molinas Vega, and Saavedra 2010.

ANNEX D

Shapley Decomposition of the D-Index—An example

In country A we want to calculate the contribution of income to the inequality in access to a basic opportunity. The circumstances considered are the gender of the household head, the gender of the child, and the household income, and the opportunity is defined as having electricity in the household. The total D-Index is obtained using all circumstance variables and equals 3.48 percent (table D1). The D-Index using only income as a circumstance equals 3.24 percent and the index without circumstances (only a constant in the logistic regression) equals 0.

To obtain the marginal addition to the D-Index of income (D_I), we estimated the D-Index with all possible sequences of circumstance variables where income can be added. In each situation we calculate the marginal contribution of income as the

difference in the D-Index before and after income is added. Finally, we average the marginal contributions over all combinations. In a set with three circumstances (Income, I ; gender of child, G ; and gender of household head, H), there are six different sequences in which income can enter $\{(C,H,I) (H,C,I) (C,I,H) (H,I,C) (I,C,H) (I,H,C)\}$. Nevertheless, since in the regression model two sets of covariates with the same circumstances and different order generate the same result, there are only four different values for the marginal contribution of income. In the example below income contributes to 63 percent of the D-Index.

$$D_I = \frac{2}{6}[D(I,C,H) - D(C,H)] + \frac{1}{6}[D(I,C) - D(C)] + \frac{1}{6}[D(I,H) - D(H)] + \frac{2}{6}[D(I) - 0]$$

Table D1 D-Index based on circumstance set

Circumstance set	Contribution to the D-Index	D-Index
Gender head U gender child U income	D(gender head U gender child U income)	3.48
Income	D(income)	3.24
Combinations of circumstance sets where income is added		
Income U gender child	D(income)—D(constant)	3.24
Income U gender head	D(income)—D(constant)	3.24
Gender child U income	D(gender child U income)—D(gender child)	2.40
Gender head U income	D(gender head U income)—D(gender head)	1.29
Gender child U gender head U income	D(gender child U gender head U income)—D(gender child U gender head)	1.50
Gender head U gender child U income	D(gender head U gender child U income)—D(gender head U gender child)	1.50
Average contribution of income		2.20
Share contribution of income (%)		63

Source: Hoyos and Narayan 2011.

ANNEX E

Opportunities and circumstances for Zambian children

Table Opportunities and their definitions

E1

Opportunities	Description
Education	
School attendance (ages 7–13)	Currently attending educational institution for children ages 7–13
School attendance (ages 14–16)	Currently attending educational institution for children ages 14–16
Start primary school on time	Attending grade 1 of primary for children age 7
Finish primary school on time	Have reached primary (grade 7) education completed for children age 14
Basic reading skills or higher	Classified in the 3 or higher level of competence in reading (SACMEQ)
Basic numeracy skills or higher	Classified in the 3 or higher level of competence in numeracy (SACMEQ)
Health	
Exclusive breastfeeding	Only received breast milk and nothing else, for children below 6 months
Full immunization	Immunization against polio, BCG, DPT, and measles for children ages 12–23 months
No underweight	Over –2 in the Z-Score for weight for age. Children ages 3–59 months
No stunting	Over –2 in the Z-Score for height for age. Children ages 3–59 months
Has a mosquito net	At least one mosquito net in the household. Children ages 0–16
Housing	
Access to improved drinking water	Access to a source of drinking water such as protected well, borehole, rainwater, protected spring, or piped water. Children ages 0–16
Access to a near source of water	Access to an improved source of water in less than 1 kilometer. Children ages 0–16
Access to improved sanitation	Flush toilet, or own or communal pit toilet latrine with slab
Access to electricity	The household uses electricity for lighting or cooking. Children ages 0–16
No living in overcrowding	Ratio persons per room is less or equal to 1.5
Access to waste disposal services	Garbage is collected
Access to telecommunications	At least one cellphone (operating) or land phone (operating) in the household. Children ages 0–16
Has a refrigerator	At least one refrigerator in the household. Children ages 0–16
Has a television	At least one television in the household. Children ages 0–16

Table Circumstances and their definitions

E2

Dimension	Circumstances	Details
Gender	Gender	
Household composition	Total number of children ages 0–16 in the household	
Orphan status	Is the father alive?	
	Is the mother alive?	
Education of the household head	Level of education of the household head	4 categories (none, primary, secondary, and tertiary)
Gender of the household head	Gender of the household head	
Location	Urban-rural province	
Socioeconomic status	Expenditures quintiles	

Notes

Section 1

1. Zambia's tax revenues minus mining averaged 14.5 percent of GDP since 2009, comparing unfavorably with countries at the same income. There is room for improvement in the domestic value-added tax.
2. Like many other Sub-Saharan countries, Zambia received debt relief under the Heavily Indebted Poor Countries Initiative and the Multilateral Debt Relief Initiative, and its external debt fell substantially from about 86 percent of GDP in 2005 to about 9 percent in 2006.
3. Nonconcessional sources are those with less than 35 percent grant element.

Section 2

1. This is based on the decomposition of the Theil measure of inequality, or GE(1).
2. International comparisons are difficult to make as estimates for wage inequality (as opposed to aggregate income inequality) for countries are not widely available.
3. While the primary and secondary education spending is progressive, their progressivity is outweighed by the extreme concentration of tertiary education benefits among the wealthiest members of Zambian society.
4. Estimating health effects on income is difficult due to problems in measuring health and the potential endogeneity of health (Deaton 2006). Bloom, Canning, and Sevilla (2004), Weil (2007), and Lorentzen, McMillan, and Wacziarg (2008), using different methods, have shown health effects on income or

growth to be important and probably exceeding the reverse effect, namely that of income on health. But the debate is not fully settled, due to the difficulties mentioned above.

5. There are four channels through which health could contribute to an economy and ultimately economic growth: enhanced labor productivity, greater labor supply, education and training fostering higher skills, and more savings for investment in physical and intellectual capital.
6. Molina and others (2012) finds that inequality of opportunity—attributable to circumstances a person is born into—in education among children negatively affects per capita income. Similarly, Marrero and Rodriguez (2010) find a negative relationship between the component of income inequality attributable to circumstances and economic growth.
7. Perhaps most important for the proposed work are the contributions of John E. Roemer, whose Equality of Opportunity (1998) was the first to formalize an equality of opportunity principle.
8. See, for example, Chetty and others (2010) for evidence that early childhood education has substantial long-term impacts, ranging from adult earnings to retirement savings. Child malnutrition has also been shown to generate life-long learning difficulties, poor health, and lower productivity and earnings over a lifetime (Alderman, Hoddinott, and Kinsey 2006; Hoddinott and others 2008).

9. The data used come mainly from the 2006 and 2010 rounds of the Living Conditions Measurement Survey conducted in Zambia. For opportunities related to the quality of education, data are from the 2007 round of the Southern and Eastern Africa Consortium for Monitoring Educational Quality. And, to make cross-country comparisons, the report uses data from the Demographic and Health Surveys.
10. Grade progression requires that children learn the content adequately enough. For Zambia we measure this by the opportunity to have completed grade 7 (lower and middle basic) on time, when the child reaches age 14. A more direct measure of learning in schools would be through test scores. We use data from the 2007 round of the Southern and Eastern Africa Consortium for Monitoring Educational Quality to define the opportunity as having acquired basic competency in reading and numeracy by the time the child reaches grade 6.
11. Children who experience spells of malnutrition in early childhood are found to have poorer test scores on cognitive assessments, activity level, and attention span (Alderman, Hoddinott, and Kinsey 2006). They also tend to start school later and are at a greater risk of dropping out before finishing primary school. A recent study in Guatemala finds that being stunted at age 6 is tantamount to losing four grades of schooling based on performance in tests (Maluccio and others 2009). The accumulated evidence on child malnutrition suggests that children's learning potential in school and their productivity in later life is predetermined largely by their health and nutritional status before age 2.
12. In Zambia malaria is the primary cause of morbidity and mortality, with 4.3 million reported cases and 50,000 deaths a year. It also accounts for a quarter of childhood deaths. Note, however, that owning a bednet is not the same as actually using it. Indeed, in Zambia, for all types of bednets, ownership was 64 percent in 2007 while use was only 33 percent. The same figures for insecticide treated bednets, known to be more effective against malaria, are 53 percent and 29 percent.
13. The major health threat posed by drinking unsafe water is infectious diarrhea—the leading cause of mortality for children under age 5 and estimated to cause 1.5 million deaths a year (Cabral, Lucas, and Gordon 2009). In India the prevalence and duration of diarrhea among children under age 5 in rural areas are significantly lower for families with piped water than for those without it (Jalan and Ravallion 2003). And in Pakistan private behavioral choices and policies that affect the health and nutrition of rural children have important effects on school enrollment and thus on eventual productivity (Alderman and others 2001). Improved nutrition increases enrollments, especially for girls, thus closing a portion of the gender gap.
14. See, for example, Gove, Hughes, and Gale's (1979) study on Chicago households.
15. Note that the age group used for cross-country comparison is different from the age groups used for various other enrollment indicators for Zambia—to ensure comparability. In addition, wherever cross-country comparisons are made, the data used for Zambia are from the Demographic and Health Surveys.
16. These countries were the basis of a broader, regionwide analysis of inequality of opportunities in Africa. They represent a wide variety of countries of different sizes, geography, and level of development.
17. Keep in mind the fraction of Zambia's overall population that would fall into each of these categories while making interpretations. For example, for opportunities, such as access to electricity, 85 percent of the children in the top quintile live in urban areas, reflecting a sharp rural-urban divide because the urban population in Zambia is only 35 percent of the total. For full immunization the share of urban children in the top quintile is about 34 percent, very similar to the fraction of the population in the urban areas, suggesting that the coverage of full immunization may not be significantly different between urban and rural areas of Zambia.

References

- Alderman, Harold, Jere R. Behrman, Victor Lavy, and Rekha Menon. 2001. "Child Health and School Enrollment: A Longitudinal Analysis." *The Journal of Human Resources* 36 (1): 185–205.
- Alderman, Harold, John Hoddinott, and Bill Kinsey. 2006. "Long-term Consequences of Early Childhood Malnutrition." *Oxford Economic Papers* 58 (3): 450–74.
- Barro, Robert J. 2001. "Human Capital and Growth." *American Economic Review* 91 (2): 12–17.
- de Barros, Ricardo, Francisco H. Ferreira, Jose R. Molinas Vega, and Jaime Saavedra. 2009. *Measuring Inequality of Opportunities in Latin American and the Caribbean*. Washington, DC: World Bank.
- de Barros, Ricardo, Jose R. Molinas Vega, and Jaime Saavedra. 2010. "Measuring Progress toward Basic Opportunities for All." *Brazilian Review of Econometrics*, 30 (2): 335–67.
- Bloom, David E., David Canning, and Jaypee Sevilla. 2004. "The Effect of Health on Economic Growth: A Production Function Approach." *World Development* 31 (1): 1–13.
- Bloom, David E., David Canning, and Günther Fink. 2009. "Disease and Development Revisited." NBER Working Paper 15137, National Bureau of Economic Research, Cambridge, MA.
- Cabral, Christie, Patricia Lucas, and Dave Gordon. 2009. "Estimating the Health Impacts of Unsafe Drinking Water in Developing Country Contexts." Aquatest Working Paper 01, University of Bristol, Water and Health Research Centre, Aquatest 2 Project, Bristol, UK.
- Central Statistical Office of Zambia. 2006. "Zambia Living Conditions Monitoring Survey 2006." Lusaka.
- . 2010. "Zambia Living Conditions Monitoring Survey 2010." Lusaka.
- Cervelatti, Matteo, and Uwe Sunde. 2009. "Life Expectancy and Economic Growth: The Role of the Demographic Transition." IZA Discussion Papers 4160, Institute for the Study of Labor, Bonn, Germany.
- Chetty, Raj, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane W. Schanzenbach, and Danny Yagan. 2010. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR." NBER Working Paper 16381, National Bureau of Economic Research, Cambridge, MA.
- Deaton, Angus. 2006. "Global Patterns of Income and Health: Facts, Interpretations, and Policies." NBER Working Paper 12735, National Bureau of Economic Research, Cambridge, MA.
- Gove, Walter R., Michael Hughes, and Omer R. Galle. 1979. "Overcrowding in the Home: An Empirical Investigation of its Possible Pathological Consequences." *American Sociological Review* 44 (February): 59–80.
- Grimm, Michael. 2011. "Does Inequality in Health Impede Economic Growth?" *Oxford Economic Papers* 63 (3): 448–74.
- Hoddinott, John, John A. Maluccio, Jere R. Behrman, Rafael Flores, and Reynaldo Martorell. 2008. "The Impact of Nutrition during Early Childhood on Income, Hours Worked, and Wages of Guatemalan

- Adults.” *The Lancet* 371 (February): 411–16.
- Hoyos, Alejandro, and Ambar Narayan. 2011. “Inequality of Opportunities among Children: How Much Does Gender Matter?” Background Paper for *World Development Report 2012*, World Bank, Washington, DC.
- Jalan, Jyotsna, and Martin Ravallion. 2003. “Does Piped Water Reduce Diarrhea for Children in Rural India?” *Journal of Econometrics* 112 (1): 153–73.
- de Kemp, Antonie, and Charles Ndakala. 2012. *Unfinished Business: Making a Difference in Basic Education*. 2012. The Hague, the Netherlands: Ministry of Foreign Affairs of the Netherlands. www.minbuza.nl/binaries/content/assets/minbuza/nl/services/evaluatie/making-a-difference-in-basic-education-in-zambia.pdf.
- Ley, Eduardo. 2011. “Exhaustible Resources and Fiscal Policy: Copper Mining in Zambia.” World Bank, Washington, DC.
- Lorentzen, Peter, John McMillan, and Romain Wacziarg. 2008. “Death and Development.” *Journal of Economic Growth* 13 (2): 81–124, June.
- Maluccio, John A., John Hoddinott, Jere R. Behrman, Reynaldo Martorell, Agnes R. Quisumbing, and Aryeh D. Stein. 2009. “The Impact of Improving Nutrition during Early Childhood on Education among Guatemalan Adults.” *Economic Journal* 119 (537): 734–63.
- Marrero, Gustavo A., and Juan G. Rodriguez. 2010. “Inequality of Opportunity and Growth.” Working Paper 154, Society for the Study of Economic Inequality, Palma, Spain.
- Ministry of Finance. 2012. “2013 Budget Address.” Delivered to the National Assembly of Zambia, October 12.
- Molina, Ezequiel, Ambar Narayan, and Jaime Saavedra. 2012. “Opportunity and Development: Assessing the Effect of Equality of Opportunities in Development Outcomes.” World Bank, Washington, DC.
- Roemer, John E. 1998. *Equality of Opportunity*. Cambridge, MA: Harvard University Press.
- Sen, Amartya. 1979. “Utilitarianism and Welfareism.” *The Journal of Philosophy* 76 (9): 464–89.
- . 2001. “Development as Freedom.” Oxford, UK: Oxford University Press.
- Weil, David N. 2007. “Accounting for the Effect of Health on Economic Growth.” *Quarterly Journal of Economics* 122 (3): 1265–1306.
- World Bank. 2005. *World Development Report 2006: Equity and Development*. Washington, DC.
- . 2011. *World Development Indicators 2011*. Washington, DC.
- . 2012a. *Africa’s Pulse: An Analysis of Issues Shaping Africa’s Economic Future*. Volume 6, October. Washington, DC.
- . 2012b. “Zambia Human Development Note: Challenges and Opportunities.” World Bank, Africa Region Human Development Network, Washington, DC.
- . 2012c. “Zambia Poverty Assessment: Stagnant Poverty and Inequality in a Natural Resource-Based Economy.” June, Washington, DC.

