

CENG 6108 Construction Economics

Introduction to Construction and the Economy

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TO DO

- ① Introduction to Construction and the Economy
- ② Course Introduction

Introduction to Economics

- The term Economics is derived from the Greek Language and means house-keeping.
- Economics is concerned with the allocation of scarce resources.
 - Firms: Income from sales and Investment options
 - Government: Income from tax and Policy options to select
- Economy:
 - Real Economy: Actual goods and service available, which, depending on their distribution throughout the population, determine the standard of living of the nation.
 - Money Economy: Money is used to enable transactions to take place, and this money is a liquid asset.
 - Narrow money: is coin and notes in circulation and banks' own bank balances in the National Bank (\$14.92 Billion, Dec. 2017)
 - Broad money: includes narrow money plus bank deposits and shares (\$28.53 Billion, Dec. 2017)

Introduction to Economics

- Study of Economics can be divided into:
 - Microeconomics: deals with the individual parts of the economy, specially the markets and market places.
 - Mesoeconomics: deals with different sectors or parts of an economy and how they interact with each other. The economic problems, theories and issues of the construction industry are discussed at this level.
 - Macroeconomics: is the study of the economy as a whole. Is concerned with issues such as inflation, unemployment, international trade and government economic policy.

Introduction to Construction Industry

- Economic systems range from centrally planned to free market systems:

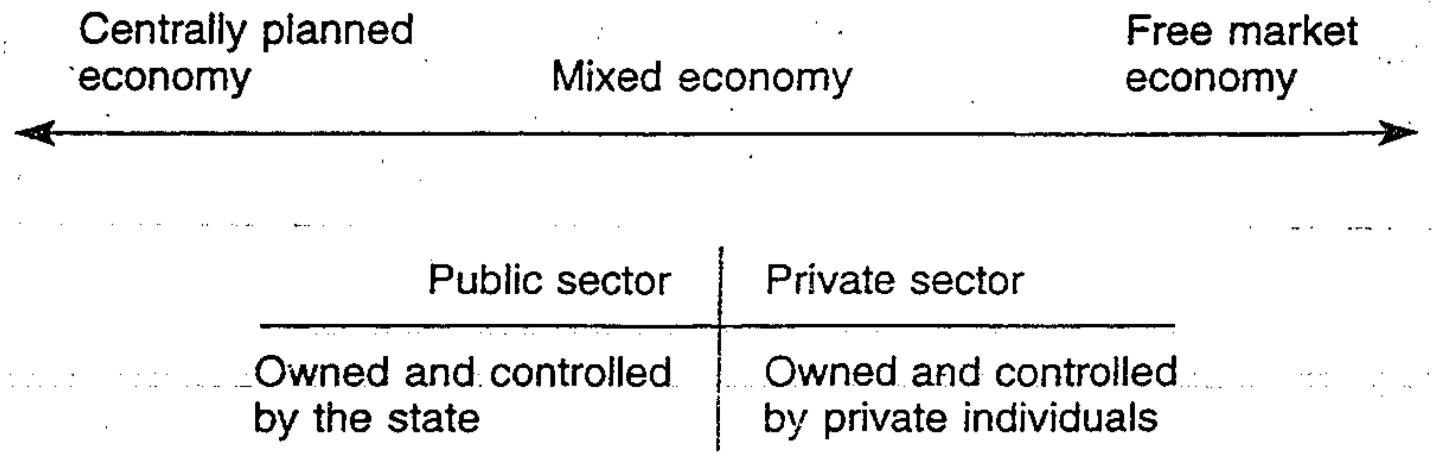


Figure 1.1 The range of economic systems

Introduction to Construction Industry

- Adam Smith (1723-1790) argued in his classic “An Inquiry into the Nature and Causes of the Wealth of Nations” (1776), that individuals working for their own self-interest could create a stable and well-provisioned society (Capitalist Society) through a mechanism he called the Invisible hand of the market.
- Karl Marx (1818-1883) saw capitalism as a source of instability, struggle, and decline. In his classic “Capital” (1867), he argued for communist society, where “the people”, i.e. the workers, own the means of production and thus have no need to exploit labour for profit.
- Keynes (1883-1946), in his classic “General Theory of Employment, Interest, and Money” (1936) favored the use of government’s power to spend, tax, and borrow to keep the economy stable and growing.
- Chalmers Johnson (1931-2010), in his book “MITI and the Japanese Miracle” conceptualized the developmental state as a state that is focused on economic development and takes necessary policy measures to accomplish that objective.

Introduction to Construction Industry

- National economies are built on the following main economic sectors:

Primary Industry	Secondary Industry	Tertiary Industry	Quaternary Industry
<ul style="list-style-type: none">• Agriculture, mining, oil exploration, forestry, farming, fishing and hunting, and processing and packaging of raw materials	<ul style="list-style-type: none">• Construction, smelting, automobile manufacturing, textiles, energy utilities, breweries and bakeries	<ul style="list-style-type: none">• Transportation, health care, food service, retail sales, advertising, entertainment, tourism, banking and law	<ul style="list-style-type: none">• ICT, Research and Development, and Non-governmental organizations.

- Each of these sectors are interdependent on each other.

Introduction to Construction Industry

- Ethiopian Economy (The World Factbook_2017): Pop. 105,350,020
- $GDP = C$ (Consumer Spending) + G (Government Spending) + I (Investment) + NX (Net Export)
- Commercial Bank Prime Lending Rate: 13% (Dec. 2017) and 12% (Dec. 2016)

GDP = \$200.2 Billion
(PPP)

GDP = \$80.87 Billion
(Nominal)

GDP Rank = 65th

GDP per capita =
\$2,200 (PPP)

GDP per capita =
\$767.63 (Nominal)

GDP by sector:
Agriculture (35.8%),
Services (42%),
Industry (22.2%)

Inflation (CPI) = 9.9%

Population below
poverty line (\$1.90 per
day)=29.6% (2014)

Gini Coefficient =
33 (2011)

Labour Force = 52.82
Million

Unemployment =
24.9%

Exports = \$3.076
Billion

Imports = \$16.76
Billion












Gross External Debt =
\$29.09 Billion (2017)
= \$24.82 Billion (2016)

Credit rating = CCC

Foreign Reserves =
\$3.147 Billion (2017)

BUDGET BREAKDOWN

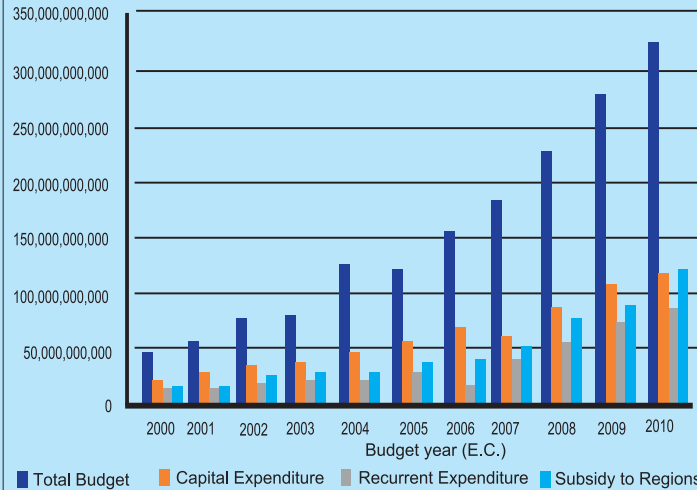
Region's Subsidy SDG's

Oromia		42.25 Billion Birr
Amhara		26.48 Billion Birr
Southern		24.66 Billion Birr
Tigray		7.93 Billion Birr
Afar		3.71 Billion Birr
Somalia		12.24 Billion Birr
Gambella		1.63 Billion Birr
Benishangul		2.24 Billion Birr
Harari		931.9 Million Birr
Addis Ababa		1.64 Billion Birr
Dire Dawa		1.08 Billion Birr

BIG TICKET ITEMS % of Budget

Road & Housing 15.6 %  50 Billion	Education 13.4 %  43 Billion	Debt 5.3 %  17 Billion	Agriculture 3.75 %  12 Billion	Defense 3.75 %  12 Billion	Hydro Energy 2.81 %  9 Billion	Health 2.81 %  9 Billion
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Ethiopian Budget Evolution



2010 E.C Budget Expenditure **320.8 Bln** Total Budget

117.3 Billion
114.7 Billion
81.84 Billion
7 Billion

Subsidies
Capital
Recurrent
Support for SDG










2010 E.C Budget Financing

221.8 Billion
17.14 Billion
28.62 Billion
53.88 Billion

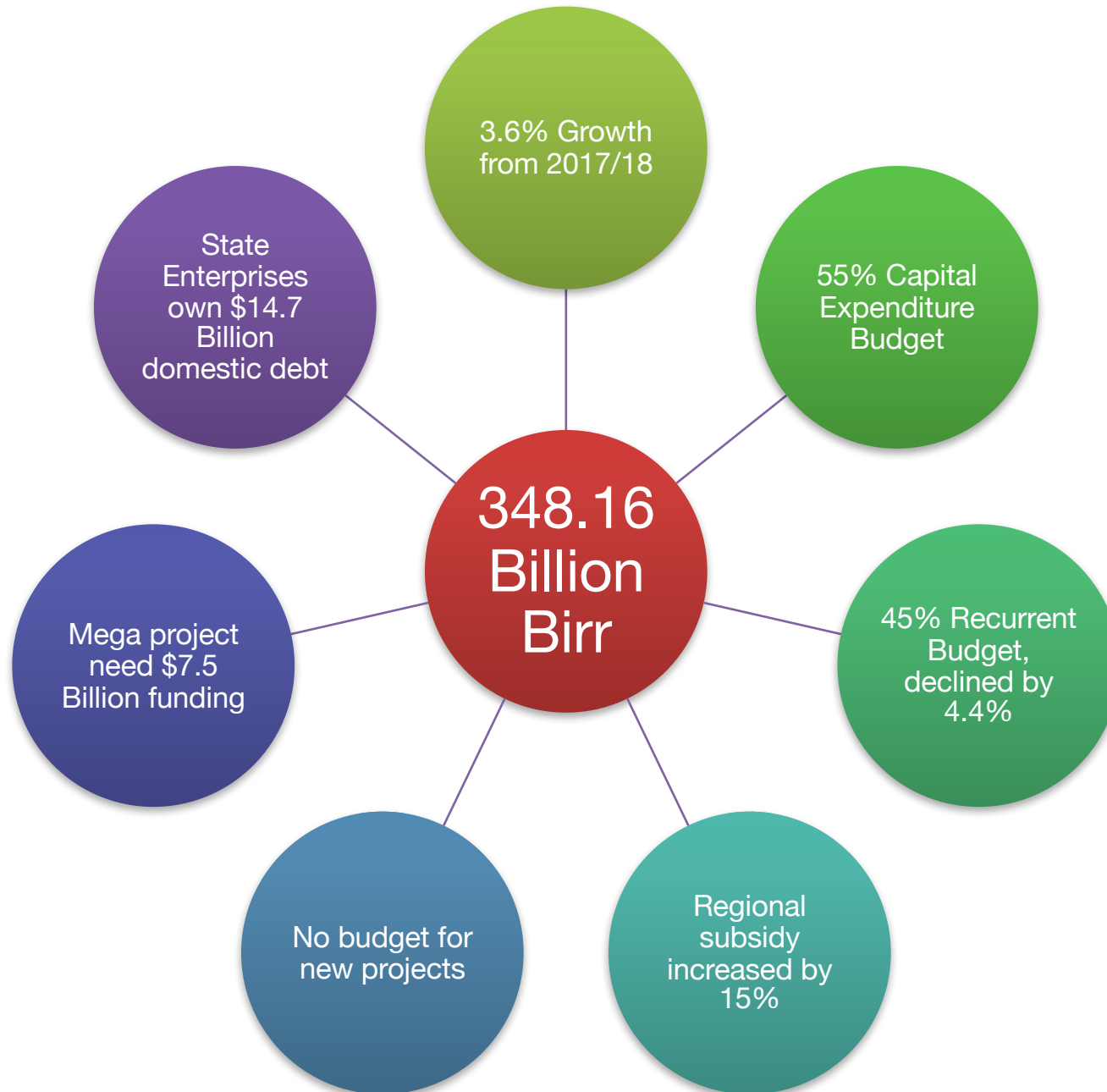
Domestic Revenue
External Assistance
External Loan and Credit
Deficit

With the current Ethiopian fiscal year ending on June 30, the last few weeks in the month of June are usually when the details of spending plan for the upcoming fiscal year is revealed to the House of Peoples' Representatives (HoPR). Keeping up with that timetable, Abraham Tekeste (PhD), finance minister of Ethiopia, presented his budget speech to HoPR last Thursday. This budget bill came weeks after the report of the Auditor General indicating that billions of birr allocated through the budget bill of 2008 EC has been mismanaged by several federal agencies in Ethiopia. Regardless, Abraham heralded a 320 billion birr budget plan which is 17 percent higher than the budget approved for the current fiscal year. For detailed breakdown of the proposed budget figures and historical trend analysis of the budget instrument in Ethiopia, SEE THE FULL STORY ON PAGE 10.

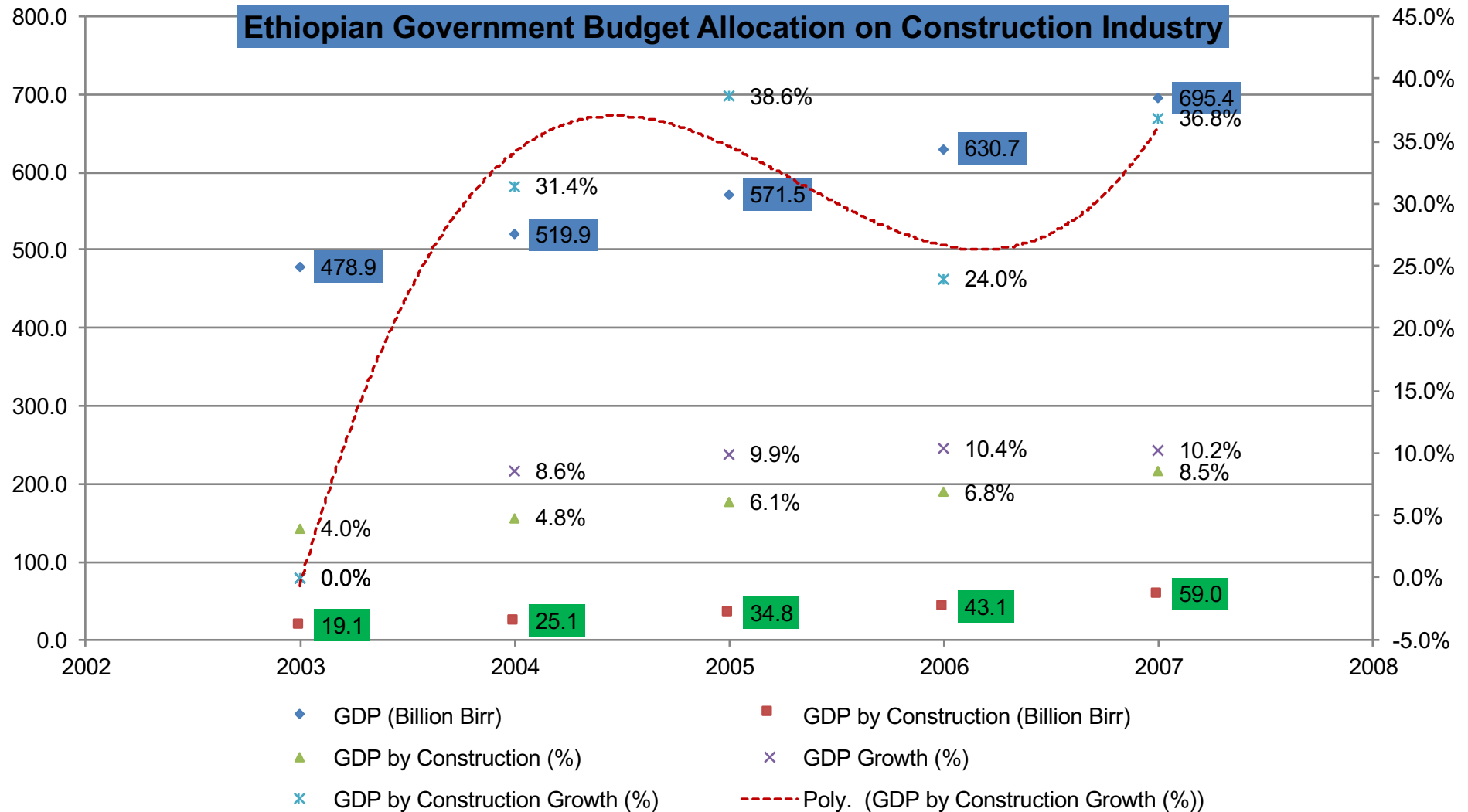
Major Institutions

Ethiopian Roads Authority		Araya Girma	45.8 Billion Birr
Ministry of Defense		Siraj Fegessa	12.0 Billion Birr
Ministry of Health		Yifru Berhane Professor	9.63 Billion Birr
Ministry of Agriculture and Natural		Eyasu Abraha (PHD)	9.50 Billion Birr
Ministry of Water, Irrigation & Elec.		Sileshi Bekele (PHD)	8.83 Billion Birr
Ministry of Education		Shiferaw Teklemariam (PHD)	4.82 Billion Birr
Ministry of Urban Dev. & Housing		Ambachew Mekonnen (PHD)	3.02 Billion Birr
Federal Police Commission		Aseffa Beyu	2.79 Billion Birr
Addis Ababa University		Admasu Tsegaye	2.21 Billion Birr

2018/19 Ethiopian National Budget



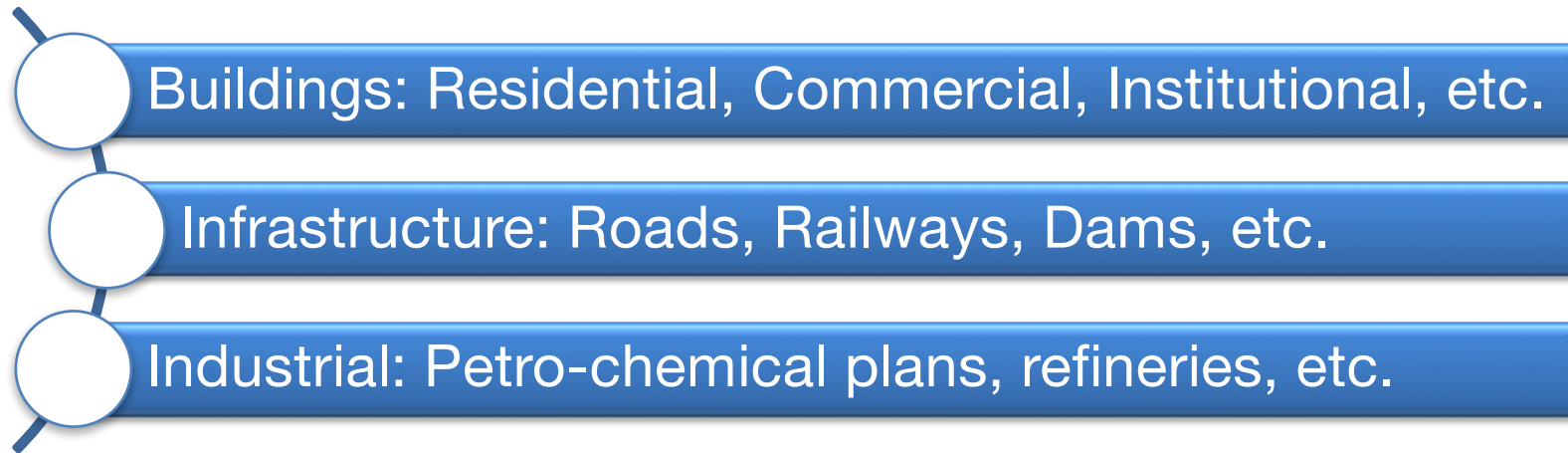
Introduction to Construction Industry: Definition



Source: WB in association with ECPMI

Introduction to Construction Industry: Definition

- Construction Industry: is an economic sector which, through planning, design, construction, maintenance and repair, and operation, transforms various resources into constructed facilities.
- Construction facilities include:



- According to UN (1996), International Standards Industrial Classification (ISIC): Construction is defined generally as an economic activity directed to the creation, renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, etc.

Introduction to Construction Industry

- In the case of Ethiopia, the definition adopted by the National Accounts department of MoFED is the same as that of ISIC.
- The activities actually covered under the industry are the construction and maintenance activities of (MoFED, 2005):
 - 1) Residential buildings in urban and rural areas,
 - 2) Non- residential buildings, i.e. factory buildings, ware houses, office buildings, garages, hotels, schools, hospitals, clinics, etc.,
 - 3) Other construction works, like roads, dams, dikes, athletic fields, electricity transmission lines, telephone & telegraph lines, etc.
- Also includes activities such as quarrying of stone, gravel crushing, and manufacturing of bricks are accounted in the construction industry.

Introduction to Construction Industry

- Key characteristics:

Unstable construction demand due to the specialized character of each facility, seasonability, and exposure to economic fluctuation and demographic influences

Custom-built nature, resulting in project-oriented production

Floating labour force due to unstable construction demand

Immobility (creates reliance on local markets)

High initial expense

Complexity

Introduction to Construction Industry

- Key characteristics:

Unique financing procedure: customer has to pay in installments during construction process. Also, the source of the customer's short and long term finance also relies on the loans secured with constructed facility

No buffer between production and demand as stockpiling construction facilities in inventories is impossible

Continuously changing technology

Many stakeholders:
Client, Consultant,
Contractor, Supplier,
etc.

Disintegrated
production process

Similar to service
industry: product
decided ahead

- Role of construction industry:
 - **Output generation:** Satisfy basic physical and social needs through buildings and infrastructure
 - **Employment creation:** Due to the flexibility of the technology used in construction industry, it can create significant employment opportunity to skilled and unskilled labour force
 - **Income generation and redistribution:** Stimulating economic growth through backward and foreword linkages through its requirements for goods and services from other industries
 - **Revenue generation:** generation of revenue for government from corporate income taxes of companies, the rental income, sales tax, capital gain tax and employees income tax from those employed in the construction industry

Introduction to Construction Industry

- Construction industry in Ethiopian: Average growth rate of 29.9% from 2010 to 2014.
 - **Contribution to national income:** Share to GDP increased from 4.0% in 2009, 7.6% in 2013, 8.5% in 2015.
 - **Contribution to employment:** In 2005, construction industry employed 1.4% of the total employed population (31.4 million), and 2015, it employed 507,000 workers.
 - **Contribution to government revenue:** Rental income tax is one of the major sources of revenue
 - **Multiplier effect:** Ripple effect of construction is felt in service, industrial, and agricultural sectors.
- **Regulatory Framework:**
 - National Construction Industry Development Policy, 2013
 - Ethiopian Construction Project Management Institute (ECPMI) under regulation No. 289/2013
 - Ministry of Construction, 2015 or MoUD and Construction, 2018

Introduction to Construction Industry

• Evolution of the Ethiopian Construction Industry:

First Period: Prior to 1968

- Most civil works (including roads) carried out by foreign contractors through ICB

Second Period: 1968 - 1982

- Some small domestic contractors started to emerge:
- BERTA, National engineers and contractors (NEC),
- Ethiopian building road construction (ETBRC)

Derg regime

- Construction companies under state control since 1982
- State-owned construction companies were established
- Building capacity of the ERA
- No competitive bidding

EPRDEF regime

- Since 1991
- free market system
- Role of private contractors in the industry flourished while that of public companies diminished
- State company becoming more active since 2011

Post 2010

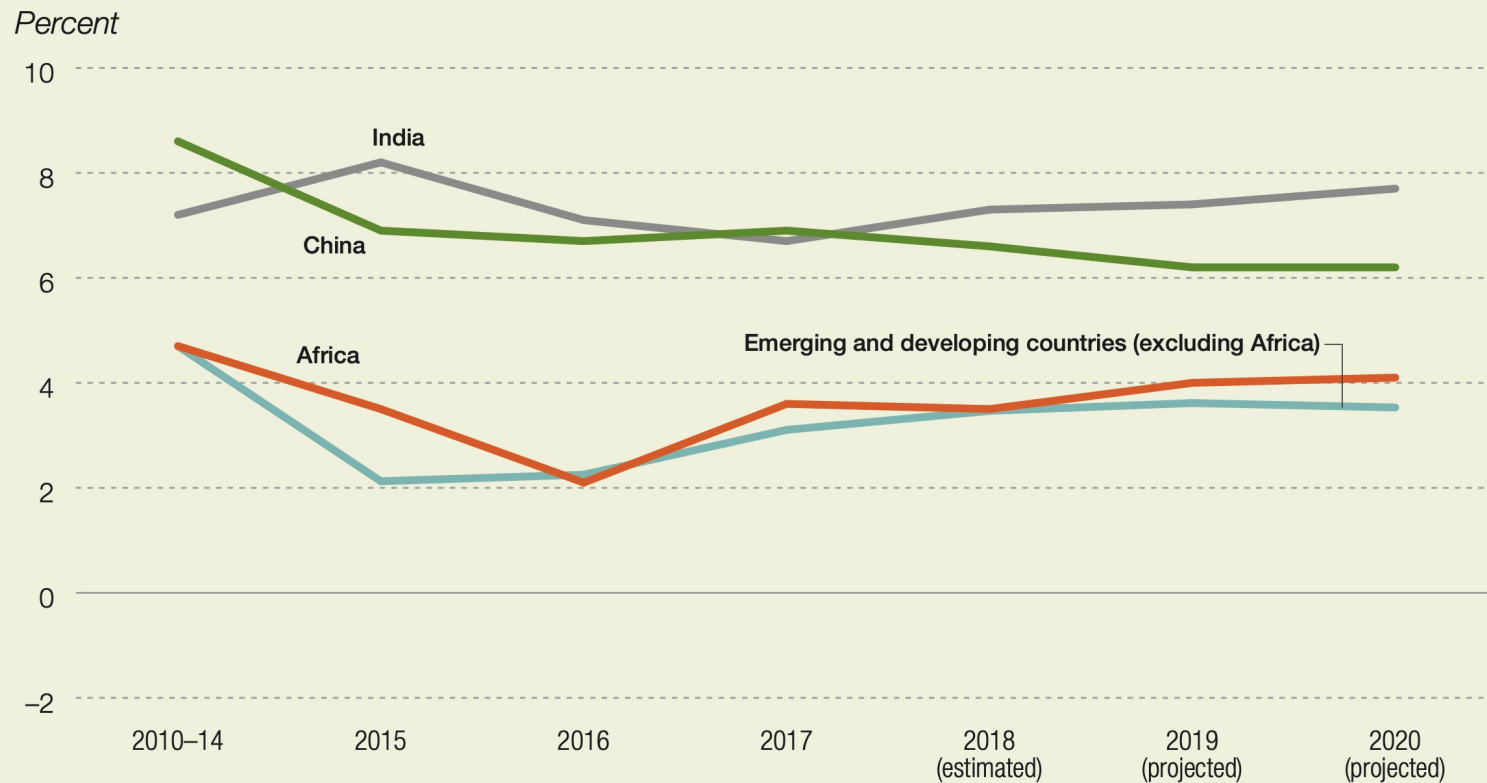
- Chinese based contractors
- State owned construction firms
- Large number of local contractors and consultants
- Mega projects

- 2019 African Economic Outlook
- Africa's economic growth continues to strengthen, reaching an estimated 3.5 percent in 2018, about the same as in 2017 and up 1.4 percentage points from the 2.1 percent in 2016.
- East Africa led with GDP growth estimated at 5.7 percent in 2018, followed by North Africa at 4.9 percent, West Africa at 3.3 percent, Central Africa at 2.2 percent, and Southern Africa at 1.2 percent.
- East Africa, the fastest growing region, is projected to achieve growth of 5.9 percent in 2019 and 6.1 percent in 2020.
- Between 2010 and 2018, growth averaged almost 6 percent, with Djibouti, Ethiopia, Rwanda, and Tanzania recording above-average rates. But in several countries, notably Burundi and Comoros, growth remains weak due to political uncertainty.

Source: ADB (2019)

Introduction to Construction Industry

FIGURE 1.1 Real GDP growth in Africa, 2010–20



Source: African Development Bank statistics and International Monetary Fund.

Source: ADB (2019)

Introduction to Construction Industry

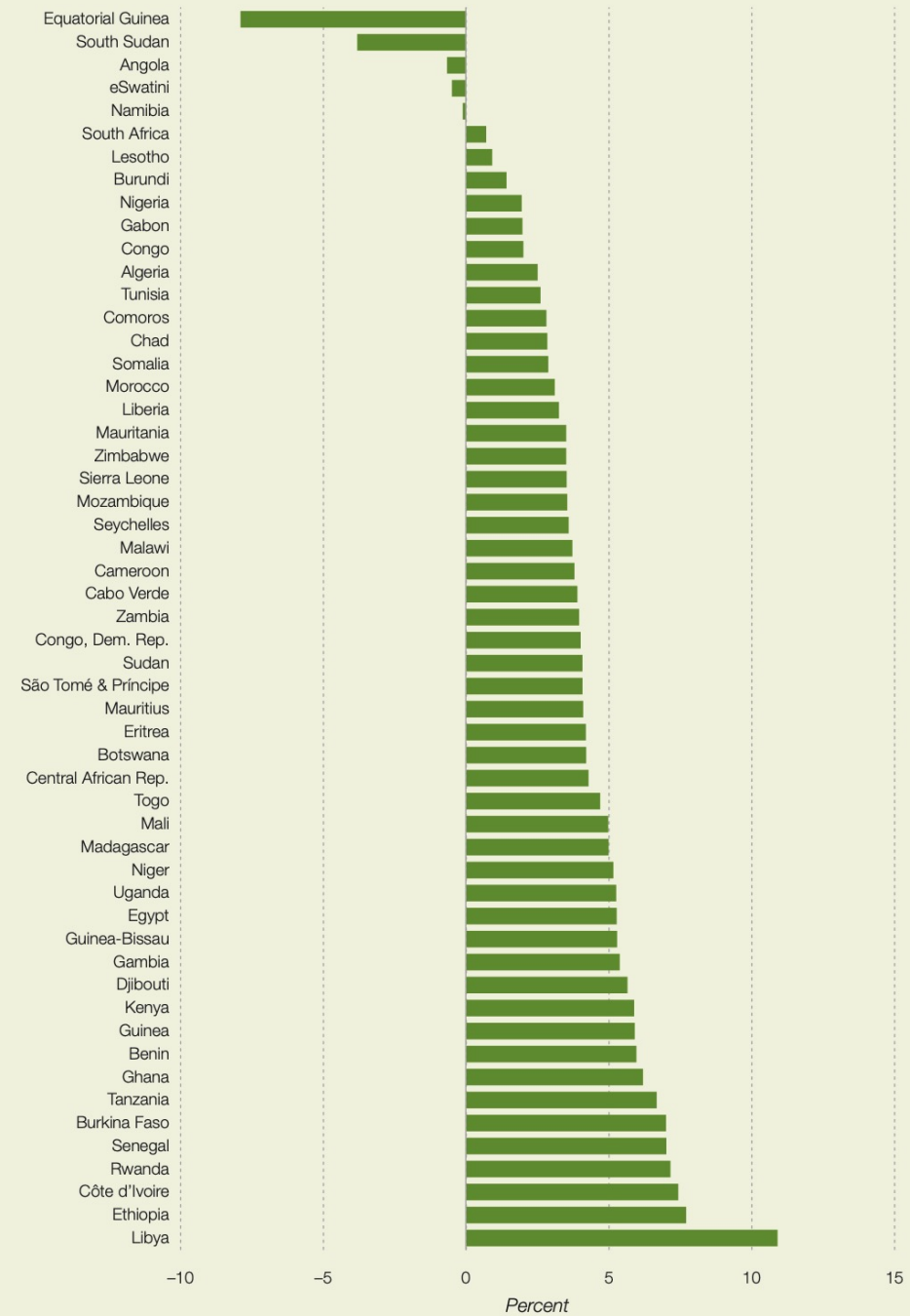
FIGURE 1.2 Real GDP growth in Africa and GDP growth needed to absorb the growing labor force, 2010–20



Source: African Development Bank statistics.

Source: ADB (2019)

FIGURE 1.6 Real GDP growth, by country, 2018

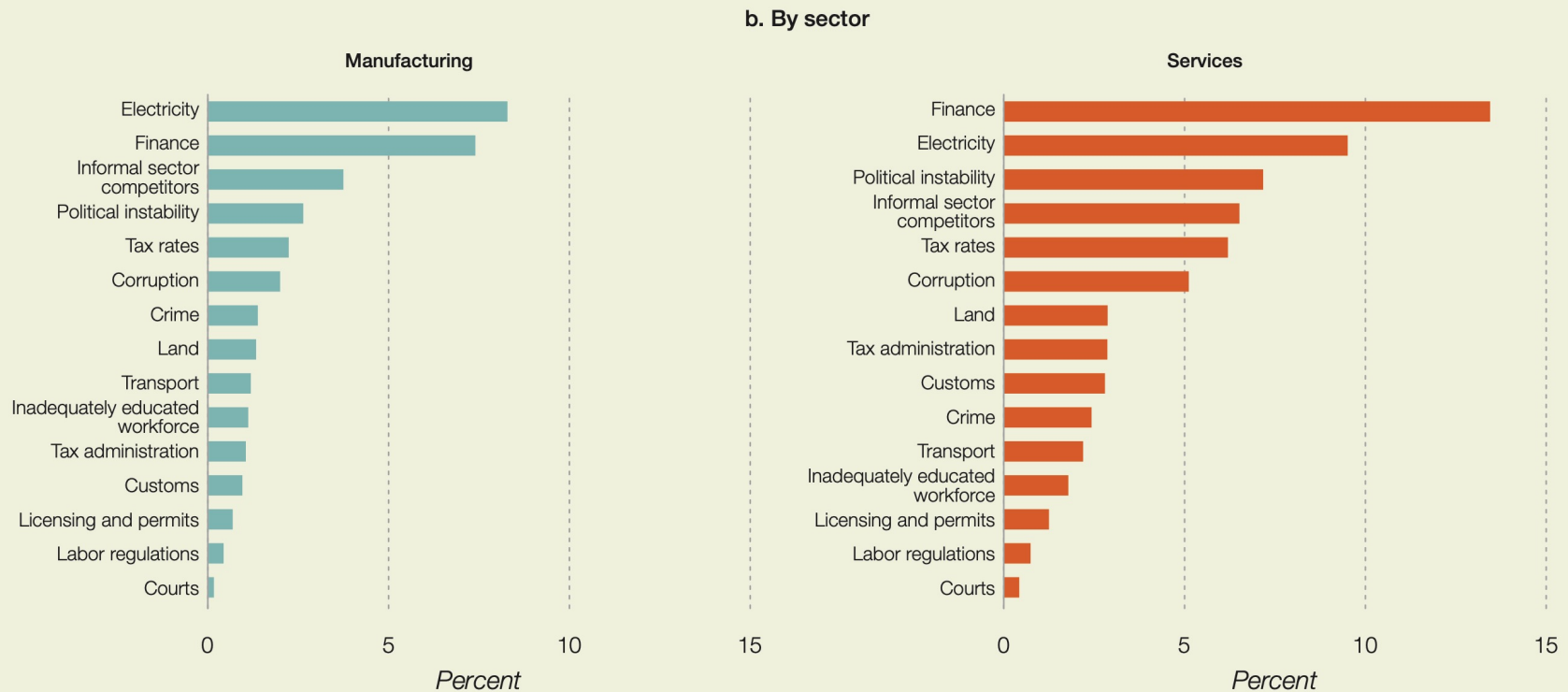


Source: African Development Bank statistics.

Source: ADB (2019)

Introduction to Construction Industry

FIGURE 2.11 Biggest obstacles to doing business in Africa, by firm size and sector, most recent year available during 2006–17 (continued)



Source: Data from World Bank Enterprise Surveys.

Note: All values are survey weighted.

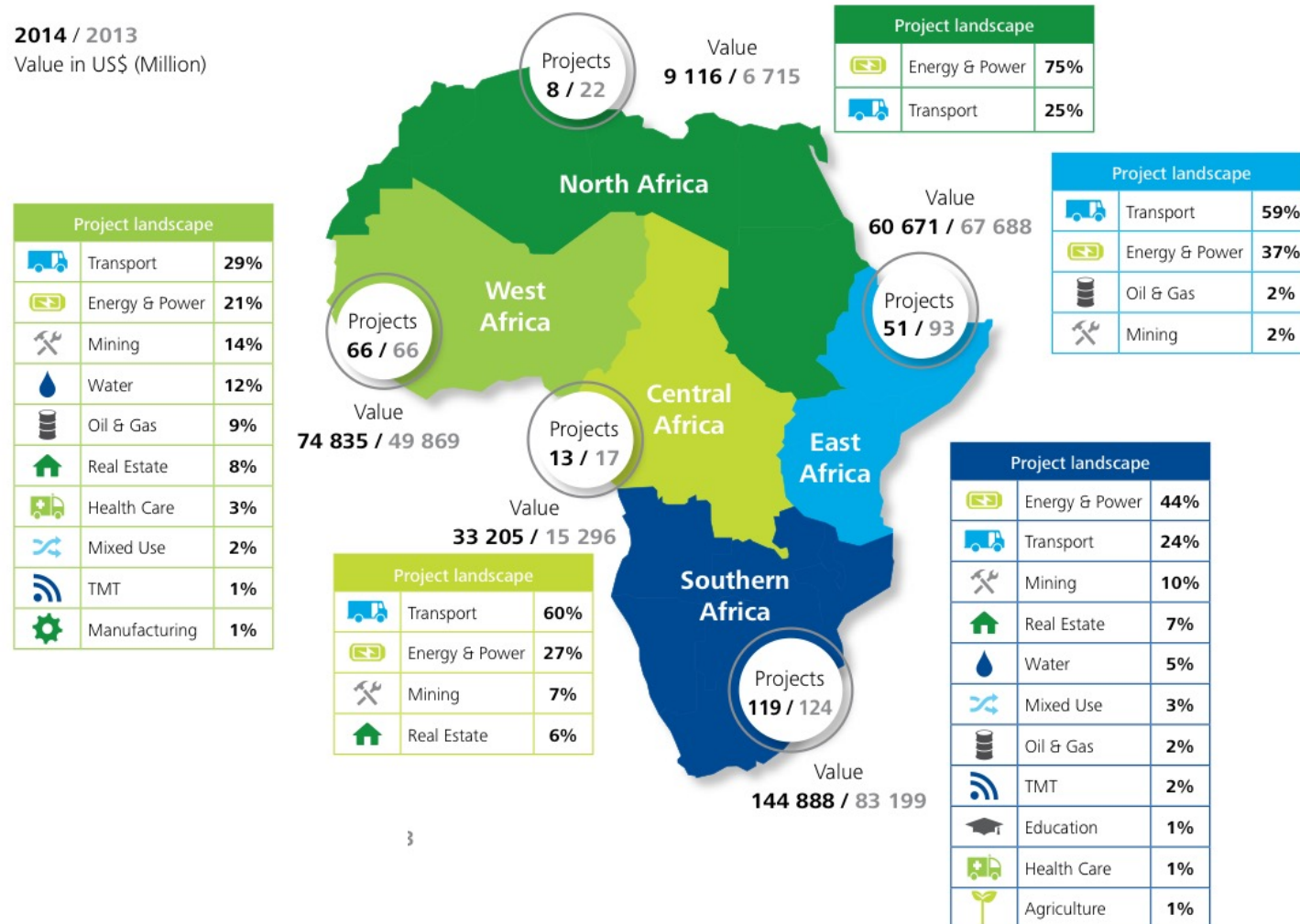
Source: ADB (2019)

Introduction to Construction Industry

- African construction trends: Project valued over USD 50 Million and broken ground but not commissioned in 2014

2014 / 2013

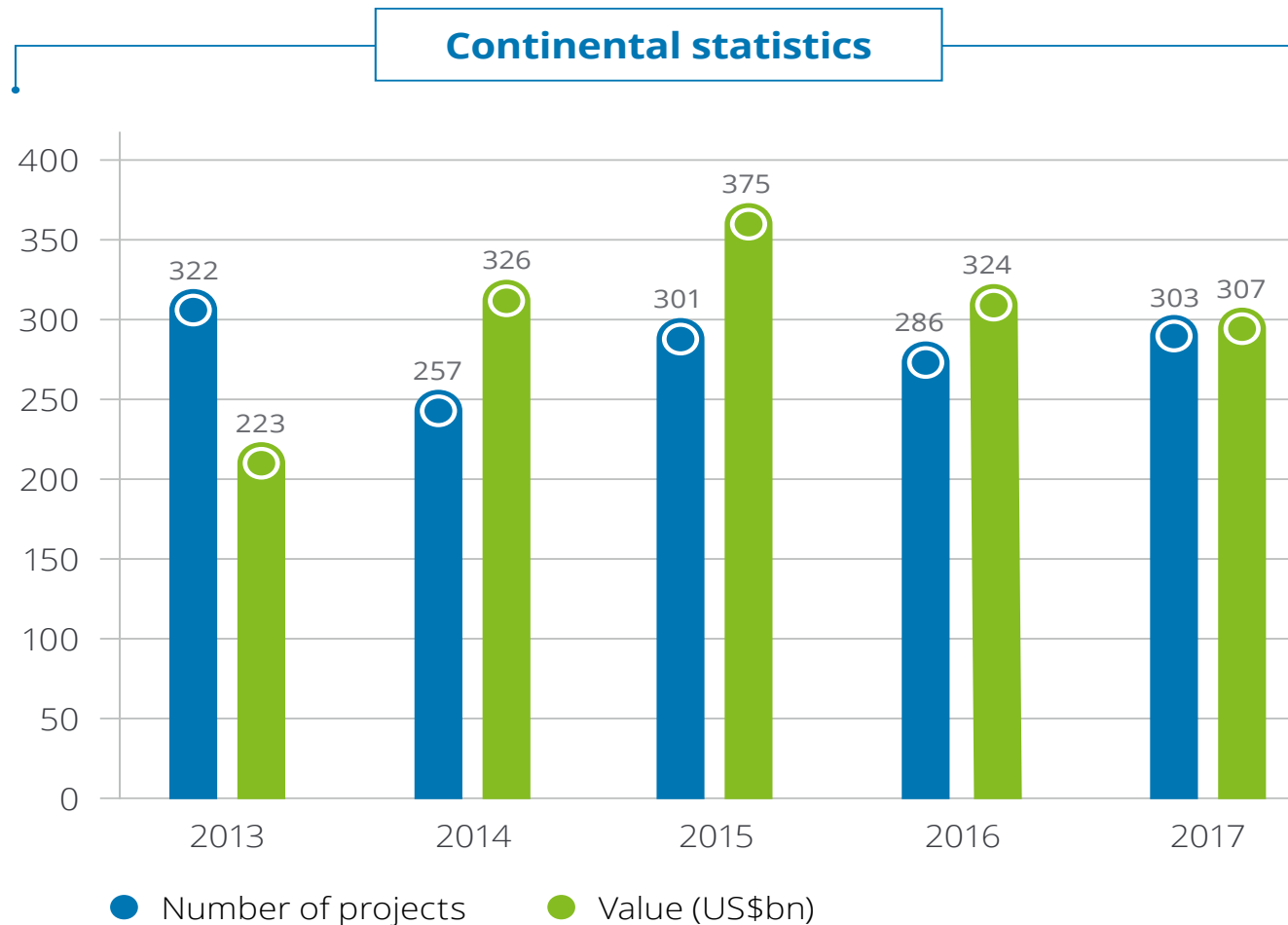
Value in US\$ (Million)



Source: Deloitte (2014)

Introduction to Construction Industry

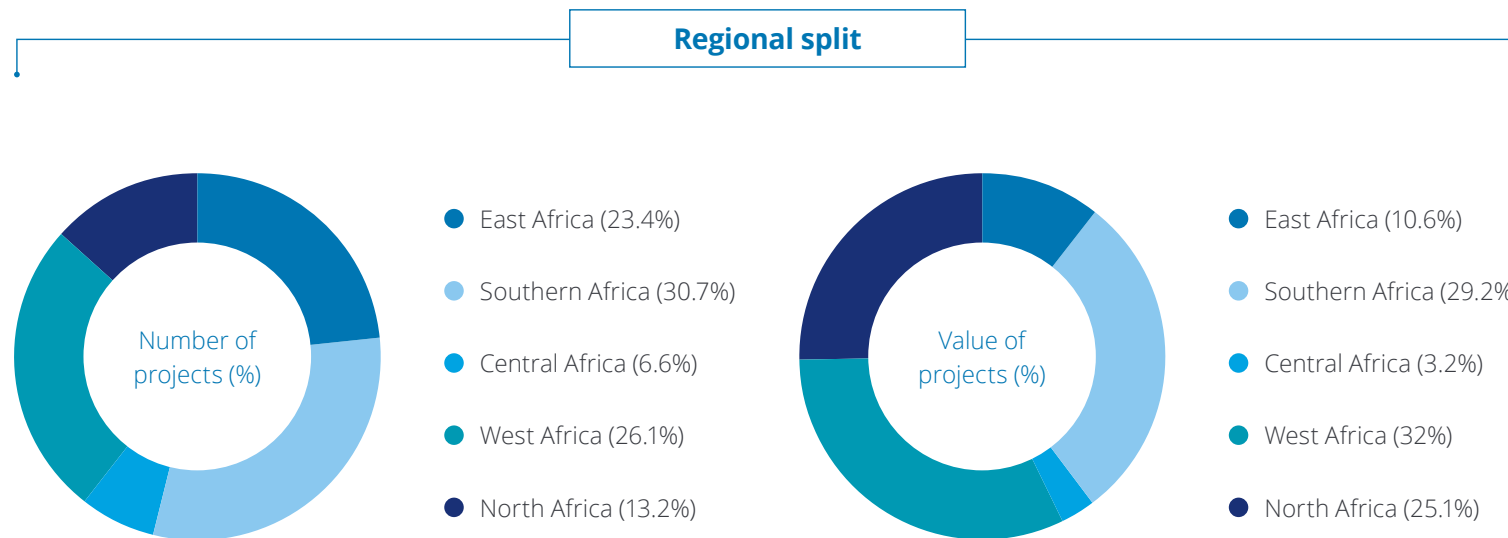
- African construction trends: Project valued over USD 50 Million



Source: Deloitte (2017)

Introduction to Construction Industry

- African construction trends: Project valued over USD 50 Million and broken ground by 1 June 2017













Source: Deloitte analysis, 2017. May not total to 100% due to rounding

Source: Deloitte (2017)

Introduction to Construction Industry

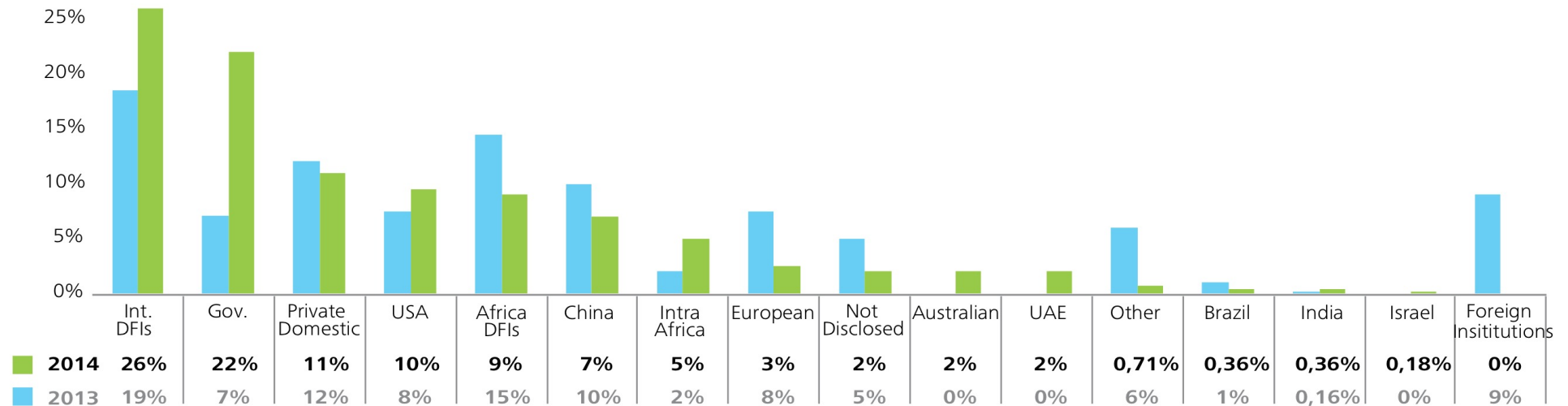
● African construction trends: Project Types

Projects by sector (number of projects)	Number of projects	Share of projects by number (%)	Value of projects (US\$bn)	Share of projects by value (%)
 Energy & Power	58	19.1%	67.4	21.9%
 Transport	109	36%	71.6	23.3%
 Real Estate	68	22.4%	42.3	13.8%
 Water	14	4.6%	3.8	1.2%
 Mining	10	3.3%	7.8	2.5%
 Oil & Gas	13	4.3%	76.9	25%
 Shipping & Ports	24	7.9%	36.3	11.8%
 Social Development	2	0.7%	0.4	0.1%
 Healthcare	3	1%	0.4	0.1%
 Education	2	0.7%	0.6	0.2%

Source: Deloitte analysis, 2017. May not total to 100% due to rounding

Introduction to Construction Industry

- African construction funding sources:

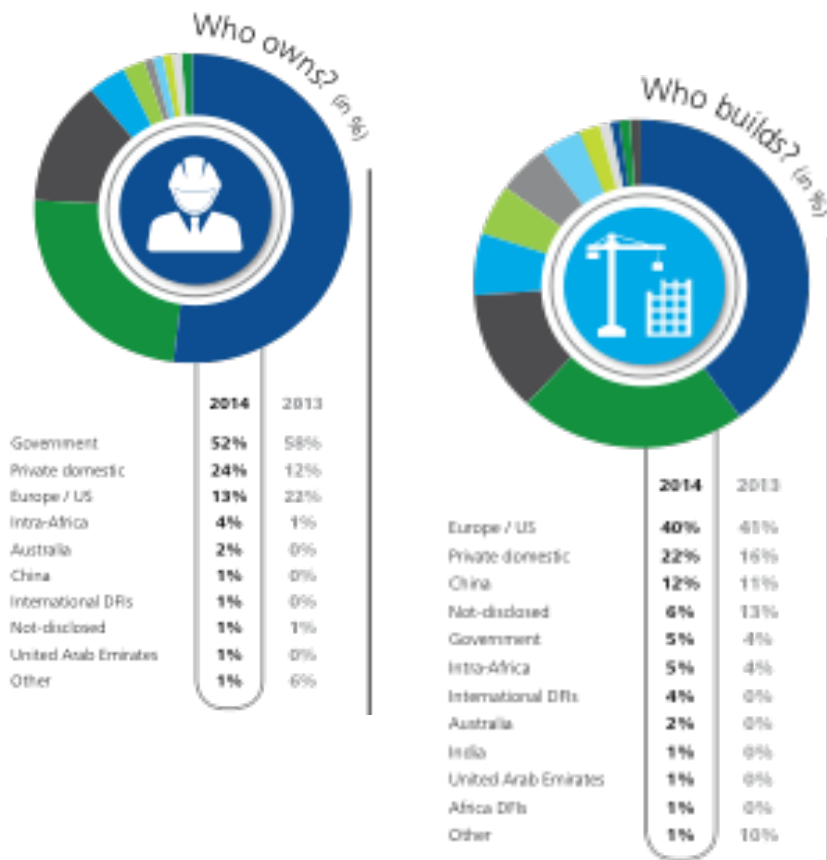


Note: DFIs represent Development Finance Institutes

Source: Deloitte (2014)

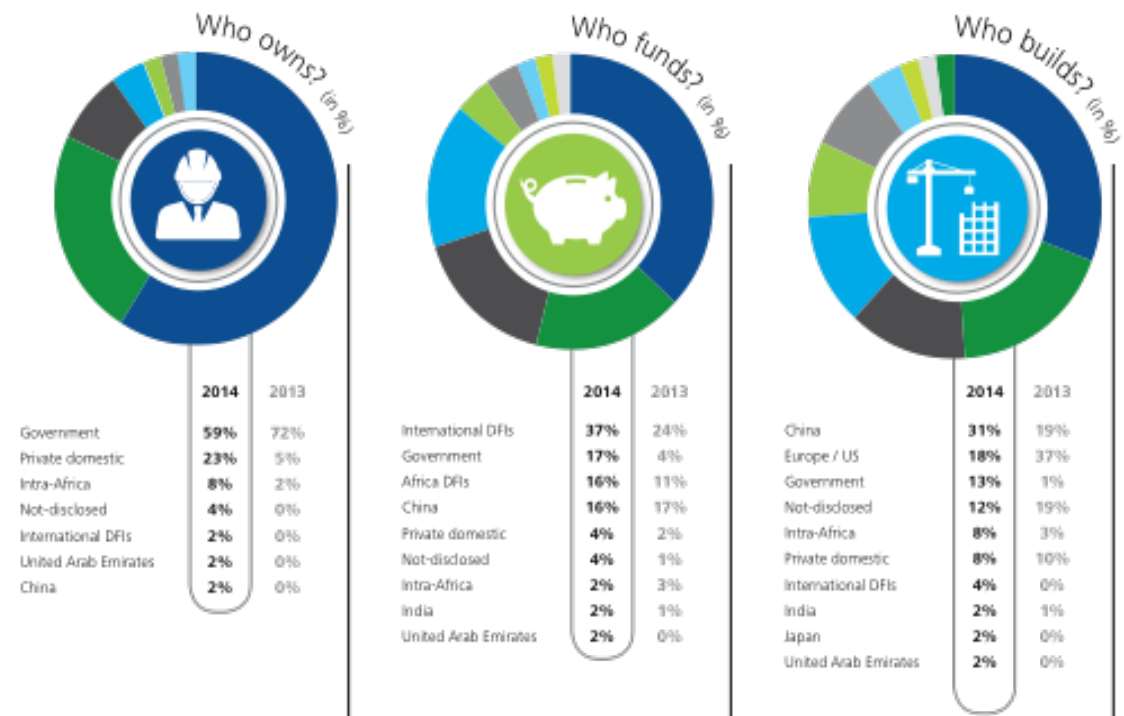
Introduction to Construction Industry

- African construction funding sources:



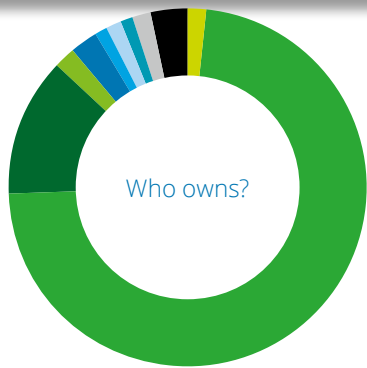
AFRICAN SUMMARY

EAST AFRICAN SUMMARY



Source: Deloitte (2014)

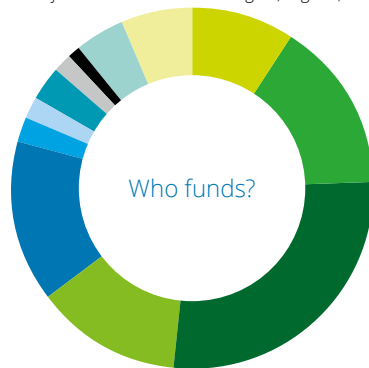
Introduction to Construction Industry



- China (1.7%)
- Governments (72.9%)
- Private Domestic (12.5%)
- UK (2%)
- US (2.3%)
- UAE (1.3%)
- France (1.3%)
- Italy (1%)
- African countries (1.7%)
- Single countries (3.3%)

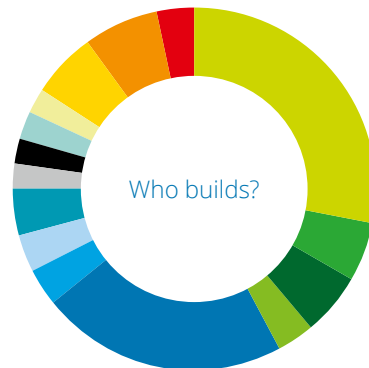
African construction trend:

Source: Deloitte analysis, 2017. African countries include Angola, Nigeria, and South Africa. Single countries include Australia, Brazil, Canada, Germany, India, Macau, Netherlands, Singapore, Switzerland, and Turkey



- African DFIs (9.2%)
- China (15.5%)
- Governments (27.1%)
- International DFIs (13.2%)
- Private Domestic (14.5%)
- France (2%)
- UK (2%)
- US (3%)
- South Africa (1.7%)
- Brazil (1.3%)
- European countries (4.3%)
- Single countries (6.3%)

Source: Deloitte analysis, 2017. European countries include Germany, Italy, Netherlands, Portugal, and Switzerland. Single countries include Australia, Canada, India, Kuwait, Macau, Namibia, Nigeria, Qatar, Turkey, and the UAE



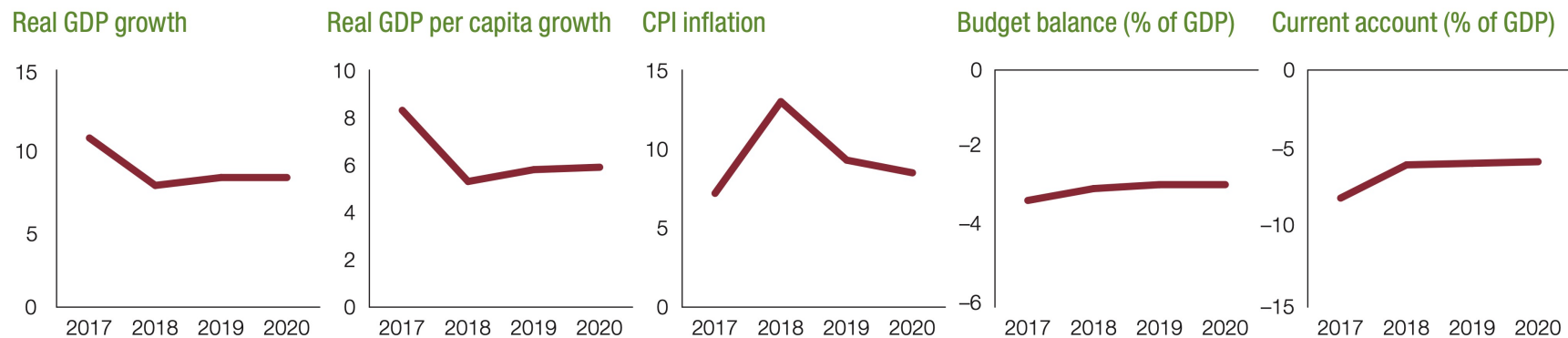
- China (28.1%)
- France (5.3%)
- Italy (5.6%)
- Portugal (3.3%)
- Private Domestic (22.1%)
- South Africa (3.3%)
- US (3.3%)
- International Consortiums (4%)
- UK (2.3%)
- Brazil (2.3%)
- Turkey (2.6%)
- Other African countries (2%)
- Other European countries (5.9%)
- Other Asian countries (6.6%)
- Other single countries (3.3%)

Source: Deloitte analysis, 2017. Other African countries include Botswana, Egypt, Equatorial Guinea, Tunisia, Uganda, and Zambia. Other European countries include Belgium, Germany, the Netherlands, Spain, Sweden, and Switzerland. Other Asian countries include India, Japan, Macau, Malaysia, Singapore, and South Korea. Other single countries include Australia, Canada, Lebanon, Saudi Arabia, and the UAE

Introduction to Construction Industry

- Ethiopia's Economic Performance:

- Real GDP growth slowed in 2017/18, due partly to civil unrest, political uncertainty, and policy adjustments that involved fiscal consolidation to stabilize the public debt.
- With a public debt-to-GDP ratio of 61.8% at the end of June 2018, Ethiopia remains at high risk of debt distress, according to a 2018 debt sustainability analysis.
- Real GDP growth is projected to recover from 7.7% in 2017/18 to 8.2% in 2018/19 and 2019/20, supported by industry and service sector expansion and agricultural sector recovery.



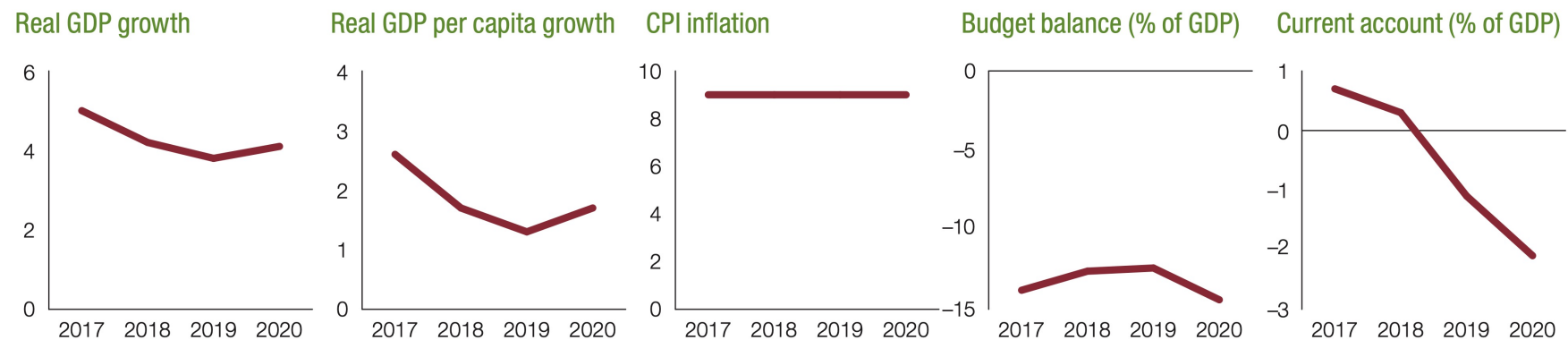
Note: Data are in fiscal years, so 2016 data refer to the 2015/16 fiscal year.

Source: Data from domestic authorities; figures for 2018 are estimates; figures for 2019 and 2020 are projections by the African Economic Outlook team.

Introduction to Construction Industry

- Eritrea's Economic Performance:

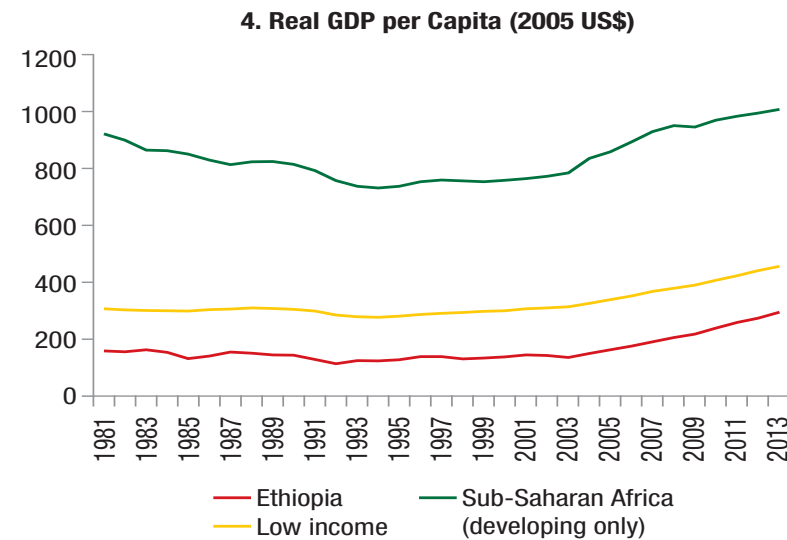
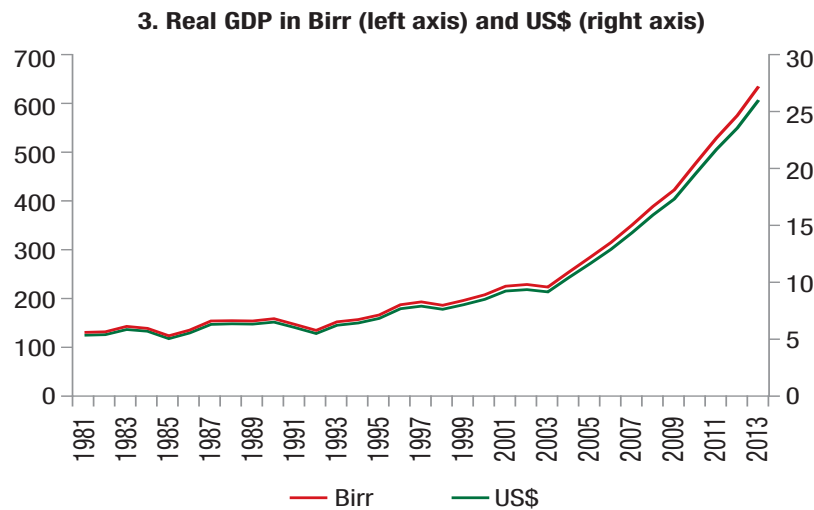
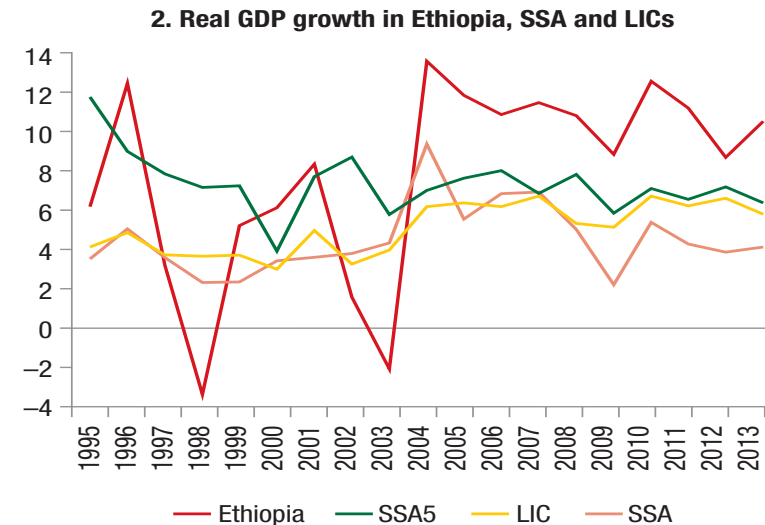
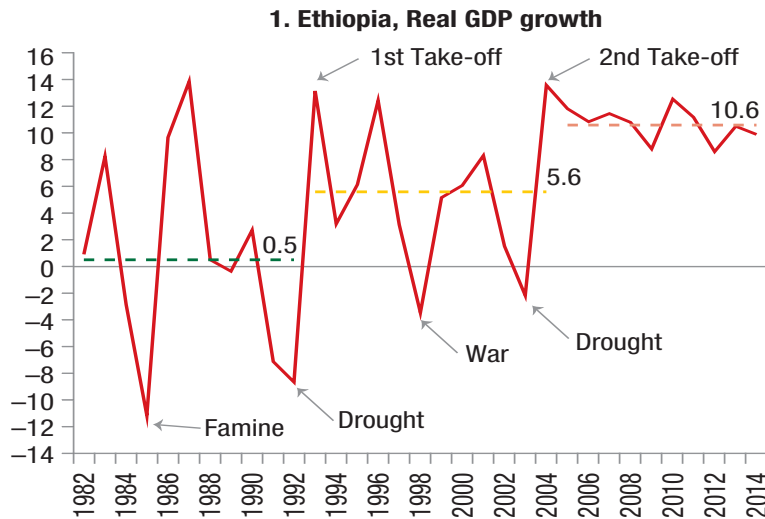
- Real GDP growth was an estimated 4.2% in 2018, down slightly from 5.0% in 2017, driven mainly by increased investment in the mining and housing construction sectors.
- The service sector's growth was estimated at 2.3% in 2018, down slightly from 2.7% in 2017, while industry grew by 1.0% in 2018 and agriculture by 0.9%.
- The fiscal deficit declined to an estimated 12.6% of GDP in 2018 from 13.8% in 2017. The country is in debt distress. Total external debt was an estimated 20.1% of GDP in 2018. The bulk of the debt was domestic, with external debt accounting for only 20% of GDP.



Source: Data from domestic authorities; figures for 2018 are estimates; figures for 2019 and 2020 are projections by the African Economic Outlook team.

Introduction to Construction Industry

Ethiopia's Recent Economic Performance:



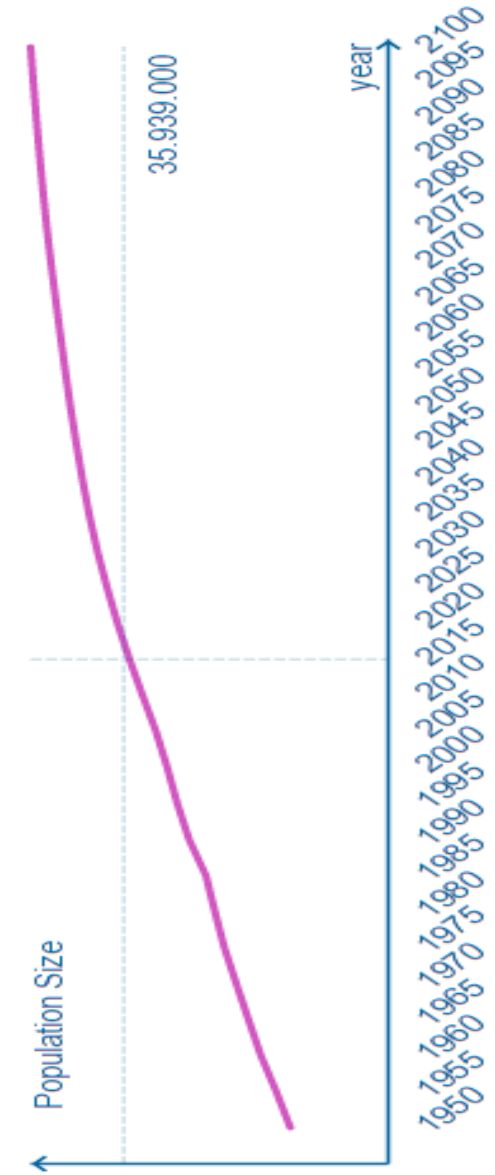
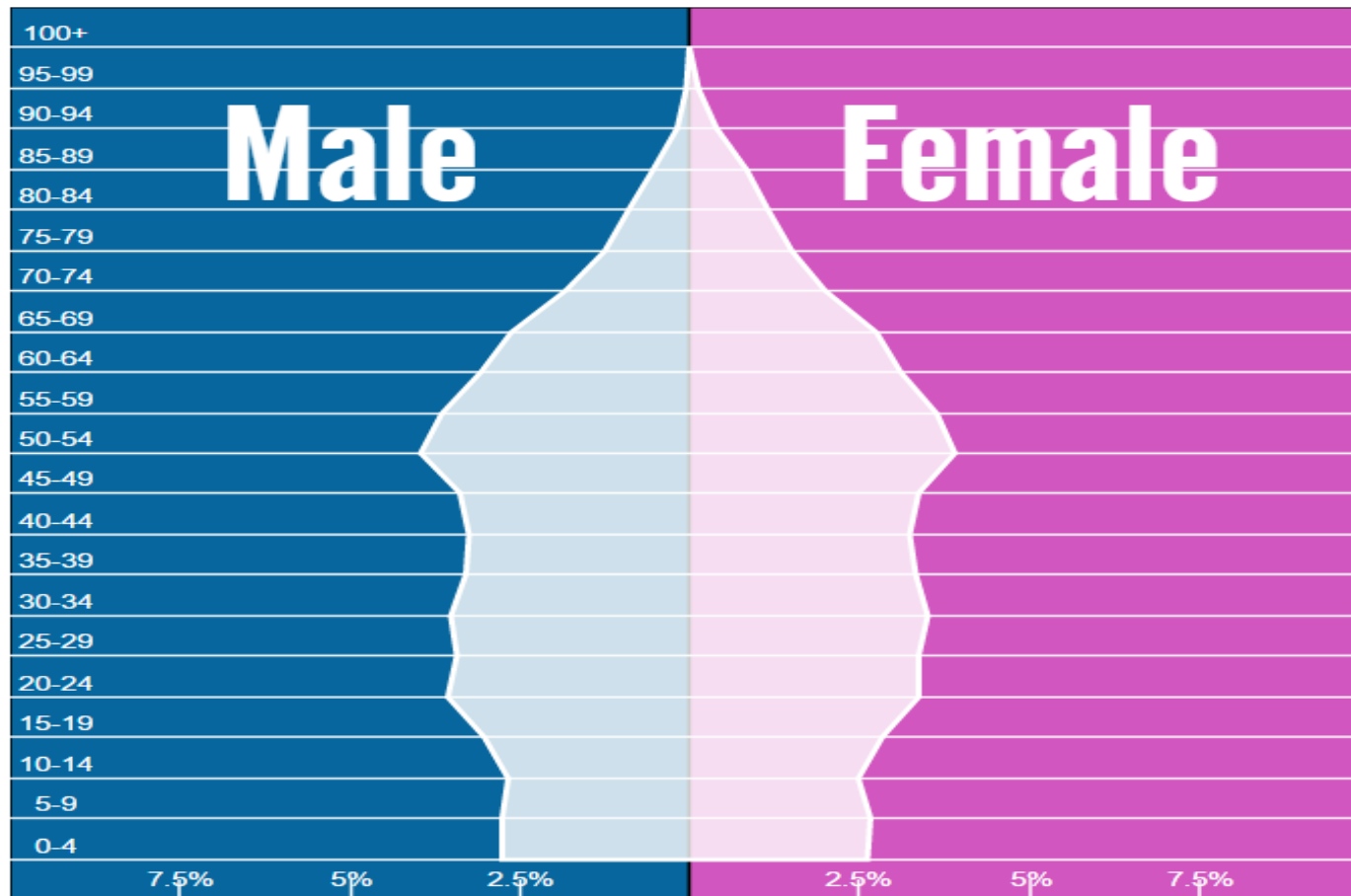
Note: SSA5 include Burkina Faso, Mozambique, Rwanda, Tanzania and Uganda.
LIC represents Low Income Countries.

Source: World Bank (2016)

Population Pyramid

Canada 2015

Population: **35.939.000**

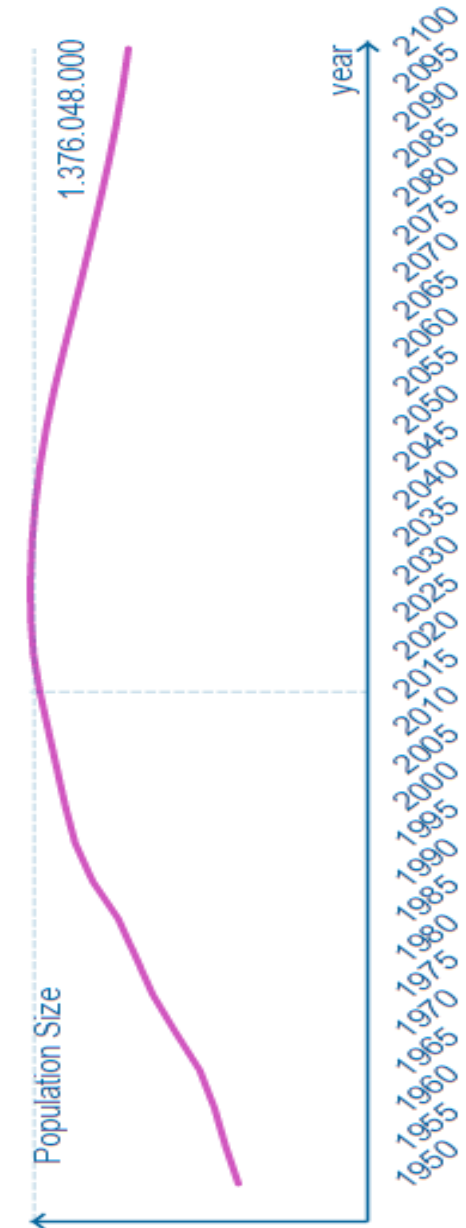
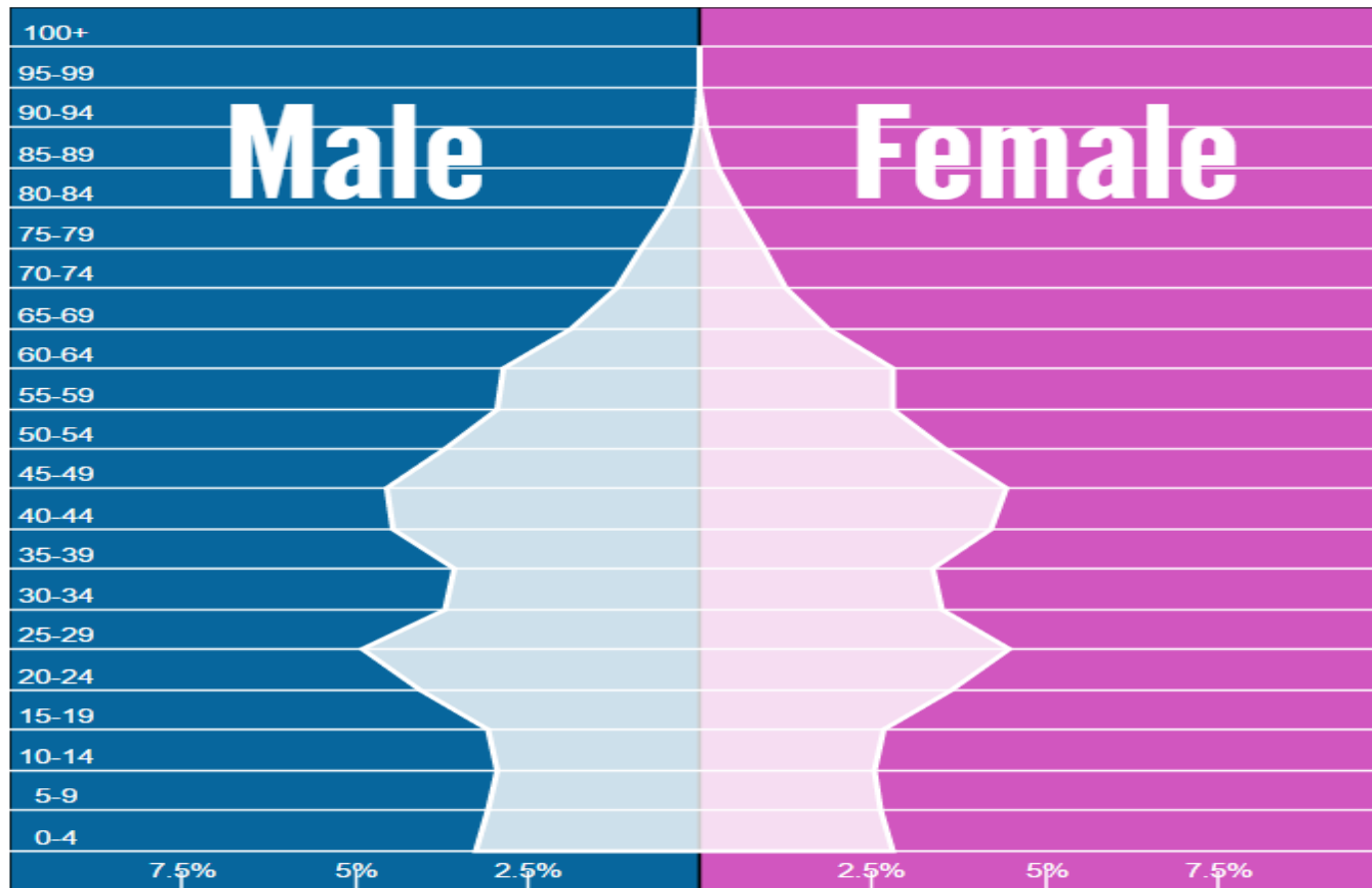


Source: <https://populationpyramid.net/canada/2015/>

Population Pyramid

China 2015

Population: **1.376.048.000**

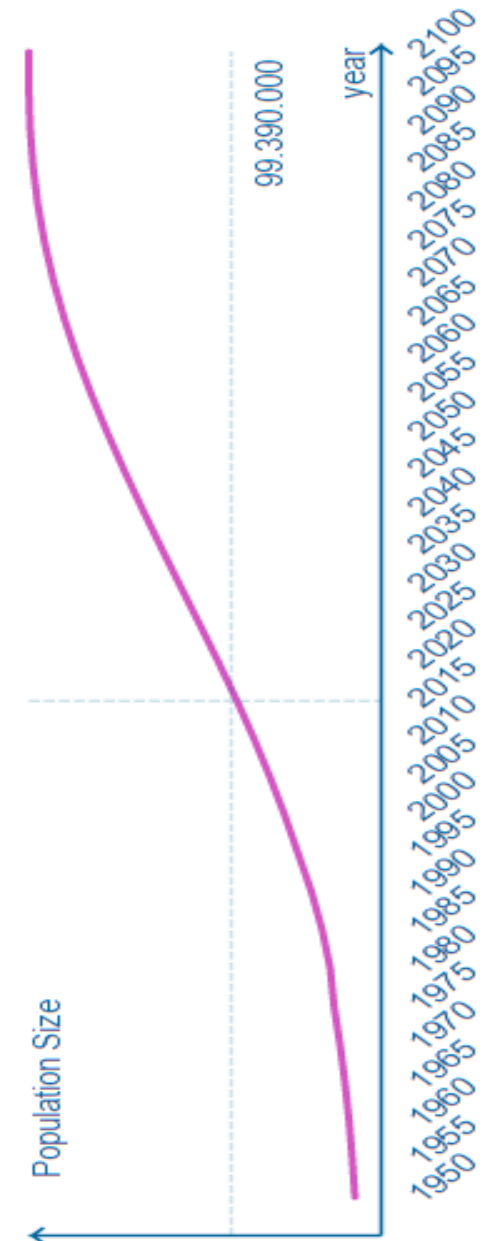
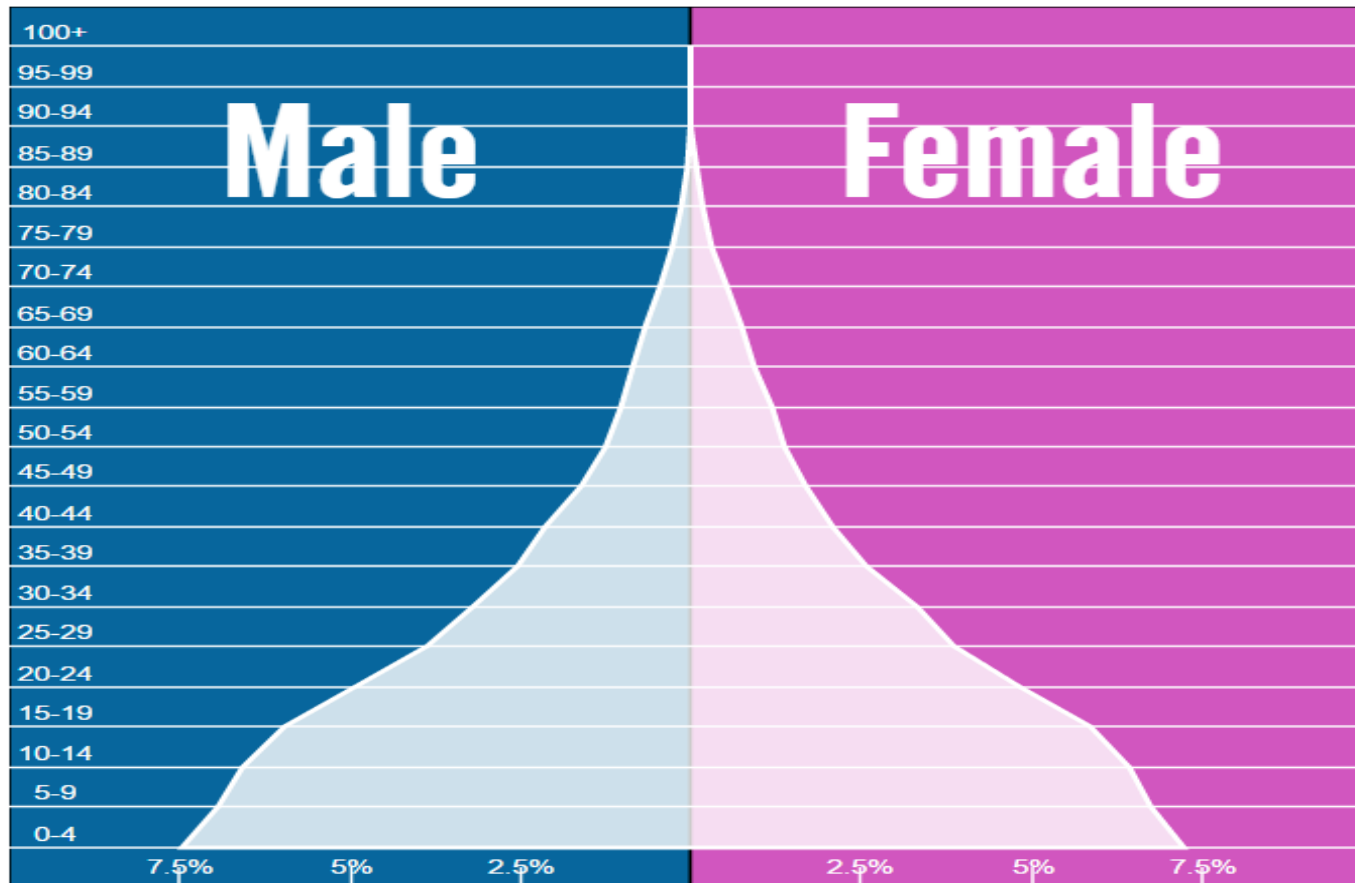


Source: <https://populationpyramid.net/china/2015/>

Population Pyramid

Ethiopia 2015

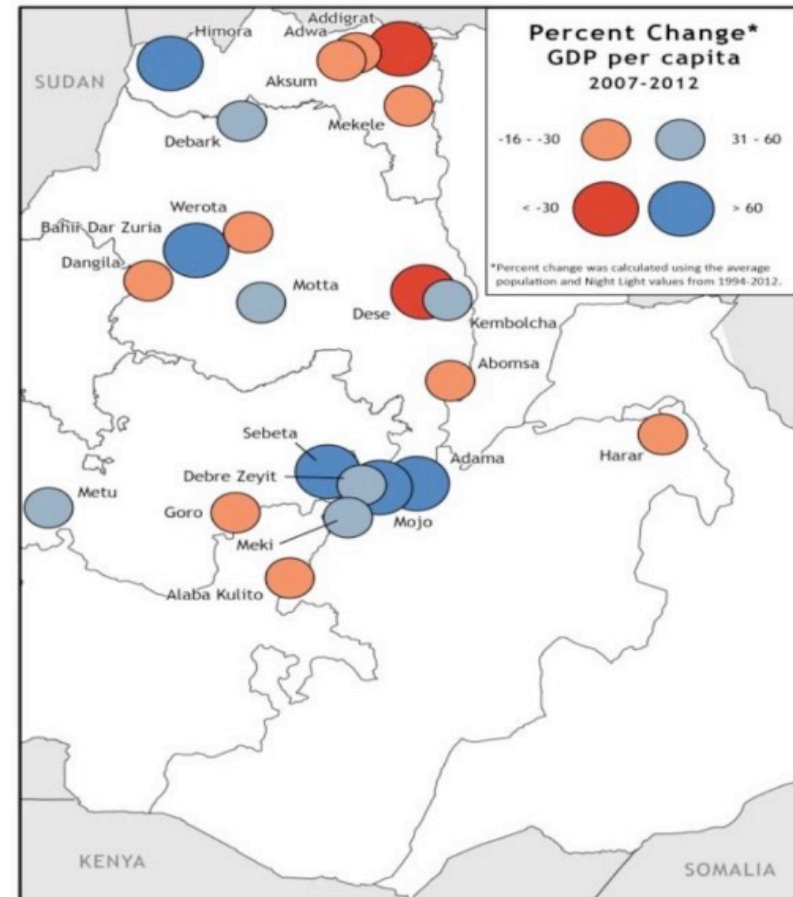
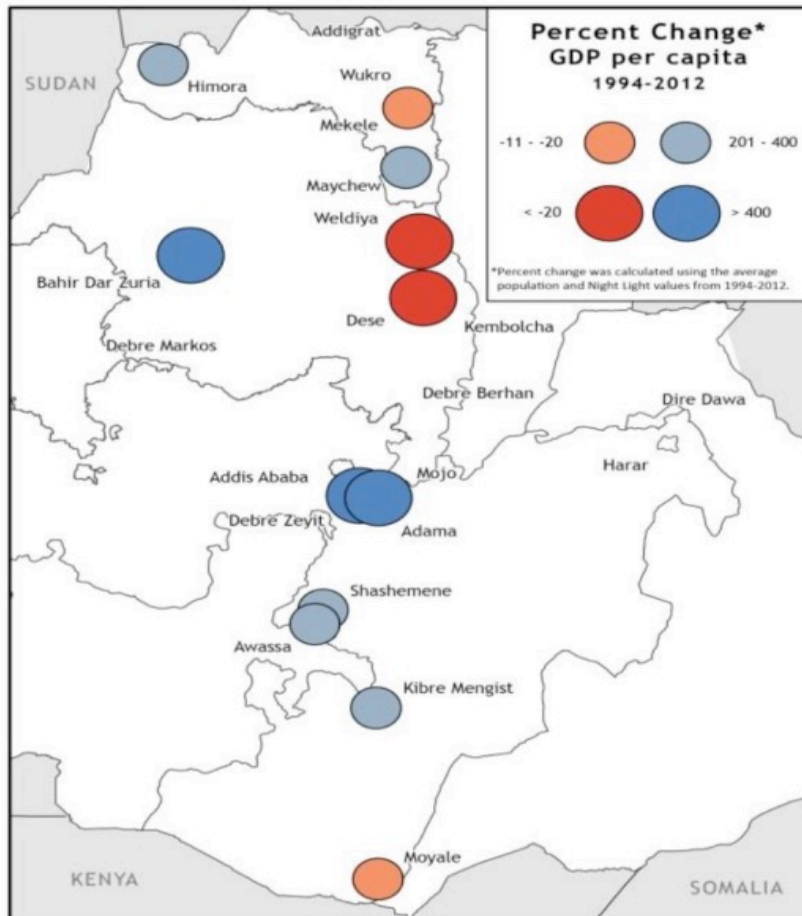
Population: **99.390.000**



Source: <https://populationpyramid.net/ethiopia/2015/>

Introduction to Construction Industry

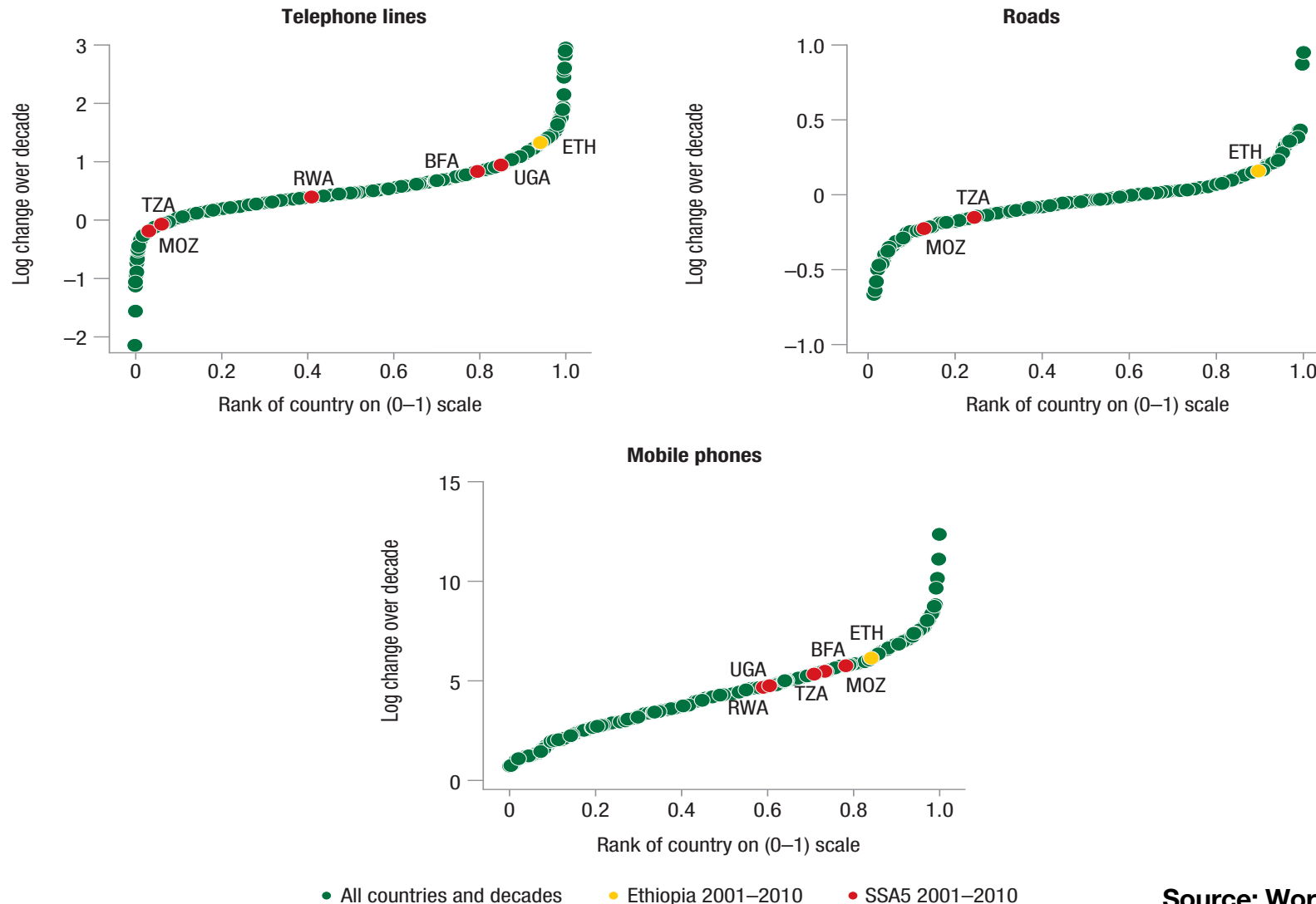
- Ethiopia's Recent Economic Performance:
- Nightlights data showing GDP per capita change, 1994-2012 (left) and 2007-12 (right)



Source: World Bank (2015)

Introduction to Construction Industry

- Ethiopia's Recent Economic Performance:
- Infrastructure Growth Rates: Ethiopia in the Global Context (1970–2010)

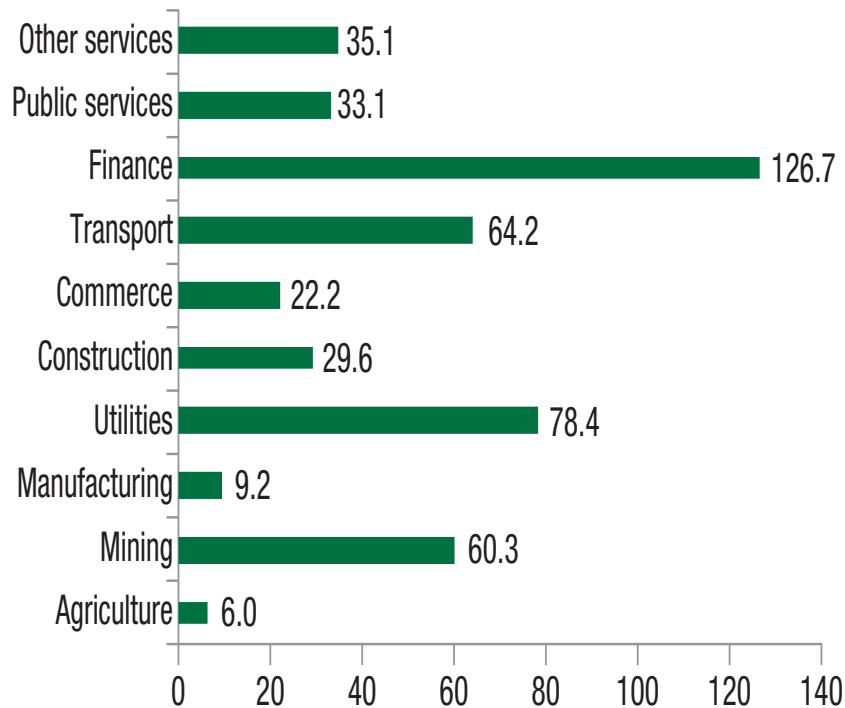


Source: World Bank (2016)

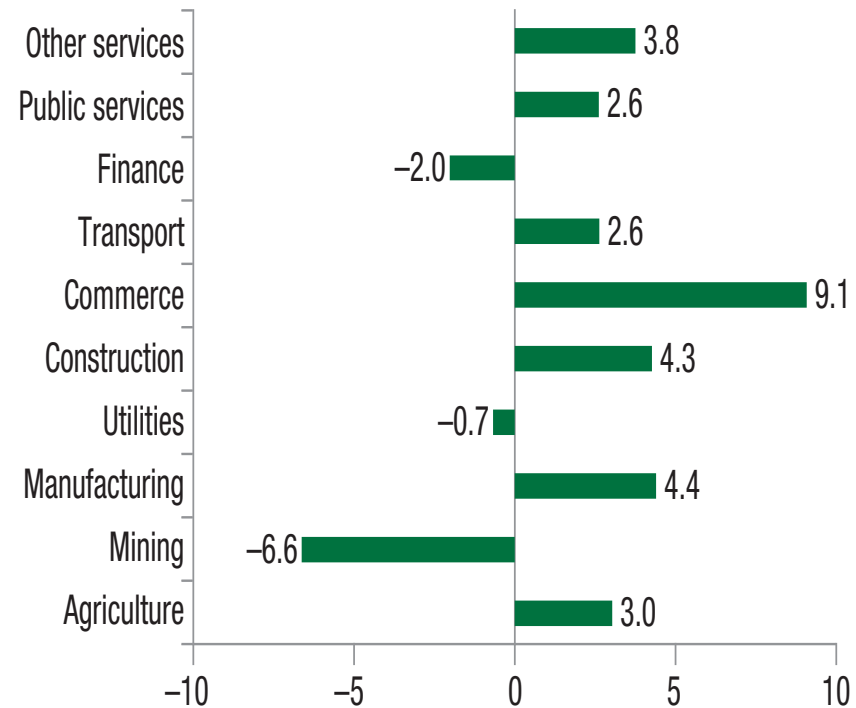
Introduction to Construction Industry

- Ethiopia's Recent Economic Performance:
- Ethiopia's Labour Productivity: 1999 – 2013

1. Labor Productivity Level, 2013 (1,000 birr)



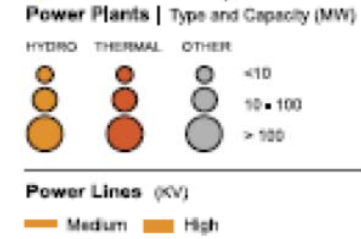
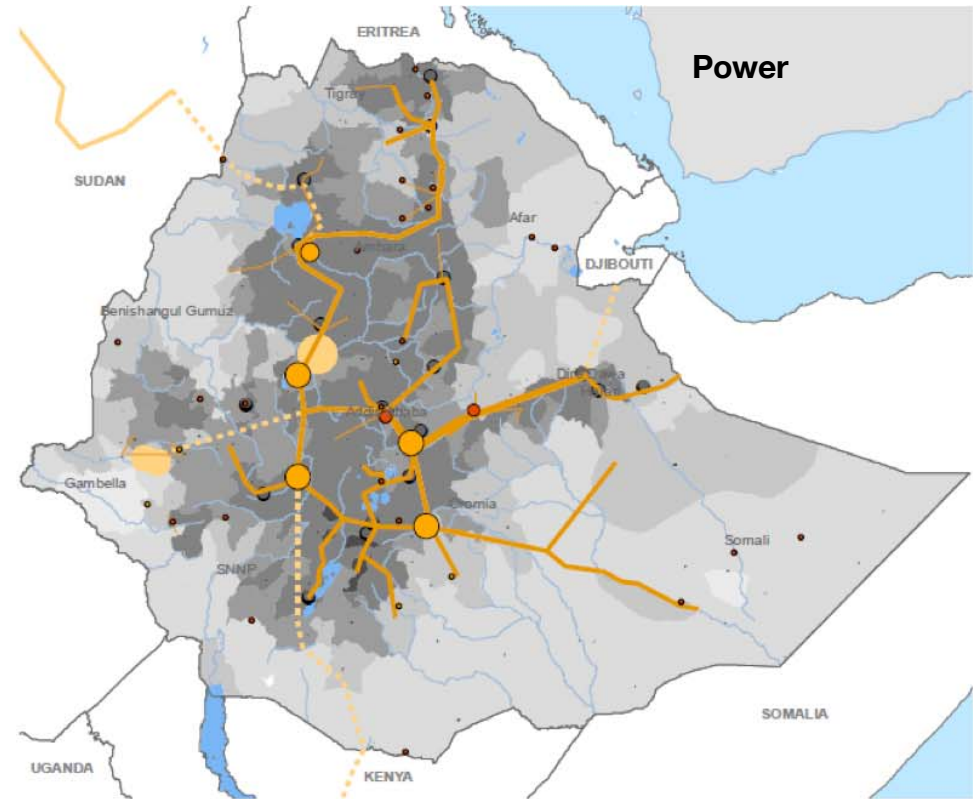
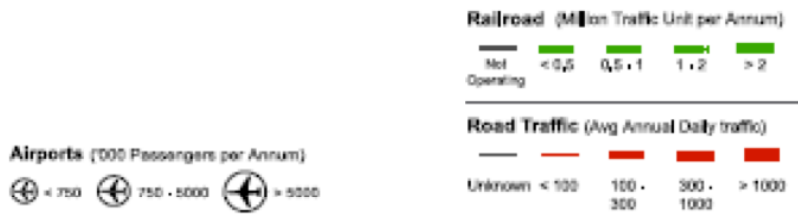
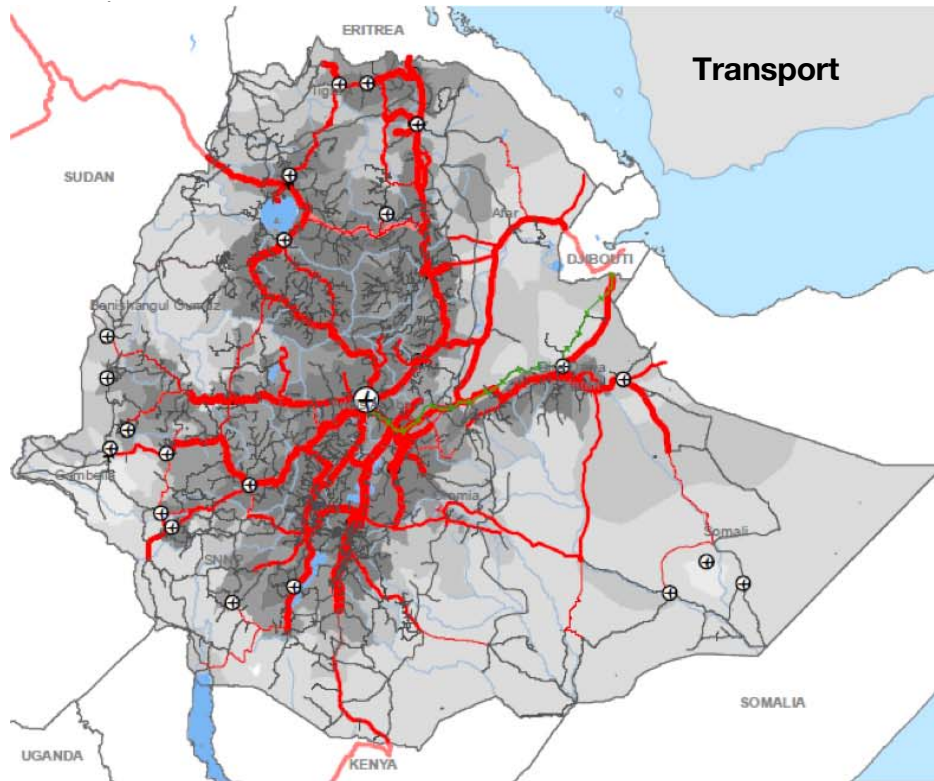
2. Labor Productivity Growth, 1999–2013 (%)



Source: World Bank (2016)

Introduction to Construction Industry

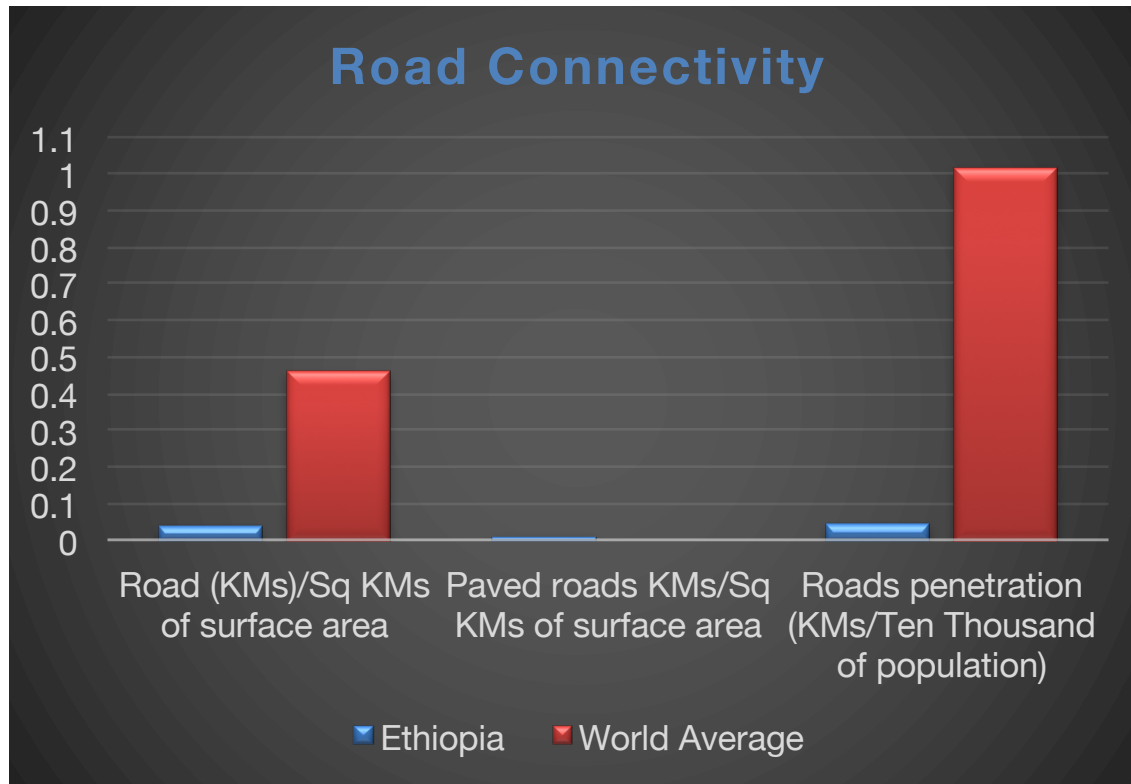
- State of Ethiopia's Infrastructure:



Source: AICD (2010)

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- Ethiopia's Infrastructure: Where do we stand?



Air:

Airports:63

No of Airports/Million of Population: 0.74 (World average 12.97)

Rail Penetration:

Total length of Railway Lines 681(KMs)

Rail lines(KM/thousand sq. KM): 0.07 (World average 9.20)

Energy:

Production (Bn KW): 3.268 (World 19,020 Bn KW)

Consumption (Bn KW): 2.941 (World 17,480 Bn KW)

Production (Bn KW/Mn population): 0.038 (World 2.8BnKW/Mn population)

Consumption (Bn KW/Mn population): 0.34 (world 2.57BnKW/Mn population)

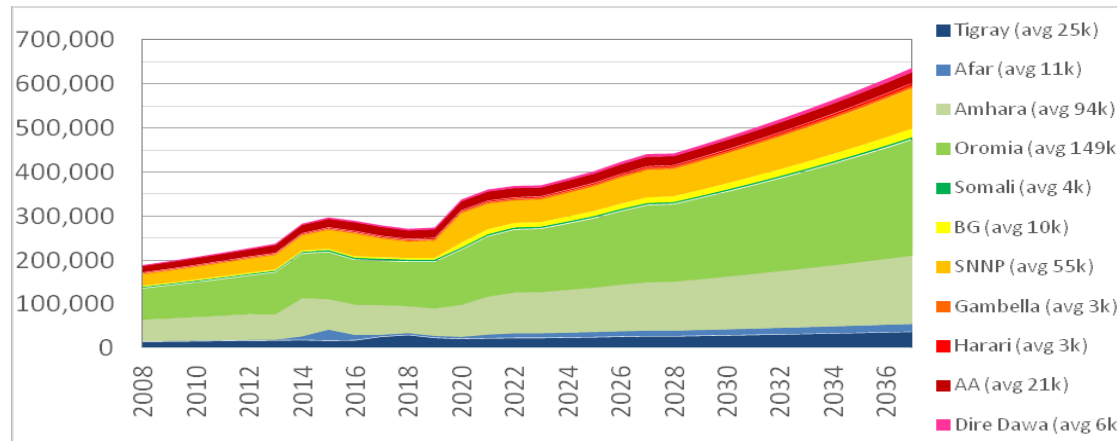
Source: Focus Africa (2016)

Introduction to Construction Industry

- Ethiopia's Housing Need:
- **Rapid urbanization:** In 2012, the urban population was only 17.3%, however, by 2028 it is expected to reach 30%.
- **Demographic transition:** Labor force has doubled in the past 20 years and is projected to rise to 82 million by 2030, from 33 million in 2005.
- **Poor housing quality:** Even lower than in neighboring countries.
 - An estimated 70–80 percent of the urban population lives in what might be considered slums, according to a commonly accepted international definition, because the units lack durability, adequate space, access to safe water and sanitation, or security of tenure.

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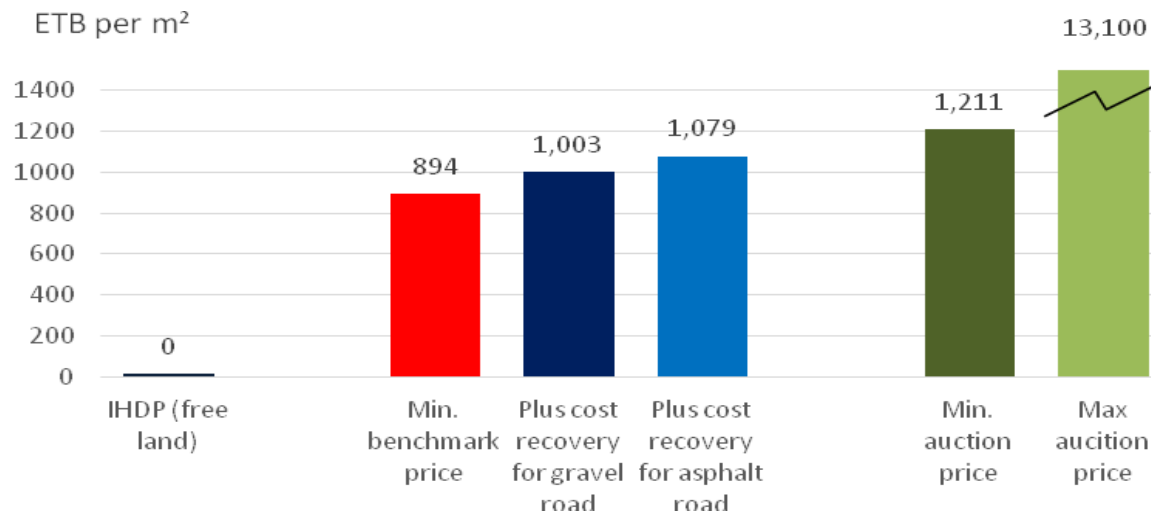
- Ethiopia's Housing Need:
- New urban household formation, by region and by year



Housing need will be more pounced in Oromia and Amhara regions. Addis Ababa will only account to 5% of the house need (2037)

Source: World Bank (2015)

- The financial burden of providing basic services to land plots is enormous:

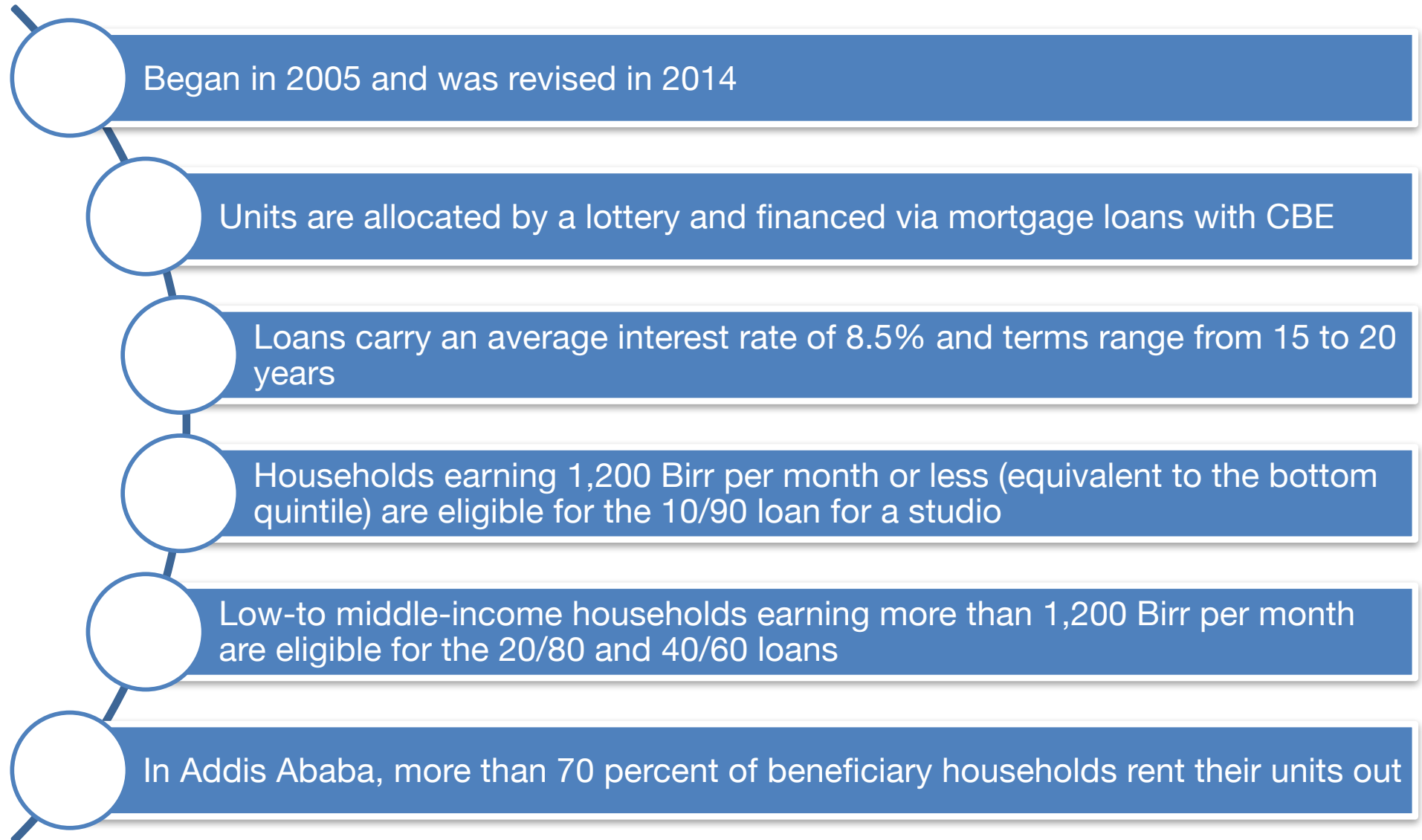


Benchmark prices for residential land in Addis Ababa (red) are less than cost recovery for even the most basic infrastructure (blue)

Source: World Bank (2015)

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Integrated Housing Development Program (IHDP)

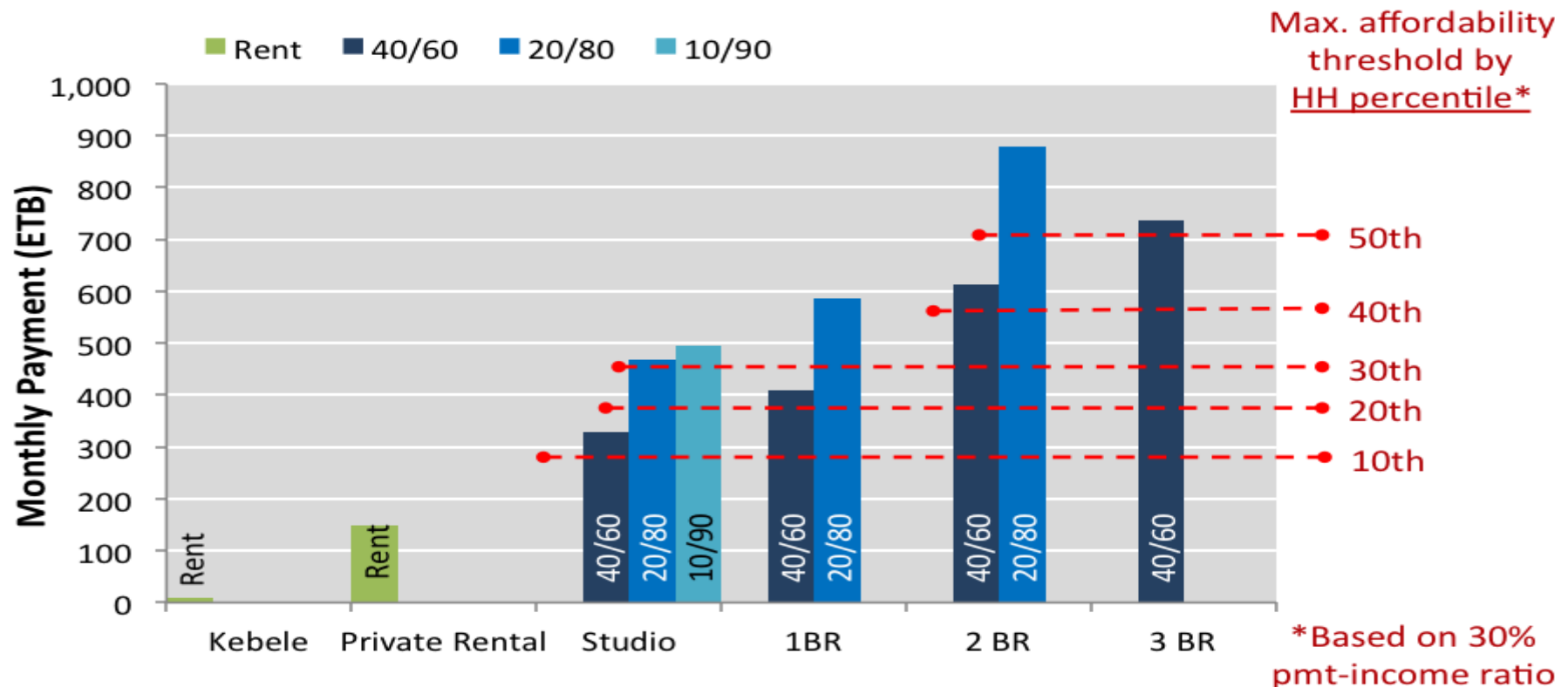


Introduction to Construction Industry

Integrated Housing Development Program (IHDP)

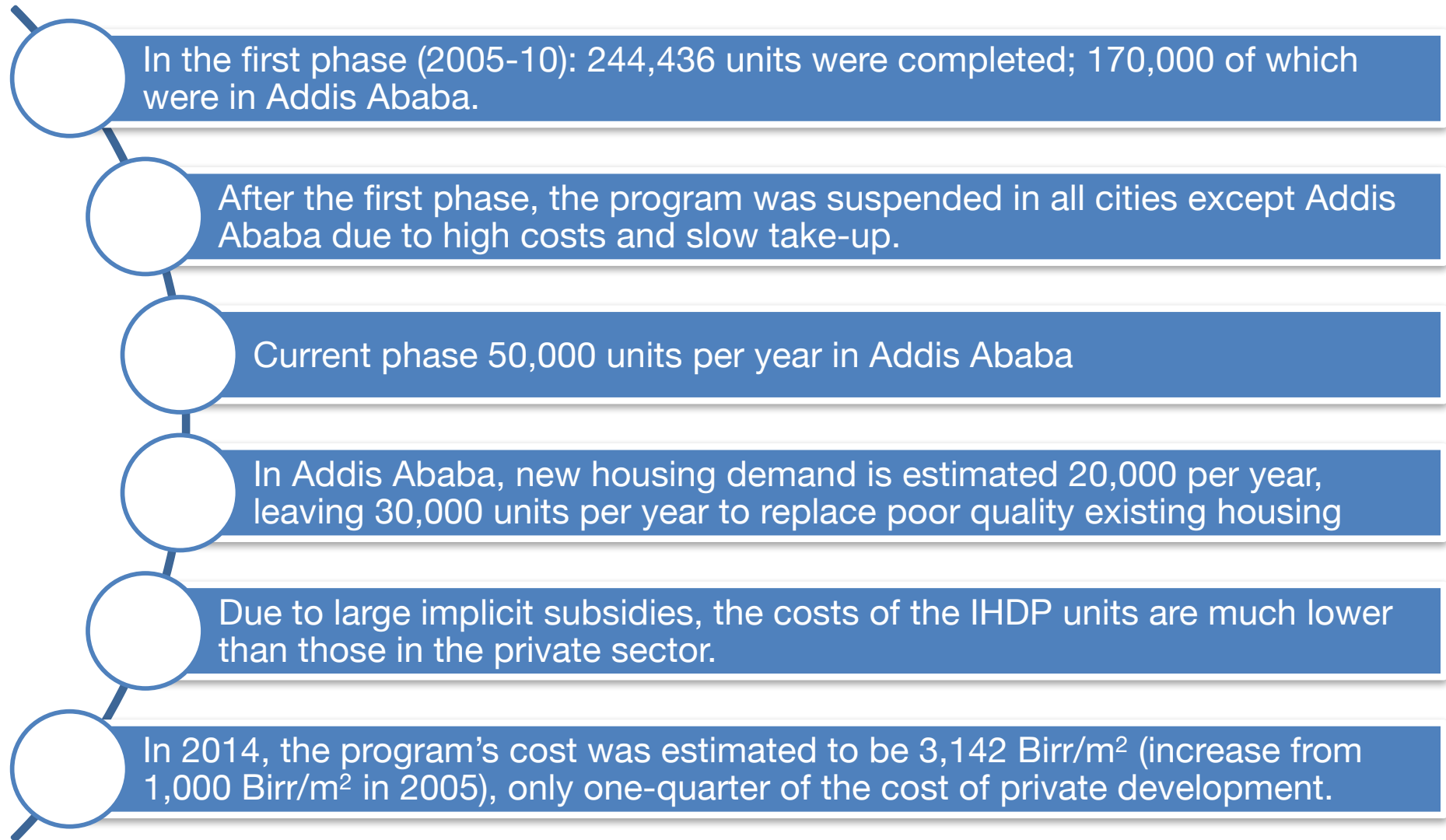
- Sale prices are based only on direct costs of construction (labor and materials), and do not include land (or its opportunity cost), infrastructure connections, and other costs including financing.

Monthly payment of IHDP units and loan programs



Introduction to Construction Industry

Integrated Housing Development Program (IHDP)



Introduction to Construction Industry

- Ethiopia's Infrastructure: Future Needs
- Addressing Ethiopia's infrastructure deficit will require a sustained annual expenditure of \$5.1 billion over the next decade.
- An option will be to improve efficiency through better execution of construction projects.

Potential gains from greater efficiency

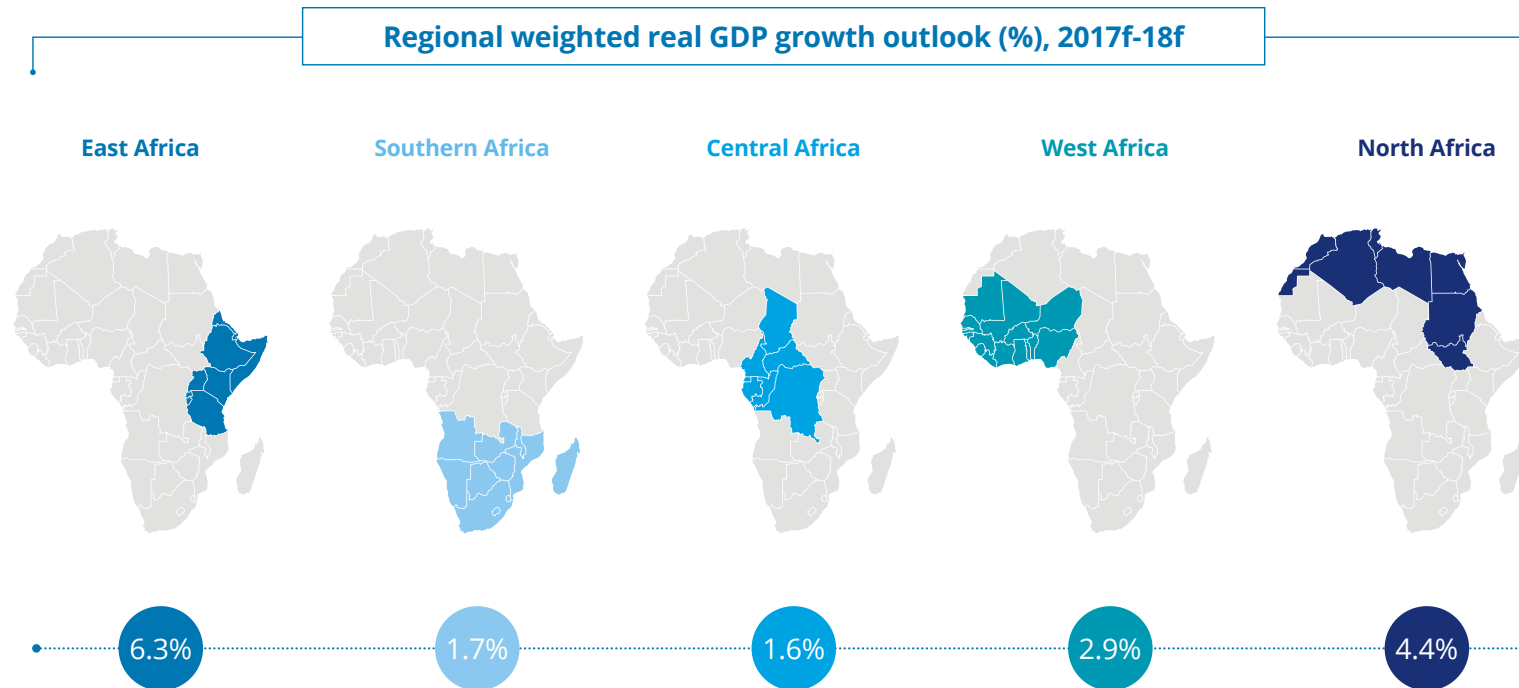
US\$ million per year

	ICT	Power	Transport	Water	Irrigation	Total
Underrecovery of costs	--	42	37	23	--	102
Overstaffing	9	--	--	--	--	9
Distribution losses	--	24	--	9	--	33
Under collection	--	15	28	1	--	44
Under maintenance	0	0	263	0	0	263
Total	9	40	290	9	0	451

Source: Briceno-Garmendia and others (2008)

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- Ethiopia's Economic Future:

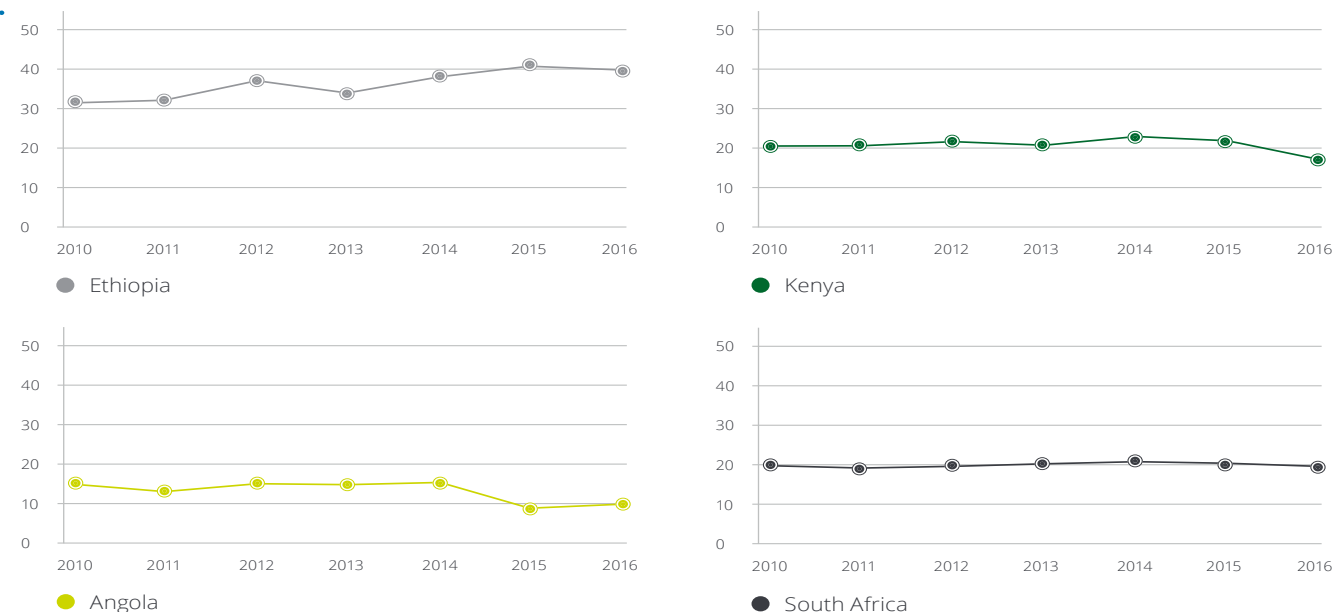


Source: Deloitte analysis based on IMF(2017)

Introduction to Construction Industry

- Gross Fixed Capital Formation (GFCF) as a percentage of GDP, which includes land improvements and the construction of infrastructure by both private and public sector, is indicative of infrastructure spend of countries.
- Economies that are investing approximately 30% GDP into GFCF are able to create an environment conducive to growth.

GFCF of key countries for regions (GFCF as % of GDP), 2010-16

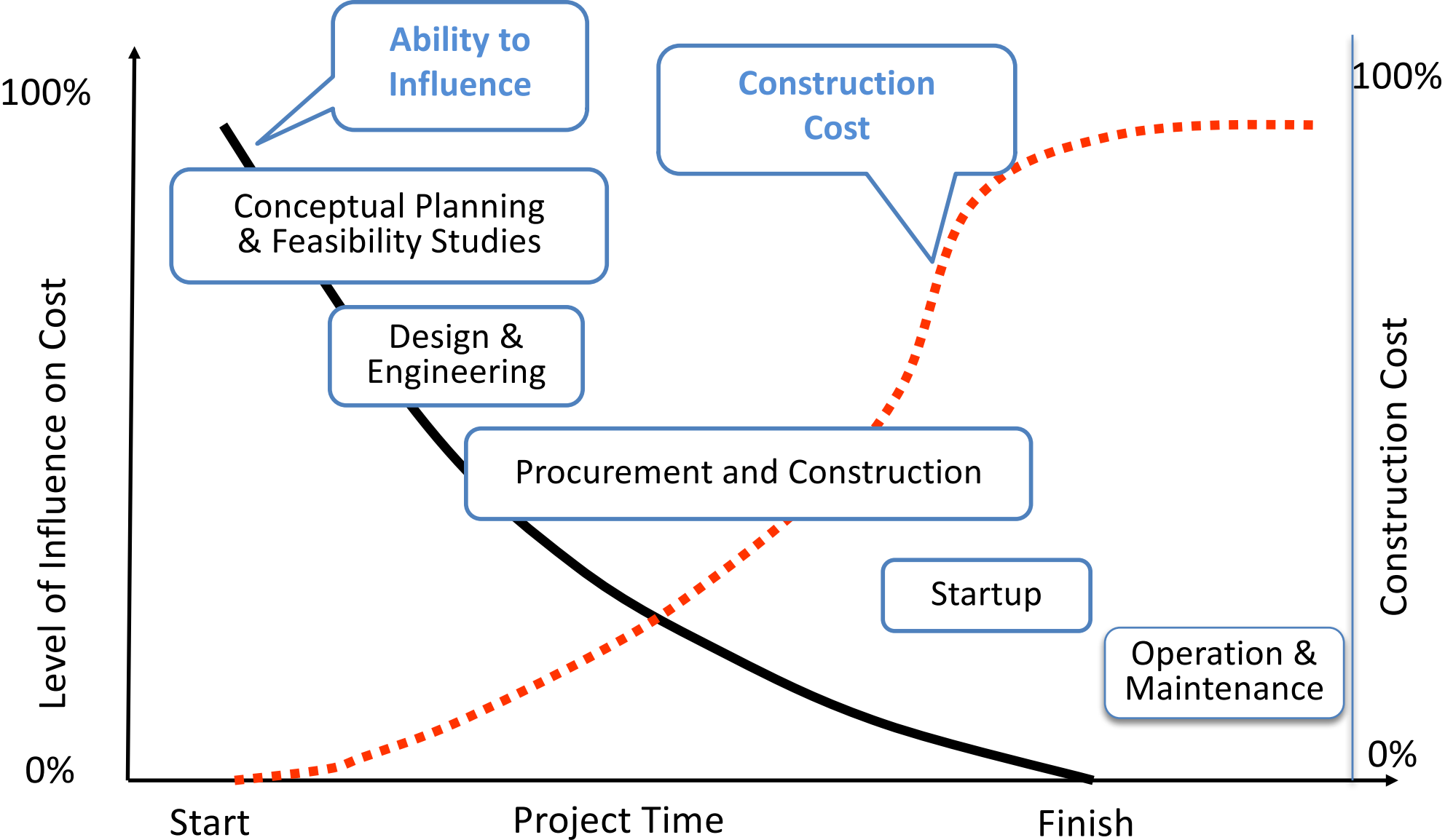


Source: World Bank (2017)

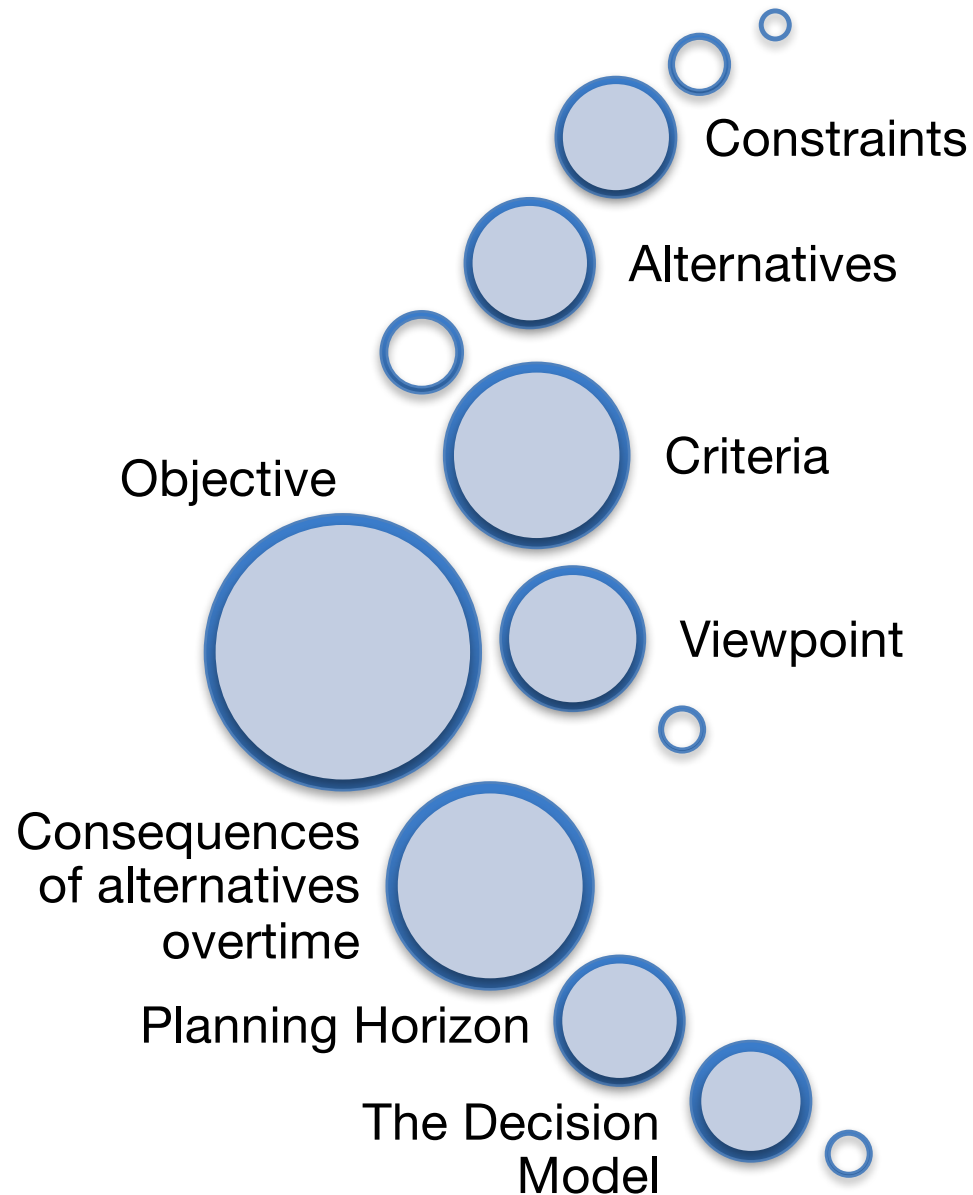
Why Construction Economics?

- Economists, engineering managers, project managers, and indeed any person involved in decision making must be able to analyze the financial outcome of his or her decision.
- The decision is based on analyzing and evaluating the activities involved in producing the outcome of the project.
- These activities have either a cost or a benefit.
- Economic/Financial analysis gives us the tools to perform this evaluation.
- Often the decision to make is to proceed or not to proceed with a project, and there could be many more courses of action (alternatives).

Project Life Cycle



Process of Decision Making



Course Introduction

- Course Objectives:
 - Develop ability to prepare detailed project business plan
- Text book:
 - Economic and Financial Analysis for Engineering and Project Management, Abol Ardala, Technomic, 2000.
 - Construction Financial Management, Tang, bookboon, 2014.
- Grading:
 - Distribution
 - Examination
- Course Outline:
 - Time value of money
 - Understanding financial statements
 - Investment appraisal methods
 - Depreciation, Tax, and Inflation

Assignment 1

Assignment 1:

- Define and explain in detail the multiplier effect of the construction industry
- Identify three countries from from developed, BRIC, and developing context respectively, and compare and contrast the level of gross fixed capital formation and multiplier effect of the construction industry.
- Prepare and submit a maximum five-page summary report which:
 - Is prepared using ASCE Construction Research Congress conference paper template.
 - Due date: April 23, 2019 before 2 P.M.
 - Submit the hardcopy submission to the Instructor at the beginning of class and also email the softcopy to: abraham.assefa@aait.edu.et

Assignment 1: Marking Rubric

Rank Category	Excellent (A+; A; A-) (80 - 100)	Very Good (B+; B; B-) (60 - 80)	Satisfactory (C+; C; C-) (40 - 60)	Marginal (D+; D) (20 - 40)	Unacceptable (F) (0 - 20)
Title page: As per ASCE CRC Format	Title, Name of students, Instructor's Name, Course Name, Semester, Date, Neatly finished-no errors	Evidence of 5	Evidence of 4	Evidence of 3 or less	Absent
Problem statement	Clearly and concisely states the paper's select delivery method	Clearly and states the paper's select delivery method	States the paper's select delivery method	Incomplete and unfocused	Absent or no evidence
Introduction	The introduction is engaging, states the main topic and previews the structure of the paper	The introduction states the main topic and previews the structure of the paper	The introduction states the main topic but does not adequately previews the structure of the paper	There is no clear introduction or main topic and the structure of the paper is missing	Absent or no evidence
Body	Each paragraph has thoughtful supporting detail sentences that develop the main idea	Each paragraph has sufficient supporting detail sentences that develop the main idea	Each paragraph lacks supporting detail sentences	Each paragraph fails to develop the main idea	Not applicable
Details on submission requirements:	The paper clearly demonstrates each of the submission requirements and subtle sequencing of the requirements through well-developed paragraphs; transitions are used to enhance organization	The paper demonstrates each of the submission requirements and some sequencing of the requirements through well-developed paragraphs; transitions are used to enhance organization	The paper presents each of the submission requirements and the requirements through well-developed paragraphs; transitions are not used to enhance organization	The paper presents each of the submission requirements without any logic and no sequencing of the requirements through well-developed paragraphs; transitions are not used to enhance organization	Not applicable
Conclusion	The conclusion is engaging and clearly explains the studied delivery method	The conclusion is clearly explains the studied delivery method	The conclusion does not clearly explain the studied delivery method	Incomplete and unfocused	Not applicable
Write up	No errors in punctuation, capitalization and spelling. No errors in sentence structure and word usage.	Almost no errors in punctuation, capitalization and spelling. Almost no errors in sentence structure and word usage	Many errors in punctuation, capitalization and spelling. Many errors in sentence structure and word usage	Numerous and distracting errors in punctuation, capitalization and spelling. Numerous and distracting errors in sentence structure and word usage	Not applicable
Citation : As per ASCE Format	All cited works, both text and visual, are done in the correct format with no errors	Some cited works, both text and visual, are done in the correct format with no errors	Few cited works, both text and visual, are done in the correct format with no errors	Absent	Not applicable
Bibliography	Done in the correct format with no errors. Includes more than 5 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with few errors. Includes 5 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with many errors. Includes 4 major references (e.g. construction journal articles, books, but no more than two internet sites)	Done in the correct format with many errors. Includes 3 major references (e.g. construction journal articles, books, but no more than two internet sites)	Absent or the only sites are internet sites

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