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The Rebirth: Tunisia's potential development pathways to 2040

Annex

Jakkie Cilliers and Stellah Kwasi

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Annex

For this report, we used a Project Data file to replace certain data in IFs with either more recent data or data from an alternative source, for example, the National Statistics Bureau. Some of the following series may not have been updated in IFs from international sources. We were able to get recent data for certain series from the Multiple Indicator Cluster Survey (MICS) of 2018 conducted by the United Nations Children's Fund (UNICEF) and Institut national de la statistique (INS) in Tunisia.

Chart A1: Project data file

Series	Alternative source/reasoning
EdPriCompletionFemale%/Male%/Total	Survey from UNICEF's MICS survey data
EdSecAdultGrads15Female%/Male%/Total%	Survey from UNICEF's MICS survey data
EdSecLowerGradRateAllFem/Mal/Tot	Survey from UNICEF's MICS survey data
IncBelow1D90c%WDI	WDI latest data update
InfMortRateIHME	Survey from UNICEF's MICS survey data
LandCrop	Tunisia Institute of Statistics (INS)
LandIRArea	Tunisia Institute of Statistics (INS)
PolityDemoc	Center for Systemic Peace data
PovertyGap$1c90perday	WDI latest data update
WSSJMPSanitationTotal%Improved	Survey from UNICEF's MICS survey data
WSSJMPWaterTotal%Improved	Survey from UNICEF's MICS survey data

Chart A2: Current Path adjustments

Series	Adjustment in IFs	Reasoning/justification
gdpadjsw	Set to 1.	Turns on the exogenous specification for GDP.
gdprext, GDP growth rate, exogenous target (%)	Set to 1.5 in 2019, before returning to -100 (which returns it to the IFs forecast) in 2020.	IFs imposes the IMF's five-year GDP growth projections exogenously. The forecast was too aggressive. We overrode 2019 data with IMF's latest projection, which is more reasonable.

Annex B: Scenarios

All interventions start in 2020 unless otherwise specified.

Chart B1: Common interventions to all three scenarios

Parameter	Definition	Adjustment in IFs	Magnitude of change (CP and intervention)	Reasoning/Benchmark
Econfreem (economic freedom multiplier)	Improve economic freedom	Interpolate to 1.2 by 2025 and hold to 2040	2025-from 6.3 to 7.6 2030-from 6.4 to 7.7 2040-from 6.4 to 7.8	Improves freedom on the Fraser Index by roughly 21% between 2020 and 2025. Zambia improved economic freedom by 53.5% between 1990 and 1995 and has sustained that growth for over 15 years.
Govcorruptm (government corruption multiplier)	Reduce government corruption	Interpolate to 1.3 by 2025 and hold to 2040	2025-from 3.8 to 5.2 2030-from 3.9 to 5.3 2040-from 4.1 to 5.7	Reduces corruption by nearly 37% between 2020 and 2025. Nigeria improved its corruption perception index by 58.3% between 2000

				and 2005. It has sustained improvements for over 6 years.
Govregbusindm (business regulation index multiplier)	Improve business regulation index	Interpolate to 0.85 by 2025 and hold to 2040	2025-from 2.2 to 2.3 2030-from 2.3 to 2.4 2040-from 2.4 to 2.5	Improves regulatory quality by almost 5% in 2025. Côte d'Ivoire reduced its regulatory index by 51.4% between 1997 and 2002.
Govhhtrnwelm-skilled (government to skilled household welfare transfers)	Reduce the rate of transfers to skilled (middle and upper class)	Interpolate to 0.2 by 2040	2025-from 10.7% to 9.9% of GDP 2030-from 10.6% to 9.1% of GDP 2040-from 10.7% to 7.4% of GDP	Among lower middle-income countries in Africa, Tunisia currently has the second highest portion of GDP allocated to household transfers. The country also has very high government subsidies in fuel that mostly accrue to the middle- and upper-class segment of the population. Reduces welfare transfers by 3.7 percentage points between 2020 and 2040. Egypt is cutting fuel subsidies by 40.5% and electricity subsidies by 75% in the 2019/20 financial year.
Edqualpriallm (primary education quality, multiplier)	Improve the quality of primary education	Interpolate to 1.1 by 2030 and hold to 2040	2025-from 45.5 to 47.8 2030-from 45.9 to 50.7 2040-from 47.5 to 52.3	The quality of education is deteriorating in the country because of inadequate infrastructure, human resource and educational supplies.

				Improves the quality of primary education by 14% in 2030.
Edqualsecallm (secondary education quality, multiplier)	Improve the quality of secondary education	Interpolate to 1.1 by 2030 and hold to 2040	2030-from 45.9 to 50.7 2040-from 47.5 to 52.	The quality of education is deteriorating in the country because of a curriculum that is out of step with the labour market, language of instruction and inadequate and unevenly distributed infrastructure and educational supplies. Improves the quality of secondary education by 13% in 2030.

Going for Growth

Parameter	Definition	Adjustment in IFs	Magnitude of change (CP and intervention)	Reasoning/Benchmark
Goveffectm (governance effectiveness multiplier)	Improve government effectiveness	Interpolate to 1.3 by 2025 and hold to 2040	2025-from 2.5 to 3.3 2030-from 2.6 to 3.4 2040-from 2.7 to 3.7	Tunisia has a very bureaucratic system of government and service delivery. This intervention improves government effectiveness by about 32% between 2020 and 2025. Côte d'Ivoire improved government effectiveness by 49.8% between 2010 and 2015.

Infraroadpavedpcntm (roads % paved, multiplier)	Increase the per cent of paved roads	Interpolate to 1.3 by 2040	2025-from 78.5% to 84.6% 2030-from 78.7% to 90.8% 2040-from 79.1% to 100%	Increases the per cent of paved roads to 100% by 2040, a 22 percentage point improvement from 2020 to bring it in line with global average.
Firmtaxrm (firm tax rate multiplier)	Reduce firm tax	Interpolate to 0.85 by 2025 and hold to 2040	2025-from 2.8b to 2.7b 2030-from 3.2b to 3.1b 2040-from 4.4b to 4.35b	Tunisia has a complicated tax system associated with ease of doing business in the country, and reducing taxes could attract FDI. This intervention initially reduces the amount of tax but it would attract investments and job creation. Between 2020 and 2025, this intervention increases firm tax by roughly US$300 million. Egypt collects more firm tax among lower middle-income countries than Tunisia.
Invm (investment in the economy multiplier)	Improve investment	Interpolate to 1.1 by 2025 and increase to 1.2 by 2040	2025-from 18.1% to 21.2% of GDP 2030-from 17.7% to 21.5% of GDP 2040-from 18.7% to 22.8% of GDP	Improves investments (1.6 percentage points of GDP) and gross capital formation by 8% in 2025, and improves government savings by more than 4 percentage points of GDP in 2040. The ratio of investments relative to GDP in Tunisia is lower than

				in countries like Djibouti, Comoros, Lesotho, Mauritania, Cape Verde, Cameroon, Senegal, Zambia and Morocco.
Xfdifinm (foreign direct investment, flow of investment from abroad, multiplier)	Improve FDI inflow	Interpolate to 1.3 by 2030 and hold to 2040	2025-from 3.3 to 4.6 2030-from 3.4 to 4 2040-from 3.6 to 3.9	FDI inflows into Tunisia have declined since the revolution. Improves FDI inflows as a per cent of GDP by over 3% in 2030. Zambia improved FDI inflows by 4.25 percentage points between 2005 and 2010.
Xfdioutm (foreign direct investment, flow of investment abroad, multiplier)	Reduce FDI outflow	Interpolate to 1.1 by 2025 and to 1.2 and hold to 2040	2025 2030 2040	Augments improvement in FDI inflows to allow existing businesses to stay and encourage domestic investment.
Xshift (export shift as a result of promotion of exports (manufactures))	Improves exports	Interpolate to 0.02 by 2030 and hold to 2040	2025-from 29.7b to 32.2b 2030-from 33.8b to 37.1b 2040-from 42.6b to 50.2b	Increases export earnings by about 48% from 2020 to 2030.
Edqualsecallm (secondary education quality, multiplier)	Improve quality of secondary education	Interpolate to 1.1 by 2030 and hold to 2040	2025-from 45.5 to 47.8 2030-from 45.9 to 50.7 2040-from 47.5 to 52.3	Improves the quality of primary education by 13% between 2020 and 2030.
Protecm(protectionism in trade, multiplier	Reduces imports	Interpolate to 1.2 by 2030 and hold to	2025-from 29.7b to 30.6b	Encourages manufacturing by

on import prices (manufactures))		2040	2030-from 32.9b to 34b 2040-from 43.8b to 42.1b	restricting imports. Reduces spending on imports by over US$1.6 billion in 2040 (between CP and scenario).

Leapfrogging

Parameter	Definition	Adjustment in IFs	Magnitude of change (CP and intervention)	Reasoning/Benchmark
Randdexpm (RD (total) expenditure multiplier)	Increase spending on research and development (R&D)	Interpolate to 1.2 by 2030 and hold to 2040	2025 2030-from US$0.008 billion to US$0.009 billion 2040	Research and development is a key and strategic pillar to promoting science and innovation. Increases R&D spend by over 11% between 2020 and 2030.
Ictbroadm (ICT broadband multiplier)	Improve broadband rate	Interpolate to 1.2 by 2025 and hold to 2040	2025-from 13.2 to 16.1 2030-from 18.2 to 22.2 2040-from 31 to 37.7	Tunisia already has a relatively good ICT infrastructure. Creating greater access to the Internet will help to scale use of technology. Increases subscriptions per 100 people by nearly 138% from 2020 to 2025. Cape Verde increased fixed broadband per 100 subscriptions by 390% between 2007 and 2012.
Ictbroadmobilm (ICT mobile broadband multiplier)	Improve mobile broadband rate	Interpolate to 1.2 by 2025 and hold to 2040	2025-from 128.7 to 129.5	Allows greater Internet access on mobile phones.

			2030-from 147.4 to 148.2 2040-from 153.6 to 153.7	Increases subscriptions per 100 people by roughly 48% between 2020 and 2025. Ghana increased fixed broadband per 100 subscriptions by over 850% between 2010 and 2015. Tunisia has achieved even greater progress in that time horizon.
Ictintnetbwpum (Multiplier on Internet bandwidth per user)	Improve Internet bandwidth rate per user	Interpolate to 1.3 by 2025 and hold to 2040	No specific series for this intervention	
Ictindexm (Multiplier on ICT index)	Improve ICT pervasiveness	Interpolate to 1.2 by 2025 and hold to 2040	See above	Scales up the use of the Internet and technology to other productive sectors of the Tunisian economy.
Ictcybbenefitm (ICT cyber benefit multiplier)	Improve the benefit of ICT	Interpolate to 1.3 by 2025 and hold to 2040	See above	See above
Edsecupprvocadd (upper secondary vocational share additive factor)	Improve upper secondary vocational training	Interpolate to 3 by 2030 and hold to 2040	2025-from 2030-from 2040-from	To create important technical skills that are in short supply in the country.
Edterscieshradd (Tertiary science-engineering share of graduates, additive factor)	Improve the rate of graduates in science and engineering subjects	Interpolate to 3 by 2025 and hold to 2040	2025-from 26.2 to 29.4 2030-from 25.9 to 29.2 2040-from 25.7 to 28.8	Improves the share of learners proceeding on to study science and technical studies like engineering by 8.5% from 2020 to 2025.

Sustainability & Equality

Parameter	Definition	Adjustment in IFs	Magnitude of change (CP and intervention)	Reasoning/Benchmark
Goveffectm (governance effectiveness multiplier)	Improve government effectiveness	Interpolate to 1.2 by 2025 and hold to 2040	2025-from 2.5 to 3.1 2030-from 2.6 to 3.2 2040-from 2.7 to 3.4	Increases government effectiveness by 24% in 2025.
Govhhtrnwelm-unskilled (government to unskilled household welfare transfers)	Increase transfers to unskilled (poor and vulnerable)	Interpolate to 1.1 by 2030 and hold to 2040	2025-from 10.7% to 11.1% of GDP 2030-from 10.6% to 11.3% of GDP 2040-from 10.7% to 11.2% of GDP	Reduces welfare transfers by 3.7 percentage points between 2020 and 2040.
Qem-Q (Capital costs-to- output ratio) in energy multiplier (OthRenew)	Reduce capital cost of renewable energy	Interpolate to 0.85 by 2030 and hold to 2040	2025-from 13.2 to 17.1 2030-from 25.2 to 41.6 2040-from 59.8 to 77.1	Because of high subsidies in energy and electricity prices, the cost of investing in renewables is still high in Tunisia. Increases renewable energy production as a per cent of total by over 36 percentage points between 2020 and 2030.
Carbtax (Carbon tax-dollars/ton)	Increase carbon tax	Interpolate to 400 by 2030 and hold to 2040	2025-from 0.0092 to 0.0096 2030-from 0.0095 to 0.0097 2040-from 0.0103 to 0.0104	Reduces carbon emissions by roughly 11.5% between 2020 and 2030.
Landirareaequipm (multiplier on land area equipped for irrigation)	Increase land area equipped for irrigation	Interpolate to 1.2 by 2025 and hold to 2040	2025-from 436.5 to 461.8 2030-from 436.4 to	Increases land area in hectares under

			473.4 2040-from 439.7 to 483.8	irrigation by 4.8% between 2020 and 2025.
Aglosstransm (loss rate of agriculture as moves from producer to consumer multiplier)	Reduce agricultural losses from producer to consumer	Interpolate to 0.8 by 2025 and hold to 2040	2025-from 21.2% to 20.9% 2030-from 20.9% to 20.6% 2040-from 19.3% to 18.9%	Tunisia has the most food wastage compared to OLMICs and other MENA countries. Reduces waste from production to consumption.
Aglossconsm (waste rate of agricultural consumption multiplier)	Reduce food waste at consumption level	Interpolate to 0.8 by 2025 and hold to 2040	See above	Tunisia wastes over US$100 million worth of food, the majority of which is bread (also Tunisia's staple).
Edsecupprtranm (upper secondary transition rate multiplier)	Improve transition rate to upper secondary	Interpolate to 1.2 by 2030 and hold to 2040	2025-from 99.8% to 100% 2030-from 99.9% to 100%	Increases upper secondary transition to 100% by 2030.
Edseclowrgram (lower secondary graduation rate multiplier)	Improve lower secondary graduation rate	Interpolate to 1.2 by 2030 and hold to 2040	2025-from 74.8% to 84.3% 2030-from 75.8% to 93.8% 2040-from 98.8% to 81%	Increases lower secondary graduation by over 19 percentage points (26%) between 2020 and 2030.
Edsecupprgram (upper secondary graduation rate multiplier)	Improve upper secondary graduation rate	Interpolate to 1.2 by 2030 and hold to 2040	2025-from 54.4% to 61.8% 2030-from 57.5% to 71.6% 2040-from 66.8% to 81.7%	Increases upper secondary graduation by over 20 percentage points (40%) between 2020 and 2030.
Edsterintm (tertiary	Improve tertiary	Interpolate to 1.3 by	2025-from 35.2% to	Improves tertiary

intake rate multiplier)	intake rate	2040	35.3% 2030-from 36.9% to 40.6% 2040-from 41.5% to 46.5%	enrolment by 5.3 percentage points (15%) between 2020 and 2030.
Wastewatertreatedm (Treated wastewater multiplier-Cubic Km)	Increase the rate of wastewater treated	Interpolate to 1.3 by 2040	2030-from 0.25 to 0.31 2040-from 0.28 to 0.39	Increases wastewater treated by roughly 39% in 2040.
Hlsmokingm (Smoking rate multiplier)	Reduce smoking rate	Interpolate to 0.8 by 2025 and hold to 2040	Many effects of smoking	Reduces smoking.
Hlobesitym (Obesity rate multiplier)	Reduce obesity rate	Interpolate to 0.8 by 2025 and hold to 2040	Reduces prevalence of non-communicable diseases	Reduces the prevalence of obesity.

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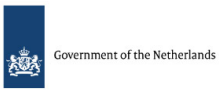

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About the authors

Dr Jakkie Cilliers is the ISS's founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees and head of the African Futures and Innovation (AFI) programme at the Pretoria oce of the ISS. His 2017 best-seller Fate of the Nation addresses South Africa's futures from political, economic and social perspectives. His three most recent books, Africa First! Igniting a Growth Revolution (March 2020), The Future of Africa: Challenges and Opportunities (April 2021), and Africa Tomorrow: Pathways to Prosperity (June 2022) take a rigorous look at the continent as a whole.

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