



# GUIDANCE

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## NOTES

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## How to Implement Strategic Foresight (and Why)

Alberto Behar and Sandile Hlatshwayo

# INTERNATIONAL MONETARY FUND

STRATEGY, POLICY, AND REVIEW DEPARTMENT

GUIDANCE NOTE

## **How to Implement Strategic Foresight (and Why)**

Prepared by Alberto Behar and Sandile Hlatshwayo with guidance from Kristina Kostial, Wojciech Maliszewski, and Daria Zakharova

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**Cataloging-in-Publication Data**  
**IMF Library**

Names: Behar, Alberto, 1979-, author. | Hlatshwayo, Sandile, author. | International Monetary Fund. Strategy, Policy, and Review Department, issuing body. | International Monetary Fund, publisher.  
Title: How to implement strategic foresight (and why) / prepared by Alberto Behar and Sandile Hlatshwayo.  
Other titles: Guidance note (International Monetary Fund).  
Description: Washington, DC : International Monetary Fund, 2021. | Guidance note. | Includes bibliographical references.  
Identifiers: ISBN 9781513593869 (paper) | 9781616356026 (ePub) | 9781616356262 (WebPDF)  
Subjects: LCSH: Strategic planning. | Forecasting. | Risk management.  
Classification: LCC HD30.28.B4 2021

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Publication orders may be placed online or through the mail:  
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P.O. Box 92780, Washington, DC 20090, U.S.A.  
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# Executive Summary

Strategic foresight is the systematic exploration of multiple plausible futures to inform present decisions. It is especially valuable when traditional risk analysis and forecasting approaches have their limits. Strategic foresight includes multiple methods that can be complementary. For example, scenario planning includes the construction of a few stories of the future that illustrate important contrasts. Policy games are dynamic simulation exercises that often include structured role-play and elements of chance to help uncover the action-reaction sequence that lead to an outcome.

Foresight has been successfully deployed in different types of organizations. At the IMF, foresight has palpably influenced strategy and operations (for example, the Comprehensive Surveillance Review, creation of the Catastrophe Containment and Relief Trust, and delivery of fiscal technical assistance). It has also uncovered blind spots (for example, on actors' responses to capital flow measures or the political economy of pandemic vaccine distribution). However, many benefits expressed by participants, such as better crisis preparedness and a more agile mindset, are harder to directly measure. Strategic foresight is an important addition to the IMF's risk-preparedness framework and there is room for economists in the IMF and elsewhere to use such tools more, potentially also in country work. Foresight is an organizational competence that should be continually developed through training and practice.

# Acronyms and Abbreviations

<b>CFM</b> .....	capital flow measures
<b>CSR</b> .....	Comprehensive Surveillance Review
<b>NDU</b> .....	National Defense University
<b>OECD</b> .....	Organisation for Economic Co-operation and Development
<b>SME</b> .....	subject- or country-matter expert
<b>TTX</b> .....	tabletop exercise
<b>TUNA</b> .....	turbulent, unpredictably uncertain, novel, and ambiguous

# Introduction<sup>1</sup>

Strategic foresight is a systematic exploration of multiple plausible future developments to inform present decisions. Foresight does not attempt to forecast the future, since a key premise is that this is not possible, especially over longer horizons. The foresight toolkit includes horizon scanning for weak signals of emerging threats and opportunities, researching long-term trends and uncertainties, producing multiple manufactured narratives that illustrate how a future might play out (scenario planning), using back-casting to conceive paths to aspirational futures or alternatively using pre-mortem techniques to anticipate failure, and role-playing through policy gaming. Regardless of the specific tool employed, strategic foresight offers ways to “learn from tomorrow” ([Édes 2021](#)).

Strategic foresight has been successfully deployed in different types of organizations to navigate an uncertain future. Governments, international policy institutions, and the private sector use strategic foresight. Recognized scenario-planning pioneers include Shell in the 1970s, which still uses it to evaluate its portfolio, respond to surprises, and engage externally, and the Singapore government, which uses it to develop current policies, prepare for long-term trends, and deal with unexpected developments (either to increase agility to shocks or to respond to a recent disruption). Policy games have been used by the military for centuries (in the form of wargames), and in recent decades the methodology was adapted for business and policy contexts.

In 2012, the IMF introduced foresight to support its [mission](#) to ensure the stability of the international monetary system in three areas: surveillance of the global economy and the economies of member countries, lending to countries with balance-of-payments difficulties, and giving practical help to members through capacity development.<sup>2</sup> Over time, strategic foresight at the IMF has shifted from purely strategic applications to include coverage of more operational objectives.<sup>3</sup>

This note explains the value of foresight and provides implementation advice based on the IMF’s experience with scenario planning and policy gaming. Section 2 provides an overview of strategic foresight and some of its tools. Scenario planning and policy gaming have been the IMF’s main foresight techniques so far, though other tools have been complementary. Accordingly, Section 3 focuses on scenario planning by illustrating applications before detailing the methods the IMF has been using, while section 4 describes policy gaming including the matrix policy gaming approach with which we have experimented so far. Section 5 summarizes the key points. In so doing, the note extends an invitation to those in the economics and finance fields (for example, researchers and policymakers) to incorporate strategic foresight in their analysis and decision-making.

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<sup>1</sup> This Guidance Note was prepared by Alberto Behar and Sandile Hlatshwayo under the supervision of Daria Zakharova and Wojciech Maliszewski. It was approved by Kristina Kostial.

<sup>2</sup> Because this work stream focused on longer-term developments that extend beyond the horizon of most of the IMF’s analysis, it was initially named Long-term Trends and Uncertainties. Of course, this does not preclude the selective use of foresight-type tools.

<sup>3</sup> Complementary exercises include those of the Tail Risk Group, which regularly produces a report and presentation for the IMF’s Management and Senior Risk Group on low likelihood but high-impact risks, and the Early Warning Exercise, which is conducted jointly with the Financial Stability Board and presented to the IMF’s International Monetary and Financial Committee ([Robinson 2014](#)).





# Strategic Foresight

## Why Use Strategic Foresight?

The world is turbulent, unpredictably uncertain, novel, and ambiguous (TUNA) ([Ramirez and Wilkinson 2016](#)). Turbulence ([Emery and Trist 1965](#)) refers to fast, unplanned, and disruptive change, actual or perceived, that challenges one's ability to adapt. Many risks can be identified in advance and have distributions that could be modeled, but these characteristics do not apply to unpredictable uncertainties, which are more akin to Knightian uncertainty, black swans, or unknown unknowns.<sup>1</sup> Even for more "known" unknowns, the interpretation of how they will play out or might interact is ambiguous. Knightian uncertainty also has the feature that the past offers incomplete insights into what are novel situations.<sup>2</sup> TUNA conditions make prediction all but impossible, especially over longer horizons and in the aftermath of large disruptions. A key foundation of strategic foresight is the premise that the future is unknowable (Box 1) yet imaginable.

Under TUNA conditions, forecasting and traditional risk analysis have limits. [Growth forecasts](#) have repeatedly proved optimistic<sup>3</sup> and central bank officials have referred to economic forecasting as being "in crisis," especially at key turning points. Quantifying risks around a baseline is an imperfect solution, as argued by [John Kay and Mervyn King \(2020\)](#). Although distributions can be reliably fitted for many risks and subsequent analysis (for example, stress tests) and decisions, estimation can be analytically challenging in others. Moreover, when a novel event occurs, the parameters of the distribution or even the set of possible outcomes changes.

Misleading prejudgments are a leading cause of failure. They were associated with [82 percent of failed strategy cases examined by Finkelstein, Whitehead, and Campbell \(2009\)](#), which suggests that plans are often conditioned on futures that never materialize. One reason may be individual hubris; in *Thinking Fast and Slow*, Kahneman (2011) notes that "[the] idea that the future is unpredictable is undermined every day by the ease with which the past is explained" to highlight a cognitive bias that makes people seek simple explanations for potentially unconnected events. In [Superforecasting](#), Tetlock and Gardner (2016) report that the average expert would not outperform a dart-throwing chimpanzee in forecasting. Poorer performers squeeze complex problems into simple templates, are more confident, and thus more reluctant to change their minds. There can also be institutional pressures to produce simple narratives for recent developments. In such settings, conviction can be rewarded while admitting ambiguity or presenting less comfortable assumptions can be difficult.

Foresight addresses these challenges by surfacing assumptions, generating alternative perspectives, and embracing uncertainty. Foresight challenges the "official future" that could lead to premature and faulty decisions. The official future can be an explicit baseline economic forecast or a "ghost baseline" representing what you think everyone else assumes and expects you to agree with. It could be an assumption that varies across individuals and needs to be compared, or one that is not even explicitly clear in one's

<sup>1</sup> [Knight \(1921, 233, 237\)](#) wrote, "The practical difference between the two categories, risk and uncertainty, is that in the former the distribution of the outcomes of instances is known (either through calculation a priori or from statistics of past experience), while in the case of uncertainty this is not true.... The uncertainty problem in economics is the forward-looking nature of the economic process..." [Vegh and others \(2018\)](#) distinguish between (1) known unknowns, whose distributions can be represented either by bell curves or fatter tail distributions (for example, sudden stops) and can include extreme events; and (2) unknown unknowns, which can include extreme events like the 9/11 attacks on the World Trade Center. [Taleb \(2010\)](#) notes that the distinction can be subjective based on the information set of the beholder and that hindsight bias can make unknown unknowns seem like predictable events ex post.

<sup>2</sup> Yogi Berra reportedly quipped "The future ain't what it used to be."

<sup>3</sup> [The Independent Evaluation Office of the IMF \(IMF 2014\)](#) found that, over the period 1990–2011, GDP growth was on average overestimated and that inflation was on average underestimated. The bias was concentrated in periods of regional recessions or individual country crises, and there was no systematic bias outside of these periods. [Hellwig \(2018\)](#) finds that, at long horizons, IMF forecasts are little better than a forecasting rule that uses no information other than the historical global sample average growth rate.

### Box 1. The Future Is Unpredictable

This box illustrates turbulent, unpredictably uncertain, novel, and ambiguous (TUNA) conditions in the past, present, and future.

Difficulties in foreseeing geopolitical shifts are articulated in the following extract from a memorandum forwarded by Donald Rumsfeld (who also popularized the terms “known unknowns” and “unknown unknowns”) to President George Bush in early 2001:

“If you had been a security policymaker in the world’s greatest power in 1900, you would have been a Brit, looking warily at your age-old enemy, France. By 1910, you would be allied with France and your enemy would be Germany. By 1920, World War I would have been fought and won, and you’d be engaged in a naval arms race with your erstwhile allies, the U.S. and Japan. By 1930, naval arms limitation treaties were in effect, the Great Depression was underway, and the defense planning standard said, ‘no war for ten years.’ Nine years later, World War II had begun. [...] All of which is to say that I’m not sure what 2010 will look like, but I’m sure that it will be very little like we expect, so we should plan accordingly.” – Source: [Rumsfeld \(2001\)](#).

Collective shortcomings in anticipating solutions to a horse manure problem are vividly contained in an extract from an article in the *Harvard Business Review* called “[Why Business Leaders Need to Read More Science Fiction](#)” (Peper 2017):

“At the end of the 19th century, New York City stank. One hundred fifty thousand horses ferried people and goods through the streets [...] producing 45,000 tons—tons!—of manure a month. It piled up on streets and in vacant lots.... [I]n 1898 urban planners convened from around the world to brainstorm solutions to the impending crisis. They failed to come up with any, unable to imagine horseless transportation. Fourteen years later, cars outnumbered horses in New York, and visions of manure dystopia were forgotten. If 19th century urban planners had had access to big data, machine-learning techniques, and modern management theory, these tools would not have helped them. They simply would have confirmed their existing concerns... limiting in a world of accelerating technological change.”

The COVID-19 pandemic made even the present more TUNA. Estimates varied considerably regarding the duration of the pandemic, and we are still grappling with how it might interact with technology, privacy, trust, social tensions, climate change, and the economy. Lots of priors were shaken, yet the tumult provided opportunities to surface assumptions and change mindsets. There were large increases in interest in foresight techniques following 9/11, the 2008 global financial crisis, and the COVID-19 pandemic (Ramirez and Wilkinson 2016; [Rigby and Bilodeau 2007](#)). Many are using the pandemic to articulate long-standing agendas. Indeed, crises often fast-forward the future ([Harari 2020](#)); as reportedly said by Lenin, “There are decades where nothing happens; and ... weeks where decades happen.”

The previous examples use hindsight to reveal the difficulties of anticipating developments. Box Table 1.1 uses technological change and COVID-19 to illustrate TUNA conditions ahead.

**Box 1. The Future Is Unpredictable** *(continued)***Box Table 1.1. Looking Ahead to a TUNA Future**

	Technological Change	COVID-19 Pandemic
Turbulence	Industries shrinking. Job categories eliminated.	Work processes upended. Contraction in global GDP.
Unpredictable Uncertainty	Which new industries and careers will exist? How might technology affect economic policy making and execution?	Interplay with behavior, privacy, trust, social and geopolitical tensions, government policies, green investment, etc.
Novelty	Threat to higher-skill and white-collar occupations.	Previous global crises less relevant (new shock requires adapting economic models).
Ambiguity	How fast will artificial intelligence evolve and be adopted?	Reproduction number. Pace of vaccine distribution. New virus strains.

own mind. Strategic foresight provides an opportunity to first surface and then question assumptions in a safe environment (for example, what optimistic assumptions are being made for debt to be sustainable). After seriously considering alternative perspectives, one has additional “lenses” through which to embrace uncertainty and interpret developing events ([Scoblic 2020](#), Ramirez and Wilkinson 2016).

At a more basic level, foresight puts the future on a crowded agenda. One of the so-called “seven effective habits” is limiting urgent unimportant tasks to make room for less urgent but important tasks ([Covey and Covey 2020](#)). Similarly, it can be tempting to focus on easy deliverables to avoid confronting challenging and potentially less-well-defined issues. Sometimes, putting a foresight exercise on the agenda can be the only way to avert perpetual postponement.

Many foresight methods exploit the power of stories set in the future ([Wilkinson 2017](#)). Even for people with quantitative orientations, stories are easier to remember than data and satisfy our appetite for tying distinct events together (Kahneman 2011). Economic stories that go viral can influence policymaking and even prompt crises ([Shiller 2019](#)).<sup>4</sup> Because stories are made up, they are not positions that need to be defended.

Foresight is used in governments, international organizations, companies, and the military ([Online Annex 1](#)). Applications include warding off complacency, making policy or investment decisions, engaging with stakeholders, or responding to surprises. Some organizations have embedded foresight capacity and developed a suite of foresight tools to address an issue, yet many tools are sufficiently flexible to complete a variety of tasks. Some foresight products are published (for example, by the [National Intelligence Council \[2021\]](#), European Commission [Figure 1]).

<sup>4</sup> For example, Shiller argues, the great recession occurred because narratives that home values would continue to rise morphed into bubble narratives. Another repeated narrative is that of technology-driven unemployment.

**Figure 1. Recent Strategic Foresight Report**

Source: European Commission (2020).

## Foresight Approaches<sup>5</sup>

Foresight practitioners use multiple tools. These include analysis of long-term trends and uncertainties, horizon scanning, scenario planning, normative futures (including aspirational futures and pre-mortem exercises), and policy gaming. The set of foresight tools continues to expand but their unifying theme is that they do not aim to forecast a single correct future.

- *Researching long-term trends and uncertainties uncovers key drivers of various possible futures.* Megatrends analysis documents key slow-moving trends (“stylized facts”) and explores potential interactions with other big trends. Megatrends analysis can benefit from historical data analysis and extrapolation. The paths for some trends that have strong priors can often be taken as given (for example, “How many people aged 25–64 will there be in 2035?”), though they may merit interrogation if they are central to the issue being researched (for example, “Will the population aged 25–64 still be a good proxy for the labor force in 2035?”). Other potential paths are so unclear that they are better characterized as uncertainties (for example, “What will be the jobs of the future?” or “Will technological change on net be job creating or job destroying?”). The set of interactions between just a limited number of uncertainties can grow very quickly, so collapsing multiple developments into a handful of trends and uncertainties<sup>6</sup> yields a manageable number of potential drivers to process or document.
- *Horizon scanning is a foresight tool that scans for faint signals of disruptive developments or breaks in trends, sometimes from fields outside of one’s profession.* Scanning can include desk research, expert surveys, attending conferences, inviting external specialists, and reviewing recent futures work. Because its outcomes and potential uses are less clear ex ante, horizon scanning can often get crowded out by activities with a clear output unless it is made a regular activity.
- *Scenarios are a small set of infinite possible futures over a sufficiently long horizon to generate perspectives different from the present.* Scenarios are sets of typically two-to-four stories that illustrate important contrasts. Each scenario has positive and negative parts. Scenarios are generally qualitative. Despite the

<sup>5</sup> This section draws largely on [Wilkinson \(2017\)](#) and [OECD \(2019\)](#). Fuller descriptions of futures methodologies and applications include [Millennium Project \(2020\)](#) and [Asian Development Bank \(2020\)](#).

<sup>6</sup> The priority areas will be tailored to the project, which is another reason why the exercise is considerably more valuable than taking third-party trends reports as the final word. Methods for prioritization can involve group discussion, identification of related issues and a possible root cause, and possibly voting or other consensus methods. More structured quantitative methods that reduce dimensionality by identifying highly correlated topics include the morphological approach (see [Johansen 2018](#); [Schoemaker 1995](#)).

name, scenarios are not quantified sensitivity analyses to the baseline. Scenario planning can be combined with other tools. For example, megatrends analysis can precede scenario building, while scenarios can be a starting point for a pre-mortem or policy game.

- *Normative futures imagine explicitly desirable or disastrous outcomes.* Aspirational scenarios are futures that are desirable by design, are produced in sets alongside expected or undesirable futures, and illustrate how they might be achieved. Visioning and back-casting work backward from an imagined preferred outcome to the present, while design futures follow a more incremental bottom-up approach to an unexpectedly good outcome. One normative future that focuses on disastrous outcomes is a pre-mortem ([Klein 2007](#)), which assumes failure and assigns participants the task of explaining why.
- *Policy gaming is a foresight approach that provides insights into endogenous interactions between various actors.* Also known as wargaming, policy games are dynamic simulation exercises and often include structured roleplay and elements of chance (for example, game elements like dice). There is typically a starting scenario and an imagined shock event that prompts action from participants (for example, a large emerging market adopting a restrictive capital-flow measure or a major protectionist action). Each game results in a single, but quite substantive, narrative for how a shock-prompted action-reaction sequence might unfold. There are also other “tabletop exercises,” “drills,” or “functional exercises” that encourage decision makers to play themselves in the context of simulated crises for the purpose of developing preparedness strategies (within and across institutions), training, and testing operational capacity ([World Health Organization 2018](#)).
- *Other foresight tools include futures wheels and causal layered analysis* ([Asian Development Bank 2020](#)). Horizon scanning and megatrends analyses can serve as a starting point for future wheels exercises, where direct and indirect effects of a certain hypothetical event are considered in a cascading and interconnected manner that, visually, takes the form of a wheel.<sup>7</sup> Alternatively, prioritized trends and uncertainties, as well as their possible implications, can be studied in greater depth using causal layered analysis. In such exercises, the identified issue is the visible part of an iceberg while successive layers of causes, systemic frameworks, worldviews, and myths and metaphors are below the surface ([Inayatullah 1998](#), [Édes 2021](#)).

<sup>7</sup> Specifically, participants: (1) choose 3-5 uncertainties, (2) take a side and posit it as a “what-if” statement, (3) identify early signals that this development could materialize, (4) explore second-round effects through a handful of “if-then” statements for each “what-if” statement, (5) infer implications for your particular policy area, and (6) consider actions that could mitigate challenges and exploit opportunities. The [OECD \(2020\)](#) listed post-COVID uncertainties to initiate a rapid futures-wheel exercise.



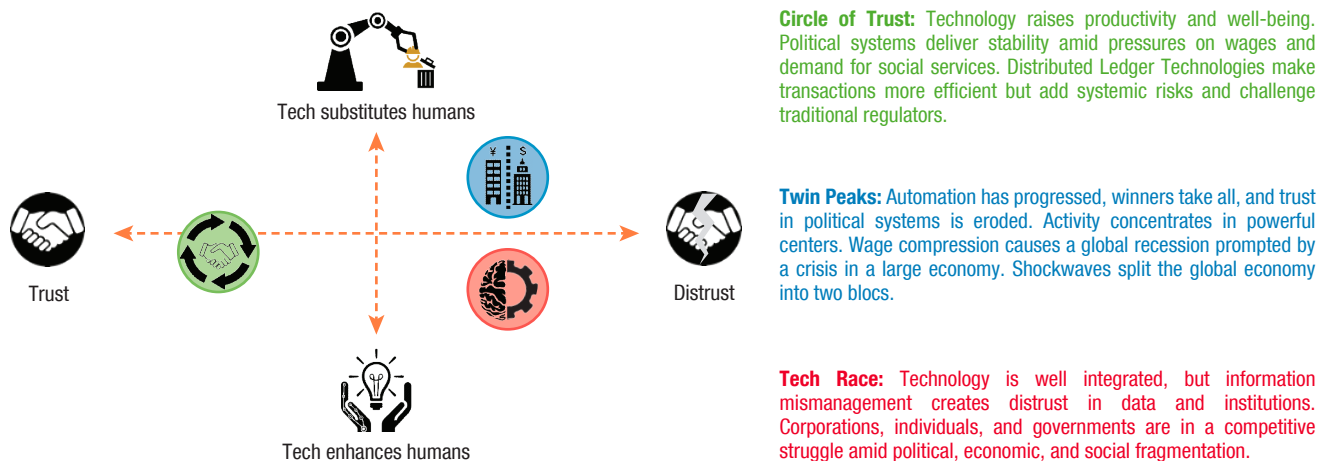
# Scenario Planning

Scenario planning has been a major part of the IMF's foresight work. This section describes scenario-planning applications. In addition to core Fund work in surveillance (for example, flagships, Risk Assessment Matrix, Early Warning Exercise), lending (for example, Catastrophe Containment and Relief Trust), and capacity development, there have also been more subtle benefits ([Online Annex 2](#)). The section also delves into methodological detail.

## Applications of Scenario Planning at the IMF for Various Objectives

The IMF's scenario-planning work began with an open-ended interrogation of its business model and offerings. The IMF's first scenarios, produced during 2012-14 and set in the 2040s, were manufactured as a broad strategic exercise to help the IMF fulfill its mission by stress testing the IMF's broader business model ([Behar, Kostial, and Ramirez 2018](#)).<sup>1</sup> The exercise, which included identification of long-term trends and uncertainties (Box 2), had tangible effects. For example, by showing how a noneconomic shock (for example, a pandemic) can trigger a global economic snowball effect, scenario planning helped motivate the speedy creation of the IMF's Catastrophe Containment and Relief Trust in response to the Ebola epidemic.<sup>2</sup> This set of scenarios also prompted the Fund to investigate emerging areas, including climate. In 2017, a second set of scenarios with a similar time horizon explored uncertainties regarding trust and technology (Figure 2). They were designed to help management, heads of departments, and the Executive Board derive implications for the IMF's strategy in dedicated workshops. Departments also adapted the scenarios to their more operational needs such as improving technical assistance in fiscal policy, the future role of the Legal Department at the Fund, and illustrating new potential sources of crisis for a paper presented to the Executive Board on quotas.

**Figure 2. 2017 Scenarios**



Source: Authors.

<sup>1</sup> The business idea is a graphically depicted system of distinctive competencies creating value and sustaining itself in a reinforcing feedback loop (van der Heijden 2005). The process elicited frank evaluation of where the IMF creates the most value for its members at present even before future scenarios were entertained.

<sup>2</sup> The Post-Catastrophe Debt Relief Trust was transformed into the Catastrophe Containment and Relief Trust, with broader application to more types of shocks (for example, epidemics).



## Box 2. Five Long-Term Trends and Uncertainties Used for Scenario Planning

Originally conducted as a stand-alone exercise during 2012–14, the IMF staff prioritized five long-term trends and uncertainties captured in a reference document on longer-term drivers that can have fundamental economic implications. Megatrends analysis over multiple decades sensitized IMF staff members to structural shifts outside of economics. As a result, some drivers, such as demographics and climate change, are now in the mainstream of IMF work. By emphasizing the uncertainty element and resisting extrapolation of past trends, it made the staff more receptive to potential accelerations, decelerations, or breaks. The trends and uncertainties fed into the scenario construction.

1. *Global power is shifting* from advanced to emerging market and developing countries, while non-state actors and sub-national authorities are gaining national and international influence.
2. *Financial linkages between countries have grown sharply*, the rise of integrated supply chains and product fragmentation have changed the nature of trade, and improvements in information and communication technology have broadened access to information.
3. *Rising global population and income will increasingly put pressure on natural resources and the environment*, exacerbated by short-sighted and unilateral government policy interventions.
4. *Demographic developments are progressing* along multiple dimensions, with varying implications across countries. Economic prosperity in aging economies is likely to be challenged while countries facing youth bulges may struggle to generate enough job opportunities.
5. *Income inequality has risen within countries* over the past few decades, driven by multiple factors including technological advances and globalization.

We subsequently used scenario planning for more focused economic surveillance topics. A 2018 *Regional Economic Outlook* chapter titled “The Future of Work in Sub-Saharan Africa” (IMF 2018) featured megatrends and [scenarios](#) set in the 2040s to describe potential paths for technology, global economic integration, and climate change and call for openness to adapt development strategies. The scenarios had synergies with more traditional economic analysis (for example, empirical analysis and theoretical modeling). Scenario planning and megatrends analysis also informed the IMF’s 2020 work on the international monetary system, illustrating how technology, economics and geopolitics might change the configurations of reserve currencies by 2045; it is summarized in a paper on reserve currencies in an evolving international monetary system (Boswell and others 2020).

Scenario planning stress tested proposed surveillance priorities of the [Comprehensive Surveillance Review \(CSR\)](#) using pre-mortem techniques for strategy (Behar and Hlatschwayo 2021). The CSR considers how to adapt surveillance over the coming decade and proposes priorities intended to be robust to an uncertain future. Authors of the CSR and representatives from across the institution built scenarios to stress test the robustness of the proposals. Stress testing was done using pre-mortem techniques ([Klein 2007](#)). For example, authors of the priorities had to imagine that an internal evaluation in 2030 is highly critical of the priorities and explain why this was the case for each scenario. This exercise, which was also conducted with members of the Executive Board and the External Advisory Groups, helped the authors refine the proposals. The broader scenario-planning process included megatrends analysis that helped the authors draft a section of the CSR.

A taskforce on policies for the post-COVID recovery applied scenario planning to a shorter horizon to consider exit options. In mid-2020, the taskforce considered how the IMF could promote policies to aid a post-COVID recovery from the perspective of the end of 2021. In a series of short online sessions, the

scenarios were structured by a trust axis from the 2017 scenario-planning round and a second axis on vaccine availability/adoption.<sup>3</sup> In the “Griffin” scenario, a treatment but no vaccine became available, and governments successfully rallied countries around the need for containment, allowing for a partial economic recovery. In “Hydra,” no vaccine or treatment was available, and, triggered by related policy setbacks, trust was further eroded. Lastly, in “Phoenix,” a vaccine becomes available, and policymakers responded to rising inequality and depressed economic activity with a Global Response Plan that made achieving the sustainable development goals its long-term objective.

## The Scenario Planning Process

The Scenario-Planning Process the IMF has used is a methodology pioneered by Shell and developed at the University of Oxford.<sup>4</sup> The approach emphasizes how TUNA conditions merit using scenario planning iteratively to reframe strategy. As described previously, we have combined scenario planning with other methods. For example, initial megatrends analysis served as an input to scenario building and application. Neutral scenarios also set the stage for bad outcomes (for example, pre-mortem) and provided the backdrop for policy games. A small scenarios team has coordinated the work but the people who “do” the scenario planning are often those who are using it. Scenario planning is a process that can be conducted in a handful of online sprint sessions (Box 3) condensed possibly into a week, while richer exercises can extend to over a year. The process involves determining the objective of the exercise, conducting research, producing scenarios, and deriving implications.

### Step 1: Determining the Objective of the Scenarios

Determining the purpose and user of the scenario-planning engagement is a critical starting point. With limited resources, scenarios should not be created in the hope that they will be used; demand-driven efforts are always preferred. Establishing the objective dictates the scenario-planning design and establishes a shared understanding with the group requesting the scenario planning on the efforts they (and, if different, the user) will need to make.

The purpose of the scenarios will affect the building of the scenarios and how they are ultimately used to derive implications. The purpose might be broad-based and open-ended like our first scenario-planning round.<sup>5</sup> Alternatively, it might be open-ended but on a focused topic (for example, The Future of Work in Africa, Reserve Currencies). It could be a search for potential resolutions to a difficulty that has already been identified. Alternatively, the purpose could be to decide between possible proposals (for example, to evaluate investment decisions) or to stress test a current set of proposals (for example, proposed surveillance priorities for the CSR). Scenario planning is easily adaptable to be fit for purpose.

Identification of core users informs who participates in the workshops and how the scenarios can cover themes that resonate with them. It is important to establish who the scenarios should primarily influence. Possibilities could be readers of an external publication, the authors of that piece, or a small group of confidential decision makers. Scenario interventions can have different effects. They can be designed to challenge, surprise, or inspire.

<sup>3</sup> Although foresight can be especially valuable for responding to a crisis and its long-term consequences, the pandemic also increased work pressures and complicated working arrangements. Preparations for a post-pandemic world had to compete with the immediate crisis response. Foresight workshops, which traditionally include groups huddled around whiteboards, had to be conducted online. Limits to time and online cognitive capacity prompted shorter engagement times broken into even shorter sessions at the cost of richness. [Ramirez and Lang \(2020\)](#) also suggested a “frugal” approach to scenario planning in similar contexts.

<sup>4</sup> See [Ramirez and Wilkinson \(2016\)](#), [van der Heijden \(2005\)](#), [Shell International BV \(2008\)](#), and the [Oxford Scenarios Programme](#). And see Schoemaker (1995) for a complementary description of the process and case studies. We have also benefitted from the expertise of Professor Rafael Ramirez.

<sup>5</sup> A broad-based and open-ended inquiry should not be confused with one that is vague or unestablished. The former could be “What developments could affect the economics profession over the next quarter century?”

### Box 3. How One Might Conduct Scenario Planning Sprints Online

*Drawing on our experience in using scenario planning on policies for a post-COVID recovery as well as [Ramirez and Lang \(2020\)](#), the scenario planning is structured around four online sessions of about 90 minutes each. These steps are an abridged version of the deductive approach described in Box 5.*

*Session 1: Brainstorm Trends and Uncertainties.* Before the first session, the purpose (see Session 4) and users need to be well established. In this session, scenario users/builders identify, discuss, and potentially prioritize core trends and uncertainties relevant for the scenario set to be built. For our post-COVID scenarios, background research into trends and uncertainties was already in progress for inclusion in a report, so there was no need for a dedicated scenario-planning session.

*Session 2: Identify Two Axes as a Framework for Two-to-Three Sketch Scenarios.* For our post-COVID scenarios, one person proposed a set of axes as a framework for a small group to compare sketch scenarios, which had been prepared individually offline. Alternatively, the bulk of this session can be dedicated to determining axes and subsequently the approximate locations of as-yet unformulated scenarios, which are only determined in Session 3.

*Session 3: Develop the Scenarios.* We used brainstorming to seek feedback on draft scenarios using online tools. Alternatively, smaller breakout groups can develop 2–3 scenarios. The core group subsequently (re)drafts the scenarios offline.

*Session 4: Derive Implications.* The type of implications being sought would have been determined when the purpose of the scenarios was established. We had a series of questions on what each scenario implies for policies to aid a post-COVID recovery. Instead of running Sessions 3 and 4 sequentially, we combined them but had separate shorter sessions for each scenario.

## Step 2: Conducting Research and Determining Whether to Build or Adapt Scenarios

To research the core trends and uncertainties, the initial phase should explore a broad range of factors and incorporate a diverse pool of views. In the IMF's case, sometimes such work was largely completed as a standalone exercise. Other times, similar work would have been needed anyway to draft a section (for example, a REO chapter or the CSR) so the discussion of findings in dedicated workshops (see [Online Annex 3](#)) served the project directly. Traditional data analysis can help participants distinguish between stylized facts and larger gaps in knowledge. Perspectives for IMF applications came from outside research on a specific topic or purpose-built foresight studies. External speakers gave masterclasses reserved for workshop participants alongside seminars for Fund staff. Even for a topic as focused as "The Future of Work in Africa," we considered factors beyond economics and outside of Africa and conducted interviews with non-economists outside the IMF. Interviews with the IMF's management team, who were the primary users of the 2017 round of scenarios, also helped the scenario team identify the uncertainties that mattered to them.

Users can then decide between adapting existing scenarios or building new ones. After establishing the purpose and having a better understanding of the relevant trends and uncertainties, users might consider that an existing set is fit for purpose with minor modification (for example, the 2017 scenarios were adapted for a Board paper on the adequacy of the IMF's resources). Pertinent questions include whether the scenarios emphasize the trends and uncertainties most relevant for the new project, whether they are sufficiently challenging, or alternatively, too sensitive for the intended users, and whether they have gone stale or become less relevant because of recent events.

### Step 3: Building Scenarios<sup>6</sup>

Scenarios are typically built in workshops with participation by the intended users. The scenarios lay out potential interactions between trends and uncertainties, including those identified earlier during the research stage. Because of the considerable value added in the building of the scenarios, scholars stress the importance of the key stakeholders (project initiators, paper authors, decision-makers) being the builders rather than recipients of finished scenarios, or worse, a final report with conclusions. Although we have not always been able to follow this recommendation to the letter, we have included the users for at least part of the time. For example:

- *More senior staff participated actively toward the end of some workshops.* After seeing sketches of the scenarios devised by junior staff, senior staff with closer contact with management provided feedback in a seminar style for the 2017 round intended for management. For the CSR, a group of senior staff responsible for providing feedback on the review not only got to critique the scenarios; they were placed in groups to rework them and address the shortcomings they had identified.
- *For scenarios built with a particular publication in mind, authors were heavily involved.* For both the REO chapter and the CSR, the core participants included authors and senior staff overseeing the publications. There were also staff from other departments, including some with prior experience in scenario planning at the IMF.
- *Some workshops also invited participants from outside the IMF.* Participants who are not economists or do not work for the IMF are valuable because they have different perspectives and will challenge assumptions that may appear self-evident to an IMF economist. The 2017 round included a biotech entrepreneur, a political scientist, and a futurist. They had influential insights and, more importantly, asked insightful questions that challenged received wisdom for economists to improve the scenarios. Other projects consulted outsiders earlier in the process (for example, interviews) or later, once scenarios were largely completed. Scenario planning that takes place in a virtual setting allows for broader participation in workshops.

Scenarios are sets of stories set possibly far in the future. From the outset, workshop participants are encouraged to place scenarios in the future and depict the situation in the present tense. Further elaboration can include a timeline or description, in the past tense, of how that point was reached. Setting scenarios in the future is an important way to make scenario builders and users more open to things changing. For this reason, scenarios should be set just sufficiently far into the future to open minds to the degree needed. Time horizons can be longer if perceived plausibility needs to be stretched further or if the decision horizon (for example, for an investment) is longer. For the CSR, a period of a decade was chosen because it sets surveillance strategy for the next five years and because typical macroeconomic frameworks span five years. Many IMF scenarios have been set over spans of 25–30 years. A good set of scenarios has a number of characteristics and should be communicated in innovative ways (Box 4).

Scenario-building workshops typically employ two alternative structured techniques, each with pros and cons.

- In a *deductive method*, the first step is to prioritize typically two key uncertainties and represent them with axes. This step can be especially insightful.<sup>7</sup> After the axes are identified, the second step enriches scenarios, which are different along the dimensions depicted by the axes. There can be one scenario in each of the four quadrants but, in our experience, there have been three (Box 5).

<sup>6</sup> This section draws on insights and materials obtained at the Oxford Scenarios Programme. Although we have dedicated considerable space to the methods, one insight from the program was that this stage should take up perhaps one-third of the scenario-planning effort and the other stages should take the remaining two-thirds.

<sup>7</sup> Alternatively, in the interest of time but at the cost of insight, a decision can be made not to spend a lot of time on this stage (the 2017 trust axis was retained for the COVID recovery scenarios alongside an axis on treatment).

## Box 4. Characteristics of Good Scenarios

*This box outlines some characteristics of good scenarios and how they can be presented innovatively.*

**Internal consistency is essential.** If participants question the consistency of a part of the narrative, this provides an opportunity for scrutiny in the context of the scenario. Perhaps an assumption built on historical experience needs to be surfaced and checked for continued validity (for example, capital could conceivably flow to emerging markets during a crisis in this scenario). Ensuring consistency also offers opportunities to unpack interim stages that might have occurred to generate a part of the narrative.

**They are just-about plausible, not necessarily likely.** Probability is not a relevant metric; scenarios with higher likelihoods are not better. Because participants can be too timid or skeptical when entertaining possibilities, they should be strongly encouraged to think the unthinkable. In our experience, scenarios that appear borderline plausible end up seeming a lot more mainstream even a few months later. We have not yet viewed a scenario as too wild *ex post*. Moreover, even if scenarios are intended for outside users or if there may be internal sensitivities, this should not be a constraint during scenario-building workshops.

**They are neither overly positive nor negative.** Many initial scenarios were gloomy (despite original intentions), which presented the opportunity to challenge the assumptions or at least introduce a twist that provides hope of improvement on the horizon. If the scenario is too positive, consider whether there are some losers (workers, countries) from the change, whether the equilibrium is stable, or if a buildup of economic and financial vulnerabilities could spell doom later.

**They work as a set to provide contrasting coverage on priority issues.** For the most important 2-3 trends identified in earlier workshops or being covered in a core report, ensure that each scenario says something. Other important trends should be covered in 1-2 scenarios. Initial scenario sets often have two scenarios that get conflated because they are similar. They should be made more distinct.

**The stories are good.** This is easier said than done. Good stories reveal contrasts and frictions and convey complexity vividly through relevant details and snapshots. They often have a timeline with an inciting moment, a rising action, a climax or turning point, and the current state (the end of the scenario). They have compelling and informative titles.

**They are depicted in innovative ways that capture users' attention** (for example, Box Figure 4.1; United Nations 2005). For written scenarios, images and assigned font colors for each scenario can add visual cues to help readers follow along. We have produced hypothetical flagship report chapters set far in the future (Behar and Hlatshwayo 2021). Longer scenarios provide more room for richness, vivid examples, and comprehensive coverage. However, some participants may not have enough time to read long narratives and some find it helpful to have summaries or quick vignettes of what it is like to be a person living a "day in the life" for each scenario. We produced a 3-minute video (IMF 2017) or presented scenarios to participants verbally in the form of speeches set in the future. Scenario-building workshops have included PowerPoint templates that require a scenario image, completion of sentences, and more generally help summarize the scenario. A comparison table showing how the scenarios show contrasts across key themes is recommended during scenario building and as part of scenario [write-up](#) (IMF 2018). Some organizations have dedicated websites for their scenarios ([Shell International BV](#), [Wärtsilla](#)).

Box Figure 4.1.



Source: UNAIDS (2005).

## Box 5. Deductive Method

This box outlines a two-day scenario-building agenda. For a detailed example, see [Online Annex 4](#).

### Day 1

*Introduction to scenario planning and objectives.*

*Contextual environment (possible futures).* Group work to discuss the most important trends and uncertainties for the current project, followed by a plenary. The length of this will depend on the work on trends and uncertainties preceding the workshop.

*Group work to prioritize uncertainties (bulk of the first day).* The criteria for the uncertainties we have used are (1) which are the deepest unknowns, and (2) which potential outcomes of those unknowns could cause the greatest impact or discomfort. This exercise is done by multiple<sup>1</sup> groups in parallel (see Box Figure 5.1), who then compare notes and “negotiate” a final set of (usually) two uncertainties. The prioritized uncertainties are represented on a set of axes and should be as conceptually orthogonal as possible to prevent an axis being wasted. The axes represent a continuum rather than binary situations and finding precise axis labels is important.

*Close of Day 1.* Plenary agrees on broad outlines of 2–4 scenarios by determining their location on the axes. We have typically not used all four quadrants, finding that three scenarios can convey sufficient variation across both dimensions. If no axis agreement could be reached, a smaller group (for example, facilitator and project leaders) meet to find a set to propose to the group the following day.

### Day 2

*Recap of scenario outlines (or proposal of axes if necessary).*

*Development of scenarios.* Groups are each assigned a scenario to flesh out. Although there is cross-comparability on the two core issues, other contextual environment issues that were also important could be addressed in a subset of the scenarios in contrasting ways while preserving internal consistency. Further details can be added to the contextual environment, followed by description of the transactional environment.

*Finalizing scenarios.* Slides are used to present the scenarios in a closing plenary and act as aides memoire for subsequent drafting. In larger groups, sub-groups can start the presentation early while others continue refinement.

*Plenary and further refinement.* Plenary invitees include project sponsors or other senior staff who could not participate in the entire workshop. Invitees also form groups to implement the feedback they might have given for one scenario.

**Box Figure 5.1. Choosing Issues**



Choosing issues that are most uncertain and most important (top right) to aid axis selection for deductive method.

Source: Authors.

<sup>1</sup> A set of axes can be conjured quickly if there is less time (for example, Box 3), especially if the uncertainties can be taken as given from the project's objectives. The process of determining the axes can be insightful precisely because they were not the obvious initial choice. The mechanics can be unwieldy when there are many groups or a large workshop.



- The *inductive method* has group members produce a story using “uncertainty” or “factor” cards. Repeating this over 2–3 rounds and 3–4 groups quickly yields about 10 sketch scenarios. A subset is chosen (by voting and/or the core set of scenario authors). This can include merged elements from sketch scenarios but without seeking to capture the content of all sketches (Box 6).

Each method has pros and cons. The deductive approach has a clearer initial structure while the inductive approach is more flexible. Workshop participants find the deductive structure less daunting than inventing a bottom-up story using the inductive method. However, the discomfort usually subsides in subsequent rounds and there can be more creativity in the inductive approach.

The scenario user itself should not be featured in the scenarios, which describe the contextual and transactional environments (Ramirez and Wilkinson 2016). Most of the building process should be dedicated to the so-called contextual environment, which describes trends and uncertainties beyond the user’s influence. However, toward the end of a workshop, the participants can consider the transactional environment, which describes actors the IMF might interact directly with. For existing actors, are they newly empowered or weakened? Do they win or lose? Are they still operating? Are there new actors? The emphasis is on those actors and not how the IMF interacts with them.<sup>8</sup>

## Step 4: Using the Scenarios

In most cases, the scenarios were not outputs, but purpose built as inputs to workshops on actions the IMF should take. Examples of workshop outputs include a memorandum prepared for the management team summarizing the conclusions they derived in the workshop or an informal aide memoire for the CSR authors recording how they decided surveillance priorities can be made more robust.<sup>9</sup> But this should not substitute for user participation. Moreover, there is considerable value in the unrecorded discussion within small groups.

Workshops typically combine group work with a plenary to solidify common takeaways (see [Online Annex 6](#)). Groups discuss prepared questions sent in advance or apply structured techniques before a plenary synthesizes insights.<sup>10</sup> However, preparation can be uneven, especially among those not directly involved in the project, so a small amount of time should be devoted to filling such gaps at the start of the workshop.<sup>11</sup>

Scenarios can also aid further engagement. For example, the CSR scenarios and pre-mortem were used to seek external perspectives from the CSR External Advisory Group, which included academics and policy-makers. Some secondary uses are not necessarily anticipated but subsequently identified, as some users find it worthwhile to repurpose scenarios rather than rebuild new ones. For example, having been designed for the management team, the 2017 set was tailored for departmental workshops (with substantial input from the departmental users) or edited to allow workshops with outside audiences. For some external engagement workshops or for publications, we revised scenarios for sensitivities (but not during scenario building or for internal workshops).

<sup>8</sup> Given the IMF’s mission, building scenarios as if the IMF does not influence the contextual or transactional environments is a challenge. However, predicted or desirable IMF responses should wait until a separate session (for example, policy games) or the application stage. If the scenarios are being made for a division, then that division should be excluded but other divisions, top management, or headquarters can be in the scenario description of the transactional environment.

<sup>9</sup> A second-best ‘output’ can be a memorandum prepared for the primary users or for secondary audiences summarizing the conclusions derived in a workshop by others. This should be avoided, especially in cases when management are the primary users (for example, applications that are strategic or require top-level decision-making).

<sup>10</sup> During the 2017 workshop, heads of department and the IMF’s management discussed and prepared answers to assigned questions in groups. There was subsequently a plenary facilitated by the Managing Director, supported by anonymous online voting. For the CSR, the authors of the draft surveillance priorities as well as senior staff had to assume the draft surveillance priorities were severely criticized in 2030, explain why the priorities failed, and propose refinements.

<sup>11</sup> Those who were involved in the building stage sometimes presented scenarios concisely and imaginatively (for example, as a speech). In breakout sessions, participants commented on what they liked or disliked about the scenarios. Alternatively, a simple quiz requiring participants to match an event to a scenario can also increase familiarity.

## Box 6. Inductive Method

Below is an outline of a 2-day scenario building agenda. For a detailed example, see [Online Annex 5](#).

### Day 1

*Introduction to scenario planning, objectives, and a warmup exercise.*

*Contextual environment (possible futures).* Group work to discuss the most important trends and uncertainties for the current project, followed by a plenary. The length of this will depend on the work on trends and uncertainties preceding the workshop.

*Use factor/uncertainty cards to sketch multiple mini-scenarios in groups.* This forms the core of the first day. The facilitator explains the process. Each of about four group members draws a “factor” or “uncertainty” card (for example, [Center for Strategic Futures 2021](#)) that they need to combine with the cards of other members to make a story.<sup>1</sup> Cards are picked randomly or based on interest. Using cards to make stories takes learning-by-doing rather than a particular technique or instruction, so the first batch sometimes ends up serving only as a trial run as participants can be coming to terms with the mechanics and group dynamics while others’ creativity needs to warm up. After the first round, the groups compare scenarios in a plenary and the facilitator offers feedback and pointers. The process is repeated another one or two times by each group to yield about 10 scenario sketches (e.g., Box Figure 6.1).

*Facilitator-led discussion/vote on preferred scenario sketches.* After the close or before the next day, a small group (for example, with project leaders with assistance from facilitators and informed by the votes) chooses 2–4 scenarios. Some sketches can be developed as standalones, some are merged with other sketches, while others are discarded.

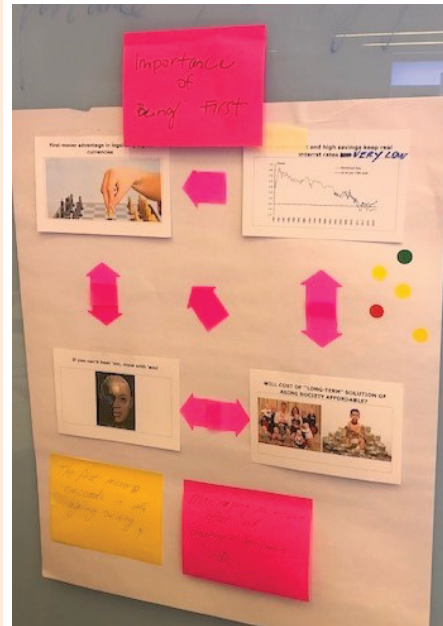
### Day 2

*Opening plenary: reflections and proposed scenario set.* Small group introduces 2–4 scenarios chosen/merged. People self-select into which scenario they would like to develop further. Facilitators give tips for further scenario refinement.

*Merging and enriching scenarios (this is the core of the second day and probably the most important session).* The bulk of the second half of the workshop has slightly larger groups working to refine the scenarios. This is initially to re-examine the internal logic of the scenario and subsequently to enrich

**Box Figure 6.1. Making Scenarios**

Sketch of scenario produced with inductive method.



Source: Authors.

<sup>1</sup> The deck of cards is sometimes produced by participants in advance (in some cases drawing on material discussed at an earlier trends workshop) or by the facilitator. Groups also use ad hoc sticky notes.



### Box 6. Inductive Method *(continued)*

the stories by adding regional variation, identifying winners and losers, etc. Facilitators suggest changes to highlight contrasts across scenarios. A timeline can be introduced as part of the storytelling technique. Subsequently, groups consider how various actors (not the IMF) might react in their scenario. A checklist of missing pieces is (usually incompletely) filled through templates provided in PowerPoint.

*Plenary and further refinement.* The slides are used to present the scenarios in a closing plenary and, along with photos of the sketch scenarios, act as aides memoire for subsequent drafting. Plenary invitees include project sponsors or senior staff who could not participate in the full workshop. Invitees form groups to implement the feedback they might have given for one scenario.

## Further Considerations

- *A facilitator can be valuable.* The IMF has used professional external facilitators for some projects and internal facilitators for others ([Online Annex 7](#)).
- *Scenario planning could include quantification.* Using models early in scenario building is neither common nor recommended since it can inhibit “out of the box” thinking. However, quantification or modelling can be part of the scenario process (for example, to aid internal consistency or illustrate a point quantitatively). Shell has comprehensive and detailed spreadsheet [models](#) that are flexible so that specific functional forms do not prejudge relationships between variables. The [Pardee Center for International Futures](#) has made its International Futures (“IFs”) model available to the public. [Econometrics](#) (Deloitte 2012) could also be informative but care should be taken not to extrapolate past relationships into futures that, by definition, explore how some of those relationships could change.
- *Scenario planning could be deployed in country work.* IMF [country reports](#) have included detailed analysis of long-term trends. However, the IMF has not yet translated global or regional scenario planning to the country level as done elsewhere by the Inter-American Development Bank, the Asian Development Bank, the Organisation for Economic Co-Operation and Development (OECD), the United Nations, and individual country governments.<sup>12</sup> The IMF could contribute macro-financial perspectives to scenario-planning activities of other institutions. Scenario planning could inform surveillance considering longer-term themes as well as analytical work conducted over longer horizons such as debt sustainability analysis used in surveillance and program documents. It could also be valuable over shorter time frames in countries where TUNA conditions are prevalent (for example, the [Mont Fleur](#) scenarios [le Roux and Maphai 1992] produced at around the time of South Africa’s transition) and that conventional risk analysis or stress tests (for example, as used in Financial Sector Assessment Programs) cannot capture.
- *Aspirational futures could also enhance the toolkit.* As described by the [Institute for Alternative Futures](#), the process builds a set of normative scenarios where it is clear that some are preferable to others. The set has an expected or conventional future, a more challenging future, and two “surprisingly successful” scenarios illustrating credible paths to a highly preferable or visionary future. Foresight can play an important corrective role in developing constructive and inclusive visions and not simply a wish list. Some OECD Multi-Dimensional Country Reviews, for example, for the Western Balkans ([OECD 2021](#)), use aspirational foresight workshops for policymakers and citizens to create an inclusive development vision.

<sup>12</sup> For example, the [United Nations \(2021\)](#) worked with Egypt’s Ministry of Planning and Economic Development on an exercise focused on the manufacturing sector, with policy recommendations that have been discussed at high levels of government.

# Policy Gaming

This section describes how we have applied policy games at the IMF and provides more detail on the methodology of matrix games.

## Policy Games at the IMF

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Policy games are dynamic strategic simulation exercises where participants engage in role-play by adopting the perspectives of different actors. They leverage the power of stories but add role-play. In the context of an initial scenario, each game begins with a starting shock. The various stakeholders then iteratively respond to the shock and one another, attempting to achieve their objectives. There are successive rounds of shocks and actions. Role-play is sometimes combined with traditional game elements such as competition, chance, and props. To date, the IMF has used a particular variant of policy games called matrix games, which allow for many actors with both complementary and competing goals and places emphasis on discussion.

Policy games stimulate out-of-the-box ideas, combat group think, uncover blind spots, support contingency planning, and enhance agility. Policy games can generate previously unforeseen and complex interactions among stakeholders and unearth comparative advantages and critical weaknesses by helping teams avoid “wishing away” potential issues. Policy gaming is tailored to address contexts of high uncertainty and shifting landscapes due to action-reaction sequences ([Dator 2017](#); [Schwarz and others 2019](#)). In particular, policy games assist when actors’ objective functions are not obvious or when events appear to be spiraling out of control in an unanticipated manner. Games and roleplaying offer experiential learning, which can be more effective than passive reading ([Prensky 2002](#); [Lacey 2016](#)). Perla and McGrady (2011) notes that “[t]he best way to train your mind to handle unexpected complex situations is to practice dealing with lots and lots of unexpected complex situations.”

Policy gaming differs from scenario planning in its coverage of the risk landscape by accentuating iterative action-reaction sequences and interactions among stakeholders. While scenario planning is beneficial for answering questions about how the contextual environment and relevant actors in that environment might evolve, it is less useful in pointing to specific sequences of organizational actions that might be taken in response to possible triggers. In this way, and unlike scenario building, the learner should try to influence outcomes (that is, the IMF can be one of the actors in a policy game). Nor does scenario planning “always capture the impact of competitive dynamics” ([Schwarz, Ram, and Rohrbeck 2019](#)). Policy gaming allows organizations to play out various actions from multiple actors’ perspectives (complete with different abilities and goals). This enables policy gaming to help mitigate the risk that an organization will be blindsided and encourages “contingent thinking by helping the organization to play out subsequent moves, highlighting the consequences of an organization’s competitive position. This in turn can support the design of preemptive actions” (Ibid, pg. 137). Policy games can also analyze dynamics between non-competitive actors such as allies or amongst policymakers the institution wants to engage with.

Still, scenario planning and policy gaming can be applied in a single complementary framework, as demonstrated by Schwarz, Ram, and Rohrbeck (2019). Insights from scenario planning about how current trends and uncertainties might evolve are key inputs in the design of a policy game. Specifically:

- *Perceiving, or trend auditing*, helps in selecting the appropriate game stakeholders. In scenario-planning terminology, this is often referred to as the transactional environment or people the user interacts with. Scenarios often indicate how current preferences or abilities might change or even if there are new stakeholders who do not currently exist.

- *Prospecting, or scenario planning*, can underlie policy games' playbooks by prompting "what if," "why," and "so what" questions to prepare participants and to generate shocks to introduce throughout the game, "raising the likelihood of altering basic assumptions and mental models that are often imperative in rapidly changing environments." ([Schwarz, Ram, and Rohrbeck 2019](#)).
- *Probing, or policy gaming*, then builds on the perceiving and prospecting by forcing "if, then" questions. As [Dator \(2017\)](#) notes, "[g]ames are the closest we can come to actually doing politics repeatedly and to pre-experiencing alternative futures to have a wider understanding of what might be viable preferred futures."

Policy games vary in design and complexity with different objectives, ranging from traditional red-blue military wargames involving just two basic actors and boardgame elements to extensive exercises that involve more actors (for example, some megagames include hundreds of players) and sometimes benefit from live computer simulations that show the effects of certain actions as the game proceeds (for example, the employment benefits of investment in a certain weapons system). Games also differ in the rigidity of their rules, with some having very constrained sets of actions and outcomes (similar to boardgames) and others allowing for any action and any outcome guided only by a loose set of rules. Games can also be used as an organizing tool (for example, for carrying out complex operations); a training aid (for example, for applying technical lessons in an applied, fast-paced setting or for training mission chiefs on how to engage with country authorities and external partners); as an explanatory tool (for example, to illustrate scenarios); or as a strategic exploratory tool (for example, to generate new insights) ([Perla and Barrett 1985](#)).

The IMF primarily conducts matrix games, a policy game variant that emphasizes discussion.<sup>1</sup> Matrix games combine open-ended discussion and the surfacing of assumptions about an issue (for example, whether a certain move will work) with finality (for example, after a dice roll) that permits moving on to the next topic (possibly leaving further discussion for follow up). In a matrix game, actions are resolved by a structured sequence of logical "arguments." Matrix games easily accommodate up to six actors, often with different capabilities.

Matrix games are suitable for the IMF's purposes, which study many key actors, with both competing and complementary goals, and can accommodate many themes. Matrix games work best when relationships are complex (for example, not strictly oppositional) among the actors—some of whom have aligned interests and some of whom do not (for example, a political unrest game included the Prime Minister, opposition parties, a global power, a larger regional country with conflicting goals, and the IMF).<sup>2</sup> Finally, by limiting players to a single action for each turn, such games unearth priorities and "low-hanging fruit," as well as the objective functions of players with less obvious goals.

For the IMF, an attractive feature of matrix games is their simplicity and flexibility. For organizers, a basic investment yields a capability that can be applied to subsequent purposes, including at short notice in a crisis situation. Matrix games' flexibility also allows for shocks to be introduced between rounds (for example, if the game end-users want several themes to be addressed during the course of game play) or to improvise. Resource and logistics costs are low (for example, there is no need to customize tokens or program computer simulations). For players, the rules are not difficult to learn as the main activity is presenting convincing arguments.

<sup>1</sup> The origin of matrix games is attributed to Chris Engle in 1988, and the term "matrix" was meant to reference a word or phrased-based mapping of the world (Engle 2016). As Engle put it, "[t]he picture of the world is the matrix of matrix games. I started off using literal matrixes of short phrases that described various institutions and ideas. Together with scenario information (maps, character descriptions, and opening events) each player forms their own mental matrix of the world, a gestalt. The matrix of the world changes by additions to the narrative." (Ibid.)

<sup>2</sup> Games can be designed to foster collaboration or amplify competition; the IMF's use of deal making in our games encourages collaboration across actors.

Policy gaming at the IMF has offered many lessons for the institution and our member countries (Box 7). Themes have included trade wars, capital flow measures (CFMs), a political crisis, and COVID-19 vaccine distribution. In line with the IMF's mandate, these applications were designed to explicitly explore hypothetical interactions among the types of stakeholders that were likely to have macro-critical consequences. In addition to substantive insights, the games have helped secure buy-in from counterparts.

Policy games reflect realistic but surprising action-reaction sequences and heterogeneity. For instance, following the announcement of steep tariffs on carbon-intensive imports by a major power, an advanced market made an unexpected pivot by dramatically lowering its environmental standards. Order also plays an important role. In the CFM game, one emerging market reconsidered its strategy and took a different course of action after seeing another country fail in a similar strategy. Deal outcomes within the trade tensions and COVID-19 vaccine games reflected the heterogeneity in outcomes that we see with real world deal-making (see "Matrix Policy Gaming: Design and Game Play" for how deal-making can be implemented). By making us step outside of our traditional role as IMF staff members, game play uncovered blind spots even among seasoned staff<sup>3</sup> and generated more insights than passive reading or listening would have. Finally, policy gaming is an excellent team-building exercise, with players tending to quickly adopt their respective roles while enjoying the theatrical aspects of fully impersonating actors.

### Box 7. Lessons from IMF Policy Games

*Policy game insights uncovered interactions between politics and economics, revealed unexpected policy missteps, and showed pathways to good outcomes through multilateral cooperation.*

In 2018, an IMF country team sought to improve traction on their monetary policy guidance with the authorities. The team replicated a traditional meeting with central bank officials. Stakeholders were played by members of the country team and prior country team members, while colleagues filled the role of opinionated observers who reflected on both the IMF and authorities' arguments. The game uncovered some of the constraints faced by the authorities and highlighted approaches the country team could take to help persuade the authorities to consider the IMF's policy advice. In subsequent IMF engagements with the country, the IMF team employed the lessons from the exercise (namely, by getting the buy-in of the authorities' technical staff first) and the authorities adopted the IMF's advice.

One game helped us expand our preparedness for an escalation in trade tensions. Based on [Tim Price's \(2019\) design](#), it highlighted how political economy can interact with macroeconomic choices (for example, a country opted to retaliate against another's green tariff program, leading to massive domestic protests among climate change activists). The game's approach to executing trade deals reflected the heterogeneity in outcomes that we see with real world trade deals (for example, one free trade agreement was a major success for one country with a dice roll of 10, but only marginally successful for the other with a dice roll of 5).

Another game explored possible dynamic interactions and spillovers associated with capital flow measures. Games imagining a COVID-19 catalyzed introduction of capital flow measures (CFMs) in emerging markets uncovered that a race to the bottom in which CFMs rapidly escalate is not inevitable. CFMs could buy time to avoid crises for countries but messaging on future plans matters. Investors seemed to focus more on policy continuity than on fundamentals. Unprecedented support from

<sup>3</sup> Of course, one would expect that more experienced staff would have fewer blind spots, but no two situations are the same and a previously successful tactic could usefully be tested in the game.

### Box 7. Lessons from IMF Policy Games *(continued)*

a large advanced economy stemmed private outflows in some emerging markets. Finally, when facing volatile market conditions, the signal of maintaining large reserves (that is, that the “powder was being kept dry”) was more effective in calming markets than the use of considerable reserves available.

A political unrest game meant to explore how a country’s economic reform commitments interacted with domestic political tensions showcased the tight corner stakeholders (both domestic and foreign) are often in to achieve their goals. An imagined backtracking in democratic reforms was shown to invite large opposition and the exercise highlighted how anti-foreign intervention sentiments can complicate a country’s relationship with international financial institutions and the broader donor community.

Finally, games on the political economy of COVID-19 vaccines sought to determine whether equitable outcomes could be achieved in the development, production, and distribution of vaccines. The game highlighted the difficulty that low-income and emerging markets without production capacity have in gaining expedient access to effective vaccine doses. Moreover, distributional barriers (for example, insufficient refrigerated transport) stymied early deliveries. Political influence sometimes mired multilateral institutions’ ability to deliver on goals of equity and fairness. Finally, emerging markets with production capacity may be able to reduce vaccine nationalism by agreeing to collectively produce a diverse pool of approved vaccines and distribute them equitably. For such countries, diversifying the set of manufactured vaccines allowed them to hedge risks while the show of solidarity increased vaccine trust and uptake amongst their populations, helping buoy their recoveries. Notably, most participants gauged the probability of success of this action at five percent, making the improbably achieved dice roll a surprising positive outcome.

## Matrix Policy Gaming: Design and Game Play

We have leveraged existing wargame advice to develop a tailored policy gaming method. The IMF’s approach to matrix gaming has drawn on valuable consultations with wargaming experts.<sup>1</sup> However, we also engineered an approach to deal-making that has been useful in game contexts where complex agreements are common (for example, trade).

### Step 1: Identifying the Purpose of the Policy Game

The defined purpose of the game heavily informs game design and outputs. In addition to helping craft the overarching theme, background scenario, and starting shock, clarifying the purpose of the games’ end-users informs which actors should be included, what types of actions they can take (for example, only economic or also including military action), and how extreme the shocks need to be in order to prompt players into action (or alternatively, how seemingly minor the starting shock should be to see if it generates larger shifts later on in the game). For instance, in the CFM game, capital flow volatility and the use of CFMs by one country was not sufficient to prompt other players to adopt CFMs, while traditional protectionist tools generated large shifts in geopolitical pressures in the trade tensions game. A clear sense of the purpose also helps the

<sup>1</sup> Experts from the National Defense University (NDU) include Scott Chambers, Caitlin Jamison, Kathryn Payne, and Timothy Wilkie. Tom Mouat of the Defence Academy of the United Kingdom has a [regularly updated website](#) on matrix gaming. We also thank participants at the Connections Wargaming Conference for helpful advice.

game designers and facilitators focus on the key components of the game that are useful for the intended outcome and design of the game more broadly (that is, all of the steps that follow). The purpose and design can benefit greatly from consultation with staff who may have relevant subject-matter experience.

## Step 2: Designing the Playbook

The background scenario should provide a broad overview of the contextual environment at the start of the game. It can be set in the present or future and combine factual depictions of the current landscape with fictional elements meant to draw out a particular theme for game play. It can be a standalone scenario or draw on other foresight work. Given that the focus of policy gaming is on the action-reaction sequences of players, the scenario should be broad enough to allow for sufficient player flexibility in taking actions. Therefore, it is typically short (for example, 1-2 pages). Sometimes, players will take issue with the initial scenario, but the facilitator should inform them that the narrative will largely be determined endogenously by game play.

Short player briefings should offer the perspective and experiences from the standpoint of the actor in question. For instance, Brynen, Fisher, and Mouat (2017) recommend drawing briefing materials from articles published in media sources with pro-government slants. For games that rely heavily on economic context, adding a press kit and the forecasts produced by your organization (for example, the IMF) or another organization (for example, the Economist Intelligence Unit) are also useful. Key incentives and institutional/market structures should be highlighted if important for realism.<sup>2</sup> If the end user wants the game to lean heavily towards economics-related narratives, the scope of actions can be limited by offering a clear mandate/character.<sup>3</sup>

Players' objectives should stem from the briefing. Player objectives can be chosen by the game designer or player, or both (for example, one given objective and another chosen by the player prior to game play). Objectives should be simple and concise. We have experimented with keeping each player's objectives secret from other players or exposing them prior to game play; to date, we have not observed any major difference in players' strategies across the two approaches. Asking players to draft an objective prior to game play can encourage them to read the playbook more carefully.

Together with the instructions for game play, the scenario and player briefings form the playbook given to the participants prior to the game. The desire to provide enough cultural and economic context should be weighed against overwhelming participants with too much preparatory material. Ideally, pre-reading including instructions should be limited to less than 60 minutes. Tim Price's [playbook](#) (Price 2019) offers a good example and [Online Annex 8](#) provides an example set of instructions, drawing on the toolkit (see Figure 3) created by Brynen, Fisher, and Mouat (2017).

## Step 3: Assigning Players Their Roles

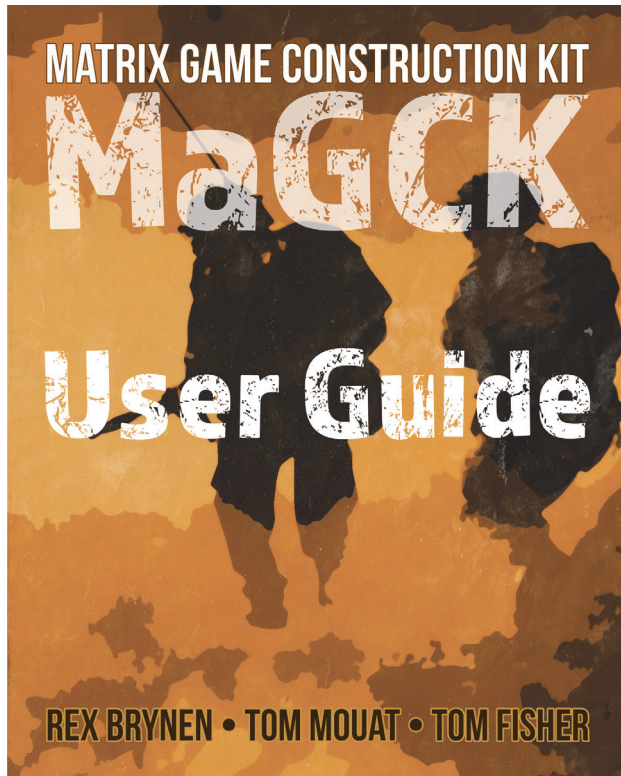
Roles can be played by individuals or teams, but must fully reflect the goals, capabilities, and leverage tools of each actor. Each key stakeholder is represented by an individual or small group (2-3 people). The players fully impersonate the stakeholders, including accurately representing their economic and non-economic goals, different capabilities, and different leverage tools. The National Defense University (NDU), which has extensive expertise in wargaming, recommends that the number of stakeholders/actors should be lower than six to help all players keep track of the game narrative and to keep the pace from becoming

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<sup>2</sup> For instance, in a policy game on vaccine distribution we used research on vaccine producer market structure for the actor that was representing vaccine firms.

<sup>3</sup> For instance, "You are the Minister of Finance, not the General of the Army" or, "You have a mandate to set vaccine tariffs and subsidies but are not the trade minister with broad authority on goods and services."



**Figure 3. Brynen and Others' (2017) Matrix Game Toolkit**

too sluggish.<sup>4</sup> Some roles can be collapsed into a single player if they are sufficiently non-competitive (for example, large emerging markets, investment banks, or small neighbor countries).<sup>5</sup>

Subject- or country-matter experts (SMEs) can add value for highly technical or specific games. In instances where technical details are important for end users' objectives, expertise adds value and increases the realism of the game. As [Rothweiler \(2017\)](#) notes, "[w]eakness in these games comes in the skill of the players to replicate their role (does the player know enough to make a good argument for themselves or against an adversary)." SMEs can be brought in as players, as advisors to certain players or all players (that is, white cells), or as facilitators.<sup>6</sup> More generally, policy games can harvest the knowledge of staff with relevant experience (for example, of in-country political constraints or previous crises) through the arguments that experts or players make.

#### Step 4: Game Play

Policy games should be conducted under non-attribution or a Chatham House rule ([Rothweiler 2017](#)).

To enhance the realism of the game and foster

frankness among participants, players should be reassured that their arguments, actions, and reflections will not be directly attributed to individuals (or institutions). This is especially important when players are high-ranking officials who often speak publicly on behalf of an organization.

The game begins with a single shock, which should be closely tied to the main theme of the game and prompt action by the players. The shock should be plausible yet challenging (for example, Box 8). Players respond endogenously to the actions of other players, but also exogenously to additional global, regional, and country-specific shocks that can be introduced. Adding extra exogenous shocks should be done with caution as they can interrupt the natural course of player interactions and disrupt the credibility of the narrative; they can also frustrate players in the midst of a multistep strategy, harming the usefulness of the game outputs. If additional shocks are included, one can allow for randomness by providing a deck of event cards or explicitly decreeing an event.

Players successively make "arguments" and all participants offer pros and cons for each suggested action. The facilitator should conduct a dummy round at the beginning of game play to ensure players fully understand how to make arguments. In this system:

<sup>4</sup> [Mouat \(2019\)](#) views 6–8 as ideal, but in our experience this slowed game play down too much and some players were viewed as non-essential.

<sup>5</sup> If a role is useful for generating exogenous shocks, it can be beneficial to not assign participants to play that role (for example, allowing the facilitator to introduce actions from this role between turns to prompt reactions from others). However, this must be weighed against not having endogenous responses from that key actor or surprise shocks to that key actor within the normal course of game play.

<sup>6</sup> For instance, we included two SMEs to advise the facilitator on which CFMs were likely to succeed. During the COVID-19 vaccine game, we included two global public health officials.

### Box 8. Example of a Hypothetical Starting Shock from a Vaccine Policy Game

**BREAKING:** (March 16, 2021) Reports of vaccinated individuals that have been re-infected with COVID-19 have now passed 100,000 in two advanced economies (AEs), with cases amongst nonvaccinated persons in associated households skyrocketing. Every vaccine producer is scrambling to defend its product as the companies simultaneously claim that other manufacturers are to blame. While health authorities rush to collect data on which individuals took what vaccine (and how many doses), many are concluding that: (1) many vaccines do not offer effective protection beyond 8 weeks and (2) the virus can still be spread from vaccinated carriers to unvaccinated persons. Still clawing back from last year's recession, several AEs are now panic-buying doses of multiple vaccines while ignoring prior commitments (if any) to promoting equitable global access to doses. With production capacity already woefully below targets and deliveries of guaranteed doses for AEs backed up until at least summer of 2021, equity markets are down 13 percent as of 10 am EST. It is unclear when alternate vaccines will become available.

First, the active player makes an argument involving three components: one action (for example, request concessional financing, lobby a government, or introduce a new regulatory system); the expected impact of the policy action; and reasons (pros) why it will be successful (see Table 1). Success is based on whether the player will be able to carry out the action and whether it will have the intended impact. The suggested action should be taken from a strategic perspective, helping the player meet his or her objectives.

Next, the other players then state: a number of reasons why it might or might not happen (if they can think of any) (additional pros and cons). While the active player's arguments should be strategic (i.e., made in a way that advances the player's objectives), the discussion of additional pros and cons should be objective about why a certain action will or will not succeed, as the outcome of the game should be as realistic as possible. After other players have spoken, the active player can also be welcomed to weigh in from a more objective perspective on whether or not his or her argument is likely to be successful.

Once the pro/cons process is complete, there are both facilitator- and player-led methods to decide if an action is successful—both are based on an objective view of the argument's merits and introduce chance through the use of dice. The merits of the arguments establish a threshold that the player's dice roll needs to meet for success. If the player's roll total meets or exceeds the cutoff, the action is a success.

- *Facilitator-Led:* The facilitator reviews the pros and cons, aggregates pros and cons that are similar, drops weak pros and cons, and assigns modifiers to the needed dice total based on this exercise. Compelling pros reduce the dice total needed and cons increase the total needed. A base of 7+ is typically used, with the probability of success at 58.3 percent. For example, if 7+ is used as the base and there are two compelling pros and one con, a player would only need a total dice roll of 6 or better to win (a 72.2 percent chance of success). Brynen, Fisher, and Mouat (2017) caution against allowing the dice modifier to adjust the needed roll by more than three as it dramatically increases or decreases the odds for success, potentially raising concerns of facilitator bias among players.



**Table 1. Player’s Argument Process and Example as Recorded During Workshop**

Active Player Action	Intended Impact	Pros (why this will work)	Cons	Voting Average and Required Roll	Outcome/ Narrative
A regional power player country launches Boots & Bridges, to extend its economic reach in a region.	The higher returns on investment and closer trading relationships with regional economies will help buoy the power player’s growth.	<p>The power player has strong institutions for implementing such a plan quickly.</p> <p>There are already solid trading linkages with regional countries, and this will just better leverage them.</p> <p>These countries are much younger and faster-growing than the power player.</p>	<p>The regional countries are not large enough—small upside.</p> <p>The initiative will be too expensive given that other countries have very low lending rates already.</p> <p>There is a risk of retaliation or a trade war.</p>	<p>Average vote of likelihood of success across all players: 37.5</p> <p>Required roll: 8+</p>	<p>Dice roll: 9</p> <p>Marginal Success.</p> <p>The regional power player rolled out the initiative—it was well accepted. And, so far, there has been no major retaliation. However, another larger actor is ramping up its own initiative, making the gains from the Boots &amp; Bridges initiative marginal.</p>

- *Player-Led*: Stepping back from their respective roles, each participant reviews the pros and cons and assigns a likelihood to the action being successful. The facilitator averages the players’ likelihoods and indicates the needed dice roll based on a pre-determined system of the facilitator’s choice (see Table 2).

The pros/cons arguments and magnitude of the total dice roll should be used to craft the narrative. Exceptionally higher-than-required dice rolls than required amplify relative success and vice versa for failure. Together with the pros and cons, this can be used by the facilitator to craft the narrative of the player’s argument, with marginal success or failure if the roll just meets the required roll. Table 1 shows how game play proceeded for a regional power player launching a “Boots and Bridges” initiative. The active player states the action, impact, and pros. Other players offer the cons (and possibly some pros). All players objectively weight the pros and cons and give the facilitator their likelihood of success. This corresponds to a needed dice roll of 8 or higher. The active player rolls a 9. The marginal nature of the success is built into the narrative, which draws on the pros and cons stated by players. If instead, the player rolled a 12, the program would be a resounding success, with even more positive impacts than originally expected.

A turn ends when all players have attempted an argument and games are played in 2–4 successive rounds that vary from 10 to 60 minutes. The rounds can represent different time periods into the future. Players sometimes question how long each turn or argument represents. There is no specific rule, but the length of implied time is sufficient for the action to be successful or fail (for example, years for a structural policy or hours/days for some monetary policy actions). The simulated “campaign” period can range from hours to decades and is based on players’ actions, while actual game play time has typically ranged from 3 to 4 hours and can occur over multiple days.

**Table 2. Examples of Likelihoods as Required Dice Totals for Success**

	Almost Certain		Highly Likely		Likely	Slightly Likely	Slightly Unlikely	Unlikely	Highly Unlikely	Almost Impossible	
Range of average vote	100-99	99-94	94-88	88-78	78-65	65-50	50-35	34-22	22-13	13-6	6-0
Dice roll required	2+	3+	4+	5+	6+	7+	8+	9+	10+	11+	12+
Dice roll probability	100	97	92	83	72	58	42	28	17	8	3

Between turns, players can make deals with one another. Deals must be announced at the start of the next session. All involved parties must verbally state the agreement and the intended specific impact of the deal for their actor. In place of making an argument, each party to the deal rolls the dice to determine whether or not the deal yielded the intended benefit for that actor. In our games, a sum of 5 or higher is needed for success, meaning that deals benefit from a disproportionate probability (83 percent) of success.

Build in time at the end of a game for a post-mortem: objectives, initial implications, characters' strengths and weaknesses, and game surprises. Players should reveal their objectives and offer their opinion of whether they were able to meet them. The facilitator should then guide participants through a reflection on the critical strengths and weaknesses of each character, what players learned, and what players found surprising—to improve the process and narrative (Perla 1990; Mouat 2019). For example, players are often surprised at how easily they adopt the character and when large geopolitical shifts occur. This reflection typically takes 15 minutes.

Players win by meeting their objective(s). In matrix games, emphasis is placed on the process of game-playing and what comes out of the action-reaction sequence. However, meeting one's objectives is also a barometer of success. A midpoint check on whether players have met their objectives is a useful device for keeping players on task and in character.

It is best practice to repeat, or play-test policy games. Playing games more than once generates multiple outcomes, exposes different players to the game, and/or rehearses game mechanics (Rothweiler 2017). Moreover, a single game is just one possible future and one should be careful in overinterpreting its results. Perla (1990) notes, “[d]on’t confuse instance-of-game insight with overall conclusion.” Military wargames are played hundreds of times, with their outcomes coded and used for probability analysis and policy development.

## Step 5: Policy Game Outputs and Applications

The write-up of the post-mortem lessons and the broader game narrative from the players' successive failures and successes should be completed as soon as possible. During the game, there is not enough time to add all the nuance from argument outcomes; moreover, the facilitator or participants can slightly edit the narrative if needed for logical consistency. Revisiting the game narrative can also uncover additional implications. The lessons from the post-mortem should also be included in the write-up.

Use the combination of narratives and the implications to inform contingency planning and policy development, for both the IMF and country teams. Where possible, the findings of the games should be linked to organizational workstreams, needed research, or contingency planning for country teams and country authorities. For instance, how to adapt the IMF's lending toolkit to better meet members' needs.

## Further Considerations

- *Games could embed other games but should generally be kept as simple as possible.* NDU notes that some applications may require a “pre-game.”<sup>7</sup> In this more complex setting, a total game play time over four hours is likely necessary. However, [Mouat \(2019\)](#) strongly advises against adding too many complications: “It is tempting to add extra rules and complexity to the simple base technique of the Matrix Game. This should be avoided if at all possible – the strength of Matrix Games come from their speed and simplicity. Additional rules can slow down production, complicate the game, hinder play and distract the players.”
- *Gamification (for example, props) can help players adopt and stay in their respective roles, as long as they do not distract from the seriousness of the content.* Some policy games utilize physical imagery (for example, hats or a projected map) to increase player engagement. A board can track a variable or temporary capability while tokens can capture differences in actors’ respective capabilities or strength.<sup>8</sup> Gamification is typically not a hinderance to serious policy gaming, but game elements should not be a distraction for players and require extra effort and testing to produce.
- *Matrix games are adaptable to a virtual environment but should account for “virtual fatigue.”* While in-person exercises are optimal for team building and can encourage and allow for more theatrics, matrix games exercises are easily held virtually and allow for a broader range of participants. A virtual setting also enables more observers. Still, multi-hour virtual sessions can be draining ([Sander and Bauman 2020](#)) for participants; therefore, we suggest virtual sessions be capped at 90 minutes each and be held over multiple days rather than in a single three-to-four-hour session.<sup>9</sup>
- *Some games use computational models, but matrix games typically do not.* If the end user wants to get reactions to a single data point or a model (or if we want players to operate within real-world constraints), modeling can be useful. However, if the intent is to see the rationale and potential universe of outcomes, a model can be too restrictive ([Mayer 2009](#)). As [Engle and Hale-Evans \(2019\)](#) put it, “[m]atrix [g]ames are a low-tech way to game events that make supercomputers twitch.”<sup>10</sup>
- *Matrix games are not recommended for participants that are high-level political appointees or principal decision makers.* Appointees and decision makers tend to have a difficult time dropping their “appointed role,” especially in an exercise with others at the same seniority level; matrix games in this context can reinforce bias and discord. A [tabletop exercise](#) (TTX) would be more appropriate, according to NDU, and the IMF has also used TTXs.<sup>11</sup> Under basic TTXs, players represent themselves, there are various mini-scenarios, and the group responds to questions in an informal round-table manner (for example, “How would you respond to this?” “What has this changed about the landscape?” and “What would you do differently today if you knew this about the world?”).

<sup>7</sup> Different branches of government would interact to yield a narrative (for example, with respect to an adopted policy). Within the main game, the pre-game outcome would then be represented by a single player who would briefly share what the various perspectives and power levers were of the different branches of government in deciding to take of the proposed action. For subsequent additional actions in the main game, the player would keep in mind which branches of government were most successful and what their objectives are, and reflect that in its arguments.

<sup>8</sup> In a trade tensions game, players were offered different endowments based on their relative economic heft using tokens; endowments could be used to decrease the needed dice roll.

<sup>9</sup> Most of the IMF’s exercises have been held virtually to date.

<sup>10</sup> In particular, NDU advises against models in exercises with high-ranking officials, who are adept at dealing with complexity and offering intuition on varying quantitative outcomes in the absence of a concrete model. Similarly, many economists implicitly use economic models or data in their arguments.

<sup>11</sup> The IMF has conducted crisis simulation exercises where country teams, functional departments, and IMF management represent themselves in the context of a fast-moving crises with spillovers that require interdepartmental coordination and rapid decision-making.

## Conclusion

- *The IMF has found strategic foresight valuable for strategy and, increasingly, for operations.* Foresight helps the IMF prepare for a future that is turbulent, unpredictably uncertain, novel, and ambiguous. It helps us respond to evolving member needs, stress test proposals, uncover blind spots, and prepare for contingencies. Foresight work includes tangible outputs (for example, publications) but also has less traceable benefits (for example, an expansion of one's sense of possible outcomes). More generally, foresight as a way of thinking helps make the staff more forward looking, sensitive to change, and agile. This note highlighted just two of the foresight tools used at the IMF--scenario planning and policy gaming--but the IMF uses an expanding array of tools that are often complementary. For instance, the IMF has used megatrends analysis as a precursor to scenario planning, which in turn has been paired with a pre-mortem.
- *Foresight work should be project-driven and deeply engage the user to maximize results.* Foresight is more likely to prompt decisions if it is targeted at the user's particular question (for example, how the configuration of international reserves might evolve). Since work pressures are high, those responsible for foresight exercises can stoke demand by selectively identifying country projects or other parts of the work program that would benefit. While scenario-planning exercises require substantial resources and need not be carried out annually, wide-angle explorations or confrontation of a strategic issue should occur approximately every four years or following periods of rapid transition in the external environment or within an organization. Regarding the user's time commitment, deep engagement (for example, building the scenario, playing the policy game) yields the most benefit.<sup>1</sup>
- *Foresight is a competence that needs to be developed and maintained within and across organizations.* We started by consulting the literature, leveraging networks, attending courses, and hiring facilitators. Foresight expertise is currently housed in the Macro-Risk Unit of the Strategy, Policy, and Review Department. More staff could gradually be exposed to an applied foresight curriculum,<sup>2</sup> as done in the Singaporean government and Shell. Sharing both low resource (for example, pre-mortems) and high resource, high impact (for example, scenario planning) tools would help individuals better discern when and where such tools are best applied to achieve stated goals. This would also empower individuals, teams, and departments to experiment with various approaches--building on user feedback. It would also help spread the benefits of foresight more systematically. Such an organization-wide approach, as described by the OECD, would further develop anticipatory governance.<sup>3</sup> In crisis situations, with time too limited to develop expertise, established capacity is key to meeting heightened demand for foresight.
- *Foresight can inform and improve the work of IMF staff and the broader economics profession (see [Online Annex 9](#) for a comparison of foresight methods).* Best practice is for strategic foresight to be an iterative process, with senior managers and a core of users seeing increasing returns through repeated exercises. Strategic foresight tools are an important addition to the IMF risk preparedness framework and there is room to use them more in surveillance and in lending (for example, as a tool to help engage a wide range of stakeholders and get buy-in on a shared, desirable future). For example, they can help crystallize unforeseeable but plausible high-impact events, which could then feed into risk analysis for multilateral surveillance (for example, flagships) and bilateral surveillance (for example, to fill gaps left by quantitative

<sup>1</sup> When the bulk of the work was completed by more junior staff, we prioritized senior staff's participation at the end of scenario planning workshops over requesting written comments.

<sup>2</sup> A [course](#) on vulnerability diagnostics offered by the IMF's Institute for Capacity Development includes a primer on policy games. There may be scope to integrate foresight in capacity development offered by the IMF to its member countries in high uncertainty environments. The OECD and UN also offer such opportunities.

<sup>3</sup> Anticipatory governance is defined as the "systematic embedding and application of strategic foresight throughout the entire governance architecture, including policy analysis, engagement, and decision-making" by the [OECD \(2019\)](#).

stress tests), behind the scenes to inform debt sustainability analysis scenarios, or explicitly as a selected issues paper). Whether for an open-ended exploration to inform strategic priorities or in pairing futures tools with a specific analytical project, if your work has interaction between multiple factors and stakeholders that cannot easily be modeled and considerable uncertainty, the tools provided by strategic foresight are good candidates.

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