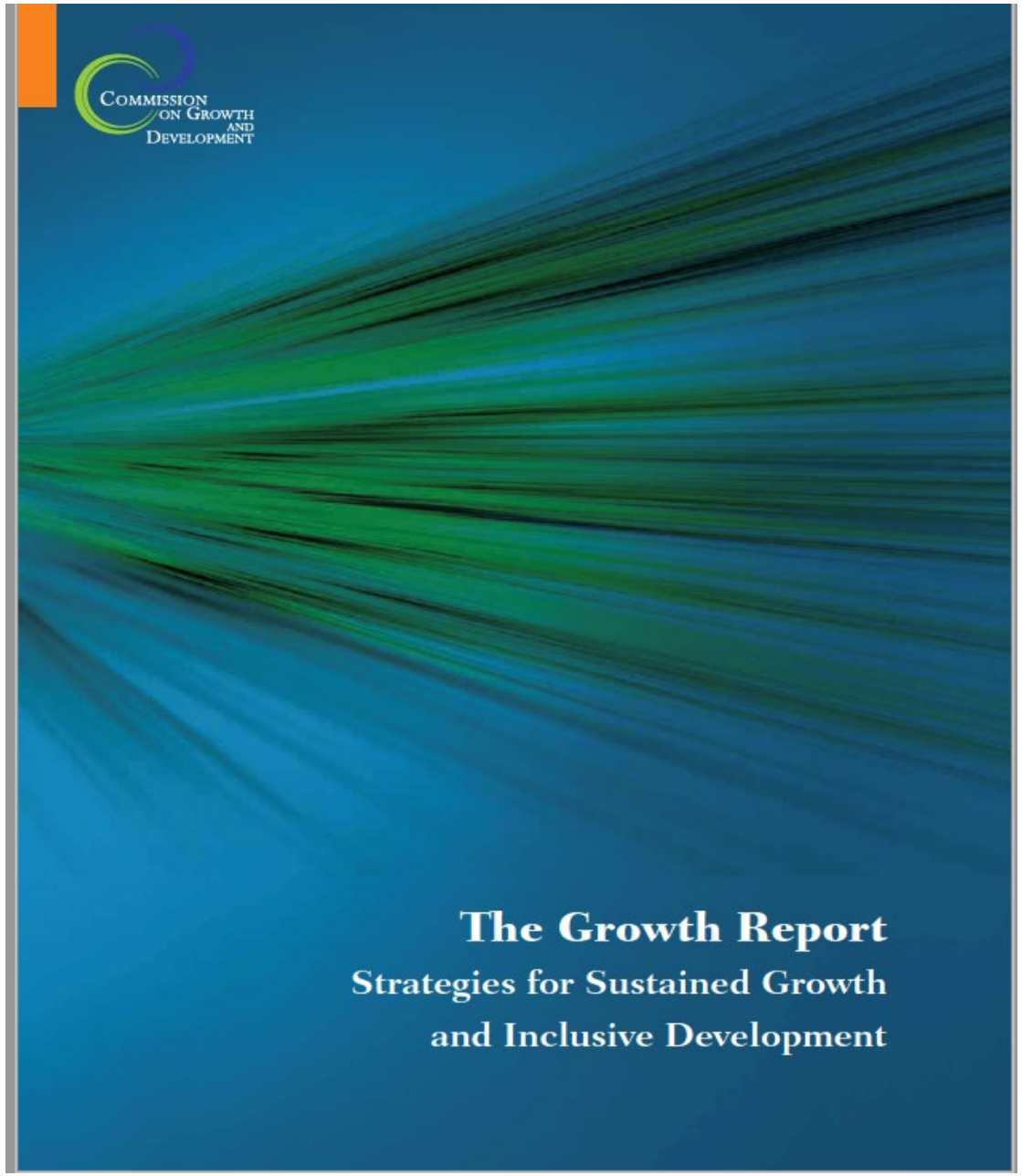
The Global Economy in the Next Generation: The Growth Report at 15

Michael Spence

Asian Monetary Policy Forum

May 2023


Commission on Growth and Development
The Growth Report
Strategies for Sustained Growth
and Inclusive Development

Members of the Commission on Growth and Development

Montek Singh Ahluwalia, Deputy Chairman, Planning Commission, Government of India, New Delhi
Edmar Bacha, Director, Casa Das Garças Institute for Economic Policy Studies, and Senior Adviser, Banco Itaú BBA, Brazil; former Senior Adviser to the Minister of Finance in the implementation of the "Plano Real," and former President of the National Development Bank (BNDES)
Dr. Boediono, Governor, Bank Indonesia; former Coordinating Minister for Economic Affairs, Professor of Economics, Gajah Mada University, Indonesia
Lord John Browne, Managing Director, Riverstone Europe LLP; former CEO of British Petroleum p.l.c., United Kingdom
Kemal Derviş, Administrator, the United Nations Development Programme; former Minister for Economic Affairs and the Treasury, Turkey
Alejandro Foxley, Minister of Foreign Affairs; former Minister of Finance, Chile
Goh Chok Tong, Senior Minister in Cabinet and Chairman, Monetary Authority of Singapore; former Prime Minister, Singapore
Han Duck-soo, Former Prime Minister, Former Deputy Prime Minister, and Former Minister of Finance and Economy, the Republic of Korea
Danuta Hübner, Commissioner for Regional Policy, European Commission; former United Nations Under-Secretary General and Executive Secretary of the UN Economic Commission for Europe; former roles in the Polish government: Polish Minister for European Affairs, Minister for European Integration and Deputy Minister for Foreign Affairs, Minister–Head of the Chancellery of the President of the Republic of Poland, Deputy Minister for Trade and Industry
Carin Jämtin, Former Minister for International Development Cooperation, Sweden
Pedro-Pablo Kuczynski, Former Prime Minister and former Minister of Economy and Finance, Peru
Danny Leipziger, Vice President for Poverty Reduction and Economic Management, the World Bank Group; Commission Vice Chair
Trevor Manuel, Minister of Finance, South Africa
Mahmoud Mohieldin, Minister of Investment, Arab Republic of Egypt
Ngozi N. Okonjo-Iweala, Managing Director, the World Bank Group; former Minister of Finance and Foreign Affairs, Nigeria
Robert Rubin, Chairman of the Executive Committee, Citigroup Inc.; Former Secretary of the Treasury, United States
Robert Solow, Nobel Laureate in Economics; Institute Professor Emeritus, Massachusetts Institute of Technology, United States
Michael Spence, Nobel Laureate in Economics; Professor Emeritus, Stanford University; Commission Chair, United States
Sir K. Dwight Venner, Governor, Eastern Caribbean Central Bank, St. Kitts and Nevis
Ernesto Zedillo, Former President of Mexico; Director, Yale Center for the Study of Globalization, United States
Zhou Xiaochuan, Governor, People's Bank of China

57701

COMMISSION ON GROWTH AND DEVELOPMENT

WORKING PAPER NO.1

Perspectives on Growth: A Political-Economy Framework

Lessons from the Singapore Experience

Tan Yin Ying
Alvin Eng
Edward Robinson

Perspectives on Growth: A Political-Economy Framework

MAS Staff Paper No. 47

Abstract

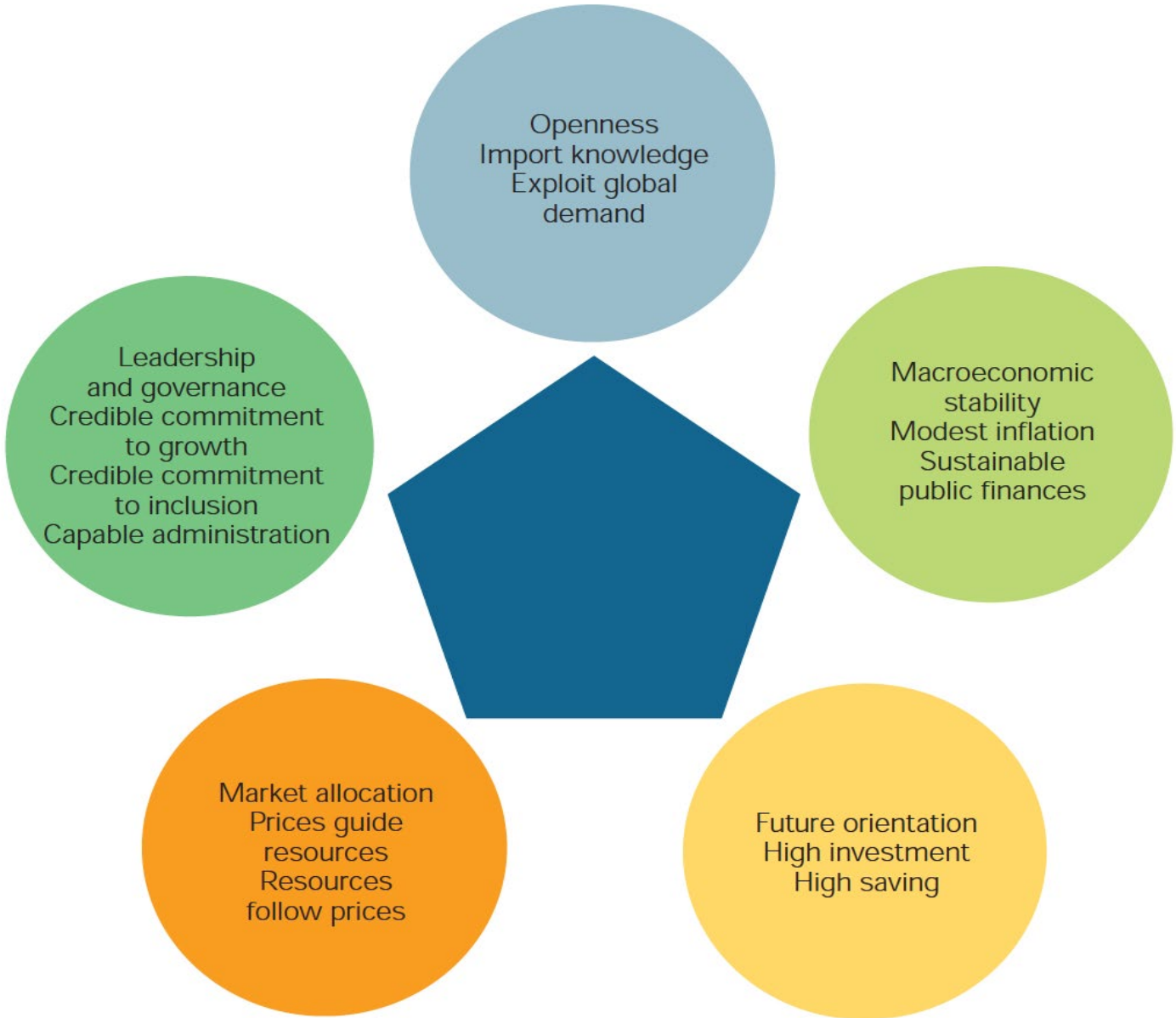
With the evolution of neoclassical growth models, it became increasingly evident that factor accumulation alone was insufficient for sustained growth. Empirically, the growth experience of many countries and the numerous extensive cross-country regressions provided evidence that good policies and sound institutions were important factors in explaining divergent economic outcomes. These factors were playing a significant role in building and sustaining the momentum for growth.

This paper attempts to develop a framework that matches a country's growth performance to a set of qualitative variables, with particular emphasis on political-economy variables covering institutions and geography. We find that rich natural endowments do not guarantee prosperity; rather, indicators measuring institutional and leadership quality matter to growth performance. Political ideologies and systems notwithstanding, strong institutions and capable leaders are relevant in (a) formulating good, pro-growth policies, (b) implementing these policies, and (c) building social consensus, which allows a country's population to be aligned with pro-growth policies. Taken together, these factors shed some insights into the art of policy making for pro-growth outcomes. The paper also illustrates the relevance of these factors in Singapore's own growth development experience over the past 40 years.

Table 1 13 Success Stories of Sustained, High Growth

Economy	Period of high growth**	Per capita income at the beginning and 2005***	
Botswana	1960–2005	210	3,800
Brazil	1950–1980	960	4,000
China	1961–2005	105	1,400
Hong Kong, China*	1960–1997	3,100	29,900
Indonesia	1966–1997	200	900
Japan*	1950–1983	3,500	39,600
Korea, Rep. of*	1960–2001	1,100	13,200
Malaysia	1967–1997	790	4,400
Malta*	1963–1994	1,100	9,600
Oman	1960–1999	950	9,000
Singapore*	1967–2002	2,200	25,400
Taiwan, China*	1965–2002	1,500	16,400
Thailand	1960–1997	330	2,400

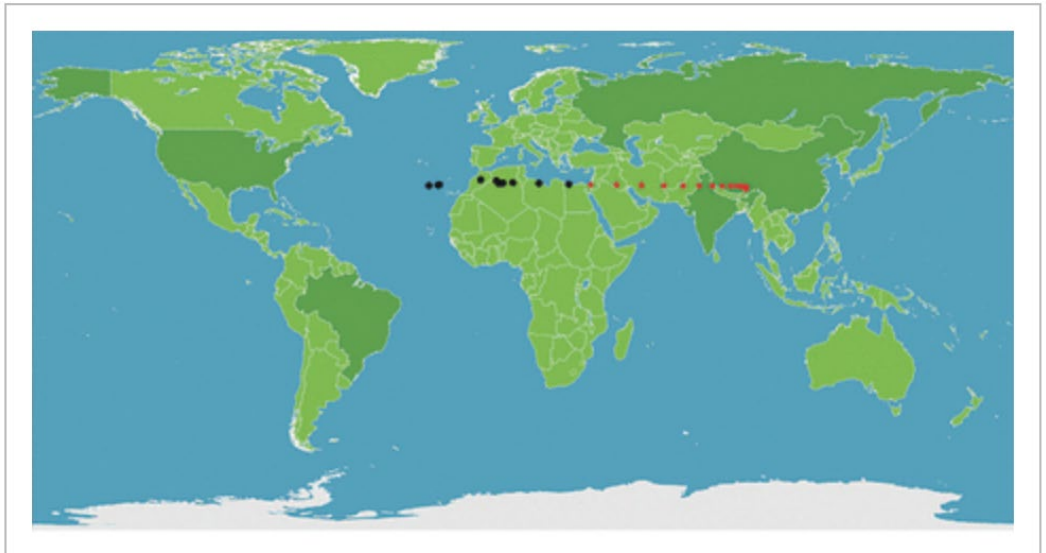
Figure 2 The Common Characteristics of High, Sustained Growth



Reflections: we knew it would become dated and indeed it has

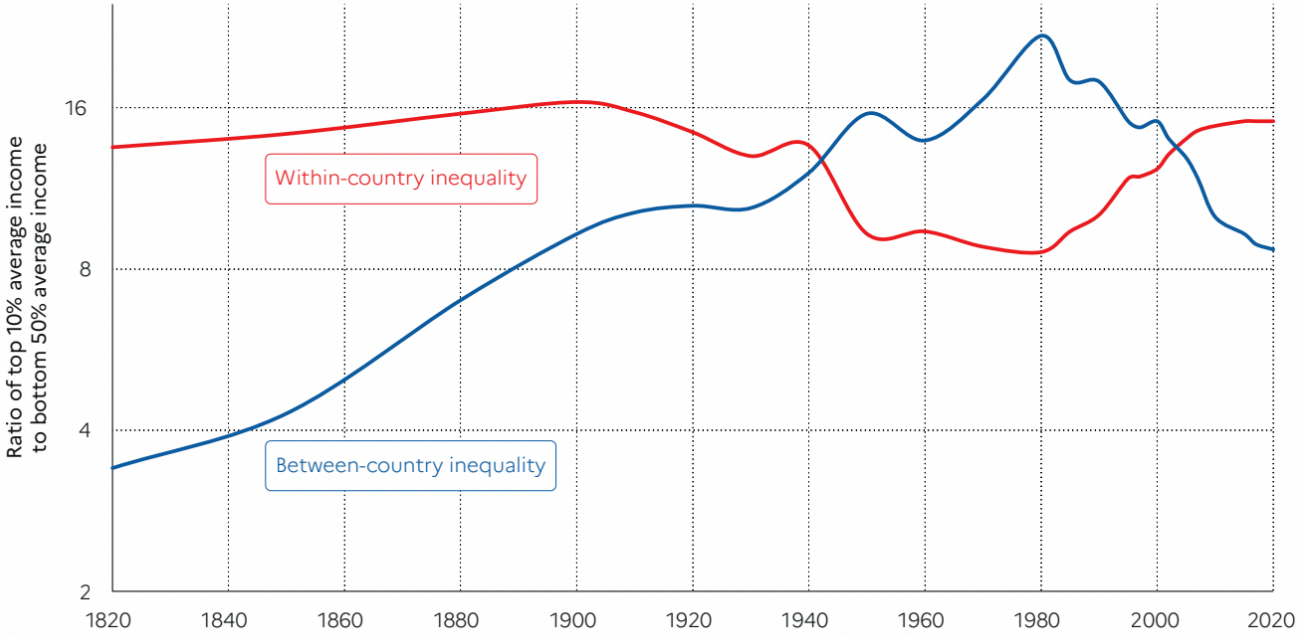
- Low to middle income transition
- The Shift of the COG of the global economy to the east and to Asia
- Climate change – we knew it was coming – now it is here
  - Awareness dramatically higher now
- Fragmentation and partial dismantling of the Post WW II system
- The digital transformation and biomedical and life sciences revolution
- Global explosion of science and tech related entrepreneurial activity
- The end of a multi-decade period of deflationary forces and demand constrained growth to supply constrained growth

Danny Quah



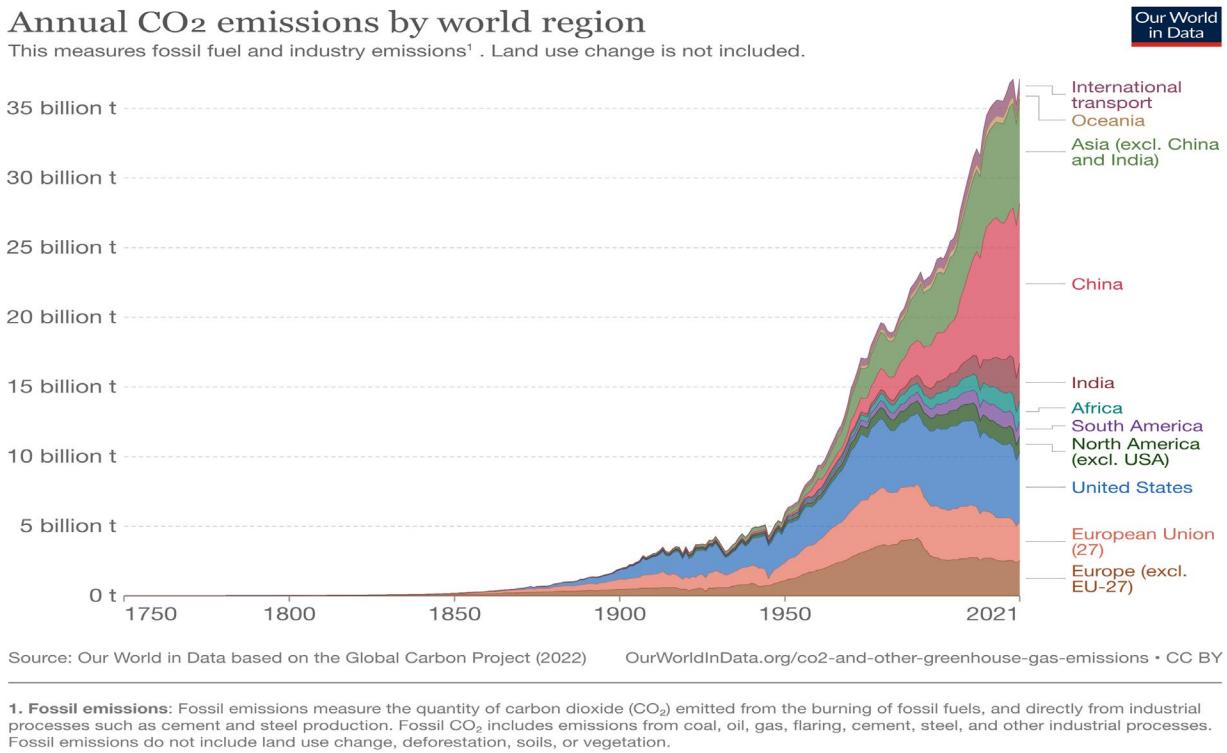
Evolution of Income Inequality: Top 10% to Bottom 50%

Figure 2.4 ***Global income inequality: Between-country vs Within-country inequality (ratio T10/B50), 1820-2020***



Interpretation: *Between-country inequality, as measured by the ratio T10/B50 between the average incomes of the top 10% and the bottom 50% (assuming everybody within a country has the same income), rose between 1820 and 1980 and has since strongly declined. Within-country inequality, as measured also by the ratio T10/B50 between the average incomes of the top 10% and the bottom 50% (assuming all countries have the same average income), rose slightly between 1820 and 1910, declined between 1910 and 1980, and rose since 1980. Income is measured per capita after pensions and unemployement insurance transfers and before income and wealth taxes.* ***Sources and series:*** *wir2022.wid.world/methodology and Chancel and Piketty (2021).*

Sustainability Challenge



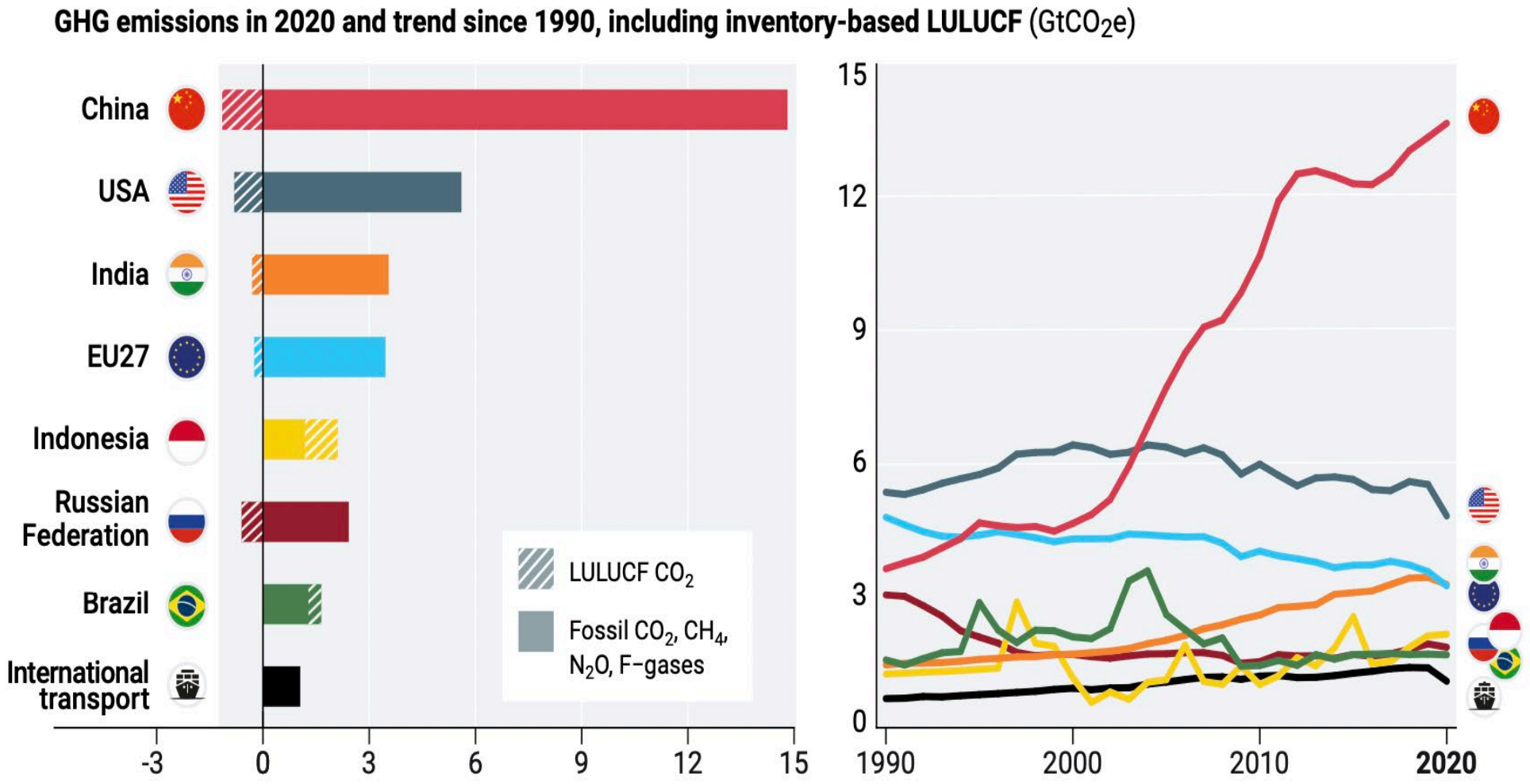
1. Fossil emissions: Fossil emissions measure the quantity of carbon dioxide (CO_2) emitted from the burning of fossil fuels, and directly from industrial processes such as cement and steel production. Fossil CO_2 includes emissions from coal, oil, gas, flaring, cement, steel, and other industrial processes. Fossil emissions do not include land use change, deforestation, soils, or vegetation.

Top Emitters

Top Emitters (*Billions of tons of CO2 per Year)

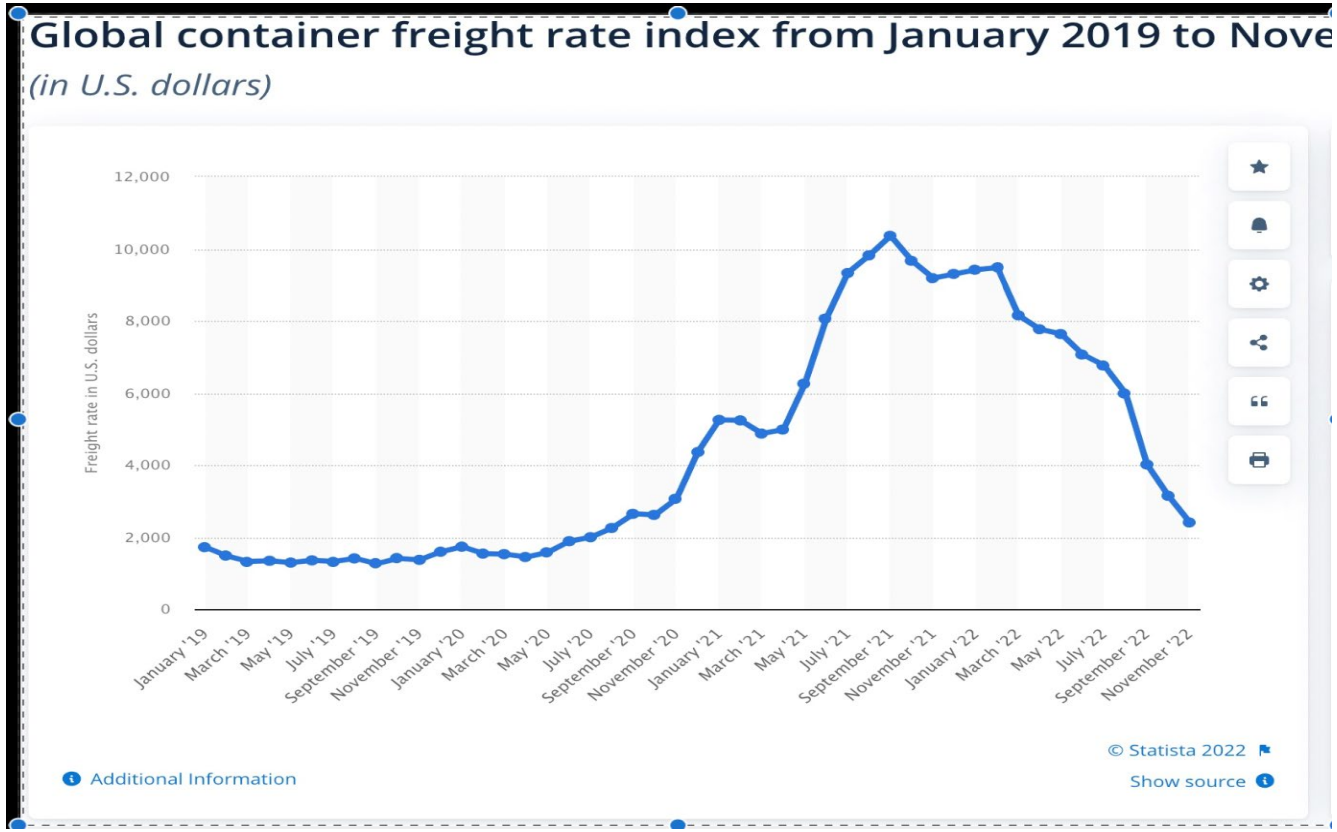
	TOTAL*	PER CAPITA
·China	10.20	7.3
·USA	5.30	15.6
·EU	5.40	9.8
·Canada/Mexico	1.20	10.0
·India	2.60	1.9
·Japan	1.10	5.5
·World	36.60	4.9
Percentage of top 6		%

Peaks and Growth in CO2 Emissions



The Transitory Mistake

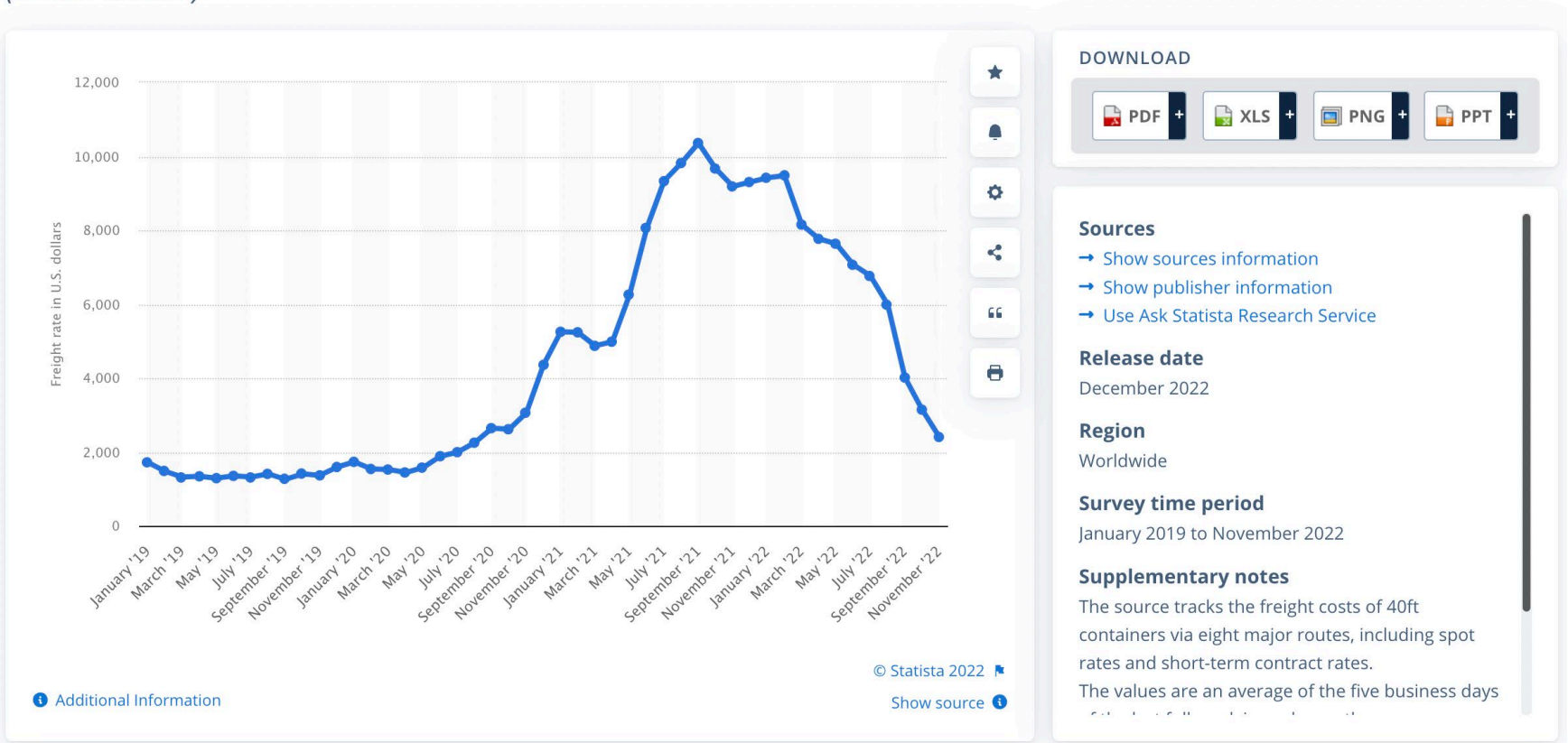
- Supply chain imbalances and bottlenecks
- Pandemic closures
- China Zero-Covid



Transitory Supply Constraints

Global container freight rate index from January 2019 to November 2022

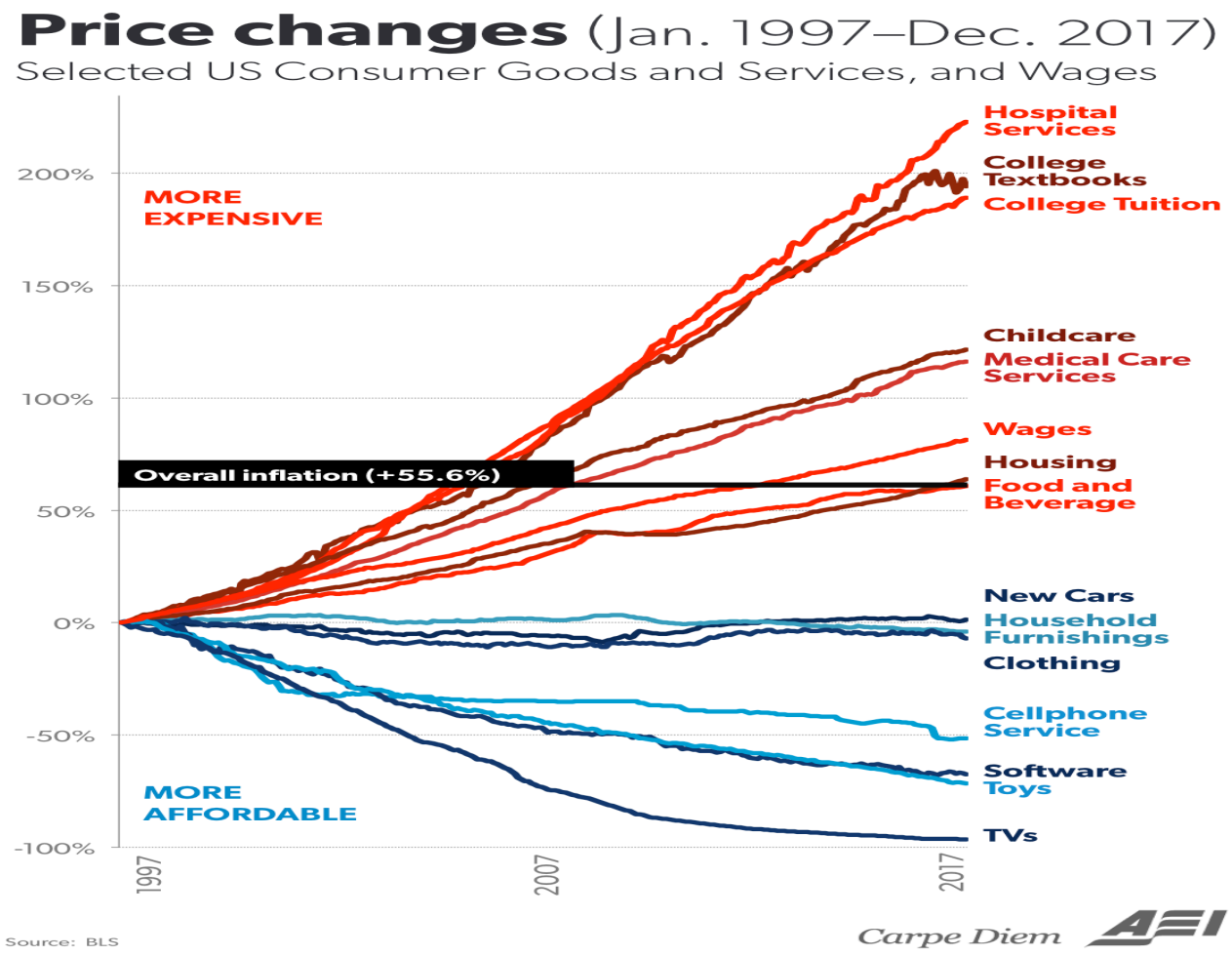
(in U.S. dollars)



Secular Supply Conditions

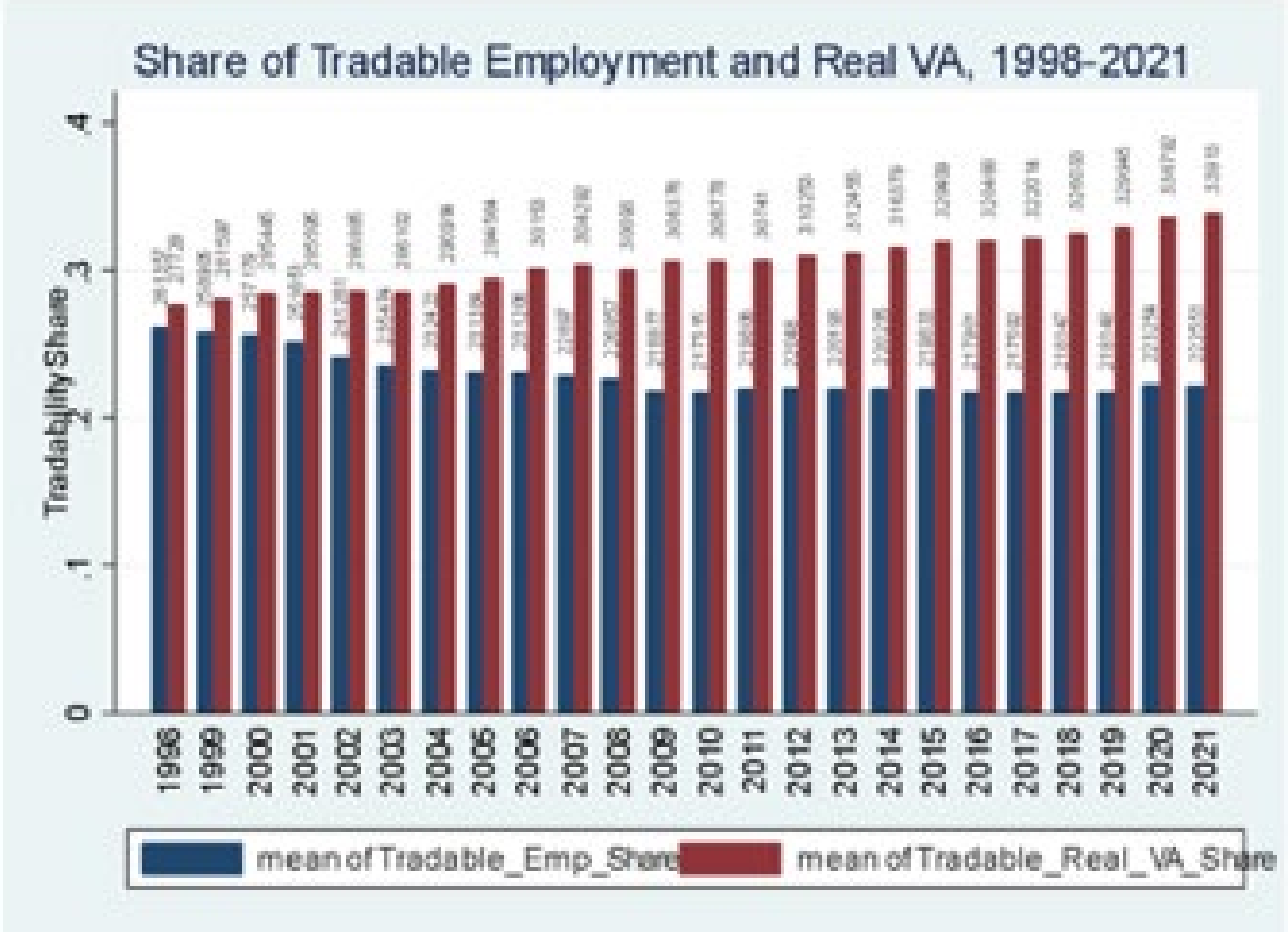
- After 40 plus years of essentially demand constrained growth
- Shift to a supply constrained growth
- Lewis turning point in the global economy
- Aging
- Shocks and Diversification
- Public Debt – in an inflationary rising interest rate period
- Declining productivity trends
- Major sectors resistant to digitally enabled productivity growth
- Geo-political tensions and fragmentation
- Permanent increase in real interest rate
- Asset price reset
- Major shifts in labor market conditions
  - Labor shortages
- Industrial concentration and questions about competition

Long Period of Deflation

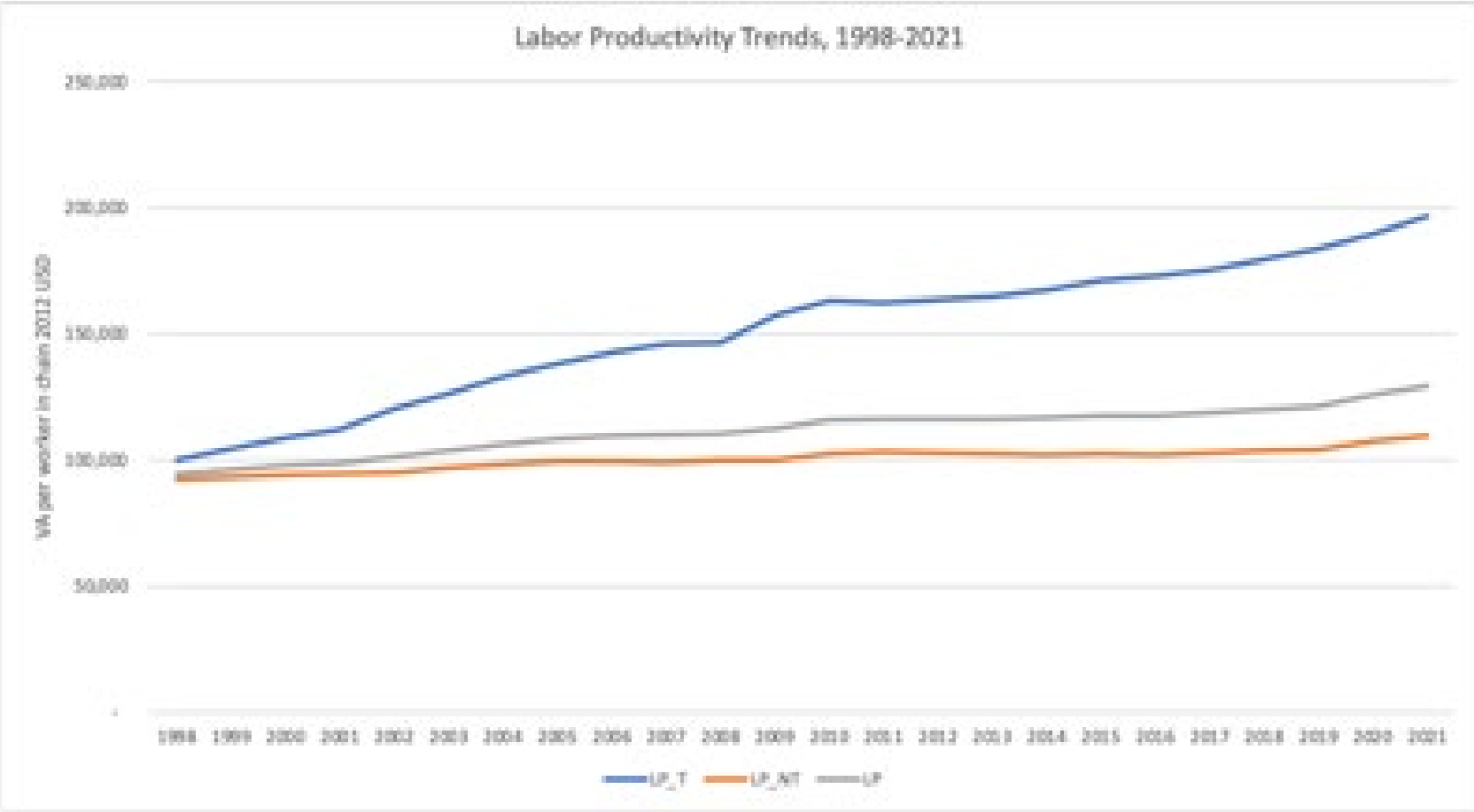


Over all 2.2%

Structure of Advanced Economy



Supply Constraints and Productivity



- For nontradable, labor productivity per worker went from 92,201 in 1998 to 104,034 in 2019 while labor productivity grew from 99,976 in 1998 to 183,601 in 2019 for tradables, That's a 0.57% and 2.94% average annual growth rate for nontradables and tradables, respectively.

The Non-Tradable Sector

- 80% of employment
- Low productivity growth
- Rising real relative costs
- Big employment sectors: government, education, health, traditional retail, hospitality
  - 45% to total employment in the US economy – or 56% of nontradable employment
- There is essentially no chance of inclusive growth if these sectors remain productivity backwater

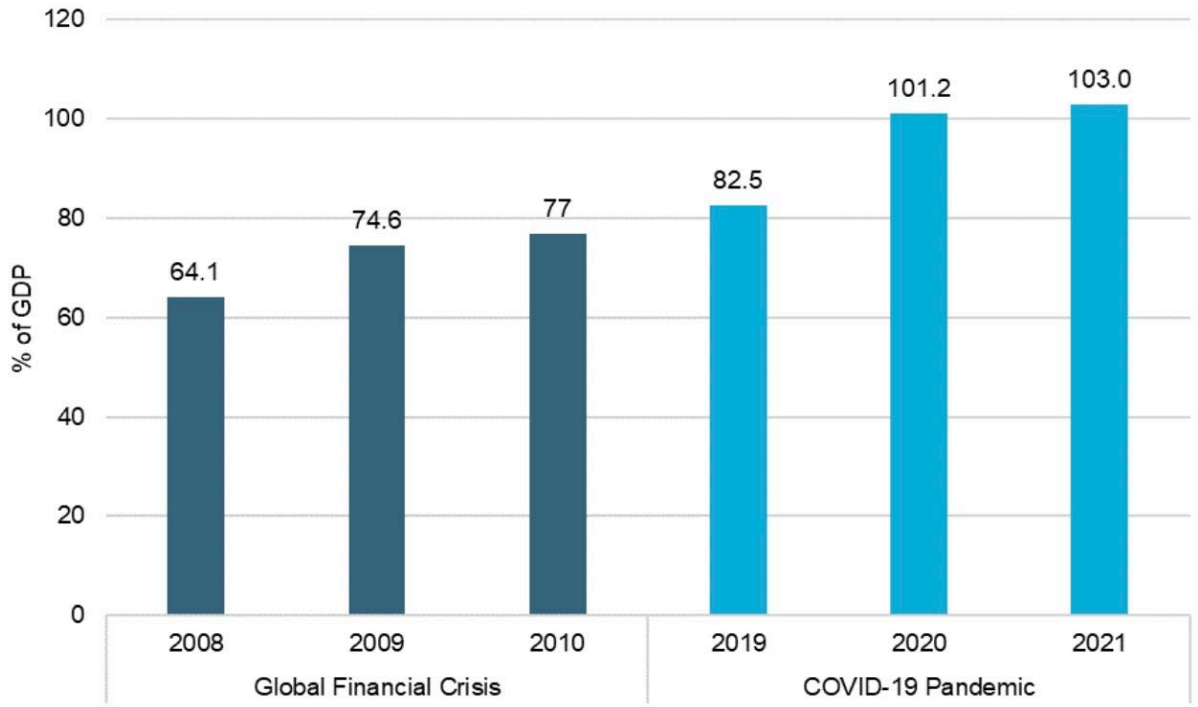
Aging, Labor Supply, Dependency Ratios and Demand

	GDP 2021 (BILLIONS $)	POPULATION (MILLIONS)
WORLD GDP	94.9	8000
AGING COUNTRIES/REGIONS		
EUROPE	23.5	746
USA	22.9	332
CHINA	16.9	1300
JAPAN	5.1	125
CANADA	2.1	38
AUSTRALIA	1.6	26
NEW ZEALAND	0.25	5
RUSSIA	1.65	143
TOTAL - AGING COUNTRIES	74	2715
% OF THE GLOBAL ECONOMY AGING - BY GDP AND POPULATION	78	34

Sovereign Debt

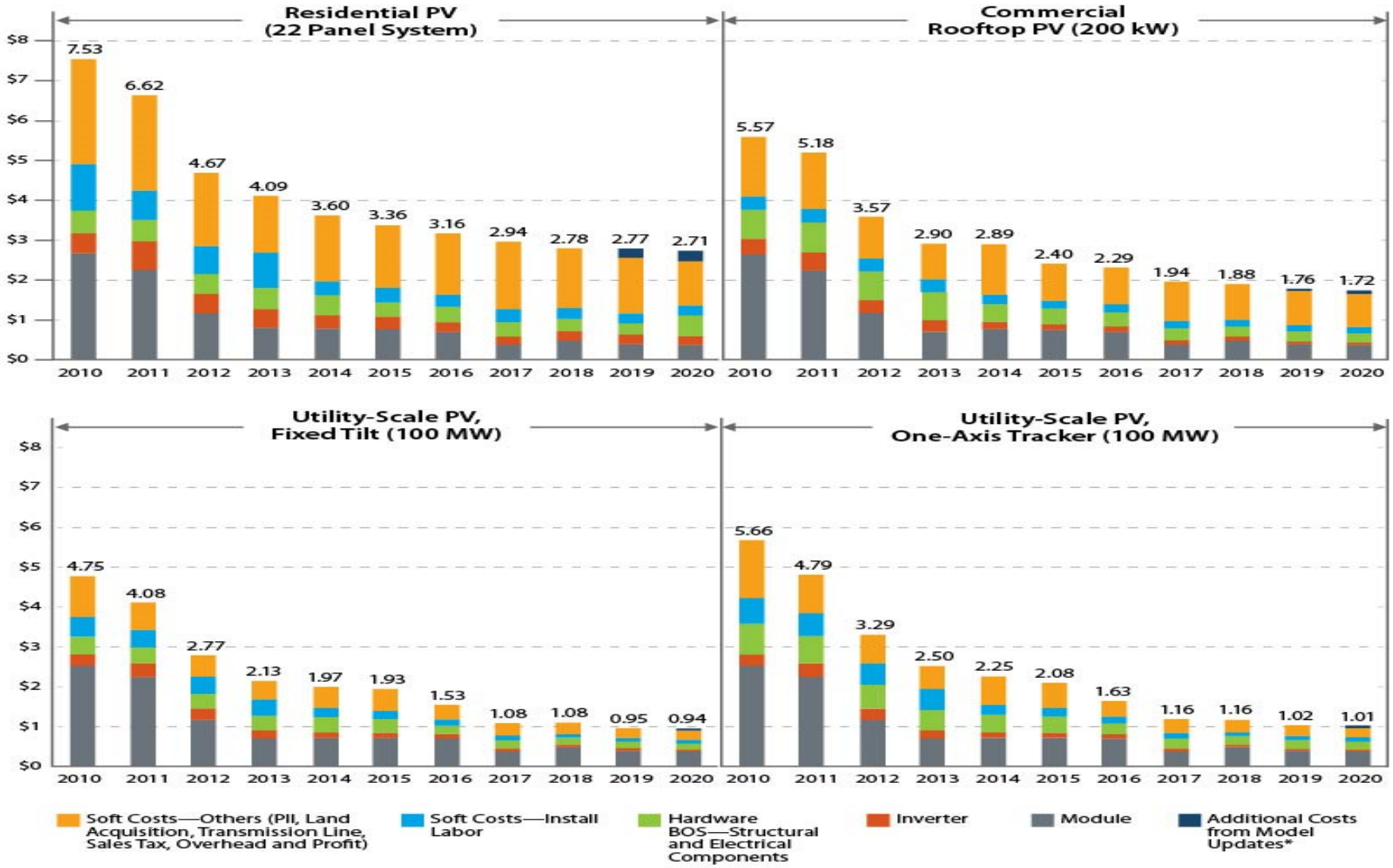
Sovereign Debt From GFC Through the Pandemic

Global Public Debt as a Percentage of GDP 2008-2010/2019-2021



Major Transformations

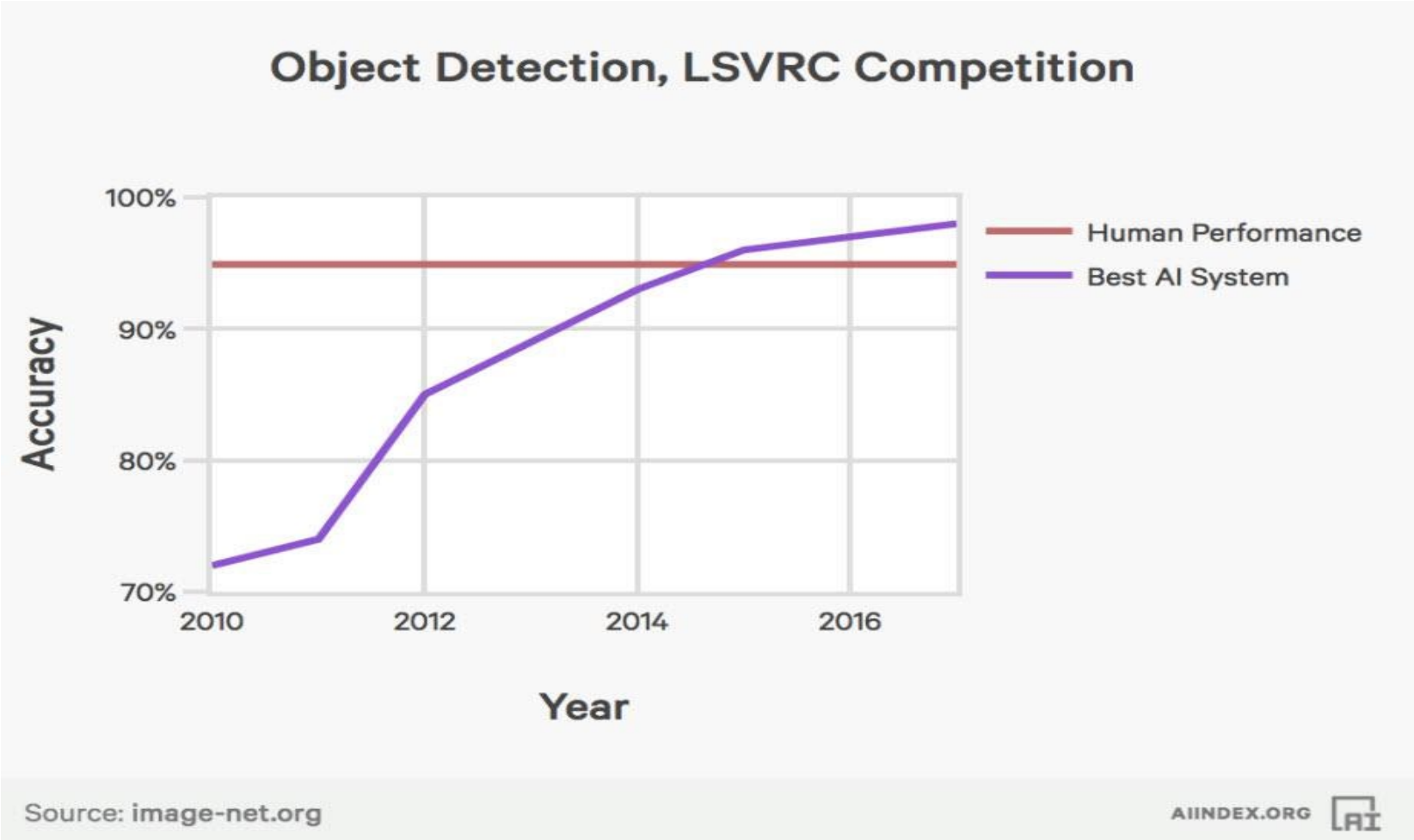
Solar Costs


Residential PV (22 Panel System)
Commercial Rooftop PV (200 kW)
Utility-Scale PV, Fixed Tilt (100 MW)
Utility-Scale PV, One-Axis Tracker (100 MW)
$0
$1
$2
$3
$4
$5
$6
$7
$8
7.53
6.62
4.67
4.09
3.60
3.36
3.16
2.94
2.78
2.77
2.71
5.57
5.18
3.57
2.90
2.89
2.40
2.29
1.94
1.88
1.76
1.72
4.75
4.08
2.77
2.13
1.97
1.93
1.53
1.08
1.08
0.95
0.94
5.66
4.79
3.29
2.50
2.25
2.08
1.63
1.16
1.16
1.02
1.01
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Soft Costs—Others (PII, Land Acquisition, Transmission Line, Sales Tax, Overhead and Profit)
Soft Costs—Install Labor
Hardware BOS—Structural and Electrical Components
Inverter
Module
Additional Costs from Model Updates*

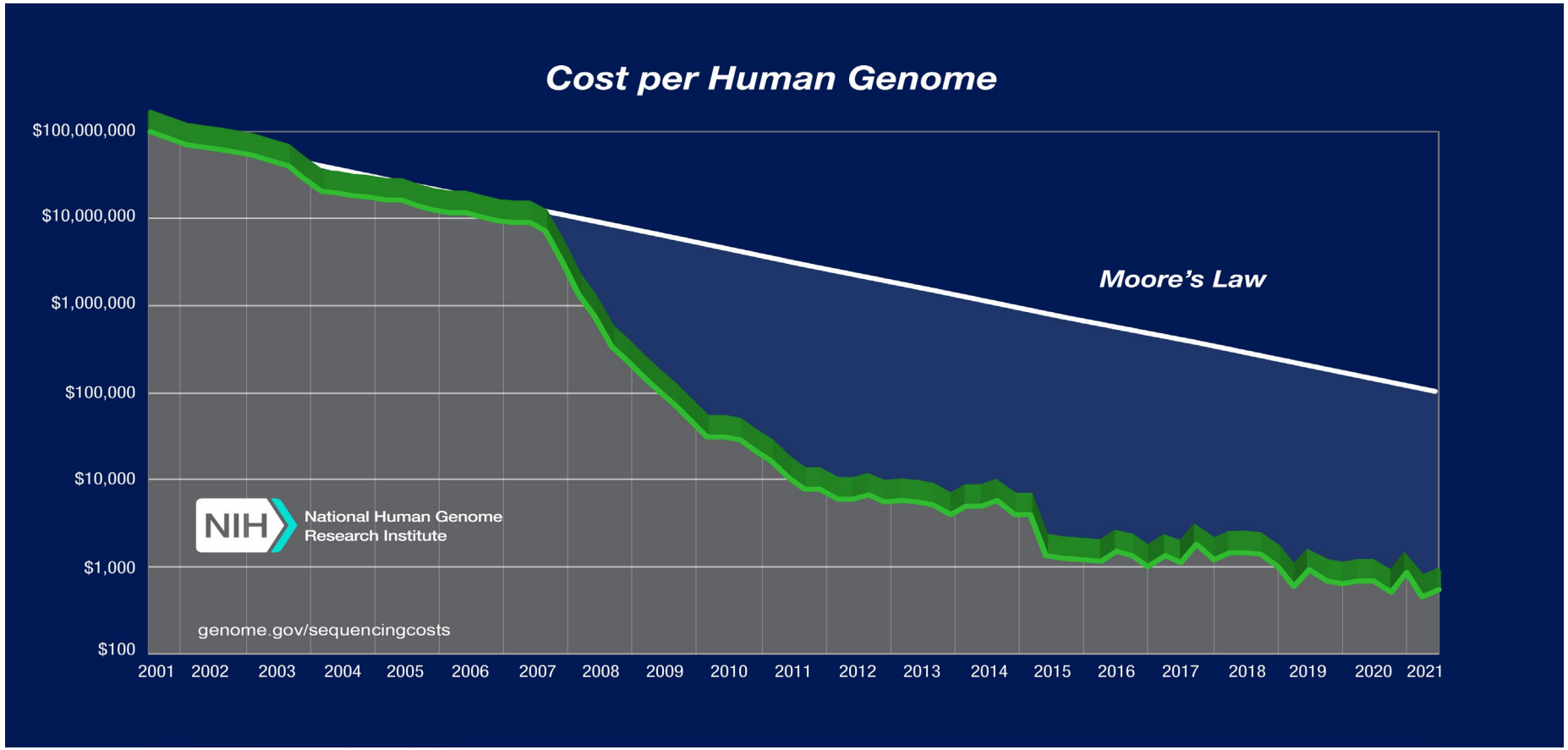
3D Structure of Proteins DeepMind

An artificial intelligence (AI) network developed by Google AI offshoot DeepMind has made a gargantuan leap in solving one of biology's grandest challenges – determining a protein's 3D shape from its amino-acid sequence.

Image Recognition



DNA Sequencing



Gene Editing

Emmanuelle **Charpentier** and Jennifer **Doudna**

How DNA defects can be edited out

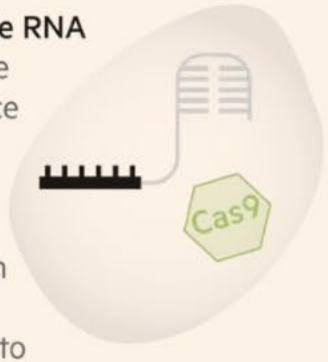
The Crispr-Cas9 technique can fight sickness at its source

1

Scientists identify a defective DNA strand to be cut out and modified

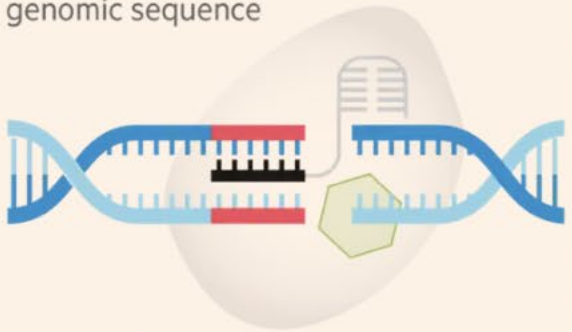
2

They create **guide RNA** that has the same genomic sequence as the defective DNA. This is combined in a cell with a protein called Cas9 that acts like scissors to cut the defective DNA



3

The **guide RNA** finds the matching genomic sequence



Then the Cas9 cuts the strand making a break in the DNA helix

4

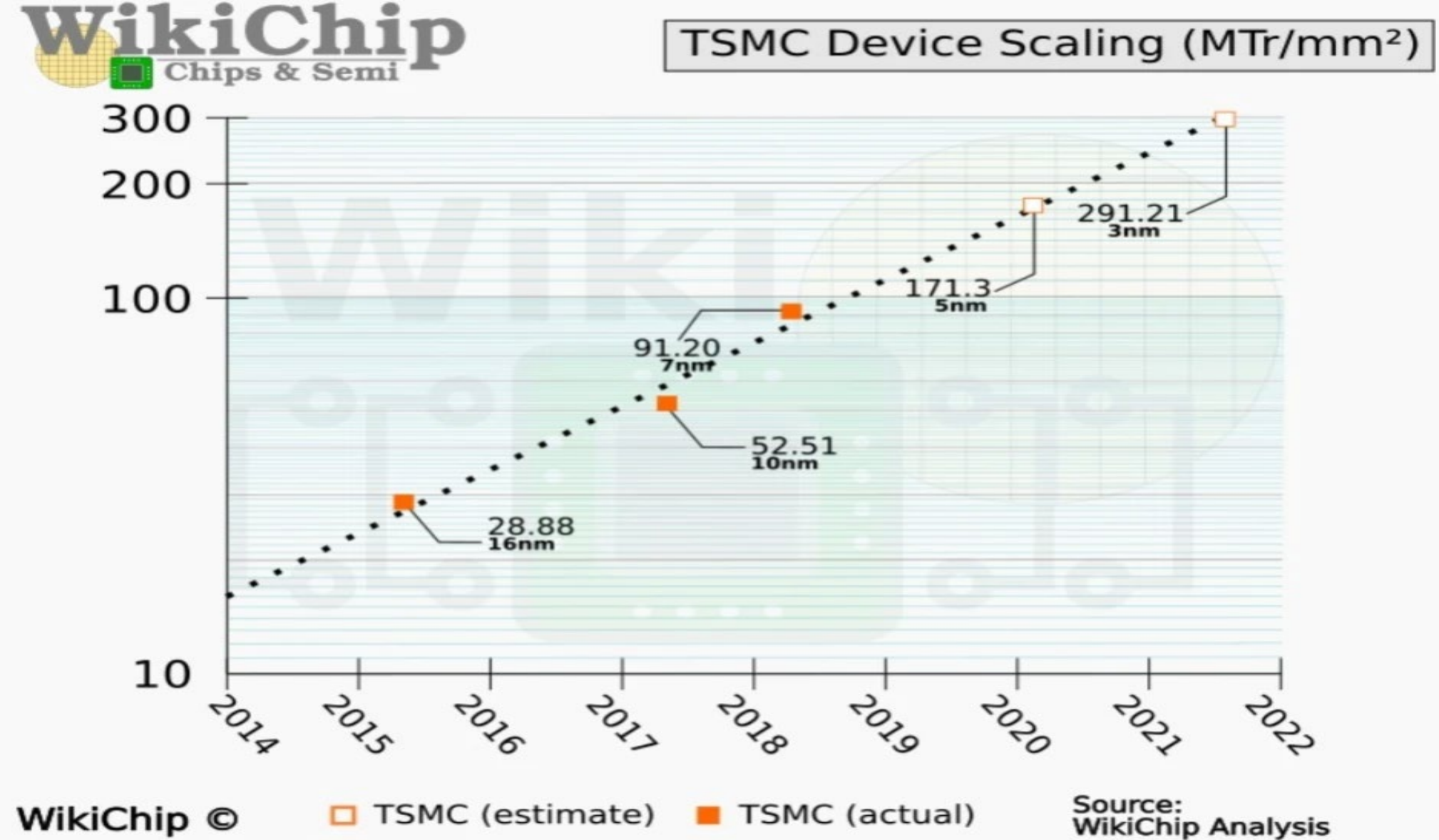
Cells are able to detect and repair broken DNA. A healthy strand of DNA is inserted at the cut site and enzymes repair it

Cell repair systems can use a piece of complimentary DNA, called a template. Scientists can add beneficial changes to the template, such as correcting a disease-causing mutation

Source: FT research

Globalization of Tech Entrepreneurial Activity

Semiconductor Evolution



Digital Transformation

- eCommerce
- Mobile Payments and fintech
- Data as the new collateral
- Secure Digital identity
- Healthcare and inclusive growth patterns
- Ambient Intelligence

ChatGPT

MS

How will Singapore evolve in the next decade?

‹ 2 / 2 ›

Predicting the future evolution of a city like Singapore over the next decade is inherently speculative. However, based on current trends and initiatives, here are some potential areas of development and changes that may occur in Singapore:

1. Sustainable and Smart City: Singapore has been actively working towards becoming a sustainable and smart city. Over the next decade, we can expect further advancements in areas such as green infrastructure, renewable energy adoption, waste management, and efficient urban planning. The city-state will likely continue investing in technology and data-driven solutions to enhance livability, efficiency, and environmental sustainability.
2. Digital Transformation: Singapore has been at the forefront of digital transformation efforts, and this trend is expected to continue. The city will likely see increased integration of technology into various sectors, including finance, healthcare, logistics, and transportation. Initiatives such as the Smart Nation vision will further drive innovation and digitalization across different aspects of daily life.
3. Innovation and Start-up Ecosystem: Singapore has cultivated a vibrant start-up ecosystem in recent years, and this trend is likely to continue. The government will likely provide further support through funding, infrastructure, and regulatory frameworks to encourage entrepreneurship and attract global talent. Singapore's focus on research and development, coupled with its strong intellectual property protection, will likely foster

4. Aging Population: Like many developed countries, Singapore is experiencing an aging population. To address this demographic shift, there will likely be a greater emphasis on healthcare, elderly care services, and infrastructure that caters to the needs of older adults. Technology-enabled solutions, such as telemedicine and remote monitoring, may play a significant role in delivering healthcare services to the elderly.
5. Connectivity and Transportation: Singapore already has a highly efficient transportation system, but there may be further developments in the next decade. This could include expansion of public transportation networks, the adoption of autonomous vehicles, and increased connectivity between different modes of transport. Efforts to reduce congestion and promote sustainable mobility options are expected to continue.
6. International Collaboration: Singapore has a reputation for being an international hub for business, finance, and trade. In the next decade, the city-state is likely to strengthen its ties with other countries and forge new partnerships. This could involve deeper economic integration, trade agreements, and collaborations in sectors such as technology, research, and innovation.

It's important to note that these predictions are speculative and subject to various factors and uncertainties. Singapore's future evolution will depend on the choices made by its government, the global economic landscape, technological advancements, and other social and geopolitical factors.

Generative AI

- Only the first chapter
- Impact: knowledge economy
  - In terms of jobs and work, think of it as the WFH universe
- A very large productivity surge
  - Some of it (maybe a lot of it) unmeasured
- If the only impact were software/coding, the impact would already be large
- Data and computing power -
- Brynjolfsson et al :
- Breaking the limited domain constraint
- Powerful digital assistants
- Generative AI operating on text, speech, images, video, at the same time, that is in an integrated way – may lead to breakthroughs in robotics
- But that is some distance in the future

Two Stories about Bard:

Inflation

Bengali

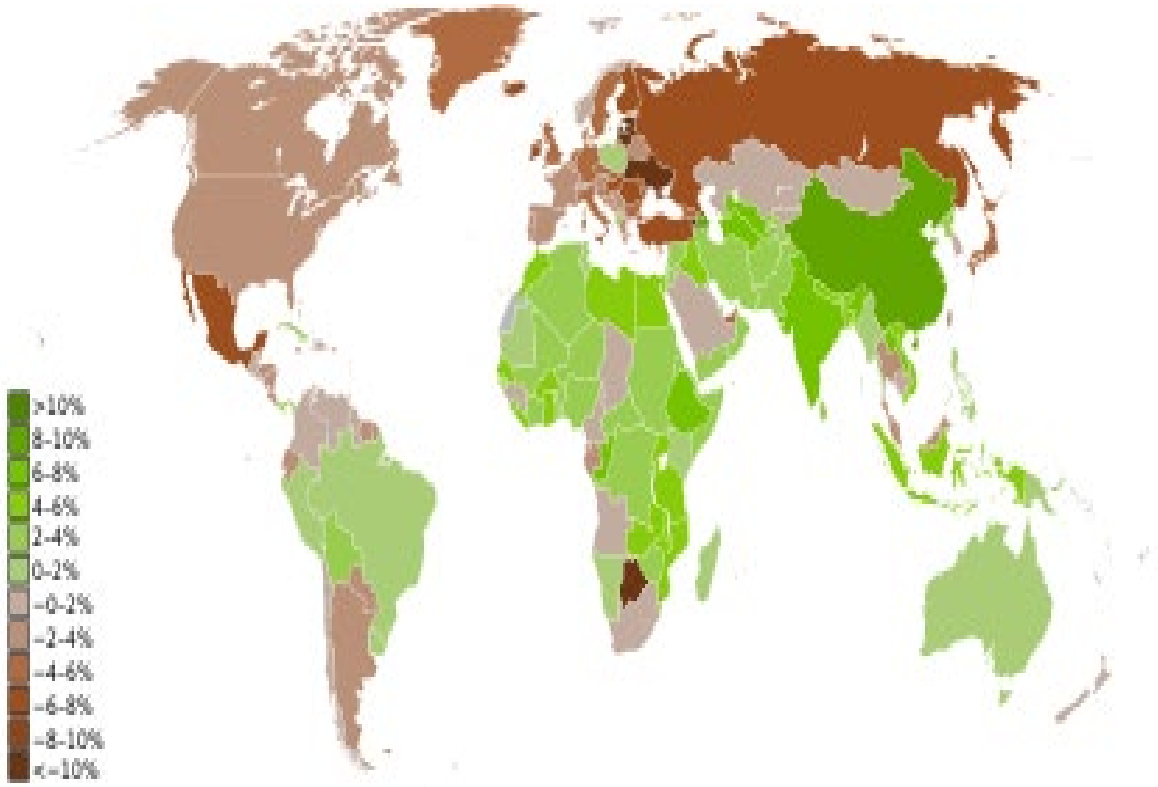
Thank you

Slides: in case there are questions about aspects of growth in the coming decade.

Short Term Implications

2008-2009 Recession - GFC

- Declining global growth
- WB cut forecast for 2023 from 3% (June) to 1.7% (Jan 2023)
- Within shooting distance of a global recession
- Central banks will eliminate the demand/supply imbalance
  - By reducing aggregate demand
  - Harder than it might seem because of “healthy” balance sheets
  - With little help from the supply side



Longer Term

- A kind of stagnation or a surge in productivity and other measures of welfare (not captured in conventional national income accounting)

Clinicians Workflow

- Clinicians spend up to 35% of their time on medical documentation tasks, taking valuable time away from patients.
- Currently, physicians perform documentation during or after each patient visit.
- Some providers use medical scribes to alleviate this burden, resulting in 0.17 more patients seen per hour and 0.21 more relative value units per patient
- Ambient microphones (with AI) could perform a similar task to that of medical scribes.

- In one study, researchers trained a deep-learning model on 14,000 h of outpatient audio from 90,000 conversations between patients and physicians.
- The model demonstrated a word-level transcription accuracy of 80%, suggesting it may be better than the 76% accuracy of medical scribes.
- In terms of clinical utility, one medical provider found that microphones attached to eyeglasses reduced time spent on documentation from 2 h to 15 min and doubled the time spent with patients.

Hurdles To Overcome

- Security of data
- Standards, rules and laws around the management of data
- Privacy is crucial
- “Ownership” is more complicated – and not really the solution
- Data is useful when it is pooled and shared
- Infrastructure (and cost)
- The Jio revolution and digital India
- AI and computing power – for the training of algorithms

Structured and unstructured environments

- This is a big technical challenge
- AI's perform best (now) in structured environments (factory flow, fulfillment center, highways with clear lane markings)
- Kaifu Lee and the gardener.
- We need breakthroughs in AI and Robotics along with VR and AR in order to automate not just routine jobs, but low paying, dangerous, or boring jobs.
- The promise is higher productivity, improved income equity, and often higher quality of delivered services.

What about jobs?

- Less of a concern in a labor shortage environment
- Incentives for labor saving higher in this new environment
- Skills different and the transitions not easy
- Automation and augmentation
  - In the end, automation and mechanization are just augmentation
  - Sure, there is “replacement” in specific tasks
- In my view, to pursue both growth and better distributional outcomes, it is crucial to focus on productivity in the the low productivity (low paying) sectors. And on expanding the reach of digital technologies to these sectors.

Low Income Countries

- Stabilize the finances and fiscal positions
- External financing and risk reduction for investment
  - Climate adaptation and mitigation
  - Digital infrastructure:
    - And they have to get the service provisions and pricing right.
- The Asian growth model may still work for awhile
- But digital will displace labor intensive manufacturing, removing abundant labor as a source of comparative advantage
- The new growth models: have to engage with the rapidly growing trade in services sectors.