



IMF POLICY PAPER

2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON SCENARIO PLANNING

May 2021

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2021 COMPREHENSIVE SURVEILLANCE REVIEW— BACKGROUND PAPER ON SCENARIO PLANNING

EXECUTIVE SUMMARY

Scenarios are narratives manufactured to illustrate how an unpredictable future might play out. Three scenarios set in 2030 illustrate plausible futures that are relevant for economic surveillance. There is no baseline scenario or assessment of relative likelihoods. There is no preferred scenario because the set was constructed to illustrate potential economic policy challenges and tradeoffs. For example, the scenarios allow for the possibility that the role of governments is further diminished; a re-evaluation of the relative importance of growth and non-economic goals; or that an information revolution will be both a boon and a bane.

In the Corporationals scenario, corporations with extensive global footprints have used technology to assume the provision of services previously performed by governments but with unequal benefits and volatile capital flows. In Planet Protectionism, poorly designed unilateral protectionist actions have amplified a negative aggregate supply shock as countries grapple with the complementarities and tradeoffs between environmental and debt sustainability. In Big Data Building Blocs, the decade's productivity gains from a big-data, 5G-fueled information wave were beginning to taper when a hybrid cyber-physical attack cemented a downshift in the global economy.

To varying degrees, the scenarios illustrate how trends relevant to the surveillance landscape can take on new characteristics and how key uncertainties might play out and how a combination of policies and shocks can compound or alleviate the effects of the initial trends.

The scenario planning exercises help to draw out the surveillance priorities and stress-test the robustness of those priorities to uncertainties in the decade ahead. To inform the two priorities on confronting risks and uncertainties and mitigating spillovers, the scenarios illustrate how different shocks and alternative policy approaches carry their own risks and can have both positive and negative spillovers. The scenarios also illustrate some of the complex economic and non-economic factors that feed into the priority on economic sustainability and demonstrate how resource constraints and changing economic structures underpin the need for a unified policy approach.

*** Disclaimer: There is no baseline or preferred scenario in terms of outcomes or policies. The scenarios and references to regions are only illustrative and do not necessarily represent the views/projections of the IMF, its Executive Board, or management and staff.**

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CONTENTS

INTRODUCTION	4
DETAILED SCENARIOS	8
A. 2030 Global Surveillance Report: Corponationals	8
B. 2030 Global Surveillance Report Planet Protectionism	14
C. 2030 Global Surveillance Report: Big Data Building Blocks	19
CONCLUSION	26
BOXES	
1. The (Lost) Fight Against an Expanding Eco-System	10
2. The Evolution of Green Protectionism	14
3. Linkages Between Environmental and Debt Sustainability	16
4. The Central Bank Response to Stagflation: A Case of Can’t or Won’t?	17
5. The EION Attack	20
6. Country Snapshots of the Information Revolution	22
7. Different Fintech Development Models	22
8. Recent and Potential Early Warning Signals	28
FIGURES	
1. From Scenarios to Strategy	4
2. Scenario Summaries	5
3. Comparison of Key Landscape Outcomes	7

TABLES

1. Policy Room for Maneuver Available to the Traditional Authorities _____	6
2. Scenario Comparison: Surveillance Landscape _____	26
3. Scenario Comparison: Surveillance Priorities _____	29

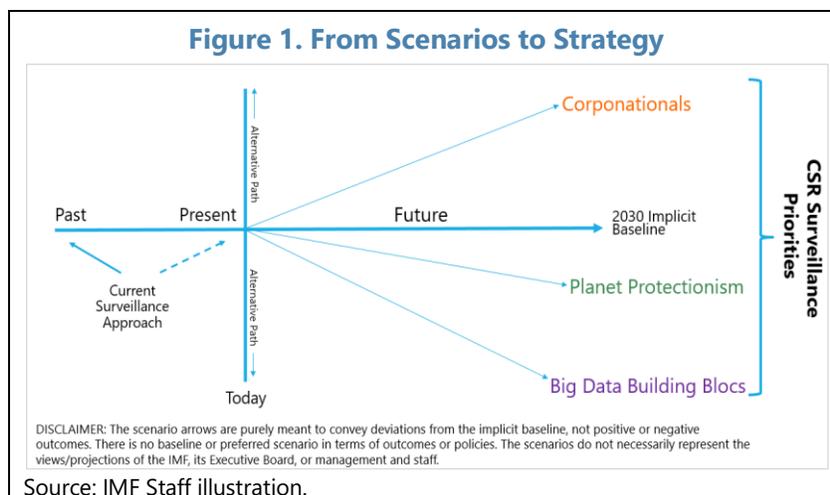
INTRODUCTION

1. Scenarios are narratives manufactured to illustrate how an unpredictable future might play out. They are designed to be challenging and just-about plausible, but they are not predictions of likely risks. Rather than relying on a single implicit forecast of future outcomes, scenario planning allows for the joint consideration of multiple trends and uncertainties. There is no baseline or preferred scenario. Scenario planning has been deployed by governments, the private sector, and international institutions to navigate an uncertain future, and the IMF has regularly applied the

Oxford Scenario Planning Approach (Ramirez and Wilkinson, 2016; Behar, Kostial, and Ramirez, 2018).¹

2. This chapter uses scenario planning to help formulate the surveillance priorities. There are an infinite number of alternatives to the implicit baseline, among which we have constructed three illustrative hypothetical scenarios told from the perspective of 2030 (Figure 1). The scenarios confront the core trends and uncertainties relevant for surveillance in novel and challenging ways and the process helps test the validity of the Fund’s proposed surveillance model in these imagined future states of the world.² Using pre-mortem techniques (Klein, 2007) in workshops with the offices of the Executive Board, members of the Managing Director’s External Advisory Groups, the ISC, and CSR authors, the scenarios helped us to design our CSR surveillance priorities to be more robust for the future.

3. The scenarios bring out potential policy challenges and tradeoffs (see Figure 2). Briefly, the constructed scenarios allow for the possibility that: the role of governments is diminished as firms meet more needs (CorpoNationals); the relative importance of economic growth and other goals is re-evaluated as bad policies make pursuit of environmental sustainability unnecessarily costly (Planet Protectionism); or that an information revolution becomes both a boon and a bane (Big Data Building Blocs). Section 2 provides more details on the scenarios, which are written as alternative Global Surveillance Reports published in 2030.



¹ See Behar and Hlatshwayo (forthcoming); *Strategic Foresight at the IMF: A How-to Note*.

² Participants researched the surveillance landscape and applied those insights in scenario building workshops. Using the inductive method, participants used uncertainty cards describing surveillance landscape possibilities to produce about a dozen mini-scenarios. A subset was selected and combined into three scenarios in order to keep the number cognitively manageable. Characteristics of a good set include novelty relative to an implicit baseline (e.g., the scenario that might materialize if future developments were an extension of currently perceived trends) and clear differences across the scenarios regarding core uncertainties related to surveillance. Nonetheless, some combination of the depicted scenarios could plausibly materialize, and it is therefore appropriate to treat the scenarios as a set.

Figure 2. Scenario Summaries

Corporationals



Global corporations have assumed the provision of services previously performed by governments. The resulting benefits are spread unevenly. The nature and drivers of cross-border investments and spillovers have shifted. Corporates expand into low-income countries and small states, but selectively, leading to uneven convergence.
Risks: rising inequality; global tensions; hidden capital flows; inappropriate technology.

Planet Protectionism



Excessive green protectionism has evolved and become entrenched, amplifying negative aggregate supply shocks including droughts. Although there are tradeoffs, there are also complementarities between environmental and debt sustainability.
Risks: social discontent; global fragmentation; unsustainable debt; inflation.

Big Data Building Blocs



Just as the productivity gains from a big-data, 5G-fueled information wave began to taper off, last year’s hybrid “EION” attack cemented a downshift in the global economy as it hit countries with less data protection and financial regulation the hardest.
Risks: cyberattacks; sluggish growth in regions with stringent regulation / crisis vulnerability in regions with lax regulations.

Sources: Pixabay, stock, and IMF staff illustrations.

4. Constructed contrasts across these scenarios illustrate key lessons in different ways.

Regarding key trends and uncertainties in the surveillance landscape (Figure 3), productivity growth has been weak in Planet Protectionism owing to stagnant technology and other factors that compound the effects of aging but technology and productivity growth are dynamic in Big Data Building Blocs. There has been extensive success in combating climate change in Planet Protectionism, but this was done in a way that caused more fragmentation than in other scenarios. Income inequality rose slightly on balance in Corponationals but fell in Big Data Building Blocs. The latter scenario is the most tech-forward amongst the three scenarios, and considers how different approaches to data privacy might generate different growth regimes. The concluding Section 3 provides tables comparing scenarios' outcomes and lessons for the surveillance priorities, namely confronting risks and uncertainties, mitigating spillovers, fostering economic sustainability, and employing a unified policy approach.

5. The scenarios suggest the strength of countries' policy toolkits may need to be upgraded. For example, fiscal responses to shocks can be constrained by limited tax revenues or adverse debt dynamics, but macroeconomic management is more adept thanks to technological advances. Monetary policy options may expand if targets are more permissive, but fiscal dominance or weak credit channels can undermine the options for reaching such targets. Although capital flow management (CFM) measures may become more widely acceptable, this relies on effective monitoring and control. (Table 1).

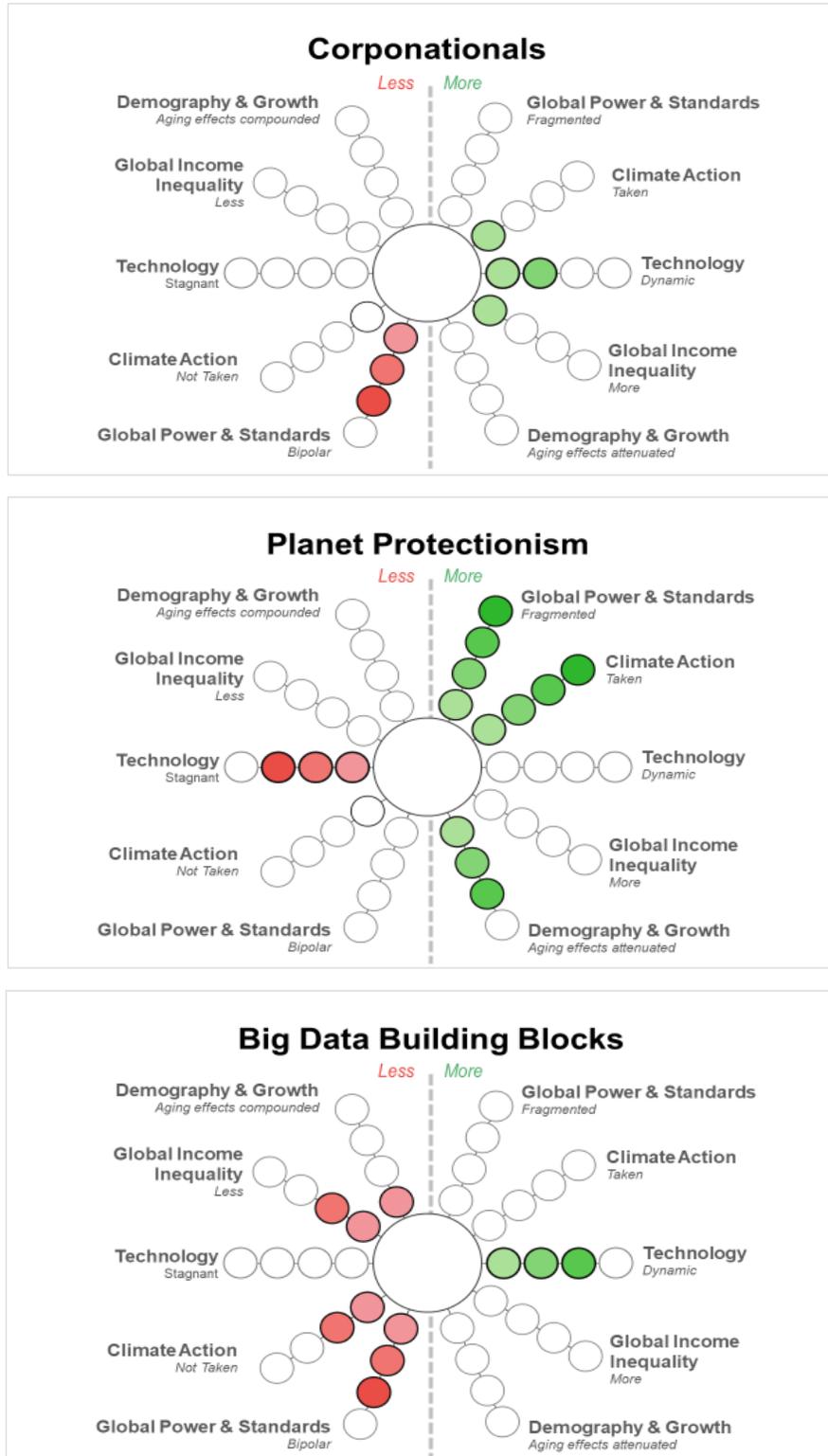
Table 1. Policy Room for Maneuver Available to the Traditional Authorities

	Corponationals	Planet Protectionism	Big Data Building Blocs
Fiscal	Limited tax ↓	Adverse debt dynamics ↓	Technology aids macroeconomic management, but gaps in supervision allow vulnerabilities and eventually crisis. ↑
Monetary-Financial	Weak transmission channel ↓	Targets less rigid but fiscal dominance ?	
External	Unmonitored capital flows; shifts in directionality ↓	Capital controls accepted ↑	

Source: IMF staff.

Note: Arrows indicate whether room has increased or decreased.

Figure 1. Comparison of Key Landscape Outcomes



Source: IMF Staff illustration.

Note: Shading indicates degree to which a trend has increased (more) or decreased (less) but with no normative implications.

DETAILED SCENARIOS

A. 2030 Global Surveillance Report: Corporationals

Corporations with extensive global footprints, both private and state-owned, have assumed the provision of services previously performed by governments. The resulting benefits are spread unevenly within and across countries and there is a shift in the nature and drivers of cross-border investments and spillovers. Corporates expand into low-income countries and small states, but selectively, which leads to uneven convergence.

Corporations are More Influential Than Ever

6. Global growth was 4 percent in 2029 and now well off its earlier peaks. The private Multinational Corporations' (MNC) assumption of services previously performed by governments has started to slow in maturing AE markets, providing less of an impulse to growth than in the past. MNC competition with State-Associated Enterprises (SAEs) has curtailed the growth model of building infrastructure abroad. Both MNCs and SAEs have extensive global footprints. Many have individual cash reserves that exceed those of G7 sovereigns and turnover several times the tax revenue of many emerging markets and some advanced economies.

7. MNCs continue to use artificial intelligence (AI) and automation to expand into new areas. AI is being applied by MNCs to market intelligence, supply-chain management, and other decision-making, while automation is reducing labor costs. Populations continue to benefit from more efficient and effective corporate healthcare, which is an example of the private sector's incursion into what, in many countries, was traditionally the domain of the government. Smaller and service-focused firms continue to find it hard to compete. However, the pace of expansion is slowing. Markets are maturing, and firm entry has been hampered by large-firm dominance and high fixed costs.

8. The SAE-driven lending and FDI bonanza earlier in the decade also served most SAE-host countries well. Mimicking earlier global infrastructure investment programs launched in the 2010s and building on success securing medical supplies and vaccines after the Covid-19 pandemic, some governments and oil exporters sought to export their infrastructure-driven model abroad via SAEs. They were also motivated by resource access (e.g., rare earth metals), diversification, and the desire to keep domestic incomes rising to preserve domestic stability. However, in some projects and countries, economic rationale was accompanied by a desire to project soft power, at times leading to lower returns on investment and more volatility for SAE-funded investments and ventures.

9. The contribution of government to GDP growth continues to be negative. Demand for government services is decreasing in MNC jurisdictions, but the ability to meet that demand is falling even faster. Fiscal buffers did not recover from the 2020-2022 Covid-19 pandemic. Low buffers forced governments in AEs to tolerate and, in some cases, invite advancement of MNCs. For

example, the collapse of a postal system prompted a large retailer to acquire it (initially to protect its own “in 12 hours or it’s free” deliveries of vaccines and other goods but eventually in response to financially lucrative requests for coverage by thousands of other companies). As guardians of the supply chain and providers of the digital infrastructure and software to improve the remote-working experience, it was increasingly the private sector that was trusted with managing newly-minted essential services. And when a public electrical grid underpinning that digital infrastructure failed due to cost-cutting, citizens were relieved to see it privatized and provided with the expertise and resources needed get it up and running again.

10. Government revenues are falling faster than expenses. MNCs have successfully leveraged their power to argue that their increasing service provision justifies far lower corporate taxes. Tax compliance is decreasing owing to rising dissatisfaction with government which, along with pay cuts, is hindering talent retention. Entitlements risk dominating the budget, and governments’ ability to perform their obligations continues to decline.

11. MNC-dominated countries are vulnerable to even moderate idiosyncratic shocks. Governments’ resources are limited and their sway in the economy is falling. Cash-rich MNCs have replaced many banks and do not use the monetary authority, which dampens the credit channel of monetary policy. However, MNCs have assisted in limited cases. For example, a large emerging market country is recovering strongly from a slowdown in 2029 only because of the fortuitous timing of MNC investment, including 3D “classroom-upgrade-in-a-day” printing services. Following a banking crisis in a small island country last year, an MNC quickly disbursed a US\$90 million loan as an advance on future taxes.

New Dimensions of Inequality are Prompting Pushback

12. Changing workforce expectations have created an MNC eco-system. Although primarily profit driven, MNCs are internalizing the values of their workforces. Millennials and Gen-Zers expect modern “corporatized” service delivery in traditional government domains. At the same time, they tolerate less generous salaries, pensions, or life-time employment if their employers’ operations prioritize social justice concerns. Employees have secured social responsibility initiatives within their employer’s “eco-systems.” Services include employer-provided transport, mortgages, and healthcare. The expansion of coverage has been gradual (for example, Covid-19 vaccines and boosters were available to employees, then their families, and then a select number of nominated recipients per employee). Alongside expectations of climate-friendly practices, initiatives to tidy the local environment (air, rivers, etc.) have become commonplace. MNC eco-systems are becoming systemically important in some countries.

13. The divide between those inside and outside MNC ecosystems widened again last year, although global inequality of opportunity is falling. Outsiders, including those in smaller firms, continue to experience stagnant wages alongside decaying and increasingly expensive government service provision. After some populations pushed back, more companies are expanding the eco-system to arms-length suppliers and promising to incur the cost of engaging the local community in order to mute social discontent (see Box 1). Physical access to the greater eco-system campuses and

transport requires a passport that certifies one is employed or sponsored by an employee, is up to date with vaccinations, and is healthy (courtesy of constant biometric health screening). Job market inequality between those inside and outside the ecosystems is also rising because new job-placement testing methods govern access to higher-paying jobs and corporation-provided training within the ecosystem meet employer needs better. By replacing expensive traditional education, talent is being rewarded more than educational opportunity within the eco-systems. Since courses and tests are available to those in remote locations, and since communications technologies (e.g., virtual reality) advanced considerably during the Covid-19 quarantines, more talented people in EMDEs are joining the global workforce of MNCs.

Box 1. The (Lost) Fight Against an Expanding Eco-System

Initially, corporations opted to only include employees in eco-systems, but this proved unsustainable. Case in point is the experience of technology companies in the US's "Silicon Valley" in the 2010s. As a benefit for employees, big tech companies [reportedly](#) introduced shuttle bus transport between neighboring cities and their large corporate campuses. The busses were well-appointed—some complete with plush leather seating, free wifi, upmarket coffee, cold-pressed juice, snacks, and bike racks—and, more often than not, free to employees. One company's own shuttle stops covered over six counties, more than a dozen cities, and over 200 miles of freeways (double that region's existing commuter train system at the time of their introduction). As one of the early program leads noted, companies were "[basically running a small municipal transit agency.](#)"



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Problems quickly cropped up: the location of stops starting driving real estate prices and catalyzing the displacement of poorer incumbents as proximity to stops attracted employees; by using the shuttles, employees could avoid having to interact with their neighbors, decreasing the sense of community; and public resources were wasted as delays from increased bus traffic during rush hour rose and employees opted out of using the existing public transit. Protests erupted in 2018. After years of discord, city officials eventually forced some companies to pay for permits, comply with city regulations (including reduced designated pick-up and drop-off zones), and provide real-time GPS tracking data to the authorities.

Box 1. The (Lost) Fight Against an Expanding Eco-System (concluded)

Amid the Covid-19 pandemic, bus use (both public and private) plummeted as teleworking increased and people complied with social distancing measures. Experiencing several revenue hits at once, cities increasingly moved to cut down their bus service. However, employers continued to offer their private bus services given demand from employees for on-site childcare, fitness, laundry, and dining services (and some just needed a quiet place to work away from their home). In mid-2021, community members without the option of teleworking, and now without alternative public bus services, launched protests calling for private services to be made public. Companies responded by making the shuttles available to the families of employees. Subsequently, they allowed anyone living within a 1 km radius of a stop to use the shuttle systems. Tech firms were praised for stepping up to fill the gap left by the public sector and protests largely halted (although there were some isolated marches following the announcement that health passports were required, effectively excluding many community members).

- 14. Recipient countries gained from SAE presence.** For example, an emerging market country's struggling oil sector recovered and supported the economy after inviting SAE participation in 2022. SAEs restored tourism infrastructure in the Mediterranean. One country implemented an SAE-financed "Sensing City" upgrade, which permits smart monitoring of human activity and makes cities autonomous-vehicle-ready, after choosing a side in a dispute over fishing rights in the northern part of the Indian Ocean. SAEs have also been effective conduits of accessible credit to increase financial inclusion and green investment. In the early 2020s, provision of vaccines on concessional credit terms was also bundled with many investment projects. Moreover, the SAE-led economic stabilization model has been exported to SAE recipient countries and reduced volatility.
- 15. SAEs facilitated digital learning in their jurisdictions, reducing inequality within SAE countries.** Worldwide, children with access to some SAEs' proprietary innovative online learning tools and physical infrastructure faced smaller disruptions to their learning in the early 2020s and hence better job market outcomes upon graduation last year. SAEs provided these tools at low cost to entire host populations to head off anti-SAE sentiment. Consequently, youth unemployment, mental distress, and feelings of exclusion are lower in SAE countries than in MNC countries.
- 16. But SAEs face emerging pressures from investment destinations.** As some countries restructured their debts that became unsustainable after the pandemic, SAE write-downs made SAEs more risk averse. As the need for vaccines became less urgent, the SAE value proposition became less attractive, and SAE preference for using source-country workers prompted resistance in some jurisdictions. In one response, a host government passed legislation to nationalize an SAE asset, Rare Earth Global (REG), but was reluctant to take control owing to REG's superior security forces. REG continues to export directly to other corporations using its own manufacturing and transport infrastructure.
- 17. Both MNC and SAE corporations have been selective in their expansion into low-income countries and small states, leading to uneven convergence.** Poor and small countries experienced especially severe damage to their fiscal positions after the pandemic and government service provision deteriorated, but corporations did not fill the gap. Judging many markets as simply too small to be worthwhile, most corporations have not extended their reach to economies like

some small island states, who were also among the last to receive Covid-19 vaccines. At the same time, resource rich but poor fragile states have been a low priority but are viewed as potentially vulnerable to being overtaken by firms with well-equipped private security forces.

Corporate Rivalries are Solidifying Blocs in a Bipolar World

18. MNCs are also stepping up the competition. Faced with maturing AE markets, private MNCs are venturing into new regions, including those with growing domestic markets, major gaps in service provision, and poor governance. Some MNCs are fomenting and leveraging pockets of anti-SAE sentiment to capture investment deals. More broadly, MNC success stories of joint ventures and service provision are prompting destination countries to seek better investment terms from SAEs than in the past, further reducing the economic rationale from an SAE perspective. The prospect of a hostile takeover of REG by an MNC was recently welcomed by the host government of REG.

19. Blocs are impinging on interconnectedness. The relationship between MNCs and SAEs is increasingly competitive rather than cooperative. SAEs and their affiliated countries were not invited to the inaugural CorpCon featuring 50 of the world's largest and most powerful MNCs later this year. The theme of the conference is "Global neighborhood watch: security co-operation options for MNCs." As "blocs" emerge, albeit unintentionally, trade and financial flows between them are dropping.

20. Capital flows directly within and between firms without intermediation. Flows are less affected by global interest rates than before (see IMF (2030a) on MNC and SAE bloc capital flows). The pattern is shifting from North-North flows to North-South flows but tracking such flows has become exceptionally difficult as corporates now avoid strict monitoring given their influence and internal foreign exchange markets facilitated by in-house digital currencies. MNCs' profits had been re-invested in destination AE countries to develop ecosystems, but maturing markets are now experiencing income outflows (and hence weakening current accounts) repatriated to source AE countries and recirculated as investment in new EMDE markets. Base Erosion and Profit Shifting continues to influence financial flows. SAE outflows have declined due to rising domestic demand and falling oil prices (MNCs have added to oil supply by applying machine learning to geology). Models suggest current account surpluses have fallen further behind those consistent with optimal saving. Capital flows have sometimes been prompted by economic or political stabilization objectives.

Policy Challenges and Trade-Offs

Within MNC-Dominated Countries:

- Given governments' declining role and resources, a focus on comparative advantage is warranted. This may entail an institutional quality upgrade. These might include (i) improving property rights and the rule of law to attract MNCs (EMDEs) and (ii) lowering the costs to doing business where MNCs are established (AEs). Governments face the challenge of reducing their

staff numbers and entitlement spending to allow better targeting of expenditures to those outside of eco-systems.

- In AEs, how can consumption and labor taxes be re-designed to address growing inequality? Low taxes at the bottom of the pay scale may be subsidizing corporates by allowing them to offer lower wages instead of increasing employment and take-home pay. What other tax sources (on capital gains, wealth, inheritance) could yield material revenues without impeding innovation?
- Which potential spillovers are EMs and the “new” frontier economies unaware of? Understanding MNC capital flows is another policy priority. Better data collection on cross-border MNC flows has become urgent. Abrupt changes in MNC investment decisions can be very destabilizing for source and destination countries. Recent work shows MNC flows are associated with measured current account fluctuations and the money supply. IMF (2030b) examines implications for AML/CFT and financial stability.

Within SAE-Dominated Countries:

- Further improvements in public financial management are paramount for efficiency. SAEs’ comparatively stronger monitoring and control of financial flows can be better leveraged as tool for stabilization, but host countries would need to be comfortable with a further erosion of policy autonomy for some parts of the economy.
- For sectors under less SAE influence, traditional monetary policy effectiveness would be a focus area for host country authorities. Complementary host country policies could include influencing the pace of within-MNC flows using macroprudential regulations and moral suasion (requiring source country cooperation).
- Labor-intensive EMDEs face the challenge of inappropriate imported production methods. Capital-intensive labor-saving technologies or imported workers risk providing limited benefit for local labor. SAE-host countries should continue to seek opportunities for transferring control of core industries to their increasingly educated and experienced domestic population. However, care should be taken to avoid military conflict with SAE-source countries that could compromise capital inflows and supply-chains.

21. Global co-operation between governments, SAEs, and MNCs can boost the common good. A large e-commerce platform is still approaching all governments in an effort to expand its global trade corridor, an initiative that started more than a decade ago. Since global corporations stand to gain more from global public goods than individual countries, corporations can take more responsibility for them. MNC delegates at the inaugural CorpCon have an opportunity to set up a global pool to finance global goals like universal access to vaccines and the internet and to enable smaller states play their role in the global economy. In parallel, agreeing to an international corporate taxation and state subsidy framework would help mitigate “beggar thy neighbor” tendencies.

B. 2030 Global Surveillance Report Planet Protectionism

Excessive green protectionism has evolved and become entrenched, amplifying negative aggregate supply shocks including droughts. Although there are tradeoffs, there are also complementarities between environmental and debt sustainability.

More Frequent Natural Disasters and the Policy Response Have Left the Global Economy Fragile

22. Global growth was anemic again in 2029, capping a decade of weak economic performance. Growth was weighed down initially by the increased frequency of natural disasters including droughts and, more recently, by the latest countries to impose exceedingly high, untargeted, and uncoordinated carbon tariffs on imported industrial goods while not taking action to transition to low carbon economies (including by discouraging carbon reduction domestically; see Box 2). Protectionism and climate shocks have compounded the drag caused by lingering Covid-19 containment, aging workforces in many large economies, and xenophobia flared up by water scarcity. In addition to anemic growth, global inflation is in the double digits.

Box 2. The Evolution of Green Protectionism

2021–22: *Successive droughts cause acute water shortages on both sides of the Mediterranean.* Rationing crimps industry and agriculture and intensifies unemployment. There is migration to relatively fertile East Africa and to AEs in hope of better policy responses even though many are hit by the same shocks.

2022: *Inadequate policy response:* Rather than responding to climate change, policymakers' rhetoric blames migrants for stealing jobs and water, heralding strict enforcement of migrant inflows and antagonism to trade. Such rhetoric is surprisingly successful in shaping the views of younger people, who endured more job losses during the Covid-19 pandemic despite being less vulnerable to the disease. Cross-border skirmishes include attacks on water utilities in the eastern Mediterranean. Investment in new technologies to sabotage rivals' water supply (cloud seeding to suppress rain, water-borne pathogens) is increasing.

2023: *A large common market agrees to an external tariff on the carbon content of industrial imports,* which includes both manufacturing and transportation for each stage of production. Energy-intensive goods produced in multiple distant countries attract taxes of 90 percent and the overall average is 50 percent. These unilateral protectionist measures contrast the carefully designed and coordinated proposals mooted at the start of the decade to promote a needed transition to a low-carbon economy. Crucially, they do not put a price on domestically-produced carbon. Politicians emphasize the environmental benefits to overseas audiences and tout job creation, including in polluting industries, to domestic ones. Agricultural trade is excluded since it embodies the water that is newly prized.

2024: *The majority of G20 countries unilaterally impose similar tariffs* in response to pressure from protectionists and environmentalists alike to avoid being "dumping grounds for filthy goods."

2025–28: *Carbon tariffs prompt a "rebundling" of production, usually relocated to the destination market.* Tariffs penalize distance disproportionately and discourages imports of goods produced in geographically diverse global value chains.

23. Countries less affected by water shortages continue to benefit from their improved comparative advantage, while water-stressed countries have seen their external positions weaken. Countries exporting water-intensive agriculture (e.g., wheat) and industry (e.g., textiles) are experiencing current account surpluses from this terms-of-trade windfall. Manufacturing protectionism and resistance to migrants has reduced the skill premium in AEs. In water-stressed LICs, women have withdrawn from the labor force as they have to travel farther for access to potable water. In AEs, many unemployed people—mostly the young—split their time between queues rationing jobs or queues rationing water. Countries that have experienced more natural disasters (including, with unfortunate irony, flooding attributed to melting land-based ice) have been severely harmed by lower and more volatile fiscal and external revenue streams.

24. Many countries continue to experience adverse debt dynamics owing to climate change. Some countries, adversely affected by the climate-driven sudden re-evaluation of their long-term growth potential and risk profiles (see Box 3), are running enforced fiscal and external surpluses in the face of limited financing and high risk of debt distress. Financial institutions with large sovereign debt exposures hold severely weakened portfolios. In some places, social shifts are making the relative importance of aggregate GDP growth versus social and environmental progress a key political issue. However, the extent of adverse effects of a lower-growth model on macroeconomic stability (e.g., debt sustainability and fiscal/external balances) could be a constraining factor.

25. Carbon tariffs have discouraged cross-border supply chains. Countries that used to specialize in narrow components of long and complex global value chains suffered disproportionately from the steep and abrupt carbon tariff since they lacked the industrial base to find substitute activities and there was no complementary support. For countries where foreign financing did not stop suddenly, demand has not had to adjust fully, so current account balances are weaker than implied by fundamentals. Tariffs have increased fiscal revenues, but not enough to compensate for the downturn in economic activity caused by the array of supply-side shocks.

26. Gross international investment stocks remain well below those at the start of the decade. Capital was withdrawn from newly risky destinations after the natural disaster shocks earlier in the decade. The one exception to that trend, the earlier rush to secure arable land and agri-processing businesses, has been slowed by measures to curtail capital flows into these now-strategic sectors.

Box 3. Linkages Between Environmental and Debt Sustainability

The surprising increase in the incidence of natural disasters in the early 2020s, which went well beyond the expected trend increase, intensified concerns that the tail of extreme weather events is much thicker than assumed during the most recent climate stress tests at the time. Even though the full effects of climate change continue to be expected only in the second half of this century, the natural disasters prompted dramatic recalculations:

Higher forecast volatility of output and exports (and fiscal/external deficits) caused by natural disasters has increased the risk premium charged to borrowers. Therefore, despite further lowering of global policy rates during the Covid-19 pandemic, almost all sovereigns experienced an unexpected spike in borrowing costs in 2023. This has adversely affected countries, particularly those already at moderate or high risk of debt distress and those more vulnerable to climate change. Traditional safe havens received many of these repatriated funds, although investors seeking yield invested in countries adjusting to global value chain disruption.

- Higher weather event incidence estimates have translated to lower long-term growth baseline projections.
- Calls for slower growth. Less money-oriented millennials in positions of authority, voters who as teens protested against climate inaction in 2019, and a middle class more concerned with clean air are calling for slower growth. Few countries can “afford” this as most are either poor or need growth to manage debt ratios.

Many countries have surpassed or risk surpassing their debt tipping points. Following the sharp rise in debt stocks during Covid-19, the above factors deteriorated debt dynamics significantly. $r-g$ quickly rose by two percentage points on average, moved an additional 35 countries into adverse debt dynamics ($r > g$), and accounted for a large share of the countries that experienced sudden stops between 2022 and 2027.

Environmental tipping points may also have been passed. Environmental dynamics are substantially more complex and less understood than debt but some studies suggest the global tipping point was surpassed a decade ago when our growth model breached planetary boundaries.

The environmental sustainability and desirability of the growth model is actively being scrutinized.

Environmentalists draw parallels with the initial interruption in economic activity in response to Covid-19. Some see a sustained period of negative growth as necessary for long-term economic wellbeing. Others argue long term well-being can and should be sacrificed for other goals like health and conservation.

Global Growth is Expected to Edge up but Remain Well Below Previous Potential Rates

27. In 2030, growth is expected to stabilize in larger markets as smaller countries pursue niche opportunities. Despite signs of higher growth than in the recent past, reclaiming the decade’s lost output seems a distant prospect.

- *Larger and more diversified economies are finding domestic substitutes* to fill the gaps left by previously foreign-sourced goods and components. Production methods are inefficient and of lower quality. Absent coordination on carbon pricing, countries acting as a haven for pollution-intensive industries by relaxing long-standing environmental safeguards are expected to see faster employment and GDP growth.

- *Some smaller countries will take over all tasks in the manufacture of a small set of goods.* They tend to be those who previously contributed a substantial share to that product's value-added; are close to large markets; and are located along the emerging Arctic trade corridor.
- *Digital services trade is offsetting some of the manufacturing decline, since some countries are responding to carbon tariffs by allowing international corporate customers to download designs.* For example, since tariffs have increased prices, demand for 3D-printed medical testing devices has grown.
- *Some countries are growing exports of established energy efficient water technologies bred by necessity* (e.g., geothermal or solar powered desalination).
- *Small states are providing expertise in coping with climate shocks,* including how to buy and sell weather-contingent securities.

28. Declining oil supply and overseas green investment could intensify global imbalances.

Lower energy-intensity of economic growth could push oil prices down. However, production in countries using water-intensive fracking could slow, decreasing supply and increasing their trade deficits. Financial flows are slowly starting to venture beyond safe havens. This is because climate-induced risk aversion is starting to ease slightly following a few years in which natural-disaster intensity has not exceeded its early-decade peaks. For example, some investors are betting on foreign technologies that reduce water scarcity (e.g., UV disinfection of wastewater) and affect the weather (e.g., cloud seeding to induce rain).

Box 4. The Central Bank Response to Stagflation: A Case of Can't or Won't?

2022: *Inflation rises above existing targets.* Ongoing stimulus alongside under-estimated negative Covid-19 aggregate supply effects pushes inflation to targets. Natural disasters push inflation higher, compounding pressures from aging and isolationism.

2023: *Most AE central banks don't raise interest rates substantially above neutral rates.* Some articulate decreasing aversion for above-target inflation given already-weak growth and desire to "hit targets from above" after reaching an implicit nominal GDP goal. In some cases, reduced central bank independence and safe haven inflows have kept real interest rates artificially low.

2024: *Some EM central banks do tighten monetary policy, but inflation is unresponsive.* Efforts to rein in inflation by reducing aggregate demand are ineffective. Analysis suggests the Philips Curve is flat on both sides of (falling) potential output and is attributable to high market power (not globalization).

2025: *Countries experiencing capital flight resort to controls on capital outflows instead of warranted macroeconomic adjustment.* They are among the EMs who choose to not raise rates (favoring growth amid already-high risk premia) and to not allow depreciations (hoping to prevent further inflationary impulses).

2025 *Higher inflation targets.* A respected large central bank lifts its target to 5 percent, citing arguments that this would alleviate zero-lower bound constraints and that inflation is only harmful at much higher thresholds (which are not far off). Inflation is currently 7 percent. Critics argue bankers are succumbing to pressures to inflate away debt.

2027: The tariff announcement pushes inflation expectations towards 10 percent in many AEs and higher in EMDEs.

29. Covid-30 represents a key downside risk to the outlook. The cause was quickly established. A drought in a large forest sparked wildfires, which caused rodents to flee and transmit the virus to humans. Cases are being recorded worldwide but the economic impact is uncertain. Hygiene habits preserved since Covid-19, which have reduced incidence of contagious diseases, could contain the spread. It might be straightforward to augment existing vaccines to provide Covid-30 immunity. However, the global community has fewer financial resources to fight a new pandemic than it had in the early 2020s.

Policy Challenges and Trade-Offs

30. Global cooperation can make climate tariffs less distortionary for global trade. IMF (2030) estimates that “green tariffs” have reduced energy-intensive trade considerably and, to a lesser extent, overall energy intensity, but at an unnecessarily large cost to GDP growth. Analysis suggests a broader carbon tax that covers domestic industry, including non-traded goods and services, would provide considerable additional environmental benefits. Moreover, by removing distortions and the excess burden on cross-border trade, this would undo some of the economic harm from the current policy. Global coordination can reduce special treatment for local sectors and can reduce the scope for energy-intensive havens to succeed. Established satellite monitoring technology can aid enforcement. Together with other measures being discussed, this could help meet the IPCC’s recently revised target of ‘net-zero’ emissions by 2055.

31. Countries should free up space to respond to shocks now. If there is little global appetite to provide financing or debt relief and Covid-30 is as serious as Covid-19, which expenses must be cut? IMF (2028) shows how removing energy subsidies is good for growth, inequality, and the environment. The unexpected rise in nominal interest rates has placed further strains on public finances. Although the zero-lower-bound no longer constrains monetary policy, fiscal dominance is handicapping its ability to contain inflation.

32. Fiscal policy to mitigate and adapt to climate change risks. The increased sense of urgency prompted a policy response that has made the tradeoffs more acute than in 2021. For larger countries making the bigger contributions to global carbon emissions, how can they transition to a greener economy while mitigating the negative growth effects already caused? How can green investments be financed when there is even less fiscal space? For smaller and poorer countries particularly affected by climate change and precarious debt situations, how do they balance the need to reduce debt stocks against the need to invest in infrastructure to make growth more resilient to climate change?

33. Trade policy and structural reforms in small open economies: should they follow the lead of larger countries and impose tariffs? What are the new macroeconomic “fundamentals” needed to attract investment and mitigate the slowdown in potential growth? In particular, should countries aim to attract green investment or provide a haven for pollution-intensive industries?

34. Monetary and complementary policy in high- inflation countries: In AEs with positive output gaps, how long should they tolerate rising inflation without risking hard-won credibility? (see

Box 4). For EMs, how committed should the authorities be to reducing inflation if the output-inflation sacrifice ratio is high? How heavily should external balance factor in interest rate setting?

C. 2030 Global Surveillance Report: Big Data Building Blocks

Just as the productivity gains from a big-data, 5G-fueled information wave began to taper off, last year's hybrid "EION" attack cemented a downshift in the global economy as it hit countries with less data protection and financial regulation the hardest.

The Effects of the Hybrid Attack Linger, Hampering Growth Across Most Regions

35. After a momentous decade of declines in poverty, we find ourselves in rough waters. Countries across the globe have begun charting a course toward recovery from 2029's catastrophic hybrid "EION" attack, which used physical and cyber means in tandem with misinformation to exploit regulatory gaps and produce a multi-front attack with global implications (see Box 1).³ Losses amounted to US\$15 trillion in assets across 10 central banks that were connected via an automated algorithmic swap system; equity market declines of almost 45 percent globally; the paralysis of health systems in 46 countries; weeks-long electricity blackouts in 93 countries; and, consequently, the deaths of just under 1 million people.

36. The global economy contracted by 2 percent last year, the worst performance since 2020. The contraction was widespread, representing most regions with the lone exception of Europe, which grew at 1 percent. The outlook is negative with risks are tilted to the downside. Low growth, financial volatility, and high exchange rate pressures plague governments. Inflation, which had been slowly rising in the two years prior to the crisis, has accelerated as supply shortages and increased demand for medical services and diesel generators has ticked up. Global current account imbalances have fallen in the near-term, but in some cases, adjustment is lagging expectations. To examine potential next steps, let us map how we arrived in this precarious position.

The big-data led information revolution created many winners; Europe took a different path.

37. In the early 2020s, governments step changed their investments in the availability, access, and use of information via an expansion of 5G and big data technology to improve their Covid-19 contact tracing efforts. While initially succeeding in quickly stamping out outbreaks within and across borders (once travel restrictions were relaxed), the broader use of these technologies induced structural changes that ushered in a decade of unbridled growth, low inflation, and expanding financial inclusion across the world. However, there was an important exception; after Covid-19 was addressed, Europe stood apart from its peers by opting to re-prioritize strict regulation of individuals' data privacy and protection over such information-led enhancements. This

³ EION is the name of the syndicate that perpetrated the attacks and stands for End Illiberal Opportunism Now. NATO describes hybrid attacks as those that "combine military and non-military as well as covert and overt means, including disinformation, cyber-attacks, economic pressure, deployment of irregular armed groups and use of regular forces. Hybrid methods are used to blur the lines between war and peace and attempt to sow doubt in the minds of targets."

path kept big data small, required protracted quarantines and containment measures, and contributed to anemic but stable productivity growth for Europe.

38. Outside of Europe, two alternative data policies allowed information-led enhancements in both market-based and centralized-planning efficiency: prices fell and access increased for health and education services; agricultural yields rose; risk was more accurately priced and fueled an investment boom; and financial inclusion exploded given the greater availability of data for credit risk assessments and the proliferation of fintech companies (see Box 2 for country-specific snapshots). European investors were largely excluded from reaping direct gains from the revolution as foreign investments in ventures that violated their regulations were prohibited and its fintech industry remained relatively limited; many of the sector’s firms were wiped out by funding pressures following Covid-19 and the remaining fintech firms were heavily regulated.

39. While improvements were shared broadly amongst countries with less stringent data protection and financial regulatory environments, some boats were buoyed more than others. Across income groups, low income countries (LICs) disproportionately benefitted, gaining from increased food security, access to better education, and higher financial inclusion. Together with the associated decline in birth rates, now-dated fears about our ability to feed a global population—with increasingly sophisticated food preferences (e.g., meat)—abated and female labor force participation is rising, especially in emerging markets (EMs). Advanced economics (AEs) with aging populations, benefited from lower health care costs placing less pressure on governments’ fiscal space and allowing the elderly to work longer. Within income groups, countries where large investments took place in digital infrastructure and in key digital skills were best positioned to leverage the benefits of the revolution. While some disruptions due to displacement and reallocation of labor took place, global poverty and within-country inequality declined and real wages rose, especially for technology-proficient workers that were able to adapt and leverage new technologies more holistically than the elderly.

Box 5. The EION Attack

On August 1, 2029, a syndicate named EION (“End Illiberal Opportunism Now”) began a multi-pronged and coordinated global hybrid-attack that would last over a month and was fought on multiple fronts.

The syndicate launched the attack primarily against what they saw as government overreach, but also included firms perceived to be plundering citizens’ data without compensation. The attack had both physical and cyber dimensions, including the spread of terror through misinformation. The attackers adeptly exploited vulnerabilities in our existing web of regulatory financial standards to steal an unprecedented amount of funds and data. 6 airports were also taken over and used to launch advanced military-like operations against nearby heavily-populated areas.



Source: Bermix Studio, by Unsplash

Box 5. The EION Attack (concluded)

The impact included:

- Hacks that deleted billions of citizens' entire social credit scores, biometric data, and banking histories.
- Paralysis of health systems in 46 countries due to misinformation campaigns spread through social media and by the official websites of disease controls centers globally. For example, one country's citizens were told that a flesh-eating, antibiotic-resistant bacteria was spreading in public areas. Hundreds of thousands of people presented themselves at hospitals with psychosomatic symptoms they ascribed to the false illness.
- Cyber, physical and, in some cases, armed sabotage caused weeks-long electricity blackouts in 93 countries.
- Theft of US\$ 15 trillion in assets across 10 central banks (conducted using weaknesses in an automated algorithmic swap system).
- Equity market losses of almost 45 percent globally. These were largely concentrated outside of Europe, where losses were less than 9 percent.
- 976,000 deaths with almost 395,000 from an inability (or unwillingness) to access medical services during the attack.

Despite a global coalition of law enforcement and network technology experts, the specific attackers have still not been identified nor have any of the stolen assets been recovered. The intergovernmental Financial Action Task Force has launched an investigation to track down the illicit financial flows, which are thought to be hidden across 100s of cryptocurrencies and in the world's few remaining "dark money" havens.

40. Both corporate-and government-controlled data offered paths to technological progress and government effectiveness. In some countries, most citizens tolerated a change in the social contract, temporarily relinquishing data privacy in return for better health security. Some governments in advanced economies outside of Europe leveraged this to take ownership of expanding and increasingly connected datasets, catalyzing and amplifying their use through central planning frameworks that quickly embedded new system platforms across large populations. This allowed them to overcome two sources of government failure, namely insufficient planning and an inability to monitor information in real-time. Elsewhere, technology reduced microeconomic market failures, including moral hazard and adverse selection. Still, after grappling with increased political backlash from better informed and well-resourced constituencies concerned about increasingly indiscriminate government intrusion in private activities, these governments began to shed their liberal democratic values in favor of illiberalism, leveraging their control of big data to create propaganda-heavy "thought bubbles" (i.e., synchronized and persistent but subtle pro-government message campaigns with contact points across individuals' personal and professional lives). In several middle-income countries, the private sector coordinated to maximize the use of their databases for efficiency and profit gains. At the same time, Fintech companies proliferated drawing those in the informal sector to the formal; in AEs and EMs these companies operated as non-banks, whereas banks in LICs adopted fintech tools (see Box 3).

Box 6. Country Snapshots of the Information Revolution

In the decade since 2020, average GDP per capita for a small subset of sub-Saharan countries of US\$700 increased ten-fold, while life expectancy at birth rose from 60 to 67 years. Use of borderless technology advancements (anonymized digital currencies) and cloud computing is now commonplace.

In a large Asian low-income country, the share of men with an account at a financial institution increased from 67 to 98 percent over the past 10 years, while the share for women increased from 46 to 95 percent, with positive and large spillover effects for that society.

Per-capita health-care spending in an aging advanced economy has dropped from US \$4,700 to \$1,300 while improving life expectancy and life quality outcomes.

However, Big-Data and the Rise of Fintech Also Generated Substantial Vulnerabilities in Exposed Countries, Outweighing Their Benefits in Recent Years

41. Vulnerabilities were building in countries exposed to the information revolution.

Fintech-driven credit growth and a surge in gross capital flows to these countries created pockets of asset overvaluation and imbalances. Traditional banks in non-European AEs and EMs were hit from several angles. Non-bank fintech companies proved to be fierce competition, partly because they were far less regulated. Regulators, despite their efforts and use of sandbox regulatory structures, were unable to bridge regulatory gaps across countries quickly enough. Banks also learned far too late that they were behind the curve in preparing for the effects of climate change. Changing weather patterns—especially flooding in heavily populated coastal areas with accompanying saltwater intrusion—and poorly implemented climate mitigation policies, triggered sudden drops in asset valuations, negatively impacting banks' balance sheets. Advances in monitoring technology could have reduced climate risks, but political will was lagging. A large swath of citizenries questioned the results of elections, as major breaches became almost commonplace. Even prior to last year's crisis, growth had begun slowing and inflation picked up as the benefits from the information revolution's efficiency gains petered out.

Box 7. Different Fintech Development Models

In advanced and emerging market countries, banks were slower to adapt to fintech due to legacy business models, dated systems, lack of coordination between departments, bureaucracy and regulatory risk-aversion. In many cases, fintech companies developed outside of the banking sector. In other cases, banks outsourced certain areas to fintech providers so there was room for cooperation— but this also created risks in the system.

In LICs, there was greater potential for leapfrogging into fintech. This came from fintech companies but also from banks themselves. Banks tended to be smaller and not have rigid systems, so they could nimbly react to emerging technologies and change to more platform-based models like those that have emerged with fintech companies.

42. Monetary institutions were less resilient than previously thought. Exposed countries' central banks weathered the deflationary environment well during the early part of the last decade but addressing the volatility from structural changes in the financial sector was an unsolved conundrum. Different data ownership regimes also stymied efforts to synergize regulatory

frameworks both across countries and regions. More frequent and larger data breaches and fintech failures generated idiosyncratic country-specific hits to growth, but none were systemic enough to affect global growth prospects prior to 2029. Until that point, central banks addressed such disturbances in an ad hoc, piecemeal manner. Unfortunately, EION showed how unprepared central banks' previous actions were to shield their domestic financial sectors from a large attack and they themselves suffered great losses in their own asset holdings.

43. Fiscal space is diminutive at a time when countries need it. On the fiscal side, many authorities had engaged in procyclical spending as most assumed the gains of the information revolution would continue indefinitely. Moreover, expensive government bailouts became a feature rather than an outlier in such countries over the past few years as more fintech ventures have failed (in the poorly monitored non-banking sector in AEs and EMs and in the banking sector in LICs). While the EION attack is unrivaled due to its scale and physical footprint, the costs of previous cyber-related attacks were also increasing in recent years, despite governments having fewer resources to direct at cyber-security (including for protecting elections) in the context of limited fiscal space. Insufficient fiscal prudence also meant debt ratios declined only modestly during the boom and the crisis has increased debt to new peaks.

The Global Outlook is Overcast in the Near to Medium Term.

44. The economic and financial outlook remains negative in the near to medium term. To date, asset recovery has been unsuccessful in crisis-affected countries, leaving their central banks in a fragile state as risk premia have increased and financial markets are set to remain volatile. Banks' and non-bank fintech's balance sheets have been decimated and the latter sector is facing an unprecedented push for far more restrictive regulation. Prior to the crisis, gross capital outflows had already slowed outside of Europe due to moderating growth. Post-EION, flows plummeted as authorities placed emergency restrictions on cross-border transfers to prevent further losses from the attack. Only highly-vetted transactions are currently approved.

45. Migratory pressures across and within countries have intensified due to the immediate fallout from EION and concern over potential copycat attacks. The human toll from the crisis was severe and prompted a wave of still-ongoing migration toward Europe. The continent found itself both protected and vulnerable. On one hand, its data privacy regulations prevented the syndicate from stealing private financial data. On the other hand, the same regulations prevented European countries from collecting data on incoming migrant flows and their movements throughout the rest of Europe upon arrival, limiting countries' ability to meet migrants' needs and integrate them. In less regulated countries far from Europe, the EION crisis led to sudden and large de-urbanization; 14 percent of an EM megacity's population has abandoned the city in the past 6 months, wreaking havoc in rural areas unprepared for this spike in demand for services, while leading to plunging real estate prices, which in turn bankrupted construction companies and led to a further round of negative asset collateral effects. Social tensions appear set to bubble over and within-country inequality is rising for the first time in over a decade as the technology-driven virtuous cycles has turned vicious. While all are suffering, it is those that were most tech-exposed that are bearing the brunt of EION's attack.

46. With both fiscal space already limited and the monetary authorities in a weak position, staff expect growth in many regions to remain negative in the next two years, before trending toward zero thereafter. While exchange rate depreciations might have improved competitiveness in a bygone era, high policy uncertainty and muted external demand are likely to prevent this channel from fully operating. Moreover, regulators in market-based economies will struggle to reign in the private sector—used to operating with little to no oversight over its data protection processes and fintech offerings—and close regulatory gaps. On the other hand, centrally-planned governments will struggle to re-structure their massive tech-heavy and tightly-networked apparatuses.

47. The outlook is less severe for Europe, despite the increased fiscal pressures it is facing due to recent migration and its previously slow productivity growth. The region’s “steady wins the race” approach and decision to prioritize data privacy and non-economic considerations over GDP growth prevented major policy mistakes and recently has made it a safe haven for global capital flows, although they currently remain quite limited in scale (i.e., Europe also imposed emergency restrictions on cross-border transfers as it also concerned that its financial system will be used for money-laundering purposes by the EION or other groups). The EION syndicate shielded Europe from its attack. The rest of the world is now looking to Europe for both lessons and leadership. Its regulatory and private sector have leapt at the opportunity to sell knowledge on how the region protected itself from previous attacks; the contribution of Europe’s cyber-security sector to GDP rose 18 percent since Q3 2029. Once crisis-affected countries stabilize and the international monetary system re-sets, stronger capital inflows are expected. Staff expect the region’s potential output to rise and for growth to reach 2.5 percent in the medium term.

Policy Challenges and Trade-Offs

48. Looking forward, all crisis-affected countries will face challenges and large policy trade-offs as they seek to: re-set the international monetary system by gradually reducing emergency restrictions; re-establish central banks’ ability to operate without threat of major data breaches and attacks (in parallel, central banks should balance the need to restore their assets with supporting price stability and recovery); prudently use fiscal space, where available, to address vulnerable populations’ needs; and repair banks’ balance sheets through careful re-structuring.

In crisis-affected economies where the private sector owns the data:

- Financial vulnerabilities in the private sector (especially, fintech) could be better understood and ring-fenced by appropriate regulation. However, regulation should not be overly burdensome as the key to reigniting growth may come from allowing some risk. Will kneejerk regulation prevent the next productivity game-changer?
- The private sector has already begun extensive efforts to re-collect lost data and establish better back-up storage mechanisms and governments could consider how they might support such efforts (e.g., by supplementing private data with archived birth and death records). In doing so,

governments must also prioritize transparency in sharing what will be provided to private firms, allowing individuals to opt-out (i.e., go off the grid) if they so desire.

In crisis-affected economies where government owns the data:

- The large and tightly-networked nature of service delivery remains highly vulnerable to additional syndicate attacks. Networks might be reorganized into “pods” so that future attacks have a greater chance of being stopped before reaching the full network. Building in these circuit breakers may reduce productivity but increase the sustainability of the system.
- Governments might consider whether there is a need to re-collect lost data. While individuals’ data were lost, the system settings, algorithmic-automated processes, and aggregate migration data were not. Avoiding such a process would free up fiscal room to address more pressing issues (e.g., de-urbanization).

49. In Europe, the authorities will need to grapple with how to monitor and manage capital inflows once restrictions are lifted (i.e., systemic vulnerabilities might develop).

Countries might also identify priority infrastructure needs to maximize the productivity gains from the shift in investment towards the region. Moreover, after a decade of out migration, policymakers will need to help populations navigate the sudden influx of new migrants in parallel with promoting a rapid integration process for migrants (e.g., by providing targeted social transfers). The “Better. Together” campaign of a small European country serves as a best-in-class example.

50. At a global level, closing still-present gaps across cybersecurity and fintech regulatory sandboxes should be a priority.

Those responsible for EION, and others like them, are working hard to construct a similarly lucrative and harmful attack; we must work harder. At first glance, the resulting landscape may appear more restrained as more systems of checks, balances, and firewalls are put in place, but in the medium-term countries will be far more resilient.

CONCLUSION

51. Scenarios illustrate some of many ways the surveillance landscape could evolve. Table 2 compares the scenarios' outcomes across for various trends and uncertainties identified in the surveillance landscape section of the Comprehensive Surveillance Review. It prioritizes the contrasts across the scenarios to help distinguish the scenarios in Section II. Although no scenario is intended to forecast future developments, the set provides alternative perspectives through which to interpret recent or hypothetical future events. Examples of such early signals are shown in Box 8.

Table 2. Scenario Comparison: Surveillance Landscape

	Corponationals	Planet Protectionism	Big Data Building Blocs
Policy Space	MNCs: governments have low fiscal space to provide core services and respond to shocks. Monetary policy is constrained by a weak credit channel and difficulty controlling corporate cross-border financial flows. SAEs use stabilization tools at home and abroad to reduce volatility in core segments of the economy.	Adverse debt dynamics (low growth, high interest rates) limit fiscal space. Disinflation not responsive to attempts to reduce aggregate demand. Inflation-aversion debate increases monetary policy options. Interest rates target internal balance and subject to fiscal dominance, so CFMs target external balance.	Countries outside of Europe used technology for effective macroeconomic management. Progressively larger data breaches, fintech failures, and central bank losses exposed weaknesses in financial supervision and monetary policy effectiveness. Weak growth limited Europe's fiscal space throughout the prior decade.
Technology, productivity, and financial innovation.	AI and automation boosts productivity , and fuels corporations' expansion into new areas including traditional government roles. More efficient and less risky financial services within ecosystem. SAE investment destinations receive state-directed credit.	Low growth, following climate and trade negative aggregate supply shocks, but less of a priority relative to environmental well-being. Diversified countries and climate-technology first-movers doing better. More room for weather-contingent financial diversification.	Large productivity gains from 5G access and big data revolution in less regulated countries; however, this begins to peter out after a decade. In regulated Europe, productivity growth is muted. The EION attack exploited monetary and financial innovations and gaps in fintech regulatory structures in poorly regulated areas.
Demographics, health, and growth	Millennials and Gen-Zers, including in remote global locations, demand social justice from MNC employers, predominantly within eco-systems. Source-country workers work on SAE construction abroad including in areas with large numbers of job-market entrants. Covid-19 vaccines opened doors to SAE investment destinations but were limited to those within MNC eco-systems while government provision was inadequate.	Adverse aggregate supply effects of aging populations compounded. Drought induces migration to East Africa and Southern Europe (although also water-stressed). Female labor force participation lower (water queues). Covid-19 containment triggers inflation. Drought causes wildfire that spreads zoonotic disease.	Some regions offset aging effects with fast productivity growth while others do not. Young populations benefit most from decreased costs for education and higher financial inclusion. Aging populations benefit from lower health care costs. Post-crisis migration patterns place pressures across and within countries, in some cases trigger the collapse of real estate markets. Big data and AI helped countries stamp out Covid-19 through contact tracing. Misinformation in the health system leads to large-scale losses of life.

Table 2. Scenario Comparison: Surveillance Landscape (concluded)

	Corporationals	Planet Protectionism	Big Data Building Blocs
Climate and the environment	Small-scale contributions to a cleaner environment and green initiatives. By MNCs corporates responding to demands from employees, families, sub-contractors' but limits on reach. SAE financing enables some green projects.	Carbon tariffs on international trade reduce emissions. Feedback between environmental and economic sustainability. "New welfare" movement discounts growth in favor of environment.	Banks' balance sheets negatively affected by asset revaluations caused by changing weather patterns and poorly implemented climate mitigation . Climate change remains an issue due to lack of political will .
Inequality	Within the MNC bloc, decreasing global labor share and increasing divide between those in the ecosystem and those outside it. SAEs facilitated digital learning and reduced inequality within their jurisdictions. Investments driving convergence, but unevenly as both corporates are selective in where they invest.	Localization reduces skill premium in many countries. Lower trade and investment generally reduces cross-country convergence.	Major gains in LICs and EMs that embraced the tech revolution drove cross-country convergence globally , with countries that undertook large investments in digital infrastructure and skills benefitting most. Outside of Europe, within country income inequality declined .
Shifting Global Economic Power, integration, and imbalances.	Corporate takeover of government services in MNC countries and in tight relationship with government in SAE countries. Corporates offer new hope for trade and global public goods. Falling interconnectedness and increasing rivalry between blocs. (1) Private MNC bloc with strong commercial interlinkages considering cross-border private security alliance. (2) SAE bloc with commercial linkages and geopolitical influence. Previous FDI recipients facing large income outflows. SAE financial outflows / CA surplus falling (more oil exporters not saving enough).	Climate response reduces interlinkages and trade is regional: but calls for global coordination on carbon taxes. Domestic diversification in larger markets mitigates losses from disrupted global trade. Economic advantage is sought by both havens for polluters and emerging producers of green goods and services. External positions weak in many agricultural exporters and specialists in global value chains. Gains in newly water-abundant countries, digital blue-prints exporters, and climate technology leaders. Domestic diversification in larger markets mitigates some of the losses from disrupted global trade. Gross investment exposures lower following capital flight from water-stressed countries. Water sabotage is new source of military advantage.	Outside Europe, two competing models (free market and state driven) both become more effective. In market-based countries, corporates leverage 5G access and own big data for their own gain; in centrally-planned economies, governments own and benefit from the information revolution slipping towards more illiberalism. Fragmented regulatory regimes cause volatility and are exploited for the EION attack. Europe becomes more isolated due to its strict data privacy and financial regulations. Post-crisis, imbalances decline, but adjustment lags expectations; cross-border financial flows drop as emergency restrictions are imposed. Amid a breakdown in the international monetary system and migrant pressure, geopolitical alliances are building to prevent further attacks.

Box 8. Recent and Potential Early Signals

Corporationals

- In 2019, a “simple global payment system and financial infrastructure that empowers billions of people” was introduced.
- Technology companies begin extending employee benefits to surrounding communities for free.
- Corporations offer discounted vaccines in exchange for favorable investment regimes.

Planet Protectionism

- In 2020, the European Union proposed a carbon border tax be introduced in 2023.
- In 2020, the Federal Reserve announced its willingness to tolerate above-target inflation for some time.
- Ratings agencies downgrade the sovereign debt of multiple countries due to their susceptibility to climate change.

Big Data Building Blocs

- In 2017, a ransomware attack reached 150 countries including England’s National Health Service. In 2020, the U.S. government reportedly suffered its worst hack to date.
- Non-bank fintech companies’ failures increase in severity and frequency. Consumer finance protection groups find gaps in the web of regulatory sandboxes, but centrally-planned governments and the private sector argue that the benefits of their models outweigh costs.
- Several countries prioritize data privacy over economic efficiency and fall in business environment rankings. Following increases in access to citizens’ data to address Covid-19, some governments persuade people to hand over evermore data and tracking abilities.

52. The scenarios help in defining the CSR’s surveillance priorities. To inform the priorities to confront risks and uncertainties and mitigate spillovers, they illustrate shocks, originating inside the macro-financial system or further afield, that could harm the economy. Shocks can be felt simultaneously or transmit from one region to another through new channels. Alternative policy approaches carry their own risks and can have both positive and negative spillovers. To inform fostering economic sustainability as a priority, the scenarios illustrate some of the complex economic and non-economic factors that feed into economic sustainability, how they might be traded off, or how they could be complementary. To underpin the need for a unified policy approach, the scenarios show how resource constraints or changing economic structures can reduce the effectiveness of traditional policies by traditional institutions. Table 3 provides examples of how each surveillance priority identified in the CSR might play out in each scenario.

53. Economic surveillance could benefit from new data and training. The scenarios suggest how data may need to be more holistic to internalize sustainability tradeoffs or feedback effects (e.g., environmental degradation). Data may need increasing supplementation by non-official sources (e.g., large technology companies) to meet new monitoring demands. Although mastery of the core macro-financial toolkit remains critical in these scenarios, complementary training could help economists incorporate non-economic shocks and longer-term trends into their analysis. As a

complement to forecasting and risk analysis, scenario planning can inform longer-term uncertainties, increase mental agility, and make surveillance more robust to an uncertain future.

Table 3. Scenario Comparison: Surveillance Priorities

	Corporationals	Planet Protectionism	Big Data Building Blocs
Confronting Risks and Uncertainties	<p>Increasingly systemic private sector can trigger underappreciated shocks.</p> <p>Tolerating corporations' encroachment as a key growth driver at the cost of further loss of influence.</p>	<p>"Long-term" risks can materialize in the short term.</p> <p>Risk-based approaches to allowing higher inflation and calibrating pace of greening the economy.</p>	<p>A cyber-attack is an example of an emergent but high impact risk, but secure big data can aid risk anticipation.</p> <p>Risk-tolerance informs tradeoffs between enabling technology driven boom and higher crisis risk.</p>
Pre-empting and Mitigating Spillovers	<p>Corporations and blocs are new conduits for spillovers, requiring humility in our ability to respond while developing new tools (enhanced engagement with non-government actors, alternative data).</p> <p>Beggar-thy-neighbor policy (e.g., lower corporate taxes) owing to jurisdiction shopping.</p>	<p>Geographically concentrated natural disasters have global spillovers (migration, debt repricing).</p> <p>Tariffs cause negative spillovers through redirected energy-intensive trade and retaliation.</p>	<p>Most of the world can be simultaneously and deliberately hit by the same shock.</p> <p>Technology and data sharing can have positive growth spillovers.</p>
Fostering Economic Sustainability	<p>Inequality and social unrest question the sustainability of the growth model.</p>	<p>Debt and environmental sustainability tradeoffs and complementarities. Both anemic growth and insufficient attention to non-economic factors can undermine the sustainability of growth.</p>	<p>Intertemporal sustainability: tradeoffs between volatility from vulnerability build-ups and longer-run income growth.</p>
A Unified Approach to Policy Advice	<p>Limited ability to carry out basic services and manage demand requires prioritization by traditional government.</p>	<p>Apparently competing objectives (controlling inflation, supporting demand, preserving external balances) introduce policy dilemmas and require considering a broader set of tools.</p> <p>Global policy co-ordination can soften some tradeoffs by meeting climate objectives while reducing economic policy distortions.</p>	<p>If traditional transmission channels (e.g., banks) do not work, alternatives are needed.</p> <p>Policy mix needs to optimize balance between prudence and growth.</p>