

30TH ANNUAL CONFERENCE

The Role of Technology in the Caribbean's Socio-Economic Transformation

December 4, 2020
12:00 PM EST

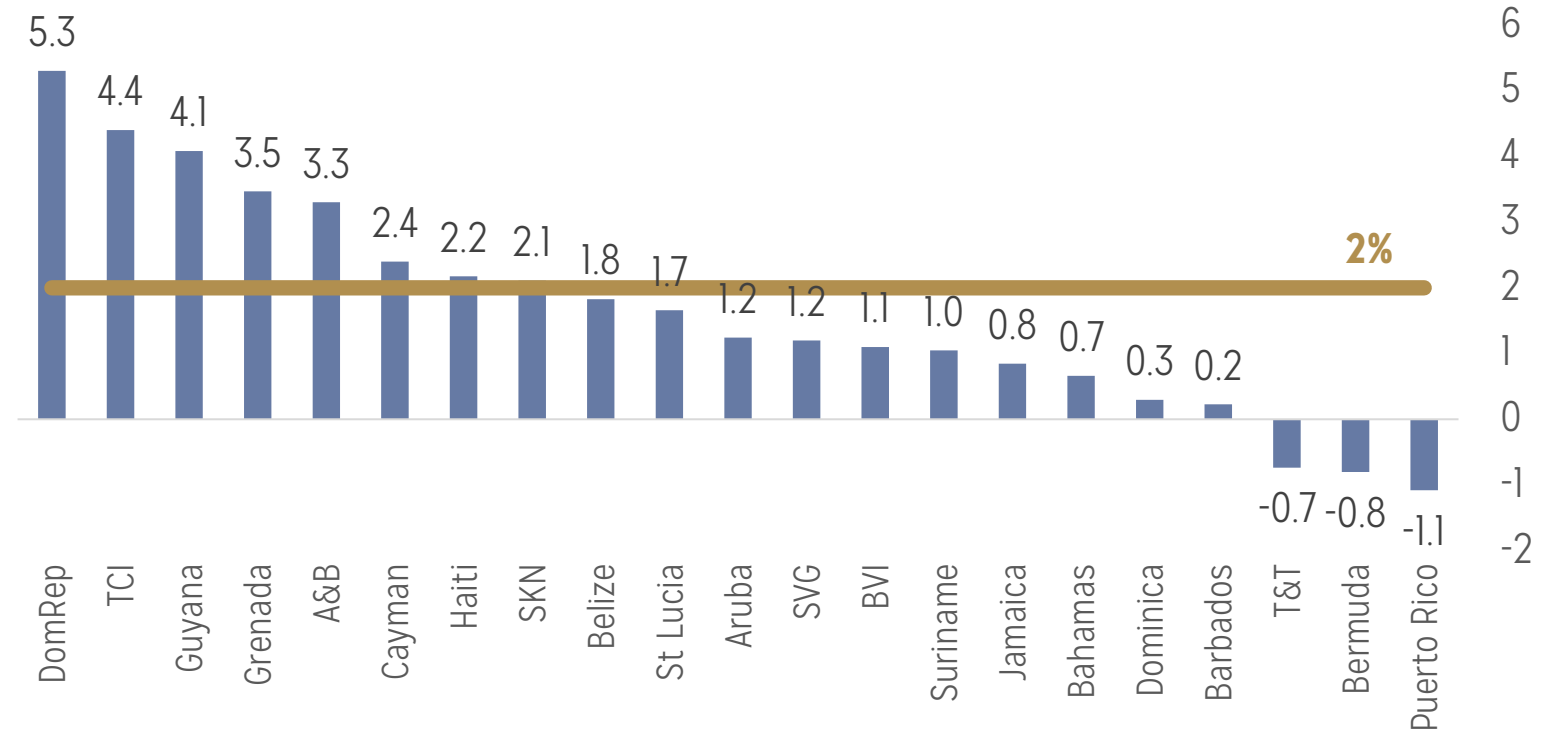


Most of our economies have averaged below 2% growth since the GFC. So this pandemic is not responsible for our economic malaise.



Average GDP Growth 2011-2019: Caribbean

GDP Growth %



Source: International Monetary Fund, various regional Central Banks and Governments, Marla Dukharan

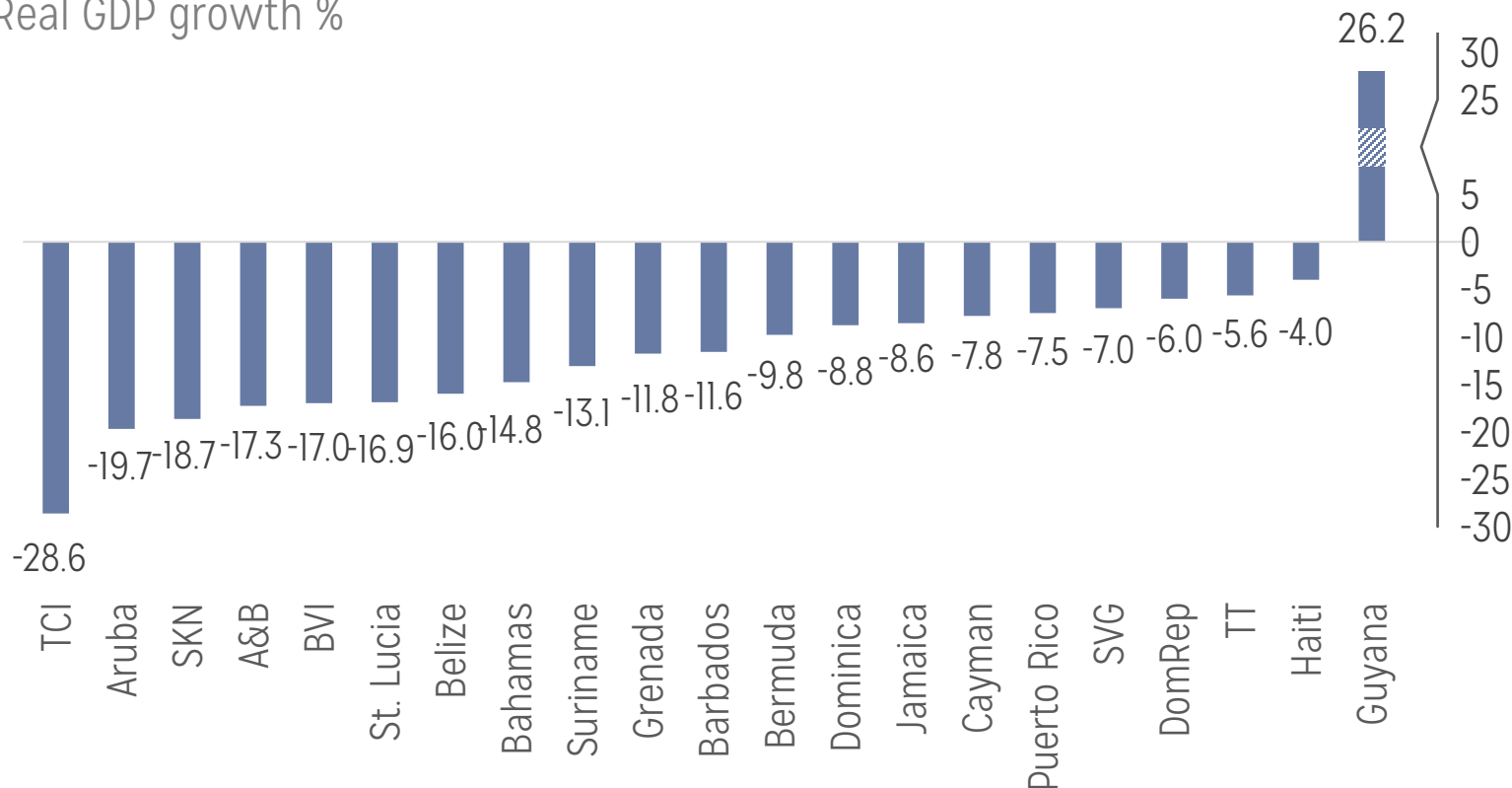


More than half of the region will experience double-digit contraction in 2020.



GDP Growth Projections for 2020: Caribbean

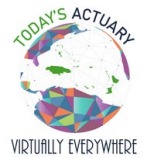
Real GDP growth %



Source: International Monetary Fund, AM Best, UNDP, various Governments and Finance Ministries, Marla Dukharan

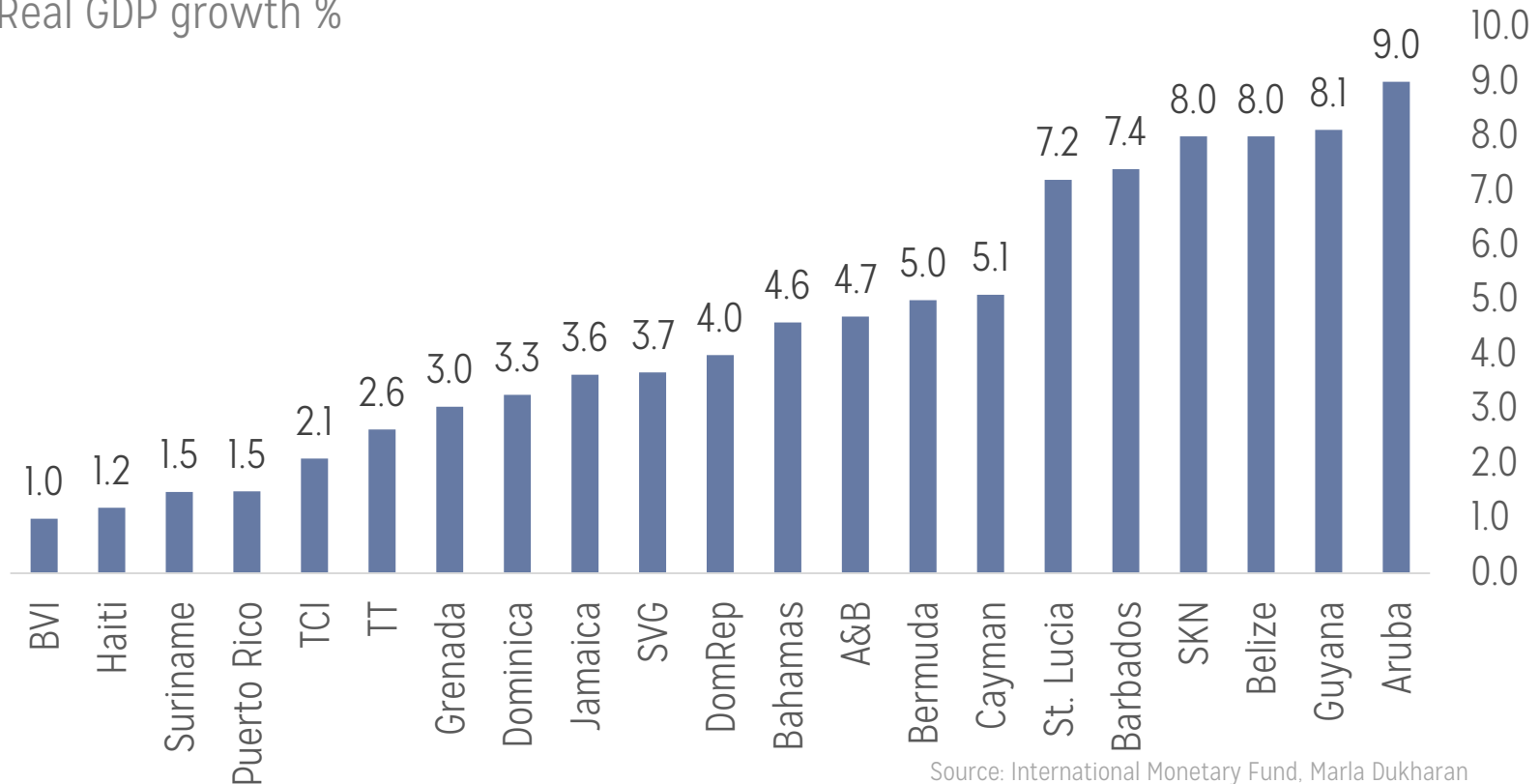


Although growth will return next year, on average, Caribbean economies will be 6.5% smaller in 2021 than in 2019, and will be structured differently.



GDP Growth Projections for 2021: Caribbean

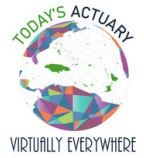
Real GDP growth %



Source: International Monetary Fund, Marla Dukharan

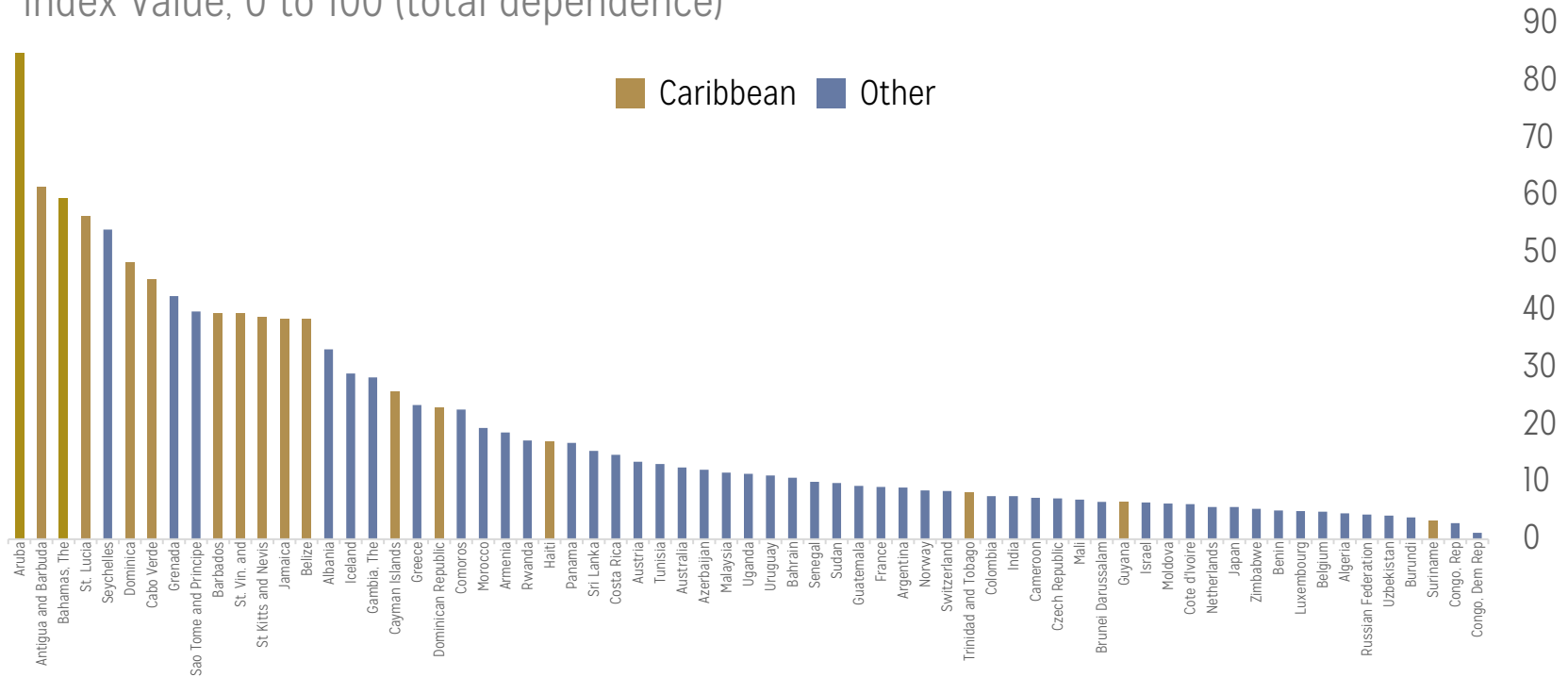
The Caribbean suffers
from chronic
PRE-EXISTING CONDITIONS
which are being amplified
by COVID-19

The Caribbean has the most tourism dependent economies in the world. Our jobs, economic activity and Gov't revenue are at the mercy of the discretionary spending from a few source markets.



Tourism Dependency Index: Caribbean

Index Value, 0 to 100 (total dependence)



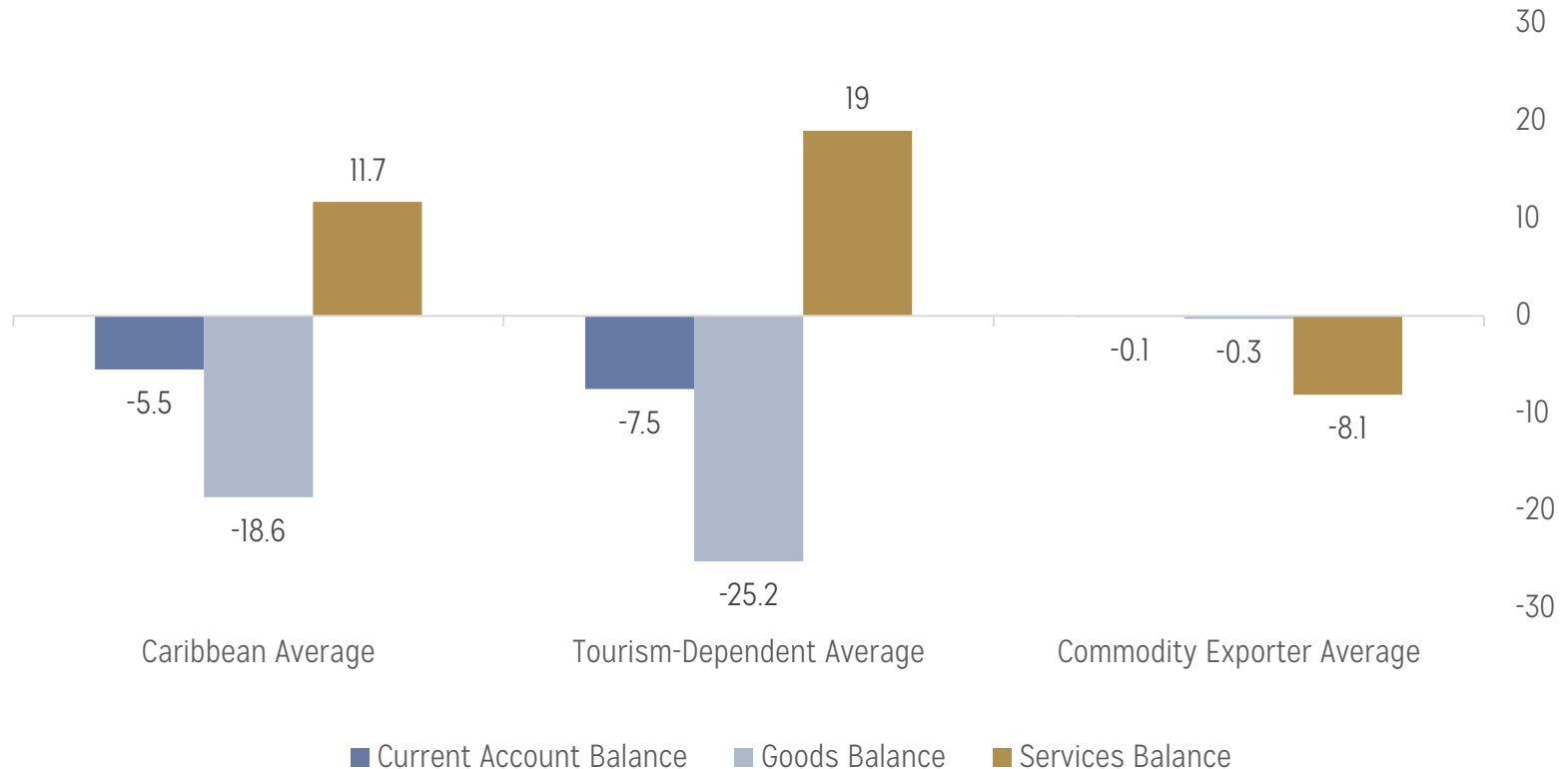
Source: IDB, Marla Dukharan

But tourism doesn't generate enough foreign currency to pay for what we import.



Current Account Deficits: Caribbean

Percent of GDP (%), 2017



Source: IMF WPIEA2019256, Marla Dukharan

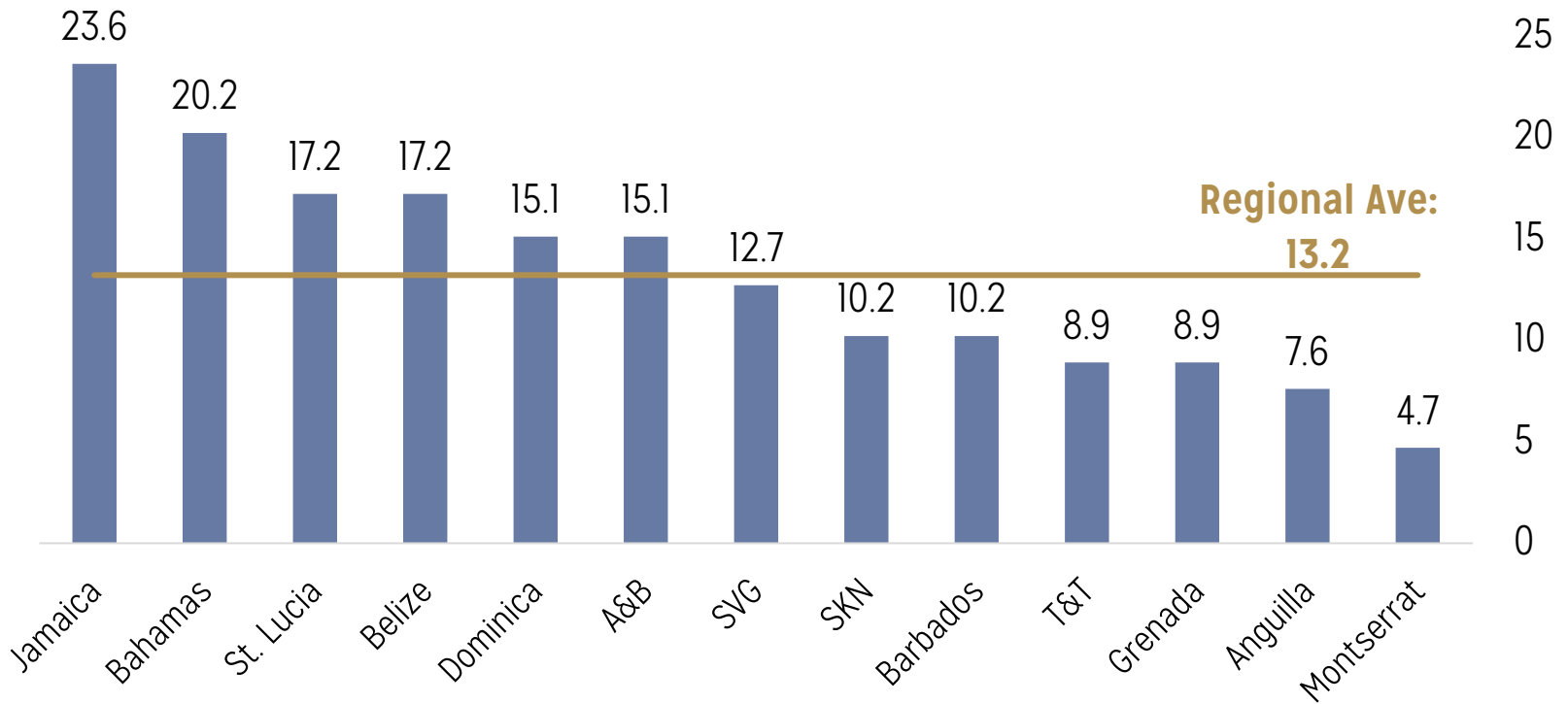


Hurricanes represent risks to livelihoods of our people, and the sustainability of our main export sector.



Probability of a Hurricane Striking on a Given Year

Percent (%)



Source: IMF, Marla Dukharan

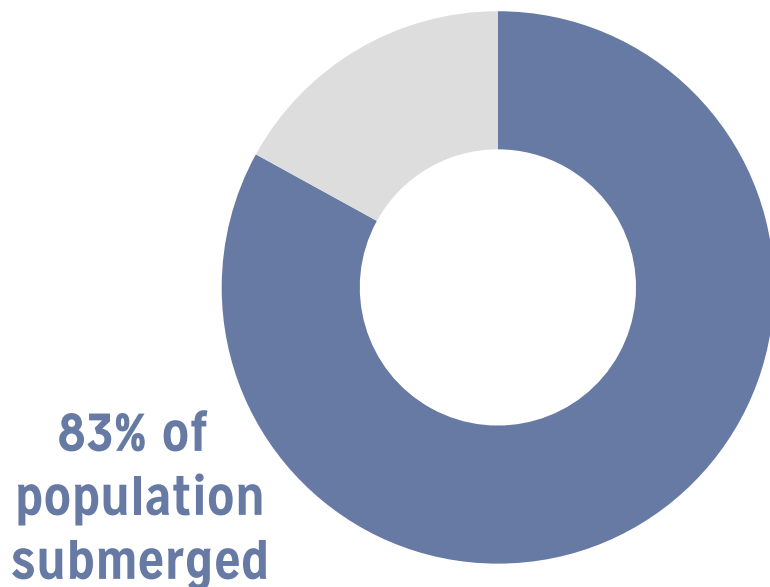


Rising temperatures pose another threat. Cayman and The Bahamas are among the most highly exposed sovereigns to the impacts of rising sea levels (Moody's).

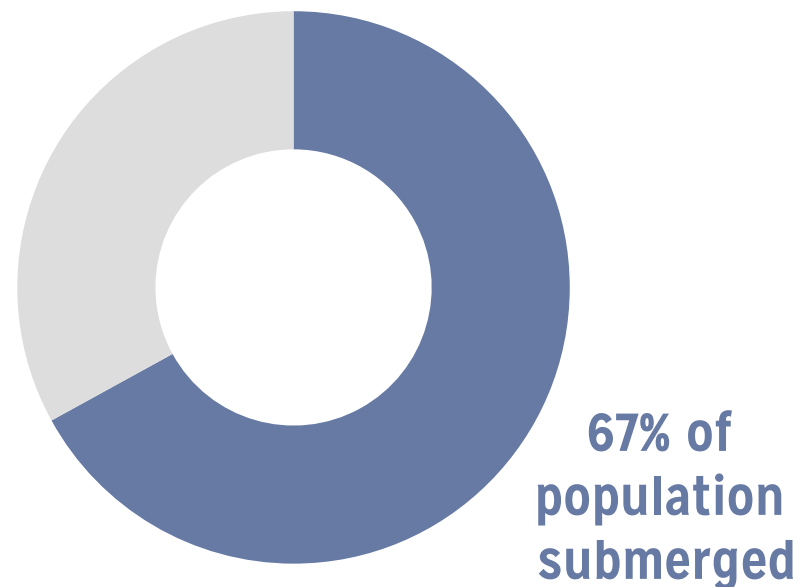


If temperatures were to rise by 3° C

Cayman Islands



The Bahamas

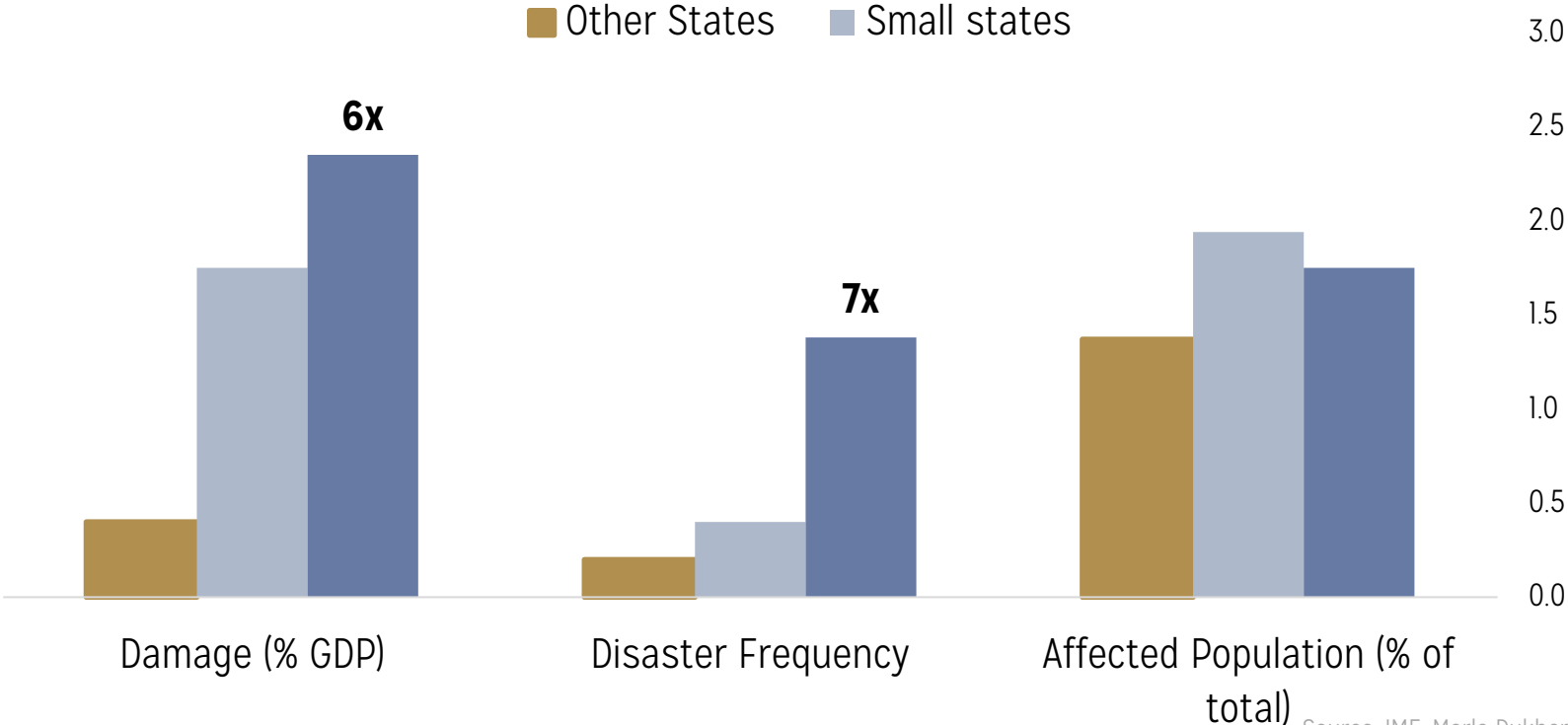


Our natural disasters are 7x more frequent and 6x more costly than in other parts of the world.



Economic Costs of Natural Disasters

Frequency and Effects of Natural Disasters



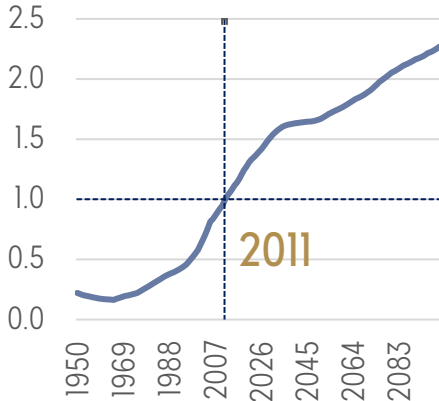
Source: IMF, Marla Dukharan



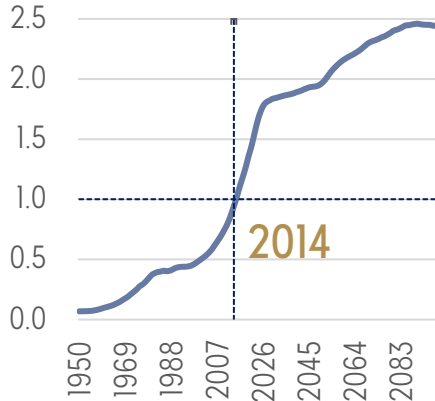
We face demographic challenges. Our populations are aging. The population over 60 has already surpassed the population under 15 in many Caribbean countries.



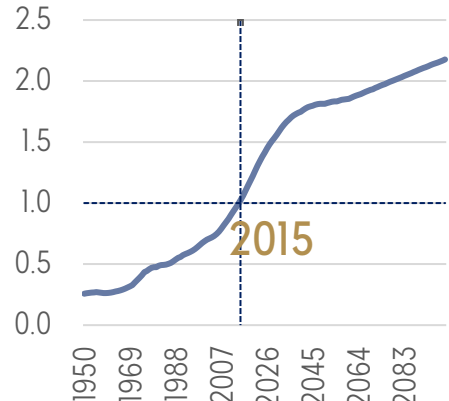
Curacao



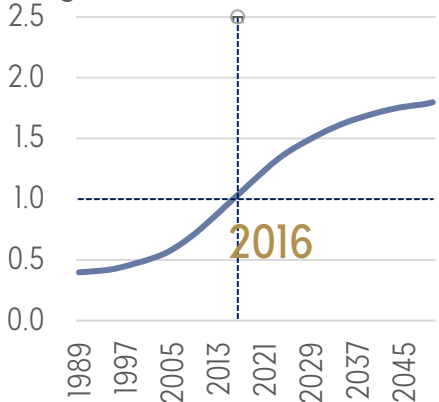
Aruba



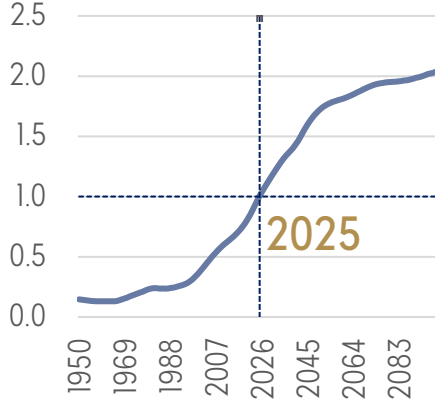
Barbados



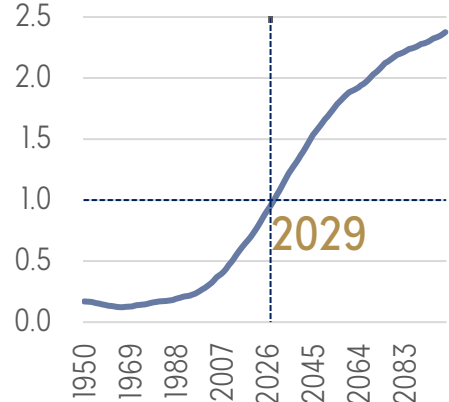
Cayman Islands



Trinidad



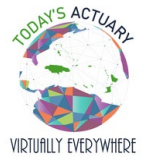
Bahamas



Source: World Population Prospects 2015, United Nations, New York, 2009

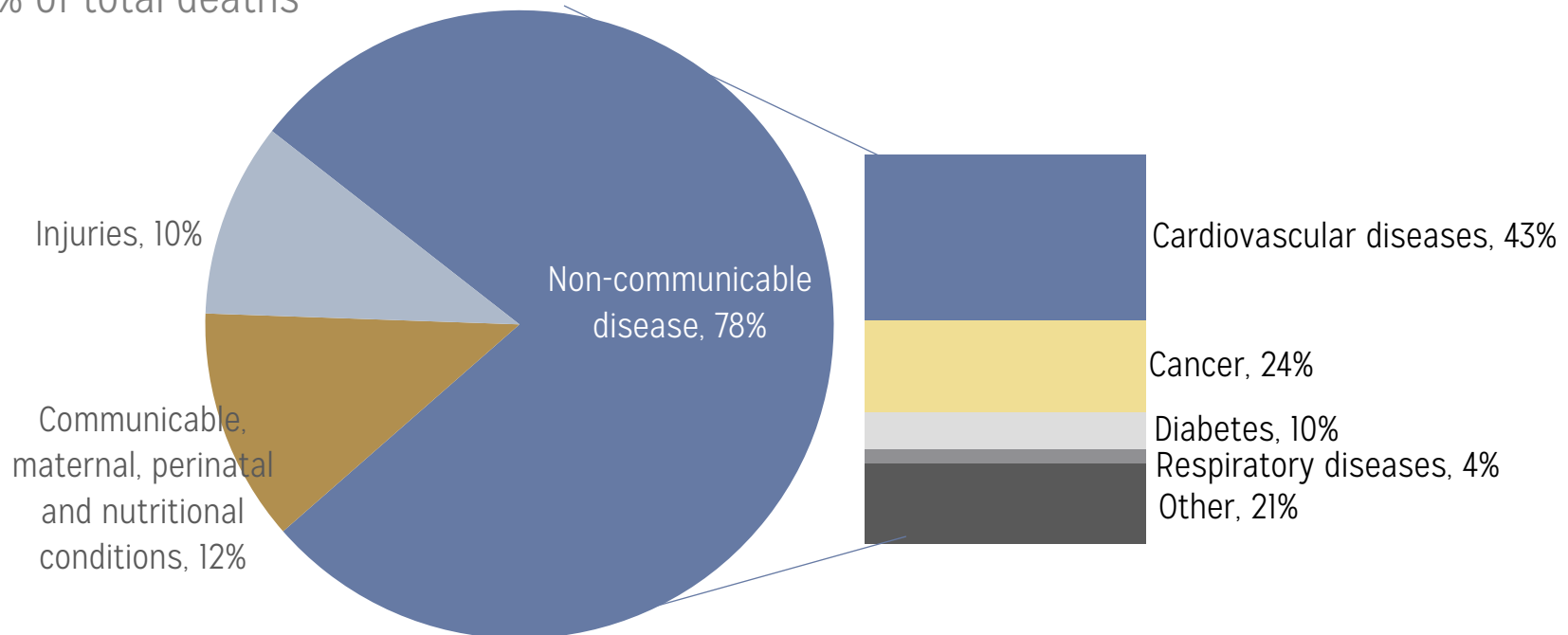


And our populations are not aging healthy. There is a high prevalence of non-communicable diseases, which currently account for 78% of deaths regionally - a significant burden on public finances.



Causes of Death: Caribbean

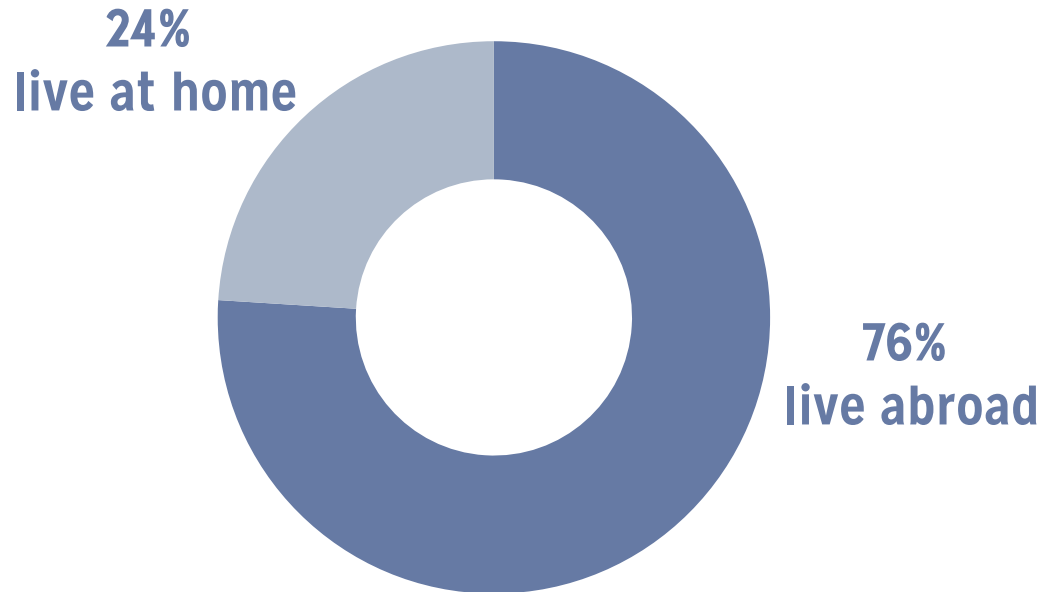
% of total deaths



“The share of nationals with tertiary education living abroad is 76%... 50% greater than for non-Caribbean small states.” - IMF



Caribbean nationals with tertiary education



Source: IMF, Marla Dukharan

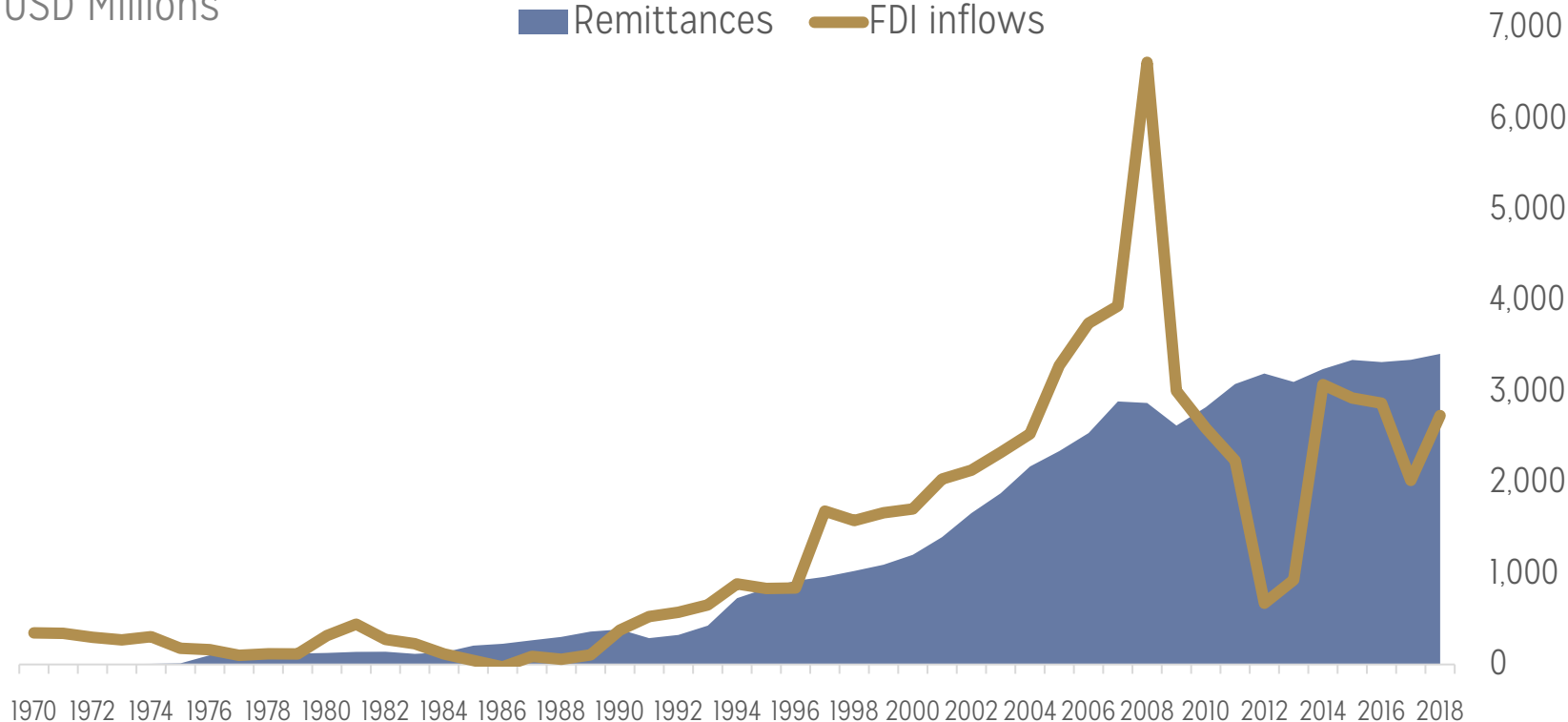
We are better at exporting talent than at attracting investment.



FDI and Remittances: Caribbean Small States

USD Millions

■ Remittances ■ FDI inflows



Source: World Bank, Marla Dukharan





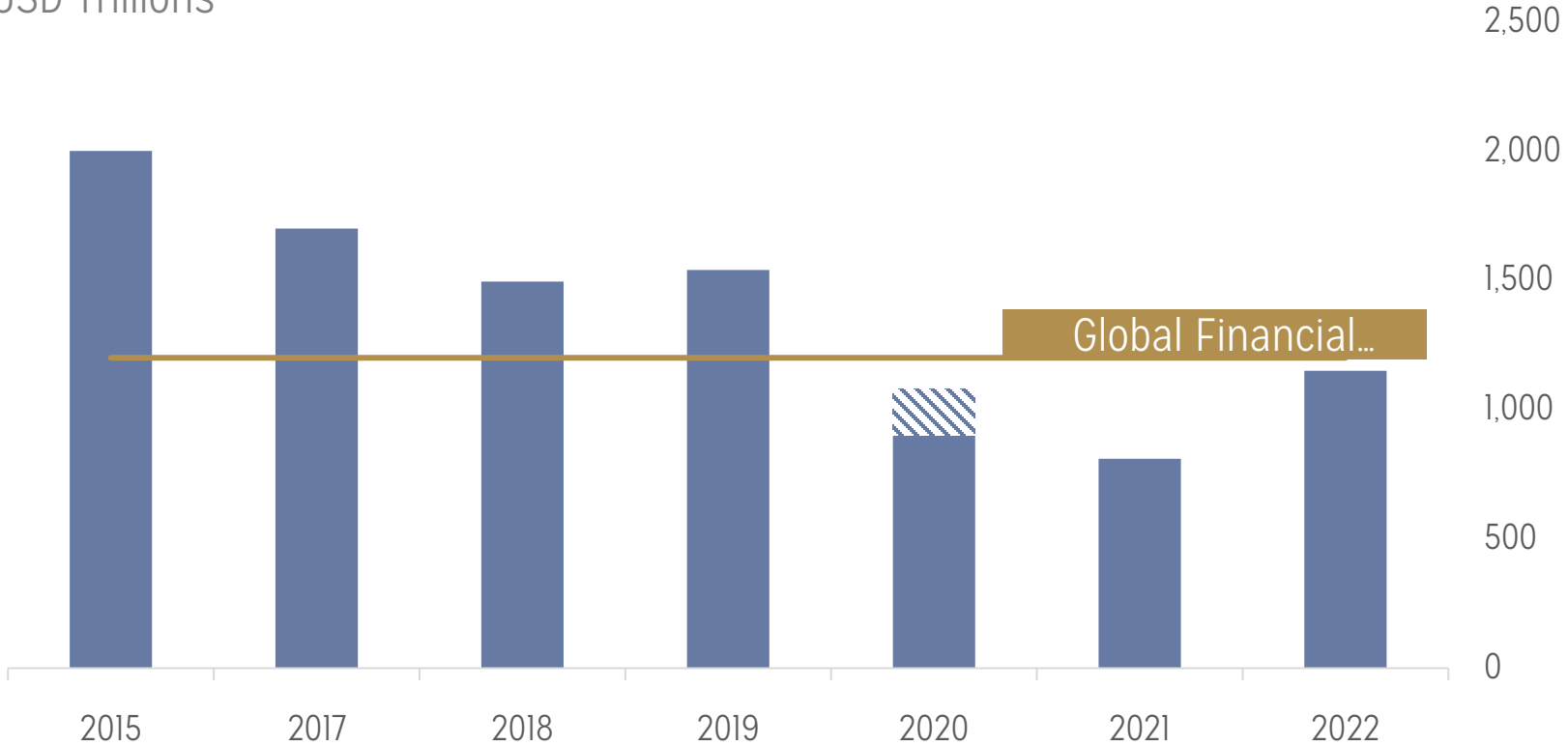
“The negative impact of emigration on real per capita growth seems to outweigh growth gains from remittances, notably for the Caribbean.”

- IMF

And investors have begun to pull back globally...

Global FDI Inflows

USD Trillions



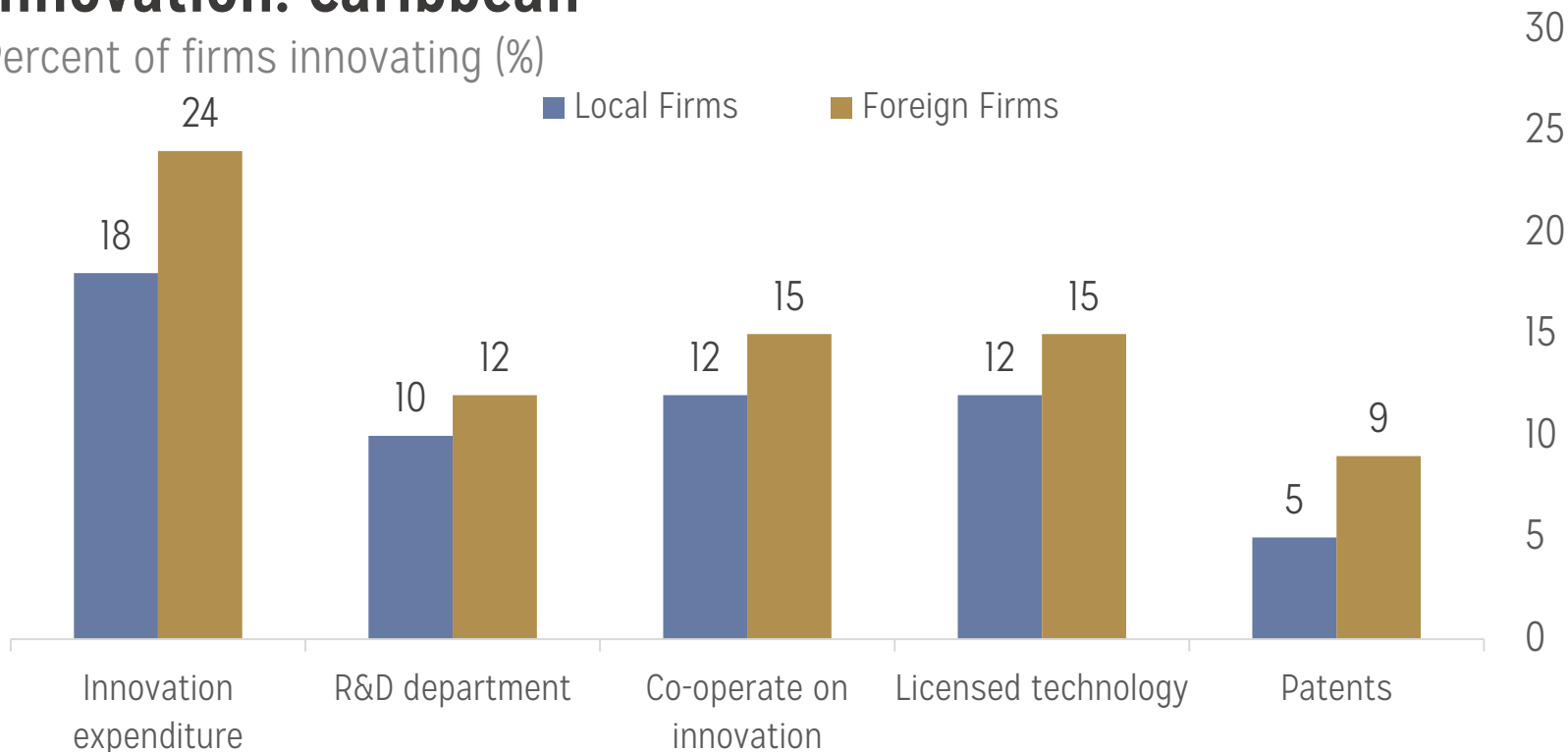
Source: UNCTAD World Investment Report, Marla Dukharan

But we rely on foreign investors to drive innovation...



Innovation: Caribbean

Percent of firms innovating (%)



Source: IDB, Foreign Direct Investment and Innovation and Productivity in the Caribbean, 2017, Marla Dukharan

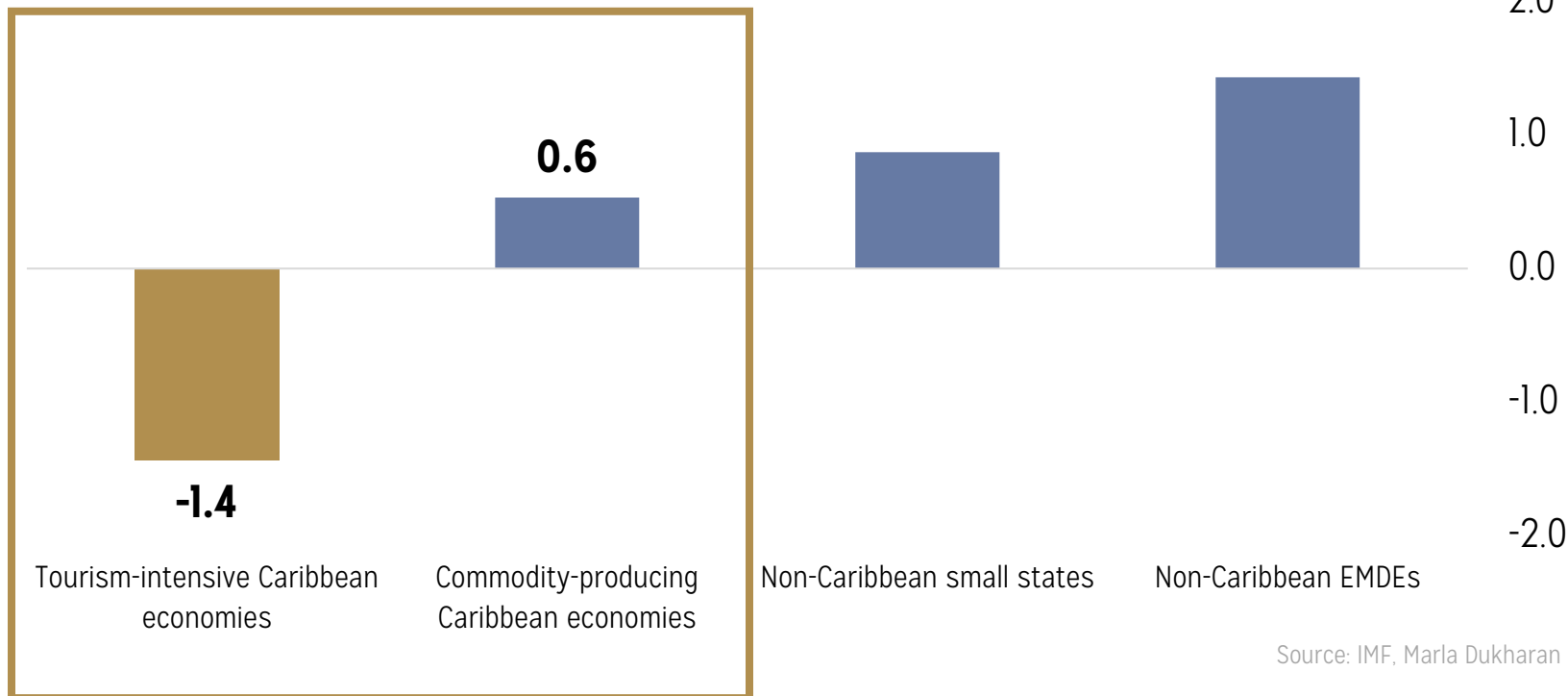


So we have been falling behind the world in terms of our use of technology and innovation to increase productivity.



Total Factor Productivity

Contributions to Average GDP Growth per capita 2000-2015



Source: IMF, Marla Dukharan

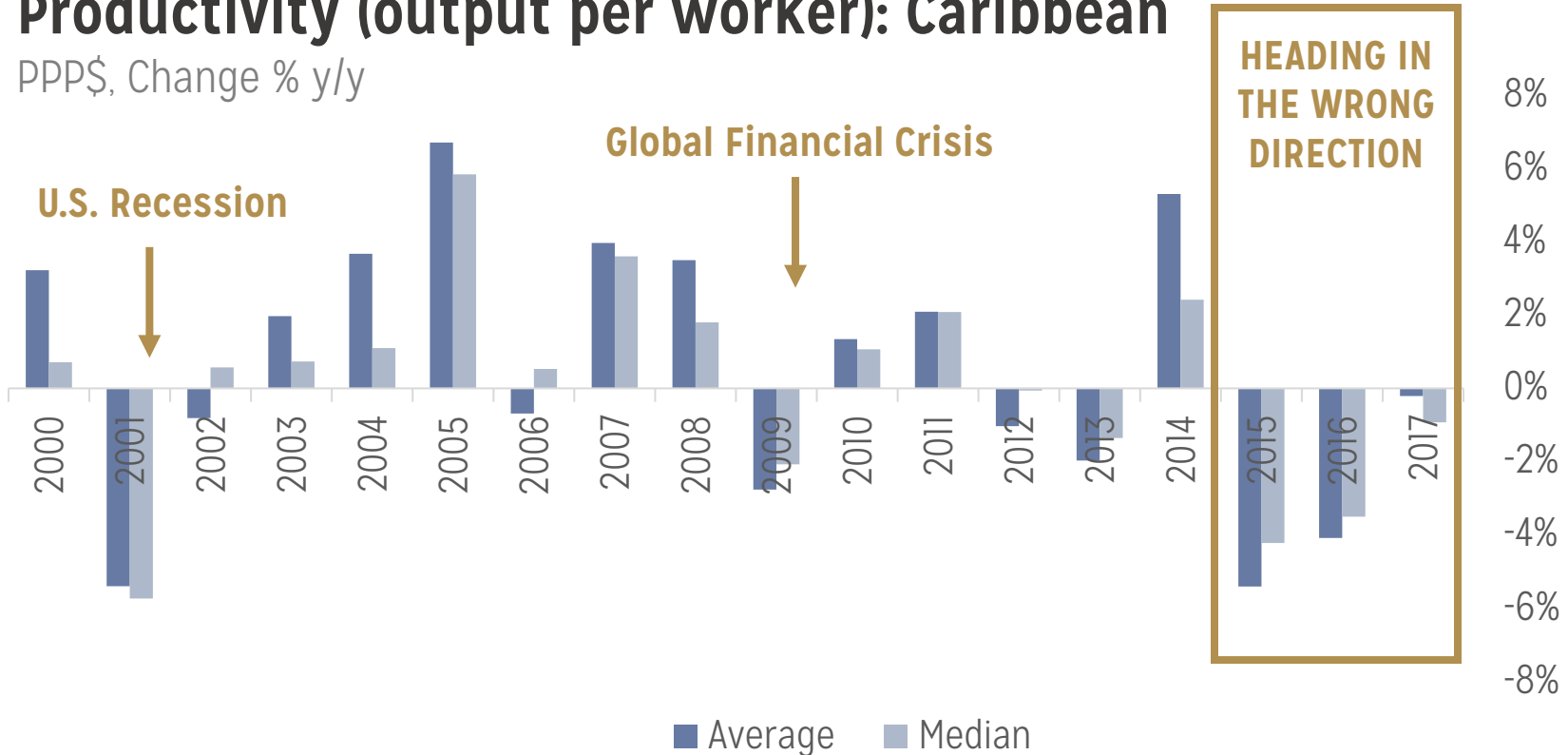
Only **19% of Caribbean firms** report
having invested in innovation in the
last 3 years (IDB)

Our pre-COVID economic models were already yielding subpar outcomes for us.



Productivity (output per worker): Caribbean

PPP\$, Change % y/y



Source: Penn World Table 9.1, Marla Dukharan

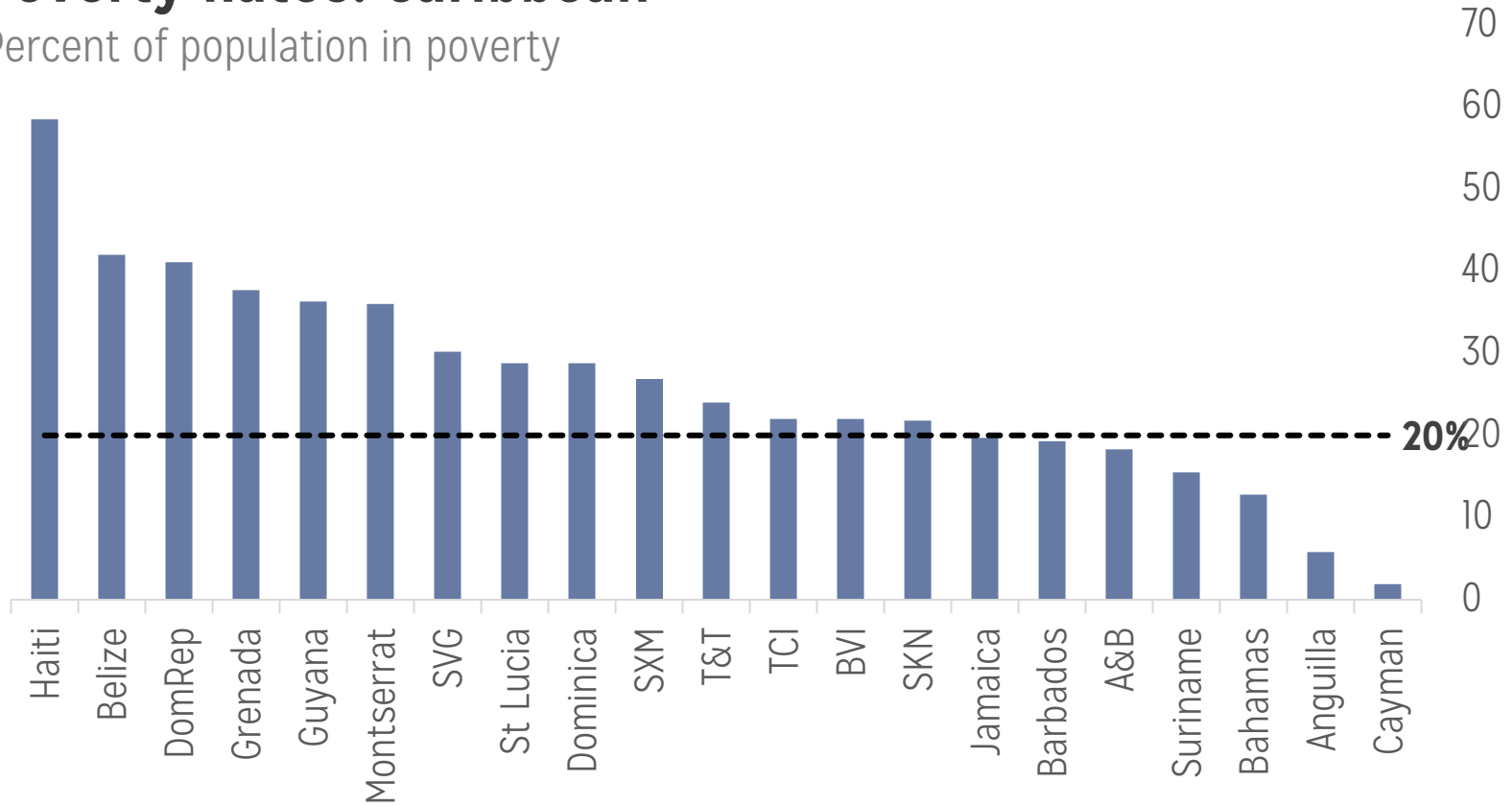


MOST of our countries already struggled with poverty rates over 20%.



Poverty Rates: Caribbean

Percent of population in poverty



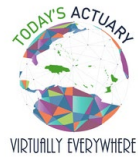
Source: UNDP Caribbean Human Development Report, World Bank, IMF, Caribbean Development Bank, Marla Dukharan



	Tourism-intensive Caribbean	Commodity-exporting Caribbean	Non-Caribbean Small States
Violent Crime	Orange	Orange	Green
Emigration	Red	Red	Yellow
Skilled Emigration	Red	Red	Yellow
Human Capital	Orange	Green	Orange
Natural Disasters	Red	Orange	Yellow
Government Debt	Red	Yellow	Yellow
Taxation	Yellow	Yellow	Light Green
NPLs	Red	Orange	Orange
Ease of Doing Business	Yellow	Orange	Orange
Competitiveness	Light Green	Red	Orange
Bureaucracy	Light Green	Yellow	Orange
Regulatory Quality	Light Green	Orange	Orange
Rule of Law	Light Green	Orange	Light Green
Control of Corruption	Green	Orange	Light Green
Trade Openness	Yellow	Light Green	Light Green
Trade Tariff	Red	Orange	Yellow
Trade Connectivity	Orange	Yellow	Red
GVC Participation	Yellow	Red	Yellow
High-Tech Export Share	Orange	Red	Light Green
Export Diversification	Orange	Red	Red

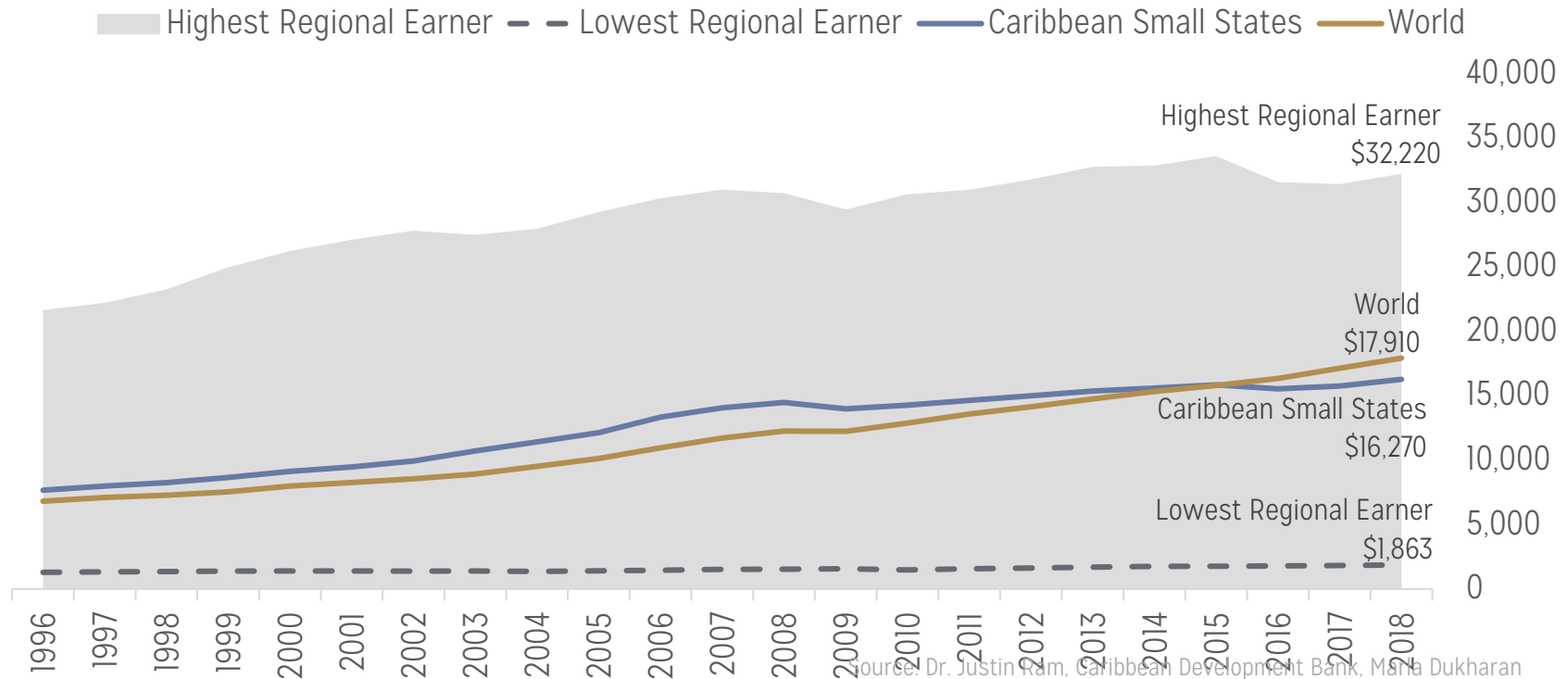
We are lagging other small states in terms of indicators for growth and prosperity

GDP per capita for Caribbean small states ALREADY fell below the world average.



GDP Per Capita

PPP, Current International Dollars





“ We must become the developers of ideas and technologies that allow us to overcome the disadvantages of being a small island developing state. ”

-Hon. Mia Mottley

How technology can enable our socio-economic transformation



1

Gender
Balance

2

Innovation &
Diversification

3

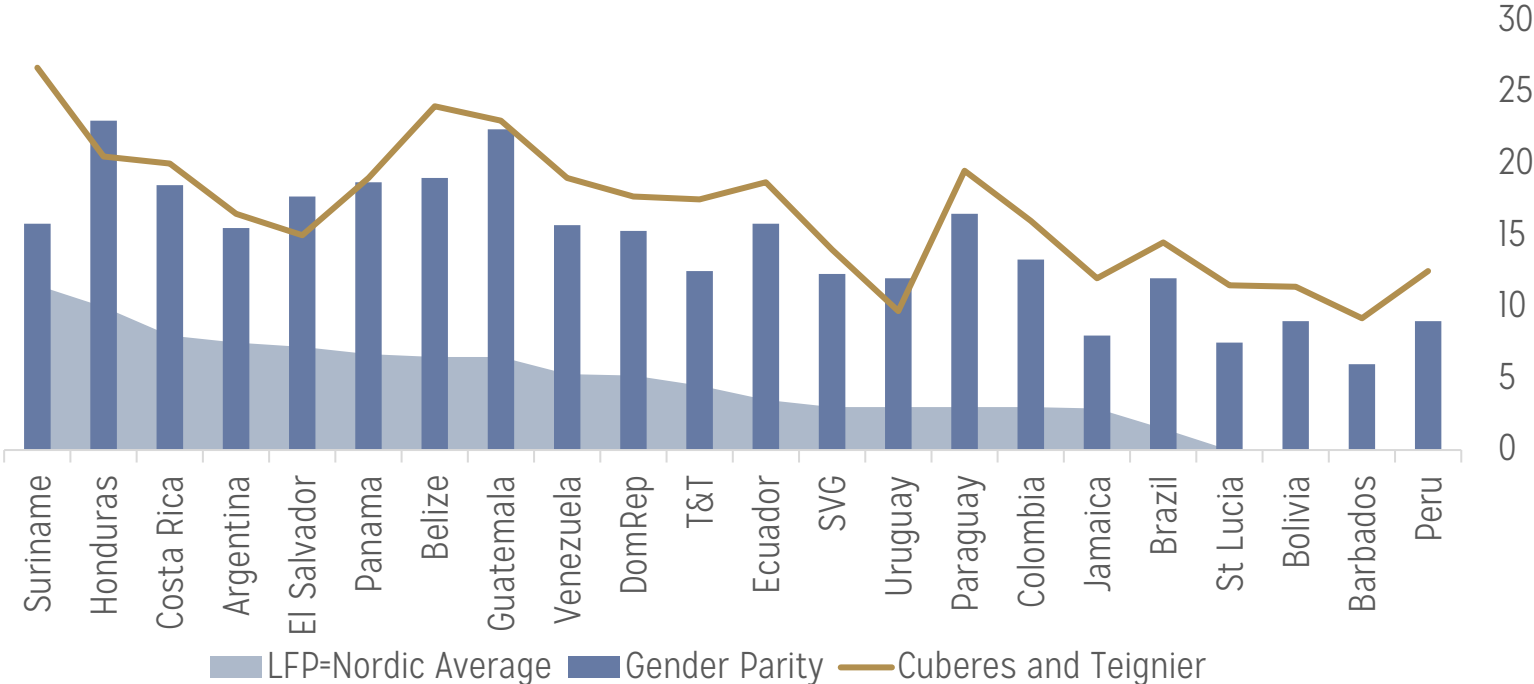
Socio-
Economic
Resilience

GDP per capita could rise by 4.5-16.7% if more women participated in the labour force.



Potential gains of GDP per capita from higher female LFP: LAC

Potential Change in GDP per capita



Source: IMF Working Paper 17/34 Women at Work in Latin America and the Caribbean, Marla Dukharan

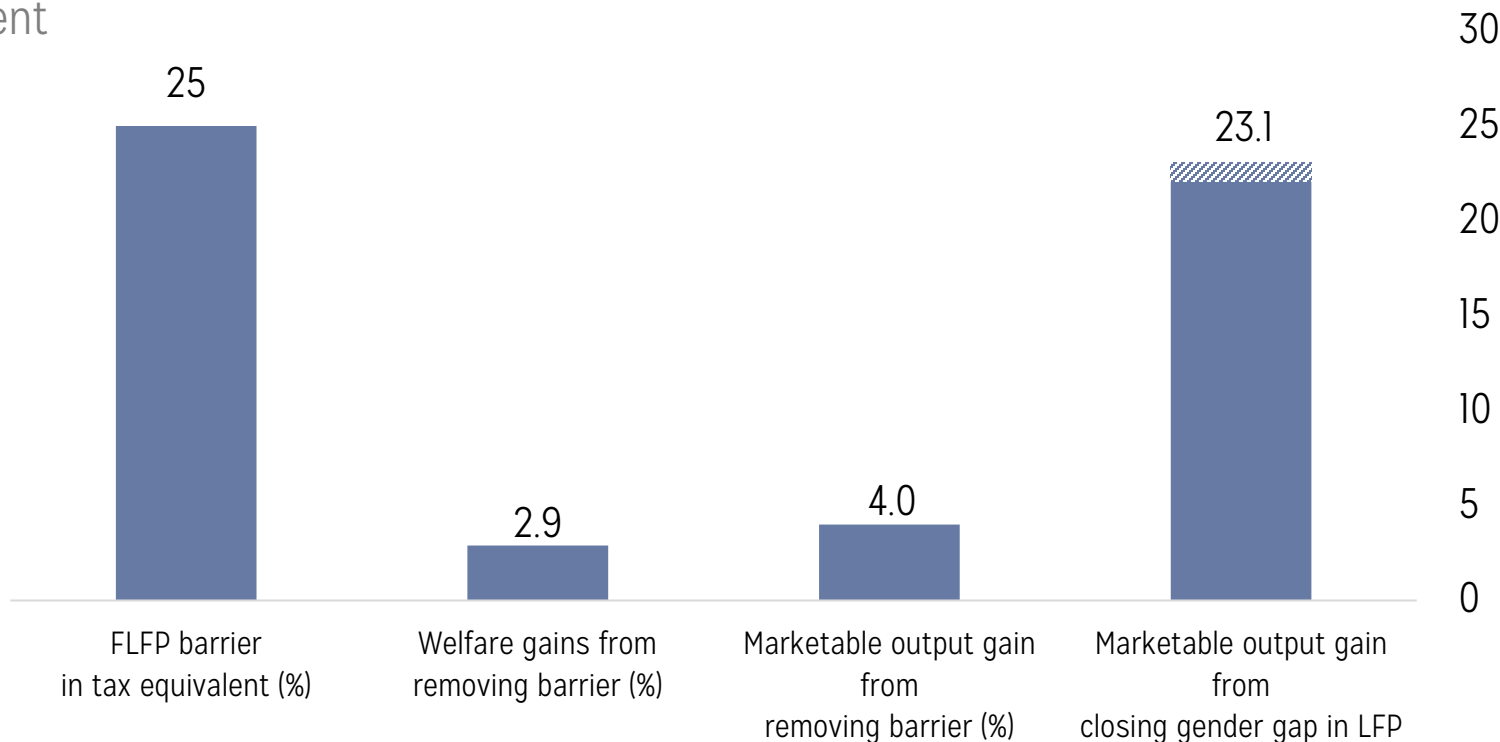


Increased productivity from gender diversity adds 1/5 of potential gains from increased Female LFP



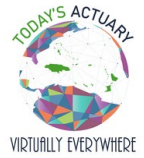
Removing Barriers to Female Labor Force Participation

Percent

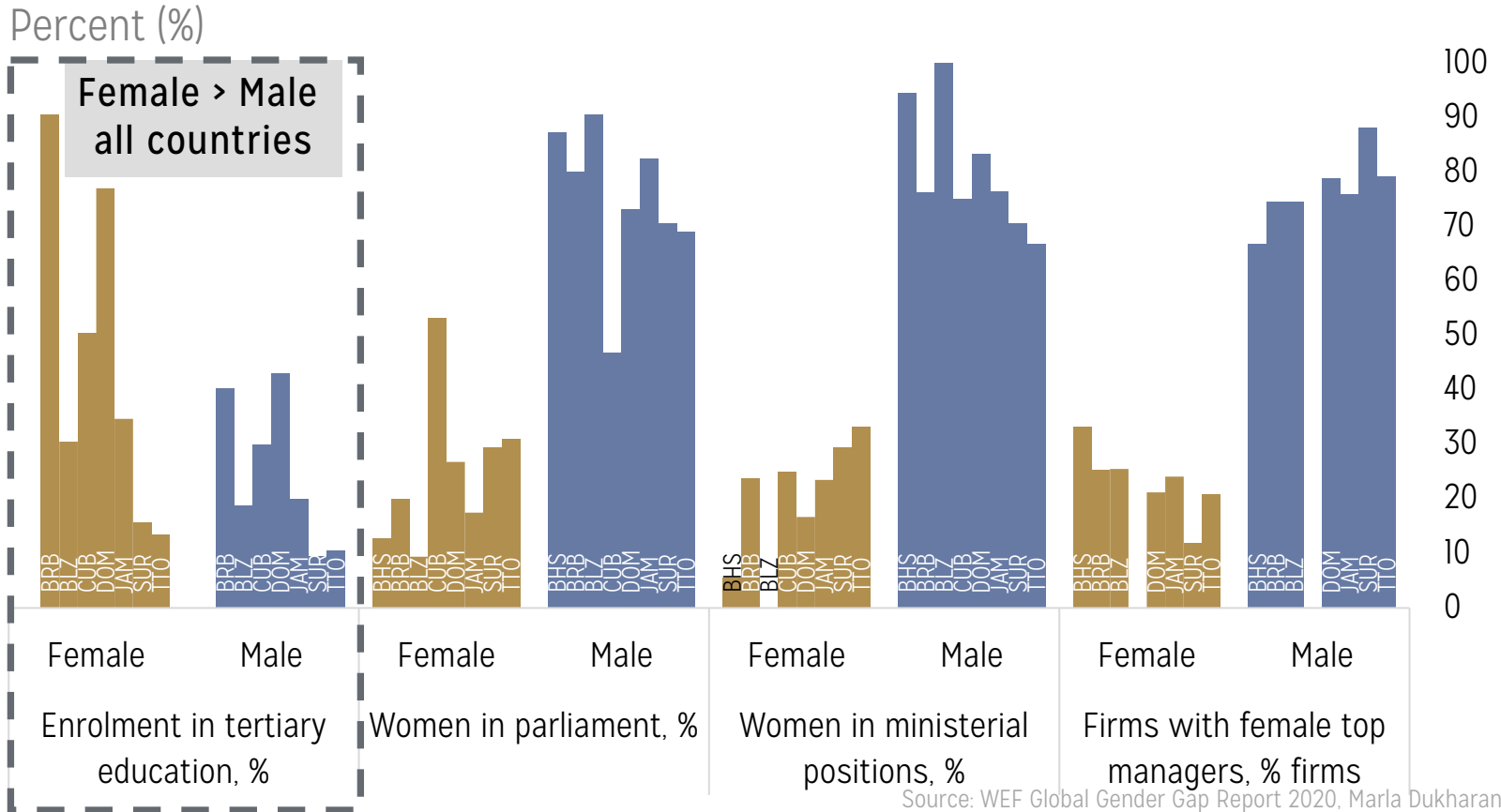


Source: IMF Finance and Development, March 2019 (Dabla-Norris and Kochhar), IMF SDN1806, Marla Dukharan

Caribbean women are more highly educated than our men, but participate less in leadership roles.



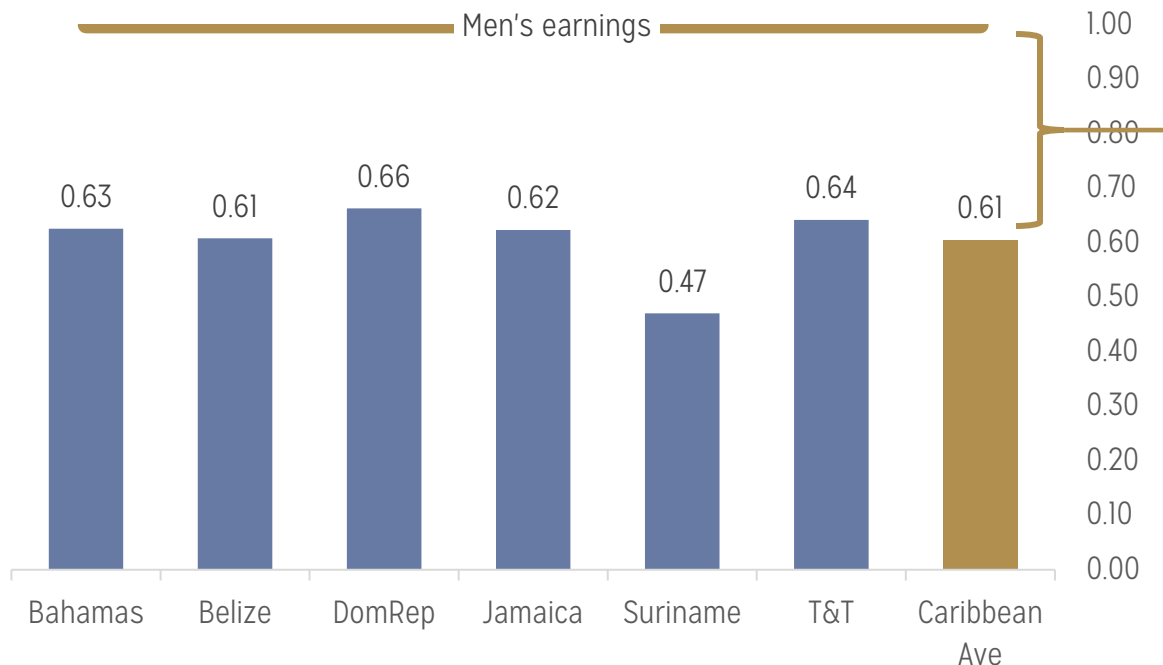
Tertiary Education vs Participation in Leadership: The Caribbean



During her 40-year career, a woman in the Caribbean will earn an average of USD332K less than a man.

Estimated Earned Income Gap: Caribbean

Women's earnings for every USD1.00 of men's earnings



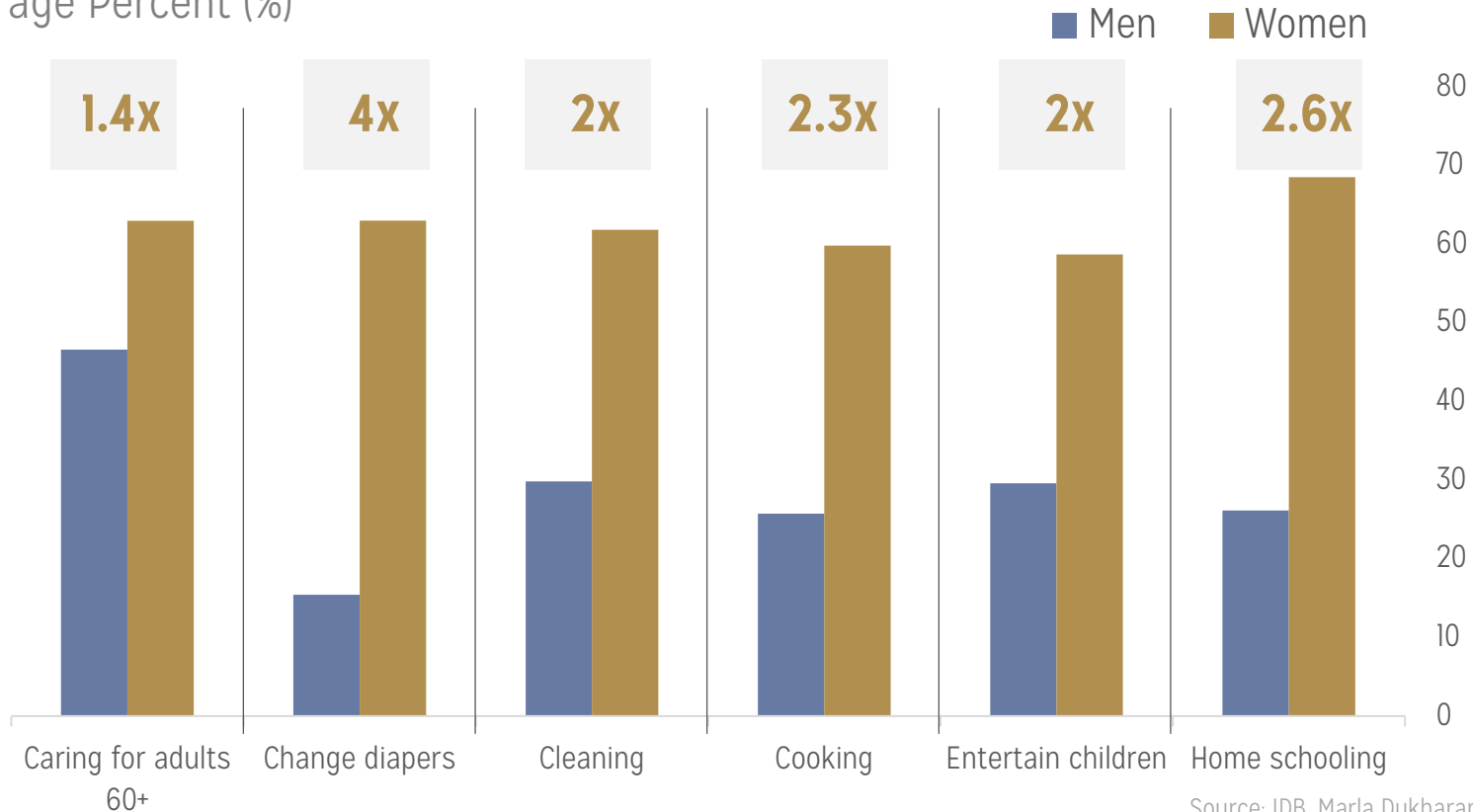
Source: World Economic Forum Global Gender Gap Report 2020, Marla Dukharan

On average, Caribbean women have to work 27 years more than men to make the same earnings.

Women's unpaid labor subsidizes men...

Distribution of Domestic Chores, COVID-19: Caribbean Average

Average Percent (%)

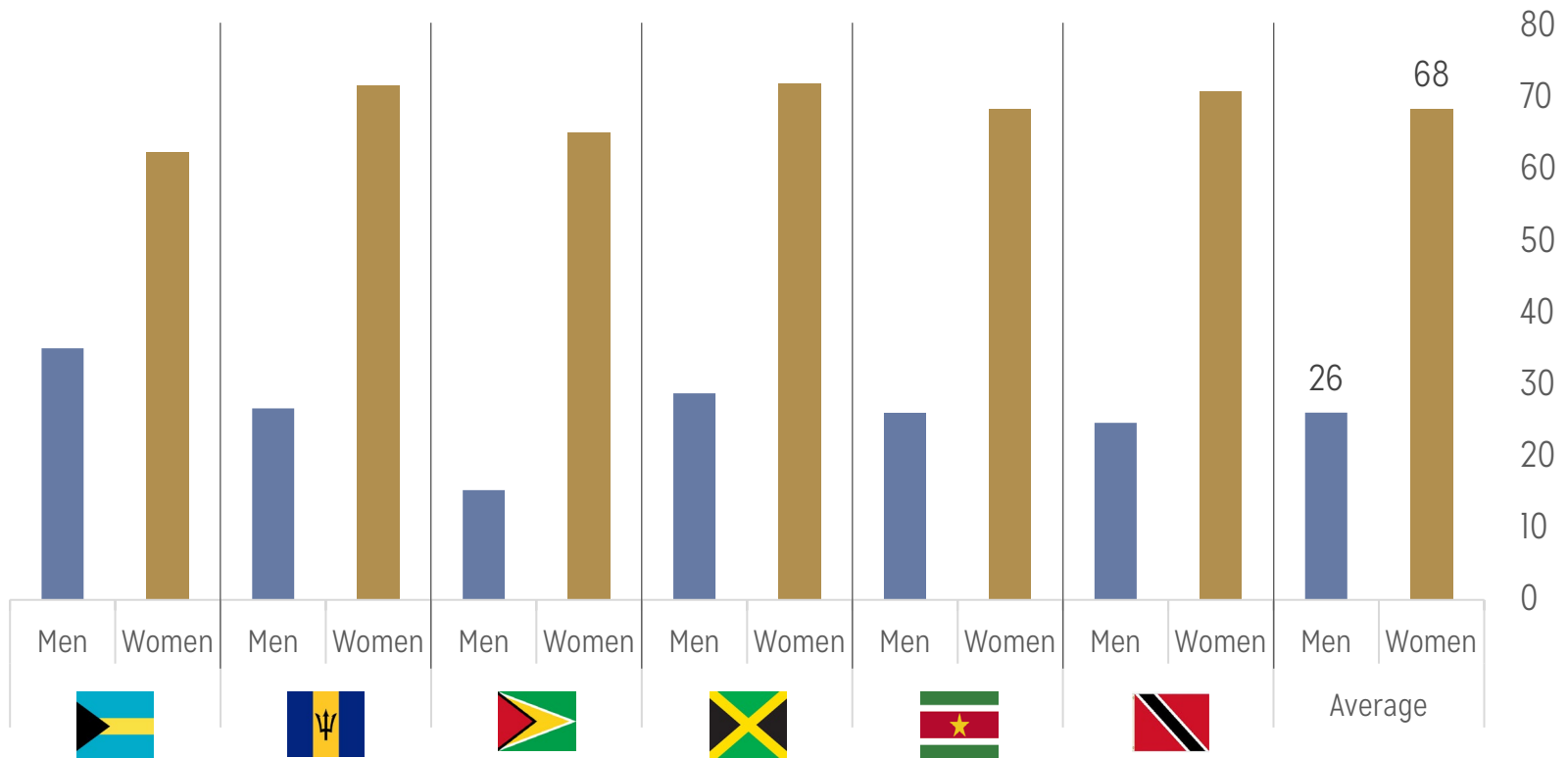


Women are also subsidizing the state with 2.6x as many women providing homeschooling as men



Distribution of Home Schooling, COVID-19: Caribbean

Average Percent (%)



Source: IDB, Marla Dukharan

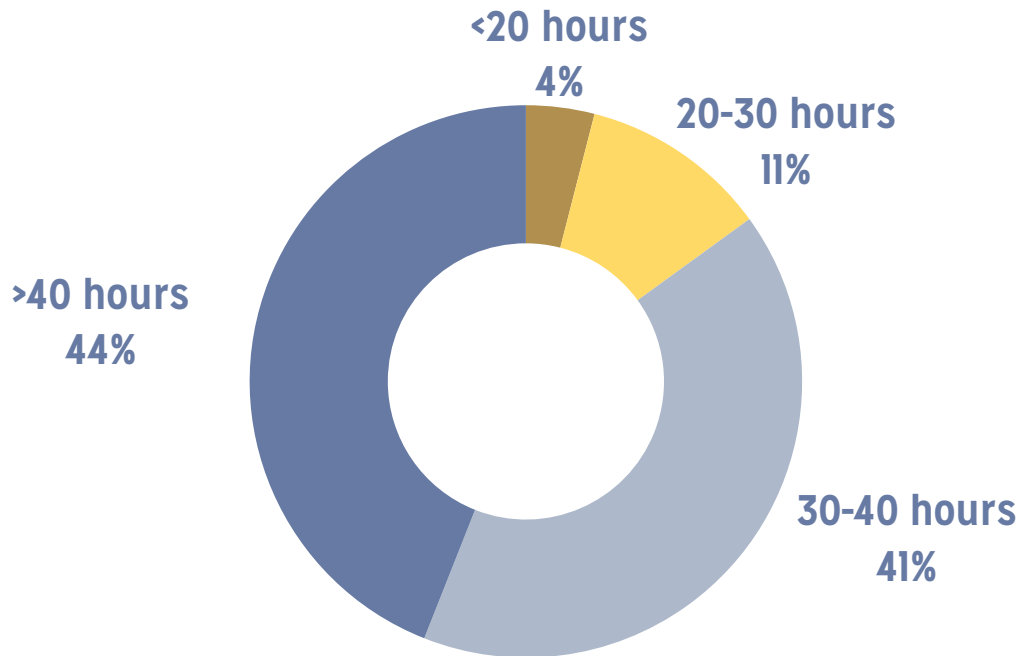


Gains from redistributing
unpaid work across genders
could amount to **4% of GDP** (IMF).

We must also re-create work-life balance to make it sustainable.



What amount of time do you work weekly?



Source: State of Remote Work in 2020 Report, remotework2020.remote.tools, Marla Dukharan



In the digital age we can bring the jobs and opportunities to the people.



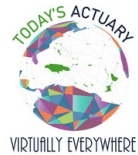
Distribution of working-age pop. engaged in independent work (US and Europe)

	Primary Income		Supplemental Income	
Preferred choice	Free agents	30%	Casual earners	40%
Out of necessity	Reluctants	14%	Financially strapped	16%

Source: McKinsey, Marla Dukharan

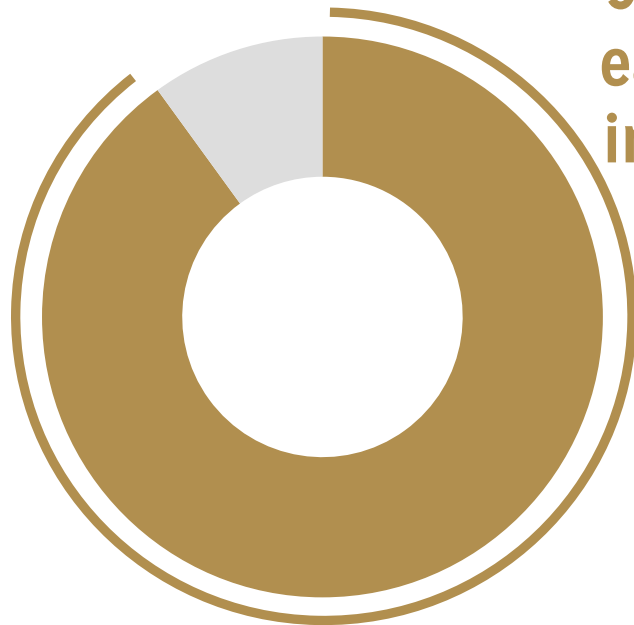


When women work, they invest 90% of their income back into their families, compared with 35% for men.



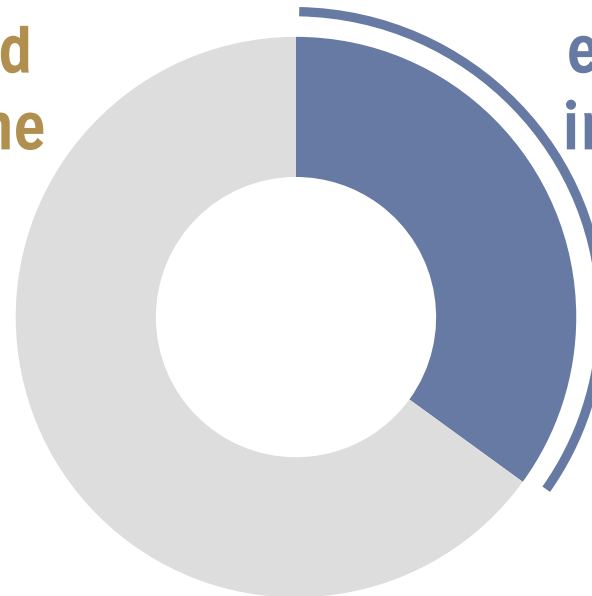
Women reinvest more in their families vs men

Women



90% of
earned
income

Men



35% of
earned
income

Technology enables us

to do things

VERY DIFFERENTLY and do

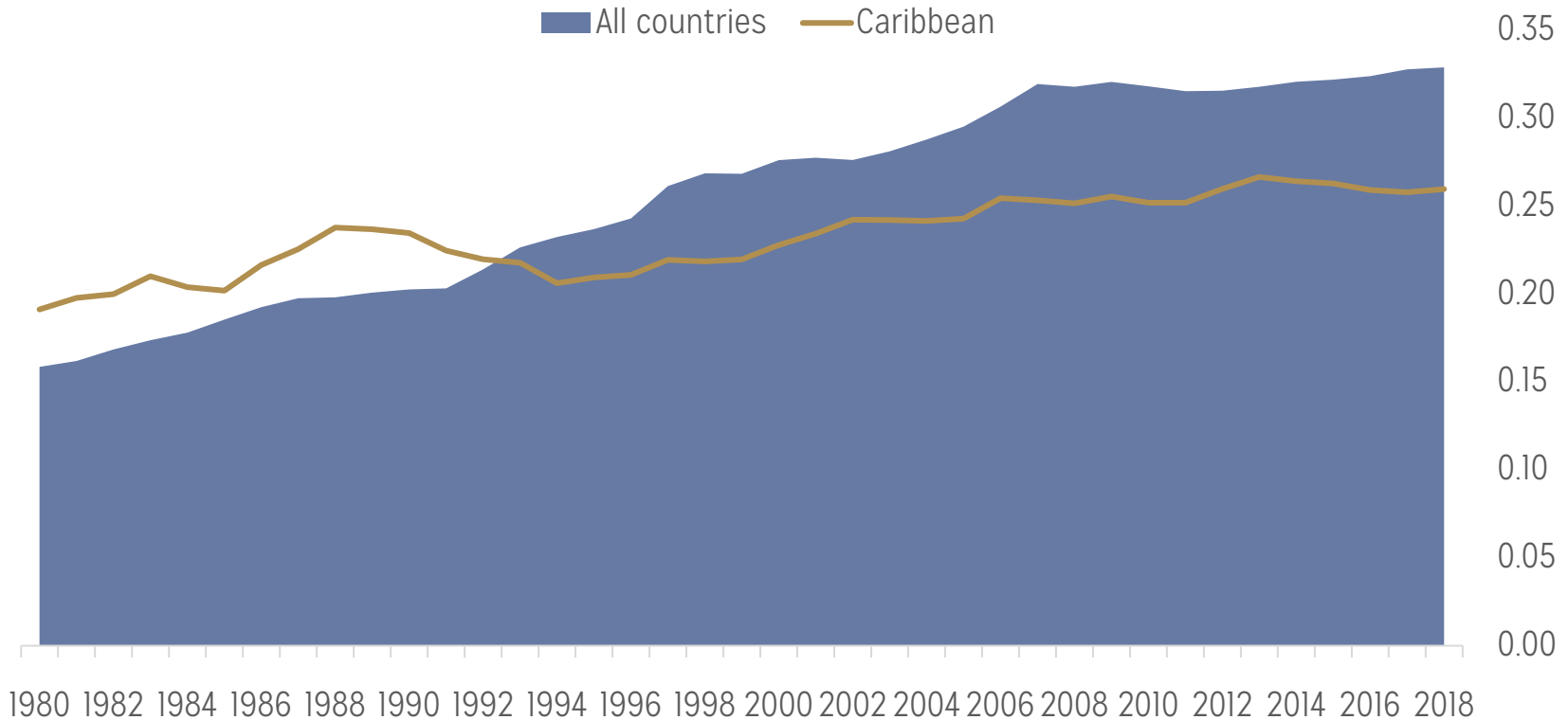
VERY DIFFERENT things!

Financial Development in the Caribbean over the last 40 years has stagnated while globally it has increased dramatically.



Financial Development Index: World vs Caribbean

Index Score 0=min 1=max



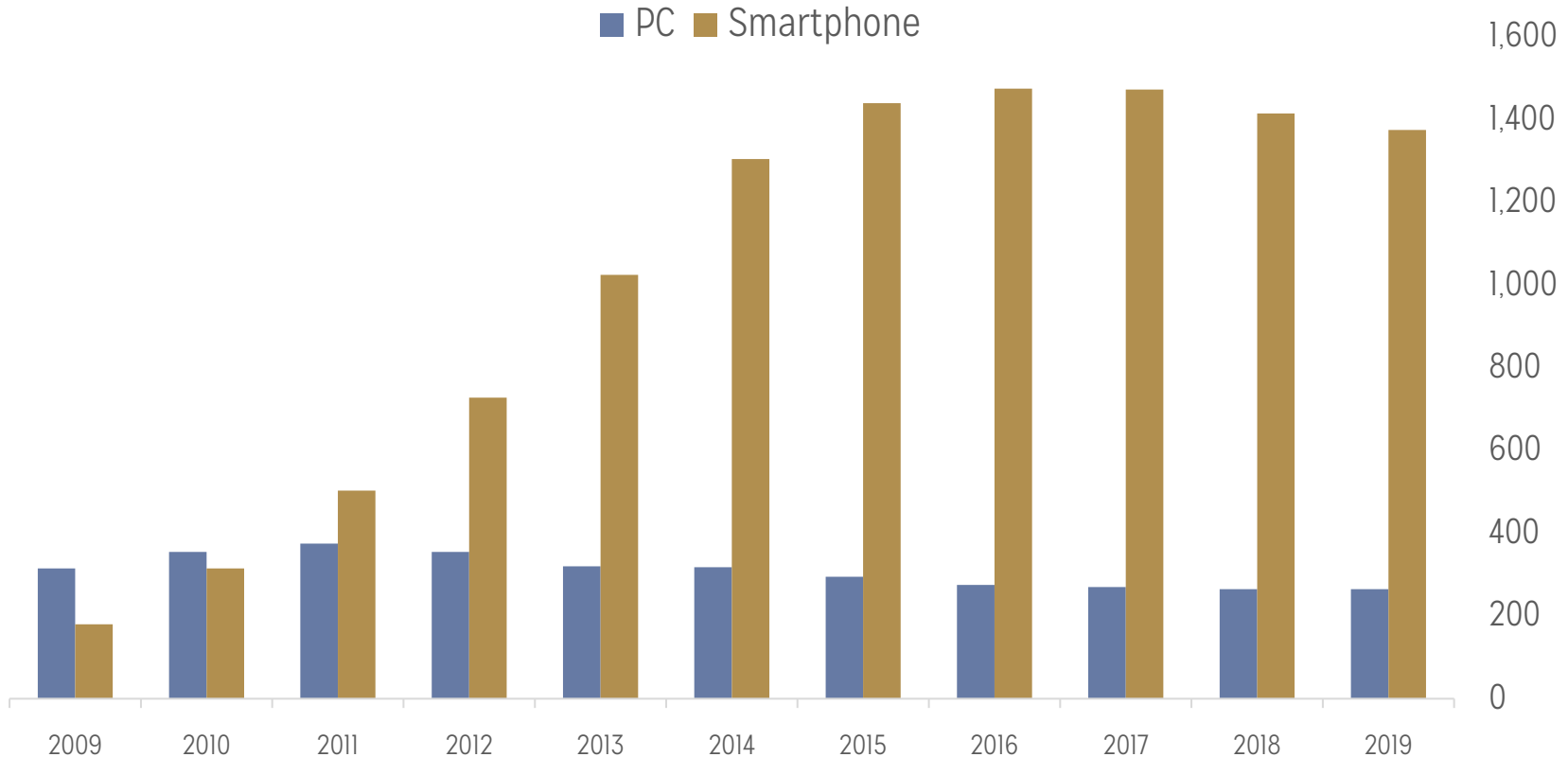
Source: Financial Development Index, IMF, Marla Dukharan

Smartphone sales remain at over 1 billion per year.
Mobile internet penetration is estimated at 77% in our region...



Global Sales of PC and Smartphones

Millions of Units



Source: Statista, Marla Dukharan

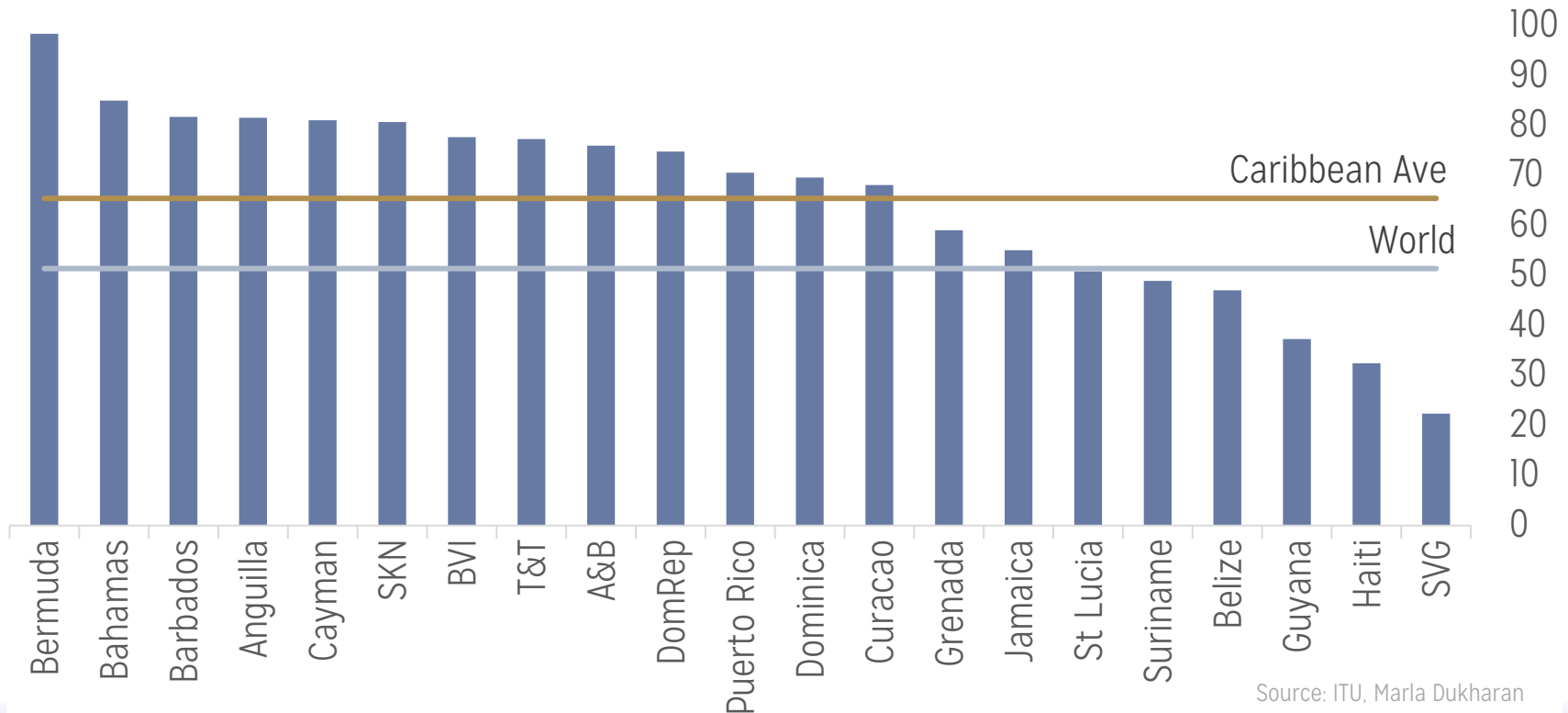
And we are already using the internet MORE than the global average.



Percentage of Population Using the Internet: Caribbean vs World

Percent (%)

Caribbean World Caribbean Ave



Source: ITU, Marla Dukharan



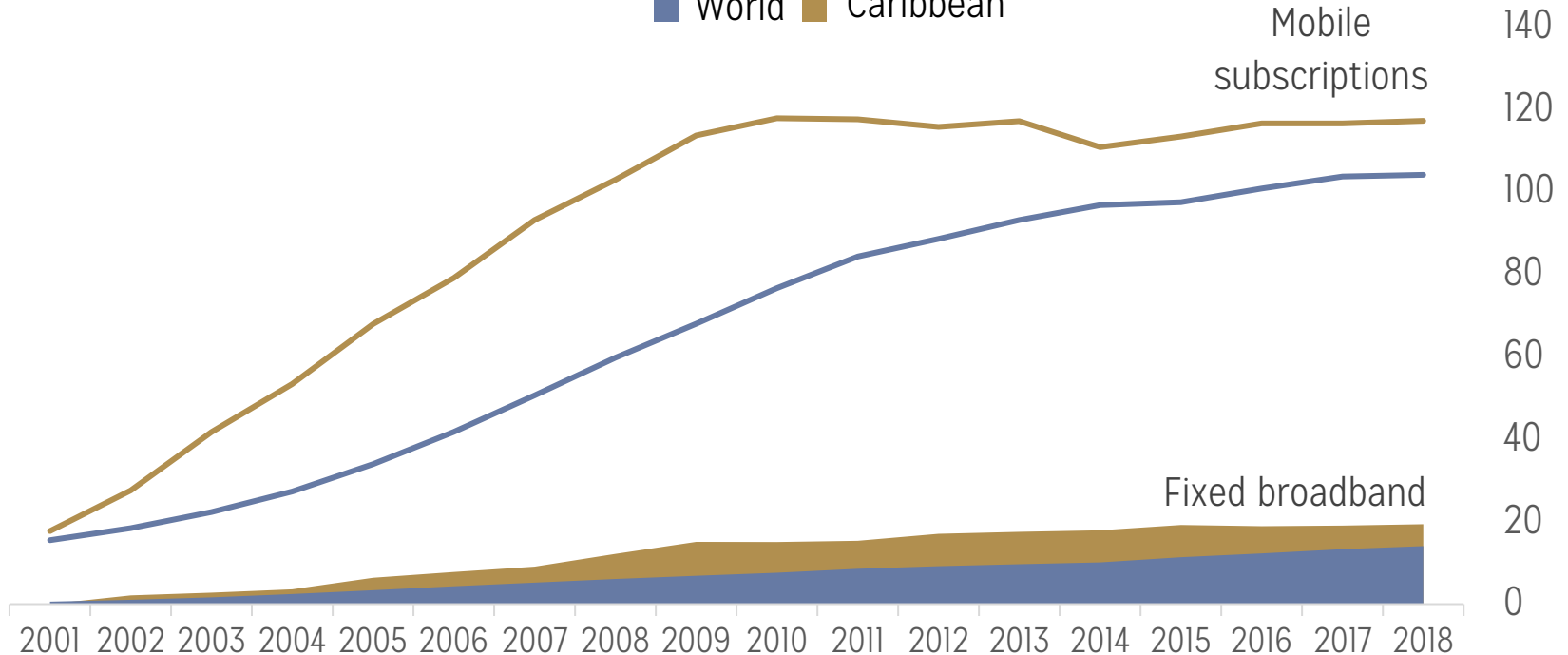
We also have more mobile and fixed broadband subscriptions than the global average.



Technology Penetration: Caribbean Average vs World Average

Subscriptions per 100 population

■ World ■ Caribbean



Source: IDB, Marla Dukharan

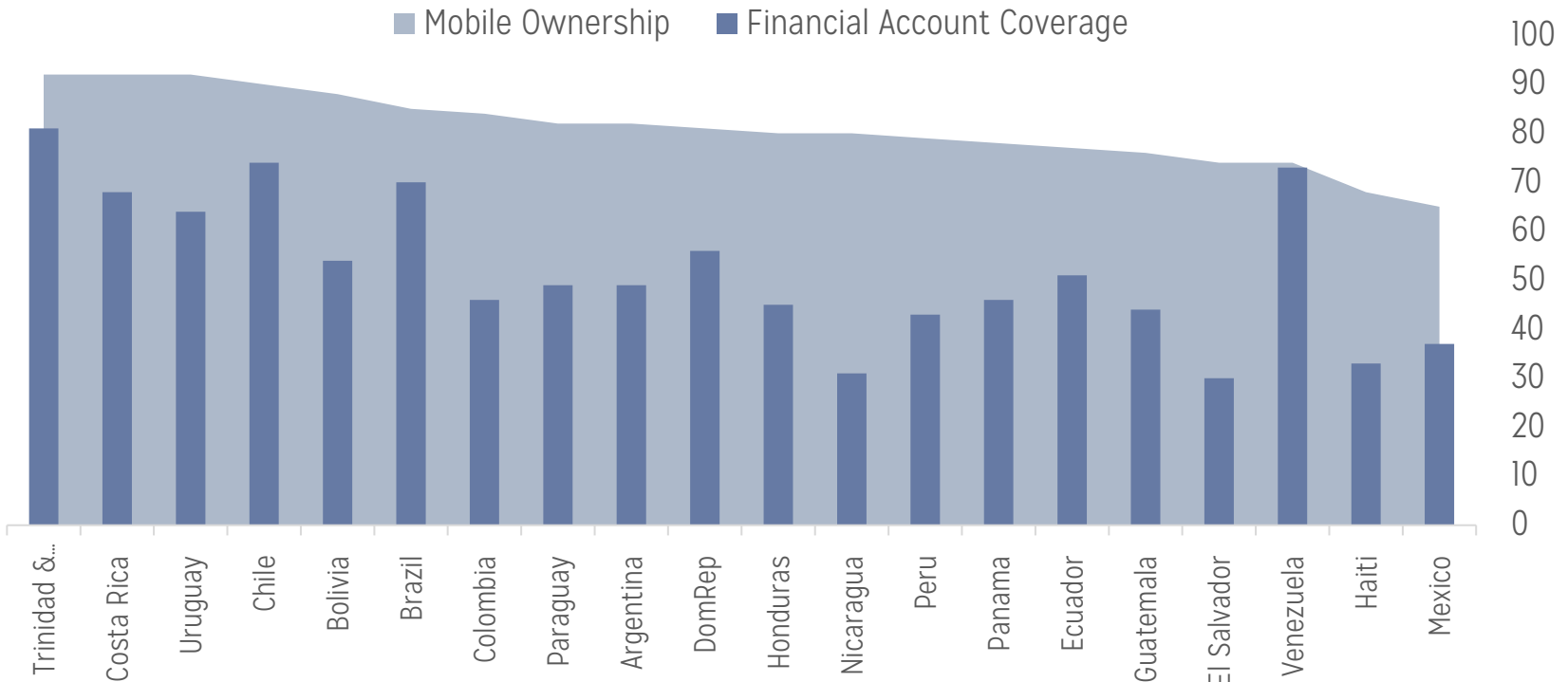


Technology can increase financial inclusion. Mobile ownership far outstrips financial account coverage by 29 p.p. on average in LAC.



Financial Accounts vs Mobile Ownership: Latin America and the Caribbean

Percent of population over 15 (%)



Source: Center for Global Development, Citizens and States Report 2020. Findex 2017, Marla Dukharan



“Our results show that firms adopting the novel payment technology (mobile money) improve their sales, by approximately 26% relative to non-adopting firms.”

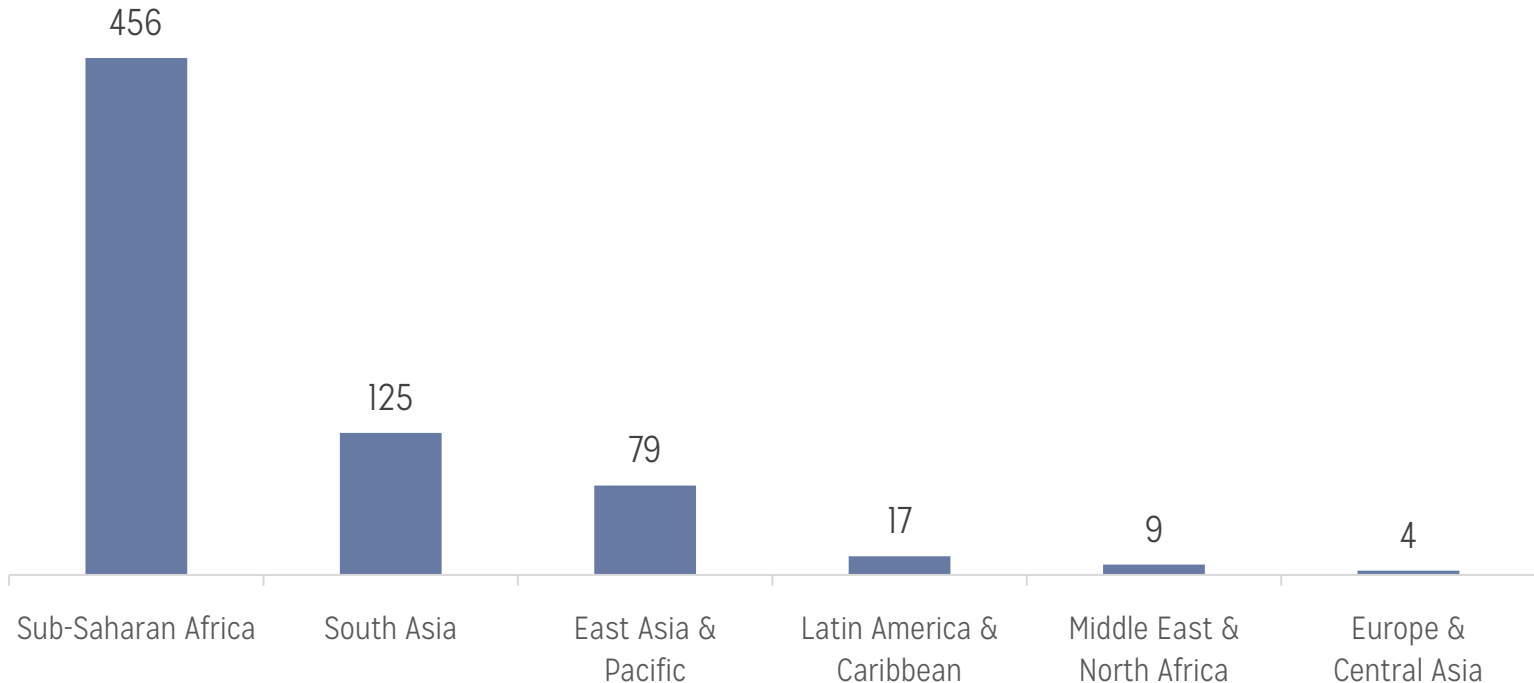
-IMF

Globally, there were ~USD2 billion in mobile money transactions PER DAY in 2019. Total transactions will grow from USD690 billion in 2019 to USD1 TRILLION by 2023



Mobile Money Transaction Value, 2019

USD Billions



Source: GSMA Intelligence, Marla Dukharan

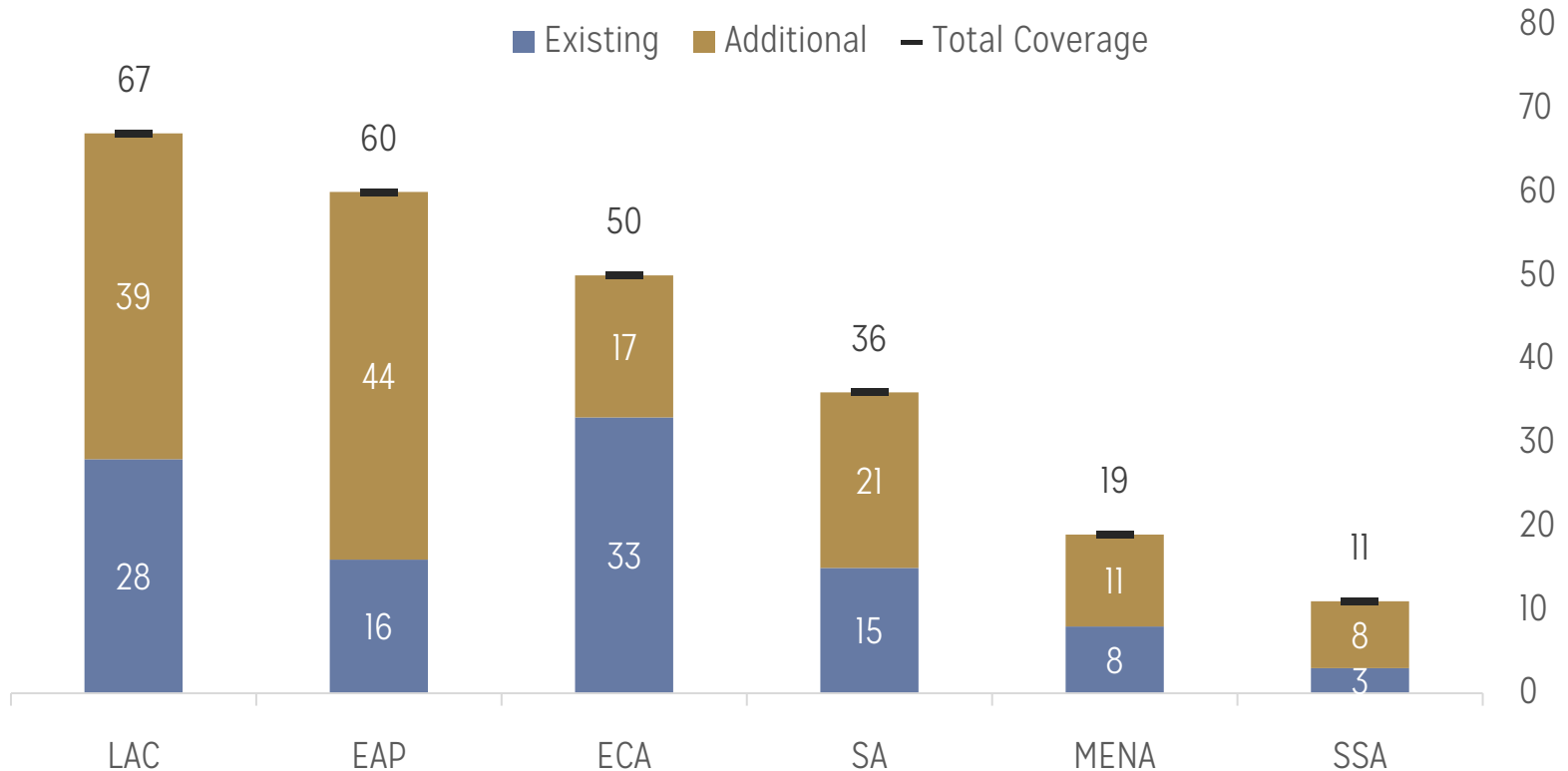
Mobile money agents earned USD70 per month on average in 2019

Technology enables rapid response! COVID-19: Govts globally financed the expansion of social spending to cover 1.8 billion people – coverage more than doubled to 38% of the population.



Government to Person (G2P) Social Transfers During COVID-19

Percent of total population (%)



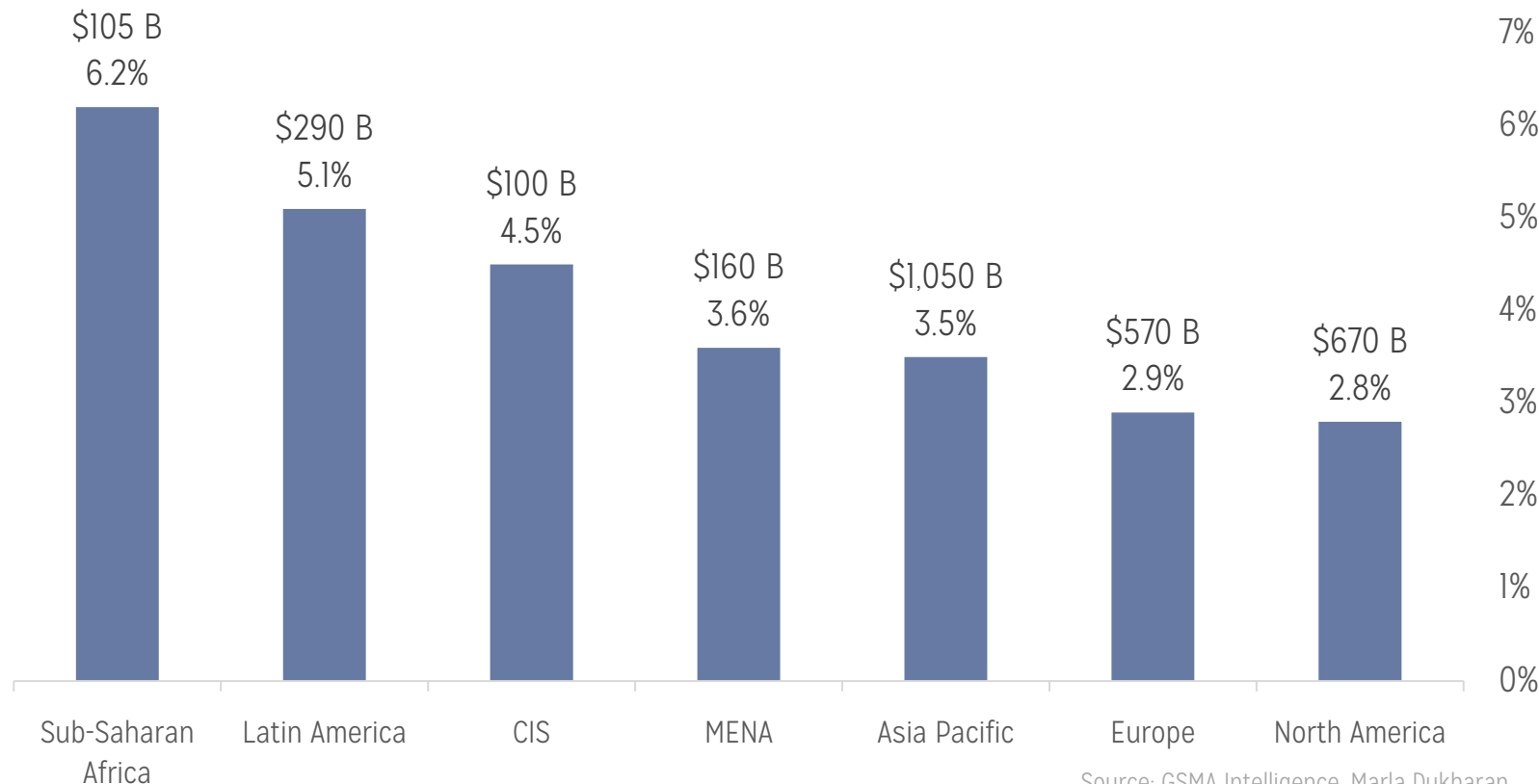
Source: IMF, Marla Dukharan

Mobile technologies are reshaping societies and redefining how markets function, facilitating greater efficiency & production.



Income Driven by Mobile Technology, 2019

USD billions, Percent of GDP (%)



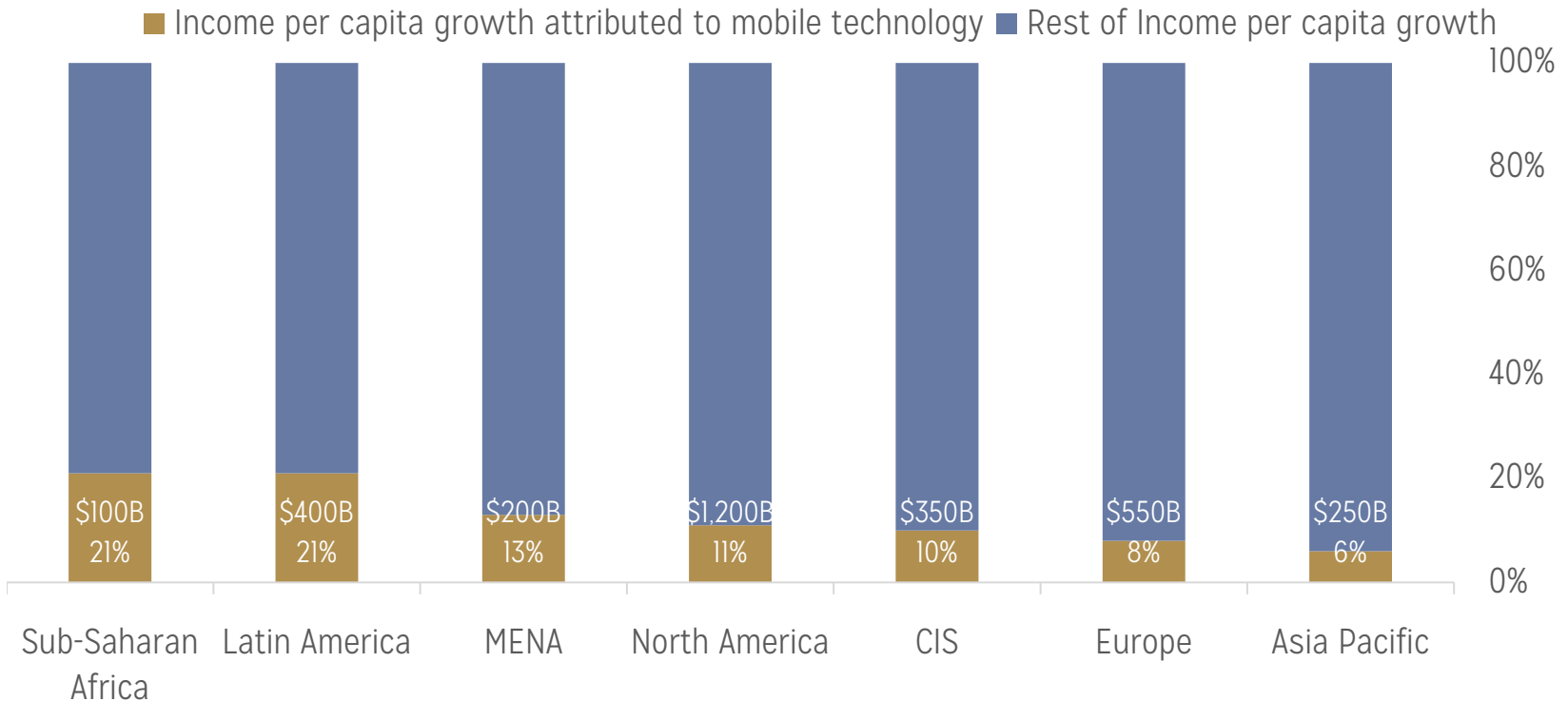
Source: GSMA Intelligence, Marla Dukharan

From 2000–2019, global income per capita increased by USD3,000 with mobile accounting for 10% of the gain (USD300).



Accumulated Income Per Capita Growth Since 2000

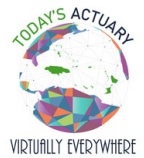
Percent of total income per capita growth (%)



Source: GSMA Intelligence, Marla Dukharan

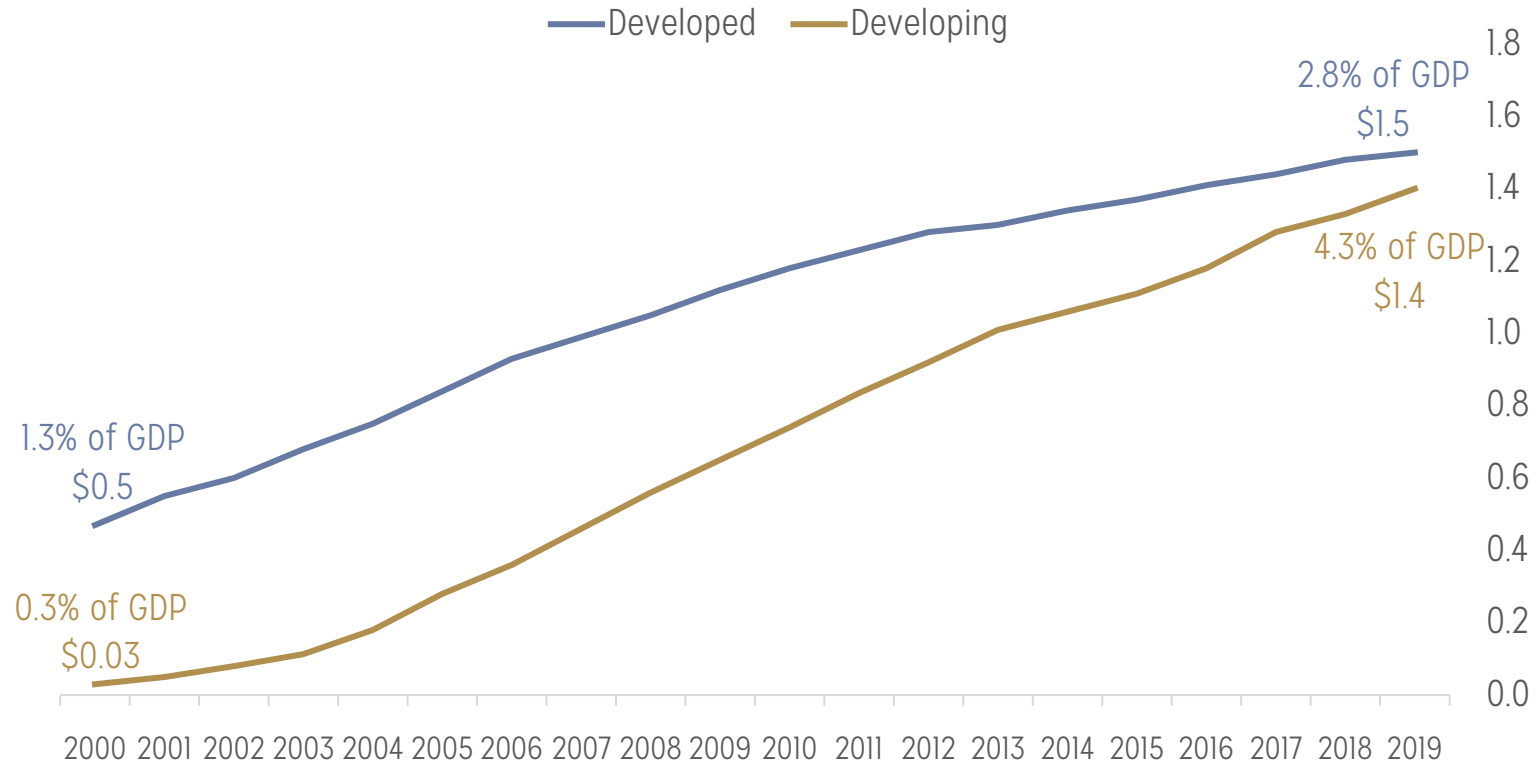


GSMA found that mobile technology had the largest impacts Latin America and Sub-Saharan Africa, accounting for > 20% of the income per capita growth of the last two decades.



Income Driven by Mobile Technology, 2019

USD Trillions



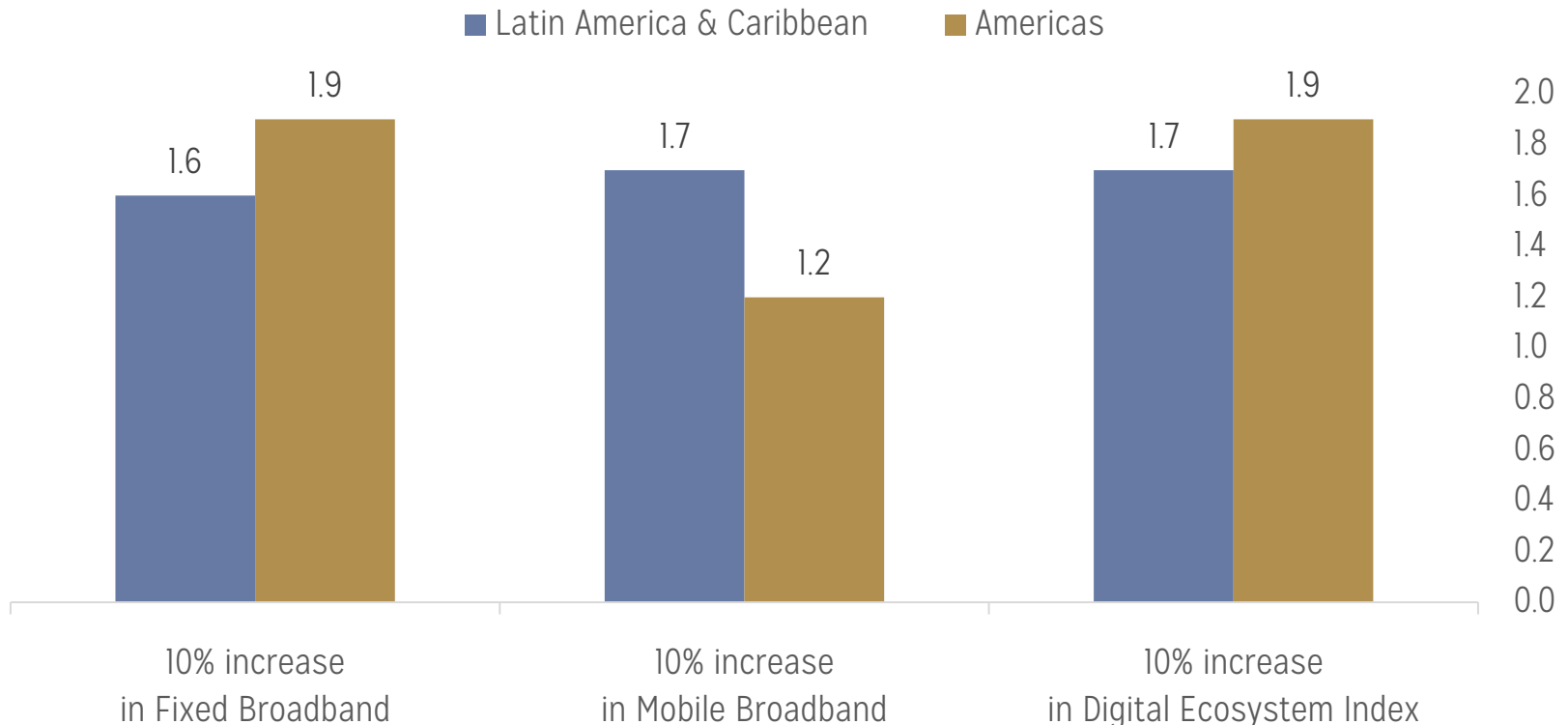
Source: GSMA Intelligence, Marla Dukharan

Higher technology penetration has direct correlation with GDP per capita growth.



GDP per Capita Growth from Increased Technology Penetration: Americas

Increase in GDP per capita from 10% increase in indicator



Source: ITU, The economic contribution of broadband, digitization and ICT regulation, Marla Dukharan





Technology enables

doing **VERY DIFFERENT** things.

Taking our services **beyond tourism...**

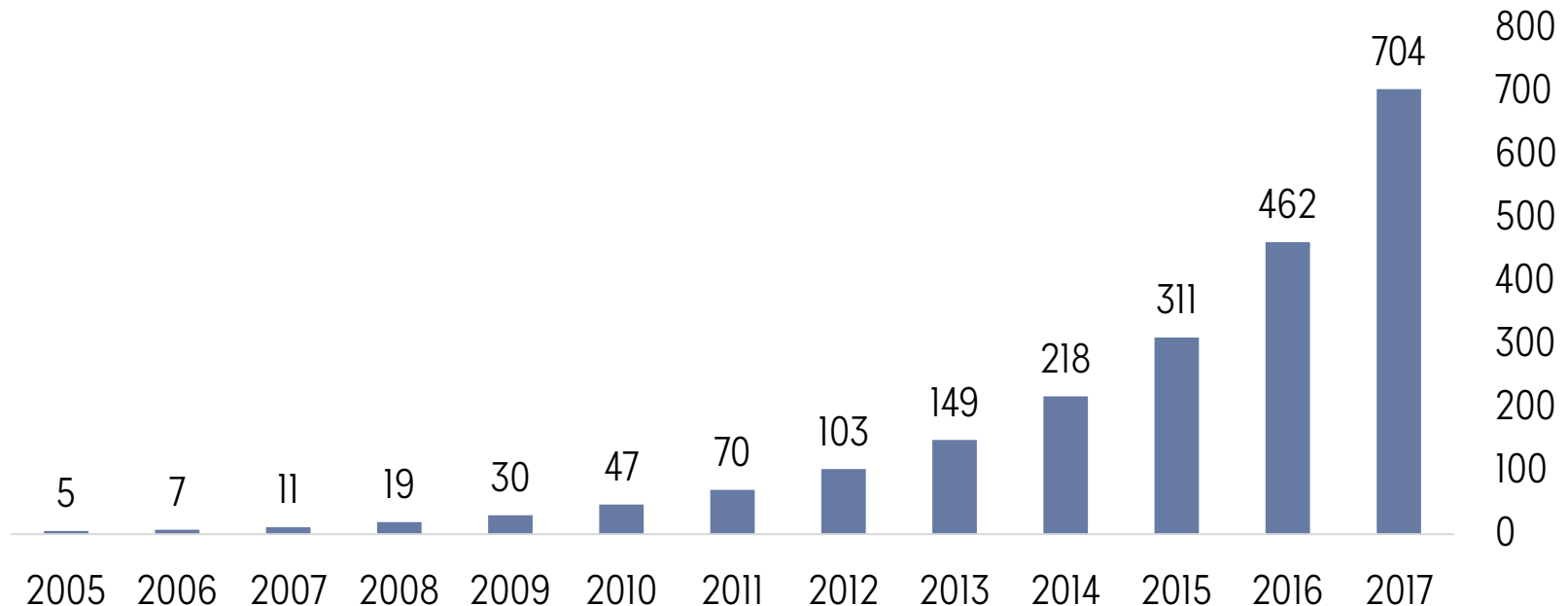


Cross-border data transfers are growing exponentially with virtually all trade, investment, economic activity and supply chains underpinned by data transfers.



Cross-border Total Bandwidth Used

Terabytes per second



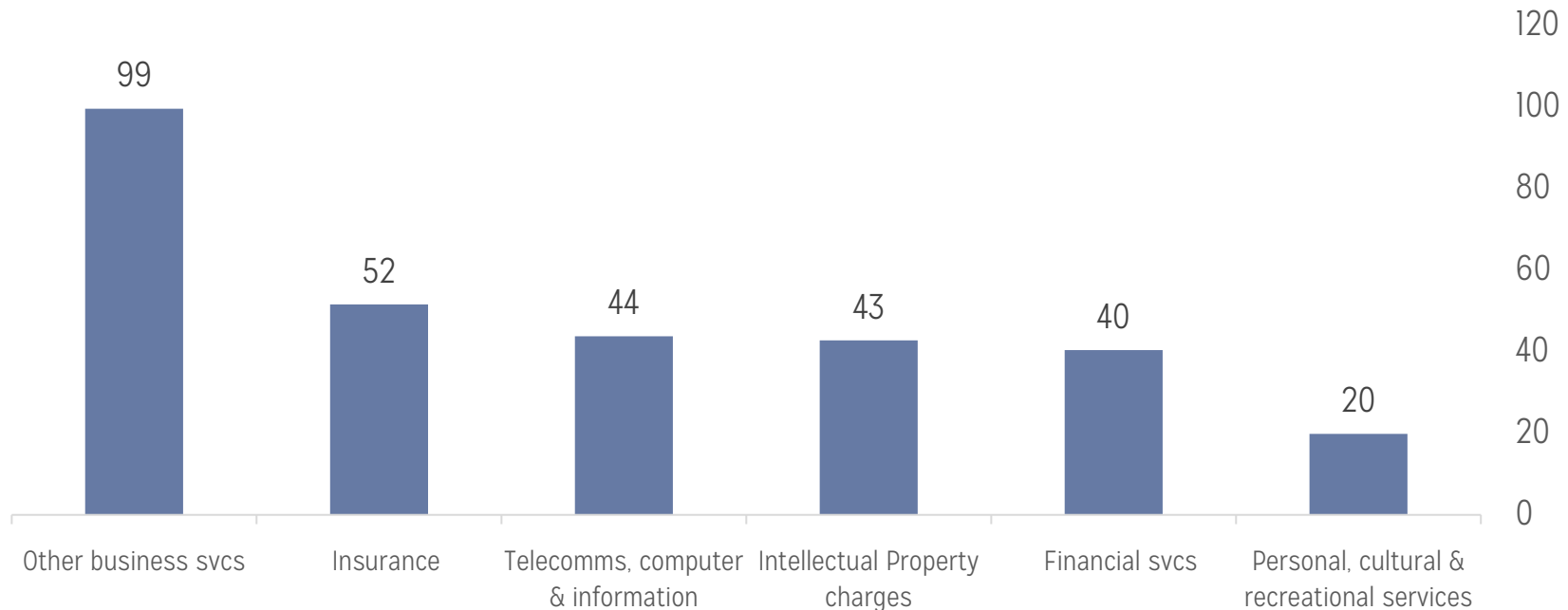
Source: OECD, Marla Dukharan

The US alone imported USD298 billion in ICT-enabled services last year.



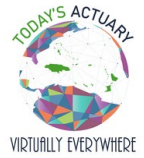
US Imports of ICT-enabled Services, 2019

Billions of USD



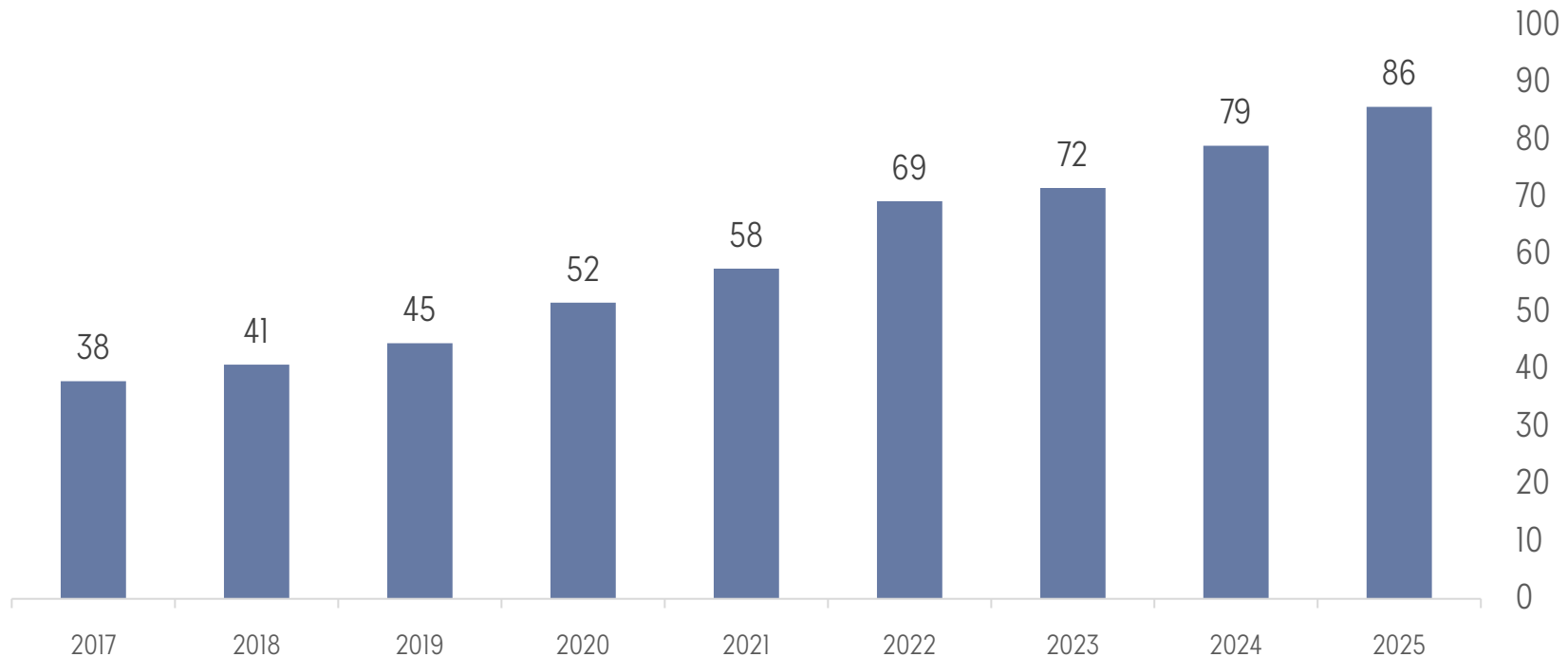
Source: US Bureau of Economic Analysis, Marla Dukharan

New ICT-enabled services constantly emerge... Why are we not participating?



Video Streaming Revenues and Forecast

Billions of USD



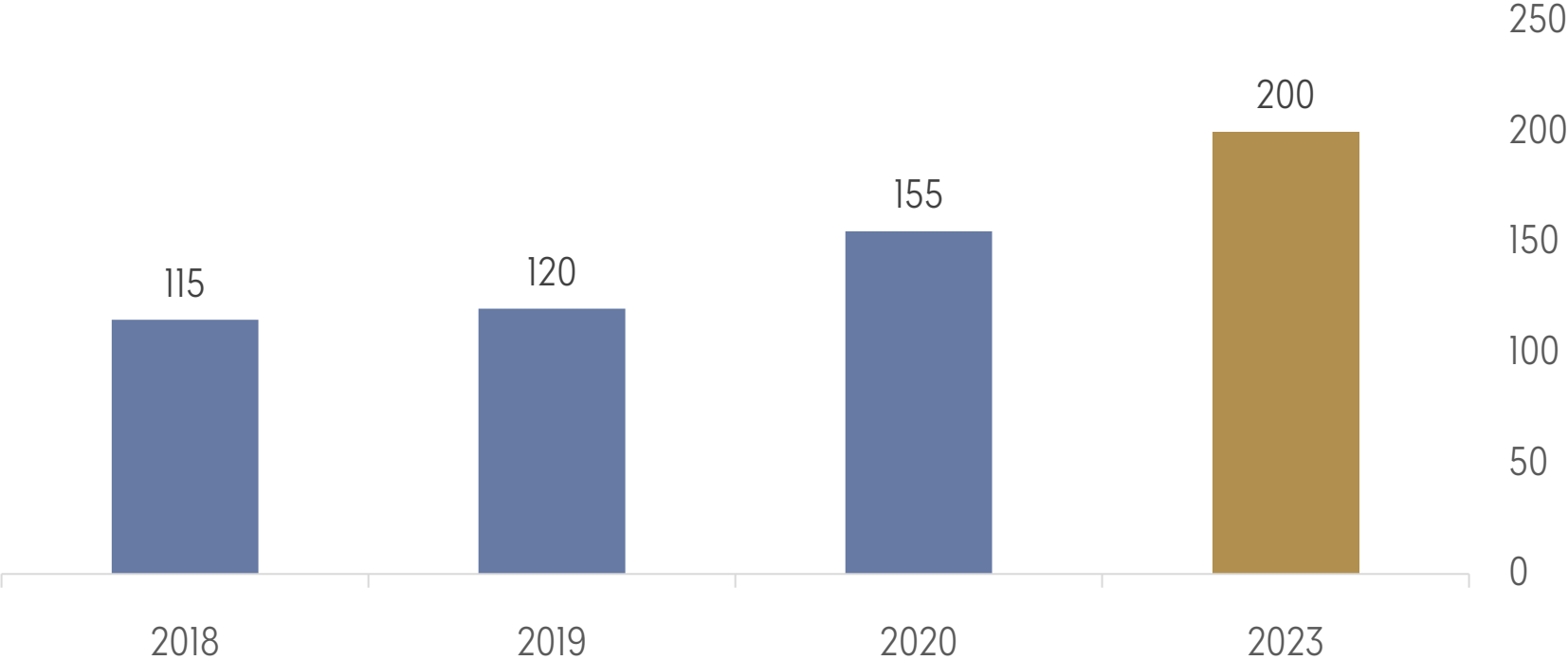
Source: Statista, Marla Dukharan

Fortnite alone has generated USD4.2 billion in the last 2 years.



Gaming Industry Revenues: Worldwide

Billions of USD



Source: Juniper Research, Nielsen, Marla Dukharan

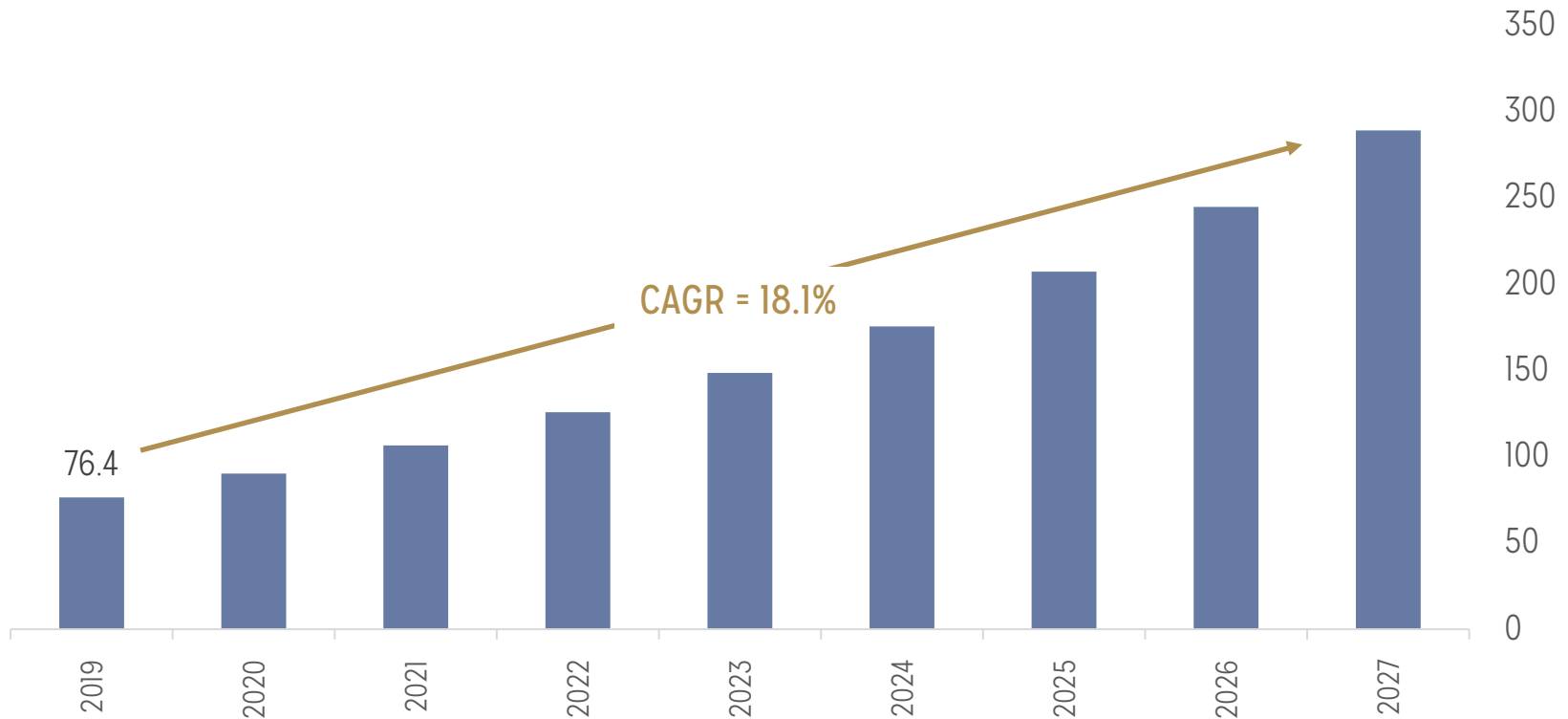


The Education Technology market was valued at USD76.4 billion in 2019



Education Technology Market: Worldwide

USD Billions

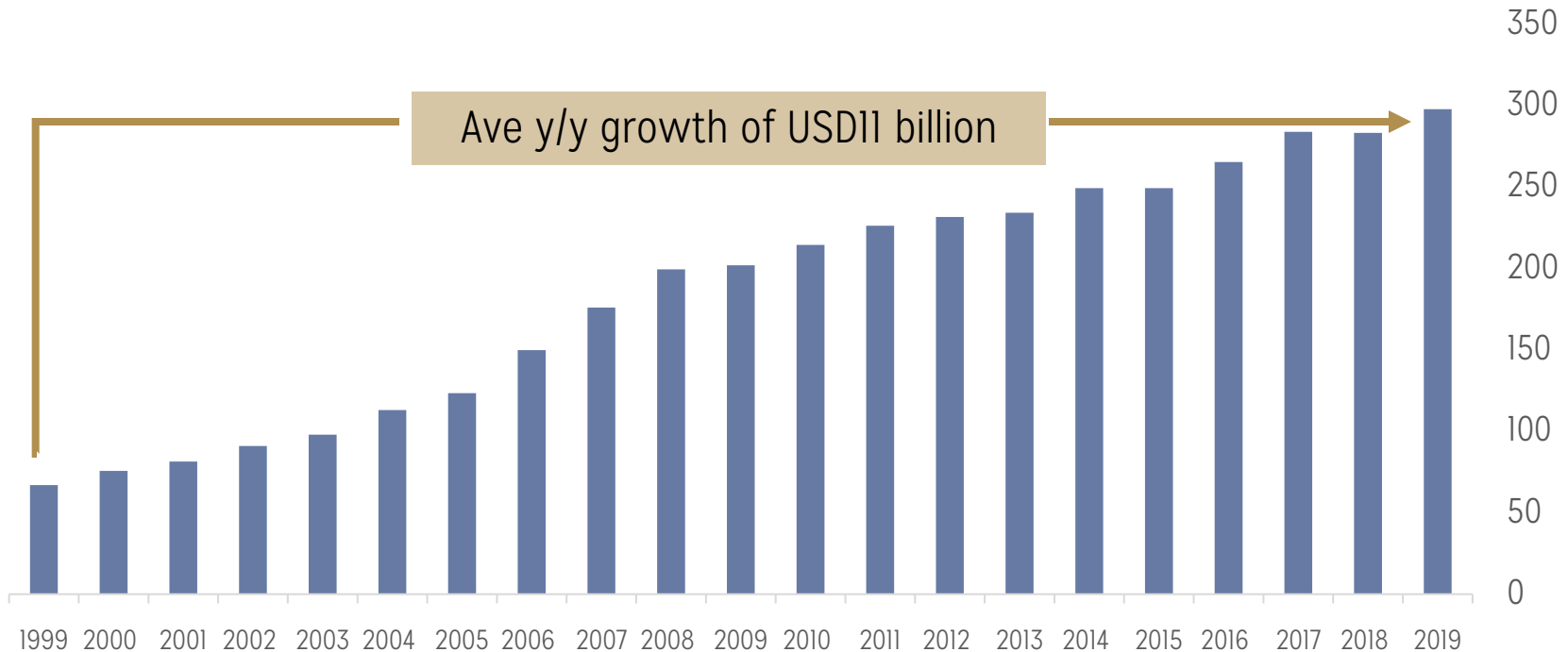


Source: Grand View Research, Marla Dukharan

The US imports 4x what it did at the turn of the century in ICT-enabled services. Canada imports about USD49 billion/yr.

US Imports of ICT-enabled Services, 1999-2019

Billions of USD



Source: US Bureau of Economic Analysis, Marla Dukharan



“In the next 10 years, 5G could enable 2.1% of global income growth – playing an important role in economic recovery and future productivity growth”

-GSMA Intelligence

Thanks to digital tools, 34% of US employees were able to switch to telecommuting in April 2020, and 30% of business owners in Canada increased sales that same month.



Internet of Things

Cloud Computing

Artificial Intelligence

Big Data Analytics

Platforms

Open Innovation / Standards & Interoperability

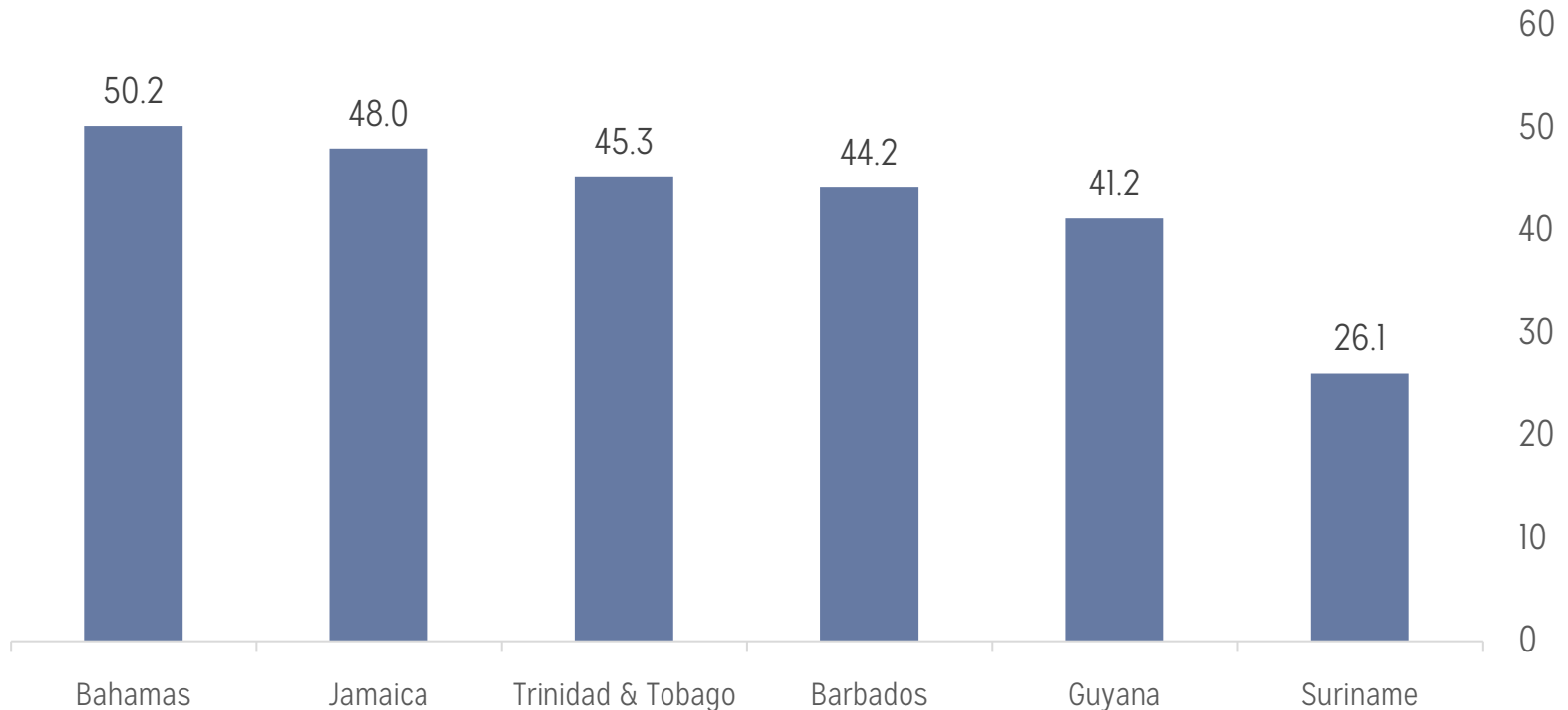
Source: OECD, UNCTAD, Marla Dukharan

We can continue to place our livelihoods on an increasingly vulnerable path...



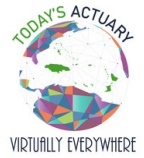
Housholds Declaring at Least 1 Job Loss, April 2020

% of Total Households



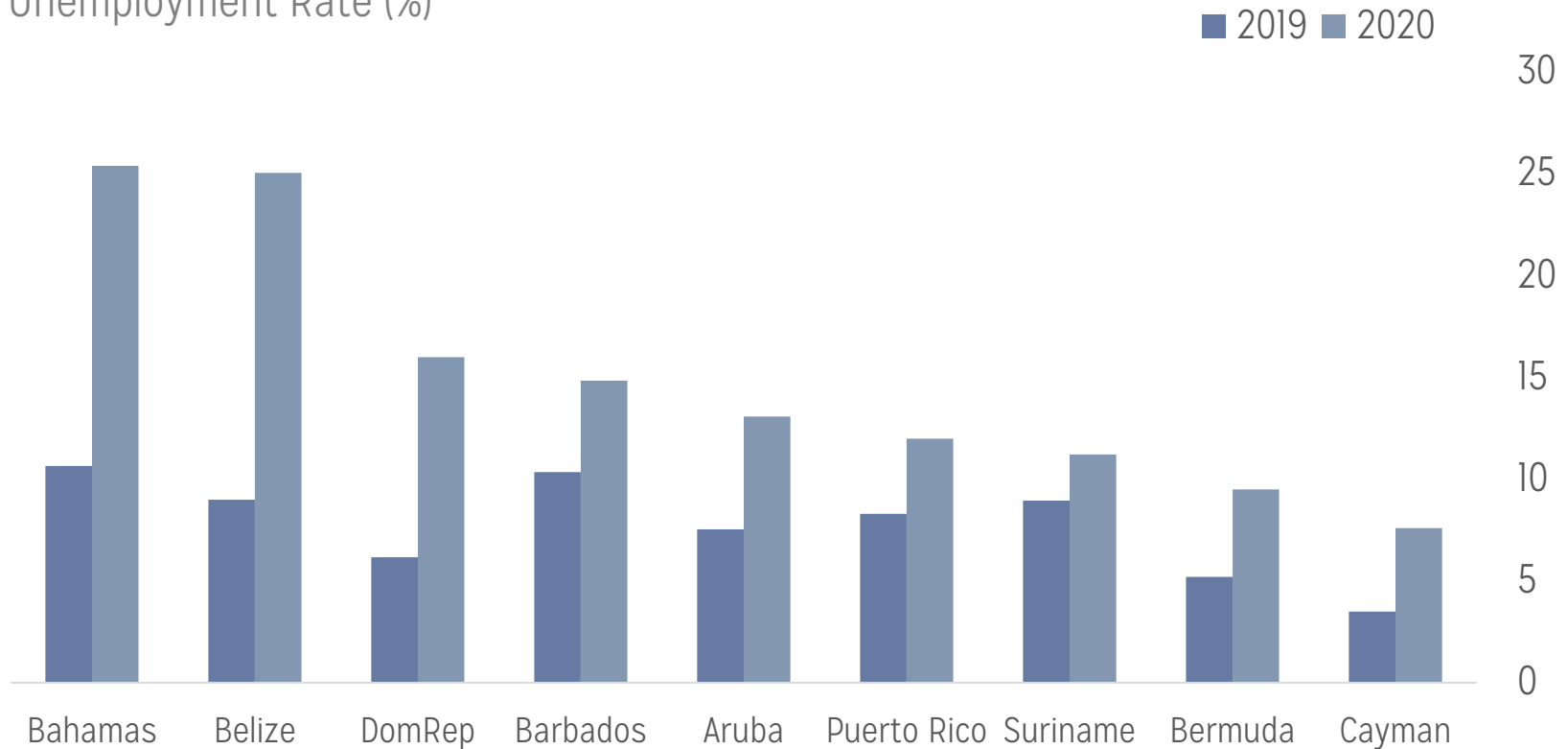
Source: Inter-American Development Bank, Marla Dukharan

Unemployment has skyrocketed, and is likely to persist



Unemployment: Caribbean

Unemployment Rate (%)



Source: International Monetary Fund, various regional Central Banks and Governments, Marla Dukharan



Or we can embrace change and develop a digital ecosystem of services and monetize the digital era.



22% growth
in global VC
investment in
EdTech



Monetizing digital:

- Digital ecosystems > USD60 trillion in corporate revenue by 2025 ~ 30% of total
- 70% of new business value over the next decade will be through digitally enabled platforms.



Frequency of digital
consumer
purchases globally
expected to
increase 160%



48% of employees
will work remotely
at least part time
post-COVID vs 30%
pre-COVID



North American
online retail orders
grew
146% y/y in April

If we embrace gender balance, have a technology bias, and are willing to diversify, we can realize the socio-economic resilience we need and deserve.



1

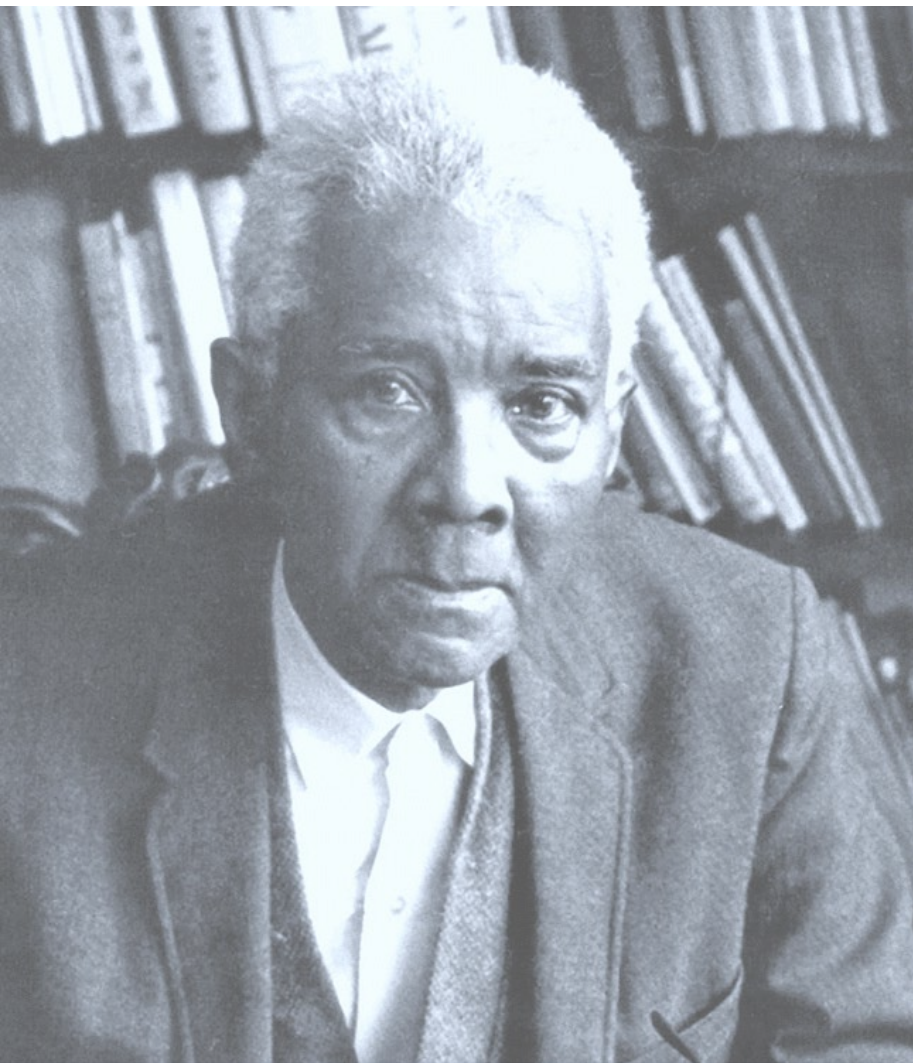
Gender
Balance

2

Innovation &
Diversification

3

Socio-
Economic
Resilience



“Nobody knows what the Caribbean population is capable of. Nobody has ever attempted to find out.”

-C.L.R. James
The Birth of a Nation