The Economist

NOVEMBER 5TH–11TH 2022

SAY GOODBYE TO 1.5°C

Why climate policy is off target

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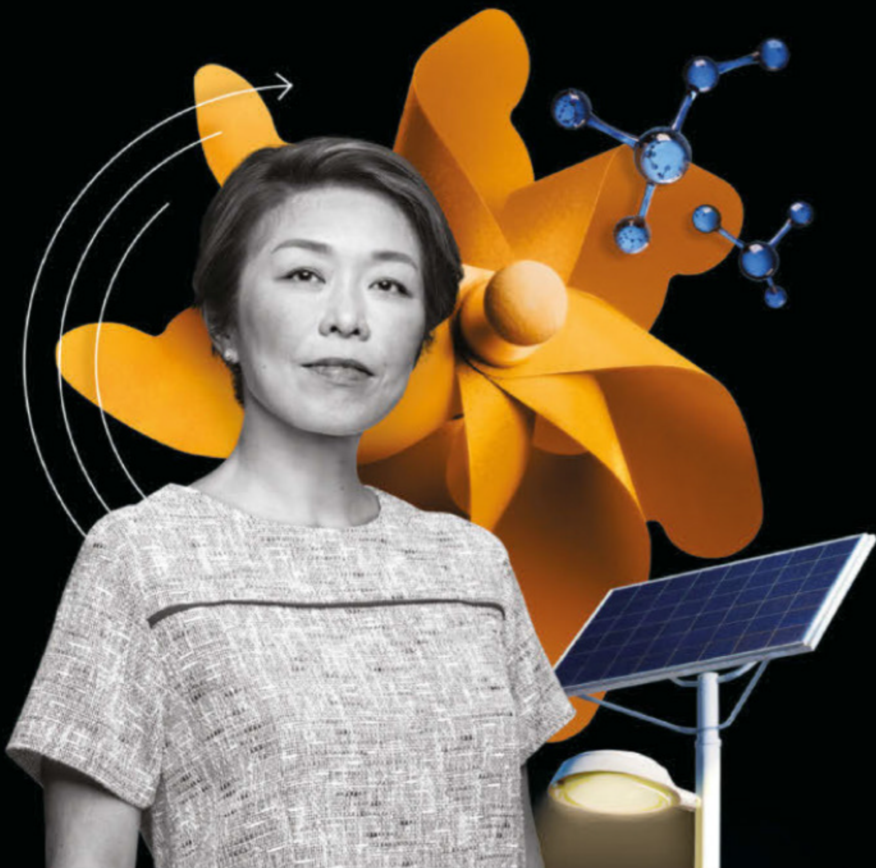

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to take part in *"a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress."*

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The world this week Politics

Luiz Inácio Lula da Silva, a leftist former president, won **Brazil's** election, beating Jair Bolsonaro, the populist right-wing incumbent. Lula, as he is known, won 50.9% of the votes to Mr Bolsonaro's 49.1%, the narrowest winning margin since Brazil's return to democracy in the 1980s. After the result was declared, Mr Bolsonaro refused to speak publicly for 45 hours. He eventually gave a two-minute speech and said he would comply with the constitution. He also asked supporters who had taken to the streets to stop blocking roads with lorries. Although Mr Bolsonaro did not explicitly concede, his chief of staff said that the transition of power would proceed smoothly.

Binyamin Netanyahu, **Israel's** longest-serving prime minister, seemed to be on track to return to office after a parliamentary election. His bloc of religious and right-wing parties was set to take 62 to 65 of the 120 seats in the Knesset, Israel's parliament.

An end to war

Ethiopia and the leaders of the rebel region of Tigray agreed to stop fighting, offering hope of an end to a two-year civil war that has taken thousands of lives and starved millions of people under blockade in Tigray. In talks mediated by the African Union the two sides also agreed to a disarmament plan and to allow the flow of humanitarian aid.

Twin bombings in **Somalia's** capital, Mogadishu, killed at least 100 people in an attack claimed by al-Shabab, a jihadist group affiliated to al-Qaeda. In recent weeks government forces have captured ten major towns from al-Shabab in an offensive supported by clan militias.

Ghana's government slashed public spending, as it tries to contain a debt crisis that has caused interest rates to soar and its currency to sink. It is in talks with the IMF over a rescue package.

Egypt arrested dozens of people accused of preparing anti-government protests coinciding with the COP27 environmental summit, which starts on November 6th.

Rishi Sunak, Britain's new prime minister, said he would attend the **COP27 climate-change summit**, reversing an earlier decision not to go because he was too busy. In his appointments to government jobs, Mr Sunak demoted the status of the minister for climate policies. Tackling concerns that he is less committed to reducing emissions than Boris Johnson was, Mr Sunak said: "There is no long-term prosperity without action on climate change."

Britain's home secretary, Suella Braverman, faced more controversy over immigration. Ms Braverman referred to migrants who cross the English Channel illegally as an "invasion", as figures revealed that 40,000 have made the dangerous trip so far this year. That is already 40% more than in all of 2021, and up from 300 in 2018. Without directly criticising Ms Braverman, the immigration minister said words surrounding the issue should be chosen "very carefully". A processing centre for migrants was petrol-bombed; the facility is meant to detain 1,000 people but was holding four times that many.

Russia again pounded **Ukraine's** cities with missiles and kamikaze drones, apparently aiming for power stations and community-heating plants. Ukraine said it had managed to shoot down most of the incoming bombs, and had quickly repaired much of the damage from those that had landed.

Russia rejoined a deal backed by the UN that allows for the safe transport of **grains and fertiliser** from ports on the Black Sea, having briefly suspended its participation when some of its navy ships were damaged by explosions in Sevastopol. Russia blamed Ukraine for the attack, but says it has received guarantees that the grain-transport safe-zone will not be used for military gain. Turkey brokered talks between both sides.

Denmark's general election returned the centre-left to power, a relief for Mette Frederiksen, the prime minister. Ms Frederiksen called the election amid growing criticism of an illegal cull of mink in 2020 that was intended to stop covid-19 transmissions but which also devastated the country's important mink industry. Her Social Democrats got the most support in 20 years at the polls. Ms Frederiksen has said she wants to cobble together a broad governing coalition, possibly bringing in the Moderate party.

An evening out to celebrate Halloween ended in tragedy in **Seoul**, the capital of South Korea. More than 150 people were killed in a crush in a small alleyway, caused by overcrowding and a lack of planning and police control. Yoon Suk-yeol, the president, has promised a full inquiry.

Tragedy also struck in **India's** western state of Gujarat, when a newly refurbished footbridge collapsed, plunging over 130 people to their deaths in the river below. The state government pointed the finger at local officials and private contractors responsible for renovating the structure.

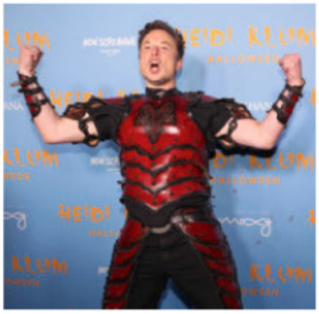
Mutual hostilities between the Koreas continued, with **North Korea** launching at least 23 missiles, including one that crossed the maritime border between the countries for the first time since the Korean war of 1950-53. **South Korea** retaliated by firing three missiles north over the line. The North says it was provoked into action by joint American-South Korean military drills.

A man was charged with trying to kidnap **Nancy Pelosi**, the speaker of America's House of Representatives, from her home in San Francisco shortly ahead of the midterm elections. Mrs Pelosi was in Washington at the time, but the intruder attacked her husband with a hammer, fracturing his skull. The suspect is a far-right conspiracy theorist.

America's Supreme Court heard challenges to race-based **admissions policies** at Harvard and the University of North Carolina. The tough questioning from the conservative majority on the court suggests that it will overturn 44 years of precedent in one of the big planks of affirmative action when it rules on the case next year.

Taxing times

The chief justice of the Supreme Court, John Roberts, issued an order that temporarily stops the House Ways and Means Committee from obtaining **Donald Trump's tax returns** until the matter is taken up by the court, which will be after the midterms. Mr Trump had asked the court to intervene ahead of a deadline by which the Treasury Department would have been compelled to provide the committee with his tax records, which he stubbornly refuses to make public.



After months of prevarication and legal limbo, **Elon Musk** completed his takeover of **Twitter** and promptly ousted the chief executive, the chief financial officer, the head of policy and the entire board of directors. Mr Musk had taken issue with senior management, blaming them for misleading him over the number of fake accounts on the platform. As interim CEO he plans big changes, such as to the "current lords and peasants system" for verifying blue-tick marks. Marking a sharp deviation from the company's platitude of enabling "healthy conversation", Mr Musk tweeted: "Twitter speaks to the inner masochist in all of us."

Get real

Meta's share price was battered for several days after the company revealed another big loss at the division developing the "metaverse" and warned of further losses to come. With its share price now down by 75% since the start of the year, some big investors are reportedly furious at Meta's emphasis on building worlds of virtual reality, but, as Mark Zuckerberg has majority control, there is little they can do.

Another casualty of the rout in tech stocks, **Amazon**, saw its market capitalisation fall below $1trn for the first time since 2020 after it issued a disappointing sales forecast. The company's share price is back to where it was around the start of the pandemic.

The **Federal Reserve** raised its benchmark interest rate by three-quarters of a percentage point for the fourth consecutive time, taking it to a range of between 3.75% and 4%. Markets looked for signals from the central bank about when it might ease the pace of increases. Jerome Powell, the Fed's chairman, hinted that the next rate rise may not be so large, but warned that the "ultimate level of interest rates will be higher than expected". Stockmarkets swooned.

Annual inflation in the **euro zone** hit another record in October, of 10.7%. In Germany consumer prices were up by 11.6%, year on year. Although the country unexpectedly avoided an economic contraction in the second quarter (GDP rose by 0.3% on the previous quarter) its economy is expected to shrink in the final three months of 2022. The **European Central Bank** recently raised its key interest rate by another three-quarters of a percentage point, to 1.5%, but it softened its guidance on further increases, a nod to concerns over the economic impact of the fast pace of tightening.

The world's biggest **oil companies** reported eye-watering profits for the third quarter. ExxonMobil's $19.7bn net income was its best ever. BP's underlying profit more than doubled, year on year, to $8.2bn. Chevron's profit of $11.2bn and Shell's of $9.5bn were the second-highest ever at both companies. Saudi Aramco dwarfed them all with a net profit of $42.4bn. The companies' riches have prompted more calls in the West to impose windfall taxes. Joe Biden accused America's oil giants of "profiteering" from the war in Ukraine, and warned of a potential tax on "excess" profits.

CVS, America's biggest chain of pharmacies, and Walgreens, a rival, each agreed to pay $5bn to settle claims from states and local municipalities related to the sale of **opioids**. Walmart was reported to have agreed to a $3bn settlement. Around 700,000 people have died in America over 20 years from overdosing on the painkillers.

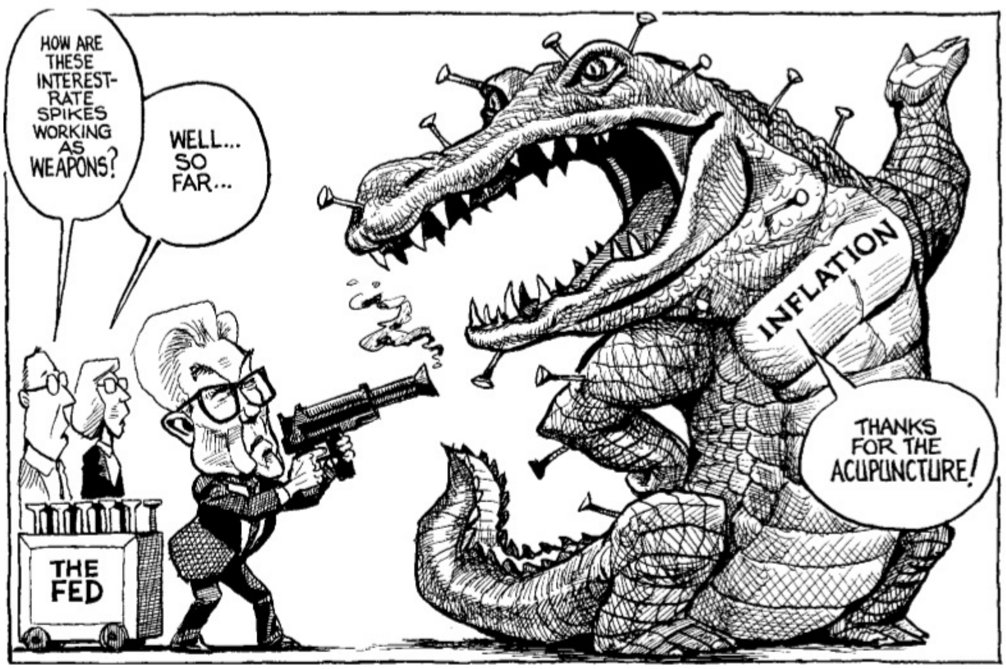
There was more evidence of the rebound in the airline industry since the pandemic. Despite flying with lower capacity, International Airline Group, which owns **British Airways**, reported that revenue in the third quarter had exceeded that for the same three months in 2019, before covid-19 struck. That is despite continuing restrictions at Heathrow and Asian airports. It also upgraded its forecast of annual profit.

Foxconn was reportedly shifting production away from its main hub in China to other parts of the country because of a covid-19 outbreak. Workers at the Zhengzhou factory, which assembles the iPhone, were seen fleeing the site. They had been quarantined for several weeks. It is not clear how production of the iPhone and other devices will be affected ahead of the Christmas season.

A judge in Washington blocked **Penguin Random House's** takeover of **Simon & Schuster**. The Justice Department, which brought the case, argued that a merger of the two publishing houses would reduce competition in the rights for best-selling books. It's not the final chapter. Penguin is to appeal against the ruling.

The watcher

Netflix launched a cheaper subscription plan that includes advertisements for the first time in the films and programmes it streams. It hopes this will entice more subscribers as well as provide it with a new source of lucrative revenue. Some content will not be available, as studios are still negotiating rights, and waiting to see if Netflix's cheaper plan proves to be a hit.



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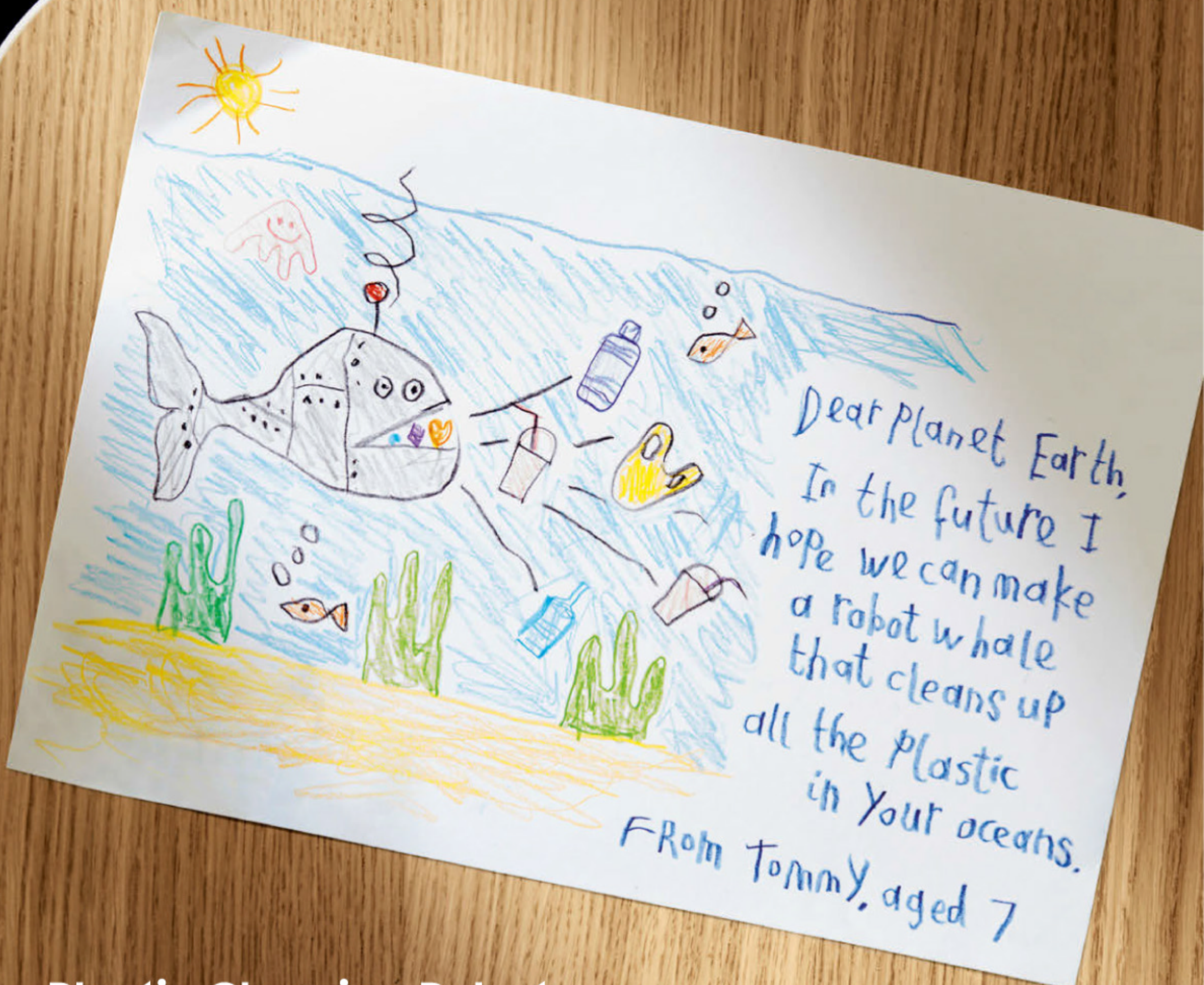

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The Economist

Goodbye 1.5°C

The world is missing its lofty climate targets. Time for some realism

To accept that the world's average temperature might rise by more than 1.5°C, declared the foreign minister of the Marshall Islands in 2015, would be to sign the "death warrant" of small, low-lying countries such as his. To widespread surprise, the grandees who met in Paris that year, at a climate conference like the one starting in Egypt next week, accepted his argument. They enshrined the goal of limiting global warming to about 1.5°C in the Paris agreement, which sought to co-ordinate national efforts to curb emissions of greenhouse gases.

No one remembered to tell the firing squad, however. The same countries that piously signed the Paris agreement have not cut their emissions enough to meet its targets; in fact global emissions are still growing. The world is already about 1.2°C hotter than it was in pre-industrial times. Given the lasting impact of greenhouse gases already emitted, and the impossibility of stopping emissions overnight, there is no way Earth can now avoid a temperature rise of more than 1.5°C. There is still hope that the overshoot may not be too big, and may be only temporary, but even these consoling possibilities are becoming ever less likely (see Briefing).

The consequences of the world's failure to curb emissions are catastrophic, and not just for coral atolls in the Pacific. Climate-related disasters are proliferating, from Pakistan, much of which was inundated by this summer's unusually intense monsoon, to Florida, which in September endured its deadliest hurricane since 1935. Even less lethal distortions of the weather, such as this summer's extraordinary heatwave in Europe, do enormous economic damage, impeding transport, wrecking infrastructure and sapping productivity.

The response to all this should be a dose of realism. Many activists are reluctant to admit that 1.5°C is a lost cause. But failing to do so prolongs the mistakes made in Paris, where the world's governments adopted a Herculean goal without any plausible plan for reaching it. The delegates gathering in Egypt should be chastened by failure, not lulled by false hope. They need to be more pragmatic, and face up to some hard truths.

First, cutting emissions will require much more money. Roughly speaking, global investment in clean energy needs to triple from today's $1trn a year, and be concentrated in developing countries, which generate most of today's emissions. Solar and wind power can be cheaper to build and run than more polluting types, but grids need to be rebuilt to cope with the intermittency of the sun and the wind. Concessionary lending and aid from rich countries are essential and a moral imperative. However, the sums required are far greater than what might plausibly be squeezed out of Western donors or multilateral organisations such as the World Bank.

So the governments of developing countries, especially middle-income ones, will have to work with the rich world to mobilise private investment. On the part of developing countries, that will involve big improvements to the investment climate and an acceptance that they will have to cede some control over energy policy. On the part of donors, it will involve focusing spending on schemes that "crowd in" private capital, such as indemnifying investors against political and regulatory risks, taking equity stakes in private projects and agreeing to absorb the first tranche of losses if things go wrong. They will have to do things they dislike, such as helping the poorest countries shut coal plants. But without give on both sides, the world will bake.

The second hard truth is that fossil fuels will not be abandoned overnight. Europe is scrambling to build import facilities for natural gas, having lost access to Russian supplies (see Finance & economics section), precisely because it cannot come up with any immediate alternative. For some poorer countries investments in gas, in conjunction with renewables, are still necessary: helping more citizens get life-enhancing electricity is a moral imperative, too (see Middle East & Africa section).

The third truth is that because 1.5°C will be missed, greater efforts must be made to adapt to climate change. Adaptation has always been the neglected step-child of climate policy, mistrusted by activists as a distraction from cutting emissions or, worse, an excuse not to make any cuts. But no matter what, the world now faces more floods, droughts, storms and wildfires. For developing countries especially, but also for rich ones, preparing for these calamities is a matter of life and death.

Fortunately, as our special report argues, a lot of adaptation is affordable. It can be as simple as providing farmers with hardier strains of crops and getting cyclone warnings to people in harm's way. Better still, such measures tend to have additional benefits beyond helping people cope with climate change. This is an area where even modest help from rich countries can have a big impact. Yet they are not coughing up the money they have promised to help the poorest ones adapt. That is unfair: why should poor farmers in Africa, who have done almost nothing to make the climate change, be abandoned to suffer as it does? If the rich world allows global warming to ravage already fragile countries, it will inevitably end up paying a price in food shortages and proliferating refugees.

Cool it

Finally, having admitted that the planet will grow dangerously hot, policymakers need to consider more radical ways to cool it. Technologies to suck carbon dioxide out of the atmosphere, now in their infancy, need a lot of attention. So does "solar geoengineering", which blocks out incoming sunlight. Both are mistrusted by climate activists, the first as a false promise, the second as a scary threat. On solar geoengineering people are right to worry. It could well be dangerous and would be very hard to govern (see Science & technology section). But so will an ever hotter world. The worthies in Egypt need to take that on board.

Overshooting 1.5°C does not doom the planet. But it is a death sentence for some people, ways of life, ecosystems, even countries. To let the moment pass without some hard thinking about how to set the world on a better trajectory would be to sign yet more death warrants. ■

Brazil's election

Now for the hard part

As president, Lula will oversee a bitterly divided, cash-strapped country

When Luiz Inácio Lula da Silva was last in office, between 2003 and 2010, he used to quip that "God is Brazilian". If so, the Almighty has a dark sense of humour. The presidential-election campaign that ended with a run-off on October 30th was one of the nastiest Brazil has ever endured, drenched in calumny and punctuated with violence. Lula, as the left-wing victor is known, won by a wafer-thin margin: 1.8 percentage points.

After the election tensions mounted as Jair Bolsonaro, the right-wing populist incumbent, took two days to speak. He did not explicitly concede. However, it looks likely that the transfer of power will be relatively peaceful. Protests by *bolsonarista* lorry drivers spread across the country, but Mr Bolsonaro, who has previously encouraged violence, told his supporters not to block roads (see Americas section).

In many ways, the result is a triumph for Brazil's democracy. The vote count was clean and Lula won fair and square. Mr Bolsonaro has for months suggested the opposite: that the polls would be rigged and the only way Lula could win was by cheating. He should admit that he was wrong, though he probably won't.

Lula will find running Brazil much harder than last time he was in charge. The country is more divided than it was then, and its public finances are in worse shape. The campaign aggravated Brazil's divisions with a torrent of falsehoods: that Lula is a satanic communist, and that Mr Bolsonaro is a cannibalistic paedophile. Tempers flared dangerously. Since August seven people have been killed for their political views.

As for the public finances, Brazil has racked up debts since Lula was last in power, because of a recession in 2014-16 and covid-19. So, although commodity prices have jumped since Vladimir Putin invaded Ukraine in February, boosting Brazil's exports, the government has little room for fiscal manoeuvre.

Lula's first task is to try to calm and unite the country. He made a good start in his victory speech, vowing to be the president for all Brazilians, not just those who voted for him. He may struggle, however, to reassure the legions of *bolsonaristas* who have been told, absurdly, that he will close their churches and impose Venezuelan-style far-left despotism. He has acknowledged that his victory was down to a broad coalition of democrats; he ought to govern in that spirit.

His next step should be to appoint a prudent economy minister. He should reiterate that he will not reverse privatisations, which he opposed at the time, and explain how he will pay for any big spending promises. If he is going to remove a cap on spending, introduced in 2016 after the recession, he needs to assure markets that there will be a sensible new fiscal rule to replace it. More clarity is needed over how he will pay for green policies. He is wisely seeking foreign help to curb deforestation in the Amazon, which has increased fast under Mr Bolsonaro.

Lula will have to find a way to work with Congress, which is dominated by conservatives. He should make clear that the graft that flourished under the rule of his Workers' Party, seen most egregiously in the Lava Jato (Car Wash) scandal, will not occur again. (Lula was jailed for 19 months on charges of corruption; his conviction was annulled in 2021 and he maintains his innocence.) He should appoint an independent attorney-general from a list the public prosecutor's office provides. Similarly, his cabinet should be chosen on the basis of merit, rather than loyalty.

The next few years will be tough. Whatever Lula does, *bolsonarismo* is likely to remain a disruptive force in Brazilian politics, just as Trumpery is in the United States. Lula should learn humility from the narrowness of his win, after coming to power with two landslides in the early 2000s. He needs to forge consensus among those he disagrees with. If he governs pragmatically and inclusively, he has a chance to restore order and progress to Brazil. ■

Business in America

Big tech, big trouble

Slowing growth is exposing the governance flaws of big tech firms

In 1997, in his first letter to shareholders, Jeff Bezos, Amazon's founder, wrote that it was still "Day 1" for his firm. Day 2, he later explained, would mean stasis, followed by irrelevance. His rousing call to avoid complacency seems apt today. Silicon Valley's five big tech giants, Alphabet, Amazon, Apple, Meta and Microsoft, have long been the bedrock of America's stockmarket and economy, miraculously combining reliable growth and profitability. But after a torrid third quarter their market capitalisations have now collectively dropped by 37% so far this year. About $3.7trn of value has evaporated.

The law of large numbers made it inevitable that the tech giants would mature. Sales growth in the last quarter slowed to 9%—barely above inflation. As they have grown bigger, they have become tied to the economic cycle; a fact which the digital surge during the pandemic only temporarily masked. Penetration rates for smartphones, digital advertising and streaming are plateauing. With slowing core businesses, the giants are venturing onto each other's turf, increasing competition.

Meanwhile, they are threatened by "conglomeritis" (see Business section). The symptoms of this disease are bloating and egomania. Consider the recent orgy of spending on hiring, experimental ventures, vanity projects and building data centres. ▸▸

In March the five firms' combined annual expenses reached $1trn for the first time, and the value of the physical plant of these supposedly asset-light businesses has reached $600bn, over triple the level of five years ago. Swollen costs and balance-sheets mean returns on capital have fallen from over 60% five years ago to 26%. Three of the five do not deign to pay dividends.

It is hardly unprecedented for successful companies to lose their focus, or to fail to control costs. In the 1980s RJR Nabisco's executives splurged on jets and golf before being ousted by private equity's barbarians. General Electric sprawled and had to be partially bailed out during the financial crisis of 2008-09. The best safeguards against such indiscipline are active boards and investors. When successful managers start to believe that they always know best, it is the board's job to rein them in.

But here, the tech firms' governance rules add a twist. Often they entrust disproportionate power to bosses and founders, some of whom enjoy special voting rights that give them near-absolute control. Such bosses often cultivate an image as visionaries, whose daring bets horrify myopic outsiders but end up lucratively transforming the world.

At the worst end of the spectrum is Meta, the owner of Facebook, run increasingly erratically by Mark Zuckerberg. Its value has dropped by 74% this year. Its core business is wobbly, attracting too much toxicity, too few young people and too little advertising. It has become clear that Mr Zuckerberg is betting the firm on the metaverse, an attempt to diversify away from social media, on which he plans to lavish 20 times what Apple spent to build the first iPhone. Because dual share classes give him 54% of voting rights, Mr Zuckerberg has been able to ignore the pleas of outside investors. Alphabet, the owner of Google, has performed better but is flabby. Its founders retain 51% of its voting rights, allowing them to overrule the wishes of other owners.

In the middle is Amazon, which has over-invested in e-commerce and expanded too far, crushing its cashflow and returns. Mr Bezos, who remains executive chairman, owns less than 15% of the firm's voting rights, so he has to be at least somewhat responsive to investors. Apple and Microsoft are at the benign end of the spectrum. Both firms are older, no longer have founders with controlling stakes and operate on the principle of one share, one vote. Both listen to outsiders. In 2013 Tim Cook, Apple's boss, sat down for dinner with Carl Icahn, a fiery investor, and took on board his request to return money to shareholders through buybacks. In 2014 Microsoft invited an activist investor, Mason Morfit, onto its board. The two firms have performed the best of the big five this year.

When you have disrupted industries and created hundreds of billions of dollars of wealth it is hard to accept financial constraints and outside scrutiny. Nonetheless, many in big tech's elite need to show more humility and better performance. Otherwise Day 3 might bring an escalating confrontation between them and investors over who controls the most successful firms of the past two decades. ■

Education in America

Making a meritocracy

The end of racial preferences in college admissions could be a chance to build a better system

AFFIRMATIVE ACTION in American college admissions may be about to end. On October 31st the Supreme Court heard two cases in which lawyers argued that the current practice—which allows universities to favour applicants of some races over others—violates civil-rights laws and the constitution. Judging by the sceptical questioning of the conservative justices, who thanks to Donald Trump now command a majority, the question is not whether such preferences will be restricted, but whether they will survive at all (see United States section).

For more than 40 years the court has allowed some positive discrimination. But it has done so with discomfort. Too-obvious tactics like racial quotas, or awarding points for skin colour, were ruled excessive. The compromise was to consider race as one part of "holistic admissions" in a way that made its weight hard to discern. In 2003 Justice Sandra Day O'Connor declared the practice ought to be time-limited, expecting it to be unnecessary 25 years from then. If the court rules as expected in June 2023, five years ahead of Ms O'Connor's schedule, there will be some sorrow, but hardly the same backlash as met the overturning of the right to abortion set in *Roe v Wade*. Surveys show that majorities of African-Americans, Californians, Democrats and Hispanics all oppose the use of race in college admissions (and in other areas). The demise of this unpopular scheme will offer a chance to build something better.

A diversity of backgrounds in elite institutions is a desirable goal. In pursuing it, though, how much violence should be done to other liberal principles—fairness, meritocracy, the treatment of people as individuals and not avatars for their group identities? At present, the size of racial preferences is large and hard to defend. The child of two college-educated Nigerian immigrants probably has more advantages in life than the child of an Asian taxi driver or a white child born into Appalachian poverty. Such backgrounds all add to diversity. But, under the current regime, the first is heavily more favoured than the others.

Racial preferences are not, however, the most galling thing about the ultra-selective universities that anoint America's elite. The legal case against Harvard, one of the universities defending itself before the Supreme Court, has prised open its admissions records to show the scale of unjustified advantage showered upon the already privileged—disproportionately those who are white and wealthy. A startling 43% of white students admitted to Harvard enjoy some kind of non-academic admissions preference: being an athlete, the child of an alumnus, or a member of the dean's list of special applicants (such as the offspring of powerful people or big donors).

A cynic could argue that racial balancing works as a virtue-signalling veneer atop a grotesquely unfair system. A study published in 2017 found that most of Harvard's undergraduates hailed from families in the top 10% of the income distribution. Princeton had more students from the top 1% than the bottom ▸▸

60%. When this is the case, it seems unfair that it is often minority students—not the trust-funders—who have their credentials questioned. University presidents and administrators who preen about all their diverse classes might look at how Britain—a country of kings, queens, knights and lords—has fostered a university system that is less riven with ancestral privilege.

Unfairness in American education will not be fixed by one court ruling. But it will shock a system in need of reform. Legacy admissions should be ended. Colleges claiming that alumni donations would wither without them should look to Caltech, MIT and Johns Hopkins—top-notch institutions that ditched the practice and, as *The Economist* went to press, still seemed reputable and solvent. Blunt racial preferences will probably need to be replaced in response to the Supreme Court. But a less socially divisive system based on income could take their place. That would do a better job of taking actual disadvantage into account. It would still favour non-white and non-Asian Americans, because they are more likely to be poorer, but would do so using a racially neutral method.

In some ways, the question of who gets into a handful of elite universities is a distraction from the deeper causes of social immobility in America. Schooling in poorer neighbourhoods was dismal even before covid-19. The long school closures demanded by teachers' unions wiped out two decades of progress in test scores for nine-year-olds, with hard-up, black and Hispanic children worst affected. Efforts to help the needy should start before birth and be sustained throughout childhood. Nothing the Supreme Court says about the consideration of race in college admissions will affect the more basic problem, that too few Americans from poorer families are sufficiently well-nurtured or well-taught to be ready to apply to college. However the court rules, that is a debate America needs to have. ■

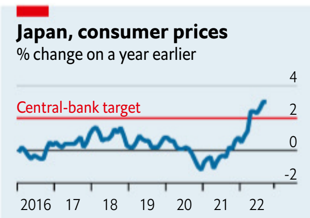
Inflation and interest rates

Japanese turning

Financial danger could be brewing in the last bastion of low interest rates

UNTIL INFLATION subsides, central bankers will keep turning the screws on the global economy. On November 2nd the Federal Reserve raised interest rates by 0.75 percentage points for the fourth consecutive time, six days after the European Central Bank made the same move. As we published this leader, the Bank of England was poised to raise rates by a similar amount. Grim news on inflation keeps dashing hopes of a reprieve from higher rates. The latest nasty surprise came from the euro zone, where prices in the year to October rose by a record 10.7%.

The higher rates rise, the sterner the test for global markets and the more likely that something breaks. Britain has already had to stave off fire-sales of assets by pension funds. Investors fret about America's Treasury market, which has become less liquid, and the risks from junk corporate debt. Yet there is another danger that has gone underappreciated, in part because it lurks in a place where monetary policy remains ultra-loose: Japan. Since 2016 its central bank has pegged the yield on ten-year government debt near zero. The end of the peg, once hard to imagine, now looms menacingly on the horizon.



Central-bank pegs often collapse in spectacular fashion. In 2015 the Swiss National Bank abandoned a limit on the value of the Swiss franc against the euro. The franc surged by over 20% in a day. In 2021 Australia's central bank gave up defending its cap of 0.1% on three-year bond yields. They soared by 0.7 percentage points in a week.

For years the Bank of Japan has found it easy to enforce "yield-curve control", because the idea that it would need to raise interest rates seemed so far-fetched. From 1999 to 2012 Japan suffered bouts of deflation; for most of the rest of the 2010s inflation was positive, but well below the central bank's 2% target. Stubbornly low inflation, and the return of deflation during the pandemic, meant that the bank looked set to stimulate the economy for ever.

Today, however, the prospect of tightening no longer seems so remote. The widening disparity between bond yields in Japan and in America has forced down the yen, which has fallen by more than a fifth against the dollar this year, to its lowest level since 1990. That has raised import costs in Japan and helped lift annual inflation to 3%.

The government has sought to prop up the yen by selling vast quantities of dollars: in September and October it got rid of over $60bn. As long as the gap between Japanese and American interest rates remains, though, such interventions are futile. And although homegrown inflation is modest—wage growth is under control and services prices are up by just 0.2% annually—resurgent inflation elsewhere cautions against assuming that it will simply dissipate. On October 28th Japan's government announced a stimulus package to support households' incomes as prices rise, which will only add to the upward pressure.

Some analysts predict that the Bank of Japan will adjust its yield cap in 2023, perhaps by raising it. Yet pegs are hard to move gracefully. As soon as investors expect them to be abandoned, they dump assets on the central bank in an attempt to avoid losses. The public often bears them instead. When the Bank of England abandoned a sterling peg in 1992, £3bn ($5.3bn then) went up in smoke. Already, the Bank of Japan has had to increase its bond-buying to suppress yields—a sign that the credibility of its cap could be ebbing. If one peg is ditched, investors are more likely to bet against any successor.

A chaotic exit from yield-curve control would be a drama for the world's third-largest economy. It would expose leveraged bets on long-term bonds, like those that blew up in Britain. Trouble could spread: the opacity of cross-border financing flows involving the yen makes the global consequences unpredictable. In the nightmare scenario, bond-market tumult could also cast doubt on the sustainability of Japan's vast net government debts of about 170% of GDP. In the days of cheap borrowing, those debts were thought to indicate the heights to which other countries might safely climb. Now Japan's economic policy looks like a tripwire for global financial markets. ■

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Investing in rural people

Associate Vice-President of the Financial Operations Department

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Secretary of IFAD, Office of the Secretary, D-1

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Drug highs and lows

You support the legalisation of cocaine ("Legalise it", October 15th). A lot is known about the effects of this substance on the brain. Cocaine artificially stimulates certain neurons in a brain circuit known as the "reward system", which drives behaviour towards stimulants that are critically important for survival, such as food, sex and social interactions, and away from unpleasant and dangerous ones. Attempts to find a cure for addiction have not failed for lack of trying or resources, but because it is a very hard problem. Any pharmacological intervention would meddle with brain processes that govern these fundamental human behaviours.

The idea that the savings gained from unwinding the war on drugs could be used to find a cure to addiction, thus mitigating the societal damage of the possible more widespread use of cocaine, may not work and is dangerous.

ANGELO BIFONE
Professor of neuroimaging
University of Turin

As someone who has long-supported the case for a regulated market in cocaine, based on my personal experience of the cost of the war on drugs in Colombia during Pablo Escobar's time, I wholeheartedly welcome your reopening of the issue. It is extraordinarily dispiriting that since that time the supply of cocaine has grown greatly and the violence associated with it has spread much more widely in the region. It is a lamentable policy failure.

As you say, the political prospects of achieving change in the drug-consuming countries, despite the damage that the uncontrolled cocaine trade does there too, still appear slim. However the open support for reform from Gustavo Petro, the president of Colombia, and the Peruvian administration puts it back on the agenda. That coca cultivation is one of the causes of deforestation in the Amazon should help to concentrate minds in the international community.

The blanket prohibition on the recreational use of narcotic drugs in the UN conventions is increasingly being called into question, not least because of the legalisation of cannabis in 19 states of the United States (the country that was primarily responsible for the conventions and their enforcement) and Canada and Uruguay as well as the decriminalisation of all drugs in Portugal.

SIR KEITH MORRIS
British ambassador to Colombia, 1990-94
London

It was her party

Your characterisation of Liz Truss as being the principal cause of her own demise was unfair ("The Iceberg Lady", October 15th). In fact, Ms Truss represented the culmination of 12 years of Conservative economic and social policies in Britain that good academic research reveals has led to increasing income inequality, low productivity and poor public services. The result is a fraying social contract, political divisiveness and a sluggish economy. Add Brexit to this toxic mix and you have the makings of long-term decline.

Those attracted to the leadership of such a party are too often the intellectual wanting, driven by an exaggerated hunger for personal wealth accumulation with little concern for the collective well-being of society at large. Britain's fiasco should be seen for what it is: the failure of laissez-faire neoliberalism and trickle-down economics.

JOSEPH INGRAM
Fellow
Canadian Global Affairs Institute
Calgary

It is rare indeed that one sees a brand new and universally applicable use of the English language appear fully formed in a veritable instant. Regarding Ms Truss, Johnson must be positively popping with pride that your worthy organ has ensured that forever hence the minimum bar any politician in the world must meet is to outlive a head of lettuce.

MICHAEL ROYCE
Toronto

In the future, perhaps British school children will remember the fates of the five Conservative prime ministers since 2010 with one word, similar to the way we remember the six wives of Henry VIII. For the first four it will be: Brexited, backstopped, partygated and iceberged. We'll see if Rishi Sunak comes to be known as "survived".

STEPHEN SILVIA
Bethesda, Maryland

What's original in pop?

Yes, a teenager in New York may be "as likely to listen to K-pop and Afrobeats tracks…as American hip-hop" ("How pop culture went multipolar", October 8th). But what do the different points of origin matter compared to the overwhelming sameness of the content? This represents one of the signal cultural triumphs of the post second world war baby-boom that made adolescents the only pop cultural audience that matters. The same dumbing down, the same rhythmic and harmonic impoverishment in pop music everywhere. The remaining differences are mere grace notes, the tease of exoticism, nothing fundamental.

HILARY HINZMANN
New York

Over medication

Public awareness is slowly catching up with the charade that has characterised the pharmaceutical industry's promotion of anti-depressant medications ("Set patients free", October 22nd). The limited benefit of antidepressants has been known since the 1990s. I recall discussing with a psychiatric colleague the results of a statistical meta-analysis of controlled trials of Prozac versus a placebo in the 1990s that showed little benefit of the drug in alleviating depression. My colleague responded that he did "not believe that type of study", which is an interesting comment on interpretive bias, as he did believe in some of the individual studies that provided data for the meta-analysis.

My colleague's response shows the fundamental problem with clinicians who rely more on their personal judgment than on outcomes from sound scientific investigation. After all, those ambitious individuals who obtain medical degrees or PhDs do so not just for the money but for the privilege of considering themselves experts in the field.

It is not just financial incentives that drive the promotion of ineffective treatments but clinicians' understandable desire to use their idiosyncratic expertise in treating patients. And, as patients, most of us want the "best" doctor or therapist, rather than the scientifically best treatment. Progress in treating mental-health conditions is a slow, arduous process with many trips into dead ends. Health-care consumers are well-advised to take a buyer-beware attitude.

WILLIAM KOCH
Clinical professor emeritus
University of British Columbia
Faculty of Medicine
Kelowna, Canada

Inactive humans

A professor of evolutionary anthropology wonders why, with a diet so similar to ours, palaeolithic humans were so much thinner than we are today ("Ham fisted", October 15th). Knowing nothing about anthropology or diet, may I suggest the clue is in the name? We call those humans "hunter-gatherers", not "recliner-gamers" or "sprawler-retweeters".

ALAN WEATHERILL
Weymouth, Dorset

Letters are welcome and should be addressed to the Editor at
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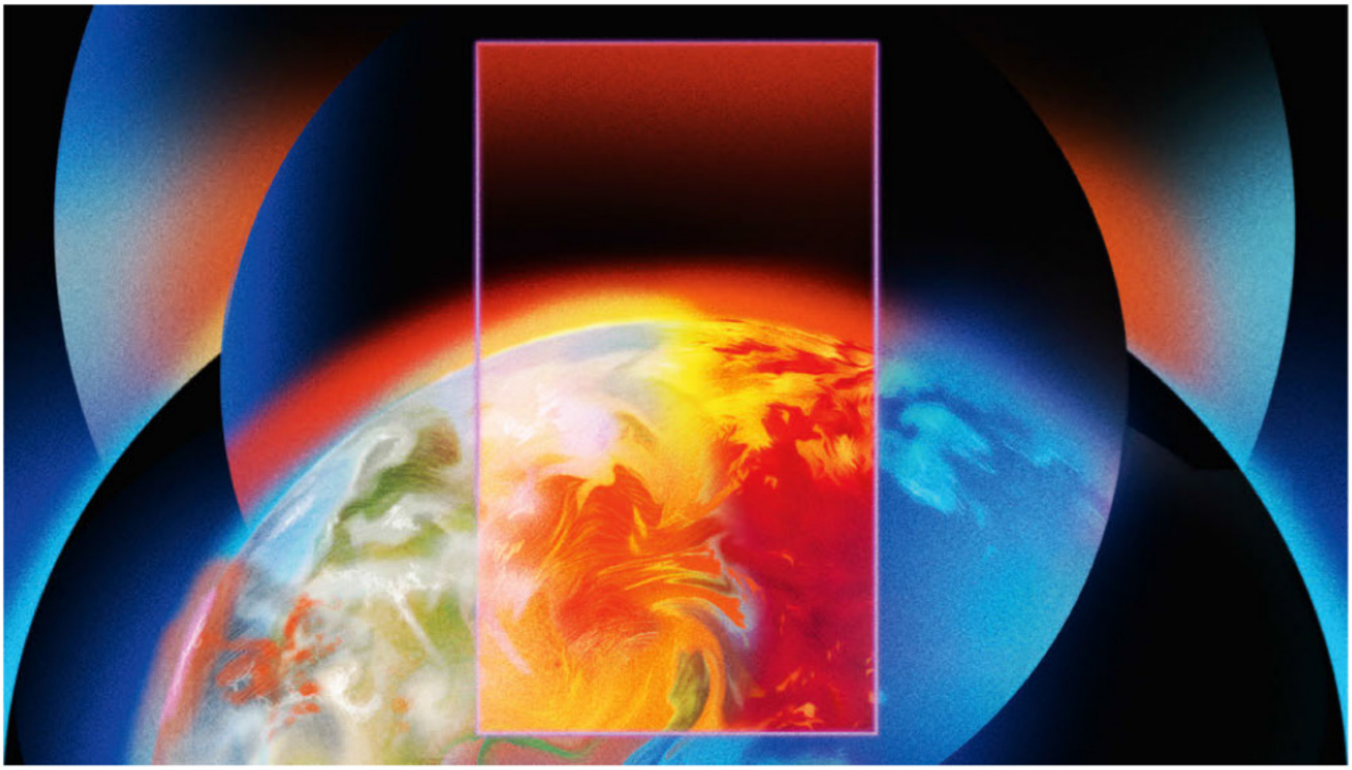


An inconvenient truth

The goal of keeping the rise in global temperatures to 1.5°C has shaped climate policy worldwide. But it is not a goal the world is going to achieve

THREE STRIKES and you're out is a pretty good rule. And the politicians and negotiators attending the Paris climate summit, "COP21", in December 2015 were facing their third strike. Their first and second attempts to bind the world into a meaningful pact that would control greenhouse-gas emissions—in Kyoto in 1997 and in Copenhagen in 2009—had failed. If on their third time at bat they could do no better, the world was cooked.

There was thus immense pressure on all at the conference to achieve a robust outcome. And a group of politicians and policymakers representing some of the world's poorest countries had a very specific and controversial requirement for what it should contain. James Fletcher, of St Lucia, recalls that he and his fellow representatives of Caribbean states were "very clear in our minds that 1.5°C was a red-line item. It was one of the things that we said kind of silently: that we would be prepared to walk away from the negotiations if there was a sign we would not be getting a reference to 1.5°C in the Paris agreement."

Many island states had the same red line. Their reasoning was simple. For a country like the Maldives, with more than 80% of its land rising less than one metre above sea level, more than 1.5°C (2.7°F) of global warming would see most of its sovereign territory disappear. Some continental countries which felt themselves at particular risk, or felt a particularly strong sense of solidarity, embraced the cause too. Third-strike make-or-break Paris was the perfect place to take a stand.

In the years since they originally signed the UN Framework Convention on Climate Change (UNFCCC), which was negotiated in 1992, the countries of the world had not committed themselves to a temperature target. Part of what mattered about Paris was that they were finally going to do so. The limit most countries, including all the big emitters, had in mind was 2°C. It had become accepted, without any compelling evidence, as a boundary below which global warming, while regrettable, did not constitute "dangerous anthropogenic interference with the climate system"—the thing that the UNFCCC's signatories were pledged to avoid. It was also much better than what then seemed on the cards if the world did not act; business-as-usual projections showed temperatures rising 3.5°C or more above the pre-industrial baseline.

Given the predisposition against it by all the large countries, the 1.5 brigade's tough stance managed to get their ideas further than most observers had expected. The text gavelled into history after two weeks of negotiations went beyond a simple 2°C goal, speaking instead of "Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C." Cue cheers and hugging. "It was one of the rare victories of the poor, vulnerable countries in this arena," says Saleemul Huq, a veteran of climate negotiations from Bangladesh.

Wishing they were there

In the years since Paris, the 1.5°C target went from something to be pursued to something totemised. A stretch goal has been widely treated as a paramount one.

The process was strengthened by a report published by the Intergovernmental Panel on Climate Change (IPCC) in 2018 which compared what the world might expect at 1.5°C with what 2°C would look like. Even as temperatures crept up by just half a degree, impacts and risks became worse in every possible domain, from fisheries to floods, droughts to decimated ecosystems. In a 2°C world, some 420m additional people would be exposed to record heat, millions more people would have their livelihoods wiped away by higher seas. An ice-free Arctic would be expected once a decade rather than once a century.

As well as looking at impacts, the 2018 report also weighed in on emission pathways. Its conclusions formalised the idea that, in order for the 1.5°C target to be met, net emissions needed to zero out around the middle of the century. The "Net-zero by 2050" mantra galvanised politicians and businesses as well as activists.

In 2019 the Science Based Targets initiative, a non-profit project that provides the corporate and financial sectors with guidance and technical assistance on their plans for climate action, launched the "Business ambition for 1.5°C" campaign with 28 early adopters. At last check, 1,558 companies had joined. In 2019 16% of the global economy was covered by net-zero pledges; by 2021 net-zero-by-2050 pledges covered 70%. "The mobilisation of finance and business is very much driven by the 1.5-degree target," says Stephanie Maier of Climate Action 100+, an investor-engagement group with 700 members holding nearly $70trn-worth of assets.

The urgency engendered by the 1.5°C target may be one of the reasons why, in the years since Paris, the peak temperatures seen on projections of what will happen if countries honour their pledges have steadily dropped. According to the UN Environment Programme (UNEP) the range of temperatures by 2100 is around 2.8°C under current policies, and 2.4°C if countries live up to all the commitments about future policy made to the UNFCCC in Paris and since. That is real progress.

At the same time, seeing the target treated as attainable has led many to believe that added political will and increasingly fervent denunciations of fossil fuels can get the range of the possible all the way down to a warming of just 1.5°C. Thus, before the COP26 climate summit it hosted in Glasgow last year, the British government framed its goals for progress in terms of an aim to "keep 1.5 alive". Two weeks later, it deemed its modest achievements to have provided the life support necessary.

That was, to put it mildly, misleading. This year, as the climate world meets in Sharm el-Sheikh on the Red Sea for COP27, hosted by Egypt, it would be far better to acknowledge that 1.5 is dead.

An emissions pathway with a 50/50 chance of meeting the 1.5°C goal was only just credible at the time of Paris. Seven intervening years of rising emissions mean such pathways are now firmly in the realm of the incredible. The collapse of civilisation might bring it about; so might a comet strike or some other highly unlikely and horrific natural perturbation. Emissions-reduction policies will not, however bravely intended.

Most in the field know this to be true; those who do not, should. Very few say it in public, or on the record. An activist movement based on galvanising enthusiasm is hard put to admit defeat on its chosen goal. Doing so can also feel, to those who care, like giving up on the poorest, who will suffer more than any others after the threshold is breached.

But the truth needs to be faced, and its implications explored. What does the certainty of a post-1.5°C world mean for the planet? Can a world which warms significantly more find its way back? And what will missing a totemic target mean for the credibility and sustainability of continued efforts to limit climate change?

Welcome to the machine

To see why 1.5°C is dead, and also to understand how it contrived to remain plausible for as long as it did, look at what is called the carbon budget: the amount of cumulative carbon-dioxide emissions associated with a specific amount of warming. Such budgets can be estimated pretty well from climate models; they are among their more robust products and among the most useful for policy.

With a sense of the budget in question, other modellers can try and produce emission pathways that deliver what the budget requires, using computer models which couple the climate to the economy which aim to be consistent with the science of both. These don't allow emission cuts to increase arbitrarily, but only at rates consistent with possible investment and other constraints such as maintaining reasonable supplies of energy.

According to the IPCC the budget for a 50% chance of avoiding more than 1.5°C of warming is 2,890bn tonnes of carbon dioxide. Some 2,390bn of this had already been emitted by 2019. That left a pre-pandemic carbon budget of 500bn tonnes. Since then, a further 40bn tonnes has been emitted each year, roughly, leaving less than 400bn tonnes in the budget.

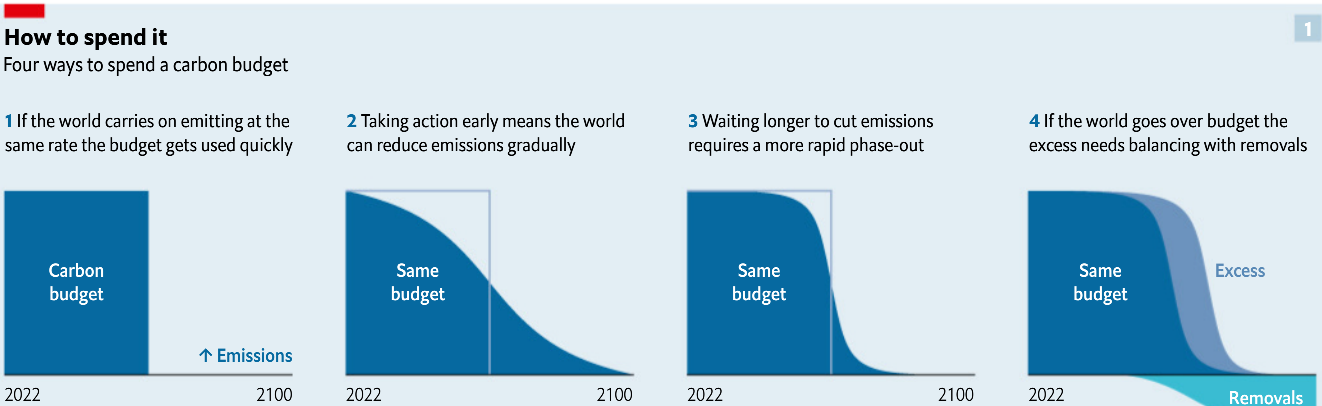
What sort of scenarios can be imagined for spending such a sum of smoke? As a *reductio ad absurdum*, ten years of emissions at today's rates would be enough to burn through the entire 1.5°C budget; after that everything dependent on combustion would have to be turned off for good. A plateau in emissions is clearly possible; an instantaneous cut-off is not (see chart 1).

If instead you imagine the world as a whole immediately beginning to cut emissions at once things look a little more practical. If it makes half the cuts in ten years, it has another ten years to make the other half. But none of the models can produce a pathway with cuts steep enough to get to zero anything like that quickly. And if the start of the cuts is delayed, as is currently happening, they have to be steeper still.

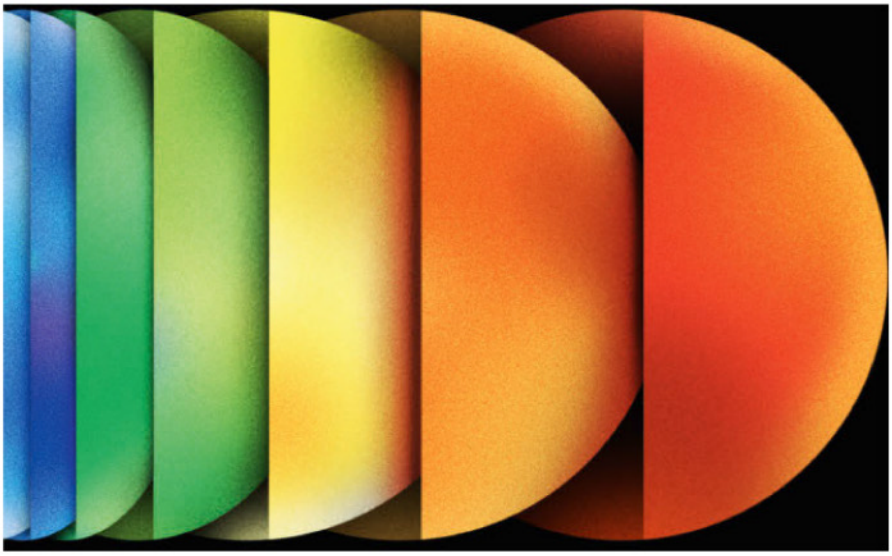
However there is a loophole. If the world commits itself to substantial "negative emissions"—to pulling carbon dioxide back out of the atmosphere—the space for positive emissions is expanded. In a world with a 400bn-tonne budget, for example, 600bn tonnes can be emitted if 200bn tonnes are quickly removed. The prospect of negative emissions justified the 1.5°C language in the Paris agreement. It has since become common currency as the conceptual basis of all "net-zero" policies.

But if negative emissions help produce plausible pathways, they also represent a dangerous lure. Delay the start of reduc-

How to spend it
Four ways to spend a carbon budget



Source: *The Economist*



tions, reduce the steepness of their decline, and you can still balance the budget by adding to the negative emissions later on. Thus pathways which give a decent chance of meeting the 2°C limit now use a lot more negative emissions than similar pathways did back in the days of Paris; the cuts not made in the past seven years have been transmuted into negative emissions decades hence.

The not-yet-final cut

This still works for 2°C pathways (see chart 2). But for 1.5°C pathways the jig is up. It is just about possible to twist models far enough that they will produce a crash-course 1.5°C trajectory. But they have some very obvious defects.

First, they require a huge new carbon-removal industry to be built more or less from scratch in just a couple of decades. One such trajectory has a billion tonnes of carbon dioxide removed by 2030 and mid-century negative-emissions of carbon dioxide at 6bn tonnes a year. That requires a level of drawdown considerably greater than today's rate of natural-gas production (around 3.2bn tonnes a year).

Second, such trajectories require cuts in fossil-fuel use which go beyond the extraordinary, with emissions reduced by 43% or more as early as 2030. "Who believes that we can halve global emissions by 2030?" asks Daniel Schrag, an Earth scientist at Harvard who was a White House scientific adviser during Barack Obama's presidency. "It is so completely outside the realm of the technology and economics and politics of the world. Is it technically feasible? I guess. But it's so far from reality that it's kind of absurd."

And, third, even such extreme and implausible trajectories do not, for the most part, actually keep the temperature rise below 1.5°C; they overshoot it a bit and count on negative emissions to then bring the temperature back down. The huge assessment report the IPCC started publishing last year has 97 hypothetical scenarios in its "low-or-zero-overshoot" category. Only six have no overshoot.

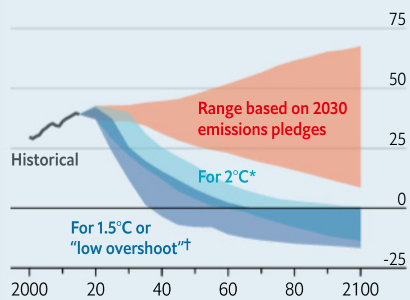
In April, shortly after the relevant part of the report's publication, Glen Peters of Norway's Centre for International Climate Research wrote that "There exists no scenario in the [IPCC] assessment that peaks in 2025, and then reaches 1.5°C." He should know: he was one of the lead modellers involved. "Maybe it is possible," he says, "but it is really clutching at straws."

Such modelling confirms and reinforces what one can see by looking at a range of indicators of progress on the mitigation of climate change, as the World Resources Institute did in a recent report (see table on next page). A lot are pointed in the right direction. None are at the level they would need to be to meet the 1.5°C target. But models and the expertise behind them go beyond noting shortfalls. They can also sketch time frames. Emissions are not just going to push the world beyond the 1.5°C limit. They will probably do so pretty soon.

Increasingly unreal 2

World, net CO_2 emission scenarios

Gigatonnes per year



Source: IPCC AR6 *67% chance †50% chance

Global average temperatures are currently 1.0-1.3°C above the pre-industrial. According to Britain's Met Office and the World Meteorological Organisation, there is a 48% chance that global average temperatures will be 1.5°C higher than pre-industrial in at least one of the next five years. Dr Huq speculates that it will be passed before the IPCC brings out the next of its monumental assessments, expected at the end of this decade; Dr Peters takes much the same view. The latest report "is the last IPCC assessment that warns us of what will happen," says Dr Huq. "The next...will just chronicle more losses and damages that have [already] happened."

For climate scientists, a single year above 1.5°C is not quite the point; they like to work with averages that smooth out fluctuations from year to year. That would require a decade or two of data. The public seems less likely to make the distinction, and rightly so. Once one year reaches 1.5°C, the odds that the average will soon rise to that level, and stay above it until after emissions fall to zero, are very high.

With that little time, even thinking outside the box offers very little hope. The box, here, is treating the whole issue as a matter of carbon budgets. There is more to climate than that. Some argue that acting really decisively on other warming factors, such as methane and soot, might change the picture. Such cuts are worth making, and indeed they sometimes pay for themselves. But the most aggressive pathways already factor in reductions in methane far steeper than any achieved to date.

Dark side of the Sun

But there is also a more radical non-carbon-dioxide based option. Solar geoengineering (also known as solar radiation management or modification) would try to cool the world off by cutting down the amount of sunlight that reaches the Earth's surface; less sunlight, less warming. The most discussed method for achieving this involves putting particles into the stratosphere to bounce a little of the incoming sunlight straight back out into space. Such cooling is seen in action after very large volcanic eruptions; the huge amounts of sulphur they squirt into the stratosphere create tiny reflective particles of sulphate "aerosols". Geoengineering would be much less spasmodic. A steady stream of sulphur would be sprayed into the stratosphere for decades, or even centuries.

According to the latest projections by UNEP, which are roughly in line with those made by others, if countries were to live up to all their most recent emissions-reduction pledges and, beyond that, those with notional net-zero targets actually hit them, warming should peak at about 1.8°C above the pre-industrial. Katharine Ricke, a researcher at the University of California San Diego who has done a lot of work on solar geoengineering, estimates that, if such a scheme were to be based on sulphate particles, the 0.3°C of cooling needed to bring a 1.8°C world down to a 1.5°C world would require something like 3m tonnes of sulphur a year delivered to the stratosphere. It would also need a new class of very high-flying planes to get the sulphur up there, a system for monitoring what exactly it was doing to the stratosphere to be set up, a world-girdling set of air bases and some chunky new supply chains.

Careful with that axe

Above and beyond those practical requirements, if such a scheme were not to be a massive source of political conflict and public concern it—and, crucially, who controls it—would need a significant degree of approval, or at least acquiescence, from all around the world (see Science & technology section). That would be a big turnaround. Solar geoengineering has been treated as the bête noire of climate policy and science for well over a decade. Researchers and environmental groups worry that engaging with the topic will start humanity down a slippery slope towards a hyper-engineered planet where greenhouse gases continue to be emitted with impunity and the underlying climate becomes ever more unbalanced.

To avoid going over 1.5°C would require getting such a scheme going in a decade or so. Politics aside, which they would not and should not be, that is highly unrealistic. One recent study suggested that it would take 15 years for the capability to be set up. And before a decision to do so could be rationally made, more would need to be known about the possible effects on stratospheric circulation and chemistry. Field tests to that end would doubtless be dogged by controversy. And models of the possible consequences in terms of regional temperatures and rainfall patterns, water security, agricultural yields, tropical storms and human health would need to be much better than those available today. "We do need at least five years to produce that new set of studies," says Dr Ricke.

If a solar-geoengineering programme would be slow to start, though, it would be much slower still to stop. Glitter in the sky would mask some of the temperature effects of higher greenhouse-gas levels, but it would not lower the levels themselves. The warming power of the gases remains the same. That means the only way to end a solar-geoengineering programme without precipitating a jump in temperatures is to bring the underlying greenhouse-gas levels down first.

For 0.3°C of overshoot that would mean removing tens of billions of tonnes of carbon dioxide. If the world treated solar geoengineering as an excuse for easing off on its current pledges, the amount needing

Game over 3

World, 40 actions for meeting the 1.5°C target

- 0 On track for meeting 1.5°C
- 6 Moving in right direction, below required pace
- 21 Right direction, well below required pace
- 5 Wrong direction
- 8 Insufficient data

Examples

- Increase the share of zero-carbon sources in electricity generation
- Reforest 100 million hectares
- Decrease the energy intensity of residential and commercial buildings
- Increase technological carbon removal
- Reduce the carbon intensity of cement production
- Reduce the carbon intensity of electricity generation
- Reduce the share of unabated coal in electricity generation
- Decrease emissions from agricultural production
- Decrease the rate of mangrove loss
- Reduce the carbon intensity of steel production
- Reduce the share of unabated gas in electricity generation

Source: World Resources Institute

removal would rise accordingly. At best, solar geoengineering merely delays the challenge of carbon removal. At worst it hugely increases it.

But knowing that the 1.5°C milestone will fairly soon be in the rear-view mirror is leading people to take the idea more seriously than they have in the past. The Climate Overshoot Commission, assembled under the auspices of the Paris Peace Forum, is a group of 15 former heads of government, senior politicians and others chaired by Pascal Lamy, a one-time head of the World Trade Organisation. Taking the idea that the world will heat beyond 1.5°C as its starting point the commission is looking at greatly enhanced adaptation, carbon removal and solar geoengineering. It is acutely aware of the risks. "One country, or one operator, does this: *barrum!*" Mr Lamy says, making the noise of an explosion. "This has inevitable consequences on the rest. We don't know these consequences, and we have to look at that."

Oliver Geden, a climate-policy analyst at the German Institute for International and Security Affairs, sees the need to open such questions up as one of the reasons policymakers have not been frank about the 1.5°C limit. "If you say 1.5 is not going to happen you create a problem," he says, "And there's no obvious solution to that problem." A "1.5°C at any cost" framing would imply solar geoengineering come what may. Trying to change the target to 1.7°C or 1.8°C would allow critics to argue that "wolf" had been cried. It would also bolster justified calls from poor countries for rich ones to provide much more generous support for adaptation (see our special report), and strengthen the case for "loss and damage" payments to those harmed by climate change, something of which the rich world is very chary. "Both of these are politically quite unattractive," says Mr Geden. "It's more attractive to stick to a keep-1.5-within-reach framing."

The demise of 1.5°C does not mean that the fundamental policy implication of the Paris agreement is changed. The world needs to stabilise atmospheric greenhouse-gas levels by massively reducing its emissions and by gaining the ability to reabsorb those emissions that it cannot abate. And doing so more quickly is better. For some, a global temperature target never made sense in the first place. Dr Schrag at Harvard points out that the climate system as a whole mostly operates on a sliding scale, where higher global temperatures bring greater impacts and risks. "1.5°C is not safe and 2.2°C is not the end of the world," he says.

Scientists do know, though, as the IPCC showed in 2018, that the less the temperature rises, the better. 1.6°C is better than 1.7°C: 1.7°C is better than 1.8°C. As a new mantra has it, "every fraction of a degree matters". To Dr Schrag, it is never too late. "It is always the case that reducing the severity of climate change is a worthy investment. If we were at four degrees, keeping it from going to six is a noble thing to do."

Set the controls...

Politically, such meliorism could weaken calls for drastic climate actions. Having an absolute goal strengthens people's rhetoric; admitting that things are on a sliding scale opens the way to trade-offs. But here, at least, reality is in the process of trumping rhetoric. And if a new realism sees pressure for impossible levels of emissions reduction give way to fierce advocacy for adaptation measures that are both plausible and vital, some at least would be well served.

As to the 1.5°C target, it may yet have a role to play. Stabilising the global temperature by achieving a net-zero world opens the possibility of a net-negative one in which that temperature could be lowered. What level of negative emissions, and possibly solar geoengineering, such a world might employ would depend on its experience and its ambition. At that point 1.5°C might become an appealing target again—but this time approached from the other, sorrier and perhaps wiser direction. ■

Immigration

Open wide your gates

SEOUL AND YOKOHAMA

Japan and South Korea are allowing in some foreign workers. That will not be enough to sustain their economies

THE UBIQUITOUS rule-giving signs of the Icho Danchi district on the outskirts of Yokohama, near Tokyo, speak far more languages than any of its residents could. Motorcycle riding is restricted in Chinese, English, Japanese, Spanish and Vietnamese. Instructions for sorting rubbish, a particularly finicky part of Japanese daily life, are offered in 11, including Portuguese.

With its Vietnamese cafés and Cambodian markets, the area is a microcosm of Japan's growing but still small migrant community. In 2009 the country had 2.1m foreign residents. By 2019 that number was up to 2.9m. Just across the water, South Korea shares with Japan more than just byzantine waste-management rules. Its foreign population more than doubled from 1.1m to 2.5m over the same period.

The influx to both countries slowed during the pandemic, but it is set to pick up. The number of foreign residents in Japan grew by 200,000 in the first half of this year. Those on work visas made up more than half the increase. The South Korean government announced on October 27th that it would welcome some 110,000 foreign workers in 2023, twice as many as in each of the past eight years.

The new arrivals may help alleviate a short-term need for labourers. But they will do little to tackle the long-term problems both countries face. In the coming decades, Japan and South Korea will need ever more foreigners to till their fields, assemble their widgets and care for their old. And both will need more taxpayers, too. Japan's population is expected to decline from over 125m now to 104m by 2050. South Korea's is predicted to fall from 52m to 46m by 2050, and then to 36m by 2070. The ratio of over-64s to the working-age population in both countries is projected to shoot up (see chart on next page).

Getting more women into the workforce, raising the retirement age and boosting productivity would help. But "we have to accept more foreigners, that is the reality," says Takahashi Susumu of the Japan Research Institute, a think-tank in Tokyo. A recent study led by Japan's aid agency concluded that, even assuming big investments in automation, at least 6.7m foreign workers will be needed in 2040 to achieve the government's modest yearly GDP growth targets of 1-1.5%. A study last year by the Migration Research & Training Centre (MRTC), an institute in Seoul, found that South Korea would need some 4m foreign workers by 2030 to maintain its working-age population.

Drawing those numbers would require not only the political will—itself a tall order—but also efforts by Japan and South Korea to make themselves attractive. Migrants are still considered a temporary resource to plug gaps before being sent back. Mistreatment of guest workers is widespread. Options for staying on are limited. In South Korea temporary workers' visas can be extended for a maximum of four years and ten months, two months short of the five years that would allow them to apply for permanent residence.

The chances of serious reform are low. Kishida Fumio, Japan's prime minister, is flailing in the polls and focused on other priorities, such as defence and energy. His advisers reckon the country is not ready for an open debate on immigration. South Korea's president, Yoon Suk-yeol, is also preoccupied. His government, too, hides be- ▸▸

→ Also in this section

hind a lack of public consensus.

Mr Kishida, for one, may be misreading the mood. "People are ready, they just need a go-ahead sign," argues Menju Toshihiro of the Japan Centre for International Exchange, a non-profit organisation. Japanese have come to recognise the necessity of welcoming more foreign workers. A survey conducted in March 2020 by NHK, Japan's national broadcaster, showed that 70% of Japanese support allowing in more imported labour.

The case in South Korea is less clear. A survey by the East Asia Institute, a think-tank in Seoul, suggests that South Koreans are becoming less enthusiastic about welcoming foreigners. In 2010 some 60% said they would like the country to become more multicultural. By 2020 that number had dropped to just below 50%, largely as a result of economic insecurity.

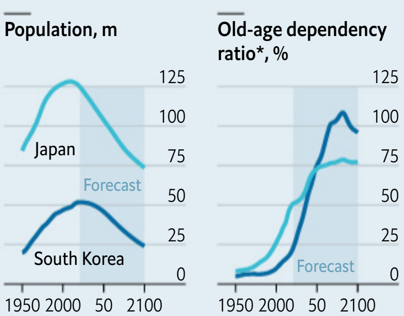
Business leaders have been asking both governments to boost the numbers that can come. Calls for change are also growing among some other groups. In Japan, local leaders in older, greyer regions have become more outspoken: the governors of Gunma and Miyagi, two central prefectures, went to Vietnam recently to recruit workers. Japan's ministry of justice is expected to review its system for low-skilled workers. South Korea intends to form an immigration bureau responsible for migrant affairs—a role currently shared by 12 different ministries—which will make it easier to design unified policy. But its focus remains on high-skilled workers.

Both governments should be bolder. Public consensus should not be an excuse for inaction but rather the aim of governmental consultations. As Kang Dong-kwan of MRTC points out, the question of "what is the population goal?" must come before those of policy design.

Japan and South Korea will also have to try harder to attract migrants than they might expect. Though there will no doubt be plenty of takers for the lowest-paying jobs, both countries face competition for more skilled workers. South Korea, at least, has the pull of soft power: cultural exports, such as K-pop and K-dramas, have made the country familiar and attractive to foreigners, says Shin Gi-wook, a sociologist at Stanford University in California. But Japan's relative economic draw is waning. Wages have been largely stagnant for decades, even as they rise in the developing countries that send the most labourers.

Moreover, both countries' currencies are weak against the dollar, leaving migrants with less to send home. They also lack a major attraction that other rich countries have—big existing migrant communities. Integration is harder than in many other places. Learning Korean or Japanese takes more effort and offers fewer opportunities than learning English. Adding to such barriers is the sense among migrants that they are not wanted. As Mr Takahashi points out, "people might start to think 'why would I bother?'" ■

Measure for measure



*Population aged 65 and over as % of people aged 15-64
Source: UN World Population Prospects

Small business

The unkindest cut

BANIBAN JAGADISHPUR

India's hair industry is in a tangle

EVERY DAY between 60,000 and 85,000 pilgrims arrive at Tirumala, a temple in southern India. Many are satisfied just with *darshan*, or sight, of the sanctum of Lord Venkateswara, an avatar of Vishnu, waiting up to 20 hours for the privilege. But a little under half of them also line up to have their heads shaved by one of more than 1,300 barbers, who work round the clock. Men, women and children alike undergo ritual tonsure, sacrificing their locks as offerings for good health, career progression or other divine favours. The temple's barbers shave some 1.2m heads every year.

That adds up to a lot of hair. In 2019 the temple auctioned off a staggering 157 tonnes of the stuff, earning $1.6m. And Tirumala is only one of many temples in India where tonsuring is part of the ritual. Much of this fibrous bounty ends up in West Bengal, an eastern state where the hair industry is concentrated. At Baniban Jagadishpur, a village about 50km (31 miles) from Kolkata, workers untangle, shampoo and sort hair before weaving it into wigs of various sizes. "I have customers who ask me for wigs for just their wedding day to look ten years younger, but end up keeping them on for life," boasts Sekendar Ali, a wigmaker.

The global market for wigs and extensions was worth $5.8bn in 2021 and is growing at a fast clip, according to Arizton, a market-research outfit. Real human strands, as opposed to synthetic ones, are woven into nearly a third of the world's hairpieces. Last year India exported $770m-worth of human hair, twice as much as in 2020. Spared the brunt of harsh chemicals—most Indians cannot afford hair products—it is prized for its quality. "It is malleable and can be curled and straightened at will," says Mustaq, an exporter in West Bengal.

The trade's low input costs and high margins attract dodgy characters, too. Smugglers mislabel the goods as cotton to avoid Chinese tariffs. Last year 120 bags of undeclared hair, worth around $243,000 and bound for China, were seized by Indian officials at the border with Myanmar. Another destination for Indian hair is Bangladesh, where criminals run wig sweatshops.

Earlier this year India placed restrictions on the export of human hair, requiring traders to seek a licence. It is unclear how crooks are affected by the regulations. Still, industry optimists hope the new rules will spur more domestic wigmaking, a higher-value business than exporting the raw stuff.

That is easier said than done, says Mr Ali. He believes there are not enough factories to process all of the hair available, and that only big firms get a licence to export. "We do not," he says. The supply glut has trimmed prices. Hair agents are out of work. Sheikh Habib, a small exporter, says his business is suffering. "I had to throw hair into a lake," he complains. Clamping down on smuggling is understandable. But it is legitimate traders who are having toupee.

That's how you make the wig bucks

Data hacks

Once more unto the breach

SYDNEY

A spate of cyber-attacks is making life miserable for Australians

"I LITERALLY HAVE no privacy any more," groans Anita, a researcher in Western Australia (who, in a bid to regain some, asked *The Economist* to withhold her surname). Her personal data has been stolen twice. On September 23rd her phone company, Optus, told her that she had been a "victim of a cyber-attack", exposing her name, contact details, and passport and driving licence numbers. A few weeks later she learnt that her private health insurer, AHM, had been hit in a separate attack. Her phone buzzes more often with spam calls and emails these days. She was recently the target of a phishing attempt.

Millions of Australians share that misery. A spate of big cyber-attacks has disrupted life down under. The one against Optus, Australia's second-biggest telecoms company, affected up to 10m of its current and former customers—about 40% of the country's population. More than a fifth of them had identity numbers stolen.

Medibank, a health insurer which owns AHM, revealed on October 13th that it had been targeted. The data of all its 4m customers was compromised, including sensitive information about their health claims. The next day Woolworths, a supermarket, reported that its systems had been breached. An attack on MyDeal, an online marketplace that it owns, exposed information on 2.2m customers. A few days later Vinomofo, an online wine-seller, said hackers had accessed data on 500,000 customers from a testing platform. And on October 31st the country's defence department said a ransomware attack had struck a communications platform it uses.

It may be simply that big hacks are getting harder to hide, says Alastair MacGibbon, Australia's former national cyber-security adviser. And each breach could entice copycats. But an increasingly plausible explanation is that Australia is the target of a state-backed campaign. Russian hackers, he suggests, may be "starting to cause fear, uncertainty and doubt" in countries supporting Ukraine.

Either way, Australians are hacked off at how much data their companies are hoarding. Successive governments have passed laws to beef up "national security" over the past decade or so. The result has been to gather lots of data about everybody, says Vanessa Teague of Australian National University in Canberra. Companies operate under one of the most intrusive data-retention systems in the Western world. Since 2017 telecoms firms have been required to retain customer metadata for two years. Medibank says it is required to hold data about its members for seven years.

Rockedus, shockedus, Optus

Australian companies have eagerly gathered more data on their customers, but have done less to beef up their defences. It is unusual to find a cyber-security expert on an Australian firm's board, notes Suelette Dreyfus, a data-security researcher at the University of Melbourne. Replacing ageing IT systems has been treated as an inconvenient expense rather than a necessity, she adds. There is little in Australia's data-protection laws to force more action. Its Privacy Act of 1988 was written "before the internet itself really existed", says Brendan Walker-Munro of the University of Queensland. The law asks companies to take "such steps as are reasonable" to safeguard data. Little punishment is imposed on those that fail to do so.

The Labor government, elected in May, wants to change that. On October 26th it introduced legislation that would slap much bigger fines on firms struck by serious or repeated data breaches, lifting the penalty from A$2.2m ($1.4m) to A$50m or more. A wider review of Australia's privacy law is also under way. Firms should be made to "dispose of data safely" after they have verified a customer's identity, suggests the attorney-general, Mark Dreyfus.

The recent spate of breaches offers companies other reasons to bolster their defences, too. Medibank's shares plunged 20% after the hack. It estimates the attack will cost it up to A$35m before legal costs or payouts. Optus is facing at least one class-action lawsuit. That is only the beginning of its problems. Fully 10% of its customers have abandoned the company since their data was stolen. Many more intend to follow. ■

Climate change and religion

The colour of Islam

Indonesia's imams are doing their bit for the environment

JAKARTA IS CONSTANTLY under aquatic assault, from above and below. Last month three pupils died when their school collapsed amid a downpour. In 2020 the worst deluge in over a decade killed dozens and displaced nearly 400,000 people. With 13 rivers flowing through it, the Indonesian capital has always flooded. But the frequency and severity of floods is growing. Parts of the city are sinking into the sea at a rate of 25cm (ten inches) each year.

A similar story is unfolding in other parts of Indonesia. Floods displaced over 600,000 people in the archipelagic country last year. The World Bank warns that up to 4.2m Indonesians could be exposed to permanent flooding by the end of the century. In the drier seasons, droughts cause forest fires, threatening Indonesia's 94m hectares (230m acres) of forest.

Yet a country so exposed to the dangers of climate change is also a hotbed of climate denialism. A recent YouGov-Cambridge poll found that 13% of Indonesians say climate change is not caused by humans, just a shade less than the proportion in America. Indonesia's imams, part of the influential Islamic establishment, want to change that. In July the country's top Islamic representatives gathered at Istiqlal Mosque in Jakarta to establish the Muslim Congress for a Sustainable Indonesia, a forum for co-ordinating Islamic environmental activism among clerics, teachers, academics and politicians.

Nasaruddin Umar, Istiqlal's grand imam, declared at the gathering that a mosque should be a place to "green the mind and the heart". He has started by installing solar panels and water-recycling systems in his own mosque. Another 1,000 mosques will be fitted with solar panels and smart energy meters. Istiqlal is part of a growing movement. In 2018 Nahdlatul Ulama, Indonesia's largest Islamic organisation, launched a series of sermons on waste and recycling. Muhammadiyah, the second-largest such body, created a programme to teach its imams to become "environmental preachers".

The Indonesian Ulema Council (MUI), the top body of religious scholars, is also involved. Over the past decade it has issued a series of *fatwas*, or non-binding legal opinions, to promote green causes. In 2011 it declared environmentally destructive mining operations forbidden under Islamic law. Three years later it banned the kill- ▸▸

ing of endangered species. In 2016 it condemned slash-and-burn farming practices as *haram* (proscribed by Islamic law).

Indonesia is officially a secular country. But its clerics wield serious clout. A survey in 2020 by Katadata Insight Centre, a local research firm, found that Indonesians place the highest level of trust in information from religious institutions. Imams have sought to convert that trust into political power. Ma'ruf Amin, Indonesia's vice-president, was personally involved in drafting and defending the environmental *fatwas* as an MUI leader. He still gives green sermons from his political perch.

Indonesia's *pesantrens*, or Islamic boarding schools, have become testing grounds for what some call the eco-Islam movement. Around 4m pupils study in these schools. Alumni often go on to lead important religious and political institutions. At Darul Ulum, a *pesantren* in Java, teachers tell stories of the Prophet Muhammad planting trees and protecting wildlife. Students must plant a tree (among other things) to graduate.

Clerics have also been active in finance. They helped design Indonesia's "green *sukuk*", or green bonds. To comply with *sharia* prohibitions on usury, these instruments involve direct ownership of assets rather than interest-bearing debt. Since 2018 Indonesia has issued nearly $3bn of these Islamic bonds, which fund renewable-energy and climate-adaptation projects.

Indonesia is the world's fifth-largest carbon emitter, and its economy depends on exporting coal and palm oil, two highly polluting industries. The country's transition to a clean economy will be long and difficult. Its imams are keen to help accelerate that shift. ■

Banyan Not enough to speak

When a disaster shakes a country, political leaders face peril

TWO DAYS after the tragedy, the streets of Itaewon were silent, save only for the whirring clicks of news cameras. In their frame was the alleyway in which a crush of bodies left more than 150 people dead. At the subway-station entrance white chrysanthemums had been left in memory of the victims.

South Korea remains in shock over the events of October 29th, when some 130,000 people flocked to a nightlife district of Seoul, the capital. Many more came than the authorities expected. As the night progressed and the numbers swelled, those crammed into steep, narrow streets were trapped. A weight of humanity caused some in the crowd to fall, triggering a domino effect. Others, unaware of what was happening, continued to pack in. No stewards were around to prevent the tragedy.

Few countries have not suffered similar—avoidable—tragedies. Yet Asia appears to have more than its fair share. One explanation is self-evident: the region has more than its fair share of the world's people, so human disasters are more frequent. The day after the Itaewon calamity, a river bridge in Morbi in Gujarat, the home state of India's prime minister, Narendra Modi, collapsed, killing at least 135, most of them women, children and the elderly. In early October a human crush at a stadium in Malang in Indonesia led to 131 deaths.

In Morbi the colonial bridge had just been reopened with a view to attracting tourist crowds. In Malang police precipitated panic when they fired tear gas at fans invading the pitch—a response long banned by football's global governing body. So another part of the explanation for so many Asian disasters flows from the pace of the region's march to modernity. Poor infrastructure, safety protocols or policing practices fail to keep up with fast-growing economies and populations which are both more mobile and ready for more varied experiences.

It is in that gap that political peril lies. Nowhere was this clearer than with South Korea's last big catastrophe. In 2014 a ferry, the *Sewol*, capsized on its way to the holiday island of Jeju. Some 300 people died, most of them schoolchildren. The vessel was overloaded. Corrupt regulators had turned a blind eye to unseaworthy modifications. The crew abandoned ship before the passengers. The then president, Park Geun-hye, failed to appear in public for hours. It turned out she even urged the national intelligence service to track critics of the official response. Public outrage led to protests and opened the door to ever greater anger against her. She never recovered politically.

Few leaders are as detached from their electorate as was Ms Park. Others responding to a calamity acknowledge its scale but seek to find fault elsewhere. Mr Modi visited a local hospital in Morbi and chaired a meeting there to review the disaster. At the same time, the state government, also run by his party, was quick to shift the blame onto the town government and private contractors. Gujaratis will have the chance to express their views in an election next month.

Pressure for accountability mounts in ways that can pose risks for leaders. Many questions surround the Malang disaster in Indonesia: what were the police thinking by using tear-gas? Why were only four paramedics on duty? The Indonesian president, Joko Widodo, has forged close ties with the national police, who have helped him politically. At first he seemed to favour an internal police inquiry. That led many Indonesians to think that, absent such ties, he would have acted differently to ensure accountability, says Aaron Connelly of the London-based International Institute for Strategic Studies. The president did then change course, approving a more independent inquiry. But it was not enough to prevent a sharp slide in his ratings.

Back in Seoul, and reflecting the national mood, the South Korean president, Yoon Suk-yeol, said that "my heart is heavy and I struggle to cope with my grief." He has promised a memorial to Itaewon's victims, as well as an inquiry. Yet more questions are raised about the tragedy than are yet being answered. Above all, how could a police force that dispatches dozens of officers to even the smallest protests be so unprepared?

As for Mr Yoon himself, he has needlessly squandered political capital and goodwill during the few months he has been in office. That makes his job harder now. Still, a leader who applies balm to a country's wounds, and who provides reassurance that lessons will be learned, can unite a country. How Mr Yoon acts now will shape the rest of his presidency.

Toshiki Kawai
President and CEO
Tokyo Electron Limited

Imagining a new digital reality

Driven by semiconductor innovation, Tokyo Electron is striving for big data and decarbonisation

Amid current geopolitical uncertainties, what is certain is the growing importance of semiconductors. Those not so distant lockdowns led to a surge in demand for gadgets and entertainment electronics. But according to Tokyo Electron (TEL), the world's third largest semiconductor production equipment manufacturer, the global market has diversified beyond these. Mr Toshiki Kawai, president and CEO of TEL, is optimistic about the growth potential for the semiconductor market. He says semiconductor innovation can be used to not only solve social problems, but also help establish a high-performing, more efficient and carbon-neutral society.

THE FUTURE IS BIG DATA

According to TechInsights Manufacturing Analysis Inc. (VLSI) data, the market for semiconductor production equipment has grown by 2.7 times since 2014. The global data traffic is also growing at an explosive speed. For Mr Kawai, the future is big data, which he says will eventually migrate to the cloud and metaverse. "We should not be satisfied with the growth so far. The era of 'big data', driven by semiconductors, has just begun. People are talking about 'big data' but I feel like we are still at a small data stage", he says.

In order to facilitate this massive amount of data traffic, TEL says the key is in large capacity, high speed, highly reliable and lower power consumption semiconductors that also achieve broader sustainability and decarbonisation goals. TEL has also introduced a new supply chain initiative called E-COMPASS (Environmental Co-Creation by Material, Process and Subcomponent Solutions), which aims to further advance technological innovation beyond industry expectations by reducing the environmental impact of semiconductor manufacturing throughout the supply chain.

TEL is galvanising the concept of Creating Shared Value (CSV) to contribute to the technological innovation of semiconductors, along with reducing CO_2 emissions by introducing renewable energy processes at all of TEL's manufacturing sites and offices; striving to reduce the environmental impact of the equipment and setting the goal to be net zero carbon neutral by 2050.

INSPIRING EMPLOYEES

Despite significant global supply chain disruptions, TEL has surpassed market forecasts, with an operating income in FY 2022 almost 7 times of FY 2015 of around ¥600 billion. Mr Kawai says TEL aims to achieve an operating income of more than ¥1 trillion by FY 2027.

Fierce competition for technological breakthroughs is also elevating the importance of securing talented professionals. Mr Kawai attributes the company's technological strength to the flexibility of its employees in being able to respond to dramatic changes in the business environment. For instance, TEL focuses on motivation-oriented management and competitive rewards to ensure technological development. "Our corporate growth is enabled by people, and our employees both create and embody the company values," Mr Kawai explains.

PLANNING FOR A DIGITAL ERA

TEL has set the bar high, aiming to earn more than ¥3 trillion in net sales by FY 2027. Mr Kawai says semiconductors are central to supporting digital infrastructure such as the Internet of Things (IoT), AI, cloud computing, as well as 5G and post-5G high-speed communications. In the next five years, TEL plans to increase R&D investments by 1.6 fold to more than ¥1 trillion. Mr Kawai says that in response to semiconductor innovations that support smart houses, smart cities, smart factories, smart healthcare and more, their main objective is to enhance existing products, as well as bring to life technology that is yet to exist.

Under TEL's new vision set in 2022: "A company filled with dreams and vitality that contributes to technological innovation in semiconductors", Mr Kawai is certain that their drive to stand out in innovation will elevate the role of semiconductors in the coming digital era and contribute to a society that will dream big.

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The armed forces

Preparing for a fight

China's new military chiefs stand out for their loyalty to Xi Jinping and careers focused on war with Taiwan

IN THE EARLY hours of April 28th 1984, a young Chinese officer led an infantry regiment in an attack on Vietnamese forces embedded in the mountains on China's southern border. The battle of Laoshan was among the bloodiest of the skirmishes that sputtered on for a decade after China's four-week war with Vietnam in 1979—the most recent that Chinese forces have waged. Like the war, the battle ended with no clear victor. But it forged the reputation of the regimental commander, who almost four decades later has emerged as the most trusted military adviser to China's supreme leader, Xi Jinping.

General Zhang Youxia cemented that status with his reappointment as vice-chairman of the Communist Party's Central Military Commission after a party congress (held every five years) that ended on October 22nd. Many had expected him to retire. At 72 he is the oldest person given the post for some three decades. But his reappointment reflects two clear priorities that Mr Xi has for his armed forces: combat readiness and unwavering loyalty.

Mr Xi emphasised those priorities in a report to the congress that warned of "dangerous storms" ahead and took thinly veiled swipes at America over its support for Taiwan, the self-governing island that China claims. Citing "gross provocations" involving "external interference" in Taiwan affairs, Mr Xi urged the People's Liberation Army (PLA) to speed up modernisation and meet near-term targets by its 100th anniversary in 2027. He has mentioned that goal before, but its inclusion at the congress reinforced a view among American officials that Mr Xi has ordered the PLA to develop the capability to capture Taiwan by then (although opinion is split over when he might attempt that, if at all).

He also included fresh language pledging to develop "unmanned, intelligent combat capabilities" and to strengthen China's nuclear forces. He made new commitments to bolster his own authority as chairman of the military commission and to encourage PLA personnel to study more history, while re-emphasising the need for "political loyalty" in the armed forces.

General Zhang is uniquely qualified to help achieve those goals. He is, for a start, one of the few PLA commanders with actual combat experience. Although the Maoist mass-assault tactics used against Vietnam are hardly relevant to modern combat, his experience still gives him standing with fellow officers, as well as with Mr Xi. General Zhang also spent half of the past decade overseeing the critical field of weapons purchases and development. Most importantly, though, he is an old family friend of Mr Xi's. Their fathers were both revolutionary commanders who fought together in China's north-west. After the Communist victory in 1949, they moved in the same elite circles in Beijing.

Having a trusted and respected general at his side is essential for Mr Xi, who needs the unquestioning support of the PLA as he embarks on a norm-busting third term as party leader with no designated successor. An heir-apparent used to be identified partly through appointment as the military commission's only civilian vice-chairman, like Mr Xi was in 2010. But the new commission has no civilians, apart from Mr Xi. That gives General Zhang an unusual level of personal authority as the most senior of the two uniformed vice-chairmen who will run the PLA when Mr Xi is busy (he often is, having taken charge of so much). China's leader "requires generals who are both politically reliable and have hard operational experience", says James Char of Singapore's Nanyang Technological University. "I think Zhang Youxia is really the man whom Xi Jinping relies on to run the military on his behalf."

His fellow vice-chairman, 65-year-old General He Weidong, is another surprise. He was appointed to that post and to the 24-member Politburo after the congress, despite not having previously been a member of the military commission or of the party's Central Committee (a body comprising about 370 high-ranking officials and grandees). He too hails from a revolutionary family and has a personal connection to Mr Xi, having served in the province of Fujian for much of the 17 years that Mr Xi was a senior official there. But his appointment is thought to be connected more to his recent experience overseeing operations relating to Taiwan and India.

For two years until January 2022, General He led the Eastern Theatre Command, which is responsible for Taiwan and has been at the forefront of efforts to enable joint operations between the services. In that period he oversaw an escalation of military flights around Taiwan, as well as drills practising island seizures. More recently he has worked in the military commission's Joint Operations Command Centre. Some experts believe he oversaw the big drills around Taiwan that followed a visit there in August by Nancy Pelosi, the speaker of America's House of Representatives. General He also led the Western Theatre Command's ground forces in 2017 during one of a series of border clashes with India that have since escalated, making that a potential flashpoint as well.

Further appointments to the military commission reflect similar priorities, but one stands out: General Li Shangfu (yet another son of a revolutionary commander). He has an extensive background in aerospace technology. He worked for 31 years at China's main satellite-launch centre, including ten as its director, and succeeded General Zhang in leading the department responsible for military equipment.

The new military commission looks to many like a "Taiwan war council", says Joel Wuthnow, a PLA expert at America's National Defence University. "To me, it's just as interesting that you have two people who don't so much know operations but they know equipment inside and out. That's going to be a pretty big deal as they pivot towards self-sufficiency and as the US is tightening the screws on advanced tech going into China."

General Li's appointment also raises new complications for America. He is expected to become defence minister, handling military relations with other countries. China suspended high-level military talks with America after Ms Pelosi's visit to Taiwan. If the dialogue is to resume, they will now also have to find a way around the sanctions that America placed on General Li in 2018 for his involvement in buying Russian arms.

Mr Xi may hope that General Li's expertise will help in negotiating more purchases from Russia and in selling Chinese weapons to countries such as Pakistan. But the appointment also reinforces the signals from Mr Xi's other choices. In short, China is bracing for confrontation. ■

China's air force

Top guns for hire

Former military pilots from the West are being lured to China

IN APRIL A Chinese fighter jet crashed in a rural part of eastern China. The two pilots safely ejected and were quickly surrounded by locals, who recorded the encounter. "Who is that?" asked a villager, pointing to one of the pilots, a white man with red hair who spoke in English. "This is our instructor," said the other pilot in Chinese. "Don't take photos."

In recent weeks it has become clearer why foreign pilots might be found in a Chinese jet. On October 18th Britain's defence ministry announced that it was trying to stop China from luring ex-military pilots to train its air force. An official said that a private firm called the Test Flying Academy of South Africa (TFASA) had hired up to 30 former Royal Air Force pilots to work in China on salaries of around $270,000 a year.

China's efforts do not end there. Australia's shadow defence minister said at least two Australian fighter pilots had also been approached and had declined. New Zealand's defence ministry said four of its former personnel have been employed by TFASA. In France *Le Figaro* reported that "several" French pilots have been training China's air force. Then there is Daniel Duggan, an American ex-fighter pilot and owner of an aviation consultancy in China, who was recently arrested in Australia at the FBI's request. The charges against him are sealed.

I had a good teacher

A spokesman for TFASA insists that Western governments knew what their former employees were up to. Pilots consulted Britain's defence ministry about the work, he says. The academy, he claims, teaches only basic flight training, such as how to keep a plane level. "There's nothing that you couldn't get from a normal flight-school syllabus."

Western officials disagree. They acknowledge that their former pilots are not thought to have broken any laws. But they say that China's aim is to understand the tactics of the Western jets and helicopters it might one day face in, say, a war over Taiwan. They also argue that foreign expertise might help China's People's Liberation Army (PLA) close the gap with rivals, given its lack of combat experience over the past 40 years.

The sense of scandal around such training efforts is a reflection of how quickly the West's relationship with China has deteriorated. Until recently, formal military exchanges were common. PLA officers attended Britain's military academy, Sandhurst, and its staff colleges. (The PLA students were often assumed to be intelligence officers and kept away from anything sensitive.)

Britain was hardly alone. New Zealand's defence ministry signed an agreement to train the PLA as recently as 2019, says Anne-Marie Brady of the University of Canterbury. Australia hosted Chinese officers at its military institutions until a few years ago, recalls a former official. America invited the PLA to naval exercises off Hawaii in 2014 and 2016. The idea was that engagement between Chinese and Western officers would build trust and understanding. That, says Ms Brady, was "wishful thinking".

Corruption

Xi's forever war

Beijing

There are no signs that Xi Jinping will relax his struggle against graft

While he was holed up in caves in Yan'an in 1938, Mao Zedong gave a series of speeches that would form one of his best-known works. In "On Protracted War" he argued that China, which had been invaded by Japan, should not expect a quick victory. It had to dig in for a long struggle.

Xi Jinping, China's current ruler, is also fighting what he calls a "protracted war". But the enemy in this struggle is official corruption. During Mr Xi's first decade in power millions of cadres were investigated for graft, from low-ranking "flies" to high-ranking "tigers", as the Communist Party calls them (see chart 1).

As he begins his third five-year term as party chief, there are no signs that Mr Xi's anti-corruption campaign is letting up. Quite the opposite. A new generation of foot-soldiers is being trained on university campuses. In February the ministry of education added "discipline inspection and supervision"—that is, stopping corruption and other infractions—to its list of undergraduate majors.

Inner Mongolia University was the first in China to set up such a programme. In September a cohort of 45 students began studying for a degree in discipline inspection and supervision. They will learn about the law and regulations. Inspectors must know, for example, how many dishes public servants are allowed to order at a meal. Students will also read up on Marxism and learn what it means to be a loyal party member. Over a dozen other universities are planning similar programmes.

The idea is to set students up for careers in the party's anti-corruption ecosystem, atop of which sits the feared Central Commission for Discipline Inspection (CCDI). Inspectors are sent to party bodies and state-owned companies to investigate corruption and disloyalty, or to hold criticism sessions with the goal of making officials "red-faced and sweating", according to party regulations. When the disease of corruption has "reached the bone marrow", offenders are cast out of the party and handed over to the police.

In "Zero Tolerance", a documentary series released this year by state television, contrite high-ranking officials opened up about their former luxurious lifestyles. Investigators from the CCDI explained how they caught offenders. The party was once wary of airing its dirty laundry in this manner. In the decade before 2014, there was an unofficial ban on corruption-related television shows. Now the party seems to think that series such as "Zero Tolerance", along with new dramas about corruption investigations, will have a deterrent effect.

Mr Xi often refers to the "three nots" of corruption: officials should "not dare to be corrupt, not be able to be corrupt and not want to be corrupt". The CCDI describes its work as "forging souls". But there is a political element to the anti-graft campaign. In his first term Mr Xi used it to purge rivals, such as Bo Xilai (pictured). The CCDI enforces loyalty as well as clean governance. "This is one of the most important ways in which Xi has centralised power," says Yuhua Wang of Harvard University. "Every official understands that if they voice any opposition, they would face the risk of being punished in the name of corruption."

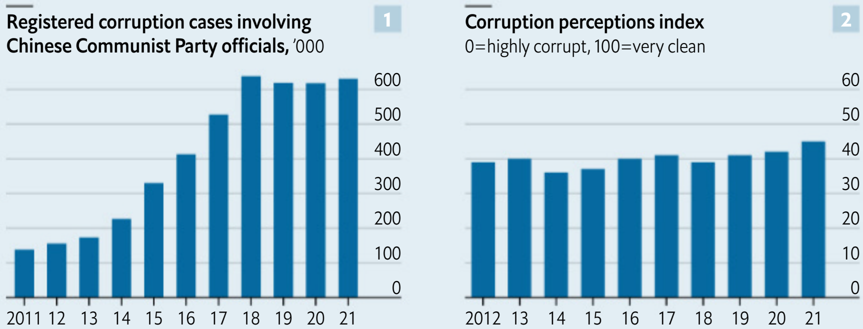
Nervous officials seem to be leading more decorous lives than in the past. The expensive watches they once sported are gone. High-end restaurants suffered after the party imposed strict limits on cadres' banquets. Last month an official in Inner Mongolia aroused public ire when she went on television wearing a fancy scarf and earrings. The local anti-corruption authorities are reportedly investigating her.

Surveys suggest that the Chinese public support Mr Xi's campaign. But China's scores on the corruption-perceptions index published by Transparency International, an anti-graft watchdog based in Berlin, have not improved much (see chart 2). The number of corruption cases involving officials has remained above 600,000 for four years running.

Mao's warning about a protracted war proved correct: it would be another seven years before the Japanese left China. Mr Xi's war has already lasted longer and "is likely to continue for as long as he is in power," says Christopher Carothers of the University of Pennsylvania. That could be a while. Studying for a degree in anti-corruption is a sensible career move. ■

Dirty looking

China



Sources: Central Commission for Discipline Inspection; People's Daily; Transparency International

Chaguan | The city that covid forgot

Chinese experiences of the zero-covid policy vary greatly. That helps Communist Party bosses

If China, in some parallel universe, allowed voting on its "zero-covid policy", the "change course" camp would be gaining ground. Battling new variants of covid-19 ahead of an expected winter surge in infections, officials have imposed partial lockdowns in cities from Xining in the west to Fuzhou in the south. Restaurants have closed, schools have gone online, access to food shops has been limited and millions of people have been plunged into some form of confinement, many for a second or third time.

"Closed-loop" policies that seal factory workers in production sites and fenced-in dormitories have come under public scrutiny, too. Videos on social media have shown workers climbing fences and fleeing on foot down busy roads to escape a virus outbreak at the world's largest iPhone factory, operated by Foxconn, a Taiwanese electronics giant, near the central city of Zhengzhou. Amid an outcry from Chinese netizens, Foxconn offered bonuses to workers who stay at their posts. Zhengzhou authorities declared the latest covid variants mild and not to be feared.

Alas, such assurances are at odds with a grim, wartime mood that grips other parts of China. Smartphone images have gone viral of white-overalled pandemic guards beating citizens who defy controls in order to buy food or medicine for their families. Guards have also prevented the gravely ill from reaching hospitals. A toddler died of carbon-monoxide poisoning in the north-western city of Lanzhou after being held up at quarantine checkpoints.

Censors have more luck smothering bad news from remote regions. Tibet's capital, Lhasa, has endured more than two and a half months under lockdown, triggering rare street protests. Xinjiang, a harshly policed north-western region, has been battling an outbreak since the summer, leaving residents hungry and desperate. With both regions in effect closed to outsiders and most travel out of Xinjiang banned since early October, their miseries are not widely known in China. That is certainly true among Chinese who trust news coverage by state television. In the past week the main evening TV news programme, *Xinwen Lianbo*, has shown viewers graphic images of death, speeding ambulances and patients in intensive care. Not one of those gloomy scenes came from China. They were from a bridge collapse in India, a Halloween stampede in South Korea and the covid pandemic in America: all part of tireless efforts to portray China as a haven of order in a frightening world. *Xinwen Lianbo* covers covid in China only tersely, with a simple graphic showing case numbers each night.

As more Chinese grow weary of the zero-covid policy and as the economy slows, some investors and other outsiders seem confident that China must soon join the rest of the world and prepare to live with the virus. Share prices of Chinese companies staged a multi-billion dollar rally on November 1st on the strength of an evidence-free rumour about a new pandemic-policy committee. Such wishful thinking puts too little weight on the disorder that would follow, were covid left to rip through an inadequately vaccinated country with no herd immunity and weak hospitals. It also exaggerates the importance, to party bosses, of urbanites grumbling on social media. Zero-covid is a numbers game. If all places were as unhappy as Zhengzhou, party chiefs would pay heed. But China has more than 100 cities with at least a million residents. At any given time, most are not under a harsh lockdown.

Seeking the clearest possible contrast with his home in covid-obsessed Beijing, Chaguan travelled 1,300km (800 miles) south to Jingdezhen. This sleepy city of 1.6m people in the forested hills of Jiangxi province may hold China's record for pandemic luck, finding no cases for the past 33 months. Jingdezhen is strict about testing new arrivals at its airport and railway station. But once a visitor is inside the city, the pandemic feels far away. Jaw agape, your columnist joined hundreds of maskless locals thronging People's Square on a weekend evening as they danced in formation, watched over scooter-riding children or twirled a dragon-headed streamer: scenes of freedom unimaginable elsewhere in China.

The good and bad of life in a backwater

Jingdezhen made ceramics for emperors. Now locals suggest they are protected from covid by being off the beaten track. The city draws few migrant workers. Residents see a trade-off in that isolation. Business is bad, says a woman selling porcelain at a street market: the pandemic keeps tourists from travelling. She has seen videos of America looking normal on social media, so knows that covid deaths have fallen there. But she does not question the government's policies. "We Chinese follow instructions from above," she says. "Whatever they ask of us is for our own good, no?"

For over a decade Jingdezhen's porcelain studios, low rents and rural charm have attracted young artists and those keen to "lie flat" and enjoy a quiet life. Some decline to take covid very seriously. The barista in a hipster café jokes, "Jingdezhen is so poor, even the virus can't be bothered to come here." Another café-owner, sporting a tweed jacket and indigo-dyed cravat, insists that Chinese in locked-down cities have enough to eat and drink, and may even enjoy a break at home. "What is there to feel sorry about?" he asks.

Not all are so glib. In a nearby studio, a young ceramicist who trained in Europe is "very sympathetic" to Chinese enduring lockdowns. He moved to Jingdezhen from Shanghai after that city's long quarantine this spring. Now he worries about smaller, little-known cities or regions with few young people. Their suffering goes unreported on social media. He suggests that many Chinese lead atomised lives: "A lot of things are unfathomable to them if they didn't happen to them personally."

Party bosses should be relieved to hear such fatalism. After all, they work hard to stop ordinary Chinese from knowing too much about conditions elsewhere in the country. The unhappy can vote with their feet, like those choosing to ride out the pandemic in tranquil Jingdezhen. No other plebiscite will be offered to them. ■

Campaigning

Following the money

DALLAS

How attempts by Google and Meta to be virtuous have contributed to record spending in America's midterms

In 1952 Dwight Eisenhower became the first politician to mount an advertising campaign on television. His opponent, Adlai Stevenson, was critical of the strategy. "The idea that you can merchandise candidates for high office like breakfast cereal", he complained, "is the ultimate indignity to the democratic process." In the end, it was Stevenson who suffered the indignity of losing to Eisenhower, twice. Today "merchandising candidates" is called campaigning and political advertising a massive business. This year will see record spending for a midterm election. AdImpact, a research firm, forecasts that $9.7bn will be spent, 144% more than in 2018.

Why the soaring spending? As Democrats and Republicans duke it out for control of Congress ahead of the election on November 8th, "every race is important, because it could be the tipping point of one party having control" in Washington, DC, says Erika Franklin Fowler, a professor and director of the Wesleyan Media Project, which tracks political advertising. Spending on Senate and House campaigns will be 136% and 60% higher, respectively, than in 2018, according to AdImpact's forecasts; spending on gubernatorial races will double. Political advertising will contribute around 4% to the revenues of American media companies this year, reckons GroupM, an advertising firm.

Four of the most expensive House primaries of all time have occurred this year. State candidates for secretary of state, a once-obscure office that helps oversee elections, are raising record sums. Since 2020 more states have offered early voting, and that increases the amount that candidates spend in order to reach voters.

Watching the flow of money reveals several things about how America is changing. One is where the battlegrounds are. Spending in Arizona, Georgia, Nevada and Pennsylvania, four tight races, will each exceed $200m this cycle; in 2018, only two states pushed past the $100m mark. For the first time in decades, Florida, the consummate swing state, is occupying a less prominent role, as Republican candidates enjoy sizeable leads and the number of registered Republican voters has been rising. "A lot of the media owners in Florida, which are used to seeing money come in by the bushels, have been shocked that more money isn't coming in," says Steve Passwaiter of Kantar, a research firm.

Much of this has to do with how uncompetitive the governor's race is. Whereas the past three in Florida were decided by about a percentage point or less, this time Ron DeSantis, the incumbent, is running far ahead of his Democratic rival, Charlie Crist, with polls showing Mr DeSantis leading by ten points. Mr DeSantis recently broke a fundraising record, attracting more than $180m through October 14th, more than any governor in history and six-and-a-half times that of Mr Crist. The race for the Senate, which pits the Cuban-American incumbent, Marco Rubio, against Val Demings, a former police chief in Orlando, is not proving to be as competitive as expected either, with Mr Rubio leading by seven points.

The second shift is the amount of money flooding across state lines from both small and large donors. More races have become nationalised, and that is changing how candidates advertise. In Pennsylvania, for example, 88% of advertising on Facebook by the Republican Senate candidate, Mehmet Oz, is targeted outside the state, with the intention of boosting donations. Software, such as ActBlue for Democrats and WinRed for Republicans, has made it easier for smaller donors to contribute. This year donors contributing $200 or less have given $1.1bn to candidates, about twice as much as in 2018.

Large donors have been piling in too, boosted by growing fortunes during the pandemic, as the stockmarket rose. Up to the end of July, billionaires contributed $675m ($360m to Republicans and $300m to Democrats), accounting for more than 10% of all federal political spending, according to analysis by USA Today. There is a "biggy" backing effect, with a billionaire's contributions prompting other mega-donors to pile in. For example, J.B. Pritzker, the incumbent Democratic governor in Illinois who is himself a billionaire, has self-financed his campaign with more than $132m, prompting mega-gifts to the Republicans running against him in what is likely to end up among the most expensive gubernatorial races ever.

Third, political advertising shows how Americans' media habits are evolving. Just as 2012 will be remembered as the "social media" election, because candidates used social networks to reach voters, 2022 will be remembered as the "streaming" election. About $1.4bn will be spent on political advertising on internet-connected TVs and streaming, ten times what was spent in 2018. Half of TV viewers now watch four or more services, and advertisers need to reach them wherever they are in the fractured marketplace, says Mike Schneider of Bully Pulpit Interactive, an agency.

Advertising this way has advantages. Connected TV and streaming allow for "micro-targeting" of viewers down to the household level, which is not possible through local broadcast television, where media markets are much larger. This is especially advantageous for candidates running for local office who do not want to do a large media buy and need to advertise to smaller and more precise audience, but it is also attractive to campaigns targeting users in greater detail than Facebook and YouTube now allow.

After it was revealed that Russians used Facebook to buy ads in roubles and stoke division ahead of the 2016 election, Meta (Facebook's parent company) and YouTube (owned by Google) have become more restrictive in what sort of targeting they allow political advertisers to do. For example, neither platform allows campaigns to target adverts based on the political affiliation of users or what political content they engage with. They also offer searchable ad "libraries" where people can see the adverts that the platforms have hosted. Other platforms, such as TikTok and Twitter, have decided that political advertising is not worth the potential reputational risk and do not accept it.

Ironically, Facebook's and YouTube's strictness has caused money to flow to platforms without strong safeguards. By restricting targeting, Facebook and YouTube have sparked "frustration" among advertisers, who are taking money away from them and putting them toward newer connected TV and streaming firms, says Grace Briscoe of Basis Technologies, a marketing firm. These newer players lack the same strict standards. According to a report by researchers at the Centre on Technology Policy at the University of North Carolina at Chapel Hill, around half of the 61 companies they surveyed lacked an explicit political ads policy, and only half of them barred misinformation.

After the midterms, people are sure to start asking how voters were reached differently this cycle, and whether newer advertising platforms are adequately transparent about who is seeing which adverts and how they are targeted. Money may follow eyeballs, as they say in advertising circles, but scrutiny does too. ■

Californian politics

The golden mean

LOS ANGELES

Is there room in the Republican Party for a pro-choice, anti-Trump candidate?

KEVIN BARROT left the Republican Party in 2010. The 32-year-old from Anaheim says he was disheartened by racist reactions to Barack Obama's presidency. As an Asian man, he wondered if his fellow Republicans felt the same animosity towards him. These days he considers himself an independent. "All Republicans are crazy now," he says quietly.

Mr Barrot recently joined a few dozen other voters in a backyard garden just south of Los Angeles to hear from Lanhee Chen, a Republican running to be California's next controller, or chief fiscal officer. Mr Chen is a moderate technocrat, a vanishing breed in Republican politics. The son of Taiwanese immigrants, he grew up in southern California, studied at Harvard, advised Mitt Romney during his 2012 presidential campaign, and taught at Stanford University. He supports a woman's right to an abortion, and recently revealed that he could not bring himself to vote for Donald Trump in 2016 or 2020.

Mr Chen's campaign slogan, "watchdog not lapdog", resonates with voters wondering how billions of dollars splashed out on homelessness and infrastructure are being spent. He laments the "policy sclerosis" he believes has gripped the state under Democratic control. Californians are intrigued. He was the top vote-getter in the nonpartisan primary in June. If Mr Chen is victorious on November 8th, he would be the first Republican to win state-wide office since 2006, and the first Republican controller since Ronald Reagan was governor.

But it is unclear whether Mr Chen's campaign is a relic of the Republican Party's past or a glimpse of its possible future. Many California Republicans once commonly held positions to the left of the national party. Democrats still laud Arnold Schwarzenegger for championing climate-change legislation when he was governor. Mike Madrid, a veteran Republican consultant, argues that the party began to move away from its big-tent coalition when it doubled down on courting white voters while the state became more diverse.

Most of the state party's official platform is national Republicanism distilled: marriage should be between a man and a woman, abortion is immoral and gun control is totalitarian. "California is a cultural vanguard of the country, for better or for worse," says Mr Madrid, suggesting that Republicans ignore Californian values at their peril. Democrats have controlled both chambers of the state legislature since 1997. Republicans hold just 11 of California's 53 congressional seats. Rick Caruso, a billionaire and long-time Republican, defected to the Democrats to bolster his chances of being elected mayor of Los Angeles.

Some soul searching is taking place in the party's top ranks. Jessica Millan Patterson, its chairwoman, bemoans the fact that her predecessors "neglected" black, Hispanic and Asian voters. She envisions a "comeback" focused on broadening her party's appeal. But as long as Mr Trump remains the party's standard-bearer, California's Republicans will find it hard to com- ▸▸

Mr Chen taking controller

pete. Some 47% of Californians are registered Democrats. But 67% of Californian voters think it would benefit the country to bring charges against the former president should prosecutors find enough evidence to do so. “He has contributed to an environment in California that makes Republican candidates and Republican ideas unattractive,” says Mr Chen. But were Mr Chen to win, that could cap a good night for California Republicans. Kevin McCarthy, a Bakersfield Republican, is the favourite to become the next Speaker of the House of Representatives should Nancy Pelosi, a San Francisco Democrat, lose her Speaker’s gavel—as looks likely.

Mr Chen says he feels at home in the Republican Party. But he chuckles when asked which of his fellow Republicans he admires. Eventually he names Mr Romney and Glenn Youngkin, the governor of Virginia. Controller is among the least partisan jobs in Californian politics. Still, a victory for Mr Chen may signal to voters like Mr Barrot, who got whiplash from the party’s hard-right turn, that the fever dream of big-tent Republicanism is not dead yet—at least in liberal California. ■

Affirmative action (1)

Off colour

WASHINGTON, DC

The Supreme Court seems ready to toss out affirmative action

“FIVE VOTES”, Justice William Brennan perennially told his law clerks, “can do anything around here.” When the Supreme Court first blessed limited racial preferences in university admissions in 1978, the margin was 5-4. In *Grutter v Bollinger,* decided in 2003, the same count upheld the University of Michigan law school’s admissions policy seeking a “critical mass” of under-represented minority applicants. In 2016, another one-vote margin salvaged affirmative action in *Fisher v University of Texas*.

Six years later, with six conservatives on the court, the balance has shifted. All are sceptical of, if not openly hostile to, using racial criteria. In nearly five hours of oral argument on October 31st, challenges to admissions policies at Harvard University and the University of North Carolina (UNC) found a receptive audience. The dissenters in 2016—Justices Samuel Alito and Clarence Thomas, along with the chief, John Roberts—seem to have Donald Trump’s three appointees on board to overturn 44 years of precedent. When decisions arrive, probably in the spring, public and private universities alike may no longer be permitted to give preferential treatment to students from certain under-represented groups. Without that licence, both sets of universities say, their pursuit of racial diversity would falter.

Take that, Clarence Thomas

The heart of affirmative action came under attack with Justice Thomas’s first question for UNC’s lawyer, Ryan Park. “I’ve heard the word ‘diversity’ quite a few times,” he told Mr Park, “and I don’t have a clue what it means. It seems to mean everything for everyone.” Justice Thomas pooh-poohed the purported benefits of diversity at several points in the hearings. He told Mr Park that parents don’t send children to college “to have fun or feel good” but to “learn physics or chemistry”. Justice Thomas admitted to David Hinojosa, the lawyer representing a group of UNC students, that he might be “tone deaf” about college life today.

But it was the universities’ admissions procedures—not the goal of diversity itself—that became the prime target for the other five conservatives. *Grutter* allowed universities to turn to race as an explicit admissions factor only if “race-neutral” means of enhancing diversity—those that do not classify students by race—came up short. Cameron Norris, a lawyer for Students for Fair Admissions (SFFA, the plaintiff behind both cases), noted that Harvard only seriously considered such alternatives in 2017, three years after SFFA sued the school. He said Harvard could achieve nearly as diverse a student body—and become “far less white, wealthy and privileged”—if it eliminated preferences for the children of alumni or big donors.

Seth Waxman, Harvard’s lawyer, contested this conclusion, arguing that the university could not reach its diversity goals without expressly taking account of students’ race as one factor in the admissions calculus. Harvard “need not blind itself to race” under the law, he said, and needs to keep its eye on applicants’ identities to provide “benefits to the nation”—including enhanced critical thinking, more innovative businesses and a more cohesive military. Mr Waxman parried charges that Harvard discriminates against Asian-American applicants by pointing to the trial court’s conclusion—with testimony from 30 witnesses and “detailed expert analysis”—that no such bias haunts Harvard’s system.

Elizabeth Prelogar, President Joe Biden’s solicitor general, emphasised the value of affirmative action to the military. “Our armed forces know from hard experience that when we do not have a diverse officer corps that is broadly reflective of a diverse fighting force, our strength and cohesion and military readiness suffer,” she said. Ms Prelogar faced a question from Justice Alito about the government’s shift in position, as Donald Trump’s Department of Justice had opposed Harvard’s policy. But her bracing presentation led Chief Justice Roberts to muse that the court might consider carving America’s service academies—including West Point and the Naval Academy—out of a ruling barring affirmative action. Justice Kagan piggybacked on this. If there is a “very convincing case on behalf of the military”, she said, might there be a case to be made for similar claims for “medical facilities”, “businesses” or other institutions that are “critical to the well-being of this country”?

Chief Justice Roberts asked Patrick Strawbridge, another lawyer for SFFA, whether he was opposed to race-neutral alternatives for reaching demographic goals. Mr Strawbridge replied that measures to expand diversity could be illicit, too, if they were motivated only by race. But he suggested that programmes like the University of Texas’s Top Ten Percent plan (which offers admission to the top decile of every high school in the state) could be kosher if they can be justified by appeals to “socioeconomic” or “geographic”, rather than racial, diversity.

Conservative lawyers and justices alike distinguished between flat-footed and more nuanced considerations of race. Using a racial check-box as a factor may be highly suspicious, but admissions officers could legitimately consider how students present their racial struggles—or other experiences—in an essay. Mr Waxman found this wanting: race should (potentially) matter for all candidates, not only for those applicants whose racial identity is of “such compelling importance that they write about it”. In another exchange, Justice Kavanaugh asked Mr Norris if preferences for descendants of slaves may be used. No, he said, as such considerations are “still problematic under this court’s precedents”.

Two hours into the marathon hearings, Justice Kagan asked Ms Prelogar whether a

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Petra Goude
Global Practice Leader, Core Enterprise and zCloud
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"committed originalist" like most members of the conservative majority would find the 14th Amendment's equal-protection clause to bar race-consciousness. There is "nothing in history" to support a principle of race-blindness in the amendments passed in the wake of the Civil War, she said. They were specifically designed "to bring African-American citizens to a point of equality in our society". Justice Ketanji Brown Jackson built on this. Isn't clear historical evidence necessary, she said, before overruling a long-standing precedent? She also wondered why it would be acceptable to give a boost to a fifth-generation North Carolinian who is a descendant of slave owners but not to a fifth-generation North Carolinian whose ancestors were enslaved. ■

Affirmative action (2)

Holistic cow

WASHINGTON, DC

The children of alumni and athletes benefit from affirmative action too

In a typical year Harvard, a $53bn endowment with a university attached, receives nearly four times as many candidates with perfect grade-point averages as it has places available. It distinguishes between these well-qualified candidates using four criteria: academic achievement, extra-curricular activities, personal qualities and athletic abilities. Admissions officers also need to keep that endowment growing, which means admitting the children of alumni and of big donors. And they strive to create a racially diverse class. The process is opaque but goes by a soothing name: holistic admissions.

Students for Fair Admissions (SFFA), a non-profit organisation, which is a plaintiff in both of the affirmative action cases before the Supreme Court, argues that 51% of Harvard's class should be Asian-American if academics alone (test scores and grades) were the sole consideration. Harvard's first-year students for 2021-22 were 53% white and 24% Asian, an increase from previous years but a far cry from 51%. The organisation alleges that Harvard and the University of North Carolina (UNC) are discriminating against Asian-Americans.

The court has in the past ruled that race could be considered among other admissions criteria, on the grounds that everyone on campus benefits from a diverse student body. This is what Harvard and UNC say they are doing without discriminating against Asian-Americans, an argument supported by an analysis commissioned by Harvard and written by David Card, a Nobel prize-winning economist.

In addition to considering an applicant's facility with a lacrosse stick or *épée*, under holistic admissions universities may take into account what kind of high school a student has come from, looking at factors such as the number of advanced courses offered, average SAT scores, class size and crime levels in the surrounding neighbourhood. Whether the prospective student has ties to the college can matter, too. It helps if a family member has attended the college, is employed there or has donated money to it. Many colleges also consider a student's ability to pay the fees.

Lots of universities have concerns beyond recruiting the best and brightest. Most, with the exception of the richest institutions, need to worry about financial solvency. This requires generous donors and a certain number of students paying full tuition. "Until someone drops another $2bn in our endowment, we will continue to be need-sensitive," says Joanne Berger-Sweeney, president of Trinity College, a selective liberal-arts college in Connecticut.

Race may therefore not be the only factor working against Asian-Americans. Legacy students (those with a family member who attended the college) are three to five times more likely to be admitted to highly selective colleges, according to a Harvard study of 30 institutions. A primary legacy—having a parent who attended the institution as an undergraduate—boosts the chances of admission up to 15 times.

Harvard reported that 16% of its class that will graduate in 2025 has at least one parent who attended Harvard. This tends to benefit white students: 19% of white, 15% of Asian, 9% of Hispanic and 6% of black students were legacies. Peter Arcidiacono, an economist at Duke University and expert witness for SFFA, found that when legacy preferences are removed, the number of white admissions falls by about 4%, while the number of black, Hispanic and Asian ones increases by 4-5%.

Other non-academic factors also come into play. Athletes are four times more likely than non-athletes to be admitted to elite private institutions. In Mr Arcidiacono's study of Harvard, removing athletic preferences decreased white admissions by 6% and increased the number of Hispanic and Asian students by 7-9%. Children of faculty and staff are also given special consideration. Mr Arcidiacono found that over 43% of white students at Harvard were athletes, legacies, children of faculty or staff, or were the subject of special interest by deans and directors, compared with less than 16% among black, Hispanic and Asian students. Nearly 75% of these white students would have been rejected if they had been treated as white students without status. That's hardly a meritocracy. But, hey, it's holistic. ■

Referendums

Obamacare's slow victory

PIERRE

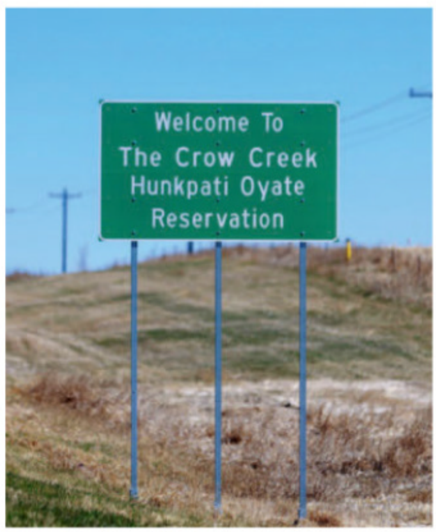
South Dakota may become the latest conservative state to expand Medicaid

After returning home to the prairie from serving overseas in the Marines, Peter Lengkeek began suffering from PTSD. Struggling to cope he became addicted to alcohol, meth and sex. The Indian Health Service (IHS), unable to offer him proper medical care, ushered him to a hospital off the reservation. Since his job provided no insurance and he was ineligible for Medicaid he was soon saddled with $40,000 in medical bills and a terrible credit history.

Today Mr Lengkeek is the chairman of the Hunkpati tribe on Crow Creek reservation, 160 miles west of Sioux Falls, South Dakota. Life expectancy for a man on this reservation is just 45 years, nearly 30 years below the national average. The county has both the lowest median household income and the highest suicide rate in the country. Addiction, diabetes and heart disease are rampant. Covid-19 killed one in every six tribe members.

Over a decade ago the Affordable Care Act aimed to help those like Mr Lengkeek caught in the "coverage gap", who found themselves unqualified for Medicare or Medicaid but unable to afford private insurance. The federal government vowed to pay at least 90% of the costs of expanding Medicaid, a health-care programme for the poor. But when the Supreme Court gave individual states the right to refuse the scheme many did. Republicans feared federal intervention and bemoaned big welfare spending.

For years the national party was relent-



Your stay will be 30 years short

less in its efforts to "repeal and replace" Obamacare. But when Barack Obama left office Medicaid expansion gradually became popular with voters. In six states—most recently Missouri and Oklahoma—citizens voted to expand it when their legislatures would not. As of early 2022 as many as 21m Americans had gained coverage thanks to Medicaid expansion. South Dakota, a beacon of conservatism governed by Trump devotee Kristi Noem, is one of just a dozen states still holding out.

That could change when South Dakotans cast their votes on a referendum on the issue next week. More than 40,000 South Dakotans would qualify. The state's big hospitals and the farmers' union both support the change. They reckon that more federal dollars would prop up struggling rural clinics and allow the IHS, which is underfunded, to offer better preventive care. Extending Medicaid would help farmers and ranchers, who pay pricey premiums because of the risky nature of their work, see doctors when crops are thin or diesel is expensive. "Jesus would be doing this," reckons Lynn Marie Welbig, a nun from Dell Rapids.

What polling there is suggests that voters support adding Medicaid expansion to the state's constitution. A fierce campaign has made that more likely, but so has the opposition's lacklustre efforts. Rather than fighting the initiative head-on they campaigned to make the ballot measure itself tougher to pass. The disheartened opponents of Medicaid expansion have raised about $4,000. The proponents have raked in over $4m.

Just two other states—Florida and Wyoming—could still expand Medicaid by direct vote, though not this year. The other holdout states do not allow citizens to propose ballot measures. But amid a pandemic that highlighted the costs of underlying maladies, President Joe Biden's administration tempted holdout states with even sweeter federal matching rates. Some Republicans have since had a change of heart. After years of resistance North Carolina lawmakers nearly expanded Medicaid this past spring. A Republican political operative in Georgia suggested that Brian Kemp, the governor, "steal the issue" from Democrats by expanding Medicaid. Alabama's former governor, who refused to expand Medicaid while in office, is nudging his successor to do so.

Back in South Dakota Mr Lengkeek is furiously trying to get members of his tribe registered to vote before the midterm elections on November 8th. That is unusual. Having been disappointed by the federal government's empty promises in the past, the Hunkpati tribe usually stays far from politics. "This time is different," the former Marine asserts. "Expanding Medicaid would give life to my people." ■

Midterm maths

Bang average

WASHINGTON, DC

How our poll-of-polls is dealing with a slew of Republican-aligned surveys

MIDTERM MATHS

For the past two months, Midterm maths has been battling bias in polls. More often we have looked at potential errors that, like in 2016 and 2020, would push surveys to overestimate support for Democrats. That is the misfire most observers are worried about. After all, little would change in the Senate if the party won 52 seats, up from the 50 they hold today. But if the Democrats win only 47 or 48, the federal government would look very different.

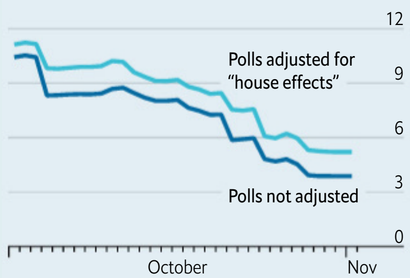
Yet what if polls are underestimating support for the Democrats? Many surveys published in the closing weeks of this midterm campaign have come from firms that are either explicitly affiliated with Republican clients or simply publish numbers that are favourable to the party—what pollsters call a "house effect". According to our poll-of-polls in New Hampshire's senate race, for example, all seven polls released since October 1st were conducted by firms that we think are publishing numbers that are overly favourable to Republicans.

Like a fine craft beer, the secret to a good poll-of-polls is in how the ingredients are blended together. (A mash that is too cold will be dry; too hot, and it will taste too much of bread.) The model that generates our polls-of-polls makes three adjustments for the predicted bias of a polling firm. The first is based on a pollster's historical record. We compare each firm's accuracy to that of pollsters who released surveys in the same or similar races. If a firm is more favourable to either Democrats or Republicans in one year, they tend to overestimate support for the same party in the next election cycle too.

Tight and tighter

United States, average Democratic margin in New Hampshire Senate race polls, 2022

Percentage points



Source: *The Economist*

By this measure, five of the seven pollsters who have surveyed New Hampshire's senate race since October 1st have overestimated support for Republicans in the past. One example is Emerson College, a prominent firm that releases surveys of races all around the country. In elections from 2000 through 2020, our model finds Emerson College's polls overestimated support for Republican candidates for office by 1 percentage point compared to the average of pollsters that surveyed the same race. So we moved their polls this year one point toward the Democrats.

The second adjustment takes into account whether a poll has been conducted for or was released by a partisan group or candidate. We use a statistical model to compare the historical bias of non-partisan polls with those associated with Democratic or Republican clients, after controlling for the firm-level biases we calculated in the first step. A poll conducted for a partisan candidate or organisation overestimates the corresponding party's vote margin by about 6.6 points. If we input into our poll-of-polls a partisan Republican poll showing a Democrat down 7 points, in other words, the algorithm adjusts the survey to see a tied race.

Finally, our model assesses whether a pollster has released polls that are still biased after controlling for the above sources of error—our so-called "house effect" adjustment. All these adjustments, particularly the last one, make a significant difference to the results of our model. In New Hampshire, for instance, our estimate of the Democrats' margin in the polls today is 3.1 points if we don't account for a firm's house effect or whether a poll is explicitly partisan. When we do, their expected margin rises to 4.3 points.

In other words we spend a lot of time removing empirical bias from polls of firms that lean systematically toward one party. But accounting for past bias can only get us so far. That's because while being smarter about the polls can help you on the margins, if all the polls are off there is nothing forecasters can do about it.

After all this calculating, our best estimate is that Republicans will win the House comfortably. The Senate is too close to call, though Republicans appear to have an edge there too. Candidate quality (or lack of it) does not seem to be hurting Donald Trump's party much. ■

See our interactive forecast

To explore all the findings of our election model, go to **economist.com/midterms**

Lexington | Crime and punishment

Democrats have once again proved insensitive to voters' fears

If the Democratic Party could muster the discipline, it would compel prospective candidates to watch a mock presidential debate held by "Saturday Night Live", a comedy sketch show, 34 years ago. During the skit vice-president George H.W. Bush, played by Dana Carvey, stammers through an incoherent answer to a question about his homeless policy, insisting he does not have enough time to explain as, in obvious panic, he tries to run out the clock.

At long last the moderator releases him and turns for a rebuttal to the supremely rational Democratic governor of Massachusetts, Michael Dukakis, played by Jon Lovitz. Mr Lovitz shakes his head, raises both hands palms up in a gesture of helplessness, looks into the camera and says, "I can't believe I'm losing to this guy."

The Democrats are having another of their I-can't-believe-I'm-losing-to-this-guy moments. In danger of losing not only their majority in the House but also their one-seat edge in the Senate, they are baffled at how Republican candidates with meagre credentials, extreme positions and fealty to Donald Trump could possibly be popular—and not just in benighted red flyover states but in groovy blue playgrounds like New York and Oregon. Mr Lovitz's plangent notes echoed down through the years when Nancy Pelosi, the speaker of the House, recently told the *New York Times*, "I cannot believe anybody would vote for these people."

Yet under almost any circumstances it would be astonishing if the Democrats held onto their flimsy majorities (and they still have a good shot at doing so in the Senate). The party of the serving president has lost seats in 36 of the 39 midterm elections since the Civil War. The most recent exception was the midterm election following the 9/11 attacks. For that reason, this is shaping up as a fairly typical midterm cycle.

That reality has been obscured for months by another midterm dynamic that is almost as predictable: the party in power tends to talk itself into believing this time things will be different. The Democrats saw two factors disrupting the pattern this year. The Supreme Court struck down a federally protected right to abortion, and Donald Trump hit the campaign trail, reminding most Americans how much they disliked him just as the January 6th committee and a Justice Department investigation into possibly purloined classified documents gave them more reasons to do so.

These developments do matter. Usually in midterms, partisans of the president are apathetic, and many do not turn up to vote, as during the "blue wave" midterm of 2018. This year a large Democratic turnout may limit the party's losses. But the court's decision and Mr Trump's antics, so shocking to Democrats, do not seem to be enough to make Democratic candidates acceptable to most independent voters, let alone many Republicans.

So Democrats have reason to wonder what they are doing wrong. Former President Barack Obama says Democrats can be a "buzzkill", annoying people with outrage at minor mistakes. Senator Bernie Sanders says Democrats must sharply contrast their economic plan with Republicans'. What is also clear is that Democrats need, once again, to learn from the travails of Mr Dukakis.

Mr Bush's campaign tied Mr Dukakis to Willie Horton, a convicted murderer who raped a woman and stabbed her boyfriend while on furlough from a Massachusetts prison. Democrats accused Mr Bush of stoking racism, because Mr Horton was black and his victims white; Mr Dukakis noted he inherited the furlough program from a Republican. They were right, but they failed to address fears of crime or persuade voters that a "Massachusetts liberal", as Mr Bush branded him, shared their sense of urgency.

Across the country this fall, Republicans threw Democrats on defence with an advertising blitz focused on crime. They spent $64.5m on such ads in the first three weeks of October alone, one-quarter their total spent on ads in that period, according to CNN. With some types of crime on the rise after Democrats flirted with radical-chic ideas such as defunding the police, it was a predictable attack. But many Democrats were caught flat-footed.

In New York the Republican running for governor, Congressman Lee Zeldin, opposes abortion rights and refused to certify Donald Trump lost in 2020. Yet he closed to within single digits of Kathy Hochul, the Democratic governor, with slashing attacks over crime. In a recent debate, he sounded like a hysterical caller to 911 as he described "people who are afraid of being pushed in front of oncoming subway cars, they're being stabbed, beaten to death on the street with hammers." When Ms Hochul responded that "data is still being collected" and "sound policy" beats "sound bites," she was taking a page from the Dukakis playbook.

Paging Snake Plissken

In a state where registered Democrats outnumber Republicans more than 2 to 1, Ms Hochul has a margin for error. But the party's failure to inoculate itself on crime has made the climb steeper for Democrats who have run excellent campaigns in red or purple states, like Tim Ryan, who is running for Senate in Ohio.

Yes, Republicans are being demagogues. Asked on Fox News about the attack on Ms Pelosi's husband, Paul, Ronna McDaniel, the party chair, turned her answer into an assault on Democratic laxity. "If this weren't Paul Pelosi," she said, "this criminal would probably be out on the street tomorrow." But Democrats, smart and righteous as they imagine themselves, should not condescend by being astonished that voters could fall for the other guy. Before 2024, they need instead to learn to hold two jostling ideas in their minds at once. They need to recognise that just as Americans would be more open to citizenship for immigrants who entered illegally if the border were secure, they would be more supportive of police reform if they felt the streets were safe.

In fairness to the real Mr Dukakis, a good man, he did not blame voters for choosing the other guy. "I lost because I ran a lousy campaign," he said. ■

Brazil

Hallelula

SÃO PAULO

Luiz Inácio Lula da Silva will oversee a more divided Brazil

In his victory speech on October 30th, after a white-knuckle election, Brazil's president-elect, Luiz Inácio Lula da Silva, confessed that he was "half happy and half worried". Avenida Paulista, a buzzy street dominated in recent years by rallies in favour of Jair Bolsonaro, the far-right populist president, was awash in the red of the Workers' Party, founded by Lula (as he is known). But the result was the narrowest since Brazil's return to democracy in the 1980s: 50.9% to 49.1%, or just 2.1m votes.

As Lula spoke, *bolsonarista* lorry drivers had already begun blocking roads throughout the country, burning tyres and calling for military intervention to prevent him from taking office. By the end of October 31st there were more than 300 roadblocks, across most of the 26 states and the federal district of Brasília. The highway police delayed obeying court orders to break them up, but eventually started doing so.

Some protesters dispersed after Mr Bolsonaro, who did not speak publicly for 45 hours after the result was announced, eventually broke his silence on November 1st. In a two-minute speech, he thanked the 58m Brazilians who voted for him. He said that the roadblocks reflected "a sense of injustice about how the electoral process was carried out", but asked his followers to refrain from "restricting free movement". Although he did not explicitly concede defeat, he said he would comply with the constitution. This, along with a video published a day later asking his fans to stop blocking roads, assuaged fears that he would copy his idol Donald Trump by claiming to be a victim of fraud and inciting an insurrection. Many of his allies had quickly recognised Lula's victory, including Arthur Lira, the head of the lower house of Congress, and Tarcísio de Freitas, the governor-elect of São Paulo.

But even if Mr Bolsonaro lets a peaceful transition take place, Lula will struggle to govern a country that is deeply divided. The slim margin of 1.8 percentage points reflects the fact that both candidates had high rejection rates, says Antonio Lavareda of Ipespe, a polling firm. Mr Bolsonaro's approval ratings dropped after mismanaging the pandemic. Lula's legacy was tainted in the eyes of many by a corruption scandal known as Lava Jato (Car Wash), which came to light in 2014. He spent 19 months in prison; his convictions were annulled by the Supreme Court in 2021. Some voters were also put off by the economic mismanagement of Dilma Rousseff, Lula's handpicked successor, which led to a deep recession between 2014 and 2016.

In the south-east, Brazil's most populous region, Lula benefited in the run-off after prominent centrist politicians pledged to support him. But he won largely due to votes from poor people concentrated in the north-east (see map on next page). Many have fond memories of social programmes introduced by his government between 2003 and 2010. In the month before the run-off, Mr Bolsonaro ramped up spending on such voters, launching a new credit line and expanding a cash-transfer programme that pays 600 reais ($113) a month to 21m poor families. These schemes may have been undermined by news that Paulo Guedes, the economy minister, was working on a plan to "de-index" the minimum wage from inflation.

Policy proposals took a backseat during the campaign in favour of mudslinging on ▸▸

both sides. Lula's priority is to boost spending to alleviate poverty, which will require tricky economic reforms. His first task is to pick an economy minister who can drum up support in Congress and the markets. Lula will also need to devise a plan to jump-start growth. It is likely to include a big public-private infrastructure programme and tax reform, which will be tough to get through Congress. Lula has also promised that he will curb deforestation in the Amazon rainforest, which soared under Mr Bolsonaro. To do so, he could well turn to allies abroad for help.

Lula will re-establish friendly relations with countries such as France and the United States (see Bello). And he will have a far less turbulent relationship with institutions at home, such as the media and the Supreme Court, than Mr Bolsonaro did. But governing will be much harder than it was when he took office in 2003 amid a commodity boom. Brazil's fiscal situation is difficult and a large number of pro-Bolsonaro politicians were elected to Congress on October 2nd. Mr Bolsonaro's Liberal Party is the biggest in both chambers.

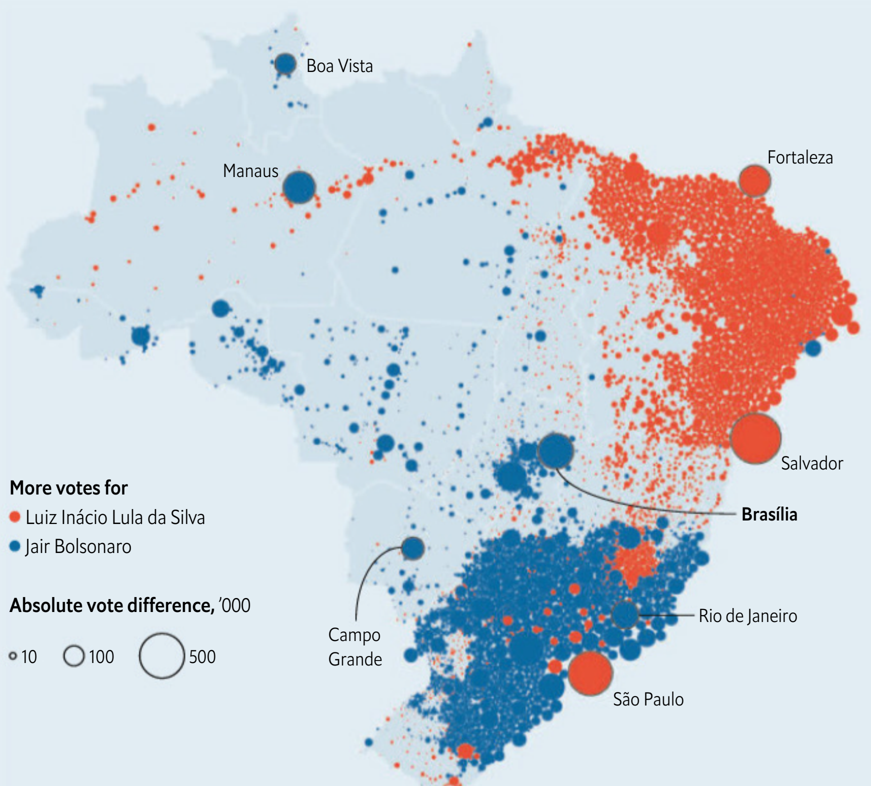
In order to get laws passed, Lula will have to build alliances with centrist parties, such as the Brazilian Democratic Movement and the Social Democratic Party, whose leader, Gilberto Kassab, is a skilled political chameleon. Mr Kassab backed Mr Freitas, the *bolsonarista* governor-elect of São Paulo, but said in an interview with *The Economist* that the party is likely to build an alliance with Lula. These negotiations will go hand in hand with Lula's cabinet picks. Marcos Nobre of the Brazilian Centre for Analysis and Planning, a think-tank, reckons Lula will have better luck building a small majority coalition (55-60% of seats) with parties who support his policies rather than aiming to replicate the "super-majority" (65-75%) coalitions he enjoyed when he was last president.

Mr Bolsonaro may have decided against alleging fraud, as he has been threatening to do for months, because he is in a strong position to lead a powerful opposition. If he avoids criminal investigations—for his handling of covid-19, for example—he could make a comeback in 2026. On November 1st Ciro Nogueira, Mr Bolsonaro's chief of staff, gave the go-ahead for the transition of power. But some *bolsonarista* bureaucrats may "throw oil on the track", Mr Nobre says, by committing petty acts such as breaking computers. Even without Mr Bolsonaro in power, *bolsonarismo* will remain a force in Brazil's politics for years to come. Lula is right to worry. ■

A divided country

Brazil, absolute vote difference between candidates in second round of presidential election, 2022

By municipality*



*Location approximated to avoid overlapping circles

Sources: Superior Electoral Court; Arthur Welle

Argentina

Slum dunk

BUENOS AIRES

Slum integration is a bright spot in the country's fractured politics

A VISITOR STROLLING down Arroyo, a street in Retiro, one of the poshest neighbourhoods in Buenos Aires, can buy a bag of coffee beans for $22 and order a kale pesto salad at a hip restaurant. But a few streets away is the city's oldest slum, known as Villa 31, which sprawls across 72 hectares (178 acres) and is home to over 40,000 people. A three-bedroom flat on Arroyo will rent for around $3,000 a month; a family in Villa 31 might pay $150-250 for their lodging. Rather than fancy coffee, street vendors there hawk used trainers and bags of cereal.

Yet though it may not be as glamorous, Villa 31 is catching up. Since 2016 the city government, with funds from the World Bank and the Inter-American Development Bank (IDB), has spent more than $300m on paving roads, titling land and laying sewage pipes and electricity cables. The slum used to have only one asphalt road. Today, all streets are paved. In 2016 no public school existed. Now the neighbourhood boasts three. Since 2019 buses go to Villa 31 and a bank has opened there.

Slum integration is a rare point of consistency in Argentina's fractured politics. In 2009 a law promoted by Mauricio Macri, then a liberal mayor of Buenos Aires, sought to improve Villa 31's infrastructure. Progress was halting until 2016, when Horacio Rodríguez Larreta, also a liberal, succeeded him as mayor. In 2017, when Mr Macri was president, a national registry was created to identify slums and upgrading shantytowns became a national priority. This has continued under a government led by the Peronists, a leftist populist movement. On October 27th the Senate approved a law that bans slum evictions for a decade and adds another 1,100 settlements to the registry, taking it to 5,600.

Four-fifths of Latin Americans live in cities. But almost every big city is encircled by slums, which house 120m people, or 20% of the region's population. They go by different names: *villa* (short for *villa miseria*, or miserable village) in Argentina, *favela* in Brazil and *barrio bajo* in Mexico. Governments have long tried to improve them. Chile pioneered a market-oriented approach in the 1970s, in which tax breaks were given to construction companies that built social housing. Between 1980 and 2000 about 2m new homes were built for the poor, representing 43% of the total housing stock. Though the effort was con-

sidered successful, some families had shoddy houses in areas far from their jobs.

One of the biggest projects took place in Rio de Janeiro between 1995 and 2008 at a cost of $600m. This sought to integrate 158 *favelas*, home to 250,000 people. But a follow-up report by the IDB suggests that neighbourhoods that took part in the project ended up having worse rubbish collection and sewers. Local gangs often sought to reassert control by destroying the new street lights and road surfaces. Lack of access to steeper, hillier areas meant that much of the new infrastructure could not be maintained. And the project could not keep up with population growth. Between 2000 and 2010 Rio's population grew by 3.4%, but by almost 30% in the *favelas*.

Villa 31 could avoid these problems. Its central location helps. And Buenos Aires has few gangs. Since 2016 an increased police presence in the *villa* has reduced crime further. Omar, a 26-year-old Senegalese street vendor, moved there in April. "Five years ago I would never have come here. There were no police, the roads were made of mud, it was all dark," he says.

The biggest change has come for the 1,200 families that once lived under a highway. The city government has built blocks of flats to house them. But in two recent surveys of the new apartments a majority of residents complained of leaks and poor insulation. Higher rents are a sore point.

Mr Larreta is hoping the publicity from Villa 31 can help him win the presidency next year. Adverts across Buenos Aires push his slogan: "The transformation doesn't stop." Mr Larreta, a Harvard-trained technocrat, may lack the pizzazz of his populist counterparts. But Argentina needs competence over charisma. ■

Bello Lula's new world

His foreign-policy ambitions will be tempered by circumstances

"BRAZIL IS BACK," declared Luiz Inácio Lula da Silva on the evening of October 30th. "Brazil is too great to be relegated to the status of a pariah in the world." With that, the once and future president conjured up the activist global diplomacy he practised in office between 2003 and 2010. Many outsiders now expect a repeat performance. But since Lula left office the world has changed. Brazil has changed, too.

Under Jair Bolsonaro, Brazil retreated into its shell. His foreign friendships were limited to Donald Trump, Israel and the national-populist regimes in Hungary and Poland, though he also visited Vladimir Putin just before Russia's invasion of Ukraine. He sent senior diplomats to stamp passports as consuls or to secondary posts. His first foreign minister, Ernesto Araújo, an amateurish ideologue, echoed Mr Trump in bad-mouthing China, Brazil's top trade partner. That prompted the Senate to force his removal. Mr Bolsonaro's enthusiastic assault on the Amazon rainforest in the name of development and sovereignty tarnished Brazil's reputation as a responsible global citizen.

Lula's foreign policy was very different. Its cornerstone was the search for a "multipolar" world at a time when the United States was hegemonic. Its main instruments were the BRICS group (in which Brazil joined Russia, India, China and South Africa) and initiatives in Latin America and Africa, including the Mercosur trade block with Argentina, Paraguay and Uruguay. "Back then multipolarity seemed reasonably easy to achieve in a quite benign way," Celso Amorim, who was foreign minister and is now Lula's chief foreign-policy adviser, told Bello. "Now things are much fuzzier."

In a world of geopolitical confrontation and war in Europe, Brazil's traditional balancing act between west and east, south and north, has become harder. The BRICS remain important in economic terms, says Mr Amorim. He would like Argentina to join, to balance Russia and China. Russia is one of the few issues on which Lula and Mr Bolsonaro agree. Brazil condemns the invasion but, like many developing countries, will not cut ties. Though Lula will be friendly to China, his team worry that the two countries' trade has undermined Brazilian industry.

Another shift is that climate change is now a big global issue. That plays to one of Lula's strengths. His pledge to crack down on deforestation will be welcomed by both Joe Biden's administration in the United States and by the European Union. The new government may try to reactivate the Amazon Pact, a treaty of 1978 which links Brazil and seven other countries that share the rainforest. Deforestation was a pretext for the EU's refusal to ratify a trade agreement with Mercosur concluded in 2019 after 20 years of talks. Lula may press ahead, but he wants tweaks, and that will be unwelcome in Brussels. And Mercosur itself is weaker than it used to be. Uruguay's centre-right government is increasingly going its own way on trade.

Lula's victory means that left-wing governments are in charge in all of Latin America's bigger countries. There are many differences among them. But there is also a sense of solidarity. All look to Lula as their elder statesman, to revive moribund regional talking-shops and to try to broker an agreement between Venezuela's government and its opposition ahead of a presidential election due in 2024. What Nicolás Maduro, Venezuela's autocrat, wants is relief from American sanctions. So Brazil would have to work closely with Mr Biden's people.

On this, as with climate action, there is scope for co-operation between Brazil and the United States. But there will also be friction. Lula's Brazil does not divide the world—or Latin America—between democracies and dictatorships. And the two are rivals in the Americas. "Brazil is sufficiently big to say we have to be independent, not part of a backyard," as Mr Amorim puts it.

Brazil was able to play an important international role during Lula's previous governments partly because it enjoyed internal stability, notes Oliver Stuenkel of Fundação Getulio Vargas, a university. It also had money: Lula's Latin American policy was underwritten by cheap credit from the national development bank, much of it tied to corrupt construction contracts. All this has disappeared in the past decade. Lula will head a weaker government facing fiscal constraints in a deeply divided country. And that is likely to limit how much energy and political capital he can devote to foreign policy. Brazil will indeed be back, but possibly in a minor key.

The Economist

SPECIAL REPORT:

Climate adaptation

→ November 5th 2022

The challenge of the age

WhaleFin Club: Taking HNWIs to the next level of crypto investing

Amber Group is setting its sights on working with high-net-worth individuals more closely. Managing partner Annabelle Huang explains how the company is helping them better capture and tailor market opportunities with an exclusive members-only club.

Amber Group started out with a clear vision: democratising access to crypto assets. That approach has clearly struck a chord, taking the company from start-up to triple unicorn in five years, with a highlight being the launch of its flagship digital asset platform WhaleFin in 2020.

Since then, Amber Group has witnessed a rise of high-net-worth customers, who bring with them unique needs and new demands in the services that they need. Sustainability, for example, is increasingly a key area of focus for these high-net-worth clients.

TAILORED OFFERINGS

That's where WhaleFin Club comes in. After members meet a certain threshold, they get to benefit from exclusive features, customised products and tailored assistance via the mobile app or web-based portal, as well as dedicated relationship managers and access to the trading desks. "And I think they benefit from WhaleFin Club, not just in terms of the products that are available to them, but actually, in a lot of ways, it is having access to us directly," Annabelle Huang, the group's managing partner, explains. "And we'll be able to help them with extensive educational materials and white-glove services that you normally can't get elsewhere."

This bespoke assistance also benefits WhaleFin Club members who may have questions about the safety of crypto, which may be a new type of asset to many. "We understand exactly what they need before we dive into a specific investment or product that works for them," says Ms Huang.

WhaleFin Club is also able to capture some of the opportunities within the venture space in this industry that are generally not available to just standard users while building a strong relationship with their clients. "It's very similar to maybe the private banking or investment banking type services in traditional finance, where there's a dedicated relationship manager, with 24/7 availability, and access to more in-depth market research and insights to really build a relationship as opposed to offering standardised products to our overall user base," Ms Huang adds.

The commitment to exclusivity doesn't end with its financial offerings. Amber Group recently held an event at a private box at Chelsea Football Club – it is an official partner of both Chelsea FC and Atlético de Madrid – for its members to get to know each other while watching a home game.

THE PURSUIT FOR SUSTAINABILITY

Sharing the green concerns that their high-net-worth clients have, Amber Group strives to provide a platform through which they can make sustainable choices.

One way this is realised is via the products it offers, to do good while you earn, Ms Huang summarises. They also make it as straightforward as possible. "Within digital assets, there's a lot more that we can play with, for example, access to carbon credits in tokenised fashion, as opposed to trading it on some esoteric exchanges or OTC if you can even find them."

Amber Group is also focused on the protection of the ocean's health: partnering with the Whale and Dolphin Conservatory, a leading non-profit organisation, the company adopted Salt, a 46-year-old humpback whale, earlier this year. And Amber is extending these kinds of opportunities to its members too, with the plan to auction off naming rights for adopted whales.

"There's a growing awareness within this group towards sustainability," Ms Huang says. "And oftentimes they want to be associated or investing in platforms that also care a lot about that. So whether it's climate change, the environment or any other ESG-related topics, this is very top of mind."

LOOKING AHEAD

This is an exciting time for the industry. Amber Group is looking towards its future, and how it can evolve along with it – while maintaining its customer-centric ethos. It's hard to predict where the industry will be in ten years' time, Ms. Huang comments, but "as these clients grow, then I think a lot of new demands or new needs will evolve. We'll continue to innovate to cater to that and be at the forefront of the industry itself."

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AMBER

The challenge of the age

Adapting to climate change is urgent, feasible and woefully underfunded, argues Edward McBride

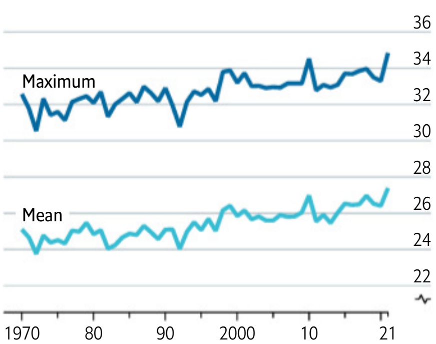
"BARREN" DOES not begin to describe Abu Ayman's small patch of land in southern Iraq. The sun pounds down, sometimes pushing the temperature above 50°C (122°F). Dry earth and withered weeds crackle underfoot. It used to be a palm plantation, but no trees remain—just rows of untopped trunks. Of uneven height and listing at odd angles, they look like ruined columns from some grand old temple, razed by long-forgotten calamity.

Except that the calamity is still unfolding, and Abu Ayman has certainly not forgotten. Twenty years ago, he says, the canopy of palm fronds above was so thick that no direct sunlight reached the baking soil on which he is standing. Farming dates and other fruit earned him a good living, he adds as he snaps a salt-bleached twig off a desiccated shrub. Water from a canal fed by the Shatt al-Arab waterway, which glistens in the glare just a kilometre away, was adequate for his needs.

But the world was warming. The mean temperature in Basra, the nearest city to Abu Ayman's farm, is more than 2.5°C (4.5°F) higher than it was in the 1980s (see chart). In July a new record high was reached, of 53.9°C. High temperatures made the palms more thirsty. But over the same period people living upstream used more of the water that flows into the Shatt al-Arab. And the rains in Anatolia that are the waters' ultimate source weakened. The long spells of low flow allowed salt water to seep up the river from the Persian Gulf, about 40km to the south. The more Abu Ayman irrigated, the more salt accumulated on his plot, killing off the palms and leaving the land covered by a saline shroud. His livelihood destroyed, Abu Ayman now works as a night watchman at a nearby government office.

Slow, steady

Basra, Iraq, average annual temperatures, °C



Source: World Bank Climate Change Knowledge Portal

Muhammad Obaid, a relative of Abu Ayman's, lost his palms in just the same way. But his land, right on the bank of the Shatt al-Arab, sits in the welcome shade of their replacements. The crowns of the young palms, still close to the ground, are interspersed with the odd fig or apple tree. The temperature in the shade is a good 10°C cooler than on Abu Ayman's low and level sands. Birds twitter in the greenery. Having painstakingly pollinated the palm flowers by hand Mr Obaid is expecting a bumper crop of dates this year.

Mr Obaid has survived as a farmer where Abu Ayman did not for two simple reasons. First, his farm is on the river, which meant he could draw water at times of high flow, when the salt is at bay, rather than making do with what the feuding clerics and militiamen who dominate local politics provide via irrigation canals. After losing his trees to salt he was able to flush the land with river water using just a small diesel pump.

He also has access to another key input: money. When the Shatt al-Arab is too salty he hires a truck to deliver fresh irrigation water. He and his brothers own a small grocery store, and so are able to invest the profits from that business into their farm. That is how they could afford the $150 a sapling needed to revive the plantation and the $35 per tanker of water. Without that money, his land would be as barren as Abu Ayman's.

The cousins are a living parable for what policy wonks call adaptation, by which they mean coping with the adverse effects of climate change. How well people cope when weather patterns change depends on the details of their situation—both in terms of geography and politics—and their access to resources. Mr Obaid was close enough to water that he did not need to rely on anything but his pump, his family's modest means and some changes to how he farms. Abu Ayman had to abandon his land and switch careers. He became poorer, the economy shrank and the burden on the Iraqi state increased.

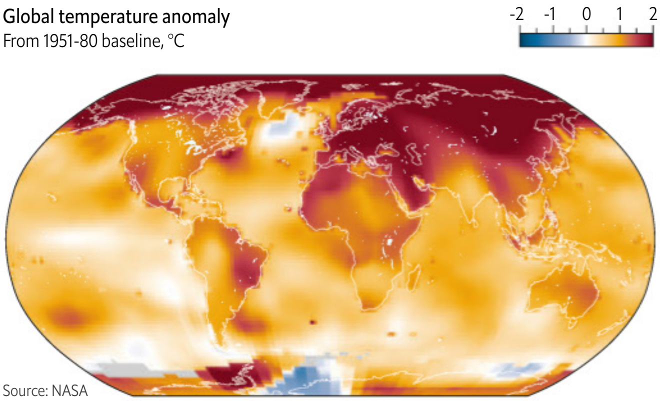
In absolute terms, the resources which would have been necessary to set Abu Ayman on the same path as Mr Obaid would have been small beer. Given a minimal degree of sound government he would have needed just a small loan. But he wanted for both. And so do billions of others. Small amounts of planning and cash could ward off many of the worst effects climate change will have on those people. But in most cases no such help is coming.

The fact that he has access to resources does not make Mr Obaid's future as a farmer secure. As the heat intensifies, and the river's flow dwindles, the periods when the water is too salty to use will grow ever longer. The expense of preserving the trees will increase accordingly. It may eventually stop making financial sense to keep going. Mr Obaid's capacity to adapt, as climate types would put it, is limited—by which they mean that his coping mechanisms are no substitute for fixing the climate. But the decades-long business of stabilising the climate is also no substitute for his coping mechanisms. He cannot wait 50 years to water his trees. And for now, at least, he is much better off than Abu Ayman. ■

The future is now

Global temperature anomaly

From 1951-80 baseline, °C



Source: NASA

An uneven playing field

To those who have...

Well run countries have big advantages when it comes to adaptation. Most of the world lags behind

FARMERS ARE not the only people who need to adapt to the changing climate of southern Iraq. The summer temperatures make air conditioning ever more vital, but it is neither universally affordable nor reliable. War, corruption and mismanagement have left Iraq's grid unable to keep up with summer demand; during the prolonged spells of extreme heat this summer, Basra suffered frequent power outages. Some Basrawis were able to keep the A/C running with diesel generators; others drove around in their cars simply for the sake of the air conditioning. The rest, including those who had no A/C in the first place, just had to put up with the heat. It will undoubtedly have killed some older and frailer residents, but the city does not compile records of such things.

Then there are the sandstorms. These have been getting more frequent and intense, thanks in large part to the drying up of marshlands to the north of Basra where the Tigris and Euphrates merge. No fewer than eight storms struck the city between mid-April and mid-May, causing or aggravating all manner of respiratory problems. Basrawis have been adapting to such weather by going to the hospital more often: officials say 1,100 sought treatment during one of the recent storms. Locals suspect that the number was probably much bigger.

Mahmoud, a lung specialist in a local hospital who does not wish to be further identified, says the numbers of patients admitted with both temporary and lasting respiratory problems is growing each year, along with the number of sandstorms. Whereas he would normally see 25 patients a day, during sandstorms he can see 200 in a couple of hours. If the number of storms continues to grow, he expects the hospital will soon be overwhelmed.

Iraq has the wherewithal to adapt to much of what climate change is throwing at it. It produces over 4m barrels of oil a day, much of it from wells near Abu Ayman's ravaged farm. But its former dictatorship, its invasion and the sectarian conflict and corruption that followed have incapacitated the state: a new wing of Mahmoud's hospital, begun in 2010, stands in uncompleted and derelict testimony to the level of dysfunction. This breakdown hobbles co-ordinated responses to climate change, leaving people to cope on their own or to suffer because they are not able to.

To its credit, the government is developing a "National Adaptation Plan" (NAP), an undertaking which is part of the UN's Cancun Adaptation Framework, agreed in 2010. These plans aim to identify which people, infrastructure and industries are most vulnerable and work out ways for governments and foreign donors to help them. Over four-fifths of developing countries have begun work on such a plan. But only a third or so have completed one. Most of them, including Iraq, have not yet finished working out what to do, let alone put the resultant plan into action.

It is on the basis of this NAP process, among other sources of data, that the UN Environmental Programme (UNEP) has estimated that the level of adaptation spending needed in developing countries will be $140bn-300bn a year by 2030, with half of that spent on just two areas: agriculture and infrastructure.

Doing what comes automatically

Those sums uncomfortably outstrip the spending taking place. The Climate Policy Initiative, an NGO, reckons that in 2019 and 2020 roughly $46bn a year was invested in adaptation globally. Take away that spent in developed countries and UNEP puts investment in developing ones as a fifth to a tenth of what is needed. What is more, its estimate of the need is increasing; as more NAPS are completed previously underappreciated requirements are being identified.

Kuwait, the city-state that is the closest settlement to Basra of comparable size, completed its NAP in 2019. The document lays out a series of steps to be taken in the short, medium and long term; assigns responsibility for these tasks to specific government agencies; and provides a budget for the initial work. $7.8m is allocated to improve understanding of and plan defences against sea-level rise and coastal erosion, for instance, with responsibility shared among the Environmental Protection Agency, the Ministry of Municipal Affairs, several academic institutes and a planning body. There are similarly detailed plans for fisheries, water and health.

> **Sweden has an unrealistically sanguine view of what it needs to do to cope with climate change.**

This is undoubtedly a help. But the bulk of the emirate's planning and spending on climate change predates its NAP. It took place in the course of the sort of routine administrative work that a better-run and better-off country takes in its stride—even if, like Kuwait, that country is a paragon neither of bureaucratic efficiency nor of environmental stewardship.

Kuwait has eight desalination plants, for instance; climate change was factored into their planning just as demography and economic growth were. Demand for power, too, is tied to climate, both because of the country's enthusiasm for air conditioning and because desalination itself consumes a lot of power. The Ministry of Electricity and Water is planning several combined desalination and power plants to cater to future needs. By the same token, the state-funded health service has expanded rapidly in recent years. A big new hospital opened in August which will treat respiratory ailments linked to sandstorms as well as more universal scourges such as heart disease. There is a government push to propagate mangroves along stretches of the coast to protect against storm surges and flooding.

Kuwaiti academics and bureaucrats study the effects of climate change in elaborate detail. Some staff at the Kuwait Institute of Scientific Research are examining the relationship between the intensifying heat and mortality from various diseases. Others are looking at infrastructure. The institute's Ali al-Dousari monitors the costs of removing sand that builds up on roads and at oil facilities and military bases. He has also conducted field trials to find out which native plants make the best windbreaks and air filters. His data on clearing costs and planting benefits informs decisions about greenbelt planting schemes. The Kuwaiti authorities have drafted in other experts to help them design new suburbs to minimise the flow of sand through the air. Public-health campaigns instruct people on how to reduce their exposure to the sorts of tiny particles that can cause breathing problems.

Mr al-Dousari has also established that much of the increase in sand and dust falling on Kuwait derives from the same area of dried-out marshland in Iraq that is causing problems in Basra. With the help of the Kuwaiti government's agency for international aid, he is trying to orchestrate a planting scheme in the region in question to reduce soil erosion. A country's adaptation needs will not all stop at its borders. The physical mechanisms of the climate and the economic relationships that rest on it both connect places far from one another, sometimes in unexpected ways. A recent report from the Stockholm Environment Institute argues that Sweden is neglecting vulnerabilities at the far end of its supply chains, and at choke points along them, fostering an unrealistically sanguine view of what it needs to do to cope with climate change.

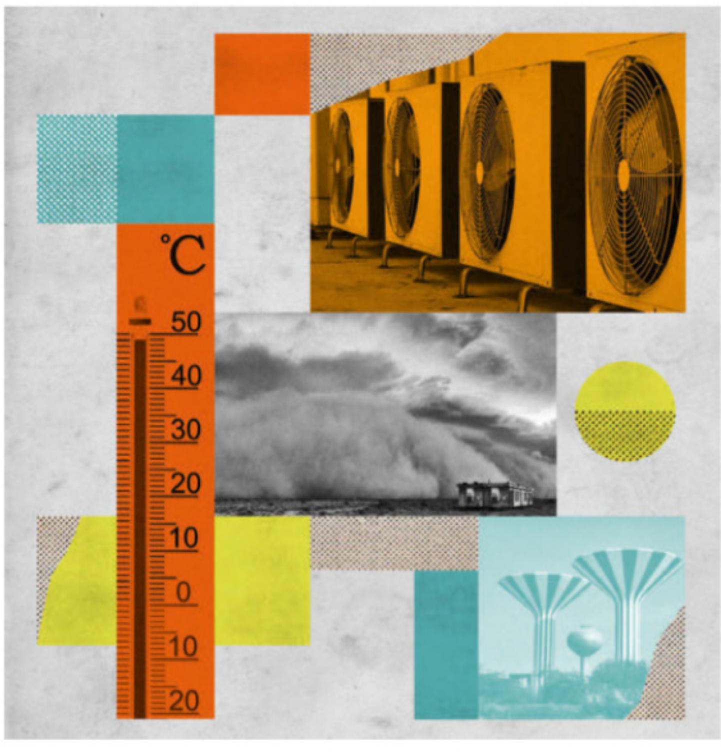
The same may well hold for Kuwait. It does not need to worry too much about its own agriculture, because it barely has any, but that hardly guarantees food security. And despite its capabilities it is not on top of everything. Barrak Alahmad of Harvard University argues that the authorities have not fully digested the tendency of extreme heat to exacerbate chronic illnesses. The current ban on outdoor work between 11am and 4pm in the hottest months is not nearly adequate, he says; Kuwait needs to base such rules on a much more sophisticated index that takes into account forecasts of temperature, humidity, wind speed and so on. But he does not think the Kuwaiti government is incapable of devising such a system. Quite the reverse: he is campaigning for it to do so.

In rich countries, much adaptation occurs almost invisibly, as a matter of course, without necessarily being labelled as such. If the weather gets hotter, people turn up the air conditioning and water their gardens more. If that pushes up demand for power or water, utilities build more power stations and treatment plants. If things go badly wrong—a fire or a flood, say—there is often insurance to foot the bill.

Such calamities also prompt wealthy governments to plan more carefully for natural disasters, reducing the damage the next time around. Big businesses, meanwhile, are used to dealing with uncertainty: potential changes in the climate are simply another variable for which they must plan. This does not mean planned adaptation in the rich world is unnecessary, or that it is a matter of course, or that it can cope with everything a changed climate throws at it. It does mean that it is a lot easier.

Trees are not enough

Start off at a disadvantage, though, and planned adaptation becomes more of a priority—you cannot expect substantial parts of it to get done in the normal course of things—and harder to organise. That does not mean that governments, businesses or people do not respond to climate change. It means they are less able to do so well, or efficiently. People who lose their income and become dependent on handouts stretch the capacity of governments already under strain. They may lose their homes, and migrate to slums in cities ill-equipped to receive them, as is happening in Basra , as former farmers like Abu Ayman move to the city. A similar influx was seen in Syrian cities before the civil war. Or they may embark on a longer journey, to a country they hope can provide greater economic and physical security—enduring peril along the way and causing consternation on arrival. ▸▸



Look, again, at Iraq. Serious engagement with climate change is almost completely absent. Abdulkarim al-Romi, who works for Basra's provincial government, cannot come up with any more resolute response than a vague plan to plant trees. Perhaps every university student should be obliged to plant one before they can graduate, he muses.

For the moment, however, Iraq's university students are adapting not by gardening, but by emigrating. In a survey conducted in 2020, 64% of Basrawis said young people did not have a good future in their country. This year another poll found that 37% of Iraqis aged 18-24 were actively trying to emigrate or considering it.

Climate change is not the only or even the main reason that so many Iraqis want to leave home: 40 years of strife, misery and decay play a much bigger part. But climate change is exacerbating economic problems, further diminishing the quality of life across swathes of the country and reinforcing the belief among many Iraqis that their political leaders are simply not up to the task of governing. The worse things get, presumably, the more people will decide to try their luck elsewhere. ■

Protecting property

Big things and little ones

Sometimes mountains can be moved. But when it is not possible, or desirable, there are alternatives

Canute, legend has it, ordered the rising tide to turn back. The tide did not comply. Some say the king—who ruled large parts of England, Denmark and Norway in the 11th century—overestimated his power, others that he was deliberately demonstrating its limits to obsequious courtiers. Either way, all agree that the tide was not to be turned on the say-so of secular authority.

An alternative reading is that Canute was undercapitalised. This is the interpretation written in earth, concrete and steel at the mouth of the River Maas in the Netherlands. The Maas, as the Rhine's main outlet into the North Sea, provides shipping with access to Rotterdam, far and away Europe's busiest port. Unfortunately it provides access for storm surges, too, and much of Rotterdam and the surrounding country are below sea level. Seas are rising; the extremes of rainfall in northern Europe are getting worse. So is the risk that a storm-swollen tide might surge up an overflowing Maas, overwhelm lesser dykes and swamp the city.

The most spectacular part of the Netherlands' response is the Maeslantkering—two vast but hollow metal barriers, mounted on even bigger steel arms, which can be swung together to seal off the river from the North Sea when the water is dangerously high. Those gates, built in the 1990s, were designed to cope with anything up to a 1-in-10,000-year extreme event. The circumstances that would merit their closure were expected on average just once every ten years. Twenty-five years on they have yet to be seen even once. But they are coming, and more frequently than the designers thought. With 35cm (14 inches) of sea-level rise—which is in the likely range for 2050—the average time between closures is expected to halve. In a world which sees 85cm of rise—in the likely range for 2100—they could become annual events.

The Maeslantkering cost €450m ($490m in the 1990s, which is $920m in today's money). But that was hardly a crippling expense for a government whose annual tax take at the time was €136bn. Flood-defence levies charged to residents and businesses comprise roughly 2% of the overall tax burden, or less than 1% of GDP. Whereas the cost of the government's plans to curb greenhouse-gas emissions causes widespread grumbling, there is almost no carping about the money spent on adaptation. Indeed, it is a matter about which most citizens feel some pride.

The foresight involved was, as is often the case, a function of past trauma. In 1953 a storm surge killed almost 2,000 in the country and flooded 9% of its land; the Maeslantkering was the culmination of decades of engineering aimed at preventing a recurrence. In a similar way, if not as effectively, America began paying more attention to its flood defences after a similar number died in New Orleans at the time of Hurricane Katrina. It took 15,000 deaths in the ferocious heatwave of 2003 for France to set up a network of air-conditioned civic centres where people could shelter rather than stifle. In 2011 a torrential cloudburst in Copenhagen caused almost $1bn in damage in a couple of hours; only then did the Danish authorities rethink how the city's drains should work.

To be able to respond to big risks with big engineering is one of the benefits of affluence. But it is not always an optimal response, and it can be a damaging one. Sea defences are a case in point. They can be vital; but they are freighted with risks of what experts call "maladaptation"—responses to climate change which simply redistribute, or sometimes increase, the risks which it poses. One problem is a false sense of security. Sea and flood defences which are good enough for the next ten years but not the next 50 encourage people to stay, and invest, in areas that are still at long-term risk. Then there is partiality. Protection that helps one part of a city at the expense of another may lead to the rich getting the lion's share of the benefits and the poor being forced into the riskiest areas. And there are the risks of not thinking in a joined up manner—concentrating on a particular aspect of the problem at hand in a way that ignores, or even exacerbates, others.

A good rule of thumb is that projects touted as solutions in and of themselves are peculiarly prone to such problems. Take Jakarta, the capital of Indonesia. Its 11m people live on a coastal plain crisscrossed by rivers and canals which is sinking because of the amount of water being removed from the ground below it. Some 40% is already below sea level.

How to stop a city sinking

The previous city government had planned to reduce the growing flood risk with a series of artificial islands off the coast in the shape of a garuda, a mythical bird that is Indonesia's national symbol. It was to have been at the same time a protection against storm surges and a catalyst for development. Its total cost, estimated at $40bn, was to be borne mostly by private developers.

Anies Baswedan, Jakarta's governor from 2017 to this October, had two misgivings. The project would cause the city's sewage, most of which is not treated, to collect in the shallow water behind the barrier—an ecological disaster. And a vast seaside development of "Dubai-style, pricey mansions", in the words of an adviser, Tom Lembong, would only heighten the already yawning gulf between rich and poor in the city.

The impediment to reducing fire damage is not a lack of funds, but the diffusion of responsibility

So Mr Anies cancelled the scheme and focused on much cheaper measures instead. First, he took advantage of a gradual expansion of the city's water mains which had been under way since long before he became governor to levy swingeing fees to those who pumped water up from below for their own use. To sort out some of the distributional problem which followed he started sending trucks full of water to poor neighbourhoods that are not served by the municipal pipes.

Mr Anies also ordered the drilling of

29,000 "vertical drains" through which rainy-season floodwater could recharge the aquifer. Sluices in more elevated parts of the city are now temporarily closed to help keep water away from low-lying areas during storms, providing a few hours' water storage. And developers have been kept away from the city's last few low-lying green spaces, so that they can continue to act as sponges. The only big, conventional engineering project Mr Anies has retained is a modest dyke which is expected to cost about $6m.

Subsidence has slowed sharply in most of the city and stopped in some of it. Does that make Jakarta sea-level-rise ready? No. But it is better off than it was. And it has demonstrated the most promising way of thinking about adaptation: as something that builds on and is built into other forms of development, which can benefit from private investment, such as in water mains, and which involves lots of small things as well as a few big ones.

Sous les pavés, l'adaptation

Vidhisha Samarasekara of the International Water Management Institute says that the best way to protect people from flooding is typically routine maintenance and planning coupled with detailed mapping which locates the most flood-prone spots. The Dutch would probably agree; their capacity for very large projects does not lead them to discount the power of micro ones. Rotterdam is keen on "green roofs" from which water drains more slowly than from tile and tin and *tegelwippen*—the prising up of paving stones in order to expose, and garden, absorbent soil beneath. It takes pride in the fact that last year it prised up 47,942 paving stones to Amsterdam's 46,484.

One of the reasons that adaptation needs to be piecemeal, even when well planned, is that climate risks and impacts are not something that can be set aside from the rest of life. A wide range of factors will determine who is at risk of what; climate change will rarely be completely dominant.

Take fires in the west of the United States. Even adjusting for inflation, eight of the ten most expensive fires, in terms of insured property destroyed, have occurred since 2017, according to the Insurance Information Institute, an industry body. This is in part because of hot summers during an unprecedented megadrought. But there are lots of other factors, such as where people choose to live, how they get insured, and what has been done previously to keep the risks low. Stopping all small fires so that the fuel available for big ones builds up is a textbook piece of maladaptation.

The most obvious way to deal with big fires is to put more effort into fighting them. In 2021 the federal government spent $4.4bn putting out wildfires, largely through the Forest Service, double what it spent in 2020. State and local governments are also boosting spending. Growing effort and investment is being put into prevention, too. California's annual budget for that is more than $1.5bn. The governor has proposed boosting it further.

According to Michelle Medley-Daniel of the Fire Adapted Communities Learning Network, the main impediment to reducing the damage from wildfires is not a lack of funds, but the diffusion of responsibility and know-how among many different groups, from the federal government to Native American tribes. Her network is trying to remedy that by disseminating information about how settlements can best protect themselves.

The forms of prevention being adopted vary from place to place, notes Ms Medley-Daniel, depending on the size and preferences of the local community and the ecology of the surrounding countryside. But it tends to be a mixture of emergency planning, to make sure not just humans but also livestock, say, escape fires; efforts to impede future conflagrations, by creating firebreaks, perhaps, or clearing or burning undergrowth that can act as tinder; and measures to help buildings resist the flames, by preventing sparks from getting into heating vents, for instance.

Alarmed property owners, insurers, different levels of government and all manner of NGOs are getting involved. The Fire Adapted Communities Learning Network helps promote prescribed burning, in which neighbours band together to set and control fires to burn off undergrowth. The state of California, for its part, is constantly revising and tightening its building codes, which have special requirements for fire-prone areas. It has also just promulgated regulations that will oblige insurers to reduce premiums for homeowners and businesses that take steps to fireproof their property. The state government did so in part because insurers have been charging higher premiums in fire-prone spots—itself an adaptation-promoting signal to property-owners.

It is all a bit of a hodgepodge, and will doubtless take some time to take effect. But those most at risk of fire now have a variety of incentives and means to adapt. There will still be big, destructive, costly fires in future, but the damage will be much less than it otherwise might have been. In other words, fires will remain a risk of living in California, rather than a bar to it.

At the moment, the same is true for floods in Bangladesh. Even were there the means, there is no way of protecting its vast coastal plains and islands with hard defences. But as Kristalina Georgieva, head of the IMF, points out, each district has at least one flood- and cyclone-proof building in which residents and their livestock can shelter during storms. And there is a well developed warning system that tells people when to use them.

As a result the terrible impact of Bhola, a cyclone which drowned 300,000 people in 1970, is all but unthinkable today. The persistent policy push which has seen these redoubts made universal not only saves lives by the tens of thousands, but hugely diminishes the economic damage of similar storms. Since the buildings are typically used for something else during clement weather (as schools, say), the only additional cost to the government has been that of ensuring they are robust enough.

More recently, a government make-work scheme for poor households has been paying workers to raise homes onto small earth mounds or concrete slabs above the flood line, with similar benefits. None of this means that Bangladesh can face the rising seas with equanimity. But it might have given Canute's fawning courtiers an idea of what prudent government looks like. ■

Agriculture

Room at the bottom

Farmers have stayed ahead of climate change so far; with help they may continue to

The 1992 Earth Summit in Rio de Janeiro, at which the UN Framework Convention on Climate Change (UNFCCC) was signed, marks the point at which the world started to pay attention to climate change. One of the reasons it did so was fear about the future of agriculture. Farming and its products are crucial to all economies, and frequently big export earners; it is of particular importance to the livelihoods of large parts of the population of developing countries; and it is as exposed as any human activity can be to changes in the weather. The only industry the UNFCCC singled out as needing help in adaptation was agriculture.

That same year, according to the World Bank, the planet produced 1.95bn tonnes of wheat, rice, corn (maize) and other cereals. That harvest provided half of the world's dietary calories.

By 2020 annual emissions due to fossil fuels were over 50% higher than they had been in 1992. Indeed, half of all the emissions since the industrial revolution took place over those 28 years, in large part as a result of the unexpected speed of China's growth.

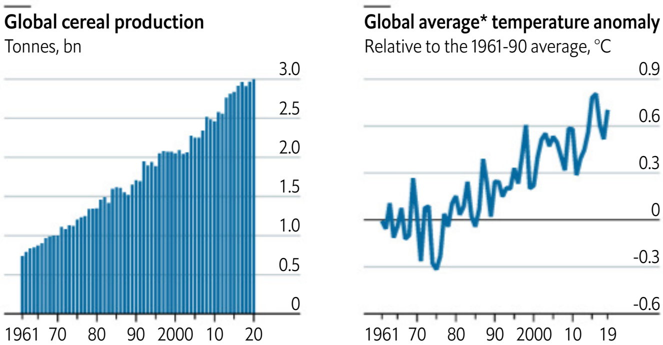
But the world's cereal production had grown even more, reaching an unprecedented 3bn tonnes (see chart). Ever more plentiful harvests did not just outstrip emissions growth; they outstripped population growth as well. There were more cereal calories per person in 2020 than in 1992. And this abundance was brought about without massive increases in the area being farmed. While industrial emissions rocketed, emissions due to land-use change fell by a quarter. In short, in the years since the world really began worrying about climate change, agriculture has boomed.

That is not because climate change has turned out, *pace* Rio, to be good for farmers. It is true that, other things being equal, plants grow better in air richer in carbon dioxide, and that helps. What is more, some temperate latitudes, where yields are often high anyway, now enjoy longer growing seasons. But by far the greatest part of the gains was down to people getting better at farming, just as they did throughout the 20th century. Improved methods, better inputs. better access to inputs and new strains all continued to deliver improvements. Total-factor productivity (TFP) in agriculture—that is, productivity calculated in a way which includes all the costs of labour, land and inputs—has more than doubled worldwide since the beginning of the 1960s.

In the rich world agribusinesses have developed hardier, higher-yielding strains of many crops. Clever gadgets are also used to boost yields. Sensors that monitor water and nutrients in the soil tell farmers when and how much to water and fertilise their crops. Satellite navigation systems steer farm vehicles around fields, making sure that every inch is sown, treated and harvested. The data from all these devices is also reaped and analysed to help refine farmers' understanding of optimal varieties, growing conditions and techniques.

Devising new additives, widgets and methods to help farmers is so widespread that it has become an industry in itself, with its own jaunty name: agtech. There are products that can help plants of all types survive with less water. Others offer substances that stimulate plants to fertilise themselves, by harnessing the nitrogen-fixing properties of certain bacteria. Another common idea is to manipulate plants' biochemical messengers to induce them to grow faster or produce more seeds or fruit.

How harvests held up



Sources: Food and Agriculture Organisation, World Bank; Met Office Hadley Centre *Median

But if this is all encouraging, it hardly means that there is not a problem. The fact that agricultural productivity has increased does not mean that climate change has done no harm—just that the harm was not large enough to change the shape of the curve. An econometric study by scientists at Stanford and elsewhere published last year argued that the gains in agricultural total-factor productivity seen between 1961 and 2019 were between 10% and 40% smaller than they would have been over the same period in the absence of climate change. The effect grew as climate change became more pronounced and the opportunity cost in terms of lost productivity growth was considerably larger in countries where productivity had started out quite low, which is to say in poor countries. Their figures suggest that in the Sahel region of Africa, for example, climate change ate up almost half of the improvements that the region would otherwise have seen.

With losses due to climate change likely to rise, the population still increasing (though at a lower rate) and the food that the population wants changing in its nature (the previously poor often have a yen for meat they could not afford before) agricultural adaptation has a great deal more work to do in the decades to come.

High-yield investments

Most agtech, and indeed much of the other equipment that developed world farmers rely on, is far beyond the reach of poor farmers in the developing world. Many of them have no savings to carry them through bad harvests, much less to invest in their farms. Almost 94% of farmland in Africa has no irrigation; it is watered by rain or not watered at all. The livelihood of hundreds of millions of African farmers therefore depends on whether the rain arrives at the right time in the right quantities.

But the fact that so many farmers in the developing world have so little also means that it takes relatively little to make a huge difference in their lives. Ville Skinnari, Finland's Minister for Trade and Development, points out that many governments do not have the equipment or expertise to work out when a dangerous storm is coming, say, or how promising conditions look for the coming growing season. A third of the world's inhabitants, and fully 60% of Africans, do not receive proper warnings of impending natural disasters, let alone easily understood routine weather forecasts. Nor do they have reliable information about the changes expected due to climate change in the years ahead.

Research conducted on behalf of the World Bank a decade ago concluded that the benefits of upgrading the early-warning systems of poor countries to the standards of the rich world would be anywhere from four to 36 times greater than the cost. It is not an expensive undertaking: providing a national weather service with modern equipment and training costs some $20m-30m, says Jarkko Sairanen of Vaisala, a Finnish manufacturer of meteorological equipment. Vaisala and the Finnish national meteorological office are doing just that in Ethiopia, with funding from the Finnish government. But plenty of other countries need similar help, Mr Sairanen notes. Mozambique, for example, has 32m people, many living in low-lying coastal areas, but not a single weather radar.

By the same token, points out Sonja Vermeulen of the CGIAR, a network of agricultural research institutes, there are already drought-, pest-, salt- and flood-resistant varieties of most crops that would massively improve yields for poor farmers if more widely disseminated, while insulating them against the worst ravages of climate change.

Take corn. Within a decade or two, the CGIAR predicts, climate change will make it very difficult to grow common strains of maize in some 40% of the area in Africa currently planted with them. That need not spell doom in itself. More than 2m African farmers are already using drought-resistant strains, and harvesting roughly a third more maize as a result. Yet, as Dr Vermeulen notes, there are national seed-distribution services subsisting on as little as $15,000 a year.

Another cheap way of helping is to teach farmers "no-till" farming, which protects soil from erosion. After harvest, crop residues are left in the fields, rather than cleared or burned, with new seeds planted through them. Anne Beathe Tvinnereim, Norway's international-aid minister, points to a project in Zambia in which a small cadre of farmers are trained not just to use conservation farming of this sort, but to teach it to others as well. In this way, some 200,000 farmers are now being trained each year. Roughly half of them have adopted conservation farming, and seen their yields rise by 88% on average as a result.

Close enough, if you have a CGIAR

Julian Lampietti of the World Bank, meanwhile, points to the potential for digital technology to help even poor farmers. Those with mobile phones can receive alerts about the weather by text message. They are also no longer at the mercy of predatory middlemen; they can work out for themselves what the market price for their crop is and haggle accordingly. Mobile money, meanwhile, makes it much easier to access small loans or insurance.

These simple sorts of assistance work best when combined, says Giriraj Amarnath of the International Water Management Institute, a branch of the CGIAR. He points to a project in Sri Lanka in which farmers were given drought-resistant seeds, access to weather forecasts and advice via their mobile phones and sold simple insurance policies against drought. The insurers were able to make the policies cheaper because they knew the farmers were receiving other help that would reduce the risk. The farmers were more willing to run the risk of trying new seeds because of the other support they were receiving. The cost of this bundle—roughly $15 a year—is far less than farmers pay for diesel to operate farm machinery, Mr Amarnath notes.

In fact, measures like these are not just cheap, they would pay for themselves if universally adopted, by avoiding the expense of importing staples and delivering food aid. The Global Centre on Adaptation (GCA), a "solutions broker", argues that $15bn a year to help farmers in sub-Saharan Africa adapt to climate change would quickly pay for itself in less need than there would otherwise be for disaster relief. And rich governments are not the only ones who should be looking at the most effective spending. India shells out almost $50bn a year, or around 2% of GDP, to provide farmers cheap fertiliser, energy, credit and insurance, among other things. Many poor countries do something similar. That money, says Maria Tapia of GCA, could bring much greater benefits in terms of both incomes and resilience if redirected towards adaptation. ■

Big business

Looking after their own

Companies' interests should be aligned with adaptation

IT CAN CLIMB stairs, check gauges and send reports. When it's not busy with work, it takes itself off to its quarters, to rest. It never needs food or water, and can plug itself in to recharge. And although it doesn't like sandstorms any more than people do, it knows how to batten down the hatches and wait them out.

Spot is a bright yellow robotic dog designed by Boston Dynamics, an American engineering firm, and deployed at a remote natural-gas-pumping station in the middle of a desert by Saudi Aramco, Saudi Arabia's state-controlled oil giant. It is not a great place for a human being to hang out: in addition to the sand whipped up by the unobstructed winds, there is blistering sunshine and nothing to drink or eat for miles around. For Aramco's managers, the fact that climate change is making all this worse is almost beside the point: Spot's pumping station was always a place where any human presence should be kept to a minimum.

Spot is not an explicit adaptation to climate change, but rather part of an existing programme to reduce the danger and expense of certain tasks using robots. Aramco also has drones that can inspect smokestacks, unmanned submarines that can conduct seismic surveys on the seabed and mechanical "pigs" that can crawl along pipes. Other oil companies are doing much the same, deploying robo-dogs of their own on platforms in the North Sea and the Gulf of Mexico, for instance.

Businesses must always plan ahead and try to anticipate problems, in spite of the big uncertainties that entails. Public companies, moreover, have shareholders, often including environmental activists, who tend to ask pesky questions about climate. And then there are regulators, trying to make sure that businesses get to grips with big problems so that the responsibility does not wind up with the government.

The result is that big corporations, at least, are talking about climate change, giving thought to how it affects their operations and planning how to adapt.

For some, the need is blatant. The region in and around London in which Thames Water, Britain's biggest water utility, operates, is getting hotter, and although the overall level of rainfall appears stable, it comes in more intense bursts, with longer dry spells in between. That means that Thames has to invest to cope with both more deluges and more droughts.

On the drought side, the company has big plans to plug leaks and to curb demand by installing meters. It will also use an aquifer south of London as a reservoir, pumping water in when it is abundant and out during dry periods, and divert some water from the Severn, a big river outside its service area, using the existing canal network. It also plans to start re-using some of the water that emerges from its sewage plants.

> **Smaller companies can't afford consultants to sketch out future climate-change scenarios**

The main answer to the deluges is the "super-sewer", as Londoners have dubbed it, a seven-metre-wide, 24km-long tunnel that Thames will manage when it is completed in 2024. The £4.9bn ($5.7bn) tube, which stretches across the city from west to east, will act as a vast overflow drain when cloudbursts overwhelm the normal sewer system. (London's sewage pipes double as storm drains, a design choice made in the 1860s that is now almost impossible to undo.) All the company's sewage plants and pumping stations have been assessed to judge whether they, too, are at risk of flooding.

To ensure adequate water supply as far off as 2100, Thames has mapped out a series of "adaptive pathways" which depend on climate change, demography and the economy. Its investments are informed by exhaustive planning and forecasting, using low-, medium- and high-emissions scenarios for the 2020s, 2050s and 2080s, at multiple levels of confidence. And all that despite the fact that, even for Thames, climate change is not the most decisive factor in its investment decisions. Half the shortfall in water supply it foresees by 2045 without extra investments is down to change in demand, largely due to population growth. Climate change only accounts for a quarter.

Even in industries less obviously affected by climate change, big business is taking adaptation seriously. Unilever, a multinational consumer-goods firm, has tried to quantify the likely impact of climate change on its results in 2030, 2039 and 2050 under three different regulatory scenarios and a range of different temperature increases. This obviously matters to the bottom line.

Give the owners what they want

Unilever's latest annual report discusses both the possibility of a €6.4bn boost to annual profits in 2050 from seizing on growing demand for vegan and vegetarian food and the possibility of a hit of €6.1bn if a carbon tax were imposed on its emissions across the board. It also helps it plan adaptation strategies aimed at both direct impacts of climate change and at systemic issues they exacerbate: stricter regulation of agriculture, higher energy prices, growing water scarcity and rising prices for commodities.

Unilever has laid out plans to relocate manufacturing if particular plants are damaged by extreme weather and has lined up emergency suppliers if supply-chains are disrupted. It is developing longer-term contingency plans, too, such as making its shampoos quicker to rinse, in case its customers are obliged to curb their use of water. Most of its dishwasher detergent works in cold water, in anticipation of a world where energy is much pricier.

If maintaining profits were not incentive enough to adapt to climate change, there is also external pressure. Environmental activists tend to be concerned mainly with reducing emissions, which climate wonks call mitigation. But for most investors, or at least longer-term ones, adaptation is also important. Both Thames Water and Unilever detail the steps they are taking to adapt in their annual reports in part because they follow the recommendations of the Task-force on Climate-Related Financial Disclosures (TCFD).

The task-force is an outgrowth of the Financial Stability Board, an international body that seeks to avoid future financial crises through sounder regulation. Companies with a combined market capitalisation of $27trn have signed up to its standards, TCFD says. Regulators in eight jurisdictions, including Britain and the European Union, require public companies to comply with different parts of its guidelines. Businesses dislike alerting investors to gaping potential flaws in their plans, so the act of disclosing such risks spurs adaptation.

Smaller companies cannot afford to hire consultants to sketch out future-climate-change scenarios and make adaptation plans for 1.5°C, 2°C and 4°C of change. Unlisted ones do not face as much pressure to do so. But they also tend to have less sprawling empires, and so a clearer idea of what the future might have in store. And big or small, public or private, businesses tend to have an unrelenting focus on their own survival. For small businesses in the developing world, and certainly for poor individuals, the problem is not a lack of willingness to adapt, it is a lack of capital. ■

Finance

Dream bigger

Adaptation gets too small a slice of too small a pie

RICH COUNTRIES, says Macky Sall, the president of Senegal, must "show more solidarity" with developing ones. He means they must compensate those countries for their losses due to climate change and that they must provide them with money for adaptation. The obvious way to pay both bills, he continues, would be to tax businesses in industrialised countries and give the proceeds to poor ones.

Whatever its merits, Mr Sall's plan stands no chance of being adopted. For one thing, rich countries are very leery indeed of paying over any money as compensation for what climate negotiations call "loss and damage". That said, they are in principle open to paying some of the costs of low-carbon development which stops poorer countries from emitting at rich levels and for some of those countries' adaptation costs. Indeed, they are committed to doing so under the Paris agreement of 2015. But they fight off raising taxes to fight climate change at home, let alone abroad.

In the Paris agreement of 2015 rich countries promised poor ones $100bn a year in climate finance. In no year have they met that commitment. Last year they agreed that 40% of that should go on adaptation by 2025: a goal that will be missed as surely as the old one was. And officials from assorted European countries say this delinquency will continue for some time. To the extent their countries have any extra aid to dole out, they say, it is all going to Ukraine. Runaway inflation is putting pressure on some to cut their spending. It also means the money they provide goes less far.

In the face of these political realities there is much airy talk about attracting more private capital to adaptation, and the fact that countries have trotted out this self-serving line for years does not mean it is not true. But though the private sector is beginning

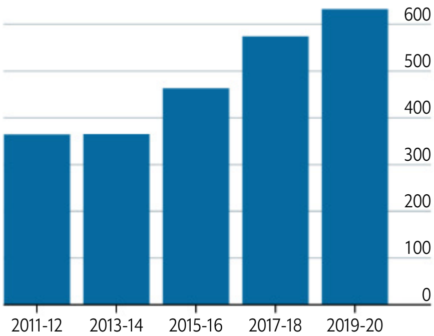
to invest in non-fossil-fuel energy in developing countries, it has yet to grapple with adaptation there.

A recent study found that only 1.6% of the money spent on adaptation in 2017-18 came from the private sector. That overstates the problem somewhat, because it does not take into account the efforts private businesses are making to adapt their own operations (see previous section). But looked at from Mr Sall's point of view, that does not make a great deal of difference.

The problem is not a lack of returns. The World Bank estimates that on average every dollar spent on adaptation brings $4 in benefits. Projects often have economic, social or environmental benefits that go beyond helping to avert future losses. Planting a barrier of mangroves along a shoreline, for instance, not only makes floods less severe, but also reduces greenhouse-gas emissions and enriches nearby fisheries.

Too little and too slow

Global climate finance, $bn



Source: Climate Policy Initiative

The problem is that the returns cannot be realised in a way that makes sense to private investors. When pitched mitigation projects such as solar farms they can be offered returns from the revenue that the new kit will produce. There are also some ways, and may in time be more, for investments that reduce emissions to be credited on a carbon market.

An indirect approach

Climate-proofing things is not quite the same. The investment is likely to earn a good return, in that replacing or repairing storm-damaged infrastructure tends to be much more expensive than forestalling the damage in the first place. But an avoided cost is not a revenue stream to which a banker can easily lay claim. Even if they could, governments tend to underprice unpredictable calamities; that would make such revenue streams too small.

A partial solution is offered by insurance. Receiving enough money to rebuild after things go awry is not a great form of adaptation. But it is better than ruin without recompense; and by making the insurers sensitive to damages it gives them an incentive to help in adaptation. Insurance is being used not only to help farmers cope with the adverse weather climate change brings, but also to help governments respond to the natural disasters it exacerbates. For decades governments (and insurers) have been issuing catastrophe bonds which pay out in the event of an earthquake or storm of a given severity.

Unfortunately insurance works best as a hedge against stable, quantifiable risks. The perils of climate change, in contrast, are growing, which implies premiums on a constant upwards trajectory. Try and do anything about their rise, though, perhaps through subsidy, and the insurance risks becoming a form of maladaptation, making people confident about staying at risk when they should be doing something.

There are some ways, though, that the signal can be built into the product. Insurers who require those seeking insurance to take certain steps, such as to fireproof their houses or use specified seeds, fertilisers and methods on their smallholdings can sell policies more cheaply because they can expect to pay out less. Donor governments could subsidise insurance on the same basis.

Blending adaptation into more conventional investments is another way to mobilise private capital. Making new infrastructure more resilient in this way tends to add only 3-10% to the cost of construction, notes Nitin Jan of the Global Centre on Adaptation. The main difficulty is helping governments with limited know-how to set and enforce the right specifications in public tenders. It is to that end that the World Bank, for instance, is helping Cambodia draw up contracts for the construction and maintenance of rural roads that include stipulations on flood-proofing.

Kristalina Georgieva, the head of the IMF, takes this logic further. Most adaptation projects, she notes, include some additional benefit beyond simply insulating people from climate change. The additional benefit, Ms Georgieva argues, is often easier to finance. She believes the best way to drum up funds for adaptation quickly is for donors and development agencies to subsidise such investments enough to make the outlay look attractive on the basis of the revenue stream from the additional benefits alone. That gets you all the adaptation for only a fraction of the cost.

This can be done by making the investment cheaper, less risky, or both. Concessionary lenders could buy equity in projects, thus giving private financiers more confidence in lending to them, or agree to absorb the first losses in the event of a default. Such financial wizardry is reasonably common in projects to cut greenhouse-gas emissions. It remains vanishingly rare in the world of adaptation, where it requires rather more imagination.

The same applies to "green bonds" used to finance projects with environmental benefits. Only 16% of the $1.5trn in such financing issued since 2007 has gone on adaptation. More than half of that those deals involved a single entity, Fannie Mae, an American mortgage lender trying to reduce water use in its portfolio. Yet most of the outfits that certify bonds as green consider adaptation a perfectly acceptable use of funds raised in this way. In 2019 the European Bank for Reconstruction and Development issued the first green bond to be used purely for adaptation. Fiji and Indonesia, among other developing countries, have sold green bonds in part for adaptation. Ivory Coast intends to do the same soon.

Despite such initiatives, many in the developing world have concluded, with reason, that the fundamental problem is a lack of will on the part of richer countries. That has prompted some climate activists to try to force the rich world to be more generous through the courts. Again, the emphasis is on mitigation, with various governments being sued over emissions-reduction targets the plaintiffs argue to be at odds with some other commitment, such as the rights of future generations. It is not a huge step from arguing in court that rich-world governments and firms have a responsibility to cut emissions to insisting that they should help people adapt to emissions already released.

The best known such case is Saúl Luciano Lliuya's suit against RWE, a German utility. Huaraz, the Peruvian town where Mr Luciano Lliuya lives, is located at one end of a narrow valley high in the Andes; at the other end is a growing lake held in place by a shrinking glacier. The glacier, his lawyers argue, is shrinking because carbon emissions have raised the temperature. RWE, they continue on the basis of figures put together by an NGO, is responsible for 0.5% of those emissions. So RWE should foot a similar proportion of the bill for an engineering scheme that will protect Huaraz from flooding. A ruling is expected next year.

Mr Luciano Lliuya is not the only such litigant: several cities in America have sued fossil-fuel companies in pursuit of money for adaptation. Such suits are unlikely to meet a huge amount of the adaptation bill. But they could be a useful spur. Revealed preference suggests that developed countries are just not that interested in meeting their obligations in far-off lands. If things start to cut closer to home, the issue may matter more to them. ■

A time to act

Common sense

The world must not let adaptation lapse in favour of mitigation

JEM BENDELL, a British academic, is an advocate of what he calls "deep adaptation". The world, he believes, should prepare for "near-term societal collapse". He urges not only "resilience", climate-speak for equipping people to withstand climate change, but also "relinquishment", by which he means abandoning "assets, behaviours and beliefs" that it will be futile to try to retain, such as living near the coast or expecting to maintain, or attain, a rich-world lifestyle. Politicians and the public are not taking this prescription seriously, he argues, not because it is excessive, but because they are not psychologically prepared to consider it.

The depth of the dislocations he talks about makes Mr Bendell unusual among advocates of adaptation. The fact that he stresses adaptation makes him unusual among those concerned about catastrophic climate change. It was once common for such people to be frank in their distrust of the whole idea of adaptation. They saw it as at best a distraction from the more important task of mitigation, and at worst an alternative to cutting emissions pushed by vested interests. Such suspicions are less common today, but they have not vanished completely. "You can't adapt your way out of climate change" is still a slogan with currency.

In one sense it is clearly true. Take low-lying atolls. Even with strenuous mitigation, some will be relinquished to the sea. The average elevation of the 1,100 islands which make up the Maldives is a mere 150 centimetres. Although reclamation is building up some of them, others are bound to disappear.

But in another sense, the submergence of much of the country does not mark the sort of "hard limit" to adaptation sceptics like to talk about. The people of the Maldives will not simply stand still as the water rises above their waists; they will resort to ever more radical forms of adaptation, presumably culminating, if need be, in mass emigration. Last year the World Bank concluded that by 2050, without more mitigation and adaptation, 216m people would be displaced within their own countries by climate change, 86m in sub-Saharan Africa alone. Most of these will not travel far from home. Some will, either through aspiration, local hostility or, in the case of island states, necessity. An ageing rich world may need such fluxes. It currently looks unlikely to welcome them.

Viewed from this perspective, mitigation and adaptation are not in competition with one another; they go hand in hand, pat as that may sound. Patrick Verkooijen, the head of the Global Centre on Adaptation, says that the more mitigation there is, the easier his job becomes, as less adaptation will be needed. What is more, in poor countries both adaptation and mitigation are in essence different forms of development work, and should be co-ordinated as such. Building a green power supply or low-emission transport network, for example, might be done in a way that draws people away from vulnerable jobs or places. Adaptation averts the losses and disruption faced by government, businesses and households when the power goes out or the road is washed away. The benefits only increase as climate change intensifies.

Those in the rich world who consider all this worthy but less than urgent should remember that the benefits of investing in adaptation are not limited to the places where the spending occurs. One of the fundamentals of climate science is that causes and effects can be widely separated. Sea temperatures in the eastern Pacific are linked to hurricane frequencies in the Caribbean; tropical volcanic eruptions can warm the poles. The world's economy and its geopolitics are stuffed with similar "teleconnections".

Most analyses of future climate calamities in the developing world focus on local impacts. In practice less adaptation and more suffering in poor countries will inevitably have consequences in wealthier places. At the very least the proliferation of flooded slums and parched fields would increase the pressure on wealthy governments to spend more on disaster relief, a vastly less productive investment than adaptation to forestall disasters. But in all likelihood, the consequences for the rich world would be much more severe. The prices of staple foods may shoot up. Supply-chains would suffer multiple ruptures. Then there is the spectre of those unwanted climate refugees.

But there is also a compelling moral case for rich countries to do more to help poor ones adapt. The people who are suffering the most as a result of climate change are the ones who have done the least to cause it. It takes money both to generate industrial emissions and to adapt to their consequences. Poor countries are not doing much of either. To leave them to suffer because of the mess created by the rich world and middle-income countries is akin to asking the people of Haiti, Niger and Nepal to pay to decarbonise America's and Europe's power supply.

To put things in Mr Bendell's terms, to relinquish something by choice may be an act of clear-eyed humility; to be deprived of it as the result of what others have done is more akin to being robbed. Leaders of developing countries are right to fulminate against the world's selfishness. It is not just climate change that is a problem for everyone; so is dealing with the damage that it does. ■

ACKNOWLEDGMENTS A list of acknowledgments and sources is included in the online version of this special report

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From digital assets to digital reality: materialising the metaverse with Amber Group

The metaverse is all the rage these days — and Amber Group recognises its potential as the future of online interaction. Thomas Zhu, chief technology officer and co-founder, discusses the company's move to incubate Openverse, a web3 platform that aims to empower creators, businesses and brands, and the plan for society to enter this digital reality.

While the metaverse is not a new concept, it isn't yet a functional technology. But Amber Group's chief technology officer and co-founder, Thomas Zhu, thinks society is merely five to ten years away from its widespread adoption.

Put simply, the metaverse is a virtual world that users can access — a 3D rendering of the internet. It could be predicated on physical assets or entirely made up. And Amber Group sees it as the future of online interaction — which is why it is incubating the Openverse, a web3 platform that services to empower creators, businesses and brands with the creative tools and infrastructure so that they can reap the full benefits of the metaverse.

Summarising its possibilities, Mr Zhu says: "The metaverse comes to represent the next frontier for growth and a lot of businesses are actually seeking a way to tap into this space. It's incredible, and it holds plenty of exciting opportunities for brands and creators to upgrade and rebuild their presence in a digital future."

One particular group Amber Group envisions Openverse will benefit and will be vital for is smaller creators. "Openverse is not just for those big companies, but it is also beneficial for those creators who have been great contributors to the web 2.0 economy, yet did not get the rewards they truly deserve," Mr Zhu says. By providing a metaverse-as-a-service, or a one-stop shop for the metaverse as he calls it, the barriers to entry can be reduced, and more types of businesses and creators are able to participate.

In investing to incubate the development of Openverse, Amber Group aims to bring society a step closer to being able to step into this digital reality. If one thinks of it as a tool first, aided by the latest technologies, then the digital capabilities it will allow brands and individuals to explore are seemingly endless.

CHALLENGES TO BE TACKLED

But before we all enter the metaverse, a number of technological barriers have to be tackled first. Security is one of the foremost among these — how can you keep people's identities secure and ensure that people are who they say they are? Blockchain is one way of solving this problem. Given its characteristics as an immutable ledger, information that is entered cannot be changed once validated. Commenting on Amber Group's authorisation approach, Mr Zhu shares that "we are developing our Decentralised Identifier (DID) technology and it's actually a deterministic way to convert your biometric information to your on-chain identity."

Regulation could also be another impediment to the metaverse's development — a pertinent issue given that policymakers must often keep up with technological advances. However, Mr Zhu is confident that this is not a problem. "The good thing that I observe now is that different governments and regulations are paying a lot of attention to this. Some of them are quite open to it."

"Some may question the metaverse's potential and longevity but there's always been scepticism expressed towards new types of technology,'' Mr Zhu says. He also cites recent research showing that, over the next five to ten years, 95% of business leaders expect the metaverse to have positive impact on their industry, which bodes well for the Openverse.

LOOKING AHEAD

Different people will have a different understanding of why the metaverse exists and what it can be used for, Mr Zhu remarks. But with more open communities and ecosystems, more participants will be rewarded in their use and experience of the metaverse. This is the heart of the metaverse: communities and people. "The interests of both the platform providers and developers will be more healthy and more sustainable when we consider who the metaverse is for and how it will benefit communities online. This is definitely the future and the way to solve the pain points of the present," he concludes.

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Africa's pitifully low energy use is more alarming than its role in climate change

A WINDOW SEAT in a helicopter flying south-west from Windhoek, Namibia's capital, offers an otherworldly diorama. The landscape shifts from earthly desert to Mars-red dunes, then to moonscape as the chopper nears Luderitz. In the early 1900s this tiny port was the hub for a diamond boom that brought the art-nouveau mansions that perch on the town's slopes. More than a century on, Namibia hopes that the area will again bring riches, this time from sun, wind and land, by hosting one of Africa's largest renewable-energy projects.

The plan is that solar plants and wind turbines will provide power to split water into oxygen and "green" hydrogen to make ammonia, an important industrial chemical. James Mnyupe, an adviser to Namibia's president, struck a deal last year with Namibia's preferred developer, Hyphen, a German-led consortium. It could lead to an investment of $9.4bn—a huge boost for a country with a GDP of about $12bn.

Namibia's green-hydrogen project is symbolic of the optimism about renewable energy in Africa. Many hope that the continent will "leapfrog" past fossil fuels.

Alas, things are not so simple. In the rich world the big energy challenge is how to make the supply cleaner. In Africa the problem is how to generate more energy. Average consumption per person in sub-Saharan Africa, excluding South Africa, is a mere 185 kilowatt-hours (kWh) a year, compared with about 6,500kWh in Europe and 12,700kWh in America. An American fridge uses more electricity than a typical African person. Low energy use is a consequence of poverty; but it is also a cause of it. If Africa is to grow richer it will need to use a lot more energy, including fossil fuels.

Yet its efforts to do so put it on a collision course with hypocritical rich countries. The rich world is happy to import fossil fuels for its own use, while at the same time restricting public financing for African gas projects intended for domestic use. "Is the West saying Africa should remain undeveloped?" fumes Matthew Opoku Prempeh, Ghana's energy minister.

To be sure, clean-energy technologies are a huge opportunity for the continent. They are already the main sources of power for 22 of Africa's 54 countries. But to hope that Africa can rely on renewables alone to boost consumption is naive. Take electricity, a source of power that is still not available to some 590m people, or about half of sub-Saharan Africans.

What electricity there is, is unreliable and costly. Adjusted for purchasing power, households in many African countries pay higher rates than those in the OECD, a club of mostly rich countries. In research published in 2019, Energy for Growth, a think-tank, noted that 78% of African firms experienced power cuts in the past year, while 41% said that electricity was a major constraint. Many businesses and well-off households rely on generators. These have more total capacity than there is in sub-Saharan Africa's installed renewables.

In a report published in June the International Energy Agency (IEA) pointed out that if Africa is to provide universal electricity access by 2030 it would have to almost double its total generation capacity ▸▸

from 260GW (currently 3% of the global total) to 510GW. Renewables could provide 80% of the increase, it reckons. Achieving that would be a mammoth task.

Africa is home to 18% of humanity, yet receives less than 5% of global energy investment. Much of this tends to go on producing oil and gas for export. The IEA thinks that total capital spending on energy between 2026 and 2030 in Africa would have to be nearly twice what it was between 2016 and 2020. Investment in clean energy would need to rise six-fold.

All of which sounds highly ambitious. African public finances are in a woeful state. Twenty-two countries are in debt distress or at high risk of it, according to the IMF. Those considering turning to international capital markets are facing eye-watering borrowing costs. China, a source of loans for energy schemes over the past two decades, is becoming more parsimonious. Its lending to domestic African power schemes fell from a peak of nearly $8bn in 2016 to $1.5bn in 2019.

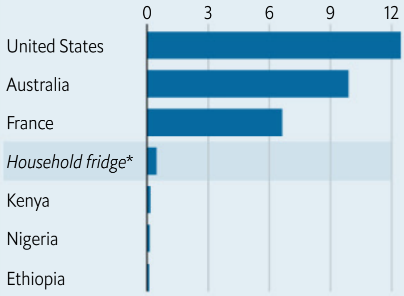
African firms could invest more in infrastructure. Some governments, such as Kenya's, are changing regulations to allow pension funds to do so. But pension assets in the ten most developed African countries (a bit more than $300bn) are only slightly greater than those of the California state teachers' pension fund. Investors rarely lend for long-term projects: 70% of loans are for less than five years.

The IEA reckons the gap will be filled by "an unprecedented level" of private foreign capital. Yet investors complain of a shortage of bankable African projects. Coal or gas plants are relatively cheap to build, as most of their lifetime costs come from buying fuel. Solar- or wind-power projects, by contrast, are cheap to run but expensive to build. This means they are very sensitive to the cost of capital. And that cost can be up to seven times higher in Africa than in America and Europe, the IEA notes.

Governments in rich countries have promised climate finance that, among other things, is meant to encourage private investment in renewables. The IEA calculates some $1.2trn will be needed by 2030. Yet the past is filled with broken promises. In 2009 rich countries pledged $100bn a year to poor countries by 2020 to help with climate change (some of it from the private sector). But the annual amount has never surpassed $85bn and much of it has been in the form of loans. Rich countries have now promised they will reach the $100bn target this year. "Talk is cheap," laments Murefu Barasa of EED Advisory, a Nairobi-based consultancy. "Nobody knows even how to account for that money."

Namibia shows that a bankable project can be put together. The government has prioritised the scheme, establishing a "green hydrogen council" to streamline decision-making. It has gone out of its way to minimise the risk of corruption, for instance by installing 24-hour surveillance cameras in the facility where contractors' bids were scrutinised. The project is attracting concessional finance from the Netherlands and Germany, which has in turn lowered the risk for private investors. But it is just one scheme.

Low-carb
Annual electricity consumption per person, 2020
MWh



Sources: IEA; Centre for Global Development *US average

One reason there are not more is because many utilities are struggling. More than half of those in sub-Saharan Africa cannot cover their operating costs—let alone fund investments. Because they bring in revenue, they "are the foundations of the building of the power sector," says Pedro Antmann, a consultant. If they fail, "the whole building collapses."

Most are state-owned, inefficient and plagued by political interference. Some utilities barely track their finances. Until 2020 Ethiopia's simply could not say with certainty if the previous year was profitable. Many do not maintain equipment, stop illegal connections or bill properly. The Electricity Company of Ghana suffers from all three problems and loses 28% of its power, admits Samuel Dubik Masubir Mahama, the managing director. (Losses in American utilities are typically about 5%.) It recently ran an amnesty in which some 120,000 people who had meters but were not paying came forward. Mr Mahama had no record of 104,000 of them. How many more might be out there? "I think it'd be quite a number," he chuckles.

Most African utilities do not charge tariffs that reflect costs. At root this is a political problem. Andre de Ruyter, the head of Eskom, the South African utility that has overseen record blackouts in 2022, admits it has been "politically expedient" for regulators to keep prices low. This has caused a shortfall of 380bn rand ($23bn) since 1994, he reckons, about the same amount as the company's debts. Other governments directly subsidise electricity tariffs. Removing subsidies entirely is not easy. "You cannot," laments Mamadou Fall Kane, who advises Senegal's president on energy policy. "Politically you will kill yourself."

If cheap tariffs were targeted at only the poor, many utilities could stay in the black without government bungs. In 2018 Niger got rid of all subsidised tariffs except for those to the poorest, who are 29% of consumers but use just 1.8% of electricity.

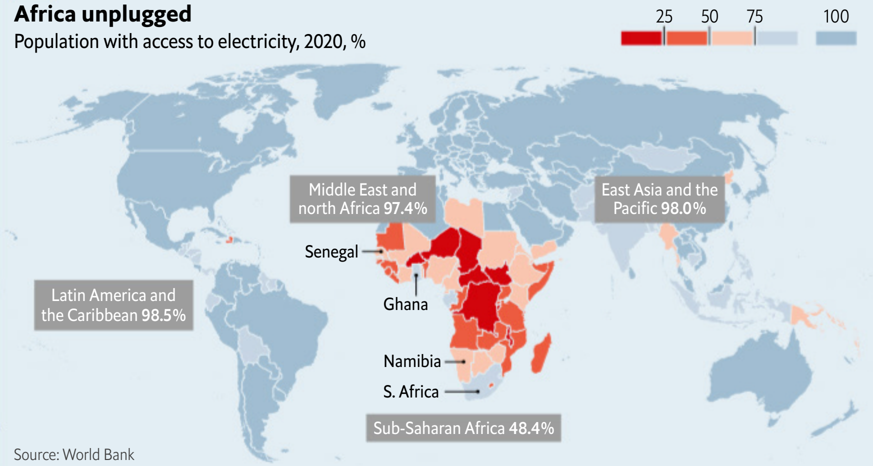
Plug it in

New technology means that some consumers can bypass utilities. In rural areas, stand-alone "mini grids" linked to small generators such as a solar park are often the cheapest way for villages to get connected. Solar-home systems are booming.

Going off-grid is only a partial solution, however. Connecting households to the grid remains the cheapest way of lighting up about 45% of unelectrified African households, according to the IEA. But without support the poor often cannot afford the upfront costs of connections.

Using grids and building connections between African countries would also make it easier to rely more on renewables. That way a cloudy day at a solar park in Senegal could be offset by a dazzling one in Mali. Yet in most parts other than southern

Africa unplugged
Population with access to electricity, 2020, %



Source: World Bank

Africa, regional interconnections are weak. And these regional links require trust that a neighbouring country will not halt power exports in a crisis.

Africa's fragmented infrastructure is one reason why gas has played such a big role in powering the continent. In the ten years to 2021 about two-thirds of new generation capacity in Africa came from gas-fired stations. Even if African countries invest heavily in renewables over coming decades, many will still need an on-demand source of electricity to cover the vagaries of the weather. Hydropower can help, but only in places blessed with steep valleys and rivers. And gas remains hard to beat for directly powering heavy industry.

The view at many of west Africa's biggest ports provides a reality check for anyone hoping for an all-renewable future. Looming over harbour after harbour are hulking beasts, loaded with glistening pipes, rows of smoke stacks and, squeezed on the end, a power pylon. In recent years the governments of Gambia, Ghana, Guinea Bissau, Ivory Coast, Senegal and Sierra Leone have signed contracts for these floating fossil-fuel power plants. They produce a large share of those countries' electricity. Some run on heavy fuel oil, but Ghana's now runs on local gas. Senegal is converting its, too.

Happily, in much of the continent renewables are already cost-competitive with gas and coal. By 2030 they should be more so. Better and cheaper batteries could eventually help renewables cope more easily with peak demand. But for now, in places with abundant gas reserves, little hydropower potential or frequent outages throughout the day, gas-fired plants may still offer the most compelling combination of flexibility, stability and price—at least for some new generation.

That is why the West's reluctance to finance gas projects is in conflict with Africa's desire to use more energy. Last year 39 countries and organisations including almost all of the world's big, rich democracies—call them the Virtue-signalling 39, or V39—pledged to stop almost all financing of new fossil-fuel projects internationally by the end of the year. The World Bank is pulling back, too. The hypocrisy is easy to spot: three-quarters of the European members of the V39 are building new fossil-fuel pipelines at home.

Gas exploration and development are largely financed by private firms, so the ban will not stop gas being found and pumped. Senegal did not need World Bank money to develop its soon-to-produce gas field, points out Mr Fall Kane, "because we have the market and we have world demand". Russia's invasion of Ukraine sent gas prices soaring, making private investment even easier to attract. And despite many European countries' refusal to finance overseas gas projects, the European Union recently labelled the fuel as green, which would allow Europe's projects to be backed by environmental investors.

Sweat equity

In recent years rich countries and multilateral banks have financed about $4bn in gas-power plants on average per year in low- and middle-income countries. Much of that funding will now be halted. The V39 pledge will not stop Africa's gas from being extracted. But it will ensure it will be mainly rich countries (including members of the V39) that get to burn it.

Gaslighting Africa

Africans are understandably angry. They argue, convincingly, that Africans using more gas should not be a cause for climate panic. Consider a thought-experiment in which sub-Saharan Africa (excluding already higher-consuming South Africa) increases its electricity consumption per head overnight by an extraordinary factor of five. That would give it a level of electricity consumption per person akin to that of Indonesia today—a scarcely conceivable transformation for ordinary Africans and one which took Indonesia almost three decades to achieve. Even if all the new electricity came exclusively from gas-fired power stations (which no one is suggesting), these would add the equivalent of about 1% of current global emissions.

Such calculations hint at a blunt truth. Because so many Africans are poor they are much more vulnerable to the harms of global warming, such as droughts, disease and higher food prices, than people in richer countries. For much of Africa the best way of adapting to a warming planet is to become rich enough to deal with its consequences. Denying Africans cheap and reliable power will make this task much harder, while doing almost nothing to curb global warming. ■

Jihadism in the Horn

Rise of the clans

MOGADISHU

Somali clans are revolting against jihadists

MUKTAR ROBOW, once a feared leader of al-Shabab, al-Qaeda's richest and most lethal affiliate, jabs his finger at a map of Somalia. Now a cabinet minister, he rattles off the names of places that have recently been recaptured from his erstwhile comrades. The lands of the Hawadle clan in Hiran, central Somalia? "They've liberated all of it." Almost all of the region's key roads are also under government control. The next districts to be liberated will probably be Galguduud and Middle Shabelle (see map on next page). And the rest of Somalia? "Al-Shabab is on the back foot," answers the former terrorist who once had a $5m American bounty on his head. "Gains are being made every day."

Those gains have, however, come at a bloody price. On October 29th twin car bombings in the capital, Mogadishu, killed at least 100 people. It was the country's deadliest attack since a blast at the same place five years ago. Al-Shabab swiftly claimed credit, saying their target was the education ministry and calling it an "enemy base" bent on turning Somali children away from their Islamic faith. Hassan Sheikh Mohamud, who has pledged "total war" against the jihadists since returning to office in May for his second term as president, replied that these revenge attacks showed the government is "winning".

Though such a claim seems premature, it is true that his administration has made real strides against the jihadists in recent months. What began in the summer as a local clan revolt against al-Shabab's increasingly onerous tax demands—amid the worst drought in four decades—has since spread. Clan militias known as the Ma'awisley have spearheaded uprisings in several districts in Hirshabelle, one of Somalia's five federal states. The uprisings are now being backed by the national army and by American air power.

The government says ten big towns and dozens of villages are back under its control. That is sparking hope for a country that has been battling jihadists for more than 15 years. "This is a historic offensive," says a senior American official.

Booting the jihadists out of Hiran severs their access to the lucrative trade routes that run right down through central Somalia from the port of Bosasso in the north. It also prevents al-Shabab from using the region as a base to attack neighbouring Ethiopia as it did in July, when several hundred ▸▸

of its fighters crossed the border in its biggest incursion ever. Moreover, whereas most previous offensives were led by African Union troops, "this time it's Somali-led," notes Omar Mahmood of the International Crisis Group (ICG), a Brussels-based think-tank focused on conflict.

The president's new approach consists of three elements: military, ideological and economic. First, the federal government is providing ammunition, fuel and food to the Ma'awisley. The doughty clansmen know their terrain better than the national army and are more motivated to fight. By supporting them the president hopes to encourage a domino effect of revolts across the country, which he likens to how Iraqis eventually rid themselves of Islamic State. To this end he has also called on the presidents of Somalia's semi-autonomous states to mobilise their own security forces against the militants. He has reportedly asked America to loosen restrictions on its drone strikes targeting al-Shabab.

Meanwhile, the government is trying harder to rebut al-Shabab's online propaganda. It is exhorting Muslim leaders to speak out against jihadism. It is also trying to squeeze the group financially by ordering businesses to rebuff its efforts at extortion. Mr Mohamud says the key lesson from his previous term as president, which ran from 2012 to 2017, is that a "military-only approach" does not work.

In an early signal of his willingness to try new methods, the president appointed Mr Robow as minister of religious affairs. His predecessor, by contrast, had put the former al-Shabab spokesman under house arrest. "He can be an asset," says Mr Mohamud. He suggests, for example, that Mr Robow could help the government "reclaim the Islamic narrative" from the jihadists. A more delicate but no less important task involves reaching out discreetly to former comrades and encouraging them to defect.

*Claimed by Somaliland and Puntland
Sources: Polgeonow.com; *The Economist*

The government's strategy has its drawbacks. Relying on clan militias could well end badly. Though determined, the militias are ill-trained and brutal. Last month the governor of Hiran even called on them to kill the wives and mothers of al-Shabab members. Their successes may also be hard to replicate in other parts of the country. Clan militias in al-Shabab's heartland in the south are neither as large nor as well-armed as those in Hirshabelle. And al-Shabab has a record of quickly seizing back territories that it has lost.

Mr Mahmood of the ICG argues that ultimately the government will have to consider negotiating with the jihadists. Yet few Somalis seem to have an appetite for this. "The only language al-Shabab understands is the bullet," says Mr Robow, whose own son was recently killed fighting the militants. "It must be eliminated." Al-Shabab, for its part, does not sound very interested in talking either. Even so, Mr Mohamud thinks it is but a matter of time. "When we reach a certain level we'll open the door for dialogue," he says. "But for now [the jihadists] are not ready." ■

Israel's election

Swinging right

JERUSALEM

Binyamin Netanyahu seems on track to be Israel's next prime minister

SAYERET MATKAL, Israel's premier commando unit, did not simply model itself on Britain's Special Air Service (SAS), it also stole its motto: "Who dares wins". It is a creed that has been tested almost to destruction by Binyamin Netanyahu, Israel's longest-serving prime minister and an alumnus of the Israeli unit. After four failed attempts and 16 months in opposition, Mr Netanyahu seems to have won a parliamentary majority that will put him back in the prime minister's office.

As *The Economist* went to press some 90% of votes cast in the election on November 1st had been counted. The tally shows that the group of right-wing and religious parties supporting Mr Netanyahu are almost certain to have 62-65 of the 120 seats in the Knesset, Israel's parliament, having won just a few thousand more votes than their rivals. Mr Netanyahu owes his remarkable comeback to a surge in nationalist voting whipped up by his far-right allies in the Jewish Power party.

Another contributing factor was the chronic division among centre-left and Arab parties, two of which seem to have failed to cross the electoral threshold of 3.25%. These differences led to the early demise of the government formed in June 2021 by a broad coalition assembled by Yair Lapid that included right-wing, centrist, left-wing and Islamist parties.

In a victory speech to members of his Likud party in Jerusalem, Mr Netanyahu triumphantly declared that "our way, the way of Likud, proved itself." In fact, Likud has barely increased its tally from the previous election in March 2021. The big gains made by his bloc are almost entirely due to the astonishing success of the Religious Zionism list, which includes the Jewish Power party, that more than doubled its number of seats. Mr Netanyahu had prevailed upon the Jewish Power leader, Itamar Ben-Gvir, to merge his list with that of two other far-right parties, ensuring that votes for his camp would not be wasted on parties falling below the threshold.

Mr Ben-Gvir was until very recently a political pariah. His résumé includes threatening to "get to" the former prime minister, Yitzhak Rabin, shortly before his assassination by a Jewish extremist in 1995, and membership of a virulently anti-Arab party that was proscribed by the Israeli government as a terrorist organisation. As recently as the election held in March 2020, Jewish Power won just 19,000 votes.

Mr Netanyahu, however, legitimised him and launched him on a rocket-like trajectory. On the day of the election Mr Ben-Gvir was mobbed by adulatory crowds as he toured working-class and religious neighbourhoods. He promised them that, with him in the new government, "we will be the landlords." He is now the co-leader of the third-largest party in the Knesset and can dictate his terms to Mr Netanyahu, who will need Mr Ben-Gvir if he is to form a government. Top of his wish list is to be appointed public-security minister, in charge of Israel's police.

Mr Netanyahu's usual coalition partners, the ultra-Orthodox parties, have their own lists of demands. These include bigger budgets for religious schools as well as the right not to teach their children ungodly subjects such as maths and English.

The parties in Mr Netanyahu's coalition also hope to weaken the power of the courts, which they see as an obstacle to their aim of grabbing more land in territories Israel occupied in 1967. That may suit Mr Netanyahu, who is on trial on charges of bribery, fraud and "breach of trust". He insists that his innocence will come out in court and denies trying to knobble the legal process. But his allies have spoken of replacing the attorney-general and striking out the crime of breach of trust.

After five elections in less than four years, many Israelis crave stability. Yet they may be disappointed in their hope that Mr Netanyahu will provide this. Once back in office he may call yet another election to cut his new partners down to size. ■

The World Cup

Not quite over the goal line

DOHA

The stadiums in Qatar are ready. The beds are not

There is no congestion on the tree-lined, ten-lane motorway out of Doha, the capital. It feels big enough to fit every car in Qatar. As drivers glide north, they pass Lusail stadium, the 80,000-seat bowl that will host the World Cup final in December. It takes just another 20 minutes to reach al-Bayt stadium, where a semi-final will be played. Qatar's promise to stage a uniquely compact World Cup has been kept: football fans should have no trouble watching more than one match a day.

Its efforts look less impressive if you turn down a narrow road soon after al-Bayt stadium. At the end sits the al-Khor "fan village", which promises hundreds of guests an "enjoyable and lavish stay" with swimming pool and restaurant. Rooms start at 1,512 rials ($415) a night.

On a visit in late October, the site looked neither enjoyable nor lavish—nor finished. Bulldozers worked the earth. Giant spools of cable sat along the perimeter. Perched amid an expanse of sun-baked dirt, it looked less like a deluxe resort than the sort of desert encampment where Arab regimes like to stick dissidents.

The drive to al-Khor is a microcosm of Qatar's World Cup preparations. First, the good news. The big-ticket infrastructure is ready. All eight stadiums are done—and creatively designed. Al-Bayt is styled like a nomad's tent, while "Stadium 974" is a vibrant structure made from 974 recycled shipping containers (the number is Qatar's international dialling code).

Many new roads have been built. A new $36bn metro will whisk fans around town (free). Doha's main airport, one of the world's best, is decked out for the tournament, and the old airfield has reopened to handle overflow. By some estimates the price for all this is close to $300bn.

There are less visible changes, too. Reforms to the hated *kafala* (sponsorship) system mean most migrant workers may change jobs or leave Qatar without their employer's permission. The International Labour Organisation estimates the new minimum wage of 1,000 rials gave 400,000 workers a pay rise. Horror stories still abound of unpaid wages and exorbitant recruitment fees. But even many of Qatar's critics acknowledge that the World Cup forced it to make real reforms.

So far, so good. But fans need somewhere to sleep. Qatar has sold 2m room-nights at everything from five-star hotels to tent villages. Earlier this month it added another 30,000 rooms (or roughly 1m room-nights) for last-minute bookings. Omar al-Jabbar, the official in charge of accommodation, was keen to show off a traditional dhow that would serve as a floating apartment. It looked pleasant, with plush bedding and a hot tub on the top deck (and a curious number of ashtrays strewn everywhere). But there are only 30 dhows available, the largest of which sleeps ten people. Far more fans will end up at places like Barwa Barahat al-Janoub, which offers rooms for 300 rials a night. Mr Jabbar says it will accommodate 10,000 guests. "The heavy construction is all done. They're fitting some beds, testing the water," he says. "But we can say 99% is done."

If so, one wonders how it looked at 98%. Some roads into the neighbourhood are still not paved. The booking website describes it as "inspired by traditional Arab homes built around courtyards". It neglects to mention that the site is ten kilometres (six miles) from the nearest metro station; officials promise shuttle buses. There are no restaurants or shops for miles, though if fans get truly peckish there is a slaughterhouse across the street.

Officials insist they have not overpromised: "Anything on our portal is finished, it's ready. We upload only the things which [are] ready," says Mr Jabbar. And much can change by the time the tournament kicks off on November 20th. Workers are toiling around the clock. For now, though, many places to stay do not seem ready.

Another fan village sits in a free zone near the port. Renderings show grassy pathways between colourful cabins. When your correspondent visited, it was a construction site. Dirt paths were strewn with pallets, boxes and barrels; excavators were digging trenches. The only greenery in sight was piles of rolled-up Astroturf.

Fans will be able to buy beer outside stadiums, but just the non-alcoholic sort inside. This is not unusual (many European countries have similar rules). Away from the stadiums, they will be able to tipple at better hotels and at "designated areas"; organisers are cagey about where these are.

Finding a spot to eat could require patience. At restaurants in souk Waqif, a popular tourist market, almost every table was full on a recent Thursday night. The same was true at the bars of West Bay, an area full of high-end hotels, and the greasy spoons in an older part of Doha. One kebab joint had a 30-minute wait.

All of this worries fans—and locals. Some Qataris are excited about the tournament. Others fear the traffic will be intolerable, the restaurants overflowing and the streets thronged with drunk hooligans. Schools will close for the month; parents wonder how they will entertain their kids. Some plan to spend the month abroad.

Quietly, some also wonder if this was all worth it. Qatar says it would have built much of this glittering infrastructure anyway, as part of its national development plan. But it has a Potemkin feel. The motorways seem too big for a country of just 3m. In fancy new malls cashiers are bored and customers scarce. Perhaps a good tournament makes Qatar a top-tier destination for tourism and big events. If it does not, at least locals heading to al-Khor will never have to worry about beach traffic. ■

All the glitz without the spritz

Germany

It's logical

BERLIN AND WARSAW

Politics is slowly becoming more female-friendly

"A POLITICAL MAN IS disgusting, but a political woman is appalling…In history there are no more cruel phenomena than political women," wrote Richard Wagner to Franz Liszt, his fellow composer, about Ortrud, the sorceress in his opera "Lohengrin". Wagner was a misogynist and an anti-Semite as well as a musical genius, but he was not alone in his dislike of political women. Well into the 20th century, many Germans thought women should concern themselves only with "*Kinder, Küche, Kirche*" (children, kitchen, church).

Much has changed. Angela Merkel, Germany's first female chancellor, came to power in 2005 and stayed for 16 years. Yet German politics remains male-dominated (and the top echelons of business even more so). The proportion of members of the Bundestag (parliament) who are women has hovered at around a third for the past 24 years, though there are large discrepancies between the parties. More than half of Green MPs, for instance, are female; only 10% of the hard-right AfD's are.

Some Germans thought that the government that took charge late last year, a progressive coalition of Social Democrats, Greens and Free Democrats (FDP), might include more women. At the highest level, it is fractionally more female. Half of Chancellor Olaf Scholz's cabinet are women, up from seven women and nine men in Mrs Merkel's last—and most female—cabinet in 2018. The current line-up includes Annalena Baerbock (foreign affairs, pictured), Christine Lambrecht (defence), Nancy Faeser (home office) and Bettina Stark-Watzinger (education). Yet the female share of MPs, at 35%, is still only average for the European Union, where the figures range from 14% in Hungary to 47% in Sweden (see chart on next page).

The Social Democrats, the hard-left Linke and the Greens have quotas. At least 40% of their party posts are reserved for women, which includes at least 40% of places on party lists for seats in parliament and lower bodies that are allocated by proportional representation. The other parties do not have quotas, though in September the convention of the centre-right opposition Christian Democrats (CDU) approved a proposal to fill half of its party posts with women by 2025.

Parliament has become a bit more female than it was in the Merkel years. Under the last Merkel government 31% of MPs were women, compared with 35% now. And in some ways it is more diverse. It includes the first two transgender MPs, Tessa Ganserer and Nyke Slawik (who is only 28), both Greens. The number of Muslims has risen from two to eight. And for the first time a woman in a wheelchair was elected.

The Greens are the most welcoming party to women. The party was co-founded in 1980 by Petra Kelly, a feminist icon. The party has two co-chairs, one of each sex, and it has a record of giving women preferential treatment. Some suspect this helped Ms Baerbock beat a male rival, Robert Habeck, who is now vice-chancellor and the economy minister, to become the Green candidate for the chancellorship. (The decision was taken behind closed doors, so it is hard for outsiders to judge.) ▸▸

As the chancellor candidate, Ms Baerbock faced a tougher audience. She was derided for missteps such as embellishing her curriculum vitae and plagiarising parts of her book. She was a target of misogynistic abuse online; in one instance, her face was photoshopped onto a picture of a naked porn star. A tornado of fake news raged around her, some of it Russian-supplied. Breathless reports suggested that she wanted to ban pets because of their effect on the climate. She also received threats of violence. Though the virulence of the attacks on her was extreme, she is not alone in any of this. In a survey by Allensbach, a pollster, 98% of female federal politicians said they had been harassed online.

Ms Baerbock has bounced back fast. After her unfortunate campaign for the chancellorship she has surprised many with her competence and communication skills as Germany's foreign minister. On a recent trip to Warsaw she responded calmly when the populist Polish government demanded reparations of €1.3trn ($1.3trn) for the atrocities committed by Nazi Germany during the war.

Her style, too, is very different from Mrs Merkel's. Whereas Mrs Merkel preferred to be thought of simply as the chancellor, Ms Baerbock talks a lot about being a woman and a mother as well as a politician. She chooses to dress in a more feminine way. And she makes a point of promoting other women. Under her stewardship Germany's foreign ministry says it is pursuing a "feminist foreign policy", a label borrowed from Sweden (though the Swedes have abandoned it). The German version is still a work in progress, but is similarly focused on promoting the three Rs (rights, representation and resources) for women around the world.

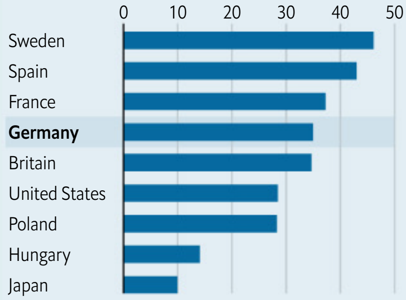
Ms Baerbock is, according to a recent poll, the politician in Germany that most of those surveyed were "content with", scoring 47%. (Only 34% were content with Mr Scholz.) She understands the power of style, the attractiveness of personal anecdotes in speeches and how to show emotion at the right moments. On the trip to Warsaw Ms Baerbock visited the cemetery of the Poles who died during an uprising against the Nazi occupiers in 1944. While holding the hand of Wanda Traczyk-Stawska, a 95-year-old survivor, she said that listening to the old lady "takes her breath away". She promised there and then to provide the €200,000 needed to maintain the cemetery for the long term.

In many ways, Ms Baerbock has had it easier than Mrs Merkel did. The former chancellor, an eastern German in a conservative party, was patronisingly dubbed "Kohl's girl", after Helmut Kohl, the then chancellor, called her *"mein Mädchen"* after he made her minister for women and youth in 1991, when she was 36. Even her nickname in later years, *Mutti* (mummy), was a shade condescending.

Less than equal

Women in parliament in lower house*

Selected countries, after last election, %



Sources: Inter-Parliamentary Union; Swedish Parliament

*Sweden and Hungary have unicameral parliaments

Towards the end of her long tenure Mrs Merkel was more willing to talk about being a woman. In her typically rational style she said in an interview in January 2019 that "parity [for women] in all areas seems logical to me. I don't need to constantly mention this specifically." She also explained that she does not like to call herself a feminist, because the true feminists for her are women like Marie Juchacz, who a century ago fought for women's right to vote in Germany.

It was a clever dodge. Mrs Merkel wanted to avoid the label "feminist", which for some German voters has undertones of "annoying" or "overbearing", while not offending those for whom it simply means treating women as human beings. Mrs Merkel was good at reading the popular mood. When she was first elected, Germany was perhaps not ready for a chancellor who used the "f" word. Today it may be. ■

Ukraine

Putin's cold war

MAKARIV

Keeping Ukraine from freezing this winter

A SMALL TOWN west of Kyiv, Makariv still wears the scars of the early days of Russia's invasion of Ukraine. In a bombed-out community centre in the middle of town, its façade blown off by an artillery strike, a local choir sings an Orthodox hymn. Misha, a boy of six, tours the wreckage of his old kindergarten, its floors lined with debris and scattered toys. Charred apartment blocks surround the scene. New problems compound old ones. Since early October, waves of Russian missiles and "kamikaze" drones have struck targets near Makariv, including an electric substation, triggering blackouts. Russia resumed its attacks on October 31st, firing more than 50 cruise missiles against Ukraine.

Makariv, like the rest of the country, is bracing for winter. The Russian attacks have become less effective. Thanks to new weapons supplies, Ukraine's army says that it has in recent days been able to shoot down all but a few of the missiles and Shahed-136 drones used by Russia. But the damage has been significant.

Around 40% of Ukraine's energy infrastructure has been impaired. The national power-grid operator, Ukrenergo, has had to impose rolling blackouts across the country. Ukrainians have been asked to scale back their consumption, both domestic and commercial. On October 31st, after the latest Russian assault, 80% of Kyiv's homes were left without water, though access has since been restored. By nightfall, much of the capital was pitch dark. The head of Naftogaz, the state energy company, recently told a German newspaper his country faced the "worst winter" in its history.

As cold weather begins to grip parts of Ukraine—the night-time temperature in Kyiv has been hovering around freezing—access to heat is also becoming a concern. Over 5m households, or a third of the total, and especially those in large cities, depend on district-heating systems installed by Soviet engineers decades ago. Plants, usually powered by natural gas, or less often by coal or wood, heat water, which is then pumped into homes through thousands of kilometres of pipes. For now the systems appear to be in good shape. Of the 22 provinces under Ukrainian control, 18 are fully prepared for the heating season, says Oleksiy Chernyshov, the development minister. The situation is worst in areas close to the front line, and in liberated areas of Donetsk, in the east. District heating in Kyiv started to kick into gear on October 7th, with schools, kindergartens and hospitals the first to receive heat.

But the systems remain vulnerable. Cities, which usually depend on a few large combined heat and power plants, are at higher risk than towns, which tend to rely on smaller and more numerous boiler houses. The Russians have attempted to destroy every one of Kyiv's main plants, says Kyrylo Tymoshenko, deputy head of Ukraine's presidential administration. Were they to succeed, most of the capital's 2m residents would risk going cold. Attacks on pipelines would also be highly disruptive, says Diana Korsakaite, of USAID's Energy Security Project. Damage to a primary pipe can easily cut off heat to tens of thousands of people. Cold temperatures can cause pipes that have been exposed by explosive damage to crack.

Nearly all heating plants in Ukraine run on natural gas, as do the 8m households ▸▸

which are not connected to district heating and rely on boilers instead. Supply, at least, should not be a problem. Ukraine has gas reserves of 14.5bn cubic metres (bcm), which ought to be enough to get through the winter. But cuts to power and water supplies can wreak havoc. District heating needs electricity to pump the water through the system, and to power the plants themselves. Most boilers also require an electrical supply.

Ukrainians, especially those living in private houses, are stocking up on firewood, power generators and electric heaters. The potbelly stove, known since Soviet times as the *burzhuyka*, has been making a comeback in the suburbs of Kyiv. About a tenth of Ukrainians used furnaces to heat their homes last year. That number is certain to rise. Mr Chernyshov says he has asked Western donors to provide 1,500 mobile thermal stations and 25,000 generators before winter, to be deployed in case of new Russian attacks. But these are yet to arrive, and may anyway not be enough.

Across Ukraine, engineers working to restore the heating and energy infrastructure targeted by the Russians are in a race against time, weather and missiles. Repairs to the 800,000 or so houses damaged or destroyed since the start of the war are also moving along, but cannot keep up with the devastation. Seven months after the Russians withdrew, scores of homes around Makariv remain uninhabitable, especially as winter approaches. “Every day”, says Vadym Tokar, the town’s mayor, “people ask me, ‘Where are my windows, where is my roof?’” The town does not have the money to pay for the necessary repairs, he says. The heating in Makariv is still working. But that does not count for much in houses without roofs. ■

Gathering winter fuel

Denmark election

Matching the right

COPENHAGEN

The Social Democrats hold on by copying right-wing policies

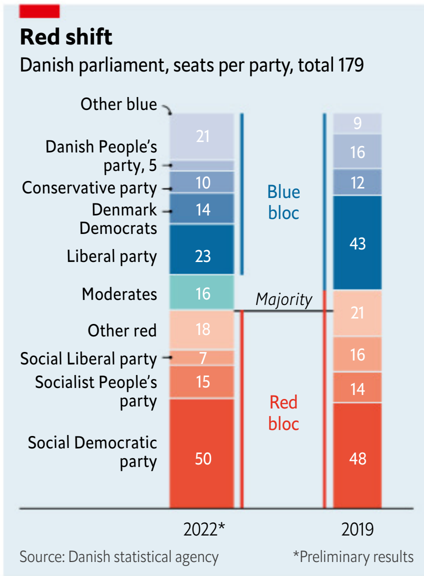
UNTIL CLOSE to midnight it looked like a bad day for Mette Fredriksen, Denmark’s prime minister. For months polls had shown growing restlessness among the 6m Danes, a general drift to the right and, with no fewer than 14 parties contesting the elections on November 1st, the prospect of protracted haggling to form a new governing coalition. But as final returns trickled in, the mood among her Social Democrats (SDP) turned triumphant.

Not only had Ms Fredriksen boosted her party’s share of votes (by a modest 1.6 points, to 27.5%), increasing its dominance of the cluster of left-leaning parties commonly known as the red bloc. The rival, right-leaning blue bloc had fragmented, as voters abandoned its traditional liberal and conservative factions in favour of upstart new parties.

Sweetest of all for Ms Fredriksen, perhaps, was the rout suffered by the Social Liberal (Radikale Venstre) party. Despite being an ally of the SDP within the red bloc, the smaller party had forced Ms Fredriksen into calling elections well before the end of her four-year term, by threatening to withdraw its support in a parliamentary confidence vote. This had been meant to censure the prime minister for her decision, as a safety measure early in the covid-19 pandemic, to order a cull of all 15m minks raised on Danish farms. Ruinous to the fur industry, the decree was later also judged an abuse of executive authority. The Danish electorate, however, decided not to punish Ms Fredriksen but to hit the Social Liberals at the polls. Their vote share dropped by more than half to just 3.8%.

Ms Fredriksen is now in pole position to once again form Denmark’s next government. With her reds holding a slight majority of the Folketing’s 179 seats, this could be an all-left coalition. More probable, says Ditte Sorensen of Taenketanken Europa, a policy-research group, is that the prime minister will use this base as a fallback, strengthening her hand to reach instead across the colour line that has defined Danish politics for the past three decades. Ms Fredriksen said as much during the campaign, asserting that a centrist coalition would be better placed to face Denmark’s many looming challenges, from rampaging inflation to the energy supply and the war in Ukraine.

One obvious partner would be the Moderate party of Lars Lokke Rasmussen. A former prime minister who last year quit the liberal Venstre party, long the core of the blue bloc, to form his own non-aligned platform, Mr Rasmussen has also called for a bridging coalition. His new party, the Moderates, won a respectable 16 seats, making it the third-largest in parliament and a potential king-maker. Having shrunk to 23 seats, the once-dominant Venstre party might now also be coaxed into a government led by the 50-seat SPD.



Since taking the helm of the SDP in 2015 and becoming Denmark’s youngest-ever prime minister in 2019, Ms Fredriksen has shown plenty of the flexibility—some would say lack of principle—needed to make such a coalition work. To counter conservative populists who called for radical curbs on immigration, especially of Muslims, her SDP simply adopted much of their platform. This co-opting of harsh rules, such as one that allows Danish authorities to confiscate the jewellery of desperate asylum-seekers, ostensibly to cover costs, has invited international opprobrium. But such get-tough measures proved so popular that other parties on the left have followed suit, even as the right-wing party that first raised a cry over immigration splintered into factions.

In contrast to neighbouring Sweden, whose anti-immigrant Swedish Democrats made big gains in recent elections, the issue has now slipped down the list of Danish concerns. “We had that Swedish election ten years ago,” says Ms Sorensen, noting that Ms Fredriksen’s SDP has now gingerly floated the idea of inviting foreign workers to plug staff shortages in sectors such as nursing. Another contrast to Sweden, reckons the analyst, is that instead of taking months after the election to form a new government, Ms Fredriksen is in such a sweet spot that she could wrap it up in a couple of weeks. ■

Turkey

Fake news and censorship

ISTANBUL

A harsh new "disinformation" law

TURKISH JOURNALISTS are used to working under political pressure. Now, the rest of the country is feeling it too. A new media law passed last month criminalises the sharing of "fake news", with punishments of up to three years in prison, and 18 months more if the news has been shared anonymously.

The government says that the law is necessary to fight the spread of disinformation on social-media platforms. Other countries, including Germany and America, are also considering legislation to hold the platforms to account. But opponents say that Turkey's law is aimed solely at chilling criticism of President Recep Tayyip Erdogan's regime, seven months ahead of elections that will be the toughest he has faced in his two decades in power.

"It is upside-down," said Taylan Yildiz, a former Silicon Valley tech worker and member of the opposition Iyi party. "The whole world is speaking about regulating social-media companies. But in Turkey the law targets individuals."

Turkey is already one of the world's biggest jailers of journalists and dissidents. Those imprisoned are usually accused of falling foul of broad anti-terror laws, or of insulting the president. Once-independent newspapers and television channels have been forcibly closed or sold to pro-Erdogan businessmen.

In recent years many ousted journalists have regrouped on social-media sites, podcasts and YouTube channels, where they find a wide audience: nine in ten Turks use at least one social-media platform. In 2020 the government passed a law requiring the biggest sites to appoint representatives in Turkey, who would be answerable in legal cases and to regulators' requests to remove content. Many platforms, including YouTube, Facebook and TikTok, have complied with this.

The new law extends the onus on the platforms to hand over information on users and broadens penalties for non-compliance, including throttling the bandwidth of sites. That means that social-media access could be severely limited by election day, although previous blocks on Wikipedia and Twitter meant little for tech-savvy Turks, who simply switched on their VPNs.

It is not only journalists who are worried about the new law. Independent economists and pollsters are concerned that they will be liable to prosecution when their findings contradict official data on inflation and public opinion. Private citizens are in the firing-line too—merely sharing or liking someone else's post can now lead to prosecution. An army of bureaucrats in the presidency's communications office combs through social media for critical content.

The irony, Turkish press unions say, is that the biggest producers of fake news are the pro-government outlets, which parrot official statements and run smear campaigns against opponents. One of the largest media groups is owned by relatives of the president.

"When the disinformation is coming from politicians, will they be prosecuted as journalists and citizens are? We know that the answer is 'no'," said Gokhan Durmus, the president of the Turkish Journalists' Union. "The government calls it the disinformation law, but from the start we have been saying it is a censorship law." ■

The French hard-right

The €9m question

PARIS

Renewed scrutiny of the links between Marine Le Pen's party and Russia

SANCTIONS ON RUSSIA "aren't working", declared Marine Le Pen (pictured) on October 4th; "moreover, they are sanctions on the French." If winter is difficult, said the leader of France's populist-nationalist National Rally (RN), it will "be the responsibility of those who took these decisions". As European resolve is tested by soaring inflation and energy prices, such arguments are worrying. They also bring fresh scrutiny of the RN's attitude—and links—to Russia.

Ms Le Pen condemned Russia's invasion of Ukraine, and called its massacre of civilians in Bucha in March "war crimes". Yet when she ran unsuccessfully for the presidency this year, a flyer for Ms Le Pen was briefly in circulation which showed her posing with Vladimir Putin in Moscow, printed before he sent tanks into Ukraine. In 2014 the RN, then the National Front (FN), borrowed €9m ($9m) from the First Czech Russian Bank, based in Moscow, to finance its electoral campaigns. During a presidential debate in April Emmanuel Macron declared bluntly: "When you talk about Russia, you are talking about your banker."

Nothing to worry about

On October 27th a French television documentary tracked down Jean-Luc Schaffhauser, a former FN MEP, who says he negotiated the loan in 2014 after other banks turned the party down. He said it came with "no conditions", but would not have been granted without the Kremlin's approval. "The interest for the Russians was to find Western allies," he said. "The United States backs all our leaders in Europe, most of them anti-Russian; so it is logical for Russia to manage its interests too."

Three days earlier *Le Monde* reported that the Paris prosecutor is investigating a group called Franco-Russian Dialogue and two of its members, Thierry Mariani, an RN MEP and former centre-right minister, and Yves Pozzo di Borgo, a former senator, for alleged influence-peddling. A regular visitor to Russia, Mr Mariani has long defended the Kremlin, including the annexation of Crimea. Last year the European Parliament banned him, and four other RN MEPs, from official election-monitoring after Mr Mariani went in 2020 as an "international expert" to observe voting in Crimea.

Contacted by *The Economist*, Mr Mariani said he learned of the judicial inquiry in *Le Monde*, declares his trips to Russia, and rejects any allegation of wrongdoing. He described the current mood as a form of "McCarthyism". Mr Pozzo di Borgo said he does not reply to journalists. Jean-Philippe Tanguy, an RN MP and deputy head of Ms Le Pen's presidential campaign, rejects all accusations of Russian influence on the party. In the latest twist, Mr Tanguy has called for a parliamentary commission into foreign interference in French party politics—in the hope, he insists, of clearing the RN's name.

Industrial action

A winter of walkouts

If strikes spread to the NHS, things could get very bad

When Rachel (not her real name), a nurse in Leeds, told her father she had voted to strike, he told her she mustn't: it would be unethical. She responded, she says, "with two words". A nurse for 27 years, she earns "not well" but better than some. Yet her job, which she used to love, has become intolerable. Every week she works for at least 15 hours more than she is paid for, working through the "massive" waiting list that built up in the National Health Service (NHS) due to the pandemic.

She has always worked more hours than she is paid, she says, and used to think little of it. But during the pandemic her department was closed and she was re-deployed trying to keep covid-19 patients out of hospital. Long days meant she was absent from home when her children were off school. Several members of her team left. They have not yet been replaced—whether that is down to nursing shortages or money-saving, she isn't sure. Soaring energy bills have her worried for her own finances. "I never, ever thought I would contemplate striking," she says.

Britain is facing a winter of strikes. They began on the railways: having launched the biggest wave of industrial action in decades this summer, the RMT rail union will hold more strikes on several days in early November. Train strikes are aggravating, but they are not as disruptive as they would have been before working from home became widespread. And they are nothing compared with the chaos that may follow if large chunks of the public sector decide to go on strike.

Last month, for the first time in its history, the Royal College of Nursing began balloting its members on whether they wanted to take industrial action (the ballot closed on November 2nd). Unison's ballot of its 400,000 health-care-worker members closes on November 25th. The Royal College of Midwives will launch one on November 11th. The GMB union is balloting more than 15,000 ambulance workers.

Teachers, too, are considering industrial action. The main teachers' unions have been followed for the first time in balloting their members by the National Association of Head Teachers. In education, as in health care, workers often mention guilt when talking about striking. Some teachers say they feel less anxious about it if they know their bosses agree with their cause. Last month, the University and College Union said overwhelming support for strike action meant more than 70,000 staff at 150 institutions could soon walk out. In a blow for retailers, Royal Mail workers said on November 1st that they will strike on November 25th (Black Friday) and November 28th (Cyber Monday).

Fears of widespread disruption—and worse—have been heightened by unions' calls for co-ordinated action. At the annual conference of the Trades Union Congress (TUC) in October, several unions passed a motion calling for synchronised strikes, which can mean holding them on the same day. That partly reflects unions' reduced power. The proportion of the workforce ▸▸

represented by them has fallen from around 50% in 1979 to 23% today (it is higher in the public sector). “Fewer members can make more noise if they act together,” says Jane Holgate, a professor of employment relations at the University of Leeds.

Unions’ chief demand is a pay rise to reflect inflation, which matched a 40-year high of 10.1% in September. Network Rail has offered an 8% pay rise over two years, which the RMT has dismissed as a “paltry sum”. The government has offered a rise averaging 4.8% to nurses, which the Royal College of Nursing calls a “disgrace”, and around 5% to teachers.

Better pay offers are less likely now that the government is scrambling to patch up the public finances. But even if they materialise, a single pay round does not explain the deepening discontent. Britons are adjusting to the fact that they are poorer than they thought, because of slow growth and rising bills. The RMT is fighting for job security and working conditions as big cuts to Britain’s railway budget loom. Universities are protesting against cuts to pensions. Individual workers have their own reasons for feeling angry which may not relate directly to pay. Kate Greenstock, a midwife, says she is prepared to join in a “safely handled strike” to protest about an exodus of experienced midwives from the profession in search of less stressful jobs.

Many of those who are voting to strike this winter still feel battered by the pandemic. While plenty of higher earners worked from home, it was chiefly lower-paid employees who kept travelling into work, often risking their health. To have gone through that and now be unable to pay the bills seems too much for many.

The effect of widespread strikes, in the NHS at least, could be very bad indeed. Figures published by the health service this summer revealed a nursing shortage of 46,828, meaning nearly 12% of nursing jobs were unfilled. Hospital staff in particular are becoming nervous. A doctor at Guy’s and St Thomas’s in London says the hospital is already cancelling operations. “Striking...I wouldn’t blame them,” he says of nurses. “But it’s very worrying.”

A winter of discontent would pose hard questions for both of the main political parties. At the TUC conference last month, union bosses demanded that Sir Keir Starmer, the Labour leader, show more support for striking workers. He had infuriated them in the summer by sacking a shadow transport minister who showed up on a picket line with RMT workers. At the conference Sir Keir vowed to tear up the Trade Union Act of 2016, which made it harder to organise industrial action, and said he backed the right to strike “unequivocally”. But he suggested he wouldn’t alter his stance on MPs and picket lines. Public sympathy for strikers can be contingent.

The government, meanwhile, seems unlikely to say anything that nurses, teachers or others want to hear. To help balance the books, the Treasury is reportedly mulling pay rises of just 2% across the public sector next year. During the Tory leadership campaign in the summer Mr Sunak said he would force transport companies to maintain a minimum level of service during a strike. That would enrage all unions, says Paul Novak, the incoming general secretary of the TUC. “They’d see it as the thin edge of the wedge.”

The health service is likely to prove the biggest headache for the government. Polling suggests that most Britons would back nurses if they went on strike (they are less supportive of other professions, including teachers, walking out). On October 28th, touring Croydon University Hospital, Rishi Sunak crouched down beside an elderly patient, hoping for a cosy on-camera chat. When the new prime minister asked whether staff had looked after her “really nicely” she replied: “They always do. It’s a pity you don’t pay them more.” ■

Cyber-security

Convenience v comfort

Why government ministers don’t stick to the rules on technology

CONVERSATION IS THE lifeblood of politics. Modern communication technologies make it easy to carry on multiple conversations. But convenience comes at a cost to cyber-security, as two recent episodes from the top of the British government show.

The first involves Liz Truss. On October 30th the *Mail on Sunday* reported that Ms Truss’s personal phone had been hacked during her tenure as foreign secretary; it said that unknown attackers made off with up to a year’s worth of messages, including discussions about arms for Ukraine and gossip about Boris Johnson. The government has neither confirmed nor denied the claims.

A similar attack on a government-issued phone would have been more difficult. But those phones are cumbersome to use. They come with long passwords that must be entered every time they are picked up; you cannot install apps you need to use without the permission of the IT department; their chat apps tend to be configured with tedious two-factor authentication. And, importantly, the daily chatter with political colleagues is not on that phone. It’s a pain to have two devices.

L.T. home phone

The second incident involves Suella Braverman. She resigned from her position as home secretary in Ms Truss’s short-lived government on October 19th, after it emerged that she had used her personal email address to handle draft documents on immigration policy. Official guidelines advise against using personal IT for government business where it is not reasonable to do so. (Ms Braverman is now back in the same job, reappointed by Rishi Sunak, and no less controversial; see Bagehot.)

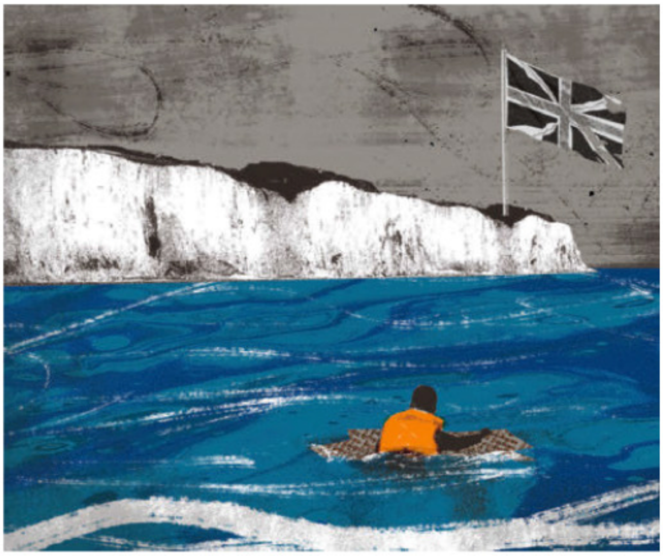
Again, convenience explains a lot. According to Ms Braverman’s own account, published on October 31st, she found herself in a car without her work phone, and so resorted to her personal email address to forward the documents. On other occasions she forwarded official documents to her personal device so that she could refer to them while doing video calls on her official phone.

There are heavy-duty ways to mitigate security risks. The Americans coined the term “SCIF“ (sensitive compartmented information facility) for rooms that are designed to be impenetrable to electronic snooping. The room in which the British cabinet meets is a SCIF; government ministers could even have SCIFs in their homes, if space allowed.

The real problem is behavioural, as anyone in an IT team can attest. Security protocols are tedious. Powerful folk tend to think that their time outweighs whatever risk the nerds fret about. They are wrong. Using their work phones for work is both the least and the most important thing that officials can do.

Bagehot | Why small boats are a big problem

A crisis in the Channel is disturbing for every part of the political spectrum



On Saturday October 29th, 990 people set off in 24 dinghies from continental Europe to make the short, dangerous voyage across the English Channel to beaches on Britain's Kent coast. The day after, another 468 arrived, crammed onto eight boats. That same day a terrorist, who had gorged on far-right memes about the country being overrun by immigrants, threw a series of petrol bombs at a migrant-processing centre in Dover. In Parliament on the day after that, Suella Braverman, the home secretary, labelled the people arriving on British shores an "invasion", triggering outrage from critics and support from backbench Conservative MPs waving dictionary definitions of the term.

These were perhaps the most depressing few days in a crisis that has evolved from a curiosity into a political nightmare. Since the start of the year, 38,000 people have made the trip across the world's busiest shipping lane, the maritime equivalent of sprinting across a motorway. Small boats pose an intractable problem for every part of the political spectrum. They reveal a miserable tale of incompetence, cruelty and complacency.

The crisis is most humiliating for the government. Politicians such as Ms Braverman have repeatedly pledged an era of stronger borders, lower immigration and more sovereignty. They have achieved the opposite. As a member of the EU, Britain had the right to deport asylum-seekers if they had previously been registered in another of the bloc's member states. But Britain left the scheme when it left the club. Instead it tried to recreate a harebrained version, paying Rwanda to accept asylum-seekers on its behalf. The courts have so far stymied this idea. In short, the government replaced a scheme that was practical, moral and legal with one that is impractical, immoral and probably illegal.

In a slapstick version of geopolitics, the Conservative Party's attempt to boost British sovereignty has instead left the country entirely reliant on its neighbour. When it comes to small boats, Britain is the *demandeur*. France has to be sweet-talked, cajoled and bribed into helping solve the problem of breaking up sophisticated smuggling networks and, ultimately, of keeping in France people who do not want to remain in France. Rather than being a sovereign, Britain is a supplicant.

The small-boats crisis caps off a decade of failure by the Conservatives when it comes to the numbers of immigrants, too. At each of the past four elections, the Tories have promised lower immigration. At each election, a plurality of voters has backed them. Yet immigration has not fallen. Instead, the Tories have ended up mimicking New Labour. Under Sir Tony Blair, Labour combined a liberal immigration policy, welcoming people from EU member states in central Europe and beyond, with performative cruelty designed to deter asylum-seekers. This government has done something similar, liberalising the rules for skilled migrants while cramming 23-year-olds from Afghanistan into crowded facilities.

The government's decisions are increasingly treated in the same way as the weather. Rather than an active choice, they are cast as a fact of life. Asylum policy is no exception. That it took 449 days to process an asylum claim in 2020, compared with the 233 days it took in 2017, is discussed in the same way people complain about a tree in their garden being blown over. Britain once aimed to handle such decisions in six months. It scrapped the target in 2019. Since then the backlog has ballooned from under 40,000 to over 100,000. How unfortunate. Oh well.

If small boats demonstrate the incompetence and cruelty of the right, they also show up the complacency of the left. For a country of 67m, runs the argument, some 40,000 people turning up on its shores should be little problem. It is a small number in the scheme of things. Except this same line was deployed, almost exactly, when only a few hundred people made the trip in 2018. That year, the arrival of under 100 people in a few days forced the home secretary at the time back from holiday. It was possible to dismiss the reaction then as hysteria. Now? Not so much.

Back then most people were—in a phrase that causes liberals to wince—genuine asylum-seekers. Until this year, about two-thirds of those who arrived on small boats qualified for asylum. But this ratio may be shifting. Dan O'Mahoney, the grandly titled Clandestine Channel Threat Commander responsible for monitoring small boats, estimates that about half of the arrivals now are truly seeking refuge. It is a waste of talent to prevent real asylum-seekers from working while their claims are processed; by the same token it is necessary to skim off those who abuse the rules.

Muddled masses

Proposed solutions to the crisis abound. Some think-tanks emphasise co-operative ideas. Britain could forge a new agreement with the EU, which would include some sort of deal on responsibility for asylum-seekers. A proper system of identity cards in Britain would meanwhile reduce the allure of the country's black market for labour, and so stem the flow. Hardliners propose tougher options, in which arrivals are imprisoned on cruise ships, breaking asylum law in the process.

Each resembles the old joke about an economist stuck on a desert island with a tin of food but no can-opener. Their solution? "First, assume a can-opener..." Every solution is impractical in its own way. Britain is unwilling to embrace genuinely liberal solutions to mitigate suffering, nor is it inclined to reshape its relationship with Brussels. The government is thwarted from ditching its international obligations, as the failure of the Rwanda scheme attests. The result is paralysis, misery and, inevitably, death.

As winter looms the seas will turn choppier. Sometimes 60 people are crammed into a boat designed for a fifth of that number. Last November 27 people drowned in a single incident. Another such tragedy is bound to happen. It will discomfort every wing of British politics. But it will be far worse for those on the boats. ■

Food and geopolitics

Bread-blocking bandits

KYIV, MOGADISHU AND RIO DE JANEIRO

Men with guns aggravate global hunger

At first glance, Vladimir Putin has little in common with an Ethiopian footsoldier. One man has palaces and nuclear weapons, the other a shack and an old Kalashnikov. Yet both illustrate a global problem: that food supplies are often disrupted by men with guns.

On October 29th Russia said it was suspending its participation in a deal to allow Ukraine to export grain by sea. The foreign ministry said Russia could "no longer guarantee the safety of civilian dry-cargo ships" leaving Ukrainian ports. Since the only threat to such ships is Russia itself, the meaning was plain. Global wheat prices jumped by 6% on October 31st, the first trading day after the announcement.

On the same day, however, Turkey, Ukraine and the UN organised a convoy of 12 grain ships from the Ukrainian port of Odessa to the safety of Turkish waters. Russia did not fire on them, and on November 2nd it became clear its bluff had been called: Mr Putin said he would allow grain shipments to resume. The world breathed a sigh of relief. Diplomats congratulated themselves for resisting the Russian despot's blackmail.

But the saga illustrated an uncomfortable truth. The global food supply is vulnerable to men with guns. Indeed, of the 828m people who do not get enough food, nearly 60% live in countries racked by conflict. Armed violence is the single greatest obstacle to ending hunger, says the UN's World Food Programme.

Start with the Ukraine grain deal, which may have won only a temporary reprieve. Turkey and the UN are feverishly trying to persuade Russia to extend the agreement, which lasts until November 19th, for another four months. So far they have failed.

The deal has always been "one rocket away from termination", says Joseph Glauber of the International Food Policy Research Institute (IFPRI), a think-tank in Washington. Mr Putin's excuse for suspending it was risible: Ukraine had attacked some Russian warships in Crimea, an occupied part of Ukraine. That an invaded country might shoot at the invaders' navy is hardly surprising, yet Mr Putin professed to be outraged. He also complained that much of the grain from Ukraine was going to rich countries rather than poor ones. This too, was disingenuous. Since grain markets are global, any extra supply reduces prices for everyone.

Guns or butter

The deal's fragility matters because it has done a lot of good. Between early August and late October Ukraine shipped 9.3m tonnes of grain across the Black Sea, helping to ease painfully high global food prices. In normal years, Ukraine is a huge supplier of calories. Last year it provided 10%, 14% and 47%, respectively, of global exports of wheat, maize and sunflower oil. It usually ships 95% of these through its ports on the Black Sea. Roads, rail and river are dismal alternatives: Ukraine's total exports of grain fell from 5m tonnes in February to 1.4m tonnes in March, after Russia invaded. By last month, the deal allowed 4.2m tonnes to flow through the Black Sea route alone. Keeping it open is essential.

Other rogue regimes have weaponised food even more directly than Russia does. In Mekelle, the capital of Tigray, streets are filled with hungry women and children. The price of the local staple, teff, is three times higher than in other parts of Ethiopia. Hundreds of thousands are starving. "People ask for food everywhere," says a doctor at the region's main hospital. "Tigray is hell on earth," says the head of the Tigray Development Association, an NGO.

Tigray has been fighting for more autonomy, and the Ethiopian government has been trying to thwart it. On November 2nd the two sides signed a ceasefire. Locals dare to hope this will mean that deliveries of food aid, which the government blocked to starve out the rebels, will resume. But they have been disappointed before. Meanwhile Eritrean forces, which are allied with Ethiopia's government, have reportedly been looting and burning crops. A video recently shared online appears to show Ethiopian troops looting trucks carrying bags of food aid.

Global hunger has many causes, from poverty (recently exacerbated by covid-19) to drought (made more common by climate change). All these are made worse by war. Of the ten countries with the largest absolute numbers of acutely hungry people, all but Sri Lanka are conflict-riven (and Sri Lanka has seen huge riots).

In Somalia the government is not trying to stop food from reaching citizens, but local terrorists are. Al-Shabab, a jihadist group linked to al-Qaeda, controls great swathes of the country. A "gentlemanly agreement" with aid agencies once allowed at least some aid to cross front lines, says an adviser to Somalia's president, Hassan Sheikh Mohamud. But these days al-Shabab blocks almost all aid from entering its territory. That includes much of Somalia's best farmland, which is enduring its worst drought in four decades.

Sometimes, the jihadists steal the food. "The strategy is: if we can get hold of this food, we can make money. And if we can make money off food, we can buy more guns," explains Donal Brown of the International Fund for Agricultural Development, another UN agency. In September al-Shabab blew up an aid convoy, killing at least 20 civilians. Aid workers are scared to travel anywhere near jihadist turf.

In recent weeks government forces and local clan militias have won back scores of districts from al-Shabab (see Middle East & Africa section). In principle, this is good news for the 41% of Somalis who are acutely hungry. But as al-Shabab is weakened it becomes more desperate, preying more viciously on locals and stealing their livestock and crops. As its fighters have retreated, they have blown up wells. And the clan militias driving back the jihadists are also obstreperous men with guns. They are "yet another actor to negotiate with", sighs a UN official.

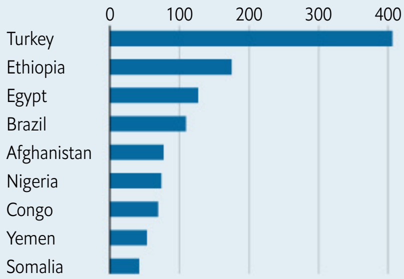
"Farmers need peace to produce," says David Laborde of IFPRI. Where war rages, fields are burned, cattle are slaughtered and farmers are drafted. Armies grab fuel, leaving little to power tractors and irrigation systems. Roads become hazardous. In Congo, where dozens of armed groups plunder and rape, local women "might not want to walk five minutes down the road to sell [their] food", observes Mr Laborde.

Elsewhere, conflict has simply brought food production to a halt. In parts of the Sahel, including northern Nigeria and Chad, jihadists terrorise farmers so they will flee to cities and destabilise the government. "They attack and kill you if you're in your

A cost-of-eating crisis 1

Food prices*, % increase Jan 2020-Oct 2022

Selected countries, local currency



*Weighted by consumption of maize, palm oil, rapeseed oil, rice, soyabean oil, soyabeans, sunflower oil and wheat

Source: Gro Intelligence

fields," says Mr Brown. "They want the whole place to fall apart," he adds—so they can take over.

Afghan farmers have endured many conflicts in recent years. Many were forced off their land by fighting between an elected, American-backed government and the Taliban, a jihadist group. Those who could grow food struggled to profit from it, says Ibraheem Bahiss of Crisis Group, a think-tank. On the way to market, they would be "taxed" at a government checkpoint and then robbed again by Taliban fighters a few kilometres down the road.

Since the American withdrawal in August 2021, the guns have largely fallen silent—because the men who wielded them most effectively are now in charge. The Taliban bar women from travelling without a chaperone, making it harder for families to buy or sell food. Soaring diesel prices add to their woes. In mobile-phone surveys of Afghan households conducted in July by the World Food Programme (WFP), a third said they had trouble getting to markets in the previous fortnight.

The rule of gunmen breeds uncertainty. A farmer in Afghanistan's Takhar province says the old government's soldiers grabbed his land a few years ago. The Taliban gave it back to him and he planted wheat. But then fuel and fertiliser prices rocketed, because of the war in Ukraine. And in September the Taliban signed a provisional deal for cheap wheat with Afghanistan's fellow pariah state, Russia. This caused the value of his produce in local markets to plummet.

Today roughly 90% of Afghans are hungry. A doctor in Kabul, the capital, says he is treating a growing number of patients with ailments caused by poor nutrition, such as anaemia and tuberculosis, and that the number of undernourished babies showing up at clinics is rising fast.

All bread-blocking bandits share a similar moral code: might makes right and fussing about malnourished infants is for the weak. But only Mr Putin is powerful enough to aggravate hunger on a global scale. Despite this week's climbdown, his warmongering affects the world's food supply by making it harder to grow food in Ukraine, by imperilling its delivery and by raising global prices for hydrocarbons, which are used both to transport food and to make fertiliser. Mr Putin's vanity war sends ripples of pain around the world.

Russian rations

It is a terrible time for disruptions. Ukraine is hoping to start shipping the 20m tonnes of wheat it harvested over the summer. Big importers in north Africa and the Middle East have exhausted their own harvests and need to restock. The countries that most need Ukrainian exports, such as Egypt, Lebanon, Sudan and Yemen, have restive populations who may take to the streets if bread becomes unaffordable. Food-price inflation is an explosive grievance in Turkey, which holds an election next year. The WFP usually relies on Ukraine for half the wheat it distributes to the needy elsewhere.

If the Black Sea deal is not extended, Uk-

Swords v ploughshares

Countries with serious conflict*, Jan 2020-Oct 2022, by level of food insecurity

Sources: ACLED; World Food Programme

*More than 500 fatalities from conflict including explosions, violence against civilians, non-violent protests and riots †More than 20% of the population with an insufficient diet: almost no meat or dairy and only intermittent beans raine could in theory export more grain by alternative routes than was feasible before July. Carlos Mera of Rabobank, a Dutch lender, reckons the country could now move 3m tonnes a month by rail and 2m tonnes by road or river. But Russia is intent on wrecking Ukraine's civilian infrastructure with missiles and suicide drones. Grain that was once shifted from plough to port by automated logistical systems might have to be moved in tiny batches. That could raise transport costs from $3-5 a tonne to $50 or more.

Mykola Solsky, Ukraine's agriculture minister, recently estimated that Ukrainian farmers, with too little water, too few hands and too many unexploded shells in their fields, would sow 20% less wheat this autumn than they had planned. Now soaring costs, dwindling revenue and uncertainty over export capacity may prompt them to plant fewer spring crops.

Other breadbaskets could perhaps export more. This year Australia had its biggest wheat crop ever (36m tonnes, up from 33m in 2021) and Russia a record summer grain harvest (yielding 94m tonnes, 10m more than the previous record in 2018). For several months Russia's wheat exports were a little slow, partly because ships crossing the Black Sea, close to the fighting, struggled to get insurance (the country's food trade is not subject to Western sanctions). In October, however, they boomed. Meanwhile America and Europe reported less disastrous harvests than feared; Brazil and India, not usually big wheat exporters, managed to sell some of their crops abroad.

All this has helped restrain global prices (though they remain much higher than in 2021). But next year this mix of lucky weather and damage control looks unlikely to repeat itself. Russia may not see another whopping crop. America and Europe are still getting too little rain, which may reduce the yield of the wheat that has just been planted. In Argentina, the biggest wheat exporter in the southern hemisphere, drought is forecast to cut the next harvest from a projected 20m tonnes to 13.7m. Floods and a lack of port capacity will make it hard for Australia to export much more.

Mr Putin's war has also made fertiliser costlier, by raising the price of natural gas, a key input. Fertiliser is 2.5 times as expensive as in early 2020, according to CRU, a consultancy. During the first half of the year Europe's fertiliser industry worked at 30% capacity.

Farmers in rich countries have coped by using old stocks of fertiliser, or skipping some applications not vital to near-term productivity. Next year they may simply decide to use less, reckons Seth Meyer of America's Department of Agriculture. That could hurt yields. Many poorer countries

Seafood diet
Ukraine, grain exports*, m tonnes

Sources: IFPRI; UN

*Includes barley, maize and wheat
†Data available from August 2022

have already run out of fertiliser. In Colombia and Peru, governments have sought to calm rural unrest by subsidising the stuff. Gro Intelligence, a data firm, calculates that the projected reductions in nitrogen applications next season could result in a loss of production of wheat, maize, soyabeans and rice of up to 216trn calories worldwide—enough to feed 240m adult males for a year.

When supply cannot grow, demand must adjust. Many people are eating less meat, milk and cheese, which are pricey. Demand for biofuel made from maize and soyabeans has also fallen. But wheat demand is not contracting, partly because so many governments subsidise it. In much of north Africa and the Middle East people see cheap loaves as a birthright, or at least as a small compensation for having oppressive governments. Drought-stricken local harvests mean such countries will import more this season.

The result is that, for a third year in a row, the world will consume more grain than it produces. More concerning still, stocks held by big exporters have been dwindling for years because of bad harvests. In Russia and Ukraine, grain that cannot get out may pile up. But elsewhere the stock-to-use ratio of exporters is projected to fall from 22% in 2019 to less than 12% in 2023 and 11% in 2024.

To bring stocks back to reassuring levels, the world needs several bumper harvests in a row. Instead, says Jean-François Lambert, a commodities consultant, expensive energy, scarce water and war have sown the seeds for a "structural food deficit". The total production of cereals and of animals that feed on them could durably fall short of the world's needs.

In importing countries, food-price inflation will be amplified by the strength of the American dollar, in which many commodities are priced. For now these countries are still buying. This year Egypt, the world's biggest importer of wheat—most of which it usually buys from Russia and Ukraine—has run aggressive tenders, trying to secure enough grain. How long that can last is unclear. Governments in several countries may have to choose between subsidies they cannot afford or food-price inflation that provokes riots.

Just as violence fosters high food prices, high food prices can foster violence. In June *The Economist* built a statistical model of unrest, and found that food (and fuel) prices were a good predictor of it. Back then we estimated that outbreaks of unrest—as recorded by ACLED, a global research project—would double in many countries in the year to come. So far that has happened in 17 countries (comparing levels since June with those in the same period of 2021). The biggest rise has been in poor countries, where unrest is up 39%, compared with 5% across all countries.

Even if the current hunger crisis only lasts for a year, the consequences will be felt far longer. A short spell of malnutrition can stunt young bodies and brains. The World Bank says that the share of ten-year-olds in poor and middle-income countries unable to read a simple text has increased from 57% in 2019 to an estimated 70% this year. The pandemic and hunger are probably the main causes.

In Brazil, a middle-income country, the proportion of people who sometimes go hungry has jumped from 9% at the end of 2020 to 15%, or 33m people, according to the Brazilian Research Network on Food and Nutrition Sovereignty and Security, a non-profit group. As a result, "we see a lot of kids who are not developing properly," says Rodrigo Afonso, the boss of Ação da Cidadania, a charity. "If you don't feed a kid, for the rest of his life he is going to be underdeveloped, physically and mentally."

That may be among the worst legacies of Mr Putin's senseless war. Millions of children worldwide will grow up to be less intelligent, and thus lead poorer and less productive lives. ■

Corporate structures

The new conglomerates

Big tech and private equity are suffering from an old disease

CONGLOMERATES COULD hardly be less fashionable. The diversified industrial empires of old are taught as case-studies in underperformance, misaligned management incentives and poor capital allocation. Bosses fear that a "conglomerate discount"—the difference between the market value of a firm and the hypothetical value of its constituent parts—will invite activist investors to agitate for divestments. Focus is now the idée fixe of industrial organisation.

Few were surprised when General Electric (GE), a poster-child for expansion-induced destruction of shareholder wealth, announced plans to break in three in November 2021. This unravelling, which is likely to be completed in 2024, is far from novel. Johnson & Johnson, 3M and Kellogg are all in the middle of breaking up. Germany's Thyssenkrupp and Siemens have both recently completed hulking divestitures. Toshiba, a Japanese industrial giant, narrowly avoided a breakup earlier this year. The conglomerate has proved more resilient in the developing world. But even there some empires are under attack. In China, for example, Fosun, an acquisitive globetrotting group, is hawking off assets in order to tackle its crippling debt pile (see article on subsequent page).

Even as some old strains of conglomeritis are in remission, however, new ones have emerged. Public and private markets have put their faith—and capital—in sprawling empires built around the twin engines that have propelled the modern economy over the past few decades: digital technology and cheap debt. A fifth of the market value of the S&P 500 index of big American firms sits in five giant technology companies—Alphabet, Amazon, Apple, Meta and Microsoft—which have spent a part of their profits chasing diversification (see chart 1 on next page). Simultaneously, low interest rates and an explosion in the assets managed by private-equity firms such as Apollo, Blackstone and KKR have created vast and diversified investment portfolios of controlling interests in firms: buy-out barons spent more than $1.1trn globally in 2021 alone.

Tech CEOs bristle at any mention of the c-word. Their diversification is fuelled by the logic and profitability of the digital economy, they insist, not by the desire to manage a balanced portfolio of distinct subsidiaries as in old-school conglomerates. Engineering clout and access to data provide economies of scale and scope in product development; demand-side synergies emerge from bundling and "digital ecosystems". Bosses at ITT, once among the largest diversified American conglomerates, encouraged employees and suppliers to rent cars from Avis, one of its divisions. The links between products at big-tech firms are far stronger: Apple's watches and earphones, as well as its TV series and playlists, are part of the iPhone ecosystem; shopping for kale and kombucha at Whole Foods is cheaper if you join Prime, Amazon's membership programme. ▸

→ Also in this section

Look closer, though, and similarities abound. Huge profits from tech firms' core businesses have funded a giant land-grab. Amazon's dominant position in cloud computing, initially intended to support its e-commerce marketplace, now contributes the lion's share of profits and bankrolls big bets in entertainment (like the $8.5bn acquisition of MGM, owner of the James Bond franchise), health (a $3.9bn deal to buy One Medical, a provider of primary care) and space (Amazon plans to invest more than $10bn in its Kuiper satellites). Alphabet's lucrative search-ad and YouTube businesses subsidise a loss-making cloud operation and a moonshot unit, which together lost more than $2bn in the most recent quarter. The result is that big tech firms now compete across multiple industries, largely with each other.

Private-equity firms, too, have come to resemble the sprawling groups they once dismantled. Low interest rates created alternative-investment behemoths managing trillions of dollars in privately held equity, credit, property and infrastructure assets. Attempts to raise sources of permanent capital invite comparisons to Berkshire Hathaway, Warren Buffett's $640bn diversified holding company. The financial groups' buy-out arms are vast pools of capital invested across multiple sectors: the portfolio companies of Apollo employ more than twice as many workers as GE.

Now the magic is fading for the new conglomerates. It is financial engineering, not operating know-how, which has juiced private-equity returns. According to a study by Bain, a consultancy, expanding margins accounted for only 6% of private-equity value-creation during the past five years. Leveraged buy-outs struck at high valuations will hurt returns for some big funds. In the absence of cheap money, dealmakers will either sit on their piles of dry-powder or try their luck as judicious conglomerate-managers capable of striking bargains and nurturing businesses. Most will struggle with this transition.

Ever-bigger tech
Big-five tech companies*
Market capitalisation as % of S&P 500

1

Source: Refinitiv Datastream
*Alphabet, Amazon, Apple, Meta and Microsoft

Capital deformation
Big-five tech companies*
Aggregate cash return on capital employed, %

2

Source: Bloomberg
*Alphabet, Amazon, Apple, Meta and Microsoft

The true extent of private-equity firms' problems may remain cloudy for a while. But the reckoning will come, because their funds are by design time-limited. Eventually, the funds' managers will be forced to sell the assets and return cash to investors. Underperformers will find themselves unable to raise new funds.

Big-tech bosses face no such automatic disciplining mechanism. So long as the companies' core businesses printed money, investors humoured their side hussles and tolerated declining returns on capital at some firms. In aggregate for the big five this has fallen by more than half over the past five years (see chart 2).

As tech firms' profit engines come under pressure—advertising and cloud-computing profits are facing cyclical headwinds and increased competition—investors are questioning the logic of the firms' portfolios, says Emilie Feldman of the Wharton School of the University of Pennsylvania. The shares of Alphabet, Amazon and Meta have all lost more than 10% of their value since the companies' latest quarterly reports in late October. Mark Zuckerberg, founder and chief executive of Meta, got an earful from investors about money-losing moonshots and bloated, costly workforces. His opposite numbers at Alphabet and Amazon, Sundar Pichai and Andy Jassy, could face similar treatment soon enough.

As hired guns, Messrs Pichai and Jassy wield little formal power over their boards. That may yet make them receptive to calls for greater focus. Mr Zuckerberg, who lords it over Meta thanks to dual-class shares, seems deaf to investors' wails. He wants to keep spending perhaps $15bn a year to expand his digital domain to the metaverse. As symptoms of conglomeritis go, none is more classic than an unaccountable boss with empire-building ambitions. ■

Technology

Bad tech

Despite superficial differences, popular digital business models share key flaws

WHEN EVAN SPIEGEL, boss of Snap, wrote in a leaked memo that the social-media firm had been "punched in the face hard by 2022's new economic reality", he might as well have been describing America's digital darlings as a whole. After a multi-year bull run, the sector is suffering a sharp correction. The NASDAQ index, home to many consumer-internet companies, has fallen by over 30% in the past 12 months; the Dow Jones Industrial Average, made up of less techie firms, is down by around 10%. Crunchbase, a data provider, estimates that American tech has already shed more than 45,000 jobs this year.

Macroeconomics is partly to blame. Soaring inflation and rising mortgage repayments are leading consumers to cut back on discretionary spending—and most digital offerings are discretionary. Even the industry's trillion-dollar giants have not been spared, despite continuing to rake in handsome profits. Alphabet, Amazon, Apple and Microsoft have collectively lost $2trn in market value in the past year.

If you think big tech has it bad, spare a thought for the not-so-big tech. In particular, three business models embraced by firms born after the dotcom crash of 2001—and subsequently by investors—are losing steam: the movers (which shuttle people or things around cities), the streamers (which offer music and TV online) and the creepers (which make money by watching their users and selling eerily well-targeted ads). Over the past year the firms that epitomise these business models—Uber and DoorDash; Netflix and Spotify; and Snap and Meta (which has tumbled spectacularly out of the trillion-dollar club)—have shed two-thirds of their market capitalisation on average (see chart on next page).

Things could get worse. On November 1st Uber reported strong growth but, despite being the global leader in ride-hailing, another quarter of net losses. In its 13-year life it has so far torched $25bn of cash, equivalent to roughly half its current market value. DoorDash, the leader in food delivery, remains lossmaking. So do Spotify ▶▶

(despite rising revenue) and Snap (on top of sharply slowing sales). Netflix—a child of the 1990s but a streamer only since 2007—turns a profit but its revenue grew by just 6% year on year in the third quarter, compared with a historical average of more than 20%. Meta's revenues have now shrunk for two consecutive quarters.

On the surface, the movers, streamers and creepers—and their problems—look distinct. On closer inspection, however, their businesses all turn out to face the same main pitfalls: a misplaced faith in network effects, low barriers to entry and a dependence on someone else's platform.

Start with network effects, or "flywheels" in Silicon Valley speak—the idea that a product's value to a user rises with the number of users. Once the user base passes a certain threshold, the argument goes, the flywheel powers a self-perpetuating cycle of growth. This explains why so many startups seek growth at all cost, spending millions acquiring ever more customers to get the flywheel spinning.

Network effects are real. But they also have their limits. Uber believed that its headstart in ride-hailing gave it a ticket to riches, as more riders and drivers would mean less idle time for both, drawing ever more users into an unstoppable vortex. Instead, it encountered high unit costs and diminishing returns to scale: reducing average wait times from two minutes to one would require twice as many drivers, even though most riders would barely notice the difference. DoorDash's hungry consumers likewise only require so many alternative Indian restaurants to choose from. And what network effects the movers enjoy are local; a user in New York cares little about the popularity of the app in Los Angeles.

Spotify and Netflix also try to capitalise on network effects, as data on the listening and viewing habits of similar users promised to deliver an unbeatable product. Belief that Netflix's trove of user information would give it a winning edge in creating content has been shattered by flops like "True Memoirs of an International Assassin", which scored a rare 0% audience rating on Rotten Tomatoes, a review website. For the creepers—whose social networks are a network-effects business *par excellence*—the worry is what happens if the flywheels start spinning in reverse. Meta had a scare in the fourth quarter of 2021, when it lost 1m users. That loss did not turn into a stampede; the company has added users since. Next time it may not be so lucky.

The second problem—low barriers to entry—is another supposed boon turned bane. Advances in technology, from smartphones to cloud computing, allowed all manner of startups, including the movers, streamers and creepers, to build consumer software cheaply and quickly. But that also meant that copycats soon emerged, and easy money allowed them to offer generous discounts to quickly build the minimum necessary scale.

Snapping before it breaks

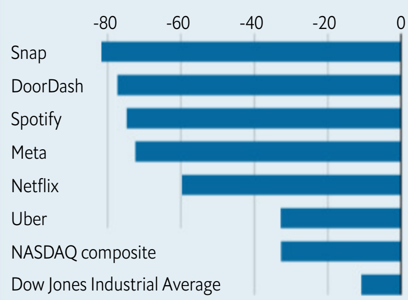
Although at home Uber faces only one real ride-hailing rival, Lyft, its global expansion soon ran up against local rivals such as Didi in China or Grab and Gojek in South-East Asia. Meanwhile, the combination of relatively simple products and free-of-charge user experience means a new twist on social media can be enough for a new challenger to gain momentum: just try prying a teenager from TikTok.

The barriers to entry for the streamers are higher—Netflix and Spotify spend a lot of money making or licensing content. But they are not insurmountable for deep-pocketed rivals. To fend off the challenge from Disney, which is spending a total of $30bn a year on content, Netflix must keep splurging, too, to the tune of around $17bn a year. Like customer-acquisition costs for the movers, content costs eat into streamers' profits. Disney's streaming services lost $1.1bn in the second quarter of this year and the company has said that its Disney+ platform expects to lose money until 2024.

Investors snap and dash for the door

Share prices, % decrease

Nov 2nd 2021-Nov 2nd 2022



Source: Bloomberg

Heavy investment explains why Netflix's free cashflow (the money companies generate after subtracting capital investments) is equal to only 6% of revenue.

The third flaw common to the three wobbly business models is their reliance on distribution platforms that are not their own. Uber and DoorDash pay a handsome fee to advertise on Apple's iPhone and Alphabet's Android app stores. Spotify forks over a 15% commission on subscriptions purchased on iPhones—a tax so annoying that it has filed a complaint against Apple over it. Netflix avoids the commission by forcing users to subscribe through their web browser, shifting the irritation to the customer—and quite possibly missing out on subscriptions.

Worst affected by the lack of their own rails are the creepers. Their dependence on the iPhone-Android duopoly is an existential threat. Apple's newish requirement that users give iPhone apps permission to track their activity across other apps and websites, a move replicated by Alphabet, may this year cost Meta $10bn in forgone revenue. Parler, a creeper favoured by the far right, was temporarily suspended by both Apple and Android. If American national-security hawks worried about TikTok's Chinese ownership get their way and force Apple and Alphabet to expel it from their app stores, the rising star of social media could find itself similarly thwacked.

The different business models do not face an equal balance of challenges. The movers would be in better nick if the industry had meaningful barriers to entry. The streamers might have been able to bat away new entrants if network effects had been stronger. And the creepers were in reasonable shape until Apple and Alphabet spoiled their party. One shaky pillar is problematic enough. Three of them is a disaster waiting to happen. ■

Twitter

Singing for its supper

Elon Musk's priority is to keep his social network solvent

TWITTER IS NO longer a public company, but it is being run in a more public way than ever before. Elon Musk, who took the social network private on October 27th at a cost of $44bn and immediately installed himself as its temporary chief executive, has been developing his plans for the firm through the medium of tweets at all times of day and night.

Mr Musk, who said he was buying Twitter to protect free speech in "the de facto public town square", tweeted on his first full day in charge that the company would set up a "content moderation council". Outsourcing moderation dilemmas to an independent board, as Facebook has since 2020, would be no bad thing. One of the chief concerns about Mr Musk's ownership of Twitter is that the platform could be leant on by anyone with leverage over his other, larger businesses. Tesla, Mr Musk's carmaker (and main source of wealth), has a factory in Shanghai and last year made a quarter of its revenue in China, whose public squares are hardly free.

Yet the focus of Mr Musk's first week in charge was not moderation but money. His acquisition was funded with about $13bn of debt. Interest rates are rising and the ad market, which provides nearly all of Twitter's revenue, is falling. Some advertisers are especially nervous of the new Musk-owned Twitter: IPG Mediabrands, a giant media buyer, recommended on October 31st that clients pause their spending on Twitter while the dust settled.

To cut costs Mr Musk appears to have started a round of lay-offs, which is probably overdue. Last year Twitter had 1.5 employees for every $1m in revenue, compared with 0.6 at Meta, Facebook's owner. At the same time he hopes to bring in more users with features including the resurrection of Vine, a decade-old app that beat TikTok to the short-video craze but which Twitter allowed to wither.

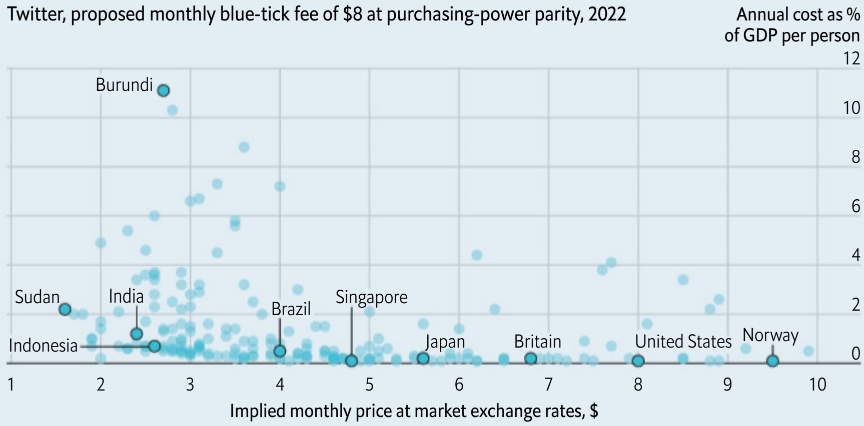
The most radical plan, though, is to boost revenues by weaning Twitter partially off ads and onto subscriptions. Users will be able to pay $8 a month (or another amount depending on their whereabouts, see chart below) to see half as many ads, post long audio and video clips and get priority for their own tweets in other people's replies and search results.

Mr Musk characterised this as a democratic alternative to the "lords & peasants system", in which Twitter awards blue badges verifying the identity of "notable" tweeters. Increasing the number of verified users may help reduce spam. But prioritising tweets that are paid for, over ones that are good, may worsen the user experience. And charging audiences risks driving them to other social platforms that are free. As Stephen King, a blue-badged novelist, tweeted in an exchange with Mr Musk: "Fuck that, they should pay me."

Subscriptions may kick off another argument. Among users who subscribe via the Twitter app, a cut of ongoing monthly fees will go to the app store in question: 15% in the case of Google and up to 30% in the case of Apple. Companies that rely on subscriptions, like Spotify, or in-app purchases, like Epic Games, have long complained about this app-store tax. In Mr Musk, Apple and Google face another opponent—one who is armed with the world's loudest megaphone. ■

Tweeting-power parity

Twitter, proposed monthly blue-tick fee of $8 at purchasing-power parity, 2022



Sources: IMF; *The Economist*

The blue-tick index

Elon Musk plans to charge Twitter users $8 a month for a "verified" account, and to adjust the fee based on "purchasing-power parity". How might that work? Think about what $8 can buy in America. Then imagine how much similar items would cost in, say, India—roughly 187 rupees on average, according to the IMF. That is what Twitter might charge in that country. Converted at market exchange rates, 187 rupees is less than $2.40, making verification look relatively cheap in India. Compared with India's income per person, however, it still looks relatively dear.

Business in China

When the circus leaves town

Will Fosun's happiness business end in tears?

IN THE PAST few years Guo Guangchang, chairman of Fosun, a Chinese conglomerate, has watched as the Communist Party has taken down his rivals. Two executives at HNA, an indebted airline that once held a big stake in Deutsche Bank, have been arrested. The founder of Anbang, an acquisitive insurer, has received a lengthy prison sentence for financial crimes. So has the founder of Tomorrow Group, a banking-and-insurance empire.

Mr Guo does not appear in imminent danger of sharing their fate. But his company is in trouble. On October 25th Moody's, a ratings agency, downgraded Fosun's debt deeper into junk territory. Chinese banks have been asking the firm to provide more collateral for loans. To meet its obligations Fosun has already divested $5bn-worth of assets this year, according to data from Refinitiv, a research firm. By 2023 it could shed $11bn-worth. That is quite the reversal for the asset-hungry group. It also marks the end of a freewheeling era in Chinese business, which is turning inwards under President Xi Jinping.

Fosun has sought to offer Chinese people a three-pronged lifestyle experience that targeted their "happiness, wealth and health". Customers could look to it to manage their money, plan their holidays and sell them medicines. To that end, it amassed, among other assets, a listed drugmaking division; financial-services firms in Europe; a large portfolio of fashion brands (such as St John Knits, an American women's label, and Sergio Rossi, an Italian cobbler); a 20% stake in Cirque Du Soleil, a Canadian circus; and controlling stakes in Club Med, a French resort chain, and Wolverhampton Wanderers, an English football club. The perceived success of this ▸▸

strategy has led admirers in Chinese business circles to liken Mr Guo to Warren Buffett, America's revered asset-accumulator.

The reality of this success is debatable. In 2015 Mr Guo vanished for a few weeks amid a police probe, only to emerge pledging to buy fewer assets and focus on managing the ones he already has. Over the next two years Fosun divested assets worth around $9bn. The discipline did not last; in 2017 it splurged nearly $7bn on new investments. Soon afterwards some of its bets began to sour. In 2019 Thomas Cook, a British travel company part-owned by Fosun, filed for bankruptcy. The following year its 20% stake in Cirque Du Soleil was wiped out under similar circumstances.

Throughout, debt has loomed large. In annual investor meetings Fosun executives have routinely pledged to bring leverage down. To little effect, it seems. And things may have got dicier of late, as the company has tapped more short-term debt, which now makes up 53% of its total borrowings of $16bn, up from 46% in 2021. Rolling it over has become harder in the past year, as many Chinese property developers have defaulted on offshore bonds, which has cooled investors' enthusiasm for Chinese firms' debt more broadly.

An even bigger problem than its debt may be Fosun's business model. It was based on a vision of the future where both China's businesses and its people travelled and spent freely around the globe. But China's zero-covid policy has trapped most Chinese at home for nearly three years and dented consumer confidence. And under the increasingly authoritarian Mr Xi, Chinese companies are viewed with growing caginess in the West. In this new world, Fosun looks like a relic of a happier time. ■

Bartleby The play's the thing

Gamification requires much more thought than many companies give it

THE MOPEI phone-swing device is ingeniously depressing. It is a cradle for smartphones that rocks back and forth when it is plugged in, and it is designed to cheat fitness apps into believing that you are on the move. If you have a step counter, this phone shaker can gull it into thinking you have taken 8,700 paces in an hour. "Ideal for those people who don't have the time or energy to get your recommended steps in," boasts the product blurb.

Such cheating is pointless but not uncommon. Blog posts run through ways to trick a Fitbit into recording exercise, from strapping it to your children to swinging it on a piece of string. Strava is an app for runners and cyclists to record their times; becoming the fastest rider on a course segment is a lot easier if you use a motorbike. Players of Pokemon Go, a smartphone game, are supposed to walk a certain distance in order to hatch virtual eggs; taping your phone to a Roomba, an automated vacuum cleaner, is the couch potato's alternative.

This behaviour is a predictable side-effect of a ubiquitous digital phenomenon: gamification. Adding game-like elements to non-game activities is part and parcel of app design. Streaks encourage users to log into products each day. Achievement points reward them for completing tasks. League tables add the spice of competition.

Such features are powerful, even if their effects often fade over time. Just as gamification can lead some people to cheat, it can help others stay motivated in pursuit of a goal they find difficult to stick to. When Duolingo, a language-learning app, went public in 2021, its prospectus was clear about the importance of game-like features in keeping its users engaged. Streaks, virtual currencies, leaderboards and a hectoring cartoon owl called Duo are all designed to encourage people to keep learning. On October 26th the firm launched a new mathematics app that relies on similar techniques.

But as "You've Been Played", a thought-provoking new book by Adrian Hon, a game designer, makes clear, firms should be very careful about how they gamify experiences. Mr Hon argues against slapping the generic paraphernalia of rewards, points and badges onto activities without thinking hard about the context. Get gamification wrong, and you can annoy three types of stakeholder.

One is the customer. The obvious dangers—badgering people with endless notifications about streaks, say, or demotivating them by showing how low down a leaderboard they sit—are not the only ones. Gamification can work with the grain of a product, or against it. Apps that are designed to encourage people to save money can happily use gamified features like totalisers and money jars to track progress: the technique fits the product snugly. But some activities really don't need added "fun". One reading app offers to unlock animations if users hit certain reading landmarks; if you present reading as a chore, a kind of mental flossing, you are telling readers they have the cultural hinterland of a tapir.

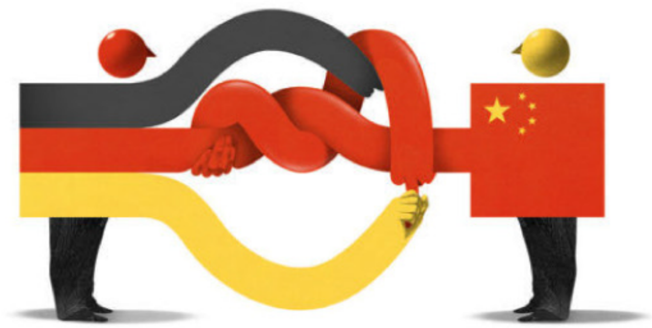
The second stakeholder, and a new one to worry about, is the regulator. Gamification is meant to encourage people to do more of something. If that something is learning Japanese, great. If that something is eating lard, less great. Worries about how gamified financial-trading apps might lead investors to undertake more transactions than is good for them have prompted the Securities and Exchange Commission (SEC), a markets regulator, to look at what it terms "digital engagement practices". Firms are already changing their behaviour as scrutiny intensifies. Last year Robinhood, one of the apps now in the SEC's sights, felt compelled to get rid of a confetti animation which showed when a customer made their first trade.

The third group is employees. Turning repetitive work into video games is a technique that Amazon has reportedly used in its warehouses, by representing workers' progress at picking and boxing items in a racing-car format. Firms that sell employee-engagement software offer the usual armoury of points, leaderboards and virtual currencies.

These ideas are likely to backfire. Forced rankings incentivise some people and stress others out. GitHub, an open-source coding platform, withdrew its streak feature after concerns were raised that it was prompting programmers to work every weekend. And as Mr Hon observes, games are a lot less enjoyable if you have no choice over whether to take part. Manufacturing fun can work, but only if it is taken seriously.

Schumpeter | Ties that blind

German business is unusually reluctant to untangle itself from China



RARELY IN RECENT years has a routine inaugural trip of a head of government been watched with such keen interest at home and abroad. When Germany's Social Democrat chancellor, Olaf Scholz, travels to Beijing for a one-day visit on November 3rd, he will be the first Western leader to do so since the start of the covid-19 pandemic. Emmanuel Macron, France's president, was keen to travel together with Mr Scholz, though preferably not right after China's leader, Xi Jinping, got himself anointed as Communist Party chief for a norm-busting third term. Mr Scholz said *nein*. He is instead taking along 12 CEOs of German blue-chip firms, including the bosses of Merck, a drug company, Siemens, an engineering behemoth, and Volkswagen, Europe's biggest carmaker.

Over the past two decades the interests of German business have shaped Germany's China policy to the exclusion of other concerns. Mr Scholz's corporate retinue suggests that this is still the case, despite Russia's invasion of Ukraine, which starkly illustrated the dangers of economic dependence (in Germany's case for Russian fossil fuels) on an autocracy driven by an aggressive ideology. A new consensus in European capitals is that Europe must rethink its business ties to China. Many Germans accept this, too. "The Chinese political system has changed massively in recent years and thus our China policy must also change," declared Annalena Baerbock, Mr Scholz's foreign minister from the Greens party, on November 1st, during a trip to central Asia. Deutschland AG, though, is reluctant to open its eyes to the new reality.

The deep commercial links between the two countries certainly complicate matters. Last year China was Germany's top trading partner for the sixth consecutive year, with combined exports and imports of more than €245bn ($255bn). That is five times the figure in 2005. Germany relies on China for the import of solar panels, computer chips, rare earths and other critical minerals. Sino-German trade also supports more than 1m German jobs directly; millions more are indirectly connected to it.

Sino-dependency is not a uniquely German affliction. America, too, trades a lot with its geopolitical rival. One important difference is that powerful German industries are unusually exposed to the Chinese market. Of Germany's ten most valuable listed companies, nine derive at least one-tenth of their revenues from China, according to *The Economist*'s rough estimates, compared with two of America's ten biggest firms. In 2021 two in five cars sold globally by Volkswagen Group were bought by Chinese motorists.

Many of these rolled off the German carmaker's Chinese production lines. This is Germany's second unique circumstance: it has ploughed plenty of money into Chinese factories. Whereas new American foreign direct investments in China accounted for only 2% of America's total in 2021, for Germany the figure was 14%. Four firms—three carmakers, BMW, Mercedes-Benz and Volkswagen, and BASF, a chemicals giant—accounted for one-third of all EU investments in China in the past four years, according to the Rhodium Group, a research firm. And German firms are doubling down: in the first half of this year they invested €10bn in China, more than ever before. BASF is in the process of putting another $10bn into its Chinese operations.

Worries about undermining those business relationship have led to some controversial policy choices at home. In late October Mr Scholz decided to ignore the warnings of six of his ministers, as well as the heads of the domestic and foreign intelligence agencies, and let Cosco, a Chinese state-run shipping company, buy a stake in one of four container terminals in the port of Hamburg. Like his predecessor, Angela Merkel, he has also refused to take sides in the debate over whether Huawei, a Chinese telecoms giant, should be allowed to bid for contracts to build Germany's 5G networks, perhaps heeding the threat by the Chinese ambassador to Germany in 2019 of "consequences" for German carmakers if Huawei were excluded from the auctions.

This kid-glove approach to China is out of step with his Western counterparts. In America China-bashing is a rare bipartisan pursuit. President Joe Biden, a Democrat, has been expanding the scope of restrictions on the export of advanced technologies to China introduced by his Republican predecessor and potential future rival, Donald Trump, most recently last month. America also bans Huawei. So do several of Germany's fellow EU members. As the geopolitical rift between China and the West widens, many Western firms are trying to reduce their exposure to Chinese supply chains and consumers. Apple is shifting some production from China to India and Vietnam, for example. Germany, by contrast, is going "full steam ahead in the wrong direction", as Jürgen Matthes of the German Economic Institute, a think-tank, puts it.

The long guten Tag

Some German business leaders publicly pooh-pooh such talk. Martin Brudermüller, chief executive of BASF and another of Mr Scholz's travel companions this week, recently bemoaned all the "China-bashing". Deep down, though, they must know better. Any lingering hope of "change through trade", the characteristically German belief that closer commercial ties with liberal democracies will spur political transformation in China just as they did to a degree in the Soviet bloc, has died with Vladimir Putin's invasion of Ukraine and Mr Xi's authoritarian turn. Indeed, many German companies tacitly acknowledge the heightened China risk by maintaining two independent production systems—one on the Chinese mainland, the other in the rest of the world.

That is not enough. Expecting geopolitical tensions between the West and China to go away is naive at best. So is expecting an autocrat like Mr Xi, who makes no bones about wanting to indigenise Chinese industry, to respect all commercial commitments to foreigners. Not cutting all business ties with China is understandable, and perfectly sensible. Deepening them looks reckless. ■

The West v Russia

From crisis to catastrophe

What happens next in Europe's energy conflict? We war game three scenarios

In mid-October, off the Spanish coast, a number of slow-moving metallic domes emerged on the skyline. They were tankers, pregnant with superchilled liquefied natural gas (LNG) and awaiting delivery at busy "regasification" terminals, where their liquid fuel is turned to gas before being transferred across the continent. Iberia has the biggest facilities in Europe, but congestion is building elsewhere, too. The amount of LNG off European shores has hit 1.2m tonnes, according to Kpler, a data firm, up from 140,000 in August. At least the crews have beautiful weather in which to relax. Across Europe, temperatures are unseasonably warm: southern Spain is still seeing days above 30°C.

This combination of plentiful gas and warm weather, which reduces demand for the stuff, is a nightmare for Vladimir Putin, and has led some optimists to declare that an end to Europe's energy crisis is in sight. For months Russia has sought to sow division in Europe and undermine support for Ukraine: first by demanding payment for gas in roubles; then by slashing flows through Nord Stream, its main pipeline to the continent; and then, in September, by shutting the conduit indefinitely. By paying over the odds, Europe has nevertheless managed to fill its storage facilities. As a result, gas prices have sunk to $39 per million British thermal units, from $100 in August (see Graphic detail). Meanwhile, Brent crude, the oil benchmark, sits at $95 per barrel, below the $139 peak it hit in March.

Yet to declare an end to the crisis is premature. Prices will rise as cold spells hit and other LNG buyers, particularly in Asia, compete for cargoes. Russia, faced with military setbacks, could crank up the pressure further. Mr Putin's options include stopping all gas deliveries to Europe or vandalising infrastructure. Such measures—or the use of a tactical nuclear weapon—would trigger another wave of sanctions from the West. To understand how the energy war might develop, *The Economist* has worked with modellers at Rystad Energy, a consultancy. Our analysis suggests that complacency is dangerous. Things could get very bad, very fast.

We have simulated three scenarios. Even the first, under which relations do not deteriorate, is far from pleasant. It assumes that the Nord Stream pipeline remains shut. It also assumes that Europe follows plans to implement an embargo on Russian crude and prohibit local insurance firms, which have 90% of the global shipping market, from covering vessels carrying Russian oil—albeit with a big exemption. Non-Western buyers that agree to pay a capped price for Russia's oil, set by America and the EU, are due to be allowed to purchase European insurance.

For Europe this scenario triggers a crisis but not a catastrophe. Supply cuts mean that by the end of 2022 the continent will have missed out on 84bn cubic metres (bcm) of Russian gas, equivalent to 17% of its normal annual consumption. Higher LNG imports have already plugged part of this hole. A smaller chunk is filled by greater piped flows from Azerbaijan and Norway, and another by painful but voluntary consumption cuts. Our simulation suggests that—even if the winter turns frigid, boosting demand by 25 bcm—Europe's ▸▸

storage will allow it to get through the summer of 2023, by which point LNG imports may start to ramp up.

Under this scenario, governments will not have to ration gas. Europe will, though, have to pay dearly for it. As Namit Sharma of McKinsey, another consultancy, notes, high prices have already led to shutdowns in energy-hungry industries, such as aluminium and ammonia. If Nord Stream remains shut throughout 2023, Europe's energy deficit will widen, requiring even bigger cuts in consumption. Gavekal, a research firm, estimates that a 1% drop in energy consumption in Germany or Italy reduces GDP by 0.5-1%.

It is hard to gauge the cost of this for Russia. Its piped exports to Europe, already down by four-fifths, cannot easily be sold elsewhere. Its pipeline to China, the only serious alternative, is too puny to handle big flows. However, the price for what it is able to sell would be much higher.

In theory, the EU's dual oil embargoes, coupled with a price cap, are a bigger threat to Russia's oil exports, the country's real moneymaker. But we assume, as the market does, that the cap will be watered down, and Russia will find buyers for many barrels it is unable to sell to Europe. Western officials are leaning towards a loosely policed cap set at near $60 a barrel. Since our base case expects global prices to stay below $90, that would not make much difference to the price of Russian oil, which currently trades at a 20-30% discount.

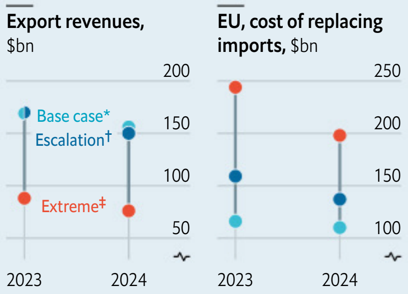
Spanner in the spigot

This explains why, in such a scenario, Russia pockets $169bn in oil revenues in 2023, barely less than the $179bn it earned in 2021. It and other market participants still incur increased transaction costs caused by longer tanker journeys, smuggling shenanigans and other frictions. Europe pays a hefty price. Importing Russian seaborne barrels cost it $90bn in 2021. The replacement of these in 2023 would cost $116bn.

In our second scenario, "escalation", Russia lobs a few grenades. It starts by shutting its pipeline through Ukraine, one of the two conduits still open, in the process depriving Europe of another 10-12 bcm a year. The country's leaders would claim a pretext (such as the "leak" that halted flows through Nord Stream). After all, Gazprom, its gas monopoly, still wants to be seen as a supplier that respects contracts, at least outside the West, says Anne-Sophie Corbeau, formerly of BP, a British giant.

This initial strike would not surprise traders, many of whom have already discounted Ukrainian volumes. Traders would be stunned, however, if Russia stopped supplying LNG to Europe—the next step in this scenario. These deliveries, worth 20 bcm a year, equivalent to half of Russia's annual LNG exports, have contin-

Staring down the barrel
Russia, crude oil and products, forecast



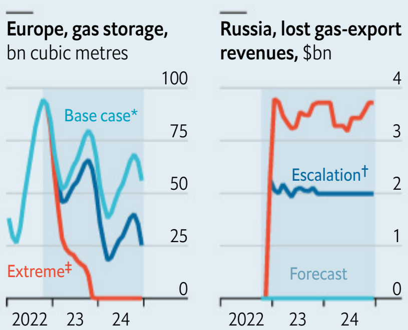
*Relations do not deteriorate further
†Russia halts some flows to Europe; the West tightens its price cap
‡All-out energy war
Sources: Rystad Energy; *The Economist*

ued under the radar. Russia would not want to lose them altogether, if only because that would cause the global spot price to rocket, hurting friendly(ish) countries, such as India and Pakistan, which struggle to compete with Europe for cargoes. Thus we assume Russia would offer the supply to these countries at cut price.

In this scenario, the West retaliates by giving its oil price cap more bite, perhaps threatening Western infringers with huge penalties, toughening checks and lowering the cap. To counter the counter, Russia persuades OPEC and its allies, some 23 countries that produce 40% of the world's crude, to cut their monthly production target by 1m barrels per day (b/d), on top of a 2m b/d cut implemented in October.

Rystad's model projects that, at the end of this shoot-out, Russia will emerge less bloody. This is partly because the tighter cap provides non-Western countries with a greater incentive to build an alternative oil-trading system. Giovanni Serio of Vitol, a trading firm, says G7-owned tankers are already being bought up by non-Western players, often in Asia or the Middle East. China and India, which have sucked up

Gas warfare



*Relations do not deteriorate further
†Russia halts some flows to Europe; the West tightens its price cap
‡All-out energy war
Sources: Rystad Energy; *The Economist*

most of Russia's excess barrels thus far, can probably self-insure their ships. Other countries may tap the "black" trade, where Russian oil—ferried on tankers with their transponders turned off, transferred from ship to ship on the high seas or blended with other crudes—cannot be traced.

Although Russia would take a hit on its gas revenues, its oil income would be resilient. Our calculations suggest the country's oil exports would fall in both 2023 and 2024 by 2m b/d, compared with 2021, forcing it to curtail production by more than 1.5m b/d. The tighter market would push Brent into the triple digits, and there would only be a small contraction in demand. This would allow Russia to make up for the volume shortfall. Its oil-export revenues would remain remarkably steady at $170bn in 2023, before falling to $150bn the year after. Europe, meanwhile, would face tens of billions of dollars in extra costs.

Our third, "extreme", scenario assumes that Russia, perhaps facing catastrophic losses on the battlefield, no longer cares about money or keeping allies sweet, and opts for all-out energy war. It begins by shutting TurkStream, its remaining gas link to Europe. The pipeline mostly serves Russia-friendly countries, such as Hungary and Turkey. But terminating it leaves Europe short of another 15 bcm a year.

Then Russia decides to wreck Europe's gas-import infrastructure. This possibility, once unthinkable, has become rather less so after saboteurs bombed Nord Stream in September. Our extreme scenario assumes that Russia manages to stop flows through Norway's two largest pipelines, robbing Europe of another 55 bcm in yearly supply. This would be quite a move. The pipelines are far from Russia and Western countries may consider it an attack on NATO.

Leaving aside potential military ramifications, we assume that Western powers would respond with "secondary" sanctions, threatening non-Western individuals or firms trading Russian oil with measures such as the loss of access to American dollars. This forces banks and insurers everywhere to dump Russian business, making embargoes far more effective.

The Kremlin retaliates by convincing OPEC to declare another 1m b/d cut to its output target. It also chokes off exports through the CPC, a pipeline that carries 1.2m b/d of mostly Kazakh oil, but which ends at the Russian port of Novosibirsk, where the fuel is loaded onto ships. America, in an attempt to dampen the oil price, accelerates releases from its Strategic Petroleum Reserve.

Yet the reserve is not infinite, notes Jason Bordoff, an energy tsar under Barack Obama. Having been raided for months, it is already at its lowest level since 1984. Thus we assume OPEC could wait it out, first cutting production and then raising it when the strategic reserve runs dry.

At the end of all this extraordinary back-and-forth Russia would enjoy a pyrrhic victory. Its oil exports, which only the black market can absorb, crater to 3m b/d or less for years. Despite the huge global supply gap, Brent rises to "just" $186 a barrel, before falling to $151 in 2024, because oil demand is crushed. Russia's oil revenues plummet, to $90bn or less.

Europe faces an excruciating squeeze. It must fork out $250bn in 2023 and $200bn in 2024 merely to replace Russian barrels. Its annual import-gas bill nears $1trn, almost double our base-case scenario, despite much lower incoming volumes. Making up for the lost gas proves impossible. Our simulation suggests that Europe's storage, empty by November 2023, would remain bare for the whole of 2024.

Europe unplugged

European solidarity would almost certainly break down, worsening the continent's misery. A recent simulation by Germany's economic ministry assessed what would happen if, in February next year, power utilities in the country's south were to receive 50% less gas than normal, many French nuclear reactors remained shut (as they have been this year) and coal plants faltered. They concluded that the EU would have to distribute 91 hours of blackouts among its members. Germany, in panic mode, might decide to cut electricity exports to France, or stop gas flows to the Czech Republic and Slovakia. Britain, which has meagre storage facilities but big gas needs, would be vulnerable.

This future-gazing has limitations. It only considers the energy war, leaving aside what will happen on the battlefield and in the broader economic conflict. Huge unknowns, from the weather to the durability of Ukraine's military, could tip the balance. And nobody knows what might trigger a transition from one scenario to the next, if only because that depends on what happens inside Mr Putin's head.

Yet the simulation holds two clear lessons. One is that, in the ninth month of the energy stand-off, Russia retains more options for escalation than the West. It has already shut its main gas supply route to Europe, but the bloc needs all it can get, so cutting off the rest would still wreck havoc. And whatever energy Europe buys from others must still pass through hubs and spokes that Russia, at its rashest, could try to destroy. The other lesson is that embargoes will not drain Russia's treasury, at least until Europe is prepared to bear much more pain. The more Russian fuel cannot get to market, the more Europe has to pay to replace it—while rising prices limit the Kremlin's losses. It is only when oil prices cannot go higher without destroying demand that Russia truly suffers. ■

Europe's economy

Double trouble

Even recession may not bring down euro-zone inflation

IT IS DIFFICULT to spot the peak when hiking in the fog. What is true in the Alps is just as true for policymakers who are struggling with inflation. In the euro zone, consumer prices in October were 10.7% higher than a year earlier. The European Central Bank (ECB) has increased interest rates by 0.75% for the second meeting in a row, as it dutifully follows the path trodden by America's Federal Reserve. Officials very much hope the peak is around the corner.

Optimists among them point out that the euro zone implemented no major fiscal stimulus after the covid-19 pandemic, unlike America, which means inflation has been driven by supply shocks and energy prices, rather than an overheating economy. Recent spending packages in Europe have sought to cushion the blow from eye-watering energy prices, not stimulate spending. In the second quarter of the year, consumption was less than 2% above the same period in 2019. In America it was 7%.

Moreover, sentiment indicators suggest the European economy is heading for recession. Wages have grown moderately, and there is little sign of a wage-price spiral. Current and future energy prices on wholesale markets have fallen from summer peaks. Bottlenecks affecting everything from microchips to furniture have eased. Perhaps the peak really is nearby.

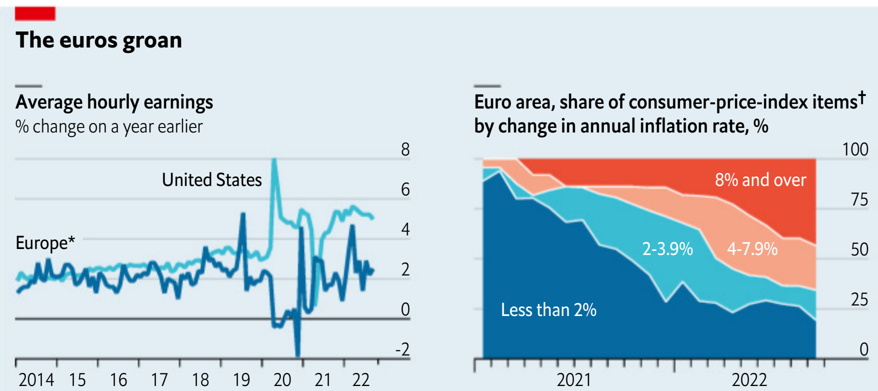
Sadly, the optimism will probably prove unfounded. Lower energy prices take time to feed through to consumers. Most are still seeing whopping rises. France has the lowest inflation in the bloc, at 7.1% in October, in part because the government has capped gas and electricity prices. Next year, however, prices will be allowed to increase by 15%, adding to inflation. In Germany, many households have long-term contracts that are gradually renewed to reflect higher prices.

And though, in the glowing sun of a warm October, wholesale prices for energy dipped, the medium-term forecast is for a cold and dry winter, which means they will probably rise again. Worse still, Vladimir Putin may escalate the energy war.

Energy and food prices comprise less than a third of the basket of goods and services used to measure inflation. But the trends in the rest of the basket are also worrying. Prices for services and goods other than food and energy increased by an annualised 6% over the past three months. Although energy prices may lie behind part of this shift—restaurants need heat, for instance—the size of the increase suggests inflation is spreading. As Chris Marsh of Exante, a research firm, notes, the situation looks unfortunately similar to that in America a few months ago.

Wage rises are likely to add to inflation. So far, European pay has increased little. Unlike in America, six in ten workers have collective-bargaining agreements, which tend to run for a year or more—meaning it takes time for economic conditions to influence their pay. Trade-union negotiators have limited demands, aware that a wage-price spiral would come back to haunt them. But negotiators' patience is beginning to wear thin. Germany's public-sector unions will enter forthcoming negotiations seeking a raise of 10.5%.

The problem for bosses is that the labour market remains exceptionally tight. The share of firms reporting that staff shortages are limiting their production is near record highs in both the manufacturing and service sectors. One reason is the enormous backlog of orders from the pandemic. Manufacturing firms have on average more than five months of work on their order books, according to a recent survey, up from four before covid struck. Add to that the cohort of workers retiring each year in ageing countries such as Italy and ▸▸



Sources: National statistics; Oxford Economics; Eurostat; *The Economist*

*GDP-weighted average of Germany, Italy, Netherlands and Spain
†Weighted by household spending

Germany, and a recipe is in place for a tight labour market throughout 2023.

All of this means the peak in inflation is probably some way off. Nor will there be much relief at the top, for the descent will be similarly tricky to navigate. Energy prices should settle at a lower level next year, which will bring down headline inflation. But inflation in the rest of the economy may still be accelerating, limiting the immediate drop. Thus the fog will remain.

Even a recession, if people expect it to be brief, may not tame inflation. In that case, the ECB would have to tighten the screws once again. "The Bundesbank in the 1970s didn't even flinch when the economy weakened. They were successful in conquering inflation," notes Mr Marsh. This time round, it may take something similar from the other central bank in Frankfurt. ■

Inflation

Faster, higher, longer

WASHINGTON, DC

The Fed delivers another jumbo rate rise, and it's far from done

As recently as the start of June investors and analysts believed that a "jumbo" interest-rate rise for the Federal Reserve meant half a percentage point. How quaint. After four straight increases of three-quarters of a percentage point—the latest on November 2nd—perceptions have changed. Indeed, a stockmarket rally in the two weeks before the announcement was rooted in the belief that the Fed may scale down to a half-point rate increase at its next meeting in December. What was once jumbo is now moderate.

Whether the Fed will in fact downshift to a half-point increase is a matter for debate. Bond pricing assigns roughly even odds to the central bank opting for that smaller increment versus yet another three-quarter-point increase. At a news conference following the Fed's latest move, Jerome Powell, the central bank's chairman, resisted tipping his hand in either direction. And for good reason: inflation figures for both October and November will be published before the Fed's next meeting, and go a long way to determining what it does. There is little sense in guessing the outcome before seeing that data.

But the focus on the size of the rise is also too narrow. As Mr Powell notes, the Fed's tightening of monetary policy can be looked at in three dimensions: how quickly it raises rates, how high it raises them and how long it then keeps them there. The first dimension is already clear. Although the Fed was late in launching its rate-rise cycle, it has moved with alacrity since starting, raising short-term borrowing rates from 0% in March to 3.75% now—its most aggressive increase in four decades.

The second dimension is also becoming clearer. In September the median expectation of Fed officials was that rates would peak at 4.6% next year. Bond pricing now has the peak pegged at 5%, reflecting the fact that a variety of inflation indicators have stayed stubbornly high. Mr Powell suggested that the Fed's thinking is in line with the bond market. Even so, there is a logic for slightly smaller increases from here on. Just as an aeroplane slows before landing, so, ideally, does a central bank before settling on its peak rate.

The biggest uncertainty surrounds the final dimension. How long will the Fed need to keep rates at a restrictive level? It estimates that the long-term neutral level—that which is neither inflationary nor stimulative—is about 2.5%. By this yardstick, nominal rates are already in restrictive territory. But in real terms, with inflation still running at more than 8% annually, policy remains loose. So the question is when the economy will react to them.

Some developments have been predictable. Mortgage rates have more than doubled over the past year, exceeding 7%. That has led to a sharp fall in house purchases. But the resilience of the labour market has been harder to predict. There are still nearly twice as many job openings as there are unemployed people, placing upward pressure on wages and, in turn, inflation.

At several points during the conference, Mr Powell emphasised that the Fed would keep rates high for as long as is required. Markets have priced in a pivot before the end of 2023. The view is the Fed will trim rates in the second half of the year. But it has raised them faster and higher than investors had expected. There is a good chance it will also keep them high for longer than investors currently expect. ■

Jerome ain't joking

Foreign reserves

A few billion between friends

The growing popularity of a strange and troubling form of debt diplomacy

Reality caught up with the Egyptian pound on October 27th. Since Russia invaded Ukraine, prompting foreign investors to flee risky assets, the country's central bank has burnt through its foreign reserves in a bid to keep the currency fixed against the dollar. But last week officials agreed to float the pound—the first of several concessions to secure a $3bn loan from the IMF. The currency promptly fell off a cliff, plunging to an all-time low.

Now Egypt faces the task of rebuilding its foreign reserves. The country's expected current-account deficit and debt repayments over the next 18 months are roughly the same as its $33bn of reserves. Tapping international debt markets is out of the question. Economic turmoil will ward off foreign investors. Thus Cairo will probably turn to old friends in the Gulf. Between October 2021 and March this year, Kuwait, Saudi Arabia and the UAE lent Egypt $18bn to sit in its foreign reserves. The IMF reports that another package worth $5bn is in the works, although it has not said where the money will be coming from.

Egypt is not the only country reliant on this unusual form of foreign generosity. In August Saudi Arabia renewed a $3bn deposit in Pakistan's central bank. It sits alongside a yuan-denominated offering from China worth $2bn. And as Argentina struggles to keep the peso fixed against the dollar, some 60% of its reserves come from a Chinese currency swap worth $23bn.

Depleted foreign reserves can become a central bankers' nightmare. Governments are left unable to make loan repayments, withdrawals sometimes have to be limited and import controls introduced. Basic goods shortages may follow. In the worst-case scenario, spooked foreign investors set off a currency crisis.

Deposits and swaps offer a quick fix. The fine print of agreements tends to be kept hushed and interest rates low. Officially, Gulf lenders want their money back. But renewals are common. Given the speed with which Egypt and Pakistan have burnt through their reserves, it is unclear whether they could return the funds if required.

When a deal is agreed, the debtor suddenly gains a great deal more foreign liquidity. For years, Argentina's yuan swap obscured the country's rapidly declining pile of foreign funds. But unlike Gulf lenders, China attaches strict conditions to its money. In some circumstances Argentine officials need China's permission to use the cash. Thus the IMF says that, although Argentina's headline reserves are $39bn, after deducting the swap lines and other adjustments, the net figure—which it focuses on—is a rather less impressive $2bn.

Informal lending also becomes a problem if a friendship flounders. In 2016, as Hezbollah, an Iranian-backed militia, gained ground in Lebanese politics, Saudi Arabia signalled its displeasure by withdrawing deposits it had made in the country's central bank. Three years later, pressure on foreign reserves contributed to Lebanon's financial meltdown. Egypt and Pakistan have in effect tied their foreign reserves to approval from the Gulf and China—a shaky basis for economic stability.

The situation in Egypt may end up illustrating another problem with this sort of informal lending. It is not entirely clear how the lenders' deposits will be treated if the country defaults. Their status would have to be tested during the restructuring process. As Brad Setser of the Council on Foreign Relations, a think-tank in New York, notes, this sets up the potential for a stand-off between donors.

The IMF's Egyptian loan on October 27th was more modest than expected, and was dependent on additional bilateral funding. Saudi Arabia's loans were made earlier in the year, when Egypt's economic situation was not quite as dire. Both sides now look keen to extract themselves from an awkward situation; neither wants to be on the hook for more big loans. But nor do they want to lose their money—or Egypt to go under. As the two sides inch away, checking the other is still in sight, they will have to ensure Egypt does not collapse from beneath them. ■

Buttonwood Red faces

Financiers' bullish pronouncements about China do not match their actions

Hong Kong brands itself "Asia's world city", a label that has been mostly deployed in mockery over the past three years of political suppression and pandemic-induced isolation. Yet the city's government would like to make the slogan true once again. It had hoped the Global Financial Leaders' Investment Summit, which welcomed financial bigwigs on November 2nd, would advertise the once semi-autonomous city's return to the world. Instead, the event turned into another symbol of the headaches facing Western investors in China. Mainland bankers, with whom chief executives would have hobnobbed, could not attend without ten days of quarantine on their return home. American lawmakers urged executives not to go, citing China's human-rights record.

China's stockmarket offers another illustration of the forces battering once-optimistic investors. Although it inched up slightly in recent days, on unfounded rumours that China's "zero covid" policy may soon come to an end, the Hang Seng China Enterprises Index, a basket of Hong Kong-listed Chinese stocks, is down by almost 40% this year. The lack of any change of tone at the Communist Party Congress in mid-October led to the most recent lurch. Warning lights elsewhere are also flashing red. A deteriorating property market threatens to upend China's economic-growth model. Souring relations with America have led to new trade restrictions, most recently on advanced chips.

Yet for much of the past decade, big investment houses have made rosy predictions about Chinese stocks. Speaking in Hong Kong Colm Kelleher, the chairman of UBS, said that global bankers were all "very pro-China". Last year analysts at Nomura, a Japanese bank, predicted that the 2020s would be "the decade to double down on Chinese equities". At around the same time, BlackRock, an investment firm, suggested that allocations to China should be two to three times their current level, of around 4%, in major indices. JPMorgan Chase's long-term capital-market assumptions, published in mid-2020, projected annual returns to domestic Chinese stocks of 8% over the next 15 years.

Could those firms have foreseen today's difficulties, or is that just the wisdom of hindsight? The pandemic, and the Chinese government's reaction to it, was difficult to anticipate. In 2016 Tim Atwill, then at Parametric Portfolio Associates, a provider of direct-indexing services, was a lonely sceptic on the matter of including domestic Chinese stocks in the major emerging-market indices. He argued that the broader industry was "blindly accepting a major allocation to a market that has shown little interest in the rights of foreign investors". The abolition of presidential term limits in 2018, when Xi Jinping began to entrench himself at the top of Chinese politics, should have been a moment for introspection. The direction of travel was abundantly clear by the time Mr Xi began to crack down on the country's tech giants in 2020.

However, the reality is that the bulls are rather less bullish than they appear at first glance. Even many funds that in public wax lyrical about Chinese investment opportunities limit themselves to allocations to China of just a few percentage points. Domestic Chinese shares are given an inclusion ratio of 20% by MSCI, an index provider, in its benchmark stock indices, meaning that their presence is a fifth of what it would be at a full market weighting.

This discrepancy, between ebullience in public and a more measured approach in practice, reflects two realisations. The first is that speaking out against China has unwanted consequences. After JPMorgan issued a report in March saying that China was uninvestible, the bank lost its position as a lead underwriter for a listing in Hong Kong of a Chinese cloud-computing firm.

The second realisation is that investing in China now comes with a serious tail risk attached: that investments could one day go to zero, should Chinese politics go horribly wrong or tensions over Taiwan ratchet up, to the extent that trade and financial links between China and the West are severed entirely. True, China could easily plod along. Yet the risk, even if relatively small, of a nightmare scenario warrants a more modest asset allocation—one that offers exposure to the mainland, but does not have the potential to sink a portfolio if the worst comes to pass. For all the efforts to suggest otherwise in Hong Kong, it is the likelihood of disaster that will have been on everyone's mind.

China's property crack-up

Breaking the banks

HONG KONG AND SHANGHAI

Xi Jinping promises financial stability. He is not providing it

Fang Hong is not a typical activist. For years she has run a packaging-materials factory in Qinzhou, a mid-tier city in southern China. Recently, though, the 51-year-old lost millions of yuan investing in "low-risk" financial products. The experience was a shock—and pushed her to connect with hundreds of mainly wealthy people, who, like her, are indignant about their losses. Ms Fang has been gathering information and petitioning local regulators. In September she gathered in the lobby of her bank with customers from around the country to demand their money back.

Such incidents are becoming more common among China's middle class. Over the past five years the state has cracked down on shadow-banking assets, which are not accounted for on lenders' balance-sheets and include a dizzying array of financial products. As a result, the stock of these assets has fallen by 15% since 2017, but still amounts to an astonishing 56trn yuan ($8trn), or a seventh of all banking-system assets. And now that China's economy is slowing, investors are discovering that many financial products marketed as low-risk are, in fact, quite high-risk.

Xi Jinping, China's leader, who has just secured a third term, lists financial stability as one of his main aims. The problem is that finding safe investments in China is becoming harder and harder. Strict capital controls prevent people from putting their money to use overseas. Chinese stock-markets are volatile and offer miserable returns. According to East Money, a financial-data firm, just 1% of local funds have produced any returns this year, with investors losing money on the rest. The property market, long the main destination for investments thanks to ever-increasing home prices, has been thrown into turmoil by a government crackdown on leverage. Prices have fallen in many cities.

This means that China's trust industry, a major part of the country's shadow-banking system and another popular investment destination, has also been thrown into turmoil. Trust products have high investment thresholds (usually above 1m yuan) and attract wealthier investors. They are often sold by banks, promising returns higher than deposits and channelling funds to riskier borrowers who otherwise might not be able to take out loans. Property developers have been big borrowers.

Defaults used to be rare. But as developers go bust, they often fail to pay back loans. Between 40-60% of assets at three large trust firms—Minsheng, Wanxiang and Huachen—are non-performing this year. Anxin, another large company, reports that almost all of its assets have gone south. Out of the 57bn yuan in investments on which trust firms defaulted in the first seven months of this year, some 80% were linked to property loans. Wang Zhen of Hwabao Securities, a broker, recently labelled these investments a "disaster zone".

Ms Fang invested almost 10m yuan in two products in 2020 and 2021. They were sold by a Chinese branch of the Bank of East Asia (BEA), which is based in Hong Kong, but were issued by Minsheng. She was assured by a BEA salesperson that she could cash out by mid-2021, when she expected to need the funds to build a polyethylene plant. But when that time came, the funds were frozen. Bank employees told her to wait. A year on, she and more than 200 other investors, with hundreds of millions of yuan on the line, have seen neither the principal or interest on the products.

Protests at the BEA have caught the authorities off guard. Hundreds of people have shown up at bank branches over the past month. At one gathering in Shanghai protesters demanding their money back surrounded the building for several hours. The incident in some respects resembled a mini bank run, with many customers asking to cash out of financial products and deposits. The bank released a statement saying customers could still withdraw from their accounts.

These protests are part of a broader trend. In May people from across the country gathered in the central Chinese city of Zhengzhou to protest against the freezing of 40bn yuan in deposits at six village banks. The banks, all owned by one tycoon, had attracted deposits through online platforms, promising high interest rates. But the funds were misused and the tycoon fled. The local government is now attempting to repay at least some of the customers.

In August angry homebuyers gathered at a branch of Bohai Bank in Shanghai to demand more information on their mortgages for homes at a development that has halted construction owing to a lack of money. Online rumours of a freeze on withdrawals also led to a run on deposits in September at one of Jiangsu province's largest banks. The bank eventually was able to calm its customers, but was also forced to increase its capital base.

A shuddering seismograph

The situation seems likely to worsen. China's central bank has identified 122 "high-risk" outfits among the country's 1,651 village banks. Trust in these smaller banks is depleting; many customers are attempting to move their deposits to larger, more established institutions. At banks with weak balance-sheets it does not take long for this dynamic to turn into a crisis. As Zongyuan Zoe Liu of the Council on Foreign Relations, a think-tank in New York, notes, some village banks have been forced to cap withdrawals, shorten business hours or even freeze accounts to avoid runs on deposits. Such measures are only a short-term solution, as they tend to trigger new panics and additional runs on deposits.

All of this is bad news for Mr Xi. There is a reason he has made financial stability a central aim. A wobbling banking industry undermines support for his government. And to people like Ms Fang, as well as those who notice her protests, China's financial system has rarely seemed shakier. ■

Free exchange | Biden's billions

The security case for bringing home manufacturing is obvious. Is there an economic one?

ATTITUDES TO MANUFACTURING were a small but telling split in the cold war. The Soviet Union had such a focus on industry that its statisticians kept services from the country's measure of national income. A year after the conflict ended, Michael Boskin, then the White House's chief economist, is said to have joked it did not matter whether the "chips" America produced were made from semiconductors or potatoes. There are echoes in the present geopolitical face-off. Xi Jinping, China's president, is so focused on hard tech that he has cracked down on consumer-tech firms.

But Mr Boskin's laissez-faire approach is no longer in vogue among Western policymakers. They have introduced a sweep of policies intended to "onshore" manufacturing. In July America's Congress passed the Chips and Science Act, which will dole out \$52bn to the chip industry over five years, mostly to subsidise domestic production. Japan and Europe are also spending big on chips. The majority of the EU's €43bn (\$49bn) package will subsidise "mega fabs", or cutting-edge chip-fabrication plants. In August America also passed a climate-change package, worth nearly \$400bn, stuffed with "made in the USA" subsidies to be spent over ten years. West Virginia is getting wind farms; electric-vehicle battery factories are coming to Ohio.

Arguments for onshoring fit into two categories. The first concern security. More than 90% of advanced chips, many needed for manufacturing weapons, are made in Taiwan—far closer to China than is comfortable for the West. The second concern economics. Advocates claim that manufacturing can create mountains of well-paid jobs. Economists are doubtful. A paper published in 2018 by Teresa Fort of Dartmouth College, Justin Pierce of the Federal Reserve Board of Governors and Peter Schott of the Yale School of Management finds that the number of jobs in American manufacturing has fallen considerably since 2000, but output has not. That is in part because American industry has become more technologically intensive and therefore productive. It is thus unlikely more high-tech factories will mean many more jobs.

But there is another, more subtle economic case for onshoring. Gary Pisano and Willy Shih, both of Harvard Business School, argue that there can be broader "spillover" benefits to innovation from having a strong manufacturing base. One way this happens is when research and development (R&D) on products is done next to the manufacturing of them. This eases collaboration between the two stages, which is especially important in the early days of new products. A working paper by Teresa Fort of Dartmouth University, Wolfgang Keller of the University of Colorado and colleagues looks at innovation among American firms. It finds that those that locate their manufacturing near their R&D produce more patents and citations. Indeed, the smaller the geographic distance between the manufacturing and innovation arms of a firm, the more innovation ensues.

What about when firms deem it better value-for-money to move production elsewhere? Another working paper by Lee Branstetter, then of Carnegie Mellon University, Britta Glennon of the University of Pennsylvania and colleagues, examines just that. In 2001 Taiwan lifted rules banning the offshoring of production to China, but only for some products. The study finds that offshoring did reduce the quantity of patents related to these products. But it also freed up resources for R&D in adjacent types of products, leading to more patents in these areas.

Mr Pisano and Mr Shih suggest that the benefits of locating R&D and manufacturing near one another depends on the type of work. For instance, when your columnist researched and wrote this article, there was no reason for him to be located near the printer or distributor of *The Economist* because software neatly separates the two steps. By contrast, new biotech drugs often require R&D to be near production facilities, because drug design is closely linked to the manufacturing process. Semiconductors, the subject of many of the recent round of industrial policies, lie somewhere in between these two types of work. A few firms like Nvidia, in California, only design chips and send the designs overseas to be made by other companies like TSMC, a Taiwanese chip firm. But Taiwan also has a burgeoning chip-design industry, in part because of its advanced-manufacturing prowess, which makes it easier for startups to prototype and test new ideas.

To subsidise or not to subsidise

That manufacturing sometimes boosts innovation does not justify the enormous price tag carried by subsidies. Even many economists who sing industry's praises concur. Governments tend to be poor at picking industries and technologies to support. And as Mr Pisano notes, if there truly were big enough benefits to be found from moving R&D and manufacturing near one another, firms would do it themselves.

The case of American competition with Japan in the 1980s and 1990s offers a useful parallel. Just like now, policymakers in Washington worried about losing market share in advanced-tech manufacturing. But as Mr Branstetter and colleagues noted in a paper in 2013, a falling market share did not stop American firms from better capitalising on the software boom that followed. One difference between the countries was openness to immigration. American firms could simply draw on a bigger pool of programmers. Mr Branstetter also notes that Japan's government incentivised hardware manufacturing, delaying a pivot to software.

In a twist of fate, such openness to foreign talent may support manufacturing at home. Another working paper by Ms Glennon finds strong evidence that restrictions on H1B visas, which are intended for employment of high-skilled foreigners, lead to more offshoring, as firms are forced to head abroad for talent. That is an inconvenient finding for the many politicians who both support domestic manufacturing and are loth to increase immigration. ■

Rogue geoengineering

A new Great Game

FORT COLLINS

America's defence department intends to model how rogue projects to engineer the climate might unfold

What if a country experiencing the bad effects of climate change—crop failures, perhaps, or serious flooding—were to begin, unilaterally and perhaps quietly, to try to modify the climate? Such a project, reckons DARPA, a research arm of America's defence department, is possible. But it could trigger chaos, and not just of the meteorological sort. The agency, the overall objectives of which include preventing "strategic surprise", has therefore recently begun to pay for research into how such an event might happen, and how to react to it.

Part of this work is pure science—upgrading the relevant computer models to forecast changing weather patterns that could result from such an irregular geoengineering project. The other part is to use a branch of maths called game theory to identify those countries, or even non-state entities, which might, if push came to shove, be most likely to give climate engineering a go.

DARPA's assumption is that any attempt at unilateral geoengineering would use a technique called stratospheric aerosol injection (SAI). This would employ aircraft to disperse sulphuric acid, or its precursor sulphur dioxide, into the upper atmosphere, to form tiny sulphate particles that would reflect sunlight back into space.

Aerosol can'ts

This would probably work (big volcanic eruptions, which do something similar, have a measurable effect on global temperatures). The costs, though, could be considerable—and not just directly in dollars. A poorly designed SAI programme might break down ozone, a form of oxygen that shields organisms, people included, from harmful ultraviolet radiation. Patterns of precipitation would also change, for cooler air absorbs less moisture, and these effects would undoubtedly vary from region to region. Another problem is the acid rain that would result.

Perhaps most pertinent, though, is that SAI would serve only to mask the effects of greenhouse gases rather than ending them. That brings the risk of "termination shock", for the injected sulphate is constantly washed out of the atmosphere in rain and snow. The closure of an SAI programme, particularly a long-lasting one, might thus cause a sudden heat jolt more difficult to deal with than the existing, gradual, warming.

It could, indeed, be yet worse than that. Joshua Elliott, head of DARPA's AI-assisted Climate Tipping-point Modelling (ACTM) programme, fears that a big SAI project might cause the climate to "very suddenly slip" into a new state. Modelling how Earth's various climatic subsystems could produce such a shift is, he says, extremely difficult. Today's models do a fair job of calculating the effects of steady changes. But they were not designed to forecast the sudden shifts and subsequent rippling effects that SAI might set off.

Nor is the risk of someone doing something stupid a fantasy. In 2019 Massimo Tavoni, a game theorist at Milan Polytechnic who is unaffiliated with DARPA, organised six games played by 144 students. Participants were given a variety of ideal climate outcomes and allowed to spend toy money they were given on geoengineering pro- ▸▸

→ Also in this section

jects to achieve them. Those who ended a round with their optimal climate outcome would then receive a payout of real cash. But an overabundance of SAI programmes were launched. To make matters worse, some players tried to counter efforts at cooling which they deemed excessive with attempts to warm the planet, resulting in a chaotic outcome that Dr Tavoni calls "geoengineering wars". In the end, he says, "everybody loses."

DARPA sees better AI as crucial to success here. The data sets involved in climate modelling are vast, and even more so when many alternative paths must be processed. For this reason, Dr Elliott says, new AI algorithms are needed to focus processing power on the streams of data that matter most, such as those governing the Atlantic meridional overturning circulation, a large system of ocean currents.

These algorithms are also to be designed with an eye toward making them as comprehensible as possible to non-specialists. DARPA calls this "explainable AI". This is important, says Elizabeth Barnes, co-leader of the ACTM project at Colorado State University (CSU) in Fort Collins. The goal is to influence policy, and people are understandably inclined to distrust the outputs of an inscrutable black box.

Another objective is to improve the computational resolution of algorithms that model chemical processes. Many of those employed in CESM, the model the CSU team is using, are ill-suited to dealing with rapid chemical changes of the sort that would probably follow SAI. Beyond this, whole new sets of algorithms are also required, says Dr Barnes. She notes in particular a lack of code to model chemical reactions in the stratosphere, and also to describe how sudden shifts in temperature might alter plant growth in farmland, grasslands and forests.

The researchers are developing, too, "early warning" code to sift through real-world climate data and flag up signs of people undertaking geoengineering mischief on the sly. To test this code, the team runs pairs of parallel simulations. In one, the inputs are actual climate data. In the other, they are tweaked to reflect an SAI programme being under way. Those algorithms quickest off the mark in noticing something amiss are considered the best. This is not easy, Dr Barnes says, for even unengineered weather is full of natural variations that she calls "climate wiggles".

Acid test

Were such mischief to involve SAI, it might be spotted before any particles were sprayed. Aircraft able to carry heavy loads to the necessary altitude of about 18km do not yet exist, so they would have to be designed, built and tested, which is hard to do in secret. But not, perhaps, impossible.

DARPA therefore reckons a better understanding of when and where SAI might be started would still be helpful. Such foresight would assist climate modellers in running more realistic assessments.

Another goal is to help the comity of nations better focus incentives and pressure to prevent ill-advised SAI programmes getting off the ground in the first place. That is where game theory comes in. People and organisations pursue their best interests as they perceive them. This means that if numerical values or rankings are assigned to the goals, motives, power and influenceability of a given set of "players", their actions and reactions can be modelled.

Such models are less exact than climate-change forecasting software, some of which has been running long enough to test its mettle, and all of which has been put through "hindcasting" tests, to see if its predictions match what actually happened in the past. Nevertheless, if the values assigned to a player's drive, capabilities and pliability approximate reality, game theorists say, the resulting predictions of that player's behaviour can be quite good.

The ACTM programme's game-theory work is being carried out at CSU and at the US Naval War College (NWC) in Newport, Rhode Island. The most straightforward part of it involves identifying entities with sufficient resources to undertake SAI. Curtis Bell, a political forecaster who leads this research at NWC, believes at least two dozen countries could afford it, merely by reshuffling resources in their defence budgets. Groupings of smaller countries might also club together. SAI could even, conceivably, be undertaken by what Stefan Schäfer, a scholar at the Institute for Advanced Sustainability Studies in Potsdam, Germany, calls "self-authorising" billionaires.

It follows that the areas which suffer most from rising temperatures would have greater incentives to take the plunge. Computer simulations are helping with this part of the work. On top of that, the team is poring over data which reveal how hard various countries have been hit in recent years by storms, droughts and wildfires. Refugee flows linked to such ills are also taken into account.

Another factor is how exposed a country is to retaliation. Military power, or lack thereof, thus matters. So, too, does involvement in international trade—as shown by Russia's economic conflict with the West after its invasion of Ukraine. As Dr Bell points out, energy exporters like Russia are more insulated from such measures than countries that sell less crucial goods.

The political systems of trading partners play a role, too. Historically speaking, democracies have been more willing than autocracies to impose sanctions in attempts to change foreign governments' behaviour, so Dr Bell reckons countries dependent on trade with the West will probably be less willing than others to go rogue. Taking such factors into account, he aims to give countries "exposures to punishment" scores on a scale of one to 100.

Game, set and match

Some political scientists think the risks of unilateral geoengineering are exclusive to authoritarian regimes. Dr Bell, however, believes a democracy reeling from a string of climate miseries could well demand action from politicians keen to please. For this reason, he says, another of the project's aims is to study how different sorts of political tipping points have led elected leaders to buck international norms.

Leaders' ages matter as well. Though SAI would change the climate faster than trimming emissions of greenhouse gases, it would still take years to develop and deploy. Elderly heads of government are known to be less likely than their younger counterparts to begin such lengthy projects. When assessing different leaders' motivations for SAI, Dr Bell therefore adds points for those who can expect still to be in power to bask in the glory of a hoped-for climate triumph. Taking all these factors into account, Dr Bell, when pressed to list his current top candidates for SAI, says that they include Algeria, Australia, Bangladesh, Egypt, India, Indonesia, Libya, Pakistan, Saudi Arabia and Thailand.

Research into geoengineering is controversial. One fear is that a better understanding of what might happen could encourage someone to try it. Indeed, the ambitions of leaders do sometimes expand in tandem with growing technological capabilities. Even so, reckons James Hurrell, the other leader of the ACTM research at CSU, where he is a professor of atmospheric science, current climate action is clearly insufficient to reverse warming. The chances that SAI would be undertaken somewhere are climbing, he says, so "war gaming" outcomes is prudent. ■

Exam nerves' real cause

High anxiety

Anxious exam candidates' problem is the run-up, not the main event

EXAMS ARE nerve-racking, especially for those already of an anxious disposition. The silence of the hall; the ticking of the clock; the beady eye of the invigilator; the smug expression of the person sitting at the neighbouring desk who has finished 15 minutes early. It therefore seems hardly surprising that those who worry about taking tests do systematically worse than those who do not. What is, perhaps, surprising, according to research published recently in *Psychological Science* by Maria Theobald at the Leibniz Institute for Research and Information in Education and her colleagues, is that it is not the pressure of the exam hall which causes the problem. It is the pressure of revision.

Dr Theobald theorised that if anxiety was truly interfering with a student's ability to transfer known information from brain to paper via pen, then those with high levels of it would perform worse in a real exam, when it actually mattered, than in either a mock beforehand or during online practice sessions. Moreover, she expected this performance-drop to correlate with levels of self-reported exam nerves.

She therefore worked with 309 German medical students who were preparing for their final state exam, the most important that they take. This test consists of 230 questions split into three five-hour sessions over three days.

During the 100 days before the actual papers, all her volunteers used a digital-learning platform which presented them with old exam questions and logged their performance. They also sat a mock examination, clearly presented to them as such, 40 days before the real thing. To assess their levels of anxiety, they were asked, every day for 40 days in the run up to the real exam and also on the day of that exam, to respond on a five-point scale to statements like, "I feel tense and nervous". On the day of the mock they were similarly asked to rate statements like, "I worry whether I have studied enough".

What Dr Theobald found was not what she expected. Anxiety on the day of the test did not predict exam performance at all. What did predict it was the level of knowledge a student displayed in the mock exam and the earlier digital-learning activities. Those who performed well in these also did well in the real thing, regardless of how anxious they were on the day.

What actually hampered students, it turned out, were high levels of anxiety during the weeks before the exam took place. The greater a student's anxiety in the days before the exam, the lower his or her knowledge-gain was during that period, leaving that student with less material to regurgitate during the exam itself.

And this, paradoxically, is a positive discovery, for it suggests a change of approach to revision by the anxious might help improve their results. Dr Theobald notes that test-anxiety is at its worst when students have low expectations of success and simultaneously know that passing the exam is exceedingly important. To reduce this anxiety, she proposes a two-fold strategy for students to consider as they revise. First, they can raise their belief in their own abilities by reminding themselves of just how much they know. Second, they can diminish the significance of the test by reminding themselves that, while it is important, it is not a life or death situation. It really isn't. Really... ■

Entomological agriculturalists

The constant gardeners

Like some ants and termites, ambrosia beetles grow crops

PEOPLE WERE not the first farmers. Several groups of ants, and one of termites, were tending fungal plantations for millions of years before *Homo sapiens* strode the planet. But ants and termites are social insects, able to spread the labour of running their estates among many pairs of jaws. Beetles, by contrast, are solitary. Yet work just published in the *Proceedings of the Royal Society* by Janina Diehl and Peter Biedermann of the University of Freiburg, in Germany, confirms the agricultural skills of at least one group of coleopterans.

The fruit-tree pinhole borer, as its name implies, bores holes in fruit trees. It lays its eggs and raises its young in the galleries thus created. Yet ambrosia beetles, of which this is a particularly pesky example, do not feed directly on the wood they bore into. Instead, they devour fungi which grow on the timber thus exposed.

Researchers have long suspected that this is a form of farming, because they have evidence the insects carry spores of their preferred crop, *Raffaelea sulphurea*, into their smallholdings—in effect, sowing it there. Now, Dr Diehl and Dr Biedermann have shown they also engage in another crucial agricultural practice, weeding.

Observations of natural fruit-tree pinhole-borer dwellings suggest that *R. sulphurea* grows in them more abundantly than might be expected, given all the fungal competition around—but not why. To check whether the beetles are, indeed, weeding their crop Dr Diehl and Dr Biedermann did an experiment. They raised 40 captives in enclosures that gave them access to test-tubes filled with compacted beech sawdust which had been enriched with salts, sugar, starch and casein (a protein derived from milk), to mimic the nutrient value for fungi of the sort of wood that pinhole borers bore into. Then they watched what happened.

Down on the farm

The beetles lived up to their name, creating galleries in the substitute wood quite similar to those they excavate in trees. As with natural galleries, they rapidly inoculated the walls of these tunnels with *R. sulphurea* spores. Around ten days later, when the fungi were flourishing, but before the beetles had started laying their eggs, the researchers collected all of the insects. They then returned half to their dwellings while leaving the other labyrinths vacant. Twenty days after that, they sampled the gallery walls for fungi.

As they had hoped and expected, *R. suphurea* was much more abundant in beetle-tended galleries than in those deprived of their residents. In the former, it made up half of the fungal mass extracted. In the latter, less than a third. These beetles, and by implication other species of ambrosia beetle, are indeed weeding their crop. How this weeding happens remains unknown. But happen it does.

Ecology

In praise of introduced species

Alien plants and animals are not all bad, and should not automatically be viewed as such

INTRODUCED SPECIES have a bad rap. From American grey squirrels displacing European red ones, to Japanese knotweed displacing just about everything everywhere, their purported negative effects on nature are there for all to see. But it is only the human eye which prefers the arboreal rodents in a particular place to be red rather than grey. Ecologically, both occupy the same niche. Nor might people fret about knotweed growing at other plants' expense if it did not also undermine human constructions such as buildings and roads.

Until the middle of the 20th century, moving species around the world was reckoned a normal, often valuable, thing to do, while the consequences of their accidental movement were rarely considered. It was not until the publication in 1958 of "The Ecology of Invasions by Animals and Plants", by Charles Elton, one of the founders of scientific ecology, that values began to change. Conservation is, as the name implies, a conservative business. Those involved often value "nativism"—the idea that the species mix in a particular place should remain as unchanged as possible. But this is just an opinion. Other opinions are possible.

A study published recently in *Trends in Ecology & Evolution* by Dov Sax of Brown University, in Rhode Island, thus asks how the benefits of introduced species might be better assessed, so that opinions can be more informed. Specifically, he and his compadres have recruited the vocabulary of moral philosophy. They thus identify three sets of reasons why an introduced species might be valuable: instrumental, intrinsic and relational.

Man is the measure of all things

Instrumental values are easiest to grasp. They pertain to things that provide direct human advantage. Dr Sax and his colleagues ignored crops, since these are heavily managed by human beings and their benefits are obvious. But they included transplanted grass species that have gone wild, yet provide grazing for stock animals, and introduced forest trees that yield timber for construction.

One little-regarded but important example of instrumental value is the transport of Old World earthworms to North America, parts of which were left worm-free after the last ice age. The presence of these is reckoned to have increased agricultural productivity by as much as 25% in previously worm-deprived areas, though recent work suggests other invertebrates have suffered.

Honeybees, too, are an Old World species introduced into the New. Their instrumental benefits in the form of honey and wax are obvious. But they also pollinate flowering plants, including many crops.

Honeybees' role as pollinators also makes them pertinent to the second category, intrinsic values. These pertain to the ecosystem into which the introduction has happened. Since honeybees pollinate wild plants as well as domesticated ones, they have a positive intrinsic effect on their adopted habitats.

Introduced species can bring other benefits. Sometimes, in a manner reminiscent of the nursery rhyme in which an old lady swallows a fly, a spider to catch it, and a bird to catch the spider, an introduction may be made to undo a previous harm. Several introductions of damaging insects have been attacked successfully by further introductions of critters that eat them—though this has not worked so well for voracious introduced molluscs called giant African land snails.

Another attempt to undo a human-induced intrinsic harm is the introduction of Aldabra giant tortoises to Île aux Aigrettes, near Mauritius, to replace an extinct local species that had been crucial to maintaining this island's ebony forests. Introductions are also sometimes made to reduce the risk of a localised species becoming extinct. Pyne's ground plum, native to a handful of sites in the central basins of Tennessee but now transplanted to others, falls into this category.

Resident aliens

Relational values are the most esoteric, being experienced on an emotional rather than a practical level. Lots of people feel good about native wildlife, which is generally the main motive for its conservation. But that feel-good factor can extend to interlopers as well, especially if the interloping happened a while back. Dingoes (pictured), for example, are the descendants of dogs brought to Australia more than 3,500 years ago, presumably by human agency, but which have lived free there ever since and have entered the mythologies of aboriginal Australians. Similarly, the wild horses and asses (mustangs and burros) of North America, though not as long established as dingoes, have found places in the hearts of sufficient numbers of people to have active lobbies for their conservation.

Relational values can cut both ways, however. For example, ring-necked parakeets, an Asian and African species, have been spreading through Britain for several decades. Some find them a colourful addition to the local wildlife, others a gaudy, noisy competitor for native birds.

It's the principle of the thing

Having established their intellectual framework, Dr Sax and his colleagues suggest future research might work within it and, in particular, be properly open-minded about the benefits as well as the costs of introductions. Past attempts to do this for significant numbers of species at a time are rare, though they have come up with two. One, published in 2020, examined 105 species. It showed only benefits for 30, only costs for 31 and both for 44. Another, from 2014, came to similar conclusions for 87 marine species introduced into European waters. Seven provided pure benefit, 17 pure cost and 63 both.

In light of their analysis Dr Sax and his team therefore suggest that researchers studying introduced species should in future follow three principles. First, they should create a clear distinction in their studies between changes that have happened and judgments about the value of those changes. Second, when making those judgments, they should acknowledge all three types of values, rather than focusing narrowly on one or two of them. Third, they should actively consider biases in previous research that might have led to unbalanced conclusions.

That done, many species will surely still end up on the debit side of the ledger. But others, badly thought of in the past, may not. Dingoes, for one, were originally despised by Australia's more recent, European, settlers. Now those, too, include partisans seeking the dogs' preservation. ■

Urban development

Building his case

ISTANBUL

Recep Tayyip Erdogan's vision for a "New Turkey" is reflected in his transformation of Istanbul

THE ATATURK CULTURAL CENTRE (AKM), initially known as the Palace of Culture, was the talk of the town when it opened in 1969. Seated on the edge of Taksim Square, in the heart of Istanbul's entertainment district, the building was considered a shrine to modernity and to the man after whom it was later named, Kemal Ataturk. But in late 1970 the AKM partially burned down. After years of neglect, it was demolished on the orders of Turkey's president, Recep Tayyip Erdogan. Many feared the worst when Mr Erdogan vowed to build a "baroque" opera house in its place.

They heaved a sigh of relief when the new centre (pictured), costing $200m, opened last year. From the outside the building seems less a homage to its predecessor than an oversize replica (it was designed by the son of the architect responsible for the previous building). What sets it apart is a 2,000-seat opera hall housed inside an enormous globe in the atrium; its outer shell, covered with thousands of crimson ceramic tiles, glows like a setting sun over Taksim. The surrounding complex includes a theatre, a gallery, a cinema and a large number of cafés.

Modern Turkey, the state Ataturk salvaged from the ruins of the Ottoman Empire, celebrates its centenary in 2023. To set the stage for the festivities, Mr Erdogan has given a makeover to the country's biggest city, the ancient home of the Ottomans (and the Byzantines before them). Yet the transformation he has wrought has less to do with celebrating Istanbul's or Ataturk's legacy than with consolidating his own.

Mr Erdogan considers himself the founder of a "New Turkey", a more confident, more independent and more religious incarnation of the country he was elected to govern two decades ago. New Turkey means restoring the country to the position of greatness he believes it was destined to occupy. Mr Erdogan has used architecture to hammer the point home. He has already presided over several construction projects: a new airport, costing $11bn, on the outskirts of Istanbul, which he hopes will become the world's biggest; the country's largest mosque ($100m), on the city's Asian shore; and a 1,100-room palace in Ankara ($615m), in which he resides. His most recent project is a second Bosporus—a 45-kilometre canal that would connect the Black and Marmara seas and turn much of Istanbul into an island.

He has also made a mark on Istanbul's downtown, Taksim Square in particular. Over the past century, successive governments and other political forces have fought over Taksim, seeking to remodel, reorder and claim the space as their own. Mr Erdogan has done so by building a huge mosque across from the AKM, delivering on a promise he made when he was mayor of Istanbul in the 1990s. A swathe of concrete spreads between the two buildings, spilling onto the edge of Gezi Park, the centre of mass protests which rocked Turkey a decade ago. The park, which Mr Erdogan wanted to replace with a replica Ottoman army barracks and a shopping mall, survives. But the area around it, ostensibly designed for pedestrians, now looks more suitable for a military parade than an idle stroll.

Down the hill from Taksim, a $1.7bn revitalisation project, dubbed Galataport, has

→ Also in this section

transformed the city's neglected port district into a swanky shopping centre and cruise terminal. One of the victims of the development (or beneficiaries, depending on whom you ask) is the Istanbul Modern, the city's main contemporary-art museum. The old home of the Modern, a repurposed warehouse by the Bosporus, has been demolished. The new one, designed by Renzo Piano to resemble stacks of shipping containers, was expected to open in time for this year's Istanbul Biennial, an art show which began on September 17th. Work is still under way.

The day your correspondent turned up, the new Modern's façade, intended to reflect the waters of the Bosporus, reflected instead a 135,000-tonne cruise ship docked opposite the museum. A second ship, also the size of a small town, was parked directly behind. Visitors are meant to take in views of the Bosporus from the restored waterfront promenade; thanks to the boats, they could not see the strait at all.

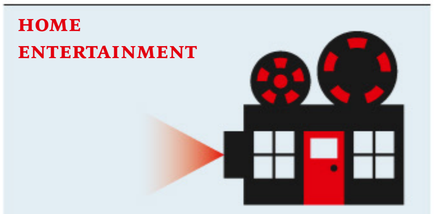
The Gezi Park protests in 2013 began as an attempt to stop the controversial projects Mr Erdogan had in store for the city. The demonstrations were smothered by force. Istanbul's "contested urban public spaces", ironically the focus of that year's biennial, are no longer contested: a decade later, Mr Erdogan's vision has prevailed.

Scores of buildings have gone up, and scores have come crashing down, with no public consultation and no concern for local communities, says Murat Guvenc, head of the Istanbul Studies Centre at Kadir Has University. Some say opportunities have been wasted. Galataport could have been one of the city's most important and inclusive public spaces, argues Yasar Adnan Adanali, an urban planner. "Instead, they built it up as much as they could, into an exclusive cruise port and yet another shopping-mall project."

Construction criticism

Istanbul is not ageing with grace. Since 2000 its population has ballooned from 11m to nearly 16m. The city may continue to charm tourists. On a clear day, the Hagia Sophia and the Blue Mosque, framed by the slopes of Mount Uludag and the shimmering Sea of Marmara, still beguile. But for residents, Istanbul has turned into a permanent building site choked with traffic; less the city of the world's desire than of the two-hour commute.

This year the Economist Intelligence Unit, a sister company of *The Economist*, ranked Istanbul as the least liveable city in Europe. In a separate survey of the world's greenest cities, Istanbul took last place. Mr Erdogan's projects are not wholly to blame; indeed some, such as the new AKM, are to be welcomed. But what Istanbul needs, more than shopping malls or mega mosques, is some room to breathe. ■



Detective fiction

Mystery lady

Josephine Tey's crime capers probed the dark side of human nature

DURING THE golden age of detective fiction in the early 20th century, four writers dominated the genre: Margery Allingham, Ngaio Marsh, Dorothy Sayers and the "queen of crime" herself, Agatha Christie. Another novelist of this era was Josephine Tey—ranked by her biographer, Jennifer Morag Henderson, as "number Five to the Big Four". In 1929-52 Tey (the pen name of Elizabeth MacKintosh) published a series of six meticulously crafted detective novels. "I had no intention of writing one", she said, "but one night an idea struck with such force that it hurt."

Tey's pain proved to be readers' gain. Her debut, "The Man in the Queue", was a critical and commercial success. It introduced Inspector Grant of Scotland Yard, whose intuition, ingenuity and perseverance help him to crack the most fiendish cases. In one book Grant's superior says he has "the most priceless of all attributes for his job: flair". In another tale Grant catches a culprit based on a small brown fleck in the iris of their left eye.

Three of Tey's books have just been reissued by Penguin: all are thick with mystery and show a great mind at work. "The Franchise Affair", published in 1948 and adapted into a film three years later (pictured), begins with a missing teenager. When she turns up again, distressed and exhausted, she explains how she fled a mother and daughter who locked her up and tried to make a servant of her. The girl's version of events ruins reputations. But then her story begins to unravel.

"To Love and Be Wise" (1950) revolves around another disappearance. Leslie Searle, a Hollywood photographer, vanishes from an English village that is home to many writers and artists. Grant arrives to determine whether a crime has been committed and quickly finds himself sifting alibis, collecting clues and taking stock of the residents' jealousies, grievances and other "subterranean tremors".

And then there is Tey's masterpiece, "The Daughter of Time" (1951), once voted the greatest crime novel ever written by the Crime Writers' Association. On this occasion, Grant is out of action, recuperating from a broken leg. To relieve his boredom, he turns his attention to a very cold case, that concerning Richard III. Did the last Plantagenet king really murder his two nephews in the Tower of London? Grant combs through the centuries-old evidence, separating fact from myth to work out whether this infamous villain could in fact be an innocent victim.

MacKintosh also achieved literary acclaim under another pseudonym, Gordon Daviot, and her first play, "Richard of Bordeaux", launched the career of John Gielgud. However, it is as Tey, and for her detective novels, that she is remembered today. They endure because of their keen psychological insight into the complexity of human nature. "The Franchise Affair" presents a captivating portrait of a chilling villain. "To Love and Be Wise" probes themes of identity and gender. And "The Daughter of Time" covers new ground through its use of history and its original ending: the antithesis of a neatly resolved drawing-room denouement. ■

Contemporary ballet

The Balanchine method

Mr B. By Jennifer Homans. *Random House; 784 pages; $35. Granta; £35*

THE FIRST part of "Mr B", Jennifer Homans's engrossing (and occasionally exhausting) biography of George Balanchine, is a journey across the political and cultural landscape of the early 20th century. He came of age as a dancer and choreographer in St Petersburg, when the city was convulsed by revolution. Balanchine fled west and plunged into the avant-garde scene first in Weimar Berlin, then in Paris, where he joined Sergei Diaghilev's famous company, Ballets Russes.

In 1933, with what Ms Homans calls "an instinct for countries and continents in collapse", he accepted an invitation from Lincoln Kirstein, a writer and future patron, to join him in America. There, he took on the Herculean task of elevating the art of dance and stirring up popular interest in the subject. In 1934 he helped to set up the School of American Ballet and in 1948 he co-founded the New York City Ballet.

There are few major cultural figures that Balanchine did not encounter. During his career he profited from the talents of composers such as Sergei Prokofiev, Richard Rodgers and Igor Stravinsky, and writers including Bertolt Brecht and Jean Cocteau. He worked with visual artists, too, notably André Derain, Henri Matisse and Pablo Picasso. Many of these collaborations gave rise to masterpieces, as when he joined up with Stravinsky on "Apollon Musagète", "Orpheus" and "Agon". Others proved less happy. Working with Prokofiev on "Prodigal Son", he clashed with the composer, who condemned Balanchine's choreography as "indecent". (For his part, Balanchine sneered that Prokofiev "wanted the 'Prodigal' to look like 'Rigoletto'.")

If the early chapters of the book brim with incident, the pace slows when Ms Homans focuses on the technical details of Balanchine's craft and the messy specifics of his personal life. Fortunately, she has a gift for evoking not only the grace of ballet but also the demands of the discipline. His choreography for Hindemith's "The Four Temperaments", for example, required dancers to "climb in and out of their own movements, squatting, skittering, backs humped with effort". The foundation of Balanchine's art was the classical tradition he learned at the Imperial Theatre School in St Petersburg, but he introduced new movements and patterns—sometimes jarring, always expressive—in response to the mood of the music.

There is still drama in these later sections, but instead of revolution and world war it is the drama of ambition realised and thwarted, of professional triumph and jealousy, along with countless romantic entanglements. For Balanchine, dance was inextricably bound up with love and sex. "Everything a man does", Balanchine said, "he does for his ideal woman." His preference was for much younger women; in a statement both troubling and pathetic, he lamented that "the history of man over 40 is 'Lolita'."

Keeping her on her toes

Balanchine was a difficult boss. He could be generous—particularly with money, which he spent and gave away freely—but also petty and tyrannical. He created tensions in the company when he lavished attention on his latest favourite and shunted others aside. When his futile pursuit of Suzanne Farrell caused Balanchine to lose focus, one of her colleagues confronted her: "Things are falling apart, why don't you just sleep with him?"

Ms Homans doesn't look away from the darker side of Balanchine's character, but is willing to forgive him for the sake of his genius. "He existed to make dances, that's all," she writes—a verdict that redeems, if it does not excuse, his many sins. She offers a poignant, fully rounded portrait of a fascinating man and a revelatory account of the art to which he dedicated his life. ■

Film and politics

The revolution will not be televised

A new documentary demonstrates the brutality of the Ugandan state

HE ALWAYS THOUGHT the camera would protect him. It did, once. Moses Bwayo was filming Bobi Wine, the Ugandan opposition leader, on the streets of Kampala when he saw a man in police uniform pointing a gun at him. It had a long, narrow barrel—the kind that fires ammunition rather than tear gas. He moved his camera in front of his eyes just in time; the rubber bullet struck his cheek. For so long, the lens had been his window on the world. Now it may have saved his sight.

But physical protection was the only kind the camera afforded; the rest of the time it made him a target. Mr Bwayo started filming Mr Wine in 2017 after the 35-year-old musician (whose real name is Robert Kyagulanyi) swaggered into parliament after a by-election. His camera was still rolling four years later, when Mr Wine ran for president. The result is "Bobi Wine: The People's President", a feature-length documentary which was shown at the London Film Festival last month and will be released by National Geographic next year. Making it has pushed Mr Bwayo into exile.

The Ugandan state is a military dictatorship doing a clumsy impression of a democracy. There are regular elections and some semblance of opposition, but the president, Yoweri Museveni, who has ruled since 1986, clings to power using violence, money and fraud. Mr Bwayo's documentary, co-directed with Christopher Sharp, a British film-maker, ably captures the capricious brutality of the regime.

Shot in a fly-on-the-wall style, interspersed with news clips and the occasional talking head, the film follows Mr Wine and his family as he hurtles towards the election. He is arrested and tortured; his supporters are shot dead on the streets. There is never any prospect of Mr Wine being declared the winner of the ballot, however popular he may be. Instead, the story is pulled along by the charisma of the singer and his wife, Barbie. This is a personal journey as much as a political one.

The same could be said of Mr Bwayo's own trajectory. He never set out to be a political film-maker. As a child, his first love was the kung-fu flicks that played in a *kibanda* (video hall) at the local market. Later his horizons widened. In Kampala he trained at a film school and attended a programme founded by Mira Nair, an Oscar-nominated director. He took inspiration from the socially conscious cinema of African directors, including Ousmane Sembène from Senegal and Souleymane Cissé from Mali.

Following Mr Wine put Mr Bwayo in the cross-hairs of the state. Strangers started calling him at odd hours, saying: "We have a project for you." Unknown men pursued his wife through a shopping mall. Sometimes an army pickup parked outside his house. He was arrested while filming in 2020 and, along with a group of opposition activists, spent several nights in a congested, flea-ridden cell. Security officers looked through his phone messages and confiscated his equipment. "Who is funding Bobi Wine?" they asked.

As the election neared, the threats towards the media intensified. "We shall beat you for your own sake," the police chief told journalists. Ashraf Kasirye, a cameraman who was live-streaming a campaign event for an online outlet, was hospitalised after police shot him in the head with a projectile, fracturing his skull. The same day Ali Mivule, a television reporter, was hit in the leg by a tear-gas canister; he says that a policeman shouted "collateral damage" before taking aim.

Mr Bwayo is a soft-spoken man who cut an unassuming figure in the maelstrom of the election campaign. On polling day in January 2021 he talked with your correspondent, who was the co-chair of an association of international journalists that Mr Bwayo had joined. The atmosphere was tense and the hours ahead uncertain, but he said he needed to finish the job. He stayed at Mr Wine's house that night to film. The next day soldiers surrounded the compound, forbidding entry or exit, and did not withdraw for 11 days.

"Bobi Wine: The People's President" is a shocking, tender work. There is much it

Laying their future in his hand

does not say. It offers little sense of Mr Wine's strategic decisions as a politician, or his mistakes. Though Mr Museveni is one of three central characters in the film, his presence looms offstage, glimpsed only in clips from television interviews. All the same, the film-makers manage to make an essential point: that he will stop at nothing to maintain his power.

Mr Bwayo knows that only too well—he and his wife have moved to America for safety. Yet he has no regrets about his work. "There are many people who have lost their lives and some of these people, I knew them. There's people who have disappeared," he says. "This is why we have made this film." ■

Janet Yellen

Queen of economics

Yellen. By Jon Hilsenrath. *Harper Business; 400 pages; $32.50 and £25*
Empathy Economics. Owen Ullmann. *PublicAffairs; 480 pages; $32 and £25*

JANET YELLEN has a strong claim to being the world's most powerful woman of the past quarter-century. In the late 1990s she led the Council of Economic Advisers in Bill Clinton's administration. In the 2000s she held a series of positions within the Federal Reserve before ascending to its apex as chair in 2014. Over the past two years she has led the Treasury. She is the only person to have served in all three of these roles, and has spent decades wielding influence over the American and, by extension, global economy.

Perhaps the most striking feature of all her power is how little it has changed her, a wonkish economist with a moral compass. Ms Yellen is esteemed by peers and subordinates alike as a fundamentally decent person, committed to the value of public service. She has remained scrupulously faithful to evidence, not ideology—sometimes to the detriment of her career, at least temporarily. And she seems determined not to play political games in Washington, that most political of cities.

Two new biographies ask the questions of how the unassuming Ms Yellen managed to rise so far and what she has accomplished. "Yellen", by Jon Hilsenrath of the *Wall Street Journal*, traces not just her arc but also that of her husband, George Akerlof, a fellow economist and a Nobel laureate. It is an elegant and erudite depiction of their intellectual voyages in pursuit of the idea that markets can fail and that sensible government action can improve people's lives. That might seem banal but, when they started out, it was a controversial pushback against the laissez-faire creed that had swept through economic theory in the 1970s. "Empathy Economics" by Owen Ullmann, a veteran journalist, is a more straightforward, pacey account of Ms Yellen's trajectory, full of reflections from colleagues and friends.

What, then, are the ingredients of Ms Yellen's formidable career? One thing that stands out, known to all around her, is her consummate planning for tasks big and small. She arrives at the airport hours ahead of flights and is often the first person in the departure lounge. Before providing her official signature for paper currency as treasury secretary, she reviewed the scribbles of those who had preceded her and practised hers again and again. As Fed chair, she would take three days to get ready for quarterly news conferences, asking staff to throw every conceivable question at her. A little fastidious, perhaps. Yet in the male-dominated world of economics, Ms Yellen has thrived by being the best prepared and usually the most knowledgeable person at the table.

Ms Yellen is driven by what she herself has called "moral passion". It is the view that economics—properly analysed and applied—makes the world a better place. Her primary focus, both as an academic and as a policymaker, has been on how to reduce unemployment. "These are fucking people!" she exclaimed once at the Fed during an abstract discussion about joblessness. She is also known for her integrity, exemplified by a speech she gave as Fed chair in 2017 defending tough regulation of banks, risking the ire of Donald Trump's advisers who were seeking to water down rules. That, plus Mr Trump's apparent view that the diminutive Ms Yellen did not look the part of a central banker, sealed her fate: he declined to renew her for a second term at the Fed's helm.

But that same integrity, combined with

her powerful intellect, is what allowed her to re-emerge as Joe Biden's treasury secretary—just when she thought she was done with public life. She has at times seemed to be on the margins of his cabinet. On a few crucial issues, though, she has shone. With a flair for diplomacy, she brought more than 130 countries together last year in a deal to establish a minimum tax on companies around the world (alas, international agreement has proved easier than assent from Congress).

Ms Yellen has a knack for being right about the big picture. She was early in detecting signs of recklessness in the American housing market in the 2000s, even if she later faulted herself for not grasping the enormity of the problem. In the early 2010s she was adamant, correctly, that the central bank should stick to very loose policy to propel the economy's sputtering recovery. The darkest blot on her record was her support for the stimulus package that Mr Biden introduced at the start of his presidency, which ended up adding fuel to inflation. Ms Yellen had initially been uncomfortable with the size of the stimulus, though she eventually defended it.

Ms Yellen granted considerable access to both writers, but there are gaps to fill in each account. The books hint at her immense frustrations in dealing with Mr Trump. They also refer to her being sidelined from time to time by both the Clinton and Biden administrations. Given her attention to detail, it is reasonable to assume that Ms Yellen has copious notes on all of this. Rumours abound that she may step down soon from the Treasury. That would be America's loss, yet one good thing might come of it: getting her story in her own words. ■

Johnson Not on the same page

An argument is being waged over research on children's language

The findings of a recent study from the Bofill Foundation, an education think-tank in Barcelona, were both obvious and surprising. It showed that children whose parents read with them had a clear advantage over those whose parents did not—a learning gap equivalent to about half a year's schooling. That is the obvious part: if you read to your children it helps them read, too. But researchers also found that, contrary to popular opinion, supervising children's homework is not particularly helpful. More useful is setting a regular place and time for them to do their studies.

What is most startling is how many academics reject such research in principle. A cadre of academic linguists argues that studies into children's learning often exhibit a "deficit ideology". Paul Gorski, the founder of the Equity Literacy Institute and a populariser of the term, summarised the idea as "a worldview that explains and justifies outcome inequalities—standardised test scores or levels of educational attainment, for example—by pointing to supposed deficiencies within disenfranchised individuals and communities."

In short, deficit ideology gives credence to the idea that poor people are poor because they are doing something wrong. Often, Mr Gorski said, the blame is placed on parents and supposed inadequacies "in the rearing and home lives of low-income students". He and other critics argue that such academic research ignores the structural factors which make advancement difficult.

The critics have a point: because of prejudice, students can be unfairly thought deficient. Studies have shown that teachers may have different perceptions of their pupils' academic aptitude based on their race; some may unconsciously mark down work by black pupils. Other factors that should be irrelevant, such as accents, can make teachers think pupils are less able than they actually are.

Students who speak in a minority dialect, such as African-American English, are often disparaged for having a poor grasp of standard English grammar. In fact, analyses have shown that they have mastered a different grammar, one that is as complex, intricate and expressive in its own way. The child is not at fault. The system to teach them skills in standard English is.

Critics of deficit ideology are further backed up by the fact that research may be misinterpreted by a simplistic press. Journalists should beware of describing academic findings as though they are irrefutable or suggesting that tentative correlations are magic solutions. A study in 1995 implied a relationship between the number of words children have heard from parents by the age of three and their academic success at nine. Youngsters from well-off families, it suggested, had heard 30m more words than those from poorer ones. But subsequent research has questioned the extent of this "word gap", whether it varies from place to place—indeed whether it exists at all.

Despite all this, it is still worth researching into children's learning. One reason is that it is better to know what early interventions might work than to remain in ignorance. The remedy for poorly controlled studies that do not account for pre-existing disadvantages is better research and robust debate, not to dismiss all work on what behaviour might help children develop their language skills merely because such work constitutes a deficit ideology. By all means research inequality and its causes, but also research things that might help fix it.

Every study worth its paper and ink controls for factors such as parents' levels of education and income—and these controls depend on an acknowledgment of the same inequalities that academics contest. For example, the Bofill Foundation's report found that socioeconomic status predicted an advantage in school performance, although the gain was not quite as much as that predicted by reading with children, irrespective of social class.

Research is a vital tool for identifying ways in which all parents, rich or poor, can support their offspring's learning—such as a regular homework routine. For some parents, its findings may be difficult to put into practice: many understand the importance of reading, but are unable to afford books and live far from a library. Yet even then, studies can help on an institutional level. Gathering evidence about early education can lead policymakers to help by introducing better policies for babies, children and their parents.

Economic & financial indicators

Economic data

	Gross domestic product % change on year ago latest		quarter*	2022†	Consumer prices % change on year ago latest		2022†	Unemployment rate %		Current-account balance % of GDP, 2022†	Budget balance % of GDP, 2022†	Interest rates 10-yr gov't bonds latest,%		change on year ago, bp	Currency units per $ Nov 2nd	% change on year ago
United States	1.8	Q3	2.6	1.5	8.2	Sep	8.0	3.5	Sep	-3.7	-3.7	4.1		254	-	
China	3.9	Q3	16.5	3.3	2.8	Sep	2.0	5.5	Sep‡§	2.5	-7.1	2.5	§§	-33.0	7.28	-12.1
Japan	1.6	Q2	3.5	1.8	3.0	Sep	2.2	2.6	Sep	1.9	-6.1	nil		-8.0	147	-22.7
Britain	4.4	Q2	0.9	4.4	10.1	Sep	8.4	3.5	Jul††	-6.2	-6.9	3.7		265	0.87	-16.1
Canada	4.6	Q2	3.3	3.1	6.9	Sep	6.8	5.2	Sep	1.3	-3.3	3.3		162	1.36	-8.8
Euro area	2.1	Q3	0.7	3.0	10.7	Oct	8.3	6.6	Aug	1.4	-4.4	2.1		230	1.01	-14.8
Austria	6.0	Q2	11.5	4.6	11.0	Oct	8.9	5.2	Aug	-0.5	-4.7	2.9		277	1.01	-14.8
Belgium	4.1	Q2	2.2	2.2	12.3	Oct	9.6	5.8	Aug	-1.3	-5.1	2.8		260	1.01	-14.8
France	1.0	Q3	0.6	2.4	6.2	Oct	5.7	7.3	Aug	-1.9	-5.4	2.7		241	1.01	-14.8
Germany	1.1	Q3	1.1	1.4	10.4	Oct	8.4	3.0	Aug	3.9	-4.4	2.1		230	1.01	-14.8
Greece	7.8	Q2	5.0	5.5	12.0	Sep	9.9	12.2	Aug	-6.4	-4.4	4.6		334	1.01	-14.8
Italy	2.6	Q3	2.0	3.3	11.9	Oct	7.8	7.8	Aug	-0.8	-5.9	4.3		319	1.01	-14.8
Netherlands	5.1	Q2	10.6	4.5	14.5	Sep	13.1	3.8	Sep	7.7	-2.2	2.5		248	1.01	-14.8
Spain	3.8	Q3	1.0	4.4	7.3	Oct	9.2	12.4	Aug	0.2	-5.4	3.2		255	1.01	-14.8
Czech Republic	3.6	Q2	-1.6	2.2	18.0	Sep	16.7	2.5	Aug‡	-3.8	-5.7	5.9		324	24.8	-10.9
Denmark	3.5	Q2	3.5	2.1	10.0	Sep	8.2	2.5	Sep	8.3	0.8	2.6		248	7.54	-14.8
Norway	3.9	Q2	2.9	2.2	6.9	Sep	6.2	3.2	Aug‡‡	17.3	11.3	1.4		76.0	10.4	-17.9
Poland	4.9	Q2	-8.1	3.5	17.9	Oct	14.4	5.1	Sep§	-3.7	-3.7	8.4		545	4.76	-16.4
Russia	-4.1	Q2	na	-4.4	13.7	Sep	14.0	3.9	Sep§	12.9	-3.1	10.4		208	62.2	15.2
Sweden	3.1	Q3	2.8	2.2	10.8	Sep	9.1	6.5	Sep§	3.0	-0.2	2.2		189	11.0	-22.3
Switzerland	2.4	Q2	1.1	2.0	3.3	Sep	3.1	2.1	Sep	5.6	-1.1	1.1		120	1.00	-9.0
Turkey	7.6	Q2	8.5	5.0	83.5	Sep	72.8	9.8	Aug§	-5.7	-3.8	11.1		-775	18.6	-48.5
Australia	3.6	Q2	3.6	3.5	7.3	Q3	6.0	3.5	Sep	2.3	-1.7	3.8		192	1.56	-13.5
Hong Kong	-4.5	Q3	4.1	0.4	4.3	Sep	2.0	3.9	Sep‡‡	4.1	-6.8	4.0		251	7.85	-0.9
India	13.5	Q2	9.5	6.9	7.4	Sep	7.1	7.8	Oct	-2.3	-6.4	7.4		104	82.8	-9.8
Indonesia	5.4	Q2	na	5.0	5.7	Oct	4.9	5.8	Q1§	1.2	-3.9	7.4		116	15,648	-8.9
Malaysia	8.9	Q2	na	6.0	4.5	Sep	3.4	3.7	Aug§	1.9	-6.1	4.3		70.0	4.74	-12.4
Pakistan	6.2	2022**	na	6.2	26.6	Oct	20.7	6.3	2021	-5.1	-7.6	12.9	†††	228	221	-23.1
Philippines	7.4	Q2	-0.4	7.6	6.9	Sep	5.4	5.2	Q3§	-3.8	-7.8	7.4		267	58.5	-13.8
Singapore	4.4	Q3	6.3	3.5	7.5	Sep	5.7	2.0	Q3	19.2	-1.0	3.4		161	1.41	-4.3
South Korea	3.0	Q3	1.1	2.6	5.7	Oct	5.1	2.4	Sep§	1.8	-3.3	4.2		167	1,418	-17.1
Taiwan	4.1	Q3	6.6	2.9	2.8	Sep	3.0	3.6	Sep	14.1	-2.0	1.8		119	32.2	-13.5
Thailand	2.5	Q2	2.7	2.8	6.4	Sep	6.0	1.2	Aug§	-1.2	-5.0	3.1		133	37.6	-11.5
Argentina	6.9	Q2	4.2	5.0	83.0	Sep	73.8	6.9	Q2§	-0.6	-4.4	na		na	158	-36.6
Brazil	3.2	Q2	5.0	2.7	7.2	Sep	9.3	8.7	Sep§‡‡	-1.8	-6.2	11.8		-46.0	5.14	10.5
Chile	5.4	Q2	nil	2.2	13.7	Sep	11.7	8.0	Sep§‡‡	-7.8	-0.3	6.6		54.0	938	-13.1
Colombia	12.6	Q2	6.0	7.6	11.4	Sep	10.1	10.7	Sep§	-5.4	-4.7	14.3		661	5,009	-24.5
Mexico	4.2	Q3	4.1	2.2	8.7	Sep	8.0	3.1	Sep	-1.0	-2.4	9.8		228	19.7	5.5
Peru	3.3	Q2	2.3	2.6	8.3	Oct	7.7	7.7	Sep§	-3.5	-2.1	8.5		268	3.98	0.2
Egypt	3.2	Q2	na	6.6	15.1	Sep	13.3	7.2	Q2§	-4.8	-6.5	na		na	24.1	-34.7
Israel	4.9	Q2	6.9	5.6	4.6	Sep	4.5	3.7	Sep	2.9	0.5	3.3		201	3.53	-11.1
Saudi Arabia	3.2	2021	na	9.1	3.1	Sep	2.5	5.8	Q2	14.0	9.0	na		na	3.76	-0.3
South Africa	0.2	Q2	-2.9	1.9	7.8	Sep	6.9	33.9	Q2§	-1.3	-6.2	10.7		109	18.2	-15.3

Source: Haver Analytics. *% change on previous quarter, annual rate. †The Economist Intelligence Unit estimate/forecast. §Not seasonally adjusted. ‡New series. **Year ending June. ††Latest 3 months. ‡‡3-month moving average. §§5-year yield. †††Dollar-denominated bonds.

Markets

In local currency	Index Nov 2nd	% change on: one week	% change on: Dec 31st 2021
United States S&P 500	3,759.7	-1.9	-21.1
United States NAScomp	10,524.8	-4.1	-32.7
China Shanghai Comp	3,003.4	0.1	-17.5
China Shenzhen Comp	1,968.2	0.5	-22.2
Japan Nikkei 225	27,663.4	0.8	-3.9
Japan Topix	1,940.5	1.2	-2.6
Britain FTSE 100	7,144.1	1.2	-3.3
Canada S&P TSX	19,277.0	nil	-9.2
Euro area EURO STOXX 50	3,622.0	0.5	-15.7
France CAC 40	6,276.9	nil	-12.2
Germany DAX*	13,256.7	0.5	-16.5
Italy FTSE/MIB	22,803.0	1.8	-16.6
Netherlands AEX	667.2	0.2	-16.4
Spain IBEX 35	7,968.6	1.2	-8.6
Poland WIG	51,334.8	4.9	-25.9
Russia RTS, $ terms	1,108.7	1.8	-30.5
Switzerland SMI	10,806.2	-0.1	-16.1
Turkey BIST	4,071.9	2.4	119.2
Australia All Ord.	7,177.8	2.5	-7.7
Hong Kong Hang Seng	15,827.2	3.3	-32.4
India BSE	60,906.1	2.3	4.6
Indonesia IDX	7,015.7	-0.4	6.6
Malaysia KLSE	1,451.6	-0.2	-7.4

	index Nov 2nd	% change on: one week	% change on: Dec 31st 2021
Pakistan KSE	41,944.6	1.0	-5.9
Singapore STI	3,141.1	4.4	0.6
South Korea KOSPI	2,336.9	3.9	-21.5
Taiwan TWI	13,100.2	2.9	-28.1
Thailand SET	1,625.0	1.8	-2.0
Argentina MERV	149,309.4	3.0	78.8
Brazil BVSP	116,928.7	3.7	11.5
Mexico IPC	50,864.9	3.1	-4.5
Egypt EGX 30	11,242.1	6.5	-5.6
Israel TA-125	1,954.2	-0.2	-5.7
Saudi Arabia Tadawul	11,530.3	-2.3	1.8
South Africa JSE AS	67,123.1	nil	-8.9
World, dev'd MSCI	2,499.8	-1.4	-22.6
Emerging markets MSCI	873.0	2.5	-29.1

US corporate bonds, spread over Treasuries

Basis points	latest	Dec 31st 2021
Investment grade	174	120
High-yield	474	332

Sources: Refinitiv Datastream; Standard & Poor's Global Fixed Income Research. *Total return index.

Commodities

The Economist commodity-price index 2015=100	Oct 25th	Nov 1st*	% change on month	% change on year
Dollar Index				
All Items	142.0	140.1	-2.6	-6.2
Food	137.7	141.2	1.8	6.1
Industrials				
All	146.0	139.0	-6.5	-15.6
Non-food agriculturals	137.9	136.1	-1.3	-7.3
Metals	148.4	139.8	-7.9	-17.7
Sterling Index				
All items	189.1	186.5	-3.1	11.4
Euro Index				
All items	158.1	157.3	-1.8	10.0
Gold				
$ per oz	1,654.8	1,645.1	-4.6	-8.0
Brent				
$ per barrel	93.5	94.7	3.1	12.0

Sources: Bloomberg; CME Group; Cotlook; Refinitiv Datastream; Fastmarkets; FT; ICCO; ICO; ISO; Live Rice Index; LME; NZ Wool Services; Thompson Lloyd & Ewart; Urner Barry; WSJ. *Provisional.

For more countries and additional data, visit
economist.com/economic-and-financial-indicators

The calm before the storm

Mild weather has caused natural-gas prices to plummet, for now

Ever since Russia tightened the valves on natural-gas shipments to Europe, markets have feared that the continent could suffer an energy shortage this winter. Yet western Europe now has so much gas that last month the price briefly went negative. Although the recent price crash does not offer full protection against an energy crunch (see Finance & economics section), it does make calamity less likely.

Before Russia invaded Ukraine, it provided close to 40% of Europe's gas. After it said it would cut off gas to the Nord Stream 1 pipeline in August, the benchmark TTF price soared above €300 ($305) per MWh, 13 times the average in 2018-21. Facing uncertain supplies, the EU set a target for members to fill 80% of their gas storage by November 1st. Many countries replaced piped Russian imports with liquefied natural gas (LNG). Germany, which had no regasification facilities, started building terminals and bought whatever gas was available.

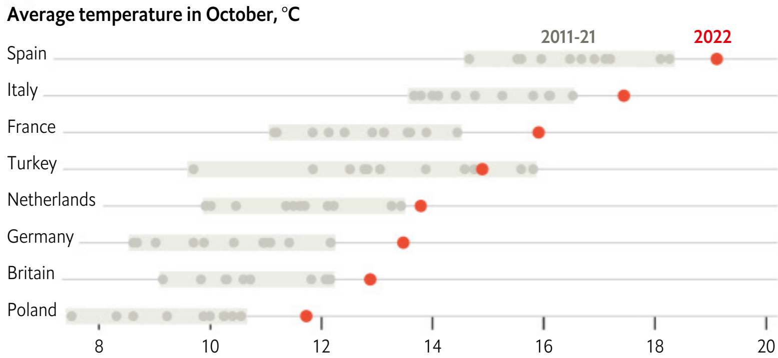
By mid-autumn, weather in much of Europe is usually chilly enough for consumers to turn on the heat. This year, however, has been remarkably balmy: all six of the continent's biggest economies enjoyed the warmest October in at least a decade. As a result, the EU has blown past its storage target, with stores now 95% full on average.

A few eastern European countries still have storage available. However, most of the continent's LNG ports are in western Europe. With nearby storage sites full, LNG tankers have had nowhere to unload. According to ICIS, a consultancy, around 30 are marooned in European waters. With LNG ships charging a record $400,000 a day, traders have been willing to pay for someone to take gas off their hands, pushing prices below zero at one point.

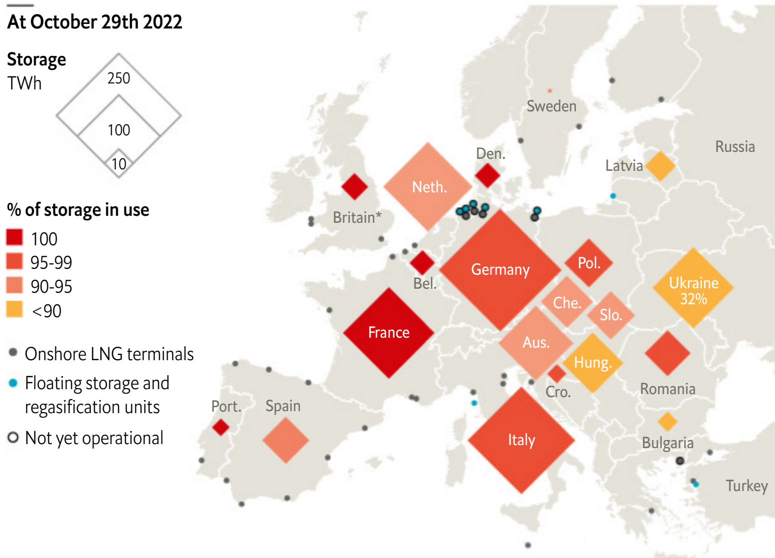
Winter is still coming, and the glut is unlikely to last. Gas costs €35 per MWh for delivery today, but €110 for a guaranteed shipment in December and €142 for one in February, once heaters turn on.

Yet even €142 represents a decline from the €232 traders charged in August for deliveries in February. With the EU's 1,000 TWh of storage—enough for roughly seven weeks of winter—nearly full, policymakers are now focusing on replenishing stores ahead of the winter of 2023-24. Although Europe managed to fill them up once, similar supply may not be available next year at any price. In a long energy war with Russia, this winter is just the first round. ■

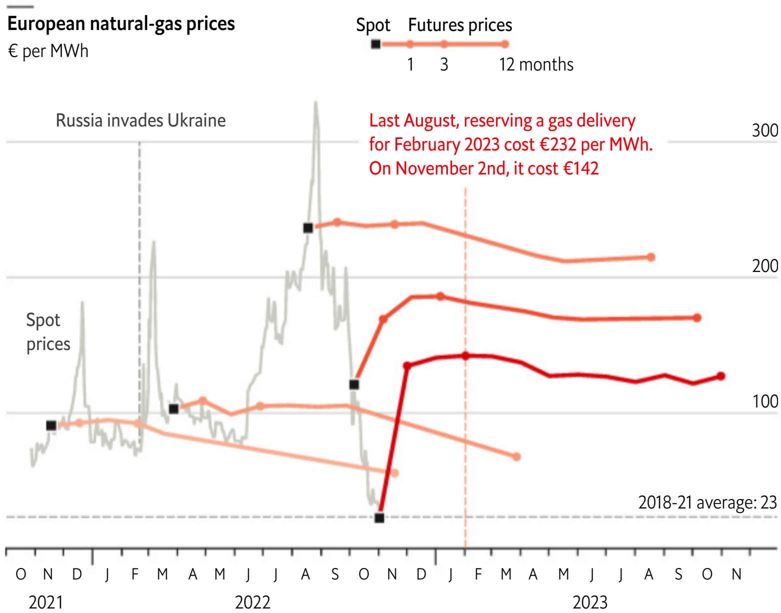
→ In most of Europe, this October was the warmest in a decade



→ Gas storage is nearly full across western Europe



→ A gas glut has reduced the cost of shipments for this winter



Sources: EIU; ENTSOG; EU Copernicus; Refinitiv Datastream; *The Economist*

*Excluding the Rough gas storage facility

Warrior woman

Carmen Callil, founder of Virago Press, died on October 17th, aged 84

She championed hundreds, if not thousands, of women writers. But if she could take just one book with her, she told the BBC radio perennial "Desert Island Discs" in 1992, it would be "Maurice Guest" by Henry Handel Richardson, whose real name was Ethel. Richardson was Australian, as was she. The novel is set in 1890s Leipzig, and is suffused with many of the things she adored: music, art, sex and a certain émigré cosmopolitanism that came from being the child of a Maronite Christian and an Irish Catholic whose forebears had made a new life on the other side of the world. She thought "Maurice Guest" was a masterpiece. That it failed to sell when it first came out in 1908, and failed again when she republished it in 1981, only reinforced her conviction that here was a cause worth mounting the barricades for.

Her father was a barrister and a bibliophile, who also taught French at Melbourne University. In his spare time, he bought secondhand books in bundles. Usually he wanted only one; the others (obscure biographies of eccentric English people and the like) he would put in the garden shed, where she would adopt them. When he fell ill with cancer, she was sent to a convent school called the Star of the Sea—in reality, a narrow place of rules, censorship and silence—to wait out the months until he died. She was only eight, but her rage at being shut up (and being told to shut up) was only just beginning. At university she read about the forced emigration of English convicts and destitute Irish sharecroppers to Australia, and her rage grew deeper. Shortly after she graduated, she left for Italy, where she lost her virginity, and then for Britain where she embarked on a life of campaigning in support of neglected and forgotten voices.

British publishing thought of itself as a gentlemanly profession, but the gentlemen it attracted even in the late 1960s, one friend wrote, were patronising, both those on the left and the old-fashioned ones ("beige men", she called them). The decision to start a company that would publish only books by women was a lightbulb moment for her. She'd been the publicist for Germaine Greer's "The Female Eunuch". She knew that books could be an agent for change.

Flicking through a volume of tales about ancient gods one day, a friend found the perfect name for the new enterprise. Virago, a female warrior. She especially loved its combination of courage, heroism and irreverence. Investing her own money—a £2,000 ($5,000 at 1973 exchange rates) inheritance from her father that she kept in a shoebox—into the venture, she was determined it should be a business, not a co-operative. It had to survive, she later said, to ensure that women writers were not forgotten again. The first title, published in September 1975, was "Fenwomen" by Mary Chamberlain, a moving portrait of an isolated Cambridgeshire village spanning a century and told through the voices of the women who lived there. The initial ten Virago books were published out of her flat. Then the company moved to its first office, up a rickety staircase in Soho, where—ever the idealists—everyone took turns at the cleaning.

As a business venture, it was tiny to begin with; only three people worked there. But its voice quickly grew stronger. When you read, one writer said, you hear the words in your most intimate organ, the brain. Reading, she added, is a way of becoming the person you're interested in being. The little convent girl who'd been encouraged to read, but not to speak, understood that there was an audience out there that was hungry for Virago books. She and her fellow editors knew who they were publishing for, wrote Lennie Goodings, a publicist who ended up as chair of the company. They shared their curiosity, their quests and their desires. Ms Goodings went on: "Women wanted a voice, women wanted to understand their history, women wanted to see themselves on the page." For her and for so many women around her, Virago was the living, breathing realisation of its readers' needs and wants.

Many of the writers she introduced, or reintroduced to British readers still enthral young women today: Rosamond Lehmann, Stevie Smith, Elizabeth Taylor, Vera Brittain and Antonia White, whose "Frost in May", a tale about a young girl expelled from a convent school in England before the first world war, had struck her so personally. When they met, Angela Carter confided that her boyfriend had thrown a typewriter at her the previous evening. Should she leave him? Yes, she said, and went on to sign Carter up as one of Virago's first authors; Carter would write more than half a dozen books for the company and became a household name.

Virago's books became part of Britain's visual landscape with the launch, in 1978, of Virago Modern Classics. Their green spines and their jacket fronts featuring contemporary paintings made them instantly recognisable on any bookshelf. Readers, as well as writers, liked to send in postcards suggesting paintings that might make arresting book covers. "The Well of Loneliness" by Radclyffe Hall, a lesbian novel set in the first world war that first came out in 1928, was forever twinned in readers' minds with Gluck's famous self-portrait with her lover Nesta Obermer that featured on the cover when Virago republished it in 1982.

Sybarite

Men who made a pass at her often found she had a sharp tongue, as did men who failed to. At Virago there was a lot of crying in the loo, and hiccups of "Carmen's not speaking to me." But she also loved clothes, sunshine, good food. Taking her out for sushi, her friend Rachel Cooke recalled, was "like watching a sea lion eat a mackerel, an entire menu disappearing in seconds". Virago might have started out small, but it was never a niche publisher. Women make up just over half the population, and are by far the biggest buyers of books in Britain. It took the creation of Virago for the industry to understand that. She never regretted not marrying or having children. What she wanted was to change the world. She didn't think the one she'd been born into was good enough. ■


LOUIS VUITTON