

The Economist

Our French election forecast model

Joe Rogan, Spotify and free speech

Why Boris Johnson won't level up

Businesses battle for talent

FEBRUARY 5TH-11TH 2022



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WILL INTEREST
RATES GO?**



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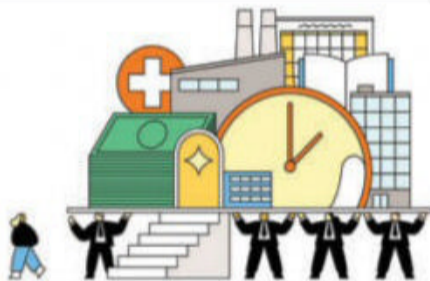
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The Economist

Volume 442 Number 9282

Published since September 1843 to take part in "a severe contest between intelligence, which presses forward, and an unworthy, timid ignorance obstructing our progress."

Editorial offices in London and also: Amsterdam, Beijing, Berlin, Brussels, Chicago, Dakar, Dallas, Dubai, Johannesburg, Madrid, Mexico City, Moscow, Mumbai, New Delhi, New York, Paris, San Francisco, São Paulo, Seoul, Shanghai, Singapore, Tokyo, Washington DC

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Joe Biden dispatched thousands more American troops to eastern European countries that neighbour **Ukraine**. A Pentagon spokesman said the troops were not intended for combat but “to ensure the robust defence of our NATO allies”. Boris Johnson visited Ukraine to express his support. Vladimir Putin accused the West of trying to provoke war, and insisted his intentions were peaceful. NATO said Russia’s troop build-up near Ukraine was continuing. Some analysts believe conflict is unlikely during the Winter Olympics in Beijing, which will last until February 20th.

An electoral college of 1,009 politicians reappointed Sergio Mattarella as **Italy’s** president for a second seven-year term. The prime minister, Mario Draghi, had wanted the job, but his political allies balked, as they could not agree on a replacement to lead the government. An election is still required by the middle of next year. There is speculation that Mr Mattarella, who is 80, may not serve the full term. Mr Draghi might well then take his place.

Portugal’s prime minister, António Costa, won a surprise outright victory at a general election. His Social Democrats will no longer have to govern in coalition with the leftist parties that brought down his previous government.

Britain’s Conservative government published detailed plans for “levelling up”, its signature policy for tackling regional inequalities. But its ideas to redress structural differences in life expectancy, pay, unemployment and so on

focused on infrastructure projects still overseen by Westminster, rather than devolving any real power to cities and regions. And in the short-term a huge jump in energy prices and rampant inflation means that many Britons are facing a big rise in the cost of living.

Partygate

Boris Johnson was in more hot water, as the delayed civil-service investigation into “gatherings” in Downing Street during strict covid-19 lockdowns was published. Of the 16 events looked into, 12 are being investigated by police. More Conservative MPs said they had lost confidence in the prime minister, though not yet enough to force a leadership contest.

Erin O’Toole was ousted as the leader of **Canada’s** Conservative Party and replaced by an interim leader. Mr O’Toole had been criticised within the ranks for being too centrist; his sacking heralds a shift to the right for the biggest opposition party to the ruling Liberals. Populists wanted him to show more support for the tens of thousands of lorry-drivers who descended recently on Ottawa, the capital, to protest against vaccine mandates.

Argentina’s recent provisional agreement with the IMF appeared to be at risk when Máximo Kirchner, the son of Cristina Fernández de Kirchner, the powerful vice-president, resigned as head of the ruling coalition in the lower house of Congress. The IMF deal is less exacting than usual and does not require pension or labour reforms. However the details have yet to be approved by the fund. A final deal would need to be passed by Congress, too.

India’s central bank will launch a digital currency, the finance minister said in her budget speech. She also announced a tax on gains from trading cryptocurrency and other crypto assets such as non-fungible tokens. The announcements are seen as

the legalisation, in effect, of crypto assets in a country that had toyed with banning them.

New Zealand’s stringent pandemic border restrictions are to be eased gradually over the year. Even citizens have found it difficult to gain entry; many have been stranded abroad. Jacinda Ardern, the prime minister, has seen her popularity slump. Later this month vaccinated New Zealanders in Australia will be allowed to return. The opening will later be expanded to other countries.

Tonga, a Pacific island nation that had avoided an outbreak of covid-19 over the past two years, entered lockdown after the discovery of community transmission. An earthquake in the Tongan archipelago in January triggered a tsunami and widespread damage to inhabited areas. The virus is thought to have arrived with aid workers.

America’s **gross national debt** reached \$30trn. That is years ahead of previous forecasts, but inevitable given the \$5trn in federal spending programmes that cushioned the economy during covid.

Building his war chest

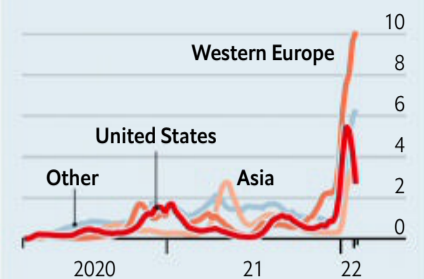
Donald Trump’s political committee has accumulated \$122m, an extraordinary sum that he can dole out to candidates he favours in the mid-term elections and to campaign ahead of a possible decision on whether to run for president again in 2024. Mr Trump’s committee and related groups raised \$1.1bn in the election of 2020.

Mali expelled the French ambassador after Jean-Yves Le Drian, the French foreign minister, called the junta that has seized power in a coup “illegitimate”. Mali also ordered Denmark to withdraw 105 commandos who had been sent to help it fight jihadists. The row has prompted France and the EU to reconsider their military presence in Mali.

Coronavirus data

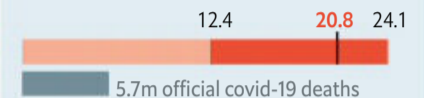
To 6am GMT February 3rd 2022

Weekly confirmed cases by area, m



Estimated global excess deaths, m

With 95% confidence interval



Vaccine doses given per 100 people

By country-income group



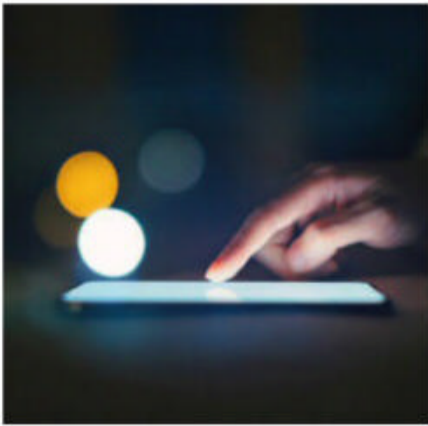
Sources: Johns Hopkins University CSSE; Our World in Data; UN; World Bank; The Economist’s excess-deaths model

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Leaders of ECOWAS, the west African regional bloc, are considering imposing sanctions on **Burkina Faso** after its government was overthrown in a military coup. ECOWAS, which has already suspended Burkina Faso as a member, is demanding a return to civilian rule.

A militia group attacked a camp for people displaced by conflict in the east of the **Democratic Republic of Congo**, reportedly using machetes to hack at least 60 of its inhabitants to death. Long-simmering feuds between different ethnic groups in the Djugu area, where the camp is located, have claimed tens of thousands of lives in the past.

Galloping annual inflation of 61% is once again eroding confidence in **Zimbabwe’s** local currency just a few years after it was reintroduced in 2019. Many in the country fear a return of the hyperinflation that forced Zimbabwe to dump its currency and adopt the American dollar in 2009.



Investors reacted negatively to the latest quarterly earnings from **Meta**. Facebook's parent company cautioned that its revenue growth would slow because of more competition for eyeballs, especially from TikTok, which is more trendy among younger users of social media. Facebook's app lost users in America, its most lucrative market for advertising, which contributed to its first-ever loss of users globally on a quarter-by-quarter basis. Meta also broke out the numbers for its Reality Labs unit for the first time. The driving force behind the company's ambitions for the metaverse made a \$3.3bn operating loss.

Boom and bust

Meta's warning along with poor earnings from PayPal and more concerns about the health of Sony's video-game business, overshadowed a rebound in battered tech stocks on the back of solid profits from America's other tech giants. **Apple's** quarterly net profit was up by a fifth, year on year, as it made \$124bn in revenue, a company record. **Alphabet**, Google's parent company, saw sales and profit both rise by a third, driven by digital ad spending.

Trying to address those concerns about its business, **Sony** said it would spend \$3.6bn buying **Bungie**, a video-game developer best known for the "Destiny" series of games. The deal follows the recent \$69bn bid by Microsoft (Sony's arch-rival in the games business) for Activision Blizzard.

Citrix, which provides cloud computing and networking services, agreed to sell itself to

a couple of investment firms in a \$16.5bn transaction. It is one of the biggest-ever private buyouts of a publicly traded tech company. Similar deals could be in the offing if the shine stays off tech stocks.

The digital-currency project originally proposed by Facebook (now Meta) came to an end, when the association that governs it sold its remaining assets to a bank specialising in cryptocurrencies. Facebook launched Libra in 2019 to much fanfare, claiming it would revolutionise payment systems. Regulators around the world criticised the plan, a backlash that caused many of its big sponsors, such as PayPal, to withdraw their support. In a statement **Diem**, as the project is now known, said it would start to wind down, but hoped its efforts had inspired future crypto projects.

Annual inflation in the **euro zone** rose to 5.1% in January, another record high. Energy prices were up by 29% compared with the same month last year. The currency bloc's economy grew by 5.2% in 2021; output is now back at pre-pandemic levels. French GDP expanded by 7% over the year, the best performance in 52 years.

Turkey's annual inflation rate soared to 48.7%. Turkey's president, Recep Tayyip Erdogan, has forced through a number of interest-rate cuts that have contributed to rising prices. A few days before the data were released Mr Erdogan fired the head of the agency that produces the inflation statistics, his latest sacking of an economics official.

OPEC+, which includes Russia, decided to stick with the gradual rises in **oil** production agreed to last year, ignoring pleas from America and other countries to increase output at a faster rate in order to tame soaring energy prices, which are fuelling inflation. Brent crude has traded at \$90 a barrel for the first time in years. **ExxonMobil**, meanwhile, reported an annual profit of \$23bn, its best since 2014.

A judge in Britain ruled in favour of Hewlett-Packard in its civil fraud claims against **Mike Lynch**. HP bought Autonomy, a British software firm founded by Mr Lynch, in 2011 for \$10.3bn. The next year HP stunned markets when it said it had been deceived about Autonomy's performance (HP took an \$8.8bn write-down). The legal saga isn't over. Mr Lynch is now appealing against

the British government's decision to extradite him to America to face criminal fraud charges.

Like a hurricane

Spotify scrambled to batten down its content-moderation policy, after Neil Young and Joni Mitchell withdrew their songs from the platform claiming covid misinformation had been broadcast on the Joe Rogan show, Spotify's most-streamed podcast. As the storm raged on (Dwayne "The Rock" Johnson indicated his support for Mr Rogan), Spotify said it would add an "advisory" to any podcast that discusses covid. The decision by the two eminent bards of classic rock to pull their tunes came shortly before Spotify warned of tepid subscriber growth.

The **New York Times** bought **Wordle**, a free game where players guess five-letter words that has become popular on Twitter since its release in October (driving non-players mad as users tweet their scores). The *Times* wants to reach 10m digital subscribers by 2025, and may end up charging customers for Wordle to reach that goal, which would generate lots of four-letter words.



How high will interest rates go?

Higher than you think in the short term, but lower than you might fear in the long run

JEROME POWELL, the chairman of the Federal Reserve, once compared setting interest rates to celestial navigation. Today, as inflation spikes, there is a growing sense that the Fed has lost its way. It looks as if it is about to make an abrupt change of course by tightening monetary policy hard and fast. That prospect has battered stockmarkets and led many firms and homeowners to wonder if the era of low rates might be over for good.

The reality is more complex. In the short term the Fed does indeed need to get a grip. But, as we explain (see Briefing), in the long run the world's ageing population will keep a cap on interest rates. That points to an unpleasant financial squeeze, rather than a return to the 1970s.

Interest-rate rises are daunting because much of the world has got used to an era of almost-free money. No G7 central bank has set interest rates above 2.5% in over a decade. Back in 1990 all of them were above 5%. Cheap financing has come to seem like an indelible feature of rich economies. It has let governments run extraordinary deficits, propelled asset prices to astronomical highs and forced policymakers to reach for other tools, such as bond-buying and stimulus cheques, to prop up the economy during slowdowns.

That is why surging prices over the past 18 months have been such a rude surprise to the Fed and other central banks. In America consumer-price inflation has reached 7% and, far from being transitory, is feeding through into wages as the idea that bills will go up is being baked into households' and firms' expectations. Private-sector wages and salaries in America are up 5% in a year (see Business section). In December the median American consumer expected prices to rise by 6% over 12 months. Many of these trends are being felt around the world: global inflation has now reached 6%.

As a result, central banks are stirring. Twelve emerging-market rate-setters raised interest rates in 2021. The Bank of England has too, and more rises are likely. Investors expect even the glacial European Central Bank, which has not raised rates for more than a decade, to do so twice this year. Yet all eyes are on America and Mr Powell. That is partly because they have a dominant role in the world's financial system, but also because American inflation is high and the Fed is behind the curve. For months it has been stimulating an economy that is already red hot by buying bonds and keeping interest rates at 0-0.25%.

The Fed says it plans to get interest rates back to about 2% by 2024, not far off most estimates of their neutral level, which in theory neither stimulates the economy nor holds it back. But as the Fed has dragged its feet, the risk has grown that it will have to go further. Higher inflation expectations make the impulse to raise prices harder to eradicate. For any nominal rate, they also reduce the real interest rate that borrowers pay, offsetting the effect of Fed tightening. The real cost of borrowing over five years is still lower now than it was in mid-2020.

The most likely prospect is therefore of a year or more of interest rates in America rising more sharply than the Fed has so far indicated. Some forecasters predict that it will raise rates by

1.75 percentage points in 2022, more than in any year since 2005.

What about the longer run? After all most homeowners and firms seek to borrow over years or decades. For an answer, you have to look beyond Mr Powell to the forces driving the economy. Monetary policy is anchored around the neutral rate of interest, the price of money needed to balance the global appetite to save with the desire to invest. This is a fundamental variable over which central bankers have little control.

Over the past 20 years this underlying neutral rate has steadily fallen as savings and investment have got out of whack. Rising global savings, caused at first by the hoarding of reserves in Asian economies, meant that vast amounts of money chased any return, however meagre or risky. Meanwhile companies battered and bruised after the global financial crisis of 2007-09 were reluctant to invest.

The question is whether these forces have shifted. On one side of the ledger, perhaps they have a little. Business investment may be entering a new phase (see Finance & economics section). Since the pandemic, it has recovered faster than it did after the financial crisis. That is partly thanks to the pandemic stimulus, which is now being withdrawn. But it also reflects optimism about technological progress that is fuelling spending on intellectual property. This now accounts for more than two-

fifths of American business investment. Meanwhile the clean-energy transition is creating an investment need of perhaps 60% of GDP in the rich world. If techno-optimism lasts and the world is serious about fighting climate change, investment is likely to be stronger in the 2020s than it was in the 2010s.

However the other side of the ledger, the world's wish to save, is unlikely to weaken.

Since Ben Bernanke, one of Mr Powell's predecessors, first noticed the "global saving glut", the growth in the reserves of Asian economies has slowed, and some governments have chalked up more debt. But the share of the world's inhabitants older than 50 is projected to rise from 25% to 40% by 2100, and may climb higher still, given recent falls in fertility in India and China. Experience shows that ageing leads to more saving, because rising life expectancy causes households to put more aside for their retirement and retirees tend to run down their assets slowly.

Bumps and slumps

These factors lay down a map for interest rates. In the long run any upward shift is likely to be small, and, to the extent that this reflects a pick-up in investment, welcome. However, between now and then there is likely to be a sharp and potentially painful rise in rates. The world's debts have reached 355% of GDP, making firms and households more sensitive to even small rate rises (see Finance & economics section). There are few examples of central banks taming inflation without the economy suffering a recession. The last time America's inflation fell from over 5% without a downturn was over 70 years ago. Fighting inflation could put the world in a slump. If so, the prospect that rates will one day fall back again would be only some consolation. ■



France's presidency

Statistically significant

Our election model gives Emmanuel Macron a 79% chance of keeping his job

MOROSITÉ, MALHEUR, déagisme: these are gloomy times in France. Covid-19 may be on the way out, but it still hampers daily life and the smooth running of the economy. Inflation, driven by disease-induced supply-chain kinks and spiking natural-gas prices, threatens household budgets. Russia and Ukraine are on the brink of war. Small wonder that only 17% of the French think 2022 will be better than 2021, and that some 45% intend in April to cast their first-round vote for a presidential candidate from the political extremes. Yet despite it all, President Emmanuel Macron has a four-in-five chance of winning re-election, according to the new election model that we launch this week.

Our forecast is the latest in a series of statistical models we have built that use data about the reliability of past polling to analyse elections still under way. In America's presidential contest in 2020, for example, we gave Joe Biden a very high chance of winning even if the polls were off by more than usual. In Germany's elections last year we calculated a fair chance of success for the Social Democrats, who now lead the government there. And in 2017 we found that Mr Macron was extremely likely to defeat Marine Le Pen even though pundits maintained she had a good chance of prevailing. In short, our forecasting models have proved their worth.

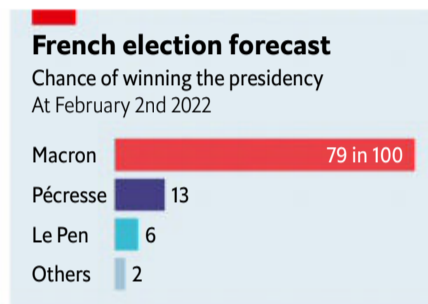
On February 2nd our model, which will be updated daily, gave Emmanuel Macron a 79% chance of victory. This figure will change as the campaign unfolds. We are more bullish than international betting markets, which rate his chances at around 70%. Mr Macron's comfortable lead in first-round polling suggests only an 8% chance of his being knocked out. And he enjoys a solid advantage over all of his second-round opponents in head-to-head polling, even against Valérie Pécresse, his closest challenger in such match-ups. Against his most likely opponent, Marine

Le Pen, our model suggests an 88% chance of victory in round two. Because this is the work of statisticians, not magicians, we are happy to reveal our methods (see Graphic detail).

What the statistics do not explain is the politics behind the polling numbers that are the raw input for our model. In large part they reflect Mr Macron's success at straddling the centre-right and the centre-left in France, drawing into his government former Socialists and former Republicans alike. The extremes are splintered, which also helps him. And the president has, improbably enough, benefited from covid, which his government has handled reasonably well. The pandemic has engendered a huge expansion of state spending at a time when some of his labour-market reforms might have caused more tensions. He has also used the pandemic as an excuse to shelve pension reforms that might have hurt him. Mrs Pécresse has yet to lay out her full platform, but so far she has not put forward policies that are substantially different.

Even if the election seems almost a formality today, that could easily change. Mrs Pécresse could well beat the president if she can get to the second round. We currently give her only a 32% chance of getting through, but that probability will change as the campaign ramps up. Besides, a 79% chance of success is by no means a certainty—as anyone would attest who has contemplated a game of Russian roulette, where the odds are even better.

This election is worth watching closely. Mr Macron is bidding to be the leader of the European Union, which has a vacancy to fill. Olaf Scholz, Germany's new chancellor, seems reluctant to take up Angela Merkel's European mantle. Italy has dodged a bullet (see Charlemagne) by avoiding an early vote, but still faces uncertainty. Britain is gone. France matters more than for a long time. It matters greatly who is in charge. ■



The Winter Olympics

An icy chasm

The Beijing Olympics symbolise a world divided, with China on the wrong side

“TOGETHER FOR a shared future” is China's wishful motto for the Winter Olympics, which will formally begin with fireworks and dancing at a ceremony in Beijing on February 4th. Officials say the slogan means humanity should work in harmony to conquer hardships such as the pandemic and its economic fallout. China's state-run news agency says the games will “break down barriers and prejudices, and illuminate the way forward”. Sadly, they will not. The event symbolises a world divided by politics and the virus, and a China turning inward.

No leader of a big Western power will attend the games. The pandemic has provided some with an excuse for staying away. But the main reason is the scale of the repression that Xi Jinping has unleashed since he took power in 2012. In Xinjiang Mr Xi has

sent about 1m people, mostly ethnic Uyghurs, to camps to “cure” them of “extremism”—a euphemism for stamping out their culture and Muslim faith. In Hong Kong he has crushed a liberal society, turning dissent into a crime. His security forces have kept a chokehold on Tibet.

In December America said that it would not “contribute to the fanfare of the games” by sending official representatives. Rightly, a few other Western countries have followed suit. But Russia's president, Vladimir Putin, does not share their scruples. As tensions mount over Ukraine, he will enjoy the limelight as the most important guest and Mr Xi's “best friend”.

How the world has changed since China last hosted an Olympic event—the Beijing summer games of 2008. The West worried ▶▶

▶ about China then, too. The country had been waging a fierce campaign to crush unrest in Tibet following widespread protests there. Human-rights groups were calling for boycotts. But many Western officials still believed that engaging with China might nudge it towards acceptance of the Western-led global order, or at least help tame the rise of anti-Western nationalism. America's president, George W. Bush, and his French counterpart, Nicolas Sarkozy, attended the opening ceremony.

A slippery slope

Their gesture yielded nothing. China has grown ever more bristly in its relations with the West. Mr Xi has fuelled an ugly nationalism and clearly wants a China-centric order. The motto he has chosen for the winter games alludes to this. It is shorthand for one of his favourite catchphrases, about building a "community with a shared future for mankind". That means a world in which countries co-operate with China regardless of its politics. Many in the West abhor the idea. Negative views of China have grown to record highs. Mr Xi's call for Olympic togetherness is, in effect, a way of telling Westerners to get over it.

State media suggest that the opening ceremony is unlikely to be such a full-throated celebration of China's greatness as was seen at the launch of the games in 2008, when thousands of costumed troops took part in grandiose performances. This time Mr

Xi has stressed the need to keep things "simple". But for athletes and others involved in the games, they will not be. The most dramatic symbolism of the event will not be found in the razzmatazz of the start or finish, but in the extraordinary lengths to which China is going to keep the SARS-COV-2 virus at bay.

No foreign visitors, other than invited guests, have been let into China to watch the games. Tickets are not being sold to people in the country. Fearful of recent outbreaks of covid-19, the government says it will "organise" people to attend. They may clap, but not shout. The athletes, their support staff and journalists are being kept in a "closed loop", isolated from the local community. Dozens of them are testing positive.

Protections make sense when admitting 30,000 foreigners into a country that lacks a highly effective vaccine (because it has not approved foreign jabs), and whose population has acquired no immunity from infections. But they also show how far China is diverging from the rest of the world in its handling of the pandemic. China is excoriating other countries trying to co-exist with the virus for failing to protect human lives. It sees its zero-covid approach as proof of its own system's superiority.

The world will watch a frosty games. It will be a gripping athletic spectacle, no doubt, but it will be overshadowed by a bigger competition—a bitter, ugly one between China and the West. That struggle will be the winter games' shared future. ■

The Joe Rogan affair

Free speech's new frontier

The content-moderation wars have come to audio. Spotify must learn from social media

WHEN NEIL YOUNG and Joni Mitchell saw an injustice, they used to attack it by writing protest songs, taking on racism in the "Southern Man" and the Vietnam war in "The Fiddle and the Drum". Today, the two musicians prefer to speak out by pressing the mute button. The pair have withdrawn their recordings from Spotify, the world's biggest music streamer, in protest at "The Joe Rogan Experience", a podcast that gave airtime to anti-vaxxers. Spotify has decided to hang on to its podcaster.

Mr Rogan is a bigmouth and he has been wrong about covid-19 and probably much else (see Business section). Yet he has broken no laws, nor even, Spotify says, the company's own content rules. As a matter of principle, Mr Rogan should be free to speak. As a commercial question, Spotify has made a publisher's gamble that his popular show will attract more customers than it repels. The fact that share prices in Spotify and other platforms such as Meta, the parent of Facebook, are tumbling because of slowing growth underlines how that gamble is, in the most literal sense, Spotify's business.

But the dispute points to a trickier emerging problem. Most of the 3.2m podcasters on Spotify are not like Mr Rogan, who sold his show to the company in 2020 for a reported \$100m. The vast majority are amateurs, uploading their shows to Spotify's platform as easily as they would to a social network. Likewise, most of the tens of thousands of new songs uploaded to Spotify every day are recorded in bedrooms and garages. The result is that the content mix on audio platforms is starting to look less like the curated library of Netflix and more like the infinite

hotch-potch of YouTube. Unlike other social networks, however, audio platforms have little experience in moderating content.

They need to learn fast. The vaccines bust-up is their first taste of an argument that other social networks have grappled with for years and which is now coming to audio. On the one hand, most consumers want protection from the most harmful content, the best example being the incitement to violence, which even America's First Amendment condemns. Facebook was used to foment genocide in Myanmar: one day audio might be, too. On the other hand, few want tech executives to become

censors. Plenty of good music features bad language, disturbing ideas and violence. Some podcasts will stoke controversy. Free speech must be the default (see Culture section).

The starting point is transparency, which the audio platforms sorely lack. Spotify published its "platform rules" only following the Rogan explosion. Apple, the next-biggest streamer, has content guidelines for podcasts

but a rough style guide for music. Amazon, the third-largest, has published even less in the way of rules. And whereas Facebook and co release regular reports on what content they have taken down and why, the audio streamers are opaque. Amid the Rogan crisis, Spotify casually mentioned that it had removed 20,000 other podcast episodes over covid misinformation. What else is it taking down? No one knows.

Liberals are rightly wary of more moderation online. Count us among them. But clear, predictable rules can protect speech as much as containing it. Rules determine not just what is ▶▶



▶ banned, but also help defend what is allowed. Facebook's arm's-length "oversight board" routinely orders the social network to restore deleted posts, if it determines that they fell within its rules. The social networks are far from perfect, but rules that are open to public scrutiny can gradually be improved on.

By contrast, the failure to spell out what is and isn't allowed risks having a chilling effect, in which people steer clear of controversy. Amateur podcasters may choose not to risk debating the efficacy of vaccines, for example, knowing that 20,000 others have been deleted for overstepping invisible lines drawn around the subject by an unpredictable censor. Worse, the lack of well-defined rules encourages an ongoing free-for-all of the

sort seen this week, in which critics hope that by withdrawing their business or shouting loudly enough, they can force companies to cancel acts that they disapprove of.

With his Spotify contract, Mr Rogan is not your average podcaster. But the dispute his show has started should be seen as a warning to Spotify and its fellow streamers of wider arguments that lie ahead. Facebook, Twitter and other social networks have long been the focus of fury over what kinds of speech they do and do not allow. As platforms like Spotify open their gates to more user-generated content, the same free-speech battles are coming to audio. Streamers should get their rules ready now, and prepare for the next, inevitable explosion. ■

Poverty in Britain

Wrong man, wrong plan

Proposals to boost the poorer half of the country fall short

AFTER A MONTH of rows about cake and Prosecco—who consumed them; who invited whom; who knew—Boris Johnson has been badly damaged. Police are investigating a dozen lockdown-busting gatherings, some in his offices and residence. A report by a senior civil servant, published on January 31st, was gutted of detail in order to prevent that investigation being compromised, leading to claims of a cover-up. Despite it all, Conservative MPs seem inclined to wait until after local elections in May to decide whether to depose their prime minister.

No wonder Mr Johnson is desperate for a policy relaunch to knock "Partygate" off the front pages. On February 2nd his government released a long-awaited white paper on its big idea for post-Brexit Britain: decreasing regional inequality, or "levelling up" (see Britain section). Mr Johnson is right to sense that his government should be judged by whether this programme succeeds: it is setting out to deal with one of Britain's most pressing problems. Sadly, the proposals fall short.

Britain is highly geographically unequal. Outside London and the south-east (and a region around Edinburgh) lies a country where wages, literacy and life expectancy are lower, and unemployment and rates of illness higher. It is as if America's rustbelt or the former East Germany were home to half the population. Average life expectancy for men in Blackpool is 74.1 years; in Westminster it is 84.7. In Barnsley 15% of disadvantaged 18-year-olds go to university; in London 45% do. The ratio between GDP per person in Britain's richest places and its poorest is 4.8—the biggest of any OECD country. Voters who wanted to leave the European Union were animated by many desires and grievances. But some expressed understandable rage at being left behind and ignored by a distant, self-serving elite.

The work of Michael Gove, one of the government's most capable ministers, the latest proposals identify 12 "missions", with numerical targets attached, to be undertaken between today and 2030. They range from increasing healthy-life expectancy and improving literacy and numeracy in what the white paper calls "Britain's forgotten communities" to rolling out high-speed broadband and encouraging "pride in place"—that is, feeling good about where you live. New directly elected county leaders will be created, and given powers in a "devolution revolution".



By 2030 everywhere in England could in theory have the sort of powers now wielded by metropolitan mayors.

Targeting outcomes is welcome: this government has focused more on inputs (this many new nurses, that many new schools). And more devolution is sorely needed. Measured by where tax-raising power lies, Britain is the most centralised country in the G7. Decision-making is also tightly held, with the Treasury overseeing almost all infrastructure. England's most powerful mayor, Sadiq Khan, takes dictation from Whitehall on how to balance Transport for London's budget. Andy Burnham of Manchester, the second-most-powerful, is locked in a battle with central government about the design of a railway station.

Look more closely, and the plans are based on a caricature of Britain. The biggest cities voted to stay in the EU in 2016 and for a Labour government in 2019. Not coincidentally, ministers often talk as if the splits in wealth, well-being and esteem map onto the same pattern. They do not. In some regions, both cities and their hinterlands are rich; in others, both are poor. The north of England will not succeed if Greater Manchester does not; the West Midlands depends utterly on the Birmingham metropolis.

What ails poor places will not be fixed by giving counties a bit of power and cash. The control over how money is raised and spent needs to be pushed out of London—and to handle such powers a region must be large. Better infrastructure, both within cities and connecting them to surrounding areas, is crucial to regional development. But how can the planned new phalanx of mayors and county authorities transform their regions if they cannot even plan transport links?

The intricacies of the white paper are not the only cause for scepticism. An ambition as big as erasing Britain's patterns of deprivation will require a leader of unusual calibre. The job will take an ability to unite the country in a common cause and to inspire it with a grand vision. It will also take a mastery of policy detail and the discipline to be steadfast when things go awry, results are slow to appear and centralisers cling to power. Mr Johnson's lockdown shenanigans, dissimulation and U-turns are no mere obsession of the chattering classes. They are evidence that this Herculean task is very probably beyond him. ■

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Let's be reasonable

I am a big fan of *The Economist's* accurate reporting and liberal values, but I was displeased to see you refer to "anti-vax protests" in Austria and Germany, describing them as "fuelled by the far-right" ("Must you be jabbed?", January 22nd). You should have a better understanding about why some people are frustrated with covid-19 measures.

The vaccines have saved many lives. I think that getting the vaccine is the best decision for your health as well as other people's. That said, I want to make the decision on whether I get vaccinated (which I have) after speaking to my doctor and doing my own research. It upsets me greatly that government officials want to make this decision in my stead through compulsion. And it is unclear where the line will be drawn once government has decided in effect to force adults into taking medication. I am in Germany being coerced into getting a booster shot. I am a young person. Government mandates cannot be fine tuned to fit all of us.

Many scientists and lay people have legitimate concerns over governments' obsession with covid over anything else. Most people protesting in Austria and Germany are not anti-vax, but anti-coercion. They do not want government to micro-manage their lives, for example deciding that meeting nine people outside is safe but 11 isn't. I do not want to be dismissed as simply "anti-vax".

JOSE GARRIDO RAMAS
Machine-learning scientist
Berlin

The word vaccine does indeed derive from the Latin for cow (Johnson, January 1st). But it was not named after a treatment for cowpox. Live cowpox was the vaccine itself. Edward Jenner infected a boy first with cowpox and then with the much more deadly smallpox (*variola*). Luckily for Jenner, us, and the boy, he survived.

BENJAMIN JOHNSON
London

Britain's public broadcaster

Winston Churchill's suspicion that the BBC was "run by reds" ("Telly addicts", January 22nd) went back to what he thought was its unduly impartial coverage of the General Strike of 1926. He complained that the BBC "had no right to be impartial between the fire and the fire-brigade".

PATRICK BARWISE
Co-author of "The War Against the BBC"
London

No skates allowed

If you got the idea from watching curling being played in China that it is "skaters" who frantically sweep debris and other impediments out of the stone's way, then I think we have a pretty good idea why China "has not enjoyed much success at the sport" ("Omicronic pains", January 22nd).

PETER ROSS
North Vancouver, Canada

The hives have it

The letter (January 22nd) from the British Beekeepers Association on the problems it had with quadratic voting (QV) illustrated Albert Einstein's observation that social innovation in matters like voting systems is often harder than technological advance in things like rockets. The RadicalXChange movement was founded to reform this imbalance by experimenting in open-minded social systems, such as Taiwan's digital democracy and the Web3 ecosystem. Ironically, the letter's author, an apiarist, chose perhaps the only context where the adoption of QV requires old thinking, not new.

As Rory Sutherland and I highlighted some years ago, biological evidence suggests honey bees use QV to signal the location of food. If it interests them, we'd be happy to help the British beekeepers take a lesson from their wards.

E. GLEN WEYL
Founder
RadicalXChange Foundation
Kirkland, Washington

Servers not included

Another factor behind "The point of tipping" (January 15th) is successful lobbying by the hospitality industry to ensure that restaurants are not included in minimum-wage regulations. Restaurant workers' pay is boosted by customers' tips, lowering the owners' costs. This wage subsidy, a free lunch for the proprietors, has no justification in a sophisticated labour market.

The remuneration of waiting staff is a cost of doing business. So the service should be included in the bill as part of the cost of the meal, which is the norm in most of Europe. Restaurant employees should become fully fledged members of the normal labour force, with minimum wages and benefits, including health care, unemployment insurance and so on. Waiting staff will adapt, as they will to the coming robotisation of restaurants, when diners will be able to choose low-cost meals with no service. Tasks that can be automated include digital menus, online payment and robots to perform chores such as removing dishes.

Call this structural change, without which living standards would stagnate.

IRA SOHN
Emeritus professor of economics and finance
Montclair State University
Upper Montclair, New Jersey

Many American states have lower minimum wages for restaurant servers, using the practice of tipping as a justification. That has led customers to tip more generously, which in turn is used by policymakers to justify the lower minimum wage, creating a never-ending low-wage cycle.

ROBERT CHECCHIO
Dunellen, New Jersey

In 2019 it was estimated that \$300bn dollars was spent in full-service restaurants in the United States, which equated to \$60bn for tipped employees. More than 13m people were employed in American restaurants, approximately 10% of all

American workers. Many of these employees count on tips from customers for their lifestyles. I personally believe that everywhere in America these tips should be legally and morally divided among the entire staff for each service.

This was a well-researched, well-written and well-argued article, but it is obvious that the differences in tipping customs from Tokyo to Paris to New York cannot be compared in any way from the customer's or the tipped employee's point of view. It's different strokes for different folks.

ALAN STILLMAN
Founder of Smith & Wollensky restaurants
New York

Brazil, Italy, Japan, South Korea and many other countries provide much better service than places where the tipping system applies. Actually, the higher the expected add-on, the worse the service is. America and the Netherlands top my tip list for abysmal service and food. "But you must tip!" is the common cry by the establishment. Really? Ditch tipping. You will have a less fictional, hypocritical server and a more relaxed customer.

DAVIDE CARDARELLI
Johannesburg

What an elaborate discussion on tipping. The most common reason for leaving a tip in my experience has been to compensate food servers who have universally been paid a cut-rate wage. During this pandemic the tips I give for even take-out food have been larger, since the job market has become more precarious. God forbid that I should tip a dental hygienist, car mechanic, or a vet, all of whom earn far more than food-service workers. Except in New York.

LELA HUGILL
Brush Prairie, Washington

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Too much of a good thing

The pandemic is unlikely to end the world's saving glut

IN 2005, BEN BERNANKE, then a member of the Federal Reserve's Board of Governors, wondered at a tide of money washing over American shores—and worried about its consequences. Grasping in a speech for a way to describe the phenomenon, he coined a phrase. “Over the past decade,” he noted, “a combination of diverse forces has created a significant increase in the global supply of saving—a global saving glut.” Savers of all sorts—from older Americans preparing for retirement to oil-exporting countries accumulating sovereign-wealth funds—were shoving more money into stocks and bonds than could be put to use by those looking to invest in plants and equipment.

In 1999, Mr Bernanke had chided the Bank of Japan for failing to rekindle Japanese growth after a bubble burst, despite reducing interest rates to zero. Yet in the 15 years after he christened the saving glut, finance ministries and central bankers around the world became familiar with the struggle to maintain steady growth in the context of zealous saving. Since 2000 alone, the value of global wealth held by

households, firms and governments has roughly tripled, from \$160trn to \$510trn, or from about 46% of global GDP to 61%, according to McKinsey Global Institute, a think-tank (see chart 1 on next page). Many of them have borrowed from each other to acquire assets, taking debts to worryingly high levels (see Finance section). But in aggregate they are prudent ants rather than spendthrift grasshoppers. This savings growth helped push asset prices ever upward and interest rates ever lower, creating macroeconomic headaches worldwide.

Now the pandemic has shaken pillars of the global economy in ways which could fundamentally alter saving patterns. Tight labour markets are shifting money to workers who are eager to spend, contributing to the highest inflation in a generation. Central banks which had found themselves unable to push interest rates down enough to keep inflation from falling below their targets are beginning to push rates up to keep inflation from soaring. Yet while new enthusiasm for government borrowing or a retreat from globalisation could help to drain savings and establish a

new normal, it seems more probable that Mr Bernanke's glut will persist, thanks to old habits and old people, who are a growing share of the world's population.

The rising reservoir of global savings, most of which is held in bank deposits, bonds, corporate equity and property, has been fed by three main tributaries: governments hungry for foreign-exchange reserves, penny-pinching households and firms, and workers nearing retirement age. It was the first flow, saving by governments, which preoccupied Mr Bernanke. Governments' accumulation of foreign-exchange reserves adds to saving in two ways. Resource-exporting economies save part of the windfall earned from their exports and plough it into stocks and bonds. Some of these piles are held as official reserves; the Russian government has reserves, excluding gold, valued at \$460bn, while Saudi Arabia's are worth \$440bn. Windfalls have also been shifted into sovereign-wealth funds; that of Abu Dhabi is worth almost \$700bn, while Norway's is valued at more than \$1.3trn.

Other economies pile up foreign-exchange reserves as they intervene in markets to reduce the value of their currencies, to boost exports or to build up a hoard of safe assets which can be drawn upon in times of financial stress. In effect, these interventions squeeze consumption in their home economies, reducing spending relative to production and thus contributing to current-account surpluses which must be absorbed by the rest of the global economy. ▶▶

► Reserves held by South Korea, Singapore, Taiwan and India have grown into the hundreds of billions. No country has engaged in such practices to more disruptive global effect than China, which holds some \$3.2trn in foreign-exchange reserves.

The contribution of growth in reserves to savings was most pronounced around the time Mr Bernanke sounded his warning. From 1998 to 2008, official foreign-exchange reserves jumped from 5.2% of global GDP to 11.5%, powered by a steady rise in oil prices and reserve accumulation by China. During this period, reserve growth probably dominated other sources of saving; research by Francis Warnock and Veronica Cacadac Warnock of the University of Virginia suggests that reserve-accumulation in the year to May 2005 alone reduced the yield on ten-year Treasury bonds by 0.8 percentage points. Reserve growth paused during the global financial crisis, then resumed in the years after, reaching a peak of 15.2% of global GDP in 2013 (see chart 2).

Reserves plateaued thereafter (and indeed fell slightly as a share of GDP), and a decline in the years ahead cannot be ruled out. A protracted period of post-pandemic financial stress could force some emerging economies to deplete their reserves. If economic strains and geopolitical tensions force Russia and China to draw down their hoards, that might place upward pressure on interest rates.

Yet it is also possible that the pandemic will lead to a new surge in reserves. Yes, a shift to zero-carbon energy may eventually doom fossil-fuel windfalls, but the transition might well mean high prices for oil and gas, since new production is likely to stagnate. Meanwhile, the pandemic and its aftermath will probably reinvigorate the appeal of defensive foreign-exchange reserves. During the financial panic of March 2020 and again in recent months, as straitened global conditions squeezed emerging markets, the economies which weathered stresses best were those with ample foreign-exchange reserves. This lesson has already been put to use. By the autumn of



2021, reserves were roughly \$1trn higher than they were before covid-19.

The effects of reserve accumulation could also be offset by increased government borrowing. Government debt loads, already high pre-pandemic, have exploded over the past two years; in 2020 alone, public debt as a share of GDP surged by nearly 20 percentage points across advanced economies, to 123%, and nearly ten points across emerging economies, to 63%. Work by Lukasz Rachel, of the London School of Economics, and Larry Summers, of Harvard University, reckons that over the past half century, rising government debt across rich economies pushed up interest rates by about 1.5 percentage points. This effect was more than balanced out by other factors in the past, but might not be in the decades ahead.

A first-class problem

A second stream of saving has flowed from the households and firms which have done best over the past few decades. Since the 1970s, inequality has risen across many economies. Wealthier households have a higher propensity to save, so this shift in the distribution of income contributed to the saving glut, according to work by Atif Mian, of Princeton University, Ludwig Straub, of Harvard University, and Amir Sufi, of the University of Chicago. From 1983 to 2019, the share of American income going to the top 10% of the income distribution rose by 15 percentage points, they reckon. Because of this “saving glut of the rich”, average annual saving by the top 1% of American earners alone has outstripped annual average net domestic investment since 2000. Increased inequality accounts for about 0.6 percentage points of the decline in rich-world interest rates since the 1970s, say Messrs Rachel and Summers.

High-rolling households have not been alone in stockpiling savings. For decades, corporations have been hoarding money as well, retaining a large share of their hefty net profits. According to Peter Chen, of the Analysis Group, an economic consultancy,

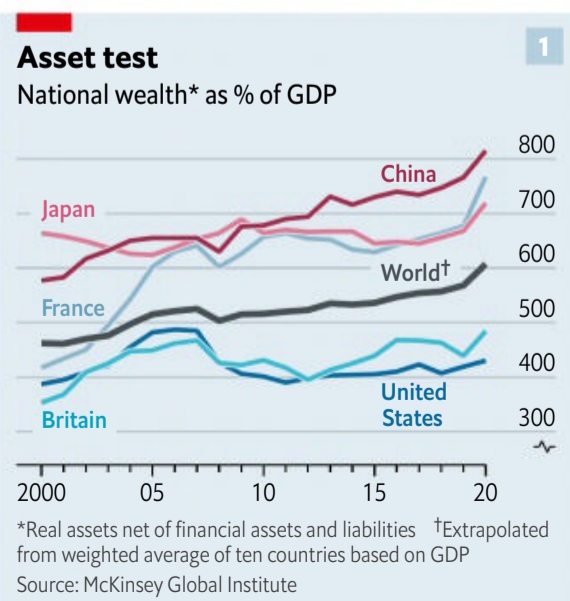
and Brent Neiman, of the University of Chicago, and Loukas Karabarounis, of the University of Minnesota, annual global corporate saving rose from less than 10% of world GDP to nearly 15% between 1980 and 2015. The corporate sector has been acting as a net lender to the global economy, rather than as a net borrower from it.

As with reserve accumulation, the relative importance of such factors has waxed and waned. Income inequality rose sharply from around 1980 to 2000. In the years since, it has levelled off in some economies, like Britain's, and increased at a slower pace in others, like America's. Corporate saving, in contrast, rose relatively slowly before 2000, then much faster thereafter, as firms salted away cash from increased profits. In America, for instance, corporate profits have hovered above 10% of GDP for most of the period since 2006, after never rising above 8% over the prior quarter century.

Income inequality and corporate profitability cannot be forecast with any certainty. Both reflect the interaction of myriad forces, from the balance of corporate and labour power, to the state of technological progress and productivity growth, to government tax and regulatory policy. It is possible that the trends of the past half century might be upended by the pandemic and its aftermath. Over the past 18 months, tight labour markets helped push wages upward and strengthened workers' leverage in bargaining with their employers. Slower growth in the labour forces of ageing societies could help to preserve these gains, and perhaps enable a resurgence by organised labour. Firms—especially big and profitable technology ones—are in the cross-hairs of regulators looking to boost competition. Better times for workers should also squeeze profits, in addition to reducing inequality.

A retreat from globalisation could amplify these trends. It would increase the earning power of the working masses in rich countries, while hitting the profits of multinational firms and the higher incomes of their white-collar workers. On the other hand, substantial reversals in inequality are relatively rare in recent economic history. The great compression in incomes that occurred from the 1910s into the post-war decades occurred as fortunes were hammered by the Depression and liquidated to fund wars, as taxes on the rich soared well above current levels. For now, such upheavals seem unlikely.

What is more, as Mr Mian and co-authors write, the effects of inequality on saving can feed on themselves. As high saving by the rich pushes down interest rates, they argue, poorer households increase their borrowing to sustain their consumption. But as debt piles up, they find themselves forced to reduce spending to pay ►

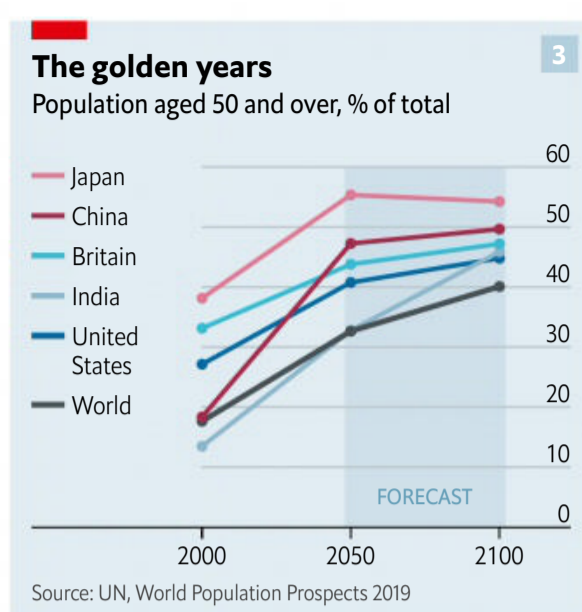


back loans. Their debt payments, furthermore, represent a transfer of more money to rich households whose purchases of assets (like mortgage-backed securities) effectively finances the borrowing of the non-rich. The trap which results—of perpetually high inequality, low interest rates, and high debt among poorer households—could prove difficult to escape, sustaining the savings of the rich as a potent macroeconomic force.

Far more certain is the third great river of savings, whose flow, which has grown in importance, might well swamp other post-pandemic changes in behaviour. The world is not getting any younger, and in coming decades the savings of the old stand to apply relentless pressure on the macroeconomy. Across time and countries, household saving follows a reliable pattern. When workers are young, they save little or even take on debt. Their savings rise through their 30s and 40s before peaking a decade or so before retirement. As populations have grown older over the past half century, in the rich world especially, the share of workers in their prime saving years has risen as well, leading to ever more money in nest-eggs and ever lower yields on the assets therein.

In a recent paper examining the effects of demographic change on saving, Etienne Gagnon, Benjamin Johannsen and David López-Salido of the Federal Reserve Board suggest that ageing in America may account for about one percentage point of the drop in interest rates since the 1980s. (Other recent work finds still larger effects, of as much as three percentage points.) If past is prologue, rates seem sure to remain low. Barring a surge in procreation, or the embrace of a dystopian “Logan’s Run” approach to the aged, the world’s population will continue to get older. The share of global population over the age of 50 rose from 15% in the 1950s to 25% today, say Adrien Auclert and Frédéric Martenet, of Stanford University, Hannes Malmberg, of the University of Minnesota, and Matthew Rognlie, of Northwestern University. It is expected to rise to 40% by 2100 (see chart 3).

That may well turn out to be an underestimate, if recent fertility trends are anything to go by. In 2021, India’s birth rate declined to just 2.0 children per woman—below the rate at which births and deaths are in rough balance. Indeed, a growing number of emerging markets have flipped to the slow population growth common in rich countries. Recent research by Matthew Delventhal of Claremont McKenna College, Jesús Fernández-Villaverde of the University of Pennsylvania and Nezh Guner of the Universitat Autònoma de Barcelona concludes that such transitions—the switch from high mortality and fertility rates to low ones which accompanies economic development—are happening fast-



er over time. The transition took a half century or more 100 years ago, but now tends to be compressed into just two or three decades. Some 80 countries have completed this transition, and in virtually all the rest it is under way.

What is more, the pandemic further depressed birth rates in many countries. China’s birth rate touched a record low in 2021, potentially bringing forward the era of declining Chinese population. America experienced a baby bust too, which in combination with falling immigration depressed the population growth rate to just 0.1% in 2021—the smallest annual increase on records going back to 1900. The end of the pandemic could bring a rebound in birth rates. But there is no mistaking the broader trend: the world is greying, fast.

Innumerable shades of grey

Will the effect of ageing on saving necessarily remain the same in future as it was over the past half century? In an influential book, Charles Goodhart, of the London School of Economics, and Manoj Pradhan, of Talking Heads Macroeconomics, a research firm, argue that the greying of the

population will depress interest rates only up to a certain point, after which there will be a “great demographic reversal”. Their view rests in part on the observation that while workers on the verge of retirement save heavily, those already retired begin to spend down their stores of stocks and bonds. An increase in the share of the population above retirement age, then, could mean that the proportion of workers in their high-saving years will peak and then decline, dragging down saving and pushing up interest rates.

A great demographic reversal seems intuitive, particularly in places like America where an oversize cohort—the baby boomers—is easing into retirement. But other economists say there are reasons to expect ageing to continue to depress interest rates. They note, for example, that it is the age profile of a population as a whole which matters. Even as more people retire, the age of the typical working person will continue to rise toward those prime saving years. There are boomers aplenty, but the median age in America is still just 38. Another reason is that, in the emerging world, a larger share of workers have their prime saving years still ahead of them. The median age in India is only 28, for instance. So long as financial markets remain reasonably integrated around the world, higher saving anywhere helps to depress interest rates everywhere.

Perhaps most important, people in retirement do not tend to spend everything. Rather, for a number of motives—to avoid outliving their savings, or to provide for heirs, among others—they tend to maintain large stocks of wealth well into retirement. In Britain, for instance, as of 2018, people 80 or older held more wealth than those aged 45 to 49. Recent work by Noémie Lisack, of the Banque du France, Rana Sajedi, of the Bank of England, and Gregory Thwaites, of the University of Nottingham, estimates that this habit of leaving behind savings will by mid-century depress interest rates by nearly half a percentage point relative to current levels. With neither inequality nor the level of reserves showing signs of sustained fall, the ineluctable force of demography should continue to drive savings growth.

The world, in other words, may come to look ever more like Japan. There, the median age is 48, more than a quarter of the population is over 65, and the yield on a 30-year government bond is a cool 0.8%, despite a government debt load of 259% of GDP. A generation ago, Mr Bernanke reckoned that Japan’s lacklustre growth and subterranean rates of inflation and interest were the consequence of “self-induced paralysis” by the central bank. Today, such realities seem more like the dull fate of a world with more savings than it quite knows what to do with. ■





Regional development

Spreading the jam

The government's long-awaited levelling-up plans have a New Labour tinge

INCREDIBLE AS IT may seem, there was a time when MPs did not talk incessantly about “levelling up”. According to Hansard, Parliament’s chronicler, the phrase was uttered in the House of Commons just 57 times between January 2010 and July 2019, when Boris Johnson became prime minister. The tally since then is 3,227. A rebranding last September gave Britain a Department for Levelling Up, Housing and Communities. And on February 2nd the government explained how it would do it.

The aspiration to raise the fortunes of Britain’s poorer regions burns strongly, for economic and political reasons. Britain is highly unequal geographically. Skilled workers and well-paid jobs cluster around London and to a lesser extent the Scottish lowlands (see map on next page). In 2019 gross value added per person—a measure of output—was 78% higher in London than in the United Kingdom as a whole. In the general election that year the Conservative Party won many seats outside the charmed zone, in the Midlands and north of Eng-

land. It would like to hold on to them.

The publication of the government’s levelling-up strategy was delayed, partly because of covid-19, partly because Mr Johnson is not the sort of prime minister who relishes pulling together a large, complex plan involving many departments. And the strategy almost seems to come from an earlier era of government. It has a particularly strong New Labour flavour.

Although Mr Johnson compares levelling up to integrating the former East Germany, he has ruled out a German-style splurge. The plans come with little new money. A Shared Prosperity Fund, worth £2.6bn (\$3.5bn) over three years, simply replaces cash that poor regions used to receive from the EU. Some pots of jam that are currently spread thickly in London will be distributed more widely. The business department promises to spend more on research and development outside the triangle of London, Oxford and Cambridge. Arts Council England will pay for more culture outside the capital.

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The British state already redistributes large sums from south-east England to the rest of the country. In the 2019-20 fiscal year, London had a net fiscal surplus of £36bn, while the north-west had a deficit of £23bn. A forthcoming increase in payroll taxes will probably widen the gap because it will fall most heavily on well-paid workers and their employers. The government is, in effect, gambling that the metropolitan goose will keep laying golden eggs even if fed a little less.

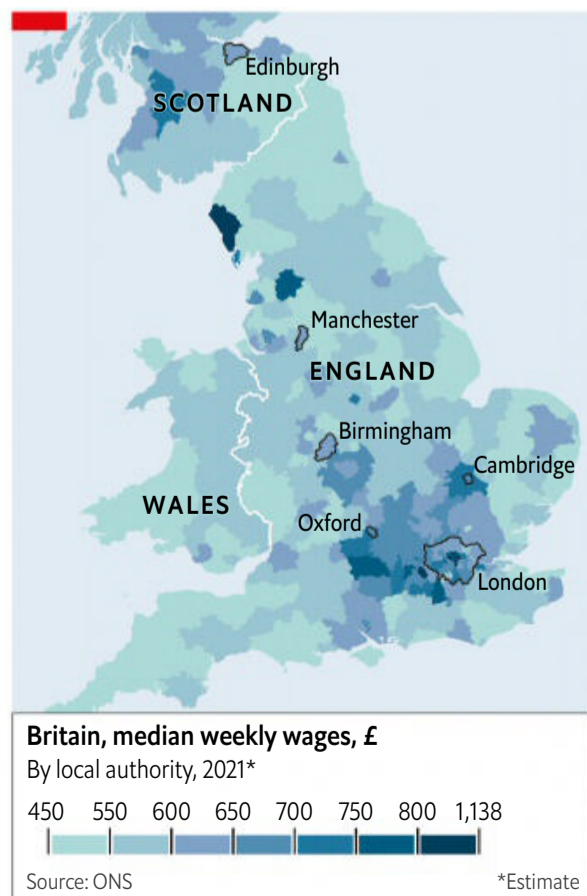
The big idea in the white paper is English devolution. Further powers for existing metropolitan governments are promised, beginning with Greater Manchester and the West Midlands, although the government is vague about which powers. Counties including Cornwall, Devon and Norfolk are invited to start negotiating for new “county deals”. Those that create directly elected leaders could be in line for more money and powers, such as a long-term investment fund and the ability to levy a supplement to business rates.

But levelling up involves at least as much centralisation as devolution. The government has created pots of money, such as the Towns Fund, and invited selected local authorities to bid for a share. To assess bids, more civil servants are required: the number employed in the Cities and Local Growth Unit is set to rise from 420 to 750. Sometimes the government simply announces that places deserve ex-▶▶

tra help. It promises to “proactively identify” 20 towns or boroughs that require regeneration. Schools in 55 areas where children do particularly badly will receive more money to help retain teachers in “high-priority subjects”—which have, naturally, also been specified by the government in Westminster.

In some ways the plans are reminiscent of those created by the Labour governments under Sir Tony Blair and Gordon Brown. They feature a list of performance indicators, such as increasing healthy life expectancy by five years and ensuring that 90% of children reach expected standards in reading, writing and mathematics. Progress will be centrally tracked and reported on, much as New Labour tracked progress in cutting child poverty. Trying to regenerate poor places through cultural spending was also a New Labour staple. But there is one big difference. Sir Tony and Mr Brown believed that Britain needed a strong London. Mr Johnson seems to think pretty much the opposite.

The new plans mention the capital often. The government says that by 2030, everywhere in England could have powers like London, and promises “London-style” transport systems. But there are two ways of achieving that. The less benign one, which might be called levelling down, is proceeding apace. Last year the government challenged London’s development master plan. It has bailed out the city’s transport network, which has been clobbered by covid-19, but only reluctantly and at the last minute. Transport for London is now considering drastic cuts to services. As the mayor, Sadiq Khan, has complained, even London might not have a London-style transport system for long. ■



Law after Brexit

Digging deep

A quixotic plan to roll back EU law

TOM DENNING, a Master of the Rolls, once described European law as “like an incoming tide.” It was 1974, a year after Britain signed the accession treaty that opened its statute book to laws and judgments crafted in Brussels and Luxembourg. “It flows into the estuaries and up the rivers. It cannot be held back.”

Four decades later Brexiteers succeeded in their campaign to stem the flow. But European law has shaped Britain’s legal landscape in areas from labour regulations to banking rules and agricultural practices. Reworking that terrain is now the objective of Boris Johnson’s government. On January 31st, as part of a relaunch after revelations of lockdown-busting parties, he announced its determination to uproot remnants of European law from the British statute book. It is an ideological move. Only lawyers will benefit.

Detaching Britain from the European legal order after the referendum presented government lawyers with their most complex puzzle in decades. Simply quitting would cause chaos. A mass of EU law would cease to have any effect. Legal certainty about the interplay between British and European laws would end. That was a nightmare prospect for judges, businesses and citizens, all of whom need clarity about what is permitted and forbidden, which rulings count as precedents and which laws take precedence.

Under Mr Johnson’s predecessor, Theresa May, the government settled on an elegant solution. A vast act snapshotted all EU law on exit day and “onshored” it, with a copy kept in the National Archives. It formed a new kind of hybrid: created by Parliament, but with many qualities of European law, taking precedence over old domestic statutes and normally interpreted by judges as if Britain had never left the bloc. Over time Parliament could pass new laws that amended old EU ones, laying new earth over old and letting Britain’s spell in Europe subside into legal history.

Many Brexiteers thought it an artful solution, compatible with Britain’s new independence. It is a mark of how ideologically brittle Brexit has become that Mr Johnson feels compelled to undo it. The project of ridding the statute book of traces of European law, dubbed “Operation Bleach” inside the government, was the hobbyhorse of Lord Frost, the former chief EU negotiator, who resigned from the cabinet before

Christmas. His ambition lives on.

A catalogue of remnants of EU law will be compiled, open to the public so citizens can track its erasure. Rather than wait for Parliament to legislate for new rules covering planes, chemicals, cosmetic surgery and so on over time, ministers propose a new power to rewrite retained EU law via secondary legislation. This would sidestep any need for an Act of Parliament. The government says speed is essential to shape regulations suited to fast-moving industries. (And anyway, says Suella Braverman, the attorney-general, many EU laws had “no democratic legitimacy” to start with.)

Lawyers fret about a significant shift in power from lawmakers to Whitehall. Secondary legislation is scrutinised only lightly; the House of Commons has not annulled a statutory instrument since 1979. The plans run counter to the Brexiteers’ avowed aim of returning power to the legislature. “If the idea is to restore true sovereignty to Parliament,” says Sylvia de Mars of Newcastle Law School, “then Parliament needs to consider issues of substance.”

Root and branch

More quixotic is a plan to “normalise” retained EU law, and thus change the basis on which judges handle it. Ministers are considering whether to strip it of its supremacy over pre-Brexit domestic law, and to remove the need for judges to heed old EU court judgments and legal principles when interpreting it. Ministers acknowledge this risks introducing legal uncertainty. Complex court cases over, say, financial derivatives could now involve days of chewing over abstract questions that were previously crystal-clear. A workaround will be required in order to resolve clashing laws, the government admits. The Bar Council, the barristers’ professional body, calls it a “litigator’s dream”.

All this is a strange use of ministers’ energies, when the government is making sluggish progress on designing new regulatory systems outside the EU. Without radical reform, Brexiteers admit, Britain cannot hope to make up for the economic cost of leaving the bloc. Lord Frost had hoped to hire a big name from America or Australia to lead the Brexit Opportunities Unit, a Whitehall body tasked with leading this work. But the salary did not attract top-notch candidates, and the unit remains without a permanent head.

Vote Leave, the Brexit campaign, put the benefits of divergence at £33bn a year; the government has downgraded that to £1bn. Daniel Hannan, a leading Brexiteer, has called its plans “thin, watery, tasteless gruel”. Still, ministers spy a chance to write the rulebooks for emerging sectors such as artificial intelligence, gene-editing and self-driving cars. That would be more useful than raking over well-trodden ground. ■

HP v Autonomy

Lynchpin

Britain's biggest tech entrepreneur has lost its biggest fraud case

TECH BOSSES are used to being feted by the British establishment. A warm welcome at 11 Downing Street, once reserved for City grandees, is increasingly offered to fintech upstarts. Budgets are tailored to their lobbyists' shopping lists. MI6's chief spy has pledged that spooks will work with them on new technologies.

But there is a big exception: Mike Lynch, aka "Britain's Bill Gates". In 1996 he founded Autonomy, a software firm that he sold in 2011 to an American tech giant, Hewlett-Packard (HP), for \$10.3bn (then £6.2bn). It remains the biggest-ever sale of a British software company. But on January 28th, after a decade of legal warfare, a high-court judge ruled that Mr Lynch had fraudulently inflated the firm's value by misleading HP about its performance. Hours later Priti Patel, the home secretary, approved Mr Lynch's extradition to America on criminal charges for the same fraud allegations.

Mr Lynch will appeal against both decisions. They nevertheless mark the close of Britain's biggest fraud trial. HP sued for \$5.1bn (the judge expects to award "substantially less"), having written \$8.8bn off Autonomy's value the year after buying it. The trial lasted 93 days, 20 of which Mr Lynch spent being cross-examined. He then had to wait two years for the ruling.

No one has come out looking good. The judge ruled that Mr Lynch and his former chief financial officer, Sushovan Hussain, had dishonestly padded revenues. Under their direction, Autonomy met revenue targets by selling hardware at a loss in transactions that served no commercial purpose and were not disclosed to the market. They sold software to friendly resellers whom they reimbursed by buying products from them that Autonomy had "little or no identified need or use" for, creating phantom revenue. Mr Lynch's arguments that he knew nothing about any fraudulent transactions, and that the differences they made to Autonomy's valuation were in any case immaterial, were dismissed.

Deloitte, Autonomy's auditor, emerged tarnished, too. In September 2020 the national accounting watchdog fined it a record-breaking £15m (\$20m) for "serious and serial failures" in its audit. Among them was accepting Autonomy's description of \$28m in costs for hardware it sold as a sales and marketing expense. Two of the audit firm's then-partners, Richard Knights and Nigel Mercer, were handed



To be continued

personal fines of £500,000 and £250,000.

Despite its victory, HP hardly emerged smelling of roses. During the trial Léo Apotheker, its chief executive at the time of the acquisition, admitted to not having read Autonomy's most recent financial reports before buying it. Nor had he read the due-diligence report prepared by KPMG, HP's advisers; not being a chartered accountant, he said, he "would not have been able to add any value". (His chief financial officer had not read it either.) Soon after the acquisition, Mr Apotheker was sacked.

The case shines a spotlight on Britain's extradition treaty with America. Signed in 2003 in the aftermath of the terrorist attacks of September 2001, it has since come under fire for being overly favourable to American prosecutors. Mr Lynch is appealing against his extradition, arguing that as a British citizen whose company was headquartered in Cambridge and listed on the London Stock Exchange (LSE), he should be tried for any criminal charges in Britain. MPs are disquieted, too. Tom Tugendhat, a Tory leadership hopeful, has called for the treaty to be "rebalanced".

The outcome casts a pall over Britain's tech scene, where Mr Lynch is not only the most successful recent exponent but also a key investor. Invoke Capital, the venture-capital fund he set up after selling Autonomy, is the only one in Europe to have its own in-house R&D division, which it has used to boost early-stage firms working on artificial-intelligence and machine-learning technologies. The first such investment, Darktrace, a cyber-security firm, floated on the LSE in April last year. None of this excuses fraud, which Britain's courts have decided Mr Lynch is guilty of. But others besides him will be sorry about that. ■

NHS waiting lists

To infinity and beyond

Unmet health-care needs are growing more visible as the pandemic recedes

DAYS BEFORE a deadline for National Health Service frontline staff to get vaccinated against covid-19, the government started to waver. It scrapped its plans entirely on January 31st. If mandatory vaccination had gone ahead, hospitals would have had to sack an estimated 70,000 workers—some 5% of staff—in England alone. Although patients would be safer if those caring for them were all jabbed, the NHS is so understaffed that losing so many people would have been catastrophic.

The backlog of patients awaiting care is larger than at any time since 2007, when records began. During the ten-year austerity squeeze that started in 2010 the NHS fared better than other parts of the public sector—but still received lower budget increases than during the previous decade. Meanwhile, demand continued to rise inexorably. Then came the pandemic.

In the queue are patients in need of treatments that are not deemed emergencies, such as cataract removal and operations on hips and knees. Many are managing chronic pain. A quarter are waiting for a diagnosis, perhaps for an x-ray or MRI scan; as they wait, undiscovered cancers and damaged joints will worsen. Some conditions may become untreatable before they are ever diagnosed.

Government data suggest that 6m people are waiting in England alone. But that figure is almost certainly wrong. The quality of the data is very poor, says Rob Findlay of Insource, a data-management company that works with the NHS to help it understand its waiting lists. The health-care system is bad at tracking urgent care that has been delayed, and waits for follow-up appointments after procedures have been done are not counted at all.

Just as worrying as the waiting lists themselves are "missing" referrals—people who, in normal times, would have been referred to a specialist by their primary-care doctor, but who did not present at surgeries during the pandemic. GPs saw millions fewer patients than normal during the past two years, and the National Audit Office reckons that 8m-9m people would have been referred. "We don't know how many are going to come back," says Mr Findlay, "or what condition they will be in."

Compounding the problem, in any given week as many as 5,000 costly hospital beds are occupied by medically fit patients. They linger largely because social care is so

underfunded that they cannot be offered the far cheaper support that would enable them to go home. One hospital trust in Northumbria is so fed up with this problem that it is proposing to offer social-care services itself.

In September 2021 the government directed an extra £5.4bn (\$7.3bn) over three years to support non-emergency care. (In a typical year, the NHS spends £28bn on such care.) In April payroll taxes are due to rise, with the extra money intended for health care and, in the longer term, social care, too. Even so, the health secretary, Sajid Javid, has warned that the waiting list could grow to 13m patients in the next few years. That is one Briton in five.

The government has yet to publish its (much-delayed) plan for tackling the backlog. It will include setting up new diagnostic centres and making efforts to move non-emergency care into dedicated facilities, whether NHS or private, that will not be disrupted by the annual winter surge in emergency admissions of elderly people. Better use of technology will be used to link up hospitals and other care providers, such as nursing homes or proposed new surgical hubs, increasing efficiency. The number of beds will have to rise. The aim is to increase the number of non-emergency procedures by 30% by 2024 compared with the pre-pandemic baseline.

At least as urgent is a realistic, up-to-date workforce plan—something that has been promised since 2016. On January 24th Sir Simon Stevens, until recently the boss of NHS England, criticised the government on this front, in stinging terms. Accusing it of “wilful blindness”, he pointed out that funding for Health Education England, the body responsible for ensuring the NHS workforce is big enough and has the right skills, was so precarious that running costs were covered on a horizon of just ten weeks. Unsurprisingly, this short-termism means it is not able to do its job properly: a recent presentation on its work opened with the dispiriting disclaimer that “we do not warrant or represent that the report is appropriate for your purposes”.

By some estimates, clearing the backlog will take the best part of a decade. As it has grown, so too has the use of private care, with those who can afford to deserting the NHS. Healthcode, a company that clears medical bills for the private health sector, says the volume of bills going through the private sector has gone up by 8% since 2019, a level of growth not seen before. But few voters in the poorer constituencies that swung to the Conservatives in 2019 will have that sort of money. It all adds up to a headache for the government, which is unlikely to have much to show for the extra spending before the general election due in 2024. As patients find themselves fighting for their lives, so will politicians. ■

Archives

Scrolling through

The laws are leaving Parliament

ONE BY ONE, every parliamentary act is being removed from its shelf in the Palace of Westminster, put in a lidded grey box—a small curatorial coffin—and carried away. Some are celebrity statutes: the Bill of Rights; the Act of Union. Others colonised countries and later set them free, enabled British slaving and ended it, oppressed women and emancipated them. By the end of 2025, all will be elsewhere.

The symbolism, for a government being investigated by the police, is unfortunate. But the rationale is sound. Parliament’s archives need reform. Ever since 1497, when a medieval clerk decided the old archive was too far away, Parliament has taken care of its own laws. Over half a millennium they have built up, and now the archives have over 10km of shelving. They hold 64,000 acts of Parliament, diaries, letters, speeches and assorted bits and bobs, including bolt-cutters (used to remove a suffragette from the railings of Parliament), a banner, recently discovered in a cupboard (“VOTES FOR WOMEN”) and, for complicated reasons, half a gravestone (in a box marked “CAUTION: EXTREMELY HEAVY”).

One reason for the grand removal will be familiar to any archivist: outmoded data formats. Many libraries struggle with CDs, DVDs and floppy disks; Parliament’s version is vellum. Until 2017 Britain’s laws were written on parchment that was rolled into scrolls and laid on shelves in the Acts Room. They were not ordered according to

any principle as common as the Gregorian calendar, but instead by the year of the reign during which they were passed. So a law passed in 1536 (for the “Punysshement of Pyrotes and Robbers of the See”) is dated, in parliamentary time, as “28 Hen 8”.

The Acts Room is popular with film and television crews, says Adrian Brown, the director of the archives. Step inside and it is easy to see why. The laws lie stacked like bolts of cloth in a tailor’s, the spirals of each scroll as perfect as the rings on a tree. This is democracy, distilled, and it takes up startlingly little space. Here, a king can be confined to a bookcase, and centuries can be strode past in steps.

Aesthetically, the laws are beautiful. Practically, they are a nightmare. The problem is partly the parchment. Shelving scrolls is tricky. The storage technique is familiar to anyone who owns a wardrobe with a top shelf: pop things in, one on top of another, hope you don’t need the one at the bottom—and if you do, tug. The system is hardly “ideal from a retrieval point of view”, says Mr Brown, though the smaller ones do slide out neatly enough.

The Victoria Tower that houses the archives is also a problem. “If you were designing a modern archive you wouldn’t put it in a 350-foot tower,” says Mr Brown. Twelve storeys high, with a central spiral staircase, it could be described as a fine example of perpendicular Gothic—or as a giant chimney filled with paper (in the 1950s a firebreak was added halfway up). Parliament has form when it comes to unfortunate storage arrangements. The Palace of Westminster had to be rebuilt after the Great Fire of 1834, which was started by archival materials (in that case, tally sticks). It is not yet known where the new archives will be, but there will definitely be less of an up-draft. Just sometimes, Parliament learns from its mistakes. ■



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Children and teenagers

The covid cohort

The pandemic will have lasting effects on a generation—not all of them bad

A HUDDLE OF 16- and 17-year-olds outside Luton Sixth Form College, in southern England, are describing how the pandemic has affected their lives. It is a long and bitter tale. Their education has suffered from repeated disruption; they have become nervous and listless; they have been unable to get drunk together. One girl says, sadly, that she and her friends became so used to meeting online during lockdowns that they have almost forgotten how to relate in person: “Even when we’re together, it’s as though we’re not there.”

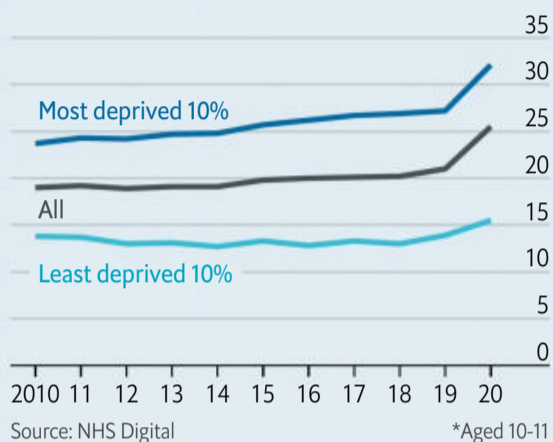
In some ways children’s and adolescents’ lives are returning to normal. Almost all schools reopened after Christmas. On January 20th, 87% of pupils were present. But a cohort has been affected by the disruptions of the past two years, in ways likely to shape them for life. Max Davie, a paediatrician, calls it “an unfortunate but fascinating natural experiment”.

During lockdown Britain was thrown back in time, to a society in which most children were educated and fed at home. Some returned repeatedly to that state as the virus swept through their schools and communities. It is as though the national welfare state splintered into millions of private ones. The “domestic soundtrack” became more important in children’s lives, says Binks Neate-Evans of the National College of Education. That was better for some than for others.

Research for the Department of Educa-

Hard to shift

England, prevalence of obesity in year-six schoolchildren*, %



tion last summer found that primary-school children had fallen behind in mathematics by just over two months relative to the previous year group. Children poor enough to receive free school meals slipped by half a month more. And large regional differences emerged. Those in London were 0.8 months behind where they should be; those in south-west England (the region of England that suffered least from covid-19) had not slipped at all. Children in north-east and north-west England were at least three months behind.

If the laggards cannot catch up—which seems likely, given the government’s reluctance to shell out for tutoring—they will be hurt for life. The Education Policy Institute, a think-tank, estimates that an extra year of schooling raises lifetime earnings by 8%. Missing out on three months entails a loss of between £15,600 (\$20,900) and £30,900. The greater learning loss in the north of England will make it even harder to “level up” that part of the country, as the government wants to do.

The covid cohort did, however, become technologically expert. During lockdown, parents and schools decided that excessive screen time and online bullying were less alarming than isolation from peers, and nudged children online. “They migrate to social media anyway, and during the pandemic we encouraged that,” says Jenny Langley, head of Kingsway Park High School in Rochdale.

Many became comfortable at home. A government survey of 8- to 15-year-olds in August 2020 found that their favourite three places to spend time were parks, beaches and gardens. A year later, their top

choice was “indoors”. Other surveys have shown that most parents rather enjoyed spending more time with their children, and, perhaps more surprisingly, that most children and teenagers liked spending more time with their parents.

Medical data tell a similar story of mostly contented idleness. Between March 2020 and July 2021 (the latest month for which data are available) the number of children aged 5-14 admitted to hospital for accidents was lower than the pre-covid average in every month. The number of children treated in hospital after falling from playground equipment has dropped particularly steeply, though that may in part reflect a desire to avoid burdening the NHS.

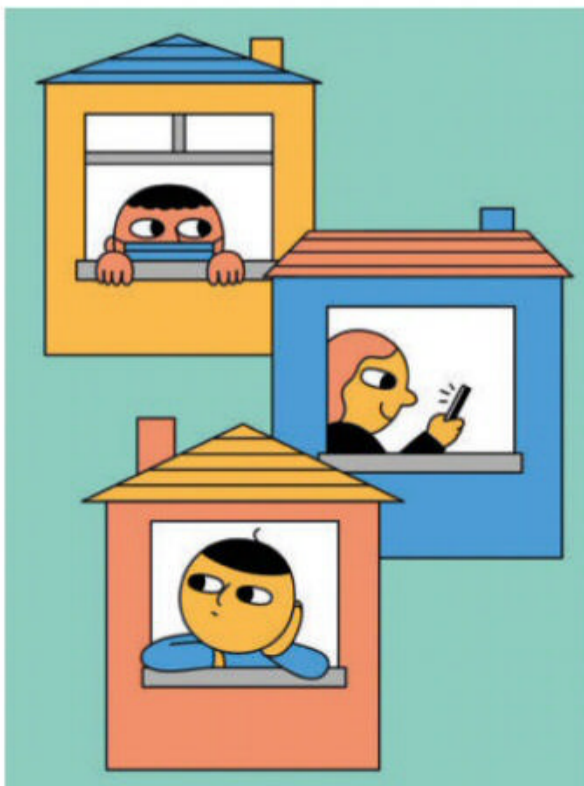
The lack of physical activity, combined with other disruptions, has made a cohort of children fatter. In November the National Child Measurement Programme, which covers English primary schools, reported a sharp rise in obesity, especially in deprived districts (see chart). As with mathematics scores, this may not be a blip. Obese children find it harder than others to do sport or eat a normal amount. “An unhealthy weight makes it harder to get back to a healthy weight,” says Dr Davie.

Teenagers have cut back especially on one physical activity. Conceptions among girls under 18 had been falling even before covid-19. But the number plunged to just 5,696 in the second and third quarters of 2020 (the last for which statistics are available), down from 7,188 in the same two quarters a year earlier. Teenagers are probably having less sex, not just getting better at using contraception. They now account for only 4.4% of sexually transmitted infections treated in hospitals. Brook, which runs sexual-health clinics for young people, found that attendance fell by 56% in the first year of the pandemic.

Young people are also remaining in education longer. More 16-year-olds are staying on at schools and sixth-form colleges, partly because of grade inflation at GCSE. Only 65,000 under-19s started apprenticeships in the 2020-21 academic year—down a third since 2018-19. This change, like some others, is likely to stick. Luke Sibieta of the Institute for Fiscal Studies, another think-tank, says that participation tends to rise during recessions and not to fall back afterwards. That may help mitigate the harm from school closures.

Push and pull

Some of these changes are good, others bad. But many point in the same direction. Children and adolescents have been bound more tightly to family and home, and separated from their friends. Teenagers are doing less of the things that made teenagers in the past feel adult, such as leaving school, working and having sex. The pandemic has stretched childhood. ■





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Every part of the British establishment has debased itself



PEOPLE LASH out when cornered and Boris Johnson is no exception. In a bad-tempered debate in Parliament on January 31st, MPs picked over a summary report into a series of illegal parties in Downing Street—including Mr Johnson’s own flat—and other locations during lockdown. Sir Keir Starmer, Labour’s leader, called on the prime minister to resign and labelled him “unworthy of his responsibilities”. Mr Johnson in turn repeated a misleading far-right meme by accusing Sir Keir, a former director of public prosecutions, of failing to charge Jimmy Savile, a former children’s entertainer and Britain’s most notorious paedophile.

It was a low point in a scandal that has debased the entire British establishment. Everyone from the prime minister to the police to the civil service bears some of the blame. The report, by Sue Gray, a senior civil servant, criticised “failures of leadership” that allowed 16 parties to go ahead while the country was in lockdown. A dozen are being looked into by the police, whose investigations may take months. After a contemptible performance in Parliament, Mr Johnson’s future as prime minister looks shakier. Yet the rot extends well beyond the current resident of Downing Street.

Take Britain’s civil service. It prides itself on being a Rolls-Royce institution. But its involvement in the succession of parties suggests that a better comparison would be to a Morris Minor. Martin Reynolds, Mr Johnson’s principal private secretary, is supposed to be a cunning bureaucrat, able to understand base politics and the complicated machinery of Whitehall. Instead, he invited more than 100 people to a booze-up during a national lockdown, reminding them via email to bring their own bottles. He resembles a hapless lackey of Stringer Bell, a drug-lord in HBO’s “The Wire”, slapped down for minuting a meeting of heroin dealers: “Is you taking notes on a criminal fucking conspiracy?”

The civil service’s initial investigation was cack-handed. When reports of parties emerged before Christmas, Simon Case, the inexperienced cabinet secretary, was asked to look into what had gone on. He later had to recuse himself after it emerged that his office had hosted a pub quiz during lockdown. The job was then handed to Ms Gray, a backroom fixer notorious among transparency campaigners for blocking freedom-of-information requests.

If the civil service botched its investigation, so did the Metro-

politan Police. At first, it took the unpopular but understandable decision not to investigate historic breaches of pandemic regulations, which were usually punished in summary fashion by smallish fines. Hypocrisy among politicians and civil servants is inadvisable, but not itself criminal. The Met then u-turned and investigated. Worse, it demanded that Ms Gray excise details in her report concerning parties it was looking into. With touching naivety, lawyers suggested that would ensure that the evidence given to police had not been pre-edited by witnesses in order to fit the facts revealed by Ms Gray—as if the thought of co-ordinating stories might never otherwise have crossed the minds of those involved in a potentially career-ending scandal.

With the Met involved, however, conspiracy is less likely than cock-up. Screwing up an investigation into illegal parties in one of Britain’s most heavily guarded locales is about par for the course for Britain’s biggest police force. Its enforcement of covid regulations was erratic. Last March it broke up a vigil in memory of Sarah Everard, a 33-year-old who had been raped and murdered by one of its own officers during the spring lockdown. Yet officials smuggling suitcases clinking with wine bottles were left unchallenged.

Journalists revelled in revealing the juicy details that triggered public rage. During one party drunken attendees reportedly broke a swing in the Downing Street garden that belonged to the prime minister’s two-year-old son. But the scandal also highlighted the cosy relationship between Downing Street and the press. One party was for James Slack, the prime minister’s departing spokesman. His next job? Deputy editor of the *Sun*. Oddly the tabloid, usually ferocious in its reporting, failed to land the scoop.

Norms that once governed British politics are no more. MPs soberly declare that Mr Johnson should resign if he has broken the ministerial code, the rules by which the country’s leaders are supposed to abide. Lying to Parliament, as Mr Johnson was repeatedly accused of doing, is one such crime. But legally, the code is little more than a PDF on a website. And in any case, the prime minister has the final say. For an indication of how seriously Mr Johnson takes the document, read his foreword to the latest version, which begins: “The mission of this Government is to deliver Brexit...for the purpose of uniting and re-energising our whole United Kingdom and making this country the greatest place on earth.” At least it omitted the thumbs-up and Union flag emojis.

Bad chap theory

The prime minister has no intention of resigning, whatever the code says. Instead, the question moves to those around him. Do they have the courage to chuck him out? It could be done with 54 letters from Conservative MPs to a backbench committee calling for a no-confidence vote, followed by a majority of MPs in a secret ballot. That would-be regicides do not yet have the numbers indicates a paucity of alternatives. It is just two years since Mr Johnson won an 87-seat majority, on the Conservatives’ largest vote-share since 1979. Tory MPs will stick with Mr Johnson for as long as they think he is their best bet for retaining their seats and staying in power. He is the product of a broken system, not its cause.

In Parliament on January 31st, Sir Keir wound up with a simple attack on the prime minister: “He is a man without shame.” Unfortunately, British politics relies on shame to function. The country still runs on the “good chap” theory of government: the idea that politicians abide by the invisible lines of the constitution. An absence of legal constraints requires an abundance of personal restraint, and Mr Johnson has none. A bad chap can go a long way. ■



The French presidential election

Macron, odds on

PARIS

Emmanuel Macron is highly likely to win a second term, according to our new election model

SO KEEN ARE the French to evict any leader they vote into office that the language even has a word for it: *dégagisme*. No French president has been re-elected for 20 years. This April, five years after Emmanuel Macron seized the presidency in his first attempt at winning elected office, voters will decide whether to keep him on for a second term. *The Economist's* election model, launched on February 2nd, suggests that they will. It puts Mr Macron's chance of re-election at 79%. If he wins, the 44-year-old will break yet another rule of French politics.

Our model suggests that Mr Macron's most serious challenger is the candidate of the centre-right Republicans, Valérie Pécresse. Yet on February 2nd it put her chances of becoming France's first female president at only one in eight. The model gives the nationalist Marine Le Pen even worse odds: one in 17. Even this is far better than the chances for Eric Zemmour, a far-right polemicist, whose entry into the race dented Ms Le Pen's poll numbers; his current polling average of just 13% and poor showing in hypothetical match-ups give

him a 1% chance of victory. On the left, no candidate has even as much as him.

To produce these results, *The Economist* has built a poll-based statistical forecasting model (see Graphic detail). The election will have two rounds, on April 10th and 24th. Our model, which runs 10m sim-

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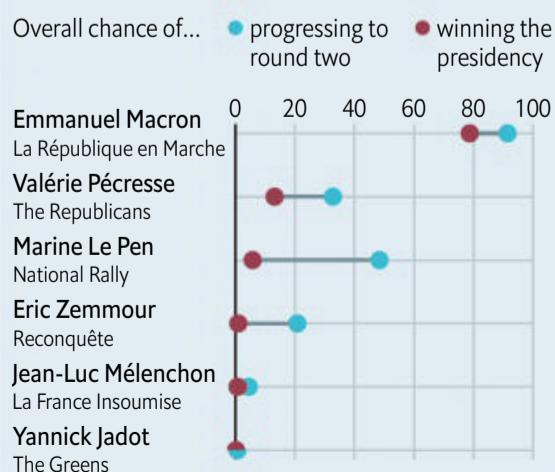
ulations a day, calculates the probability of each candidate reaching the second-round run-off, and of then winning that to secure the presidency. Charles de Gaulle devised this electoral system as a direct "encounter" between a candidate and the people, unfiltered by an established party. Before narrowing the choice to two, it offers outsiders the chance to try their luck against party nominees—provided they secure the 500 signatures from elected officials needed to validate their candidacy.

The Economist's model gives Mr Macron greater chances of winning than the disgruntled mood in France might suggest. He may lead in first-round polls, but the French are scarcely enamoured. Nearly half of voters tell pollsters that they will vote for a candidate from the extremes, either on the left or the right. Mr Macron detonated the previously dominant two-party structure in 2017, having launched his centrist party, now called La République en Marche. He remains a divisive figure, resented by left and right alike, and reproached for a haughty and know-it-all governing style. Anti-vax protesters regularly take to the streets. Teachers and parents have been exasperated by the complex covid-19 testing regime in schools.

In January Mr Macron's approval rating was only 38%, according to Kantar, a polling outfit. This is better at this point in his presidency than either of his two immedi-

One-horse race?

France, presidential election, %
At February 2nd 2022



Source: *The Economist's* French election model



For full details of our election forecast, visit economist.com/interactives/france-2022

ate predecessors, François Hollande (19%) or Nicolas Sarkozy (29%). But it is lower than that of the only two presidents to have won re-election since de Gaulle: François Mitterrand in 1988 and Jacques Chirac in 2002. Each was helped by running for re-election while in “cohabitation” with a government from the opposition, which deflected responsibility for voters’ gripes away from the president. Mr Macron enjoys no such advantage.

Mr Macron’s favourable odds stem from his consistent and significant first-round poll lead, combined with his very high chances of beating either Ms Le Pen or Mr Zemmour in a run-off. Under the French system, victory in the run-off can come despite a far-from-commanding first-round score. In 2017 Mr Macron secured just 24% of the initial vote, but won 66% in the second round.

Politically, Mr Macron’s base seems quite loyal. His 24% first-round score in 2017 roughly matches his showing in polls today. Those who say they will vote for him in April are more certain of their choice than are those who back Mrs Péresse, according to Ipsos, another polling group. Mr Macron’s party has successfully occupied a broad political space, borrowing politicians from the left and the right, crushing many potential rivals and splintering the opposition. The Socialist Party, supplier of two previous post-war presidents, is a feeble version of its once grand self.

Moreover, Mr Macron’s management of the economy and the pandemic has proved reasonably solid. In 2021 French GDP rebounded at a rate of 7%, its fastest growth for 52 years. Workers and firms have been protected from lay-offs and closures by generous government support. The employment rate for 15- to 64-year-olds has reached a record high. The latest wave of covid infections seems to have peaked. France’s vaccination rate for first doses is higher than in Britain and Germany, and its number of excess deaths is lower.

That said, odds this favourable to Mr Macron do not mean that he will inevitably win. Were he to face Ms Le Pen or Mr Zemmour, the polls say he would beat each by a fair margin. But should his opponent be Mrs Péresse, the race would be tighter, and could easily tighten more.

Our model gives the Republicans’ nominee, who enjoyed a bump after winning the party’s primary in December before sliding back in the polls, a 32% chance of reaching the run-off. The polling averages currently give Mr Macron a six-point lead in such a match-up—a fairly narrow margin. A serious candidate who knows her brief and likes to call herself “two-thirds Merkel and one-third Thatcher”, Mrs Péresse has been criss-crossing the country on the campaign trail. Ipsos suggests that 50% of those who back Mr Macron say

that Mrs Péresse, once considered a potential recruit to his government, would be their second choice. To be sure of defeating her in a run-off, Mr Macron would need to get out the vote on the left, which is out of her reach but might be tempted to abstain.

French election campaigns can also twist in unexpected ways. Three months before the first round in 2017, only one poll suggested that the eventual victor, Mr Macron, would get to the run-off. Our model tries to allow for unexpected poll movements, but does not incorporate the possibility that Mr Zemmour fails to secure his 500 signatures and so drops out. If he did Ms Le Pen’s score would rise sharply and Mrs Péresse’s place in the final would be very much at risk, to Mr Macron’s benefit.

Indeed, a 21% chance of Mr Macron losing, our starting projection as the model goes live, is not trivial. It reflects the risk not only of a late-breaking scandal but also of polls being off by a higher-than-usual margin. Much can happen in the ten weeks before a first-round vote, as Mr Macron knows full well. But at this point the sitting president, despite the reproaches hurled his way by voters, is looking well placed to keep his job. ■

Russia and eastern Europe

Who’s next?

NARVA AND BUDAPEST

As Russia menaces Ukraine, eastern European countries grow nervous

THE MUNICIPAL offices in the Estonian city of Narva are just a snowball’s throw from Russia. From her window Katri Raik, the mayor, can watch cars and lorries trickling through a border checkpoint. More than 80% of Narva’s residents are ethnic Russians, a legacy of the centuries during which Narva was part first of the Russian empire and then of the Soviet Union. Ethnic Russians, nearly a quarter of the population, have grown more integrated since Estonia became independent 30 years ago. Yet most send their children to Russian-language schools and rely on Russian media. “Yesterday someone on the city council said ‘*U nikh v Estonii tak* [That’s how it is over there in Estonia],” says Ms Raik.

A former interior minister, Ms Raik was elected in December pledging to bridge the gap. A new Estonian-language school will open in September. The regional economy is now oriented towards the West. But Russia’s military build-up on the Ukrainian border is reminding Narva of where it sits. Opinion is divided along familiar lines. In several conversations, ethnic Estonians saw Russia as the aggressor, whereas eth-

nic Russians tended to think the risk of war exaggerated or to blame NATO. “We each know what the other thinks, so we simply don’t talk about it,” says Ms Raik.

Across eastern Europe, the threat of war in Ukraine evokes long-standing fears. Most countries, Estonia included, are NATO members and face no immediate risk of incursion. But Russian and Soviet expansionism has shaped their politics for centuries. These days many eastern Europeans are at odds with the Kremlin over energy supplies or Russian-financed corruption. Others have friendlier relations, helped by trade, Russian-speaking minorities or politicians who get on with Vladimir Putin, Russia’s president. But even in such places, the crisis in Ukraine is causing problems.

The Baltic countries, which were Soviet territory until 1991, are the strongest voices for deterrence and harsh sanctions. “Interdependence means you can hurt the one who is dependent on you,” says Kaja Kallas, Estonia’s prime minister, whose mother’s family was deported to Siberia under Stalin. Her government is trying to send weapons to Ukraine, but Germany has been blocking the passing-on of German-made equipment. On January 27th Latvia’s defence minister called the German stance “immoral and hypocritical”.

Last summer, when Mr Putin wrote an essay claiming that Ukraine was not a legitimate nation, it rang alarms in Estonia, Latvia and Lithuania, because he had made similar arguments about them in the 2000s. Defence planners in these countries consider Russia an existential threat.

In Romania and Bulgaria, things are more complex. Both are NATO members. But their politics are plagued by corruption, some of it tied to Russia. They have not always been enthusiastic about American policies that link anti-corruption efforts to regional security. Romanian politicians have clamoured for years for NATO to ▶▶



In the shadow of the bear

► upgrade its presence, though Bulgarian ones downplay new deployments to avoid provoking voters with Russian sympathies. Still, both countries were furious when Russia demanded on January 21st that NATO pull allied forces out of their territory. On February 2nd Joe Biden instead announced the deployment of an additional 3,000 troops to the region

It is in central Europe that attitudes towards Russia are most ambivalent. Viktor Orbán, Hungary's populist prime minister, is friendly with Mr Putin and visited him in Moscow on February 1st. He has imitated Mr Putin's model of government by taking control of his country's media and judiciary. He has also bought Russian nuclear power plants, struck deals for Russian gas that circumvent Ukraine and persistently called for relaxing EU sanctions. Miloš Zeman, the Czech Republic's president, is cosy with Mr Putin, too. But Petr Fiala, the new Czech prime minister, is solidly in step with NATO and the EU.

Poland's government also has some affinity with Mr Putin's. It is conservative, religious and nationalist, and is fighting with the EU over its efforts to turn judges into political pawns. Yet it is the most fiercely anti-Russian government in Europe. The Russian empire ruled much of Poland throughout the 19th century and tried to Russify its population. In the second world war Stalin carved Poland up with Hitler and executed much of its elite. Many Poles see Russia as a country that tried to eliminate them as a nation.

Eastern European countries will pay a price for isolating Russia, especially in energy. In October Moldova was forced to strike an expensive gas deal with Gazprom, and rising electricity bills nearly toppled Ms Kallas's government in January. But only for the Baltic countries is Russia among the top five export markets. In no country is direct investment from Russia more than a tenth that from the EU, though in some pockets it plays a significant role.

In Narva, for instance, about 30% of the firms in the city's industrial zone are owned by Russians, reckons Vadim Orlov, the zone's director. Russian businessmen want factories in a country governed by the rule of law. Why should Estonia back sanctions that could make things harder for its own Russian-owned businesses?

One reason is that Russia likes to use sanctions too. Ms Kallas mentions 2007, when it retaliated for the removal of a memorial to Soviet soldiers in Tallinn by cutting off fuel supplies. Dumitru Alaiba, a Moldovan MP, recalls 2014, when Russia hit his country with an embargo after it signed an association agreement with the EU. "[We] have learned that dealing with Russia has risks," says Ms Kallas. If the region's ties to Russia are further weakened, Mr Putin will have himself to blame. ■



Ukrainian politics

The man in the middle

KYIV

Why Ukraine's president is talking down the threat from Russia

BLOOD MAY SOON be spilled in Ukraine, but will it be real or fake? On January 31st the authorities arrested a group they said was planning to stage riots in Ukrainian cities. The plot allegedly involved thousands of paid anti-government protesters, smoke bombs and litres of fake blood for the cameras, with medics on the scene to simulate first aid. The group's goal, explained Ihor Klymenko, Ukraine's police chief, was to shake the country with viral images of unrest and police brutality.

Yet two days earlier, Ukraine's government had dismissed leaks from American intelligence officials that Russia was transporting supplies of blood to its troops at the Ukrainian border to treat potential casualties of war. "The purpose of such information is to spread panic and fear in our society," wrote the deputy defence minister, Hanna Maliar, in a Facebook post. A rhetorical and analytical rift has opened between Ukraine and America. Whereas the Americans warn of an imminent Russian invasion, Volodymyr Zelensky, Ukraine's president, thinks the gravest threat may come from within.

Mr Zelensky rejects the view reportedly relayed over the phone by President Joe Biden, that a Russian invasion of Ukraine is "certain" and that Kyiv, the capital, could be "sacked" (the White House denies the report). He has reproached foreign leaders for their dire rhetoric and suggested that Russia's menace is nothing new. "I'm the president of Ukraine, I'm based here, and I think I know the details deeper than any

other president," Mr Zelensky said.

Many diplomats express frustration with Mr Zelensky, whom they see as inexperienced and thin-skinned. They note that he demands urgent deliveries of arms from the West while pooh-poohing the prospect of a war for which those weapons would be needed. Much of Washington's foreign-policy establishment, as well as Britain's prime minister, Boris Johnson, went to Kyiv this week, to show support—but also to bypass the government and explain the risk of invasion directly to locals.

For eight years Ukraine has been at war with Russian-backed separatists in its eastern Donbas region. The prospect of Russian escalation is a constant threat, which hurts Ukrainian morale and discourages investment. Many Ukrainians, who take a stoical attitude to the situation, appreciate Mr Zelensky's calm. The foreign ministry rebuked America and Britain for their "excessive caution" in evacuating staff from their embassies in Kyiv.

Some Ukrainians mistrust America's spies, who they think view Ukraine as a pawn in a wider struggle with Russia. The steady drip of American intelligence leaks seems to them to be serving American plans for Europe's security, rather than helping Ukraine. But Mr Zelensky's defenders feel the rift is overstated. They say he is simply staying positive in public while planning privately for the worst, as any leader might. After all, America and its allies are still sending Ukraine aid, sharing intelligence and pressing Russia to back down.

America sees Ukraine's armed forces as overmatched, making a Russian occupation possible. But Ukrainians have faith in the country they have built since 2014. If Russia were to invade and establish a puppet regime, it would face not just an insurgency but—just as frustrating—an uncooperative bureaucracy. The country has purged its police force of pro-Russian officers. New applicants must explain to a commission how they would respond to illegal orders.

Yet even if Ukraine is more resilient than Americans think, Mr Zelensky is in a bind. If an invasion comes, his decision to play down the risk of it could cost him public trust, and his enemies are circling. In negotiations in Munich next week with Russia, France and Germany, he will face pressure to implement the Minsk protocols, a deal imposed by Russia at gunpoint in 2015 which would in effect give pro-Russian regions in Ukraine a veto over foreign policy. On January 31st the head of Ukraine's national security council said the country would not implement the protocols, and the West should stop pushing it to do so. Running a country under the seemingly endless threat of invasion turns out to be quite tricky. ■

Turkey and Armenia

Caucasian thaw

IGDIR

The foes are talking. But normalisation will not mean reconciliation

BLANKETS OF SNOW cover Igdır, a drab town in eastern Turkey near the border with Armenia. Mount Ararat, where Noah and his ark supposedly washed up after a spot of rain, towers over the scene. The closest big city, Yerevan, Armenia's capital, is 30km away. But there is no going there, nor is there a way for Armenians to reach Turkey by land. The border between the two countries is closed. At the crossing outside town, Turkish soldiers stand guard opposite an unused customs building, braving the cold.

Happily, a thaw seems to be coming. Turkey and Armenia, divided by regional disputes and the legacy of the mass murder of Armenians by Ottoman forces over a century ago, are talking again. Flights between Yerevan and Istanbul, home to nearly all of Turkey's remaining Armenians, resumed on February 2nd, after a hiatus of two years. Weeks earlier, the two countries launched talks aimed at normalising ties. (Armenia and Turkey have never established diplomatic relations.) Armenia's foreign minister will attend a conference in Turkey in March. The opening of the border may be next.

Armenia is cut off from the east by Azerbaijan, with which it fought a war less than two years ago. It is separated from Russia, its main ally, by Georgia, and largely excluded from regional transport and energy projects. It has much to gain from direct trade with Turkey, a market of nearly 85m people. (Armenia is home to a mere 3m, and much poorer.) A reopened border could become its gateway to Europe.

Places like Igdır could undoubtedly use the boost from trade, too. Turkey's currency crisis and surging inflation, which reached an annual rate of 49% in January, have made the region, which was already one of Turkey's least developed, even poorer. At a teahouse in Orta Alican, a village close to the border, farmers sitting around a wood stove complain they can no longer afford fertiliser, whose price has tripled in only a few months, or diesel. One of the men recently sold most of his cows because he could not afford animal feed. For some, the only way to escape poverty has been to escape altogether. Over the past year, says Davut, one of the farmers, as many as 30 men from the village, about one per household, have upped sticks, many for Europe. Davut's own brother was recently caught by border guards in Croatia.



He had sold all his possessions to pay smugglers over \$8,000 for passage to France. "If I had that much money," says Davut, "I would leave as well."

Over the past three decades, the fate of the border has hinged on events hundreds of kilometres to the east, in Nagorno-Karabakh, an Armenian enclave inside Azerbaijan. Turkey closed the border in 1993, out of solidarity with Azerbaijan, towards the end of a bloody war that saw Armenian forces take control of the enclave and occupy seven neighbouring Azeri districts. In the war in 2020 Azerbaijan, backed by Turkey, recaptured much of the region (see map). Armenia's defeat means one of the main obstacles to the reopening of the border, and to Turkey's rapprochement with Armenia in general, is now gone.

Turkey and Armenia were on the verge

of patching up most of their differences in 2009, before a backlash from nationalists on both sides, and from Azerbaijan too, upended the process. Things are different today. Armenia, defeated and more dependent than ever on Russia, is negotiating from a position of weakness. America and Europe, which once saw the rapprochement as a way to dilute Russian influence in the Caucasus, are less involved. Turkey itself has become more cosy with Russia. The talks in 2009 took place in Zurich. The current ones are in Moscow.

Normalisation, if it happens, will not mean reconciliation. Turkey refuses to recognise the deaths of 1m or so Armenians in 1915-17 as a war crime, much less as genocide. Armenians arriving in Igdır would be aghast to spot a towering statue, featuring 40-metre swords raised to the sky, commemorating the "genocide" not of Armenians by Ottoman Turks, but the other way around. A monument to Turkish-Armenian friendship, built on another section of the border, was demolished in 2011 after Recep Tayyip Erdogan, Turkey's president, called it a monstrosity.

Attitudes on the ground are less stubbornly entrenched. Locals in Igdır say that they would welcome visiting Armenians. "If the border were to open tomorrow, 99% of the people here would approve," says Murat Yikit, the town's former mayor. The opening would of course not transform the region's economy or the relationship between the two countries overnight. "But it would give young people from both sides a chance to overcome past hatreds," says Habib Eksik, a local lawmaker from the progressive Peoples' Democratic Party. There are some good omens. Earlier this year locals in Orta Alican spotted a group of officials from Turkey's highways directorate near the village. They turned out to be carrying out surveys for a project to widen the road leading up to the border. ■



Noah's parking

Charlemagne | Pigs can fly

Southern Europe is reforming itself—and maybe the EU, too



THE ACRONYM stuck for a decade, no matter how bitterly the countries it lumped together moaned about it. Being branded one of the PIGS—short for Portugal, Italy, Greece and Spain—as the euro teetered was to be the perennial butt of bond-market bullying, Eurocrat nagging and German tabloid contempt. But look today and the bloc's Mediterranean fringe is doing rather well. Those once stuck in the muck in the aftermath of the global financial crisis are now flying high. Southern Europeans are running their countries with the competence and reformist zeal all too often lacking in their northern neighbours. It may be a flash in the pan. But if it endures, it will come to change the nature of the EU.

The political stars in Europe these days are found down in what used to be termed “the periphery”. On January 30th António Costa led his Socialist party to an absolute majority in Portuguese parliamentary elections, obviating the need for ungainly coalitions of the sort now hobbling Germany. On the opposite side of both the continent and the political spectrum, Kyriakos Mitsotakis of Greece is the centre-right's undisputed idol, recently hosting Valérie Pécresse of France as she sought to burnish her Macron-beating credentials. Between the two is Mario Draghi, who looks set for a longer stint as Italy's prime minister after the prospect of his promotion to the presidency revealed a lack of any other politician who could hold his disparate coalition together. By bidding for the top job Mr Draghi miscalculated. But he was lucky: to be seen as the only calming force in Italy's choppy political waters adds to the already considerable credibility he enjoys. And he may become president in a year or two.

Better yet, the southerners are achieving the rare feat of combining political success with reforms to economies previously thought unreformable. Mr Costa has gained plaudits since 2015 as a lefty who also knows how to balance a budget. Italy's technocrats are overhauling its creaking courts and overly generous pensions—necessary, urgent changes that governments of all stripes have for decades shirked. Spain, under somewhat more fractious political leadership, has made useful tweaks to its labour markets. Greece has worked on digitising a rickety bureaucracy, among many other things. All are growing faster than the EU as a whole.

When Europe's problems are pored over today, most fingers

point north and east. Poland and Hungary are challenging European norms on the rule of law with as much abandon as Greece once ignored the bloc's deficit rules. Germany is sending helmets to Ukraine when what is really needed are howitzers. Over 40% of French voters are expected to cast their ballot for extremist candidates in April, even though they have suffered none of the wrenching reforms of the sort undertaken by the dynamic southerners since the pandemic struck. The Netherlands, once an enthusiastic PIGS-baiter, only recently acquired a government following nine months of haggling. The previous one had collapsed after a benefits snafu plunged thousands into penury. Could nobody from Athens be dispatched to help them get a grip? Is it time for a visit from the troika?

To austere types in Berlin or Helsinki who tormented southerners during the eurozone's darkest hours a decade ago, the periphery's success is evidence that tough love works. In their telling, it is the threats and badgering doled out at interminable EU summits that put southern Europe on the righteous path of tighter budgets. The beatings continued and morale improved. Reformed economies were in better shape to handle the pandemic.

Tosh, say their opponents. The PIGS are airborne today because the austerity-led playbook of the 2010s has been binned in favour of solidarity. As covid-19 struck, rich countries agreed to an EU fund that will end up funnelling €750bn (\$850bn) in loans and grants mainly to poor countries. It is this Next Generation (NGEU) money—Italy alone is entitled to €192bn—that is giving politicians there the space to adopt reforms they always would have supported if they could have afforded them. The Germanic cudgelling of yore merely boosted populists, which made enacting change all the harder. Now, sane politicians are back in charge.

It's a bird, it's a plane...

Convincing either side of the merits of the other is a lost cause. All agree any crowing over southern Europe's current success is premature. Growth is high mainly because the porcine foursome slumped hardest during the pandemic. Unemployment remains high. Reforms still have a long way to go; opponents to change may simply be biding their time. Public debt levels—over 200% of GDP in Greece's case—are worrying. PIGS are able to borrow at low rates only thanks to the ECB snapping up their bonds, a form of monetary-policy largesse that inflation may soon render untenable. Italy faces a fractious election by 2023 at the latest. A snowstorm that paralysed Athens two weeks ago acted as a reminder of the enduring limits of the state there. And what if the Mediterranean becomes, once again, the focus of a migration crisis?

For now, though, the southern bloc is enjoying its time in the sun. Its reforms provide backing for its views on the future of the union's economic governance. Arguing against the hasty return of strict deficit limits is easier if steady GDP growth makes debt seem manageable. (Not even Germany seems keen on a strict return to the old rules.) Pleading for more NGEU-type funding resonates more with Dutch voters if they feel their money has supported useful reforms in countries with which they share a currency.

Convergence between north and south takes some venom out of what remain poisonous debates around who makes the EU's rules and how they are enforced. Beyond being a good thing in itself, a fast-growing southern fringe lets both the austere and their opponents believe their pet economic policy is what created a richer Europe. While the argument drags on about why PIGS are flying, everyone can look up and enjoy the view. ■

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Florida

A peninsular podium

TALLAHASSEE

Under Ron DeSantis, America's third-most-populous state is lurching to the right

FLORIDA'S REPUBLICAN governor, Ron DeSantis, recently released his "Freedom First" annual budget. If that sounds like a campaign slogan, it's no accident. Mr DeSantis is running for re-election as governor in November and is believed to be plotting a run for the presidency in 2024. With the state government's legislative session in full swing (it ends in March), the goings-on at the Capitol in Tallahassee are worth watching for what they show about Mr DeSantis's ambition, as well as Florida's political direction. America's third-most-populous state is veering to the right.

In 2018 Donald Trump, a fellow Floridian who happened to be in the White House, transformed Mr DeSantis's career, helping the then unremarkable House member win the Republican gubernatorial primary by unexpectedly endorsing him. Mr DeSantis's defiant response to covid-19—fighting restrictions such as mask mandates and pushing for schools to reopen—elevated his stature nationally, as

have his frequent attacks on President Joe Biden and his "biomedical security state". He describes Florida as the "freest state in the United States". His record on covid-19 has won him both friends and foes: Florida's 64,000 deaths represent a higher rate per head than America's as a whole, but not as high as some predicted, given his aversion to restrictions common elsewhere.

Mr DeSantis is using Florida as a peninsular podium to advertise his policies. In his proposed \$100bn budget, he is pushing

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for a special police force to oversee state elections, which he calls an "election integrity unit", and wants to make it easier to penalise companies that "facilitate illegal migration" to Florida. He envisages bonuses for police officers who move to Florida, and wants to create a state militia of volunteers that could work with the National Guard in emergencies.

The federal government and Mr Biden may be Mr DeSantis's favourite foes, but they are also funding parts of his agenda. Mr DeSantis proposes pay rises for teachers and police, as well as \$1bn to offer Floridians a holiday from the state's petrol tax. Florida will use at least \$3.8bn in federal stimulus for programmes like these in the coming fiscal year, reckons the Florida Policy Institute, a think-tank.

The legislature is allied with the governor in taking aim at social issues. It is trying to block classroom discussions about subjects that make pupils feel "discomfort, guilt, anguish or any other form of psychological distress on account of his or her race", an allusion to critical-race theory, a topic that helped a Republican win election as governor in Virginia. Another proposal would ban discussions of sexuality and gender identity in public schools.

A bill banning abortions after 15 weeks of pregnancy is likely to become law before long. Lawmakers are designing it so that if the Supreme Court rules in favour of Mis-▶

Mississippi, which pioneered the 15-week cut-off with its own controversial law, Florida will “have a law on the books that can be enforceable”, says Chris Sprowls, speaker of the Florida House of Representatives.

What explains Florida’s lurch to the right? Recently the number of voters registered as Republican exceeded the number of registered Democrats for the first time in modern history. Now 35.9% of registered voters identify themselves as Republican. Democrats and independents are at 35.6% and 26.8% respectively. Republicans see momentum on their side. Mr Sprowls says people moving to Florida are “realising that there’s a reason that they chose to come here”; which is, Republican policies.

The DeSantis bandwagon also plays its part. “This is a company town, and the Republicans you meet here are very DeSantis-oriented,” explains Steve Schale, a Democratic operative. Many remark that they have never seen so little dissent within the Republican Party when it comes to the governor’s agenda. Mr DeSantis “has emerged as the most powerful governor in state history”, according to James Clark, the author of “Hidden History of Florida”.

With Republicans holding close to a supermajority in the state House, Democrats are powerless to stop them. Evan Jenne, the House minority co-leader, says Democrats have “a definite gallows sense of humour”. He likens their current experience in state government to having to “lay down on the train track, even though we know [the train] will drive right over us”.

This legislative session will test the extent of Mr DeSantis’s power. He has intervened in the legislature’s redistricting process, submitting his own proposed maps that would strengthen Republicans’ position in future elections—the first known time that a governor of Florida has gone so far. Opponents say the proposal could violate state law. Another test will be whether the legislature creates his proposed election police force, which has received a lukewarm reception and is more “transparently political than some other things he’s proposed”, says Aubrey Jewett, a professor at the University of Central Florida.

All this suggests that those who hope Mr DeSantis offers a more moderate brand of Republicanism than Mr Trump may be mistaken. Post-election pragmatism has given way to a penchant for grandstanding. The man rehearsing for a national role is a complex one: well-educated and wonkish, but lacking charisma. His wife Casey, who has been battling cancer, is impressive, quietly pushing his national campaign and advocating among donors for her husband’s “faith-based” policies.

For the moment the governor seems to be heading towards re-election. Florida is booming: businesses stayed mostly open despite covid-19, and people are moving to

the state. That makes it harder for a Democratic opponent to make a persuasive pitch. Charlie Crist, a former Republican governor, is now running as a Democrat, as is Nikki Fried, the state’s agriculture commissioner (though she muddied her prospects when she compared Mr DeSantis to Hitler for acting like a dictator).

The most compelling candidate is Annette Taddeo, the first Latina Democrat to be elected as a state senator, representing Miami-Dade County. She thinks Mr DeSantis’s biggest weakness “is that he is concerned about Iowa and New Hampshire voters, not Floridians”. In November, Sunshine State voters will be able to express at the polls whether their governor’s pitch for national attention irks them. One Floridian watching closely will be Mr Trump, who has been taking oblique potshots at his protégé-turned-potential-rival. ■

Preschool education

Wondering what’s best for the kids

A new study finds that preschool can be detrimental to children. Really?

FREE, UNIVERSAL preschool for three- and four-year-olds is a key component of the Democrats’ agenda. Proponents say pre-kindergarten, or pre-k, education can be transformative for children, particularly those from disadvantaged backgrounds. A new study seems to contradict this. It finds that children who attended a pre-k programme in Tennessee actually scored worse on a range of education and behavioural measures. Yet this might reflect general improvements in early education rather than the impact of one programme.

Studies from the 1960s and 70s suggested that pre-k might be a silver bullet for improving the outcomes of poor children. In one striking example, those enrolled in

the Perry Preschool Project, which targeted African-American children from low-income families, were by the age of five more than twice as likely to have an IQ above 90. As adults, they committed fewer crimes and earned more money. For every dollar spent, the programme generated nearly \$13 in economic returns.

More recent results are far more nuanced (see chart). A meta-analysis of 22 experiments conducted between 1960 and 2016 shows that children who were enrolled in preschool were less likely to need special-education services or repeat years and graduated from high school at higher rates. But the improvements were small. One study published in 2021 of programmes in Boston found that attending preschool did not affect test scores in adolescence but did boost high-school graduation and college attendance.

The new study complicates the picture further. Researchers at Vanderbilt University followed nearly 3,000 disadvantaged Tennessee children, some of whom were randomly assigned places in a free pre-k programme. Like previous studies they found that attending preschool made children better-prepared for kindergarten. But the benefits ended there. Between third and sixth grade, the children who attended preschool did worse on standardised tests, had lower school attendance, racked up more disciplinary infractions and needed more special-education services.

The effects were small, however. The biggest differences were in sixth grade, where scores in reading and maths were between 1% and 4% lower than for children who were not given spots in the programmes. In the context of previous studies, this difference is modest.

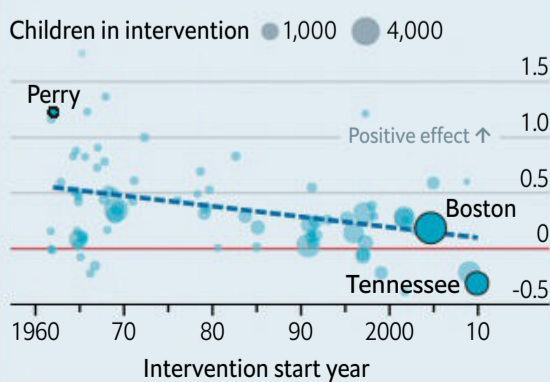
Measuring the impact of pre-k is difficult. Many of the effects don’t emerge until later in life. And the effect of individual programmes is becoming harder to isolate. In the Tennessee study 18% of children in the control group enrolled in Head Start, a programme offering early education, nutrition and health care to children from low-income families. A further 16% attended private day-care centres. Parenting has also changed a lot since the 1960s: parents are more hands-on, and home-educational resources have vastly improved.

The quality of pre-k instruction may have deteriorated, too. Programmes have expanded. Teacher-student ratios in Tennessee were double those in the Perry project. And America has the third-lowest spending on early-childhood education among 36 mostly rich OECD countries.

Even if pre-k programmes are only as good as the alternatives, they help in other ways. They allow parents to return to work. A number of papers have found that the economic benefits of child-care or pre-k programmes vastly outweigh the costs. ■

Falling, if not failing

United States, effect of preschool programmes
Standard-deviation units



Sources: “Investing in preschool programmes”, by G. J. Duncan and K. Magnuson, 2013; *The Economist*

Abortion by mail

Easier does it

WASHINGTON, DC

A safe, simple way to end pregnancies is becoming more readily available

MEDICATION THAT allows women to end pregnancies at home up to ten weeks after conception has transformed abortion health care in many countries. Data are patchy but more than two-thirds of abortions in northern European countries and 90% in India are thought to happen this way. America, however, has lagged. Restrictions imposed by the Food and Drug Administration (FDA) since the drugs were approved for this purpose in 2000 mean that only around 40% of abortions in America are chemically induced.

That is beginning to change. In December the FDA lifted its most onerous requirement, that women collect the first of the two drugs used to end pregnancies from a clinic or medical office in person. This made permanent a relaxation the FDA introduced during the pandemic. Now women can be prescribed mifepristone, which blocks the pregnancy-enabling hormone progesterone, after an online consultation, and receive it in the post. A second drug, misoprostol, which causes the uterus to contract and expel the fetus, taken several hours later, has several uses and is available over the counter in pharmacies.

The advantages of medication abortion are many. Research suggests it is largely safe. In conservative states with few abortion clinics (six states have only one left), removing the need for women to travel, often long distances, to in-clinic appointments is particularly beneficial. Being prescribed abortion medication in this way is also cheaper than going to a clinic, a big advantage in a country where federal money cannot be used to pay for abortions. In a clinic the cost of a drug-induced abortion is between \$500 and \$800. Buying the pills from one of a growing number of telemedicine startups costs around \$200.

Medication abortion may also have the potential to dampen the flames of America's abortion war. Increasing its use is likely to reduce the number of abortions performed later (surgically) in pregnancy, the sort that give antiabortionists their most grisly and potent campaign imagery.

The successes of America's anti-abortion movement will limit the impact of the FDA's action, however. Some 19 states have laws requiring a doctor to be present when mifepristone is taken. In December Texas introduced harsh jail sentences and a \$10,000 fine for anyone who prescribed abortion medication by telemedicine. In

all, 15 states introduced bills restricting medication abortion last year; nine of these were enacted. Women in many parts of the country will still have to travel across state lines if they want an abortion.

But removing the in-person requirement will make things easier for them. Lauren Dubey, a nurse and co-founder of Choix, a sexual and reproductive telehealth startup that offers asynchronous care (dispensing with the need for a live consultation), says that a woman can order the pills to an address in a state where this is legal and travel when she is able, without having to keep to an appointment. She adds that allowing women to order the pills by mail will free capacity in bricks-and-mortar clinics for those who need in-person care—women whose pregnancies have passed the ten-week point, say, or who want to keep their abortion secret

from their partner or parents.

If the Supreme Court overturns *Roe v Wade* this year, as many expect it to when it rules on a case involving Mississippi's ban on most abortions after 15 weeks of pregnancy, the benefits of abortion-by-mail will become even more obvious. Nearly half of America's states would ban most abortions if *Roe* was ditched.

Abortion-rights activists are working to raise awareness that abortion medication is a safe option. Some stress that it is available even when it is not legal: Aid Access, a charity based in Europe, prescribes and sends the drugs to women in any state. It has seen a surge in demand from Texas since most abortions were banned there. Women can also buy the pills direct from overseas pharmacies. If *Roe* is overturned, more women are likely to get abortion drugs this way, whatever the FDA says. ■

Drought victim

The loneliness of the desert tortoise

JOSHUA TREE NATIONAL PARK

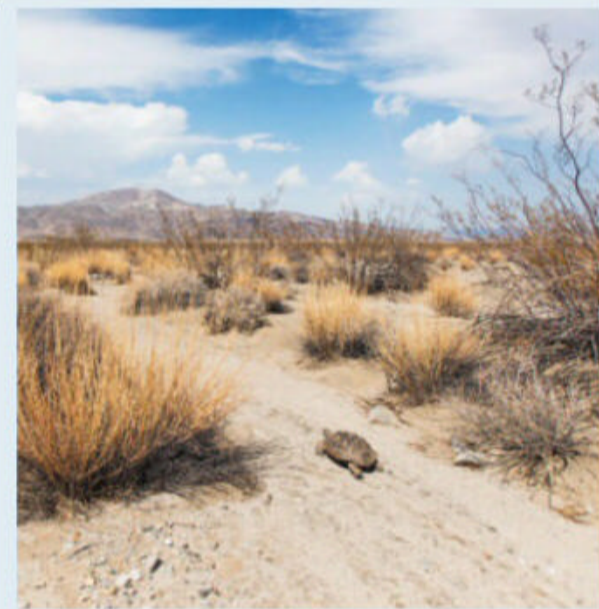
A once-abundant species struggles to survive

THE SOUTHERN CALIFORNIA desert is not for the faint of heart. The temperature rises above 100°F (38°C) in the summer. There are months of suffocating dryness, and flash flooding during monsoon season. Yet the desert in Joshua Tree National Park is filled with life.

The desert tortoise is one of Joshua Tree's many species. Despite its name, it is not faring well in the desert. Since the 1980s the population has declined by about 90%. Michael Vamstad, a wildlife ecologist at the park, describes what is happening as "thirty to three": where once researchers would count 30 or more tortoises per square kilometre, now they count three.

This has dire implications. "There's a minimum population density that is required for the tortoises, and three tortoises per square kilometre is right below that limit," says Mr Vamstad. Below this threshold, tortoises struggle to find a mate. It becomes nearly impossible for mature adults to reproduce with enough frequency to sustain the already dramatically reduced numbers.

Two things have conspired against the tortoises. First, the West's megadrought has made conditions difficult. The summer monsoon season should bring heavy rains that sustain the plants and wildlife through dry times. Desert tortoises can store a quart of water for about a year and will spend roughly 95% of their time below ground, making them excellent at conserving water. Mature tortoises can withstand drought condi-



Oh for tortoise Tinder

tions but it is harder for hatchlings.

And even for adults, drought reduces resilience. An infection has made its way into the tortoise population, giving some of them a runny nose. That may seem innocuous enough, but the water lost and the increased difficulty of finding water to replace it is proving a fatal combination for some tortoises, including breeding females.

"We feel that we are at the very edge right now," says Mr Vamstad, though he remains optimistic: "They seem to be holding the line." Ecologists are beginning to look at captive breeding programmes if the tortoises are not able to bring their numbers up on their own. For now, the tortoises are still burrowing their way through the desert.

Crypto and the far right

White power and dark money

Why white supremacists have taken to cryptocurrencies

ON AUGUST 11TH 2017 far-right groups from all over America came to Charlottesville, Virginia, to protest against the removal of a Confederate statue. The next day a white supremacist drove his car into a crowd of counter-protesters, killing one of them. In the aftermath PayPal, an online-payment platform whose terms of service forbid raising money to promote hate, suspended extremists' accounts. So did Apple Pay and Google Wallet. Visa and Discover, two credit-card firms, followed suit, as did Patreon, a crowdfunding site. Far-right groups found themselves in search of other places to raise money. What many of them embraced was cryptocurrency.

The Southern Poverty Law Centre (SPLC), an advocacy group, has identified over 600 cryptocurrency addresses used by members of the far right. They include ones associated with Andrew Anglin, publisher of a neo-Nazi website, the Daily Stormer; Andrew Auernheimer, a white-supremacist hacker; and Don Black, founder of a white-power online forum. They advertise their wallets on their websites and social media, asking for donations. And they get them. Stefan Molyneux, a far-right podcaster who was ousted from YouTube, has received over \$1.67m in bitcoin. Mr Anglin has reportedly received over 100 bitcoins (\$3.8m).

About 16% of Americans hold or trade crypto. But the authors of an SPLC report published in December struggled to find a prominent American far-right figure without a cryptocurrency presence. Tim Squirrell of the Institute for Strategic Dialogue, a think-tank concerned with extremism, believes much of this has to do with deplatforming efforts.

That cryptocurrencies can be used by all appeals to those cast out by payments platforms. But bitcoin was not a panacea for far-right groups. Because any transaction on the bitcoin blockchain is public and transparent, researchers were for a long time able to monitor individuals' dealings once an anonymous wallet had been identified as belonging to a radical-right group. Neonazi BTC Tracker, a Twitter account created by John Bambenek, a cyberthreat expert, chronicled transactions in real time for three years. Technological advances in crypto have since made privacy tokens like Monero, which hide transactions, possible. These groups have probably flocked to them.

The wider crypto scene is often imbued with an anti-establishment spirit. Its fans proclaim that decentralised blockchains will revolutionise finance. This idea appeals to libertarians or those who distrust the traditional banking system. But it also appeals to anti-Semites. Those who believe banks hold too much power because they fear Jewish control over business will be seduced by the idea of an independent or decentralised financial system. Cryptocurrency can therefore be both a useful funding tool and seen as a revolutionary technology which distances people and their money from "elites and banksters".

This idea extends into other industries, such as tech, that have tried to quash white supremacists from using their platforms. "One of the dreams of the far right is not just a blockchain cryptocurrency, but a decentralised future where they don't have to

rely on mainstream structures," says Mr Squirrell. "They want blockchain blogging websites, blockchain streaming websites" to escape deplatforming.

Others' angst is grist to their mill. "Breathless, pearl-clutching 'exposés' about powerless political dissidents using cryptocurrencies are transparent smear campaigns by hirelings of the political and economic establishment that fears the erosion of its power," says Greg Johnson, author of "The White Nationalist Manifesto".

As long as bitcoin and its ilk are decentralised, the ability of far-right groups to use them will remain. (Intermediaries, exchanges such as Coinbase and Binance, are another matter.) But crypto still has plenty of disadvantages that may stymie extremist adopters. In May 2021 Monero reached \$480; it now stands at \$150. Bitcoin has shed 40% of its value since November. ■

The 2020 census

America is stagnating

As far as the country's demography is concerned, that is

IT IS THE cars' fault, apparently. Because the rear seats of American automobiles are inadequately enormous, only two child seats will fit in the back. Parents wanting three children must therefore buy a minivan, which many do not wish to do. Hence, smaller families. According to "Car Seats as Contraception" (we're not making this up), a research paper by Jordan Nickerson of the Massachusetts Institute of Technology and David Solomon of Boston College, child-

safety seats have resulted in about 130,000 fewer births since 2000.

That is only a small share of the decline in the number of births, which was over 142,000 in 2019-20 alone. But tiny social and legal constraints do make a difference. According to the Census Bureau, America's population grew by just 0.12% in the year to July 2021, the smallest annual rise since the bureau began collecting such data in 1900. America's white population is falling. So is ▶▶



Where have all the babies gone?

▶ the number of those under 18. Politicians and commentators fret about a “baby bust”.

Demographers elsewhere might wonder what the fuss is about. America’s population is still rising, unlike that in Russia and Japan. Even at the modest growth rates of 2010-20 (when the US population expanded by 7%), the number of Americans could increase over the next 40 years to over 410m, from 332m in 2021.

But among rich countries, the United States has long been an outlier, with relatively high and rising fertility, robust immigration and an expanding labour force. Trends that Europeans view without anxiety can seem alarming to Americans accustomed to demographic dynamism. Nicholas Eberstadt, at the American Enterprise Institute, a think-tank, fears the possibility of “indefinite population decline barring only offsetting immigration”. Monica Duffy Toft of Tufts University even asked if America might collapse under the weight of its demographic stagnation, as the Soviet Union did (she concluded it wouldn’t).

Against that background, it makes sense to consider what the data from the ten-year census of 2020 actually say about the severity of the population downturn. A county’s population increase or decline is determined by two trends: natural increase (births minus deaths) and net migration (arrivals from abroad minus those returning home). Both are falling.

The covid-19 pandemic pushed America’s death rate up and birth rate down. Deaths soared from 2.8m in 2018 to 3.4m in pandemic-stricken 2020. Research by the Federal Reserve Bank of St Louis argues that the pandemic affected fertility among women aged 30-34 (prime child-bearing age) the most. As a result there were only 150,000 more births than deaths in 2021, one of the country’s lowest rates ever.

This may be, Mr Eberstadt suggests, a blip. Death rates and perhaps birth rates will return to normal when the pandemic eases. But what is normal? The decline in America’s natural increase long predates covid. It has fallen steeply since 2007, when births outstripped deaths by 1.9m people. The total fertility rate—how many children women will bear in their lives—was 2.1 in 2007, the “replacement rate” which keeps the population stable. Now it is 1.64. This change reflects the ageing of the population (there are fewer women of child-bearing years) and young adults’ decisions to postpone having children as a result of the Great Recession of 2007-09 (economic uncertainty is often associated with a fall in the birth rate).

For a while, this did not matter much because of immigration. By adding around 1m people each year to America’s population in 2000-15, net migration cushioned the impact of a smaller natural increase. In 2016, however, migration fell off a cliff (see

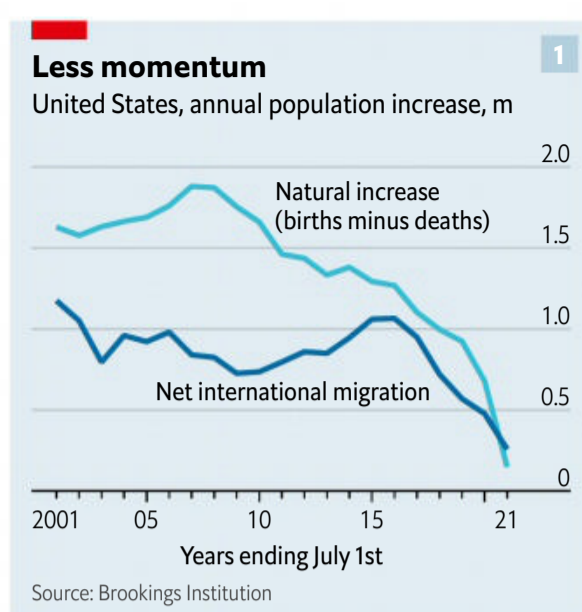


chart 1). In the 2010s, the foreign-born population saw its smallest increase in 40 years and net migration is now little more than 250,000 a year. Initially, the squeeze was imposed by President Donald Trump’s anti-immigration policies. Recently the pandemic has sent workers scurrying home. This element of America’s demographic stagnation was partly the result of policy choice.

All this makes America more European than it was. But it is worth remembering that “Europe” covers a multitude of sins. There are two European demographics, the eastern one (Russia, the Balkans), with falling populations and what demographers call “low, low fertility”, and the western (France, Britain, Scandinavia), where populations are still growing slowly and fertility is higher. America is not identical to the second group and remains nothing like the first. Despite a decline, America’s fertility is not low by rich-country standards: in 2015-20 it was just below that of France, which has relatively robust demography, and higher than Germany’s and Britain’s.

America’s urban population continues to expand. Of the 50 largest cities, 32 saw faster population growth during the 2010s than in the 2000s. New York City, for example, grew by 8% in the 2010s to 8.8m, nearly four times the rate in the 2000s (covid has since taken some of the gloss off that achievement). Despite the return home of many Latino immigrants, the United States has not lost its capacity to attract the best and brightest, at least from Asia. Asian immigrants now outstrip those from Latin America by more than two to one, and 87% of new immigrants have college degrees. If—a big if—the country could liberalise its immigration policies again and expand access to child care, it could go some way to slowing down its demographic decline.

Perhaps most important, ethnic minorities show little of the stagnation affecting whites (see chart 2). The number of Hispanic and Asian Americans grew by 23% and 36% respectively during the 2010s whereas that of whites contracted by 2.6%.

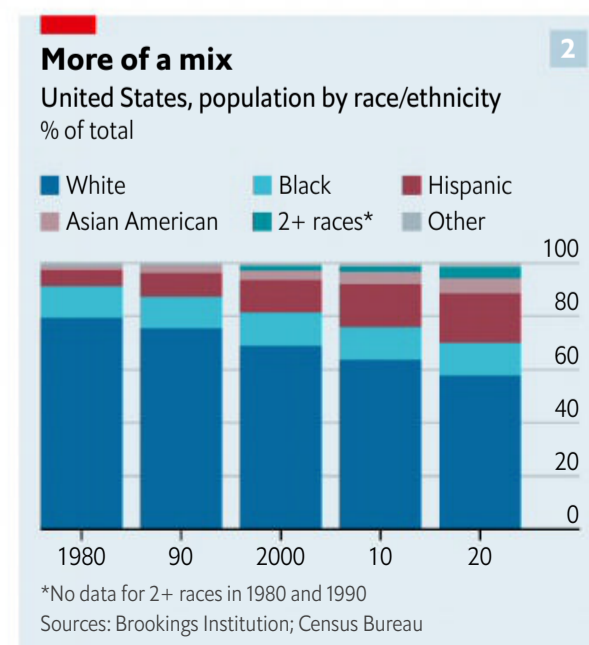
The under-18s became majority non-white in 2020 and the 18-29 age group will follow suit within five years. The number of people describing themselves on the census form as “two or more” races soared from 9m in 2010 to 34m in 2020, though this reflects decisions to switch racial identification as well as the birth of more multiracial Americans. As William Frey, at the Brookings Institution, points out, without ethnic minorities, in its demography America would resemble Japan or eastern Europe.

As it is, it looks more like western Europe: older, with more births postponed. According to the census, the population of those aged 55 or more rose by 27% in 2010-20. That of the under-55s rose by just 1.3%. Women are having children later. Americans’ average age of first birth in 2019 was 27, the highest ever. In 1990, women aged 15 to 19 had about 60 births per 1,000; in 2019, that had fallen to just 17. In contrast, birth rates for women aged 40 to 44 have increased by a third since 2007.

Farewell, exceptionalism

Lastly, some of the distinctiveness of Americans’ attitudes that accompanied (or perhaps caused) their unusual demography is disappearing. These included greater religiosity than in Europe, more optimism and a willingness to move from place to place. Recent global polls by the Pew Research Centre on what makes life worth living and attitudes to political rights suggested there is little difference between Americans and Europeans, though older Americans are more likely to say faith is important to them.

In 2019, less than 10% of Americans moved house, the smallest share of the population to do so since 1947 and a far cry from the heady days of the post-war mobility boom when twice as many Americans upped sticks and moved annually. Ageing and double-income households have made Americans less footloose, more reluctant to pile into their (child-safe) automobiles and head to new life. ■



Lexington | America is uniting against Vladimir Putin

Republicans are playing a more constructive role in the Ukraine crisis than Donald Trump must like



WHEN WALTER CRONKITE turned sadly against the war in Vietnam, legend has it, Lyndon Johnson knew he'd lost Middle America. By contrast, there is nothing reluctant about the denunciations of America's much more modest military posture towards Ukraine by today's most popular news anchor. For weeks Tucker Carlson of Trump-loving Fox News has been pushing an "America First" cocktail of disdainful isolationism, paranoid anti-elitism and Vladimir Putin fandom.

Ukraine is "strategically irrelevant" to America, he insists. "Senile" Joe Biden is running a neoconservative "war machine". The machine is being fuelled by defence contractors who stand to profit from a war, suggests Mr Carlson. Mr Putin, perfectly understandably, "just wants to keep his Western borders secure". And any elected Republican who backs Mr Biden's effort to deter him should be "ruthlessly" primaried. Mr Carlson's views have gone down a storm with Russian state media.

Mr Carlson is so influential on the Trumpian right that he has himself been touted as a future president. Inevitably, therefore, some of his 3m viewers have told their congressional representatives that they should be backing Russia, not Ukraine. Yet, in another contrast with Cronkite, who had almost ten times as many viewers, Mr Carlson's is now a marginal voice on national security. Most Americans view the Russian troop build-up as a threat to American interests and want to support Ukraine by all means short of troop deployments—and there is little distance between Republicans and Democrats on this issue. A year after Mr Trump left office, Republicans' view of the bear has normalised.

This has encouraged many Republicans in Congress to revert to their pre-Trump Russia positions. Those in the House have predictably found it hardest. A faction of Trumpian diehards, such as Paul Gosar of Arizona, agree with Mr Carlson; and some of their colleagues—including the party's leader in the House, Kevin McCarthy—are afraid to disagree with him openly. Yet many of the same Republican House members who in 2019 shrugged off Mr Trump's underhand effort to lean on Volodymyr Zelensky are now among the Ukrainian leader's fiercest defenders. Liz Cheney, who called the scandal Mr Trump's coercion of Mr Zelensky elicited "a political set-up", is one of them.

Republicans in both houses are blaming Mr Biden excessively for the crisis. "Biden is weak and Putin preys on weakness," says one senator. But their sniping has not prevented the Senate drafting a bipartisan list of sanctions on Mr Putin's regime, which could soon be passed. Including lend-lease arrangements for Ukraine and curbs on the Nord Stream 2 gas pipeline, it represents an effort to defuse earlier partisan disagreements on the conflict. The idea, according to Jeanne Shaheen of New Hampshire, was "both to support Ukraine and to show Vladimir Putin that he's not going to divide Democrats and Republicans on this issue."

On national-security policy, in other words, Mr Trump has changed his party much less than many feared. It was the realm where Republican senators felt able to resist him even during his presidency. Thus, for example, their near-unanimous support for a bill forbidding him from lifting sanctions on Russia in 2017—a rare act of Republican defiance against Mr Trump. Its architects were emboldened by the relative independence of the Senate's foreign-policy committees, a last vestige of bipartisanship. They could also count on Mr Trump's voters being relatively unfussed about foreign policy. Meanwhile, the fact that Mr Trump's foreign-policy chiefs were often able to moderate or obstruct his isolationist diktats encouraged many Republicans simply to ignore them.

Post-Trump dynamics in both parties have further steeled America's response to the Russian threat. To distinguish itself from Mr Trump, the Biden administration took early pains to signal its support for Ukrainian sovereignty. In an effort to define Mr Biden as weak, Republicans nonetheless demanded it do more. The result, says Fiona Hill, a Kremlinologist and bruised former witness to Mr Trump's misuse of Mr Zelensky, has been a far more unified political response than Mr Putin—or she herself—could have expected. "My experience during the impeachment trial made me feel we were incapable of collective action on national security," she says. "But we are pulling together."

Three qualifiers must be admitted. First, that conclusion may be premature. The combination of sanctions and security pledges that most Democrats and Republican have agreed upon is politically easy. They might disagree wildly on whatever additional measures could be necessary if the situation escalates. Most Republicans will certainly blame Mr Biden if it does.

Second, even if Trump-style isolationism has little influence in Congress, it matters in Republican primaries. Candidates in the most fraught current contests—including Senate races in Arizona and Ohio—are parroting Mr Carlson. That is a promise of a more populist Republican Senate conference, especially if Mr Trump maintains his hold on the party, which is the third big caveat.

Putin things in perspective

The former president has said little about the Ukraine crisis, beyond claiming that it "wouldn't have happened" on his watch. But it will not make him less anti-NATO or pro-Putin. His former national security adviser John Bolton predicted that Mr Trump would withdraw America from the alliance if he won re-election. And the more Mr Biden stands by NATO and confronts Mr Putin, the likelier that would seem. One of the organising principles of Mr Trump's time as president was his efforts to dismantle Barack Obama's legacy. In a second term he would try even harder to undo anything associated with Mr Biden. And the Republican establishment, even if willing to oppose him at the margins on security issues, would not stop him. ■



Haiti

Aiding and abetting

Foreign aid has done little to help the impoverished Caribbean country

FOR MANY Haitians it felt wearily familiar. On January 24th a large earthquake hit the south-west part of the country, the second in the area in less than six months. The victims would of course need help, and the dysfunctional government of the western hemisphere's poorest country was unlikely to provide much. But the prospect of yet more foreign aid workers descending on the place once dubbed the "Republic of NGOs" did not inspire much enthusiasm either. They are "like vultures", complains Monique Clesca, a journalist and activist: they live off disasters, but do little to improve things. It is a common view.

Haiti's situation is dire. Since Jovenel Moïse, the president, was assassinated in July last year gangs have taken over more of the country. Even the well-off are struggling. Rose-May Guignard, a former civil servant who lives in a once-prosperous neighbourhood to the south of Port-au-Prince, the capital, said she only leaves her home for short trips to get food and see her

family. Travelling on the highway would put her at risk of kidnapping.

This lawlessness is compounding Haiti's poverty. Even before the pandemic, three-fifths of its 11m residents lived on less than \$2 per day. It is placed 170th out of 189 countries on the most recent Human Development Index, a UN ranking of the quality of life derived from data on life expectancy, education, health and the like.

What makes this misery all the more depressing is that Haiti has been receiving vast quantities of foreign aid for decades. Since 2000 rich countries have handed over \$17bn: worth almost 8% of gross national income between 2000 and 2019, and roughly equal to government spending over that period. After an earthquake in 2010

which killed perhaps 200,000, aid surged.

This bonanza, however, has done little good. Haiti's economy has grown more slowly over the past ten years than those of many other poor countries that receive much less aid per person (see chart on next page). Relative to the citizens of countries that benefit from similar largesse, Haitians have lower life expectancy and are less likely to finish primary school. Other places that have suffered catastrophes, such as Rwanda and Cambodia, have grown much more quickly in the aftermath.

The received wisdom is that corruption has sapped the effectiveness of aid to Haiti. Indeed, Western donors have been wary of the Haitian government since the 1950s, when a kleptocratic dictator, François Duvalier, took power. He was succeeded by his son, Jean-Claude Duvalier, who is thought to have stolen as much as \$800m in aid money during his 15-year rule, according to a report in 2004 by Transparency International, a watchdog.

Haiti's fitful transition to democracy in the 1990s does not appear to have fixed the problem. Two recent presidents, Moïse and Michel Martelly, a former pop singer elected after the earthquake in 2010, have been accused of diverting aid from Petro-Caribe, a scheme whereby Venezuela provides oil on easy terms to Caribbean countries. (Both denied the accusation.) Haiti ranks 164th out of 180 countries in Transpa- ▶▶

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41 Bello: Squabbling Peronists

► rency International's corruption index, a measure of perceived public-sector graft.

In addition to corruption, Haiti also suffers from frequent political upheaval. Since Moïse's assassination, a long-standing constitutional crisis has merely intensified. Two men claimed to be in charge after the killing. After weeks of confusion, Ariel Henry, who had been nominated as prime minister by Moïse but had not yet taken office at the time of the assassination, became acting president. He is unpopular, and survived an apparent assassination attempt in January. He says he will not step down on February 7th, the date that would have marked the end of Moïse's presidential term. On January 31st Mr Henry rejected a resolution of the body set up last year to elect a provisional president and prime minister. Elections originally scheduled for last year have not been held.

The corruption and turmoil have caused donors to steer aid away from the government. In the decade after the earthquake in 2010 they promised more than \$13bn to Haiti, but hardly any of that went to the authorities. In the two years after the earthquake, it was less than 1%. The United States Agency for International Development (USAID) has funnelled 97% of its aid since 2010 through non-Haitian agencies or charities. Most of that went to a handful of organisations based in Washington, DC.

One problem when donors dodge the government is that the organisations they turn to instead often fail to take local advice. In 2008 an NGO funded by USAID spent \$22m in Haiti on early education and teacher training. At the launch of the programme, the minister of education asked USAID to align its support with the government's education plan in the future. After the 2010 earthquake, a commission to direct aid money paid for less than a fifth of rubble-removal projects that the government asked for, but four times the number of infrastructure projects. (The commission, co-chaired by Bill Clinton, then UN

special envoy to Haiti, and the Haitian prime minister, was intended to include Haitians in decisions. But Haitian members of the committee said their opinions were largely ignored.)

Left to their own devices, aid agencies tend to focus on vanity projects. Ms Guignard, who worked in the land-management ministry, says that in 2015 she agreed with a French NGO that an isolated neighbourhood needed a better road. The NGO spent money on cultural projects instead.

Similarly, in 2011 USAID pledged \$124m towards a project to build an industrial park in northern Haiti. Foreign economists thought that, before the earthquake, Haiti could develop by exporting cheap clothes. But according to Jonathan Katz, an American journalist, the park never reached full capacity. It created a fraction of the expected 65,000 jobs, and booted hundreds of farmers off their land. An expansion of a nearby port never happened—although USAID spent \$72m on the project even after an appraisal suggested it was not viable.

Foreign donors can also be inefficient. After the earthquake in 2010 the American army spent at least \$368,000 earmarked for aid on posh hotels in the United States and the Dominican Republic. The American Red Cross raised \$488m to help victims. But an investigation by ProPublica, a website, found that 40% went on overheads.

According to Lant Pritchett at Oxford University, aid organisations often define success as creating tangible assets (building schools) as opposed to practical benefits (higher literacy). They can create the impression of helping without actually achieving much. In fact, foreign aid can sometimes make things worse. Donors tend to poach the best civil servants. Ms Guignard, for one, left the government for a job at an NGO. They diminish the state's standing by providing basic services. And when aid disappoints, locals assume sticky-fingered bureaucrats are to blame.

Direct aid to governments can work. A study by the OECD, a club mostly of rich countries, found that seven African governments that were given money directly between 2010 and 2014 became better at delivering services, and did so more cheaply. Graft did not increase; in some cases ministries became more transparent.

A way to diminish worries about graft is to find parts of government that are working and channel aid to them, says Mr Pritchett. In Haiti the agency in charge of responding to disasters fits the bill. Since 2017 it has been run by a respected doctor, Jerry Chandler. At the moment, however, Mr Chandler's budget does not cover the salaries of his employees. Outsiders want to donate flashy items such as emergency vehicles instead of funding routine expenses, he complains. "We can't just take a photo op," he says, "and be done." ■



Canada

A populist turn

The Conservative Party is becoming less moderate

IT HAS BEEN a bad week for moderate conservatives in Canada. On January 28th a "Freedom Convoy" of tens of thousands of protesters in pick-up trucks, eighteen-wheelers and SUVs shut down much of downtown Ottawa, where they stayed for several days. The spark for the protest was the introduction of a law which requires lorry-drivers who enter the country, including Canadian ones, either to be fully vaccinated or to stick to quarantine rules.

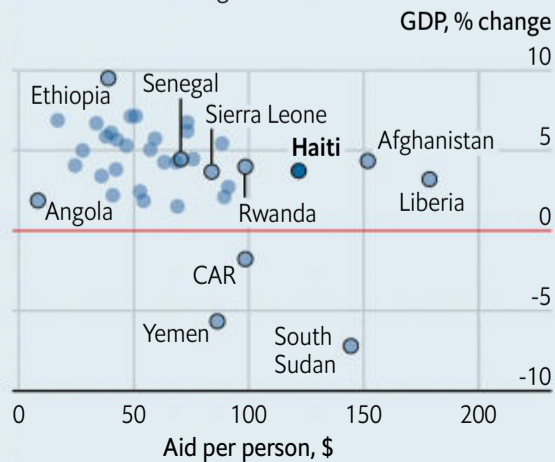
Although the protesters called for the resignation of Justin Trudeau, the Liberal prime minister, it was the main opposition leader who got the boot. On February 2nd 73 of the 118 Conservative members of parliament voted to sack Erin O'Toole, the party's relatively centrist leader. Mr O'Toole has only been in the job for 17 months. Candice Bergen, his deputy, was voted in as interim leader.

It was not just the Conservative leadership that changed; so did the protests. Initially they involved a rowdy display of honking horns, booze and loud music. "It looked like a massive street party," remarked Matt Luloff, a city councillor. But as the demonstrations grew, they also became more extreme. Participants wielded signs with swastikas and Confederate flags. On January 30th Ottawa's police force announced that it would investigate various illegal activities, including the desecration of public monuments.

Both events are striking. The surprising part of the protests, aside from the fact that they became so unpleasant, is that for ►►

Big bucks, small results

Least developed countries*
2010-19 annual average†



Sources: IMF;
World Bank

*Excluding countries with population <2m
†2011-19 for Somalia and South Sudan

▶ most Canadians, Mr Trudeau's vaccine mandate is not controversial. One poll found that over two-thirds of those asked felt there should be a screening process for lorry-drivers crossing the border.

Indeed the country boasts high inoculation rates, with 85% of eligible adults having had one dose and 79% both doses. In the United States, in contrast, only 75% have had one dose and 63% two or more. Another poll found that Canadians were more likely than Americans to support covid-related restrictions, too.

But a minority of Canadians are tired of

public-health measures. The recent protests shows they are becoming more vocal and better organised. As the lorry-drivers made their way across the country they whipped up donations, and now boast over C\$10m (\$8m) in funds. Many of those anti-lockdown types are tempted by the People's Party, a far-right alternative that challenged the Conservatives during the most recent general election in September.

Mr O'Toole's sacking suggests that his party is shifting to the right to fight back. During the election, Mr O'Toole attempted to woo moderate voters. The Conservatives

ran on a platform broadly similar to the Liberals on issues such as climate change, child care and indigenous rights. He also flip-flopped on gun control, having initially espoused a pro-gun stance.

Similarly, Mr O'Toole tried to navigate the events of recent weeks by not taking sides. He met protesters, ostensibly celebrating the right to demonstrate. He also denounced a "handful of unacceptable incidents". Other right-wing politicians have more actively supported the protesters. They appear to see votes in a more forthright stance. ■

Bello Adrift in treacherous currents



Argentina's Peronists squabble over a desperately needed agreement with the IMF

THE DELTA OF the river Paraná, through which much of Argentina's exports pass, is an aquatic labyrinth of cross-currents and channels that merge and then separate again. So it is with Peronism, the broad nationalist-populist movement that has governed the country for 25 of the 38 years since democracy was restored in 1983. Power, or its prospect, unites it. But in adversity its constituent currents often take different courses, as a row this week over a proposed agreement with the IMF shows.

The government of President Alberto Fernández took two years to edge towards this deal, which would roll over \$44.5bn borrowed from the fund by his centre-right predecessor, Mauricio Macri. The reluctance is partly ideological: Cristina Fernández de Kirchner, the vice-president and leader of Peronism's leftist-populist wing, has made a political career out of blaming her country's mainly self-inflicted problems on the IMF and "neoliberalism". It is also economic: in return for its money the fund wants Argentina to print less money, run smaller deficits and scrap its dual exchange rate. That involves short-term belt-tightening for medium-term gain in a country whose economy is not fully recovered from the pandemic and where four in ten live in poverty.

The outline agreement announced on January 28th is less exacting than the fund normally requires. Mr Fernández boasted that it doesn't oblige Argentina to carry out pension or labour reforms and will allow an increase in public investment. It is an agreement "without austerity policies", claimed Martín Guzmán, the economy minister. The IMF's board still has to approve the detail. But the plan was swiftly rejected by the Kirchneristas. On January 31st Máximo

Kirchner, the vice-president's son, resigned as the leader of the Peronist caucus in the lower house of Congress. He said he "didn't share the strategy used and still less the results obtained" from the fund.

Mr Kirchner is right that the agreement is tougher than the government suggests. It requires a cut in the fiscal deficit to 2.5% of GDP this year, from 3% last, and then to 1.9% in 2023. The problem for Mr Fernández is that last year's number was flattered by one-off items, including a now-lapsed wealth tax and a temporary spike in the prices of Argentina's farm commodities and thus in export taxes. Without changes, this year's deficit would be perhaps 4.5% of GDP. So the government must trim around two points of GDP from its spending, probably by reducing subsidies for electricity and gas and letting inflation (at 51%) erode the value of pensions.

The deal also requires the Central Bank's money-printing (to cover the deficit) to fall from 3.7% of GDP last year to just 1% this year, and for its international reserves to rise by \$5bn. The government hopes the deal will allow it to scrape up

some more international money.

The IMF knows that Mr Fernández's government is weak and faces an election next year. The fund has accepted that it made mistakes with Mr Macri's loan. IMF staff have long argued that a sub-standard deal is better than a default. "I think the IMF sees this as a bridge to a new government that has the ability to do the reforms that Argentina needs to put its accounts in order and for growth," says Eduardo Levy Yeyati, an economist. For Argentina, too, a low-level deal is preferable to none. Default would pile pressure on the peso and mean more inflation and less growth. But any formal agreement has to be approved by Congress under a law adopted last year. The Kirchneristas seem set on voting against. The government must either depend on the opposition or sidestep the vote with an emergency decree.

The underlying problem is that the Peronist penchant for protectionism and inflation-financed subsidies has left Argentina with low growth and a chronic shortage of foreign exchange. Mr Fernández's team talks of growth, but blocks it with punitive regulation and taxation. "This is a government that is a machine for destroying any business opportunities," says Federico Sturzenegger, a former Central Bank chief. Argentina has plenty of entrepreneurs but many take their businesses elsewhere.

Even if Mr Fernández gets his deal, the country will merely idle. Kirchnerism has only rhetoric to offer Argentines. The next election looks to be the opposition's to lose. But steering the economy into a high-speed channel requires the nation to face some hard truths. Drought last year left the Paraná dangerously shallow. Peronism seems to be in the same state.





Egypt's economy (1)

Rise and shine

CAIRO

Abdel-Fattah al-Sisi wants a more vibrant private sector. Some big obstacles stand in his way

TACT IS NOT Abdel-Fattah al-Sisi's strong suit. Egypt's authoritarian president, who overthrew an elected government in 2013, lectures his citizens for being fat and spoiled and chides foreign leaders who mention his dismal human-rights record. In recent weeks he has aimed criticism at his own government. Inaugurating a new chemical plant on December 28th, the president observed that the state was not great at running the economy. "We need the private sector," he said. "We have been proven incompetent in management."

Executives in Egypt were surprised by his comments, but not his conclusion. They have complained for years about unfair competition from state-owned firms, which enjoy tax breaks and other perks. The ever-expanding economic empire of the armed forces crowds out private firms.

The IMF warned in 2017 that this could hinder growth, and indeed it has. Annual growth was more than 4% from 2015 to 2019, and stayed above 3% during the pandemic. But most of it comes from a booming gas sector and lavish public spending. The purchasing-managers index, a gauge of business activity, showed private output

contracting in all but nine of the past 60 months. Foreign direct investment fell from 3.4% of GDP in the 2016-17 fiscal year to 1.3% in 2020-21.

In several recent speeches Mr Sisi has acknowledged the problem. Adam Smith he is not: he describes the private sector as a partner for the state. Still, some business-people are encouraged by the change in tone. With the IMF's urging, Egypt has taken steps to improve the business climate. Yet even if Mr Sisi is serious about reining in the state—and it is too early to tell—private growth may not come quickly.

The case for optimism starts with Egypt's much-maligned bureaucracy. In 2017 parliament passed an investment law that offered a range of incentives, one of Egypt's obligations under a \$12bn deal with

the IMF signed a year before. Then in 2018 it approved a bankruptcy law that, in effect, decriminalised default.

Ministries have started to digitise services, including land registration. Last year Egypt started rolling out a digital customs system, replacing the old mess of papers and stamps. That should make it easier for firms to clear goods through ports, and for the state to collect revenue.

When Mr Sisi took office, regular black-outs were a nuisance for citizens and a disaster for industry. Today Egypt has more power than it can use. Big gasfields in the Mediterranean provide ample fuel for three new gas-fired plants that produce a combined 14.4 gigawatts. Investments in solar energy are growing fast, too. Ministers hope to start exporting the surplus.

The government has spent billions on new roads and bridges that have helped Egypt's notorious traffic. A new industrial zone along the Suez Canal has drawn investments from China, Russia, the United Arab Emirates and elsewhere. Broadband speeds, still sluggish by global standards, have increased sixfold since 2018.

All of this has laid the groundwork for growth. Yet there are reasons to be sceptical. First is whether Mr Sisi, a former general, means what he says. Some of his men talk of privatising army-owned firms. But the army's role is opaque; no one knows the full scale of its holdings. In 2016 Sherif Ismail, then the prime minister, said the army would reduce its economic activity within a few years. Instead, it expanded.

Then there is the state-security agency, ▶▶

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which insists on vetting foreign investors, a process that has held up big deals. “If you don’t have a foreign shareholder in your company, establishing a business will take a few days,” says one CEO. “If you have one, it could take a month, two, three.”

Even if the army and security services back off, there are questions about what Egyptian firms will produce and where they will sell it. Many operate only at either end of the supply chain. Over half of Egypt’s exports are primary commodities. At the other end, finished goods rely on inputs from elsewhere. The World Bank estimates that just 20% of Egypt’s electrical exports rely on local components. The car industry sources less than a quarter of parts domestically, compared with 60% for some carmakers in Morocco.

To create jobs and boost exports, Egypt needs to make these products, not just assemble them. Bosses say inefficient state-owned firms are an obstacle, along with poor education and training and expensive financing. None of these are easy to fix.

At home, years of new taxes and cuts in subsidies have left domestic consumers strapped. Almost a third of Egyptians live below the official poverty line, a paltry 857 pounds (\$54) a month. The middle class grumbles at endless new fees. In December the education ministry said it would start charging students to take the mandatory exams required for advancement.

On January 18th Mr Sisi raised the minimum wage to 2,700 pounds a month, the third increase since he took office in 2014, when it was 1,200 pounds. This is not as generous as it looks, though. The minimum wage has not kept pace with inflation (see chart). Egyptians earning it have less purchasing power than they did eight years ago. That matters little to the two-thirds of Egyptians whose work is informal. All in all, more than 80% of working-age adults are either sitting at home or toiling in low-paid, insecure jobs.

The next few years will be more difficult. Costlier commodities will fuel inflation in a country where foodstuffs make up

Try to keep up

Egypt, monthly minimum wage, Egyptian pound



21% of imports (see next article). Another worry is public debt, which was 91% of GDP last year, up from 73% a decade earlier. Debt service consumes about a third of revenue. The government has relied on interest-starved foreign investors to finance megaprojects and big arms deals. Fitch and Moody’s, two rating agencies, assess Egypt as less than copper-bottomed.

Now Egypt faces rising interest rates in America and other rich countries. This will reduce the relative return on Egyptian debt and so dampen foreigners’ enthusiasm, just as higher commodity prices widen the trade deficit. An analysis of emerging markets by *The Economist* ranks Egypt as the third-most vulnerable to tighter monetary policy at the Federal Reserve.

Mr Sisi’s newfound enthusiasm for the private sector may be the child of necessity. The state cannot sustain its high level of spending. But after years of underinvestment in firms and people, and with consumers so squeezed, the private sector may not be ready to scale up. “People have barely had a chance to catch their breath,” says an executive. “And now we’re going into a much less benign global environment.” ■

Egypt’s economy (2)

Grains of wrath

CAIRO

How tensions in Ukraine could harm Egypt

THE BIGGEST buyer of wheat in the world is Egypt, which will import over 13m tonnes of the grain this year. Odd, then, that the way it makes these purchases is so archaic. Every few weeks it summons traders to a ramshackle building in Cairo. Agents from the big firms that source, store and ship foodstuffs are told to bring an envelope with their best price inside. These are then opened and the prices revealed to all. That’s when the haggling begins. The tenders drag on for hours, but eventually Egypt announces a purchase so big that global wheat prices move in response.

Egypt’s stability depends on these imports. The government uses the wheat to make subsidised bread, on which many families rely. When Anwar Sadat, a former president, lifted the subsidy in 1977 there were riots and he quickly backtracked. When Egyptians revolted in 2011, their three main demands were “bread, freedom and social justice”. The latter two proved elusive, but the provision of cheap loaves continues. A small one sells for 0.05 Egyptian pounds, or a third of a penny, a fraction of what it costs to make.

Now, though, a potential disruption in



Do you accept change?

commodity markets threatens this Egyptian staple. The vast majority of the wheat Egypt imports comes from Russia and Ukraine, which are lurching towards war.

Wheat prices already reached their highest levels in almost a decade last year. A number of factors were to blame, including higher fuel and fertiliser prices, poor weather and backlogs at ports exacerbated by the pandemic. A Russian tax on exports, intended to keep excess stocks at home, didn’t help. At Egypt’s latest tender, on January 28th, it paid \$350 per tonne, \$100 more than what it had budgeted for. At that price Egypt will pay an extra \$1.5bn (0.4% of GDP) this year for wheat.

Things will probably get worse. When Russia seized Crimea from Ukraine in 2014, wheat prices spiked. Ukraine has since become a grains powerhouse. Last year its wheat sales grew by 28%, making it the fourth-largest exporter of the stuff. Russia comes first. Together they account for 30% of global wheat exports, twice their share in 2014. (Ukraine also sells maize, barley and cooking oil to the Middle East.) “Tensions in Ukraine are only going to make wheat prices jump further,” says a trader. “It can easily hit the 400s.”

How will that affect the price of bread in Egypt? President Abdel-Fattah al-Sisi knows it is a sensitive issue. When his government signed a deal with the IMF in 2016, it agreed to slash subsidies on petrol, electricity and vegetable oil. Bread was left out. But last year, as commodity prices rose, Mr Sisi reconsidered. He warned that food rations would soon be limited to two beneficiaries per family and that newly-weds would be cut off entirely. The government is mulling replacing the entire system with cash payments. The plans are vague, but one thing is clear: Egypt cannot afford to pay such a high price for wheat and continue providing cheap loaves to the masses. ■

Guinea-Bissau

Pushers and putschists

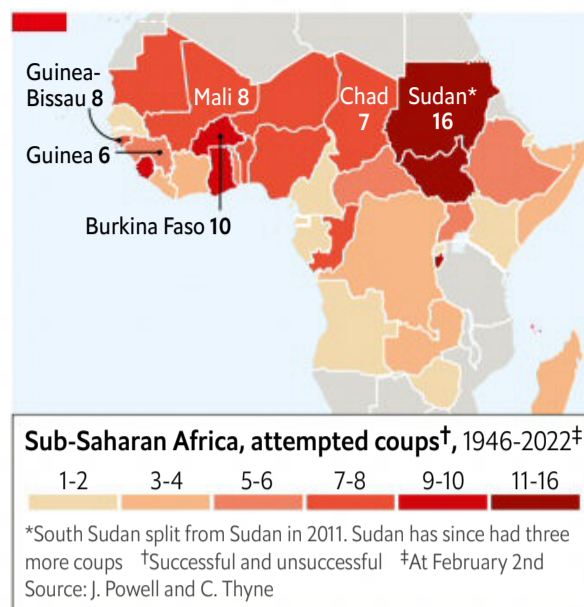
Was a failed coup in Guinea-Bissau linked to the powerful drug trade?

FOR THE second time in just over a week heavy gunfire rang out from government buildings in a west African capital, this time in Guinea-Bissau's. This coup attempt failed, unlike the earlier putsch in Burkina Faso. On February 1st President Umaro Sissoco Embaló declared he had faced down not just a coup, but "an attempt to kill the president, the prime minister and all the cabinet". At least 11 people died in the firefight. Mr Embaló, a former army man, suggested the coup could "be related to people involved in drug-trafficking", without elaborating.

Although it is not yet clear how drug-smugglers may have been involved, the idea that they may have tried to overthrow the government is not as far fetched as it sounds. People linked to the trade have done so several times in the past in order to control or protect a cocaine route linking South America to Europe. It is run with the connivance of army officers and politicians. The trade started in the mid-2000s after João Bernardo "Nino" Vieira won a well-funded campaign for president. But he then seems to have fallen out with the cartels. In 2009 the army chief was blown up in his headquarters and hours later Vieira was gunned down by soldiers.

The two killings, which locals blame on the cartels, allowed a new group of army officers to take over the drug business. Among them, according to charges filed by American prosecutors, was Antonio Indjai, another army chief who led a failed coup in 2010 and a successful one two years later. The latter was known as the "cocaine coup", because smuggling of the drug surged soon afterwards. Although America has offered a \$5m reward for the arrest of Mr Indjai, he is thus far untouchable, flitting between his various homes. He was seen publicly supporting Mr Embaló during his contested election in 2019. Since then the president has refused to extradite Mr Indjai, saying that no Guinean should face justice in another country.

Drug money has been able to corrode politics in Guinea-Bissau so thoroughly because its institutions were pitifully weak to begin with. Since independence from Portugal in 1974, Guinea-Bissau has suffered four successful coups and several more attempted ones. The latest putsch may also have been inspired by a spate of others in recent months in nearby countries including Burkina Faso, Guinea and



Mali (see map). Guinea-Bissau is not suffering from the sort of jihadist insurgency that has undermined faith in elected governments and sparked the mutinies that led to coups in some other countries in the region. But it, too, suffers from grinding poverty. Meanwhile, the regional bloc, ECOWAS, has done little to stand up for democracy. Covid-19 is not the only plague working its way across the region of late. ■

Uganda

Pipe dreams

KYOTERA

A big oil project is moving forward at last—but does it still make sense?

SOON MORE than 200,000 barrels of oil a day will flow through Fred Lubowa's garden: past his tin-roofed house, under his banana trees, and beneath the spot which currently houses the family graves. But for now the only sign of the disruption to come is a line of wooden stakes in the undergrowth. It is three years since surveyors came to his village in Kyotera district, central Uganda, to mark the route for the longest heated pipeline in the world. It will carry oil 1,443 kilometres from the shores of Lake Albert to the Tanzanian coast. He has waited, in limbo.

On February 1st TotalEnergies, a French oil giant, and CNOOC, a state-owned Chinese firm, and their partners announced a "final investment decision" on Ugandan oil, the last milestone before work can begin. The field to be exploited was declared viable in 2006, but progress stalled as the government arm-wrestled with foreign companies over tax and a planned refinery. Covid-19 caused further hold-ups. For people in Uganda's oil region, life now follows the rhythms of distant boardrooms. They are not the only ones wondering whether the project makes sense.

By the time the first oil flows, in 2025, oil infrastructure will have uprooted 2,000 households and directly affected more than 20,000. Farmers will not receive compensation for crops planted after a cut-off date, which in Mr Lubowa's village was almost three years ago. He cannot plant the coffee that would pay for his children's school fees. His mother, Annet Nakyanja, looks forlornly at her wilting banana trees, unable to replace them. Last year one of their neighbours, Robert Birimuye, organised people to object to compensation rates and was arrested on charges of "inciting violence, sabotage of government programmes and unlawful assembly".

The state takes a dim view of dissent. In 2019 a man who travelled to France as a witness in an ongoing lawsuit, challenging TotalEnergies' compliance with French law, was questioned for nine hours at the airport on his return; another witness had unknown men trying to break into his home. The Ugandan authorities have suspended the African Institute for Energy Governance, an NGO that is supporting the case, and in October arrested six of its staff. TotalEnergies says it has repeatedly urged the government to respect human rights.

The unspoken logic of the project might be this: that land acquisition is always messy, and politics brutal, but the price is worth paying if oil makes Uganda richer. Officials reckon the development phase will bring \$15bn-20bn of investment, of which they hope 40% might go to Uganda-based companies, in a country with a GDP of around \$40bn a year. A UN study forecasts that oil will raise government revenues by a third over the estimated three-decade life of the project.

The first risk is that oil money lubricates the very politics of patronage that are holding Uganda back. The president, Yoweri Museveni, will be in his 80s when oil starts to flow. Frustration at his 36 years of rule is mounting. The question of who will succeed him looms. Spending on the security forces that suppress his opponents has increased three-fold since 2017, overtaking spending on education or health.

The second problem is the climate. "There is no possibility of petroleum *kudiba*"—Luganda for "not having buyers"—said Mr Museveni. Markets may decide otherwise. In 2020 researchers at the Climate Policy Initiative, an international NGO, estimated that the value of Ugandan reserves had fallen by 70% since TotalEnergies and CNOOC acquired their stakes in 2013, partly because of lower forecasts of oil prices. The value would halve again if the world's leaders reduce the use of fossil fuels in order to stick to their pledge to keep global temperatures to "well below" 2°C above pre-industrial levels. The oil companies are still seeking funders for the pipeline, after several big banks said no. ▶▶

▶ The oil giants extracted sweeteners before putting pen to paper. Ernest Rubondo, Uganda's top oil regulator, says that production-sharing agreements have been amended since 2019 to give the companies a larger share of the profits when oil prices are low. In effect, they have passed on some of the financial risks of a global transition to low-carbon energy to the Ugandan government. Meanwhile, without radical emissions cuts, the project remains an attractive prospect for TotalEnergies. It will produce about 20% of the firm's African cash flows and 13-15% of its growth in worldwide production over the next decade, says Juma Mlawa of Wood Mackenzie, a consulting firm.

The irony is that Uganda is already suffering for the carbon emissions of rich countries. Unless it takes steps to adapt to climate change, global warming could impose costs amounting to some 3-4% of GDP a year in coming decades, the government reckons. Seasons are already being muddled and farmers do not know when to plant. The oil that will flow beneath Mr Lubowa's garden may well further scramble the rains that sustain it. ■

The sexual abuse of children

A continuing horror

MONROVIA AND BUKAVU

Child rape is appallingly common in some war-torn African countries

FOR A FLEETING instant it is possible to believe that Yei (not her real name) is a normal, if shy, three-year-old. "Smart Brave Amazing" declares her pyjama top, the words smiling up in red, yellow and green. But the woman Yei clings to is not her mother and the building she is in is not her home. She is in a UN-funded government shelter for survivors of sexual assault in northern Liberia. A few months earlier her grandmother trusted a familiar motor-bike taxi driver to take Yei to her parents. Instead he raped her. Yei spent two weeks in hospital as doctors tried to repair the damage. She no longer speaks and has been in the shelter for three months. Her parents, wary of the rapist's family, are scared to bring her home.

Sexual abuse of young children happens all around the world. But children living in war-torn countries are at much higher risk. Those in countries recovering from conflict, such as Liberia, may also face greater dangers. The UN has recorded 15,000 cases of rape and sexual violence against children in conflict zones over the past 15 years. This, it warns, is probably a fraction of the true number. Around 72m

children live in war zones in which fighters sexually attack children, according to research by Ragnhild Nordås of the University of Michigan and co-authors. That is almost ten times the number in 1990.

Reliable data about sexual assaults on young children in post-conflict places are scarce. As happens elsewhere, many attacks go unreported. Last year Liberia recorded 1,275 sexual assaults or rapes of people of all ages, according to official figures. Fully 10% of the victims were younger than six and 36% were younger than 13.

At a sexual-violence clinic in Monrovia, the capital, a nurse recounts how an eight-month-old baby was raped by her stepfather. A soft toy to comfort children perches on the examination table next to a large doll which young victims, often unable to speak, can point at to show what happened to them. About a year before Yei was attacked, another three-year-old was lured away from a water pump by a 15-year-old who used a razor blade to cut open her genital area to penetrate her. That attack caused large protests in Monrovia, which prompted President George Weah to declare rape a "national emergency".

Why so many men rape young children in war and its aftermath is not well understood. Some experts think that war warps not just morality but also common sense. Between 2013 and 2016 in Kavumu, a village in eastern Congo, at least 11 men kidnapped and raped about 40 girls under the age of ten. Some were as young as 18 months. After each rape the men would take some blood from the victim's hymen, believing this would protect them from bullets in battle. In 2017 a court convicted the 11 men of murder and rape.

Many of their victims were treated at Panzi Hospital, which was founded by Denis Mukwege, who was jointly awarded the Nobel peace prize in 2018 for his efforts to end sexual violence in war. The number of

babies and infants treated for rape at the hospital dipped in the year after the trial, says Sylvain Mwambali, a doctor who works there. But it soon shot up again, to a higher level than in the three years before the convictions. In the past three years the hospital has treated 103 raped children aged five or younger, or about one every ten days. In 2020 Dr Mwambali treated a baby just a few months old whose vagina and intestines were mutilated by rape. "I could not sleep for weeks," she says. "How can someone carry on, creating a wound like that? She would have been suffering, crying, they destroyed her vulva, up until the anus, yet they continued."

War and warped beliefs

Sometimes rebels may rape children to terrorise and control the population. Other men may copy them, perhaps because it makes them feel powerful. A breakdown in law and order may allow rapists to escape any punishment. "There is a social deterioration," says Dr Mwambali. "People can rape your mother in front of you...there are rapes in churches."

In Liberia, warped beliefs of a different kind are a common explanation for why men rape young children. Some traditional healers tell people, "If you have intercourse with a young girl, you will become rich," says Margaret Taylor of Women Empowerment Network, an NGO. "The younger the person is, the more riches they get."

Research elsewhere suggests that the sexual abuse of children is more common in societies that are more violent in other ways and, in particular, where rape or sexual abuse of adults is widespread. Liberia suffered back-to-back civil wars between 1989 and 2003 in which tens of thousands of child soldiers—some as young as nine or ten—fought and, in many cases, were forced to execute prisoners. Many of them are now back in their villages, but have received little or no treatment for the psychological trauma they suffered. Drug-taking, a huge problem in Liberia, has been shown elsewhere to lead to the abuse of children. Much remains unknown. "We haven't really put our finger on it," admits Williametta Saydee-Tarr, the minister of gender and children.

That makes combating child rape more difficult. It does not help that prosecutors often struggle to convict perpetrators. The government in Liberia has three DNA machines to try to better identify those responsible, says Ms Saydee-Tarr. But the courts are overwhelmed and prisons are overflowing. The head of the clinic in Monrovia complains that prosecutions of those who rape children are rare and slow. She follows the cases of the many victims of all ages who are seen in the clinic. For "more than a year," she laments, "we have not heard of a conviction." ■





South-East Asian tourism

Out of office

SINGAPORE

Labour shortages and chronic uncertainty are hobbling the industry's recovery

A THAI BEACH in high season is normally a carnival of umbrellas and selfie sticks, drained coconuts and peeling skin. But this year Koh Samui, an island popular with foreign tourists, “is like a graveyard”, says Virach Pongchababnapa, a local hotelier. Tourists are gone. Hotels and restaurants are boarded up. “There is no life, no movement,” Mr Virach sighs.

This was supposed to be the year that South-East Asia's tourism industry—on life-support since the pandemic struck—began to recover. The Omicron variant, however, delayed the revival. At the end of 2021 several countries began admitting tourists for the first time in nearly two years, only to slam the door shut again when Omicron emerged.

This month borders started creaking open once more, some wider than others. Fully jabbed travellers no longer need quarantine in Thailand as of February 1st, or the Philippines, starting February 10th. Thailand is expecting 300,000 visitors this month—a far cry from the pre-pandemic

monthly average of 3m, but a start.

Government bean-counters will be pleased. South-East Asia's economy relies on tourism more than any other region in the world bar the Caribbean, according to the World Trade and Tourism Council, an industry body. In 2019, the last year that people could travel freely, tourism contributed nearly 12% of the region's GDP. The industry accounted for about a seventh of Cambodia's economy and employed a fifth of Thailand's workforce.

People from outside the region are the lifeblood of the business. They spend half

of all tourist dollars even though, in countries with robust domestic tourism, they make up just 33% of visitors, and sometimes as little as 5%. Yet the virus grounded these travellers. Compared with 2019, international visitor arrivals in South-East Asia dropped by 82% in 2020 and 98% in 2021. Those figures should improve somewhat this year. As the region opens up, Europeans and Americans will flock back to the sandy beaches of Bali and Phuket. But the recovery will be tentative. Most of South-East Asia's tourists come from elsewhere in Asia. China, the biggest source, shows no sign of letting its citizens travel abroad for pleasure any time soon.

This absence has taken its toll on the economy. In 2020 tourism's contribution to regional GDP fell by more than half. Receipts from international tourists declined by 78%, more than in any other region. Many businesses have shut. In May, when a wave of covid-19 swept Cambodia, some 47% of small- and medium-sized enterprises canvassed by the Asia Foundation, an American NGO, had closed. A quarter of Thai tourism firms have shut permanently since the pandemic, according to the Tourism Council of Thailand.

Many South-East Asians are out of work. Seven million of the 43m tourism jobs that existed in 2019 had vanished a year later. Many workers who held onto their jobs had their shifts or wages cut. In the Philippines, hours were reduced by an ▶▶

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▶ average of 38%, reckons the International Labour Organisation (ILO), a UN agency. The pandemic's impact on the tourism sector in Asia and the Pacific "has been nothing short of catastrophic", says Chihoko Asada-Miyakawa, its regional director.

Yet even if international tourists were to return in their pre-pandemic numbers overnight, the woes of hoteliers like Mr Virach would continue. Indeed, they may be exacerbated. Labour shortages are already being felt in countries with strong domestic tourism or which have begun reopening. Hotels in Phuket are struggling to hire engineers, electricians and chefs, says Kongsak Khoopongsakorn of the Thai Hotel Association, an industry body. Singapore's restaurant industry faces a shortfall in manpower of 20-30%. The city-state's biggest hotel operator, Accor, has ample vacancies in its kitchens, housekeeping and security departments. In November the Malaysian Association of Hotels, another industry group, said that the lack of workers meant hotels were not prepared to receive guests when the country re-opens.

Hotels and restaurants in these countries have long relied on migrant labour from poorer neighbours, such as Indonesia and Myanmar. But lack of work, fierce immigration rules and the absence of much of a safety net prompted many of them to return home during the pandemic. Singapore's foreign workforce declined by 16% in the 18 months to June. Malaysia's has decreased by 800,000, from 1.9m in 2018, in part because work permits expired and could not be renewed. At least one-fifth of Thailand's 2.5m foreign workers have left since the pandemic. The Federation of Thai Industries says that the tourism industry and related businesses need 300,000 migrant workers immediately.

Even in countries where most workers are locals, employers are nervous. Many Cambodians are riding out the pandemic in the countryside. Returning to tourism hubs entails paying for transport and accommodation—costs that can be borne if stable jobs are in the offing. But stability is precisely what employers cannot offer. "So long as you don't provide a guarantee that they will have these jobs for a long-term perspective, then people still hesitate to come back," says a Cambodian consultant.

The problem is chronic uncertainty about the timing of the industry's recovery. Some workers are fed up and leaving the business for good. According to the Food, Drinks and Allied Workers Union, a Singaporean lobby group, a growing number of hotel workers have taken up jobs in other industries that offer better wages and greater job security. A survey conducted by the Vietnam National Administration of Tourism last June found that nearly a quarter of "highly qualified workers" in the tourism industry had moved on.

The consequence is that tourists are not receiving the standard of service they expect. Hotel guests in Singapore are complaining about having to queue to be seated for breakfast. Visitors to Penang, in Malaysia, gripe that it takes hours to check in to their hotels. Complaints are piling up on sites like TripAdvisor, an online-review behemoth. Such frustrations are likely to persist for a time.

But in the long run these experiences will prove to be the exception, as they were

before the pandemic. Once migrants can easily cross borders and the virus becomes endemic, thereby allowing some semblance of normality, workers should return to their posts. The industry remains appealing to South-East Asian workers, particularly those from the region's poor countries. There is a "plethora of low-wage people willing to take this low-wage work", says Sara Elder, a senior economist at the ILO. But they are not breaking out the coconuts and umbrellas just yet. ■

The environment in India

Seeing green

Is the government overcounting the overstory?

AT THE COP26 climate summit in Glasgow last year, when more than 100 countries committed to ending and reversing deforestation by 2030, India, home to some of the world's biggest and most biodiverse forests, demurred. No matter: India's forests seem to be thriving—at least on paper. Between 2019 and 2021 India gained 1,540 sq km in forest cover, according to a biennial report published last month by the Forest Survey of India (FSI), a government agency. Over the past 20 years, says the report, forest cover has grown by 5.7%, or around 40,000 sq km, an area roughly the size of Switzerland.

This should be good news. Forests are a boon for the environment. Many of India's poorest people depend on them for their livelihoods. Yet India's greens are unimpressed. They say the FSI's definition of "forest" is misleading and has been for the past 20 years. Officially, any patch of land greater than a hectare with canopy cover of at least 10% counts

as a forest no matter who owns it or to what use it is put. By the FSI's reckoning, tea estates in the hills of east India, cashew plantations on the western coast and parks in the posh suburbs of Delhi, the capital, all qualify. The FSI "can't be accused of favouring only tree-clad areas in counting India's forests", M.D. Madhusudan, an ecologist, quipped on Twitter, illustrating his point with a scattering of trees in the scorching desert of Rajasthan, a western state.

Indeed, almost all the increase in India's forest cover in the past two years has been driven by growth in plantations. Of the forest added since 2019, only 31 sq km came in "recorded forest areas", meaning actual forests. Global Forest Watch, an online tracker that uses a stricter definition, suggests that forest cover may actually have fallen by 3.4% between 2002 and 2020.

The government says its definition aligns with international norms. It also stresses that every tree, whether in a city, plantation or jungle, provides some ecological benefit. This is true. Yet quality matters: fully fledged forests, with dense canopies, provide habitats to animals and health benefits to humans.

The real problem may be methodology rather than definitions. The FSI report is compiled using data from satellite images, which struggle to see the forests for the trees. Raj Bhagat, an expert on remote sensing, says that without rigorous ground-level surveys to supplement the data, the reported change in forest cover is just "noise". Moreover, the satellite data are not easily accessible, Mr Bhagat and others complain, thwarting attempts at crowdsourced verification. Anoop Singh, the FSI's director-general, insists the methodology is robust, especially given the constraints of time and resources. And the data are available for anyone to purchase—at a hefty cost.



Forest, hump

Anti-vaxxers in Papua New Guinea

A nation of holdouts

BOSSET, WESTERN PROVINCE

Online misinformation, like covid-19, reaches even the remotest places

FOR CITIZENS of a country where AIDS, dysentery and road traffic accidents rank among the top ten causes of death, it is difficult to get worked up about a new-fangled ailment like covid-19. And when friends and family appear more scared of vaccination than of infection itself—when they say that a jab is a one-way ticket to hell—it is perhaps natural to resist getting inoculated. Little surprise then that Papua New Guinea, a desperately poor corner of the world, has the lowest vaccination rate in Asia and among the lowest in the world. Just 3.3% of the population has received even a single dose.

It is not for lack of infection. The country of 9m has officially recorded more than 37,000 cases and some 600 deaths. But these numbers dramatically understate the disease's prevalence. In rural areas testing is extremely limited. People diagnosed with covid have sometimes been thrown out of their homes by their families, so few are keen to be tested in any case. The bigger hospitals are nonetheless overwhelmed from time to time when cases surge. *The Economist's* excess-deaths tracker suggests the true death toll is six times greater than the official number.

The government has tried to keep the pandemic at bay. A state of emergency was declared in March 2020, borders were closed for well over a year and a two-week quarantine in hotels was required of the few allowed to enter. These measures helped, for a while. Yet the virus found its way in, in some cases through the highly porous border with Indonesia and in others thanks to commuting mineworkers from Australia and elsewhere.

The government, to its credit, also acted quickly to secure supplies of vaccines, mostly donated through Covax, a global programme to get jabs to poor countries. Early last year James Marape, the prime minister, took his shot on national television. Influential church leaders urged their flocks to get their jabs. The government set the modest target of inoculating 20% of the population by the end of 2021.

To no avail. Even as the virus has found its way into remote communities, fears of vaccination have only grown, fuelled by scare stories from the internet embellished in the retelling. Despite its rugged terrain and limited development, Papua New Guinea enjoys internet coverage even in far-flung areas, thanks to the efforts of

Digicel, a mobile operator focused on small, poor countries. Enough people now have access, usually on old smartphones, to hear the call of the anti-vaxxer.

A tradition of superstition and a belief in sorcery worsen the problem, and add a local twist to the online humbug. Health workers deployed to vaccinate vulnerable people in the near-inaccessible interior of the country report being met with naked hostility. Locals told them they had heard that the vaccine would cause them to drop dead in three years. Others said the jab would turn their arms magnetic. Some believed they were immune because covid was a “white man's disease”. Many said that the disease was made up.

“They don't believe in covid,” says Paul Gai, a health worker in Bosset, a swampy lakeside community of some 2,000 people in Western Province, the biggest of the country's 22 districts. “Most of the people believe in these internet messages.” Many field visits by health workers have ended with zero vaccine recipients and wasted shots. Papua New Guinea even sent a stock of doses to Vietnam as they neared expiry.

Meanwhile, mobile “outreach” clinics and specialist facilities for other common, serious diseases, including malaria, TB and AIDS, have at times been closed to ensure enough resources to keep covid hospitals operating. Expectant mothers have been deprived of antenatal care. TB patients have found it hard to get their drugs.

“Covid-19 is going through the community. It will continue to go through in waves and some people will die, [but] most people will get over it,” says a senior doctor with decades of experience in Papua New Guinea. More people are likely to die of other diseases as a result of well-intentioned attempts to keep covid in check, he says, than of covid itself. It is a grim prognosis for an already stricken country. ■



Waiting for the other 96.7%

North Korea

New year fireworks

SEOUL

What is behind the latest flurry of missile tests?

OBTAINING INFORMATION on what is going on in North Korea has been even harder than usual over the past couple of years. Kim Jong Un, the country's dictator, enforced the world's strictest border closures in response to covid-19 (North Korea claims to have succeeded in keeping out the virus). But there is one area in which the world has been able to glean a surprising amount of insight: the development of Mr Kim's arsenal of missiles.

The latest hint came on January 30th, when North Korea test-fired an intermediate-range ballistic missile (IRBM) that it claimed could reach targets up to 5,000km away. It was the longest-range test since 2017, at the height of the “fire and fury” period of tensions between North Korea and America. The launch topped off the busiest month on record for North Korean missile tests (see chart on next page). It followed a series of shorter-range tests throughout January, including two launches of what state media claimed was a “hypersonic missile” able to manoeuvre at high speed while flying at relatively low altitudes, the better to evade missile defences.

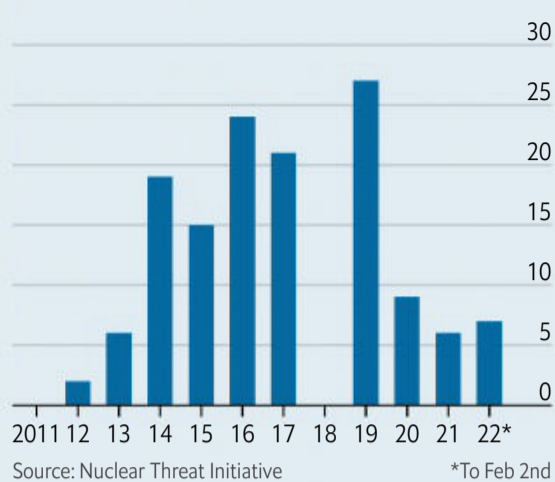
The tests reinforce the impression that the hardships of the pandemic have done little to slow the pace of military development in the closed-off country. They fit with the regime's recent demonstrations of military prowess and statements by Mr Kim about the importance of martial advances. At a military parade to mark the 75th anniversary of the Workers' Party in the autumn of 2020, North Korea showcased a range of previously unseen hardware, including an enormous new intercontinental ballistic missile which has not yet been test-fired.

In remarks made at a committee meeting of the Workers' Party at the end of 2021 and relayed by state media as an apparent stand-in for the dictator's usual New Year address, Mr Kim outlined two main ambitions for 2022. He called for continued belt-tightening amid efforts to improve agricultural output—and for ceaseless efforts to strengthen the armed forces.

Tests are a necessary part of Mr Kim's stated goal to advance his missile programme. Still, the sheer number of them in one month, and the launch of the IRBM, have prompted speculation among analysts about other possible motives. Some suggest that Mr Kim decided to conduct them in advance of North Korea's usual ▶▶

Making a splash

North Korea, missile launches under Kim Jong Un



▶ testing season—February and March—to avoid disturbing the Winter Olympics in Beijing, which start on February 4th. His regime, after all, is reliant on Chinese economic support and goodwill.

There are probably domestic reasons, too. Mr Kim may be trying to shore up support given that the economic pain associated with the pandemic lockdown looks set to continue. On February 1st state television aired a documentary emphasising the hardships the country had suffered over the past year, and Mr Kim's tireless efforts to alleviate them. It suggested his body had "withered away" as a result of his work for the people, an apparent reference to the formerly pudgy Mr Kim's dramatic weight loss last year.

Shortages and high prices remain a problem inside the country, according to Daily NK and NK News, outlets based in South Korea with sources inside North Korea and along North Korea's border with China. Freight-train traffic across the border appears to have resumed in January for the first time in two years. But even elites in Pyongyang will have to wait for weeks before any goods reach them, owing to lengthy quarantine measures. Mr Kim may be hoping that pride in the nation's military strength will allow him to test his citizens' patience a little longer.

It is less clear what message, if any, the tests are intended to convey to the rest of the world. After America imposed fresh sanctions on North Korea earlier this year, state media dropped hints that the armed forces might abandon the moratorium on long-range missile tests which Mr Kim announced during a period of detente in 2018. But unlike in 2017, the latest round of tests have not been accompanied by unusually aggressive rhetoric towards America or South Korea. The responses from both countries to the flurry of tests have, in turn, been muted. Mr Kim may simply hope to persuade other countries to accept his missile tests, including those that violate UN resolutions, as a fact of life. If so, he seems to be succeeding. ■

Japanese demographics

Mujin tonic

KOFU

The world's oldest country is searching for the secrets to healthy old age

MOST PEOPLE see living longer as a good thing. Getting creakily old, however, is a less attractive prospect. Extra days of globetrotting with a spouse or relaxing with a grandchild? Yes, please. Interminable years spent bedridden? No, thank you.

Most people lucky enough to get old will have at least some unhealthy years in later life. The global gap between life expectancy and healthy life expectancy (HLE), a measure of how long a person lives without health problems that impede everyday activity, is nearly ten years, according to the World Health Organisation.

That is bad enough for individuals and their families but it is also concerning for ageing countries where large elderly populations can drain public finances. In Japan, the world's oldest country, men live an average of 81.6 years and women an average of 87.7 years. But in 2019, the last year for which data are available, the healthy parts of those lives were on average nine years shorter for men and around 12 years shorter for women. (Japan uses surveys of people's own assessment of their health along with mortality rates to measure HLE.)

Shrinking that gap has thus become an important goal for the Japanese government. Staying healthy for longer, the thinking goes, will make people happier—and put less strain on medical systems, and on the government's budget. "For a long time [Japan] made a collective effort to extend life expectancy," says Akiyama Hiroko of

the University of Tokyo's Institute of Gerontology. "As the average age approached 80 years old, we began to think we had achieved it, but also noticed we had many bedridden seniors and many underemployed 60-somethings."

The health ministry has made extending HLE a central pillar of its policy. It hands out a yearly "Let's extend healthy life expectancy!" award to those contributing to the effort. Recent winners include Fukui prefecture, north of Kyoto, for its "Sneaker Biz" programme, which encourages local companies to let employees wear sneakers to work, leading to a big increase in step counts, and a group in Osaka that turns abandoned buildings into community cafeterias. Local governments are required to have plans for extending HLE. Initiatives range from practical to quixotic. Oita, on the southern island of Kyushu, rolled out an app that counts steps and turns them into points for discounts at local shops and facilities. Aomori, a frigid northern prefecture, created a "high blood-sugar stopper" division that aims to raise awareness about diabetes; its efforts include a competition for the best diabetes-themed *senryu*, a form of poetry similar to *haiku* but focused on human foibles.

Many efforts look a lot like the prescriptions for raising overall life expectancy. It is true that common causes of mortality will also affect healthy living: Aomori, which has low HLE, has high rates of smoking and salt consumption. Screening for diseases helps: Yamanashi, a bucolic prefecture at the foot of Mount Fuji that consistently ranks in the top two prefectures for healthy life expectancy for both men and women, has some of Japan's highest cancer-screening rates.

But those with the longest healthy lives are not necessarily those with the longest lives overall. Many conditions that crimp ▶▶



When I aged I learnt, That dumbbells make for long lives, Friends are dumbbells too

▶ the quality of life are not fatal, such as back pain, eye disease or mental-health problems. Helping people stay healthy, rather than simply alive, involves looking at broader social and environmental considerations. Jobs are essential. Working longer keeps people physically and mentally active, but also keeps them connected to others. Yamanashi has the second-highest elderly-employment rate in the country.

Social networks—the real-world kind—play a big role, too. Strong ties with friends, family and neighbours make for better mental health, more active lifestyles and

better support. Investments such as upgrading cultural facilities or creating mobile libraries to serve remote communities may not appear to be health-related, but can benefit public health, says Kondo Naoki of the University of Tokyo.

In Yamanashi, many public-health specialists point to *mujin*, traditional local microcredit associations which have evolved into something more like social clubs. Members chip in funds for regular gatherings, often over noodles and sake (some prefer tea or mah-jong). Mr Kondo's long-term studies have found that those who

participate actively in *mujin* stay healthier for longer, even when controlling for wealth and other variables. The group activity offers a sense of purpose, and also acts as an informal safety mechanism, with other members noticing when someone is absent or looking worse than the previous month. "Being lonely is most detrimental to health," says Nagasaki Kotaro, Yamanashi's governor, who recently started offering subsidies for *mujin*. The secret to a healthy life, then, is similar to a happy one: keeping busy and regularly seeing friends, even over a drink or two. ■

Banyan Irony-free zones



Myanmar's generals have a dubious role model in Thailand

SOON AFTER General Min Aung Hlaing mounted a coup against Myanmar's elected government, a year ago this month, the army chief wrote to the prime minister of next-door Thailand for advice. How, he asked Prayuth Chan-ocha, to build a flourishing democracy?

It sounded like a bleak joke. But the generals do not do irony. General Min Aung Hlaing had just smashed what fragile democracy had taken root in Myanmar. In 2014 Mr Prayuth, then Thailand's army chief, had seized power from an elected civilian government. Before a general election in 2019 in which Mr Prayuth put his army-led party forward, a military-appointed committee rewrote the constitution to entrench the role of the armed forces in politics and to neutralise popular parties.

To be doubly sure, Mr Prayuth also stripped the election commission of independence. When all that still failed to hold back one political force, the Future Forward Party, the courts obligingly dissolved it. This, then, is the "genuine democracy" that Mr Prayuth had promised back in 2014.

And that, to the generals in Myanmar, is the point. They envisage something very similar when they talk about a "disciplined democracy". That is, re-engineering the political system to stay in charge. Thailand—relatively prosperous, relatively stable, if mainly in relation to Myanmar—is the role model to which that country's generals aspire, argues Thitinan Pongsudhirak of Chulalongkorn University in Bangkok.

Myanmar and Thailand have different histories, and a historical rivalry. Unlike Myanmar, modern Thailand was never colonised. Nominally it has been a constitutional monarchy since 1932; in reality an absolutist king, in whose name the



armed forces speak, holds sway. In contrast, Myanmar's last king died in exile in India in 1916.

Yet the affinities are stronger—as the generals see it. Pavin Chachavalpongpon of Kyoto University describes how in both countries the top brass claim to act as the ultimate guarantors of the state's integrity and as protectors of a Buddhist majority. Do not underestimate the personal ties, either. The epitome of the royalist-military nexus under Thailand's previous monarch, King Bhumibol Adulyadej, who died in 2016, was the late Prem Tinsulanonda, another army chief and prime minister. In 2012 he "adopted" General Min Aung Hlaing as his son.

In their irony-free zones, the generals' poor long-term performance rarely registers. General Min Aung Hlaing yearns for the blissful prelapsarian era before democrats were allowed a say. Yet the "Burmese way to socialism"—which the army promulgated as the state ideology after it seized power in 1962—brought only grinding poverty. As for Thailand, the armed forces are less economically incompetent.

But their favouring of their own interests and a handful of family-led conglomerates has undermined economic institutions while pushing out entrepreneurs. Meanwhile, the fact that the army has staged two coups in the past 15 years suggests that it has yet to perfect its management of the political system.

For how much longer can the generals ignore reality? After all, Myanmar's coup has produced a failed state. Far from being the bulwark of national unity, the Tatmadaw, as its army is known, is under attack from new, armed-resistance movements even in the ethnic-Burman heartlands from where it has traditionally drawn recruits. General Min Aung Hlaing has managed something that decades of ethnic conflict around Myanmar's borderlands failed to do: unite the country's jumble of ethnic minorities with the Burman majority. Myanmar's bureaucratic administration has crumbled, while hunger mounts and the economy implodes. All the while, the Tatmadaw continues to target civilians.

The Tatmadaw threatened a harsh response towards anyone taking part in the "silent strike" that the underground shadow government called for to mark the coup's first anniversary. On February 1st streets were empty all the same, and in the central town of Kyaukpadaung a man set himself alight in protest at the Tatmadaw's brutality.

Over in Thailand, where many Burmese refugees have fled, Mr Prayuth insists that the Tatmadaw, the destroyers of Myanmar, remain an essential part of any effort to repair it. He and those around him also continue to think of themselves as role models for Myanmar's rulers. Sure, stagnation is better than disintegration. But what kind of commendation is that?



Technology

Virtual state of control

The Communist Party may try to build a metaverse with Chinese characteristics

THE YEAR IS 2035. You are walking along the Bund, Shanghai's storied waterfront, with two of your old classmates, pointing out how much has changed since the last time you were here 20 years ago. You almost joke about how the only thing that never changes is Xi Jinping being in power, but you think better of it. Someone might be listening. A message flashes in your glasses, and you say hurried good-byes. The landscape of the Bund dissolves into the fantasy realm of a multiplayer game, where three friends in magical armour are waiting, swords at the ready.

The metaverse is for the foreseeable future quite literally science fiction: a fully immersive, persistent virtual world where, with the help of high-tech goggles and other kit, people interact, work and play via online avatars of their real-world selves. In the West, Mark Zuckerberg has become its most famous promoter. His renaming of Facebook in October, as Meta, accelerated a race among tech giants in Silicon Valley and Asia to be the first to turn the idea of the metaverse into reality.

There are reasons why the Communist Party might not want Chinese firms to join that race. "If you were to describe what a communist state doesn't want, it's the establishment of a virtual plane of existence that sits outside of, and without any, national boundaries," says a consultant who advises Chinese-invested technology companies on metaverse development. Dan Wang, an analyst of the Chinese tech sector, wrote recently that if the metaverse does come about in China, "I expect it will be an extremely lame creation heavily policed by the Propaganda Department". The party has also in the past year imposed severe time restrictions on youths playing online games, and encouraged tech firms to invest more in concepts, like smart manufacturing, that tie directly into the real-world economy. A form of technology

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that invites people to spend more time wearing goggles might seem suspect.

But there are signs that China does in fact want its companies to build the metaverse first, and to build it with Chinese characteristics: with content controls, monitoring, censorship and no scope for anonymity. The data-rich environment of the metaverse could be an authoritarian dream. There could be a digital record of everything that happens within it, including chit-chat at virtual cocktail parties that would remain private if uttered offline. Those inclined to joke about Mr Xi would be easier to identify and monitor. If someone is deemed to be spending too much time in the metaverse, they could be given a warning, then booted offline.

Much as the Communist Party has managed with the internet itself, defying the predictions of many in the West, the metaverse could become a powerful means of boosting the state's grip on society. This authoritarian vision assumes a mastery of internet controls that may not happen. But the ambition to build metaverses, in China and elsewhere, is likely to take the contest between democratic and authoritarian values into a new, virtual dimension.

As with social media, the nuts and bolts of the metaverse will be built by companies, not the party. Already there is a metaverse gold rush in China to match the hype in Silicon Valley. By the end of 2021 some 1,600 firms had applied for 11,000 trademarks with the Chinese word for meta-▶

verse (*yuan yuzhou*) in them. From September to November venture capitalists poured 6.4bn yuan (\$1bn) into Chinese metaverse-related technology like virtual-reality (VR) headsets and games, more than twice the sum invested in all of 2020, says Sina Tech, a website. That does not include the acquisition, announced in August, of Pico, a VR-headset maker, by ByteDance, the parent company of TikTok. The undisclosed sum is rumoured to be between 5bn and 9bn yuan. The leading Chinese tech firms, and many small ones, have announced metaverse plans. Share prices have shot up on the hype.

Keeping control

The central government has so far been mostly silent. In November state media warned against a speculative fever among investors. But authorities are beginning to ponder how to embrace virtual worlds. In December and January officials in the cities of Shanghai, Wuhan and Hefei put the development of metaverse technology into their five-year plans. In November the government of Zhejiang province held a “metaverse industry development symposium”, where speakers agreed that Zhejiang, home to Alibaba Group, should be at the forefront of the new technology.

In October the China Institutes of Contemporary International Relations (CICIR), an elite think-tank affiliated with the Ministry of State Security, issued a paper on the metaverse. It described the concept as the next generation of the internet and warned of the need for laws and regulations to deal with “virtual labour”, economic crimes and other issues in “the grey area between the virtual world and reality”. CICIR predicted that the concept was “likely to explode in the next five to 10 years”.

A think-tank at the Ministry of Industry and Information Technology, a powerful state regulator, convened a workshop in January on the metaverse with big Chinese tech firms, including Tencent, Baidu and Alibaba. The participants agreed on the groundbreaking importance of the metaverse and on the need for “risk countermeasures” to be “deployed in advance”.

To analysts, the workshop and the CICIR report were signs that leaders are thinking about the metaverse as an emerging technology where they have a chance to beat the West. In official parlance, this is known as “overtaking on the curve”. “When there’s some kind of shift in emerging technology, China’s strategy is to try to develop it first and faster,” says Kendra Schaefer of Trivium China, a research firm. “We saw that in the 5G race.”

It will probably take many years for anything akin to a fully fledged metaverse to take shape, where people can toggle seamlessly from one activity to another while sitting on a public bus, lost in their high-

tech glasses. For a long time the intermediate offerings will be a mix of virtual-reality experiences. Some early concept videos, including Mr Zuckerberg’s, have been mocked by users (despite plenty of investment from business titans). There are many technological challenges to overcome.

But China has the will and ability to pursue a metaverse with speed and vigour. The country’s state-owned and state-backed telecoms giants have outpaced their Western rivals in developing and building 5G telecoms infrastructure. They are well positioned to do the same with 6G and successor technologies, which will be essential to providing the enormous mobile bandwidth and high speeds needed for the constant, data-drenched connections the metaverse will require.

China also has deep-pocketed tech firms such as Tencent, Baidu and Alibaba, with the rudiments of the technology needed to support a metaverse, such as cloud-computing infrastructure. They are also already steeped in the different expected elements of metaverse life, including social media, gaming, e-commerce and virtual currency. And although the party is wary of these companies’ power, it wants them to help China “overtake on the curve” in new technologies.

Tencent may be the best positioned of any company to win the race. It is the world’s biggest publisher of games and one of the biggest forces in social media and e-commerce. It invests in or operates many of the most popular multiplayer online games in the world. It owns a minority stake in Epic Games, the creator of “Fortnite”, a game which Tim Sweeney, Epic’s founder, has called a possible vehicle for a metaverse. An edited version of the game was allowed a test run in China, but Epic gave up on that trial in November.

Official nervousness about controlling the metaverse could slow China down. But it has built systems for managing risk into each generation of the internet. Tech platforms like Tencent work to keep the government’s trust by self-policing.

And Chinese citizens will be careful about crossing red lines, lest they lose access to a virtual world that could become almost as integral to day-to-day life as the physical one. A Chinese metaverse would make possible the sort of dystopian, hyperbolic visions that are often predicted for daily life in China but that have not yet come to pass: the tracking of every movement and whisper, the tyranny of a social-credit score that rules everyone’s existence. But even if China’s future is not an episode of “Black Mirror”, a grim science-fiction television series, says one tech executive in China, “having some kind of more systematic way to manage this will probably be needed”. That the party will want that is a virtual certainty. ■

New Year

Lame tiger

BEIJING

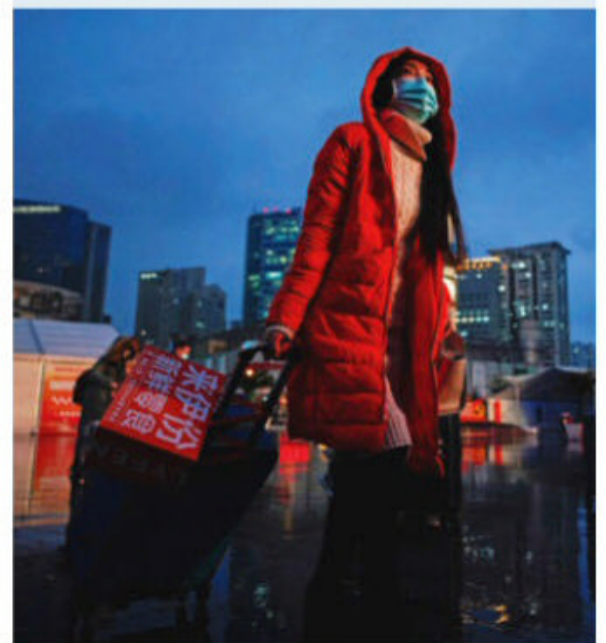
Not much to cheer at new year

SPEAKING TO FOREIGN bigwigs at last month’s World Economic Forum, President Xi Jinping said that, to meet its many challenges, humanity must “act with the courage and strength” of a winged tiger. At home, however, the year of the tiger he welcomed on February 1st has not felt much like the winged variety. Chinese people are struggling to negotiate their third muted new year of the pandemic amid an array of ever-changing travel rules.

Some 260m “journeys” were made in the ten days after January 17th (an official metric whereby each leg of a trip, such as a flight or a train ride, counts as a journey) and 1.2bn journeys are forecast before February 25th. That would be up by 36% on a year ago, but still way down on the 3bn journeys taken during new year of 2019.

The Omicron variant is bubbling up. Media describe people travelling long distances only to be told on arrival that they must quarantine for two weeks or return home. In Hangzhou officials have offered gift vouchers to those forgoing holiday travel. In Ningbo and Hefei, some factories remain open and a daily subsidy of 100 yuan (\$16) is offered to those who stay at work.

In the first week of new year 2021, consumers spent 821bn yuan on retail and food, up by 29% on covid-ravaged 2020 and by 5% on 2019. But economic growth slowed from 4.9% to 4% in the last quarter of 2021. With no visitors even for the Winter Olympics, opening on February 4th, few expect the tiger year to start with a roar.



Giving it a go

Chaguan | Nixon in China, 50 years on

Eye-witnesses from 1972 offer their views of a relationship in bad shape



HALF A CENTURY ago Richard Nixon took a gamble that made history. On a cold, hazy February morning, he landed in Beijing, the capital of a communist regime that America did not officially recognise, to meet China's ailing tyrant, Mao Zedong.

The president's stated motives were grandly visionary. China, home to a fifth of humanity, languished in angry isolation in 1972, its borders all but closed to the world. Desperately poor, its people were six years into the Cultural Revolution, a decade of ideological purges and violence at times approaching civil war. Nixon, a cold-war hawk who had spent years smearing opponents as soft on communism, had come to believe that a stable global order must include China. "We simply cannot leave China forever outside the family of nations, there to nurture its fantasies, cherish its hates and threaten its neighbours," Nixon wrote in 1967. His visit was a global sensation, televised live. Years later, it inspired an opera.

Yet alongside noble talk of ending China's isolation, Nixon and his foreign-policy adviser, Henry Kissinger, flew to China for secret, cynical reasons, too. With China and the Soviet Union on such terrible terms that Mao feared a Soviet invasion, Mr Kissinger and his president saw a chance for geometric diplomacy, to realign the global balance of power. In their plans, embracing weak China would usefully unsettle the mighty Soviet Union. They hoped it would also hasten the end of America's war in Vietnam, as North Vietnamese leaders realised it was time to sue for peace. The costs included betraying an ally. Nixon was ready to end diplomatic ties with a rival Chinese government, the Nationalist regime that had fled to Taiwan after losing a civil war to Mao. The price of a successful visit in 1972 was a joint declaration, the Shanghai communiqué, in which America "acknowledged" that "all Chinese" agree that Taiwan is part of China, though it stopped short of accepting that the Communist Party should run the island.

Declassified American records of the visit reveal much relish for cynical realpolitik. Nixon and close aides calculated the benefits of each move to America, but also to the president's re-election campaign. They sighed about the brilliance and subtlety of Mao and his prime minister, Zhou Enlai, despite the horrors unfolding in China at that time. Fifty years on, China's leaders seem nostalgic for such values-free diplomacy, hinting that it offers the best

way of repairing relations that are in dire shape. China's read-out of a telephone call on January 27th between the foreign minister, Wang Yi, and America's secretary of state, Antony Blinken, notes the upcoming 50th anniversary of the Shanghai communiqué, without mentioning Nixon's visit. Mr Wang cited a clause from the communiqué which talked of looking past essential differences in America's and China's social systems. He told Mr Blinken that a pre-requisite for peaceful co-existence, in 1972 or in the future, was each country eschewing any "intention to change the other". China's message seems to be: if 1972 made history, all credit goes to Mao's and Nixon's ability to weigh national interests coldly, and none to lofty rhetoric about ending China's isolation.

That being a bleak take on an important event, Chaguan sought advice from Chinese and Americans who remember the Nixon-Mao visit. Shi Yinhong, an expert on America at Renmin University, was 20 years old in February 1972. He is sceptical that romantic visions about the family of nations moved either man. Mao chose to meet Nixon and emerge from strategic isolation as a calculated move to counter the Soviet Union, he says. Professor Shi is sure that Nixon's aims were similarly unsentimental: to get America out of Vietnam without China filling a regional vacuum, and to align with China against the Soviets. With the balance of power between America, China and Russia changed beyond recognition, he sees few lessons from 1972 that apply directly today. Even a renewed focus on national interests cannot help much, he worries, because America and China are determined to pursue stability "on their own terms", by maximising their respective power.

Very different memories move Zha Jianying, who in 1972 was a 12-year-old schoolgirl in Beijing. Her father, like many intellectuals, was in a labour camp. She recalls a life of shabby, propaganda-filled monotony, and a fear that "maybe this is going to be the rest of our lives". Nixon's arrival, from long-demonised America, offered a first glimmer of hope by showing that "a different world exists", says Ms Zha, now a writer based in New York.

Ideology, practicality, despondency

Winston Lord, an aide to Mr Kissinger, attended the Nixon-Mao meeting as a note-taker. To him the visit involved both grand vision and realpolitik. If Nixon's initial impulse was to end China's isolation, while Mr Kissinger was at first focused on the balance of power, the pair soon shared both reasons for rapprochement, he says. To Mr Lord, later America's ambassador to China, it is a straw man to claim that the Shanghai communiqué was mostly a pledge to ignore ideology. To him, the genius of the communiqué lay in artful drafting which postponed intractable problems, such as Taiwan's final status, while allowing co-operation where possible.

In contrast, a diplomat and lead translator for the Nixon delegation, Chas Freeman, argues that America frittered away opportunities created in 1972 for a peaceful accommodation between Taiwan and the mainland. He urges America to push Taiwan to negotiate a settlement now, to avoid a war, though he concedes that Chinese rulers would roll back some democratic freedoms in Taiwan. "The most likely course of events is tragic," Mr Freeman says.

Trade and people-to-people exchanges were an afterthought in 1972, says Nicholas Platt, a diplomat on Nixon's trip who later served in America's first liaison office in China. In time "those more mundane issues became the relationship," he says, driven by "the power of curiosity" between America and China. Drawing China out was a noble goal in 1972. It remains one. But curiosity between China and the West is fading. A sad anniversary looms. ■



Welfare in poor countries

Just keep us alive

KAMPALA, NEW DELHI AND SÃO PAULO

The pandemic has prodded the governments of some poor countries to rethink how they should provide welfare

FRADIA BULAGE, a school nurse in Kampala, Uganda's capital, says the 100,000 shillings (\$29) the government gave her last year through a scheme to help the country's poorest 500,000 households was not nearly enough. The one-off payment amounted to about a week of her pre-pandemic salary. Her school, like all Uganda's, had been closed for the best part of two years, due to covid-19 lockdowns, and reopened only last month. Strapped for cash, she stopped paying utility bills. Instead of turning on the tap she bought water by the jerrycan; for light she relied on candles. Her mother, who lives in a village, sent cassava in the hope of saving Ms Bulage's household from hunger.

Still, Ms Bulage is luckier than many Ugandans. Barbra Nakyeyune, who runs a liquor shop nearby, was badly hit by the dusk-to-dawn curfew under covid, so she too registered for the handout. "But we never got any money," Ms Nakyeyune says. "Not even a message apologising." She was

afraid she wouldn't be able to afford the fees for her children's education when schools reopened.

Nearby, in an office piled high with bundled documents, Geoffrey Kirabira, the local boss at the lowest rung of government, explains what went wrong. It was a Thursday evening, he recalls, when he was told to draw up lists of beneficiaries by Monday. Who should get help? Uganda has no central database whereby the poorest of the country's 46m people can be identified. "Who do you leave out?" he asks.

Around the world, covid and the restrictive measures that have been imposed to limit its spread pushed about 110m people into extreme poverty in 2020, says the World Data Lab, a Vienna-based firm funded by the German government that collates statistics from UN agencies, the IMF and the World Bank. It calculates the figures to be around 30m in sub-Saharan Africa, 9m in Latin America and 42m in India.

Covid has thrown hosts of Ugandans,

even from the middle class, into difficulties. Teachers, waiters, drivers and traders have all had lives shattered by the virus. "All are needy," says Mr Kirabira. The distribution of cash handouts, in any case derisorily small, was "haphazardly executed", he concedes. The payments, even if they had been fairly administered and well targeted, would have reached only the poorest 5-6% of households. Giving money to everyone would have been simpler, but far too expensive. More than a third of Ugandans live in extreme poverty (that is, on less than \$1.90 a day), according to the World Data Lab.

The Ugandan state collects about 400,000 shillings (\$110) of revenue per person a year. Even with the addition of loans and foreign aid, its budget is meagre. To give every adult a cash transfer of 100,000 shillings would have cost more than the entire annual health-care budget. Uganda has had a relatively low incidence of covid, with around 162,000 cases and 3,500 deaths reported so far. But the true figures are likely to be far higher; barely 4% of the population has been fully vaccinated, according to the Johns Hopkins University's covid tracker.

Existing social-protection schemes are paltry and narrowly targeted. At the start of the pandemic the government bolstered a grant to those over 80; after a pause for modifications, it now issues two lump-

► sum payments a year rather than monthly handouts. Such programmes, as in many parts of the poor world, require recipients to have national identification cards. Millions of Ugandans do not.

Some local officials simply registered their friends instead of the neediest. Opposition politicians complained that the ruling party benefited itself. Some bigwigs suggested that giving people free cash would make them lazy.

Uganda's tribulations illustrate many of the puzzles over how to save the very poorest from destitution and even death. Should schemes concentrate on the distribution of free food, which often skews markets and makes peasant farmers even poorer? Or is the straightforward transfer of cash a more reliable way of averting disaster, albeit in the short term?

If cash is best, how should it be distributed—in wads of paper money, by vouchers, or through mobile-phone payments, such as Kenya's m-pesa system? And how should the very poorest be identified and targeted, when millions of citizens, especially in sub-Saharan Africa, eke a living entirely outside central databases.

Worldwide some 2bn workers who make ends meet doing informal jobs such as hawking snacks and cleaning homes saw their livelihoods shrivel overnight, as social distancing and lockdowns came into force. As covid hit everyone more or less at once, many millions of people could no longer fall back on their usual last resort, such as loans from family and neighbours, or remittances from relatives abroad.

But the World Bank, among others, spies some glimmers of improvement. Poverty may now be falling slightly again, as governments distribute vaccines and economic activity resumes. Some poor countries have provided emergency assistance to the poor with unprecedented speed. In the first year of the pandemic the World Bank counted more than 3,300 new welfare programmes, roughly a quarter of which have been in poor countries.

All told, the world's governments have spent almost \$3trn on covid-related welfare schemes between the start of the pandemic and May last year, at least four times as much as during the global financial crisis of 2008-09. The vast majority of the spending—87%—was in rich countries. The very poorest ones accounted for just 0.05% (see chart 1).

But even governments of similar means have varied in their generosity. Latin American ones spent \$90bn on emergency transfers in 2020, falling to \$45bn in the first ten months of 2021. Argentina has lavished 5.3% of GDP on its struggling citizens. Mexico, by contrast, has been relatively stingy, shelling out less than 1% of GDP in extra spending and revenue forgone, according to the IMF.

To them that hath...

Global welfare spending during covid-19
By income group, Mar 2020-May 2021, \$bn



Some poor-country governments have built new welfare programmes from scratch. Togo, for example, has been praised for getting a digital cash-transfer scheme off the ground in just ten days. Citizens could register for the scheme with a mobile phone. Many of Togo's poorest people work in informal jobs outside the tax system. The government identified them by perusing a recent voters' register, which included information on what people do and where they live, then created mobile wallets, into which it began depositing about \$20 a month. For a dirt-poor country of under 9m people with a GDP per person of only \$2,223 a year even after adjusting for the low cost of living, that is quite an achievement.

Uncowed by cash

Other African countries have expanded cash-transfer schemes with rare speed. One in Angola went from covering about 5,800 people before covid to more than 7.7m. In Madagascar coverage rose from 192,000 of its 28m people to about 2m.

Since long before the virus struck, development economists have argued about the best methods to raise the poor out of poverty, not to mention how to rescue them in times of emergency. Brazil's Bolsa Família, which has been credited with reducing the country's poverty rate by a quarter, has helped build a consensus that cash is generally the most efficient way to help

the poor without skewing markets, as handouts of food and guarantees of employment often do. At the same time, subsidising staples, such as bread and rice, or fertilisers and essential fuels, such as petrol and kerosene, is increasingly frowned upon, partly because this cossets the middle class as well as the poor, and so punches big holes in national budgets.

Bolsa Família (now renamed) is a conditional cash-transfer scheme that requires recipients to show that their children get regular health check-ups and go to school. From 2003 to 2010 it grew into the largest such scheme in the world, with more than 30m Brazilians escaping poverty by 2014 out of a population that then numbered 203m. The benefits have been paid mainly to women, by a chip card.

When the virus struck, Brazil's populist right-wing government under Jair Bolsonaro announced that it would pay 600 reais (then worth \$112) a month to 68m Brazilians, a third of the population, in what it called *auxílio emergencial* (emergency aid). Single mothers got twice as much. Including job-retention schemes, the overall cost of assistance was 8% of GDP. The government has since pared its generosity, but by last October 35m Brazilians still benefited..

A number of governments in Africa, even though they have comparatively tiny economies from which to fund such payments, have been inspired by Brazil's example. Even before the pandemic they had made big steps towards setting up welfare programmes. In 2013 Senegal started to distribute cash to the poorest households in a scheme that covers about 20% of the population of 17m. Tanzania's main welfare policy, known as the Productive Social Safety Net, created in the same year, now helps over 1m households. Recipients earn extra cash as labourers on public-works projects or for ensuring that their children go to school and health clinics. Uganda is piloting a cash-for-work scheme in the north-western town of Arua.

One lesson from the pandemic is that cash, however, is not always a panacea. It is of limited use when shops are shut or supply-chain disruptions send the price of basic goods soaring. Housewives in the slums of New Delhi have another worry: when they are given food, they tend to use it immediately to feed their children, but if the government hands out money, landlords and creditors immediately come knocking. Besides, cash handouts can take a long time to reach the very poor. One study of 53 low- and middle-income countries found it took an average of 107 days from the first reported case of covid until the first payments were made.

Even when cash-transfer programmes are up and running in poor countries, the funds on offer are usually measly. Many governments are limited in what they can

Helping hands

Global welfare during covid-19
Cumulative number of measures, '000



► spend because they are heavily in debt—some on the brink of default—or have puny tax bases. Since covid hit India, its government has made three rounds of cash payments into 200m women’s accounts. Each payment, however, was only 500 rupees (\$6.70), barely enough for a few meals for a family in a city like Delhi. In the Republic of Congo the cash transfers can be as low as 5,000 CFA francs (\$8.56) a month. New cash-transfer schemes worldwide have lasted on average for just four months.

Just get it there

However miserly or generous handouts are, there is still the problem of distributing them. Technology, naturally, can speed up delivery. Within months of the virus’s arrival in Thailand, the government had managed to register 23m farmers and informal workers, over half the working-age population, for a new scheme. Around 6m of South Africa’s 59m people registered online for a pandemic-aid programme within a few weeks of its inauguration.

Some governments continue to rely on low-tech ways to distribute money. But the pandemic revealed new flaws with that. The Peruvian authorities moved fast to proffer emergency cash when the virus hit but eschewed digital transfers. The long queues of people at branches of the state bank, however, rapidly turned into super-spreaders. Peru had one of the world’s highest death rates from covid.

Other new cash-transfer schemes, especially in sub-Saharan Africa, rely on digital payments. Yet these often exclude the neediest. Over half the world’s population does not use mobile internet. Around 6%, mostly in poor countries, live in areas without any broadband coverage. Getting online can be much too expensive for those living in penury.

The very poor, especially women and the old, tend to lack the most basic tech skills. In New Delhi, Amrita Johri of Satark Nagrik Sangathan, a citizens’ group, spent days helping poor families sign up for emergency food handouts during India’s long lockdown. The process involved filling in a form online, getting a one-time password sent to a mobile phone, photographing the beneficiary’s government identity card, then converting it to the right file format before uploading it. This can baffle even a boffin, says Ms Johri.

In another Delhi slum a woman called Kandadevi, who knows neither her age nor family name, has paid middlemen hundreds of rupees to help her register on Aadhaar, India’s pioneering biometric identity system, to help her get government assistance and a vaccination. Another poor woman, Arpana Haldar, cannot get food handouts for her family because she, like everyone else living in similar shacks, has no proof of address.

Some countries have been adept at finding ways around such obstacles. Namibia’s government let up to ten applications for emergency aid to be submitted through a single sim card, so that households without a mobile phone could borrow from neighbours. South Africa’s said it would send volunteers into poor townships to help people apply for aid.

In any case, it is exceedingly hard for governments to identify precisely who most deserves help, however delivered, especially when the pot is small. Some development specialists are against “poverty-targeting”, whereby governments try to identify the very poorest by means-testing. Shahra Razavi of the International Labour Organisation (ILO) says unduly tough eligibility rules “erect barriers that people have to jump through to get peanuts at the end”.

Technology can help with selecting beneficiaries. Togo’s government has expanded cash handouts beyond informal workers as lockdowns have been lifted. It has used whizzy methods to find needy households, such as satellite imagery to identify the poorest communities based on population density. It has used algorithms and anonymous mobile-phone records to assess individuals’ consumption and thus how poor they are.

But narrowly targeting programmes can be expensive. The ILO reckons that the cost of selecting beneficiaries soaks up between 10% and 15% of the value of the handouts, not counting any waste from graft. And even then, the administrators often miss the worst off in poor countries, like Uganda, which have incomplete tax and payroll databases.

Some poor governments try to simplify things by offering benefits for particular categories of people. Many countries, such as Bolivia, give specific handouts to preg-

nant women, the elderly or the disabled—all easily identifiable groups. Others have set up “self-targeted” schemes, such as India’s rural employment guarantee, whereby gruelling manual work is offered with low pay, so there is little risk of the well-off signing on. Last year this provided paid work to 112m people, many of whom would otherwise have been destitute.

All this heartening experimentation and innovation encompassed by new welfare schemes in the poor world, however, does not fix their fundamental flaw: there is not enough money behind them. The amounts of cash dished out in the poorest countries, mainly in Africa, remain minuscule. Whereas rich countries spent \$847 per person to provide extra benefits, over the first year or so of the pandemic, the World Bank reckons, 17 of the poorest countries spent a pitiable \$4 per person.

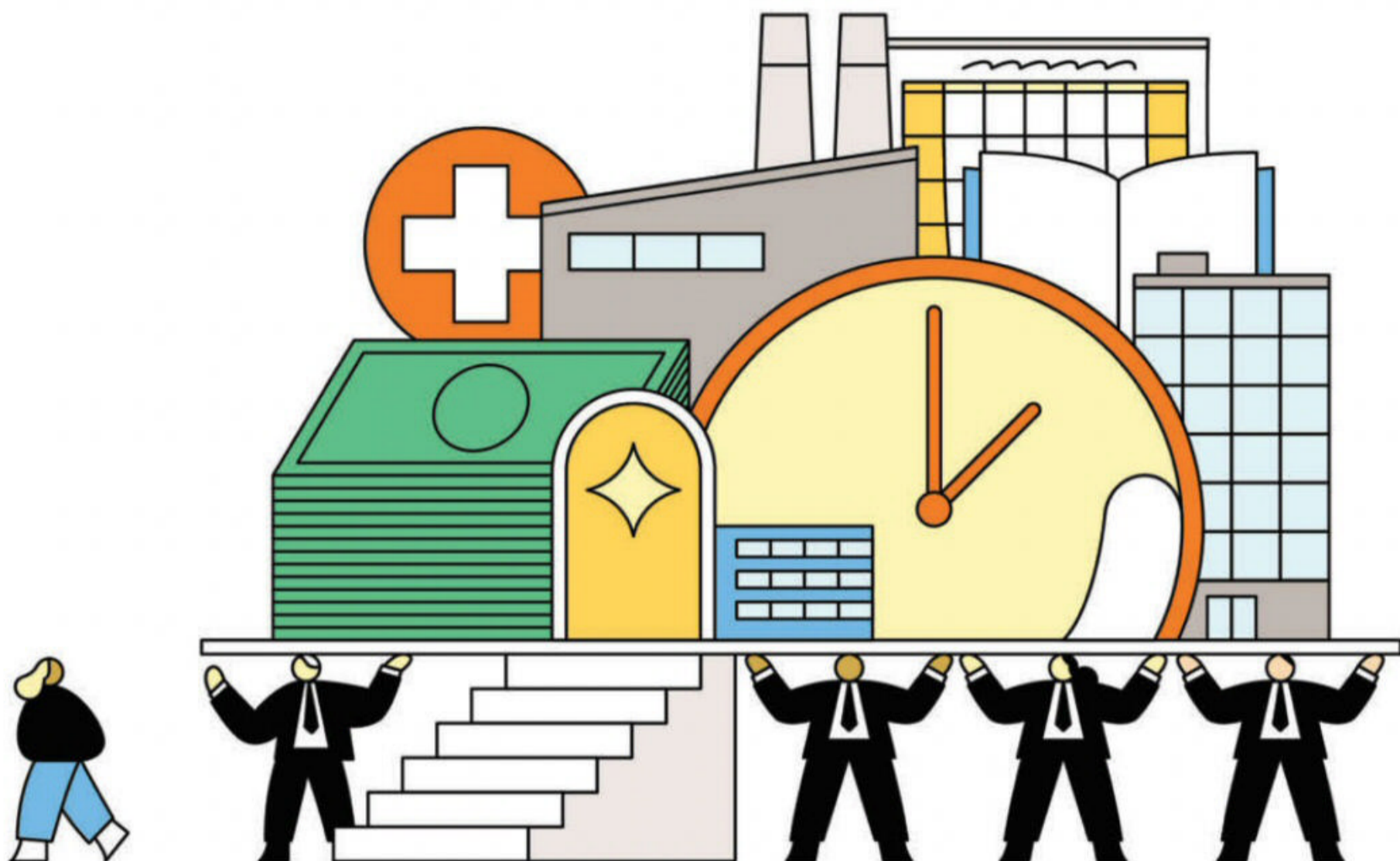
Beware of cheery statistics

Regional data often disguise this grim reality, since the poorest countries tend to be bundled up statistically with middle-income places. In Africa, for instance, Egypt, Morocco and South Africa skew the numbers on average welfare spending. The World Bank concedes that its estimates, though probably the best available, have gaps. It has full financial data for only about 15% of the welfare programmes it tracks. And its sample includes only 33 out of Africa’s 48 sub-Saharan countries. Most of the missing ones are so poor they struggle to collect proper data.

Still, it is good that governments in countries blighted by poverty have been pondering how to build welfare systems, in some cases virtually from scratch. If covid has prodded them into thinking more flexibly, it is a rare benefit of the dreadful plague. Let it be seized. ■



Nimble fingers and big brains needed



Business and labour (1)

Talent wars

BUFFALO

Companies are falling over themselves to attract workers—and reshaping American business in the process

DCL LOGISTICS, like so many American firms, had a problem last year. Its business, fulfilling orders of goods sold online, faced surging demand. But competition for warehouse workers was fierce, wages were rising and staff turnover was high. So DCL made two changes. It bought robots to pick items off shelves and place them in boxes. And it reduced its reliance on part-time workers by hiring more full-time staff. “What we save in having temp employees, we lose in productivity,” explains Dave Tu, DCL’s president. Full-time payroll has doubled in the past year, to 280.

As American companies enter another year of uncertainty, the workforce has become bosses’ principal concern. Chief executives cite worker shortages as the greatest threat to their businesses in 2022, according to a survey by the Conference Board, a research organisation. On January 28th the Labour Department reported that firms had spent 4% more on wages and benefits in the fourth quarter, year on year, a rise not seen in 20 years. Paycheques of

everyone from McDonald’s burger-flippers to Citigroup bankers are growing fatter. This goes some way to explaining why profit margins in the S&P 500 index of large companies, which have defied gravity in the pandemic, are starting to decline. On February 2nd Meta spooked investors by reporting a dip in profits, due in part to a rise in employee-related costs as it moves from Facebook and its sister social networks into the virtual-reality metaverse.

At the same time, firms of all sizes and sectors are testing new ways to recruit, train and deploy staff. Some of these strat-

egies will be temporary. Others may reshape American business.

The current jobs market looks extraordinary by historical standards. December saw 10.9m job openings, up by more than 60% from December 2019. Just six workers were available for every ten open jobs (see chart 1 on next page). Predictably, many seem comfortable abandoning old positions to seek better ones. This is evident among those who clean bedsheets and stock shelves, as well as those building spreadsheets and selling stocks. In November 4.5m workers quit their jobs, a record. Even if rising wages and an ebbing pandemic lure some of them back to work, the fight for staff may endure.

For decades American firms slurped from a deepening pool of labour, as more women entered the workforce and globalisation greatly expanded the ranks of potential hires. That expansion has now mostly run its course, says Andrew Schwedel of Bain, a consultancy. Simultaneously, other trends have conspired to make the labour pool shallower than it might have been. Men continue to slump out of the job market: the share of men aged 25 to 54 either working or looking for work was 88% at the end of last year, down from 97% in the 1950s. Immigration, which plunged during Donald Trump’s nativist presidency, has sunk further, to less than a quarter of the level in 2016. And covid-19 may have prompted more than 2.4m baby boomers ▶▶

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into early retirement, according to the Federal Reserve Bank of St Louis.

These trends will not reverse quickly. Boomers won't sprint back to work en masse. With Republicans hostile to outsiders and Democrats squabbling over visas for skilled ones, a surge in immigration looks unlikely. Some men have returned to the workforce since the depths of the covid recession in 2020, but the male participation rate has plateaued below pre-pandemic levels. A tight labour market may persist.

Both workers and employers are adapting. For the most part, they are doing so outside the construct of collective bargaining. Despite a flurry of activity—Starbucks baristas in Buffalo and Amazon workers in Alabama will hold union votes in February—unions remain weak. Last year 10.3% of American workers were unionised, matching the record low of 2019. Within the private sector, the unionisation rate is just 6.1%. Strikes and pickets will be a headache for some bosses. But it is quits that could cause them sleepless nights.

Pay as they go

Companies' most straightforward tactic to deal with worker shortages is to raise pay. If firms are to part with cash, they prefer the inducements to be one-off rather than recurring and sticky, as with higher wages. That explains a proliferation of fat bonuses. Before the Christmas rush Amazon began offering workers a \$3,000 sign-on sweetener. Compensation for lawyers at America's top 50 firms rose by 16.5% last year, in part thanks to bonuses, according to a survey by Citigroup and Hildebrandt, a consultancy. In January Bank of America said it would give staff \$1bn in restricted stock, which vests over time.

But base pay is rising, too. Bank of America says it will raise its minimum wage to \$25 by 2025. In September Walmart, America's largest private employer, set its minimum wage at \$12 an hour, below many states' requirement of \$13-14 but well above the federal minimum wage of \$7.25. Amazon has lifted average wages in

its warehouses to \$18. The average hourly wage for production and nonsupervisory employees in December was 5.8% above the level a year earlier; compared with a 4.7% jump for all private-sector workers. Firms face pressure to lift them higher still. High inflation ensured that only workers in leisure and hospitality saw a real increase in hourly pay last year (see chart 2).

Raising compensation may not, on its own, be sufficient for companies to overcome the labour squeeze, however. This is where the other strategies come in, starting with changes to recruitment. To deal with the fact that, for some types of job, there simply are not enough qualified candidates to fill vacancies, many businesses are loosening hiring criteria previously deemed a prerequisite.

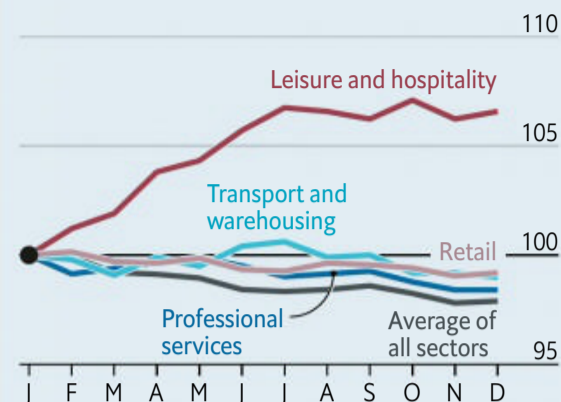
The share of job postings that list "no experience required" more than doubled from January 2020 to September 2021, reckons Burning Glass, an analytics firm. Easing rigid preconditions may be sensible, even without a labour shortage. A four-year degree, argues Joseph Fuller of Harvard Business School, is an unreliable guarantor of a worker's worth. The Business Roundtable and the US Chamber of Commerce, two business groups, have urged companies to ease requirements that job applicants have a four-year university degree, advising them to value workers' skills instead.

Another way to deal with a shortage of qualified staff is for firms to impart the qualifications themselves. In September, the most recent month for which Burning Glass has data, the share of job postings that offer training was more than 30% higher than in January 2020. New providers of training are proliferating, from university-run "bootcamps" to short-term programmes by specialists such as General Assembly and big employers themselves. Employers in Buffalo have hired General Assembly to run data-training schemes for local workers who are broadly able but who lack specific tech skills. Google, a technology giant, says it will consider workers who earn its online certificate in data analytics, for example, to be equivalent to a worker with a four-year degree.

Besides revamping recruitment and training, companies are modifying how their workers work. Some positions are objectively bad, with low pay, unpredictable scheduling and little opportunity for growth. Zeynep Ton of the MIT Sloan School of Management contends that making low-wage jobs more appealing improves retention and productivity, which supports profits in the long term. As interesting as Walmart's pay increases, she argues, are the retail behemoth's management changes. Last year it said that two-thirds of the more than 565,000 hourly workers in its stores would work full time,

Waiting for more

United States, real wages
Selected sectors, January 2021=100



Source: Bureau of Labour Statistics

up from about half in 2016. They would have predictable schedules week to week and more structured mentorship. Other companies may take note. Many of the complaints raised by labour organisers at Starbucks and Amazon have as much to do with safety and stress on the job as they do wages or benefits.

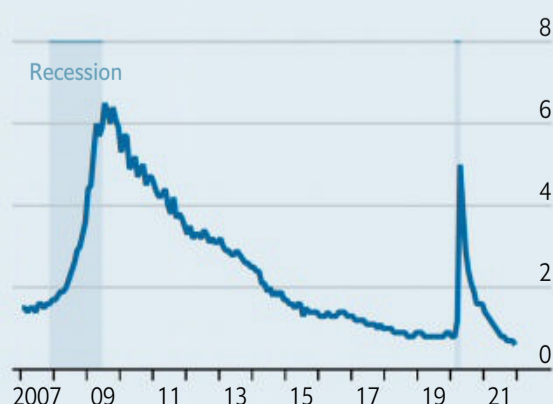
Companies that cannot find enough workers are trying to do with fewer of them. Sometimes that means trimming services. Many hotel chains, including Hilton, have made daily housekeeping optional. "We've been very thoughtful and cautious about what positions we fill," Darren Woods, boss of ExxonMobil, told the oil giant's investors on February 1st.

Increasingly, this also involves investments in automation. Orders of robots last year surpassed the pre-pandemic high in both volume and value, according to the Association for Advancing Automation. UPS, a shipping firm, is boosting productivity with more automated bagging and labelling; new electronic tags will eliminate millions of manual scans each day.

New business models are pushing things along. Consider McEntire Produce in Columbia, South Carolina. Each year more than 45,000 tonnes of sliced lettuce, tomatoes and onions move through its factory. Workers pack them in bags, place bags in boxes and stack boxes on pallets destined for fast-food restaurants. McEntire has raised wages, but staff turnover remains high. Even as worker costs have climbed, the upfront expense of automation has sunk. So the firm plans to install new robots to box and stack. It will lease these from a new company called Formic, which offers robots at an hourly rate that is less than half the cost of a McEntire worker doing the same job. By 2025 McEntire wants to automate 60% of its volume, with robots handling the back-breaking work and workers performing tasks that require more skill. One new position, introduced in the past year, looks permanent: a manager whose sole job is to listen to and support staff so they do not quit. ■

Help needed

United States, number of unemployed people per job opening



Source: Bureau of Labour Statistics

Business and labour (2)

Depopulation pressure

BERLIN

How German companies court employees

HOYERSWERDA, BAUTZEN, KAMENZ and Radeberg are cities in the eastern German state of Saxony that lost tens of thousands of inhabitants, especially the young and the educated, after the collapse of communism. Once a coal-mining hub, Hoyerswerda has seen its population shrink from 70,000 inhabitants in 1985 to 32,000; the average burgher is 53 years old. In all four cities baby boomers are retiring or preparing to. Worried about staff shortages, in 2019 the quartet's city halls and two dozen local employers launched the "late shift" programme. It involves busing local teenagers around factories, workshops and offices in the afternoons to encourage them to sign up for an apprenticeship.

Worker shortages are a huge problem in Germany. The country's workforce may peak soon in absolute terms and could shrink by up to 5m by 2030. Covid-19 has made the problem worse. Early in the pandemic, lockdowns and a recession meant that lots of German companies had too many workers, plenty of whom ended up in state-supported furlough schemes. As the economy has reopened, they find themselves with too few.

And co-opting new staff is only getting harder. Employees, especially young ones, increasingly seek greater security. Having watched some lines of business such as hotels or airlines shut down almost entirely, they would prefer a safe job in public administration over the private sector, says Zuzanna Blazek at the German Economic Institute, a think-tank.

Last October 43% of firms said their business was suffering because of the lack of skilled labour, up from 23% a year earlier and the most since German reunification in 1990, according to a survey of 9,000 companies by KfW, the state development bank, and Ifo, a think-tank. Services were hardest hit, followed by manufacturing. The shortage of skilled workers is now so serious that it is "dramatically slowing down our economy", warned Christian Dürr, a leader of the pro-market Free Democrat Party, last month. He thinks Germany needs to attract about 400,000 immigrant workers per year to soften the economic impact of an ageing society.

Even though many Germans share Mr Dürr's pro-immigration stance, his goal cannot be met overnight. Because German companies need employees now, they are pulling out all the stops to come across as

an attractive place to work. Some of their efforts look similar to what is happening in places like America (see previous article). Many are extensions of existing schemes designed to stave off the spectre of a shrinking workforce.

The obvious—and universal—way to secure enough employees is to pay them more. Since German workers are already among the best-paid in the world, companies have little room for manoeuvre. Still, rises are coming. The new government is increasing the statutory minimum wage in several steps from €9.60 (\$10.10) in 2021 to €12 by the end of the year. Higher earners can count on a modest increase, too. In a poll published last month, Ifo found that 78% of companies expect wages to go up this year, by an average of 4.7%—in line with union demands of around 5% and above the 3.3% inflation forecast the federal government has for 2022.

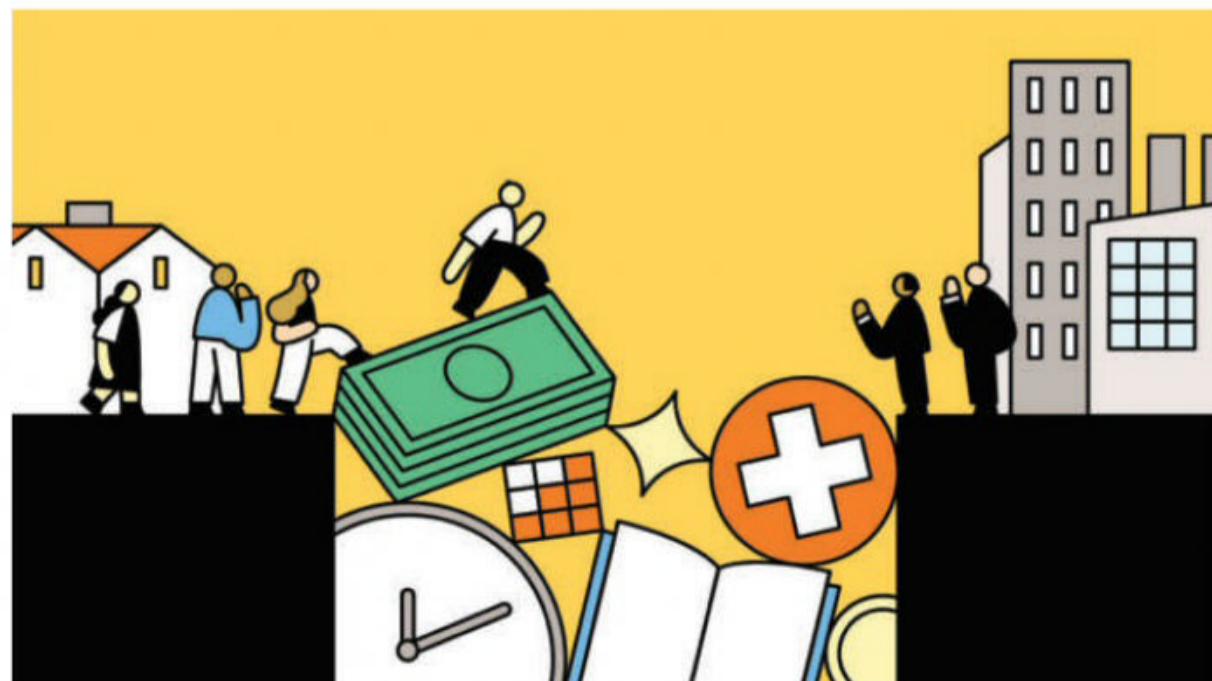
Social engineering

Another popular pandemic strategy around the world is for employers to offer more flexible work arrangements. Allianz, a big insurer, has launched a new "ways of working" programme that includes options such as working remotely at least 40% of the time, up to 25 days a year abroad and travelling significantly less for business. Some German firms are taking this to the extreme. Bosch, an engineering conglomerate, lets workers pick one of 100 models of working hours. It has extended job-sharing, where two people divvy up responsibilities so that each can work part-

time, to senior management positions.

Like their counterparts in other rich countries, employers are also advertising their concern for employees' well-being. They have long offered help with child care. Bosch and Siemens, another industrial giant, both run day-care centres for employees' offspring. Now they are expanding the range of assistance. Bosch has spent €75m on a health centre at its headquarters in Abstatt where employees have access to counselling, physiotherapy, a gym and a climbing wall. Delivery Hero, an online food-delivery firm based in Berlin, offers workers virtual yoga classes, gym memberships, accounts at Headspace, a meditation firm, and subsidised bike rentals. Allianz lets staff take "focus time" where no meetings are scheduled, and its "global meeting etiquette" limits meetings to 25 or 50 minutes and allows for a break between calls. In addition, it provides mental-health support, including to employees who prefer to remain anonymous.

Deutschland AG is also leaning ever more heavily on its world-renowned training and apprenticeship schemes. Bosch works closely with prestigious institutions such as the Technical University of Munich and the Institute for Technology in Karlsruhe, where its representatives hold lectures and other events for students, as well as offering them internships and training. Allianz encourages employees to devote an hour of work time a week to take one of more than 10,000 courses, from graphic design to big data. Siemens spends €175m a year on training and retraining its workers in Germany (plus nearly as much doing so in its overseas operations). On top of that, it currently offers 3,700 domestic apprenticeships, considerably more than a few years ago. Smaller firms have fewer resources but no less get-up-and-go. Despite operating in Germany's most depopulated region, Saxony's late-shifters, all of which are medium-sized, have so far managed to fill their vacancies. ■



The snow business

Avalanche risk

Will the money ploughed into China's ski industry melt away?

IN MUCH OF the world the business of running ski slopes has, like most of tourism, been crippled by lockdowns and travel restrictions. China is no exception. Visits to Chinese ski areas slumped by 38% in 2020—steeper than a global decline of 14% after covid-19 hit. Two in five winter-sports businesses lost more than half their revenue as a result of anti-virus measures, according to the Beijing Olympic City Development Association, an official group set up to champion sport. One in 14 ski areas, especially small ones, gave up the ghost in 2020. As China prepares to host the Winter Olympics, which open in Beijing on February 4th, its ski-industrial complex is hoping that this celebration of all pursuits below freezing will mark the end of a short-lived icy patch.

Unlike Europe and America, where the winter-sports sector's downhill slide predates the pandemic, Chinese skiers were taking to the slopes in record numbers. The Beijing Ski Association says that people paid more than 20m visits to China's ski venues in 2019, twice as many as in 2014. Eileen Gu, a teenager raised in San Francisco who has chosen to represent China, where her mother was born, in freestyle skiing, has recalled that just a few years ago she knew virtually all the freestyle skiers in the country. Now the gold-medal contender suggests they are like snowflakes in a blizzard.

Investors have been swept up, too. China had nearly 800 ski areas before the pandemic, four times the number in 2008 and not a world away from around 1,100 in the Alps, where they began popping up around 1900. Though the Chinese areas still have many fewer lifts than Western ones, they are getting more sophisticated. Some now offer summer pastimes like mountain-biking, hiking and rafting. China's 36 indoor ski centres—it has more of these than any other country—accounted for a fifth of all ski visits in the country in 2020. Sunac China is the world's largest operator of such venues. Indoor ski slopes contributed to the success of the developer's culture-and-tourism business (which also includes malls, water-sports venues and hotels), where revenues grew by 166% year on year in the first half of 2021.

Even so, Chinese ski-resort operators are vulnerable to two industry-wide uncertainties. The first is climate change. Since milder temperatures mean less snow, ski

resorts everywhere are hostage to global warming. Doubts over sufficient snowfall have prompted Olympic organisers this year to rely entirely on artificial snow for the first time. But making the white stuff artificially uses an awful lot of water—a scarce resource in China's drought-prone north, home to half its population and most of its resorts. The Olympic games alone may need 2m cubic metres—enough to fill 800 Olympic-size swimming pools—to produce sufficient snow cover, according to Carmen de Jong, a hydrologist at the University of Strasbourg. Officials reckon the event will use up to a tenth of all water consumed during the ski events in the Chongli district, which will host them. Indoor slopes, for their part, need less snow but all of it is artificial.

The second uncertainty has to do with future demand. China still has room to catch up with big skiing nations. Chinese skiers hit the slopes once a year in the winter of 2020-21, on average, compared with half a dozen times for those in Austria or Switzerland. Optimists also point out that many Chinese skiers are young, and so in principle have plenty of skiing left in their legs; whereas in America more than one-fifth of skiers are over 55, about 80% of China's are under 40 years old, according to Laurent Vanat, a consultant on the global ski industry.

However, precisely because China lacks a strong tradition of skiing, absolute beginners are exceptionally common on its pistes. Around 80% of skiers in China are first-timers this season, up from 72% in 2019, according to Mr Vanat. In Europe and America the share is less than 20%. China's ski industry is counting on a strong showing from Ms Gu and the rest of the national team to convert such neophytes into regulars. Like her, though, resort owners face tough terrain ahead. ■



Ready for a bumpy ride

Spotify v singers

Blockin' in the free world

A controversial podcaster kicks off a new battle on content moderation

NEIL YOUNG was five years old when, in 1951, he was partially paralysed by polio. Joni Mitchell was nine when she was hospitalised by the same illness around the same time. Both grew up to become famous singers—and, lately, prominent campaigners against anti-vaccine misinformation. The two musicians, followed by a handful of others, have withdrawn their music from the world's biggest streaming service in protest at a podcast that gave airtime to anti-vaxxers.

“The Joe Rogan Experience”, to which Spotify bought exclusive rights in 2020 for a reported \$100m, hosted vaccine sceptics and promoted dubious remedies such as ivermectin, which Mr Rogan himself tried out when he caught covid last year. At the time of writing Mr Rogan, Spotify's most popular podcaster, had promised to “balance things out” in future interviews, but was still on air, to the irritation of his critics (including some Spotify staff, who in the past have accused him of sins including transphobia). Mr Young, Ms Mitchell and a few others were holding out.

The bust-up looks like a gift to Spotify's rivals. Yet it has raised questions about content moderation which could prove tricky—and rather expensive—for all audio-streaming platforms.

As the biggest streamer, with 180m paid subscribers, Spotify has power over artists. Mr Young says he gets about 60% of his streaming income there. A rough calculation by Will Page, a former Spotify chief economist, based on figures from MRC, a data firm, suggests the musician stands to lose about \$300,000 this year if he continues his boycott (though it seems that, for now, streaming of his songs is up by about 50%, owing to more plays on other platforms amid publicity from the spat). But Spotify, too, is vulnerable. On February 2nd it warned of slowing subscriber growth, sending its share price tumbling. Its main rivals, Apple and Amazon, have market values some 70 and 40 times its own \$37bn, respectively, and bundle audio along with tv, gaming and more. Mr Young and Ms Mitchell are no longer A-list stars, but their departure undermines Spotify's claim to offer “all the music you'll ever need”. Apple and Amazon wasted no time in promoting the pair on their social-media feeds.

Nonetheless, the Rogan affair touches on a sensitive subject for all streamers. Unlike “The Joe Rogan Experience”, which is ▶▶

professionally produced and owned by Spotify, most of the tens of thousands of new podcasts and songs uploaded to the platforms every day are user-generated. Services like Spotify thus increasingly resemble social networks like YouTube. A big difference is that their oversight of what is uploaded seems primitive by comparison.

Spotify, a 16-year-old company, published its “platform rules” only after the Rogan controversy erupted. Apple has content guidelines for podcasts, but for music only a style guide that asks artists to flag explicit lyrics and to keep album artwork

clean. Amazon seems to have published even less by way of rules for audio content.

And whereas most social networks publish regular reports on what content they remove, the audio platforms are mute on the subject. Amid Rogagate, Spotify revealed it had deleted 20,000 podcast episodes over covid misinformation. The rest is guesswork. Facebook employs 15,000 content moderators. How many work for the audio streamers? None will say. (Insiders suggest the answer is not many.)

“It’s always been baffling to me how podcasts have flown under the content-

moderation radar,” says Evelyn Douek of Harvard Law School. “It’s a massive blind-spot.” It could also prove to be a pricey one. As audio platforms host more user-generated content, the moderation task will expand. It will probably involve lots of human moderators; automating the process with artificial intelligence, as Facebook and others are doing, is even harder for audio than it is for text, images or video. Software firms’ valuations “have long been driven by the notion that there’s no marginal cost”, says Mr Page. “Content moderation might be their first.” ■

Bartleby Body of research

Online working has changed the nature of non-verbal communication

COMMUNICATION IS AN essential part of leadership. And body language is an essential part of communication. On these slim pillars rests a mini-industry of research and advice into how executives can influence, encourage and ascend without needing to say a word. The pandemic has made much of it redundant.

Plenty of studies have looked into the non-verbal behaviour that marks out “emergent leaders”, people who do not have a specified role in the hierarchy but naturally assume a position of authority in groups. They are a bag of tics. They nod; they touch others but not themselves; they gesture; they furrow their brows; they hold themselves erect; their facial expressions are more animated.

Other research suggests that, to win votes in an election, candidates should deliver speeches with their feet planted apart. The second-most popular TED talk claims that two minutes of private, hands-on-hips “power posing” can infuse a job candidate with confidence and improve others’ perceptions of them.

Gazing can foster a sense of psychological safety as well as confer authority: in a recent paper, a trio of researchers from Harvard Business School found that receiving more eye contact from a bigwig led to greater participation in group interactions. Leaders who adopt open body positions, with arms and legs uncrossed, are also more likely to encourage contributions.

There are three problems with this body of research on non-verbal communication. One is that so much of it is blindingly obvious. Nodding at someone rather than shaking your head in incredulity when they are speaking to you—this does indeed send a powerful signal. But so does punching someone in the face, and no one thinks that requires a



journal publication.

A second problem is that people look for different things from their bosses. Frowning is seen as a mark of emergent leaders but not of supportive ones; the reverse is true of smiling. (The effect of smiling with lowered eyebrows cries out for study.) A recent paper found that male recipients regarded bosses who used emojis, a form of not-quite-verbal communication, in an email as more effective, but that female recipients perceived them as less effective.

The third problem is newer. Almost all of the research on body language dates from a time of in-person interactions. Even when the pandemic wanes and offices in the West refill, most buildings will not return to full capacity. Employees will keep working remotely for at least part of the week; Zoom will remain integral to white-collar working lives. And if there is one thing for which online interactions are not suited, it is body language.

That is partly because bodies themselves are largely hidden from view: whatever language they are speaking, it is hard

to hear them. You will know the partners, pets and home-decor choices of new colleagues before you will know how tall they are. And although faces fill the video-conferencing screen, meaningful eye contact is impossible.

Once past a basic threshold of attentiveness—not looking down at your mobile phone, say—most people have the same glassy-eyed stare. If several faces appear on screen, these participants have no way of knowing that you are gazing specifically at them. (Anyway, admit it: the face you are looking at with most interest is your own.) If your camera is in the wrong place, you may think you are looking meaningfully at your team but you are actually just giving them a view of your nostrils. Animated expressions are hard to spot, particularly when people attending hybrid meetings in the office are Lowry-like figures seated metres away.

There are no good ways to compensate for these problems. One tactic is to go all in on expressiveness, nodding furiously and gesturing dementedly—a small tile of caged energy somewhere in the bottom left-hand corner of the screen. Another is to do a “Zoom loom”, placing yourself so close to the camera that you will give everyone nightmares.

The simpler option is not to think too hard about body language. At a few specific moments, like job interviews and set-piece speeches, first impressions matter and a bit of self-conscious posing pays off. But posture is not leadership. If you want to give people a break from staring at a screen, turning off your camera is a good way to do it. If you want to waggle your eyebrows, up or down, let them loose. And if you need to be told that looking at someone makes them feel valued, you have bigger issues.



Schumpeter | Epic battle

How Sony can outmanoeuvre Microsoft in the console wars



FOR THE uninitiated, which includes your columnist, there are two things to know about video gaming. The first is that some things never change. For all the virtual worlds they can create, gamers, a mostly male bunch, like nothing better than to blow their on-screen opponents to smithereens. The second is that everything else is in flux. Gaming is moving from consoles, PCs and smartphones to streaming and the metaverse. It is not just avatars that are being shot to shreds. Business models are, too.

Bear both points in mind when making sense of recent deals involving the two biggest rivals in the console wars, Microsoft, maker of the Xbox, and Sony, producer of the PlayStation (Nintendo is in its own orbit). To cater to those itchy trigger-fingers, both want to expand their bestselling “first-person shooter” rosters. Microsoft’s \$69bn acquisition of Activision Blizzard, a publisher, would give the tech giant ownership of “Call of Duty”, one of the most successful shoot-’em-up franchises of all time. Sony’s \$3.6bn takeover of Bungie brings it “Destiny 2”, another popular shooter.

The large sums of money changing hands highlight the second point: that everything is up in the air, even the relative strength of each firm. For years Sony has had the advantage. Its latest consoles, PlayStations 4 and 5, have far outsold equivalent Xboxes. It has more exclusive games, which draw in fiercely loyal players. Yet Microsoft’s acquisition of Activision, if it fends off antitrust concerns, could alter the balance of power. According to Newzoo, a data-gatherer, it could put Microsoft’s game-software revenue ahead of Sony’s, even combined with Bungie. It underscores Microsoft’s commitment to a subscription and streaming service, funded by a mountain of cash and supported by its Azure cloud business. It reflects a willingness to be open to a range of devices and business models, including free-to-play games and ad-supported ones. It could, literally, be a game-changer.

Like Netflix in video, Microsoft hankers after vast subscriber growth. That fits with the current zeitgeist that everything in business, from media to Microsoft’s Office 365 programs, should be based on subscriptions, rather than one-time sales—and reliant on the cloud. But while it is tempting to think Sony should chase after Microsoft, it has neither the money to outspend it on content nor, despite a foray into streaming called ps Now, the infrastruc-

ture to compete with it in the cloud. The Bungie deal, which is big for Sony, makes the gap between the two companies’ financial firepower starkly clear. Thomas Aouad of Drawbridge Research, an analysis firm, likens it to taking a spoon to a gunfight rather than a knife. To outmanoeuvre Microsoft, Sony must do something different—and uncharacteristically bold.

For starters, it could make the case that streaming and subscription services are no guaranteed road to riches. Yes, streaming dispenses with the need for a costly console, which could draw in casual gamers. But unlike Netflix viewers, players interact with streamed material, often at speeds measured in the milliseconds when their fingers are on the trigger. Low latency, or lag, over an internet connection is a life-and-death matter for a player’s avatar.

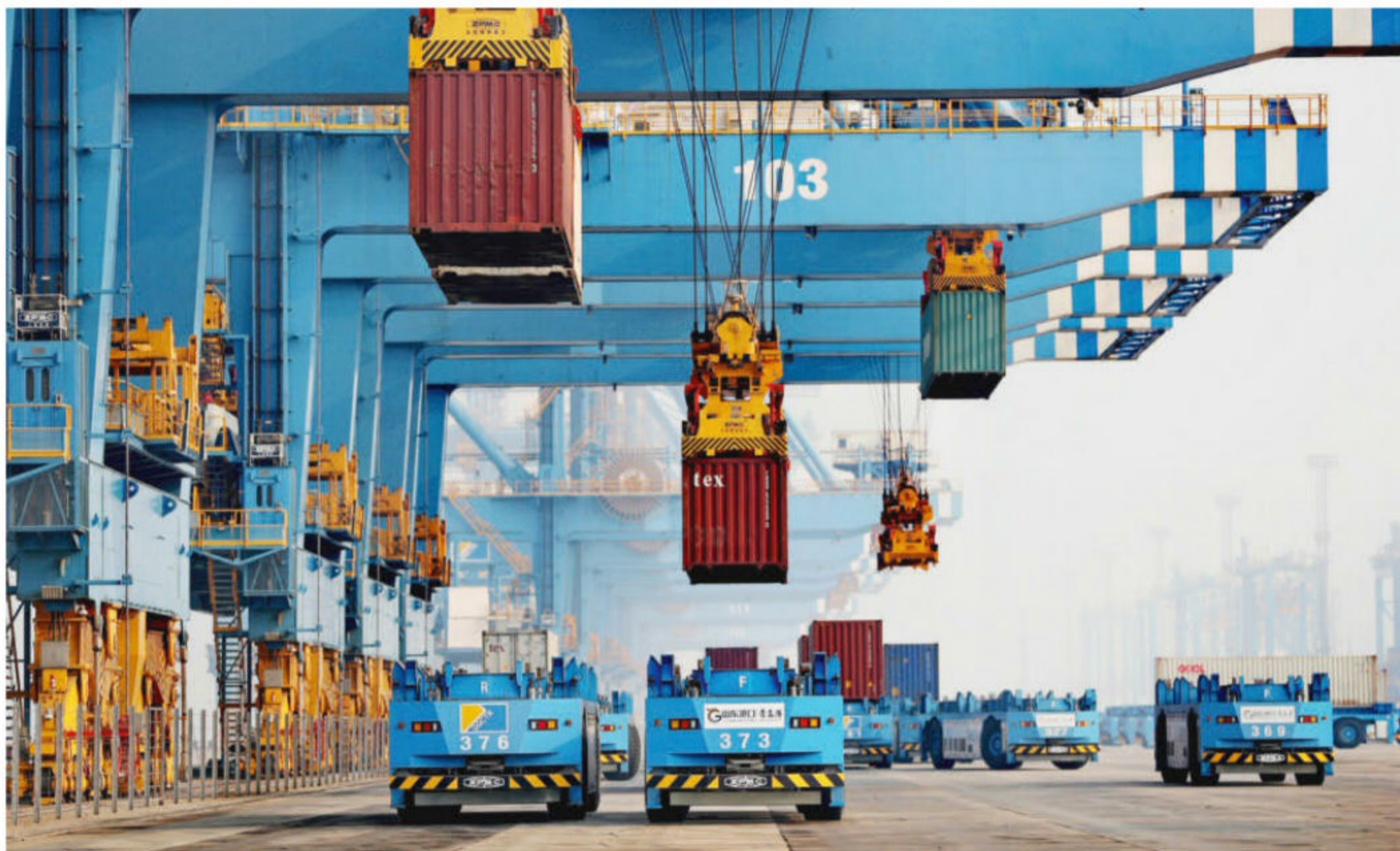
The business model is unproven, too. Sony and Microsoft have long used consoles as loss-leaders to sell high-margin games to which they often hold exclusive rights (think Gillette razors and razor blades). The approach has benefited their overall gaming businesses, as well as independent game developers. In contrast, selling blockbuster content via monthly subscriptions involves vast outlays and fewer barriers to entry. It may attract lots of new users. Microsoft’s Game Pass service, which grants access to a library of games to run on consoles for up to \$14.99 a month, has 25m subscribers; Netflix is getting into games. But such services could face brutal competition and need constant replenishing with blockbuster titles to reduce customer churn. Indeed, Sony, with a deep catalogue of music and films, has profited from being the source of such replenishment for video- and music-streamers.

As an alternative gaming strategy, on February 2nd it outlined plans to double down on “live service” games such as “Destiny 2”, which are regularly upgraded and hence easy to monetise. That is not enough, though. It also needs to outline a strategy that draws on its efforts to break down the silos between its gaming, music, film, electronics and image-sensor businesses. As Kato Mio, who publishes on Smartkarma, an investment-research site, puts it, while other firms, such as Meta, talk of building the metaverse, Sony already has many of the ingredients for immersive entertainment (including virtual reality) at its fingertips. It needs to turn its conglomerate structure into a virtue.

That means cross-fertilising its entertainment business, by releasing games as films, for instance. More ambitiously, it should put its cutting-edge technologies in better service of the future of entertainment. Here, its small stake in Epic, a maker of hit games such as “Fortnite”, and gamemaking technology such as Unreal Engine, could be a building block. If Tencent, a Chinese tech giant, were ever minded to sell its 40% stake in Epic, Sony should consider raising its investment. With Epic as a partner, Sony could hold its own much better against Microsoft.

Mutually assured destruction

In the near term, Sony needs a strong enough slate of content to retaliate if Microsoft tries to deprive the PlayStation of Activision titles (Microsoft says it won’t). It has other problems to confront, such as a slowdown in PlayStation 5 sales due to the supply-chain crunch, and game developers’ demands that console-makers cut the commissions they charge. In the longer run, Sony’s strength is that gaming, which accounts for over a quarter of its revenues, is crucial to its future. For Microsoft, it is less existential. That is an incentive to think big—and laterally. Sony has a panoply of entertainment and technology businesses to turn to, as well as a potential partner in Epic. To safeguard its future, it should do so. ■



Capital spending

The urge to splurge

Why the impressive pace of investment growth looks likely to endure

FOR YEARS after the global financial crisis the world economy was starved of investment. The aftermath of the covid-19 downturn has been drastically different. In America private non-residential investment is only about 5% below its pre-pandemic trend, compared with a shortfall of nearly 25% in mid-2010, the equivalent point in the previous economic cycle (see chart on next page). The country has enjoyed the fastest rebound in business investment in any recovery since the 1940s, according to Morgan Stanley, a bank. In the rich world as a whole, predicts the World Bank, total investment will have overtaken its pre-pandemic trend by 2023.

The lacklustre investment of the 2010s was largely blamed on slow output growth and dismal prospects for the economy. By contrast, the vibrant recovery this time is part of a v-shaped rebound encompassing growth, employment and—less happily—inflation. It helps, too, that investment fell less steeply than it did in 2008-09, even as GDP sank at rates not seen since the De-

pression. Economies shrank in spring 2020 mainly because consumption disappeared as people stayed home.

Yet the investment rebound is not purely a cyclical bounceback. The changes wrought by the pandemic have necessitated more investment, too. The extent to which such investment continues will depend on whether those changes endure. One feature of the pandemic, for instance, has been soaring demand for everything digital. As a result, investment in computers in America is 17% above its pre-covid

trend. Roughly a year ago the Taiwan Semiconductor Manufacturing Corporation announced that it would spend \$100bn over three years to expand its chipmaking output. In mid-January 2022 it upped the stakes, saying it would spend \$40bn-44bn this year alone. Days later Intel, another chipmaker, said it would invest more than \$20bn in two factories in Ohio.

Blockages in the global supply chain for goods have also led to a splurge on new capacity. In 2021 shipping companies ordered the equivalent of 4.2m twenty-foot containers—a record, according to Drewry, a consultancy. Perhaps the archetypal business investment of the pandemic is being made by logistics companies testing whether autonomous cranes can increase throughput at ports and rail terminals.

As the heat of crisis has passed, the pace of the investment rebound has subsided a little. A composite indicator built by JPMorgan Chase, a bank, suggests that global capital spending rose at a underwhelming rate of 2.2% in the fourth quarter of 2021. Economists have recently marked down their forecasts for global GDP growth in 2022 owing to the spread of the Omicron variant of coronavirus and the prospect of tighter monetary policy, both of which might weigh on bosses' willingness to splash out on risky projects.

There are, however, three reasons why business investment might be stronger in the 2020s than it was in the 2010s. The first ▶▶

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► is that companies are likely to keep spending on their supply chains as they seek to strengthen and diversify them. During the pandemic many have discovered the inconvenience of distant suppliers shutting down when lockdowns or staff shortages strike: factory closures in Vietnam last year, for instance, imperilled America's supply of tennis shoes and yoga pants. Firms must also cope with increasingly fraught geopolitics, which increases the chances of tariffs on trade and state meddling. This may not be good news for economic growth, because fragmentation means duplication and inefficiency. But it does mean tying up more capital.

The second reason to expect more investment is the growing optimism about the potential of new technologies to boost productivity growth. Not long ago economists fretted that the world was running out of useful ideas. Yet firms are increasingly betting on technological progress. Intellectual property now makes up 41% of America's private non-residential investment, compared with 36% before the pandemic and 29% in 2005. In 2021 the big five technology firms—Alphabet, Amazon, Apple, Meta and Microsoft—alone spent \$149bn on R&D.

Impressive technological advances are everywhere, from synthetic biology and the “messenger RNA” vaccines with which the world is battling covid-19, to areas such as virtual reality and decentralised finance. The advances in some frontier fields are headline-grabbing. In December Synchron, a medical-technology firm, revealed that a man with one of its chips implanted next to his brain's motor cortex had sent a tweet just by thinking it. In January surgeons announced that they had successfully implanted a pig's heart into a man for the first time.

The third force driving investment higher is decarbonisation. A number of countries, together making up 90% of the world economy, have pledged to reduce carbon emissions to net zero over the coming decades in order to fight climate

change. If that goal is to be achieved, the world will need everything from electric-vehicle charging infrastructure to battery storage and energy-efficient housing.

Punters are pouring money into green-tinted investment funds, the assets of which amounted to \$2.7trn in the fourth quarter of 2021, according to Morningstar, a data provider. Global investment spending on the transition away from fossil fuels reached \$755bn last year, about half of which was spent on renewable energy, according to BloombergNEF, a research firm. Spending on electric vehicles has risen particularly quickly, by 77% since 2020 to \$273bn, helped along by rapidly shifting consumer preferences and big orders from delivery and car-rental companies.

If net-zero targets are to be met, however, then the green-investment boom still has a long way to run. The Office for Budget Responsibility, Britain's fiscal watchdog, estimates that achieving the country's target by 2050 requires investment worth about 60% of its GDP today, three-quarters of which would have to be stumped up by the private sector. If that share were to apply across the rest of the rich world too, then its need for private-sector green investment would exceed \$20trn at present values. Other estimates of what is needed are higher still.

An investment boom is hardly nailed on. The mass upheaval of supply chains is still a subject that is more often talked about than seen in the statistics. There were plenty of notable advances in the previous economic recovery, which began only two years after the launch of the first iPhone in 2007. Yet investment remained tepid (perhaps because many new technologies seem not to need much capital). Net-zero targets could always be missed.

But the pay-offs to R&D investment, at least, may be rising. In a recent research note Yulia Zhestkova of Goldman Sachs, another bank, found that in America between 2016 and 2019 there was a positive correlation between an industry's investment in intellectual property and its la-

bour-productivity growth. It would not take much of a productivity revival to significantly boost the outlook for growth, which is being weighed down by population ageing (see Briefing). So-called total factor productivity growth, which measures increases in GDP that cannot be attributed to more capital or hours worked, averaged 1.2% a year between 1880 and 2020, notes Ms Zhestkova. By contrast, the figure was only about 0.5% in the 2010s. Simply returning to the historical average would create the prospect of a larger economy in the future, giving firms yet another reason to invest. ■

Economic warfare

Taking aim

America and Britain eye up tough economic sanctions on Russia

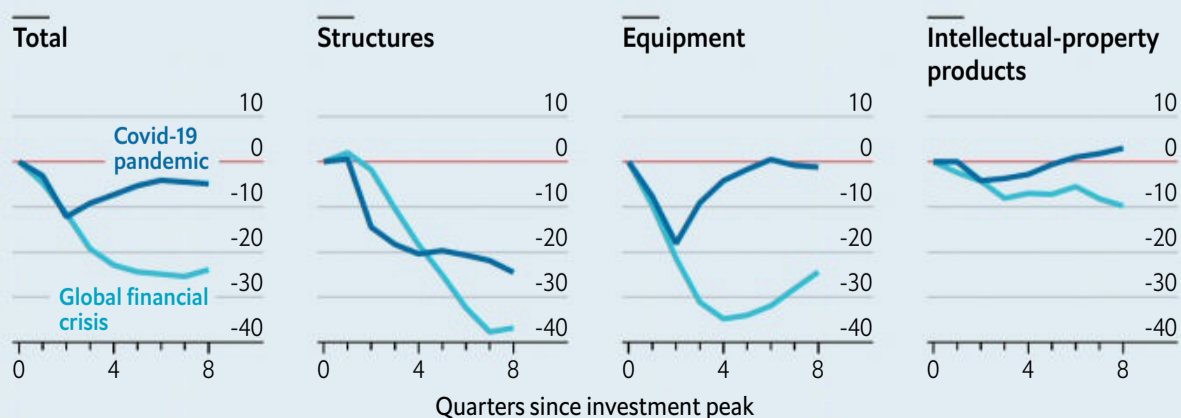
HAVING ALL but ruled out engaging militarily with Russia, directly at least, were it to invade Ukraine, the West's main weapons are economic. This week America and Britain vowed measures on a scale never seen before. “The mother of all sanctions”, was how Bob Menendez, chairman of the US Senate's foreign-relations committee, described the package being assembled by the chamber. President Joe Biden says Vladimir Putin, his Russian counterpart, has “never seen sanctions like the ones I promised will be imposed”. For sanctions to work, though, Western allies will need to show unity, and be willing to shoulder some economic pain themselves. History suggests that this may be their greatest challenge.

The Senate is expected to approve its package any day now. Some of the sanctions being drafted could be implemented before any invasion, in response to activities Russia has already undertaken, such as cyber-attacks. The administration's sanctions would target figures and companies in or close to Mr Putin's inner circle as well as the relatives they sometimes use as asset-owning proxies. The aim would be to cut targets off from the global financial system and go after money they have parked in the West.

Britain is working closely with America. On January 31st its foreign secretary, Liz Truss, announced a new sanctions law. The goal is to widen the group of Putin cronies who can be penalised. Britain has sanctioned 180 Russian individuals and 48 entities since Russia's annexation of Crimea in 2014. The new penalties, Ms Truss promised, can be slapped on anyone “providing strategic support” to Mr Putin's regime. ►►

Capital spending in the 21st century

United States, private non-residential investment, % change from five-year trend pre-crisis



Sources: Bureau of Economic Analysis; *The Economist*

▶ Britain's stance is closely watched because rich Russians have strong financial ties to the country. London is a key capital-raising centre for oligarchs and their companies.

These measures are expected to form part of a broader package of sanctions focused on finance, energy and technology. America may target Russian state-linked banks, including Sberbank, a savings giant. Mr Biden also wants to keep open the option, resisted by some European countries, of excluding Russian banks from SWIFT, the interbank messaging system used to make cross-border transfers.

In energy, the talk in Washington is of broadening sanctions to target not just current production but investment, too. One way would be to restrict capital-raising by Russian oil-and-gas giants in New York and London. America has also threatened to prevent the opening of Nord Stream 2, a pipeline that would send Russian gas to Europe.

Technology is arguably America's most powerful lever. It could, for instance, block more exports of high-tech gear on the Commerce Department's "entity list". This would restrict Russia's access not only to items used by its defence sector, but also to parts used in many phones and appliances, inconveniencing Russia's consumers as much as its weapons-makers.

The last economy of any size to be hit with broad sanctions was Iran, which was targeted with "maximum-pressure" sanctions in 2018 over its nuclear ambitions. Punishing Russia poses a more daunting challenge as its economy is more internationally connected than the Islamic Republic's. For sanctions to be effective, they will have to cause pain to the West itself.

The most obvious blowback would be in energy. Europe relies on Russia for over a third of its imported natural gas. Some large European lenders also have close ties to Russia. Among the most exposed are Société Générale of France and UniCredit of Italy. The European Central Bank has reportedly asked the most heavily exposed of the 115 large euro-zone banks it supervises to provide details of how they would navigate various sanctions scenarios.

These risks leave some of America's European allies feeling queasy. Germany gets over half of its imported gas from Russia and has wobbled on sanctioning Nord Stream 2 (though many think it will end up agreeing to do so). Even Britain's commitment is uncertain. Campaigners say it has failed to use its leverage as a major financial centre. Its Crimea-related sanctions of 2014-15 contained scant restrictions on Russians raising capital in London.

The other big question is how much even severe sanctions would hurt the Russian economy. Mr Putin's officials have gone to great lengths to sanction-proof it. Central-bank reserves have been beefed up

to more than \$600bn; the share in dollars has fallen steadily in recent years, to 16%. Only a fifth of Russia's sovereign bonds are held by foreigners.

Nevertheless, insulating the economy fully is impossible. Russian officials have boasted of riding out the Crimea-related sanctions relatively comfortably. Yet one study suggests the sanctions may have taken more than 2.5 percentage points off average annual Russian GDP growth since they were imposed. The sanctions Mr Biden is contemplating could therefore cause intense pain, if he can get his allies on board. ■

Oil

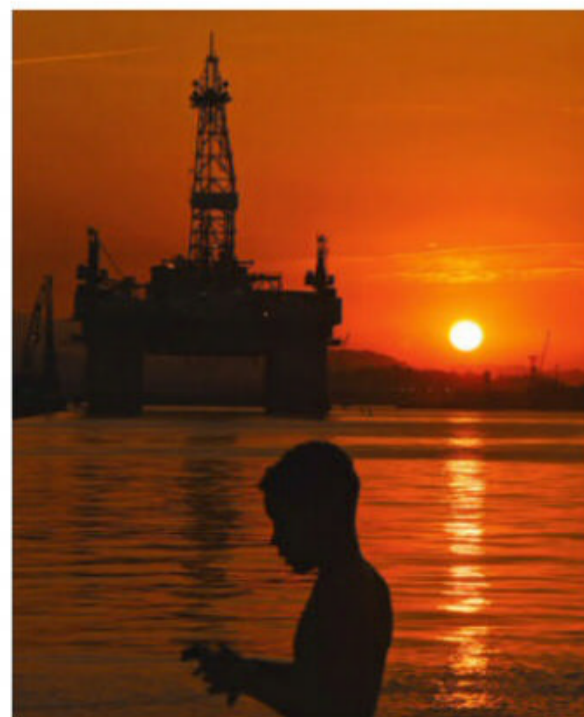
A slippery patch

NEW YORK

OPEC grapples with a precariously balanced market

OIL AND philosophy rarely mix. But when David Fyfe of Argus Media, a publisher, calls production quotas set by the Organisation of Petroleum Exporting Countries (OPEC) and its allies a "Platonic ideal"—more of a theoretical model than a practical guide—he captures the sense of self-doubt now gripping energy markets. Every month since July, the group has agreed to raise its output by 400,000 barrels per day (bpd). But experts cannot decide whether that is too little or too much—and whether the target means much at all.

The cartel's latest meeting, on February 2nd, took place against the backdrop of heightened fears about a Russian invasion of Ukraine (Russia, the world's second-biggest oil exporter, is a member of the extended cartel, known as OPEC+). Only the



In search of balance

week before the price of a barrel of Brent crude had spiked above \$90, its highest level in seven years. The alliance promised to raise output again, by the usual amount. That calmed markets a bit. The question is what happens next.

Many Wall Street analysts have lifted their oil-price forecasts for this year above \$100 a barrel. War in Ukraine, they say, could push it well past \$120. Conflict would probably not physically disrupt supply. By contrast with the gas it pipes to Europe, Russia mostly exports oil by sea. Instead, a fear of potential sanctions on trade may set prices ablaze.

Geopolitics aside, the bull case rests on resurgent demand. The International Energy Agency reckons oil consumption will rise from its present level of about 97m bpd to 100m bpd—a return to pre-covid levels—by the end of the year, even before global aviation fully recovers. Damien Courvalin of Goldman Sachs, a bank, says consumers switching to oil from gas (prices for which have been sky-high in Europe) may have boosted demand by up to 1m bpd, leading to "critically low inventory levels".

Supply is tight, too. Paul Sheldon of s&p Global Platts, a data firm, reckons global spare production capacity is only about 2.6m bpd. And pledges by OPEC+ cannot be counted on. Many members have struggled to raise output owing both to underinvestment and covid-related bottlenecks. BloombergNEF, a research firm, notes that in December the club produced 747,000 fewer barrels a day than its quotas allowed.

The bear case rests on patience, a Persian restoration and a Permian boom. If Russian exports are not cut off, then the impact of geopolitical tensions should dissipate by the summer. By then America will probably have raised interest rates, cooling growth and oil demand—just as extra supply from OPEC+ hits the market. A resumption of Iran's nuclear deal, meanwhile, looks likelier than at any point since 2017, when it was torn apart. The associated lifting of sanctions could release another 1m bpd.

The real wild card is shale. Until 2014, when OPEC orchestrated an oil-price crash, shale drillers raised cheap finance to ramp up output, turning America into the world's biggest producer of oil. But investors, who went on to lose perhaps \$300bn, are now demanding high returns.

Oil bosses have talked of stern capital discipline. Yet lofty prices are hard to resist. Baker Hughes, an oil-services firm, counts 610 active rigs in America in late January, 226 more than a year ago. BNEF predicts output in the Permian basin could rise by as much as 1m bpd by the end of 2023; ExxonMobil, an oil major, plans to increase output there by a quarter this year. As energy philosophers like to say, the best cure for high prices is high prices. ■

Interest rates

The bill balloons

The world paid \$10trn in interest last year. As rates begin to rise, we work out how high the bill might go

NEVER BEFORE has the world economy been so indebted. The stock of global debt has gone from \$83trn in 2000 to around \$295trn in 2021—a rate nearly double the pace of world GDP growth. Debt rose from 230% of GDP in 2000 to 320% on the eve of the pandemic, before covid-19 propelled it to the even greater height of 355% last year.

Part of the reason for this explosion has been the steady decline in borrowing costs over the past two decades. In early 2000 a ten-year Treasury offered a yield of 6.5%. Today it pays 1.8%. The Federal Reserve's effective policy rate has fallen from 6.5% to around 0.08% in that time. Benchmark rates in the euro area and Japan are sub-zero. Declines in government-bond yields and central banks' policy rates have fed through to loan rates for private borrowers.

As a result, even though global debt has rocketed over the years, the world's interest costs, as a share of GDP, are well below their peak in the 1980s. In America, for instance, they stood at 12% of GDP in 2021, compared with 27% in 1989.

All this could soon change. The era of super-cheap money is ending. Central banks are battling a surge in inflation. Those in some emerging economies have been raising interest rates for some time already: Brazil's central bank raised rates by 1.5 percentage points after a meeting on February 2nd, its third consecutive such increase. At the time of writing, the Bank of

England was expected to deliver its second interest-rate rise. The central bank with the most influence on global capital flows—the Fed—has signalled that it will probably put rates up as soon as March, and investors expect four further quarter-percentage-point increases this year. Real borrowing costs for governments, though still negative in many places, are inching up. In America the yield on the five-year Treasury inflation-protected security (TIPS), which hovered around -1.7% for much of 2021, now stands at -1.2%.

The scale of the global interest bill is vast. *The Economist* estimates that households, companies, financial firms and governments worldwide paid \$10.2trn in interest in 2021, equivalent to 12% of GDP. As a guide to the potential impact of rate rises to come, we consider a scenario where the interest rates faced by firms, households and governments in 58 countries rise by a percentage point over the next three years. (By way of comparison, the five-year Treasury yield has risen by a percentage point since spring 2021.)

Our calculations suggest that the global interest bill would exceed \$16trn by 2026, equivalent to 15% of projected GDP in that year. And if rates were to rise twice as quickly, say because inflation persists and forces central banks to take drastic action, the interest bill could rise to about \$20trn by 2026, nearly a fifth of global GDP.

Working out the effect of rate rises on

the interest bill is not straightforward. Some debt is tied to a fixed interest rate, such that higher borrowing costs are passed through only when it is rolled over. The median maturity of government debt, for instance, is five years. Companies tend to borrow for a two-year term; households typically borrow over a longer period. Incomes change over time, affecting borrowers' ability to afford debt payments.

Borrowers could respond to higher interest costs by paying off debt, so lowering their debt-interest costs. But in aggregate, according to research by the Bank for International Settlements (BIS), a club of central banks, higher rates raise total debt payments (ie, including interest and principal) relative to income. The higher the level of debt, the greater the squeeze, suggesting that the economy has only become more sensitive to rate rises.

Our calculations assume that interest-rate rises feed through over the course of five years to government and household debt, and over two years to company borrowing. We also assume that nominal incomes rise in line with the IMF's forecasts. As the fund's projections assume that public debt rises at broadly similar rates, we let debt-to-GDP ratios stay flat. This implies annual budget deficits of around 5% of GDP—narrower than in the years immediately preceding the pandemic.

Picking up the tab

A higher interest burden would not fall on all borrowers equally. Private-sector borrowers in a country tend to foot a much bigger share of the bill than the government, which can borrow more cheaply, for instance. Financial firms and savers, such as wealthier households, receive as well as pay interest. The more exposed the borrower is to rate rises, in terms of higher debt levels, the bigger the interest bill they

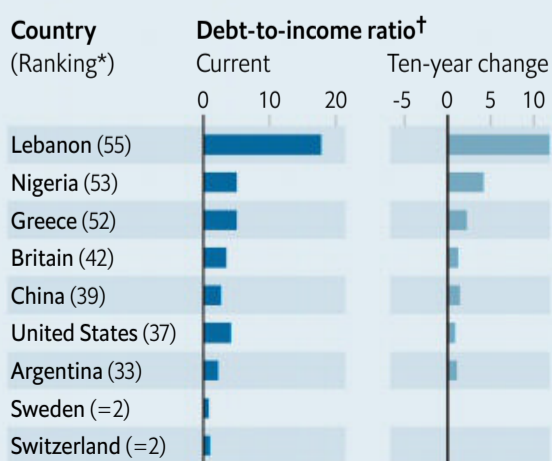
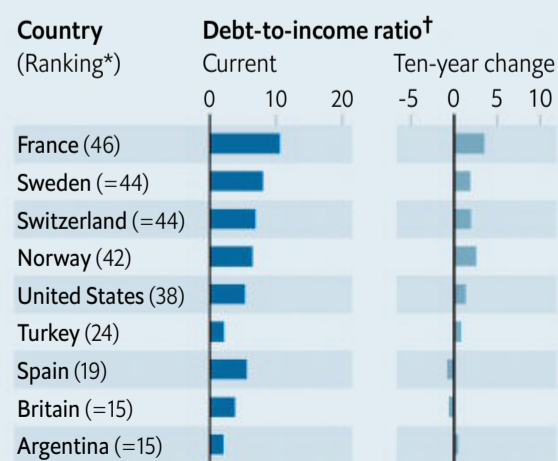
Bearing the burden

Measures of debt, selected countries, 2021 or latest available data

Households (in 45 countries)



Governments (in 55 countries)

Companies[‡] (in 46 countries)

*Ranking across two measures of debt burden: the debt-to-income ratio and change in debt-to-income ratio †Debt to gross disposable income for households; general government revenue for governments; gross operating profit for companies ‡Non-financial corporates

Sources: Bloomberg; IIF; IMF; OECD; UN; *The Economist*



face, and the more likely it becomes that they cut back spending in order to meet their higher debt costs, or, in more extreme cases, that they fall into distress. That would in turn weigh on economic activity.

To see which borrowers may be more sensitive to interest-rate rises, we rank the household, corporate and government sectors for our countries along two dimensions (for this exercise we exclude the financial sector, which intermediates lending). The first measure is the debt-to-income ratio, which gauges the extent to which debt is affordable. The second is the change in the ratio over the past decade, which captures the extent to which exposure to interest rates has increased over time. We then produce an overall ranking for each sector in each country (see chart on previous page).

Start with governments. Lebanon, which already defaulted on some of its debt at the start of the pandemic, tops the list, with a high debt-to-revenue ratio that has rocketed over the past decade. Despite being a big exporter of oil, Nigeria's government revenues only just cover its interest costs. Fortunately, most borrowing by emerging-market governments during the pandemic has been in their own currencies, notes Emre Tiftik of the Institute of International Finance, a bankers' group, which may make them less exposed to flighty foreign capital.

Our next set of borrowers comprises households. Those in South Korea, Norway and Switzerland have the most debt, relative to their income, in our group of countries. Mortgage debt in Sweden is also sizeable. House prices rose by 11% in 2021, and well over half of mortgage lending is done with variable interest rates. When rates rise, therefore, mortgage bills follow suit. Debt-to-income ratios have more than doubled in China and Russia.

Companies are the third set of borrowers. Those in France and Switzerland have the most debt as a share of gross operating profit, leaving them exposed to rate rises. Among emerging markets, Chinese and

Russian firms are also weighed down by their bills. Overall, our findings for the private sector are broadly consistent with an early indicator of financial stress, the credit-to-GDP gap, calculated by the BIS, which measures the degree to which borrowing exceeds its long-run trend. On this measure, the Swiss and South Korean private sectors rank among the five most stretched in the world.

Our rankings help illustrate who is most exposed to rising interest rates. But they cannot predict which sectors or economies will experience trouble as interest rates rise. That is a far more complex picture, which depends among other things on the prospects for economic growth and the reaction of policymakers. Strains in one part of the economy could interact with those in others, say by weakening the banking system.

Although households in rich countries are highly indebted, the interest rates they face are low in historical terms. Debt levels in Argentina, by contrast, may not look particularly high, but eye-watering interest rates, of 35% for the private sector, mean that borrowers are experiencing an intense squeeze. Poor countries with gloomy growth prospects may struggle. Rapid rate rises in America could hamper their recoveries, says Gene Frieda of PIMCO, a bond-fund manager. Incomes may not rise fast enough to meet interest costs.

China faces a combination of threats: the property market has deflated as Evergrande, a large and heavily indebted developer, unravels. Banks have become saddled with bad household debts. But the country's policymakers have also responded to these risks. The resulting drag on economic growth probably helps explain why the People's Bank of China is lowering interest rates, not raising them.

Policymakers in the rest of the world may be starting to move in the opposite direction, but the potential of highly indebted borrowers to drag down the economic recovery will nonetheless be weighing on their minds. ■

Stocks in India

Roaring tiger

Examining the stockmarket's stellar run

INDIANS CAN BE excused for looking eastward with more than a little envy. In 1980 India's GDP per person, in purchasing-power-parity terms, was nearly twice that of China. Then the dragon took off. By 2021 Chinese incomes per person were more than double those in India. Yet when it comes to the performance of the stockmarket over the past year, at least, India can declare triumph. The Sensex 30 index of stocks rose by nearly 22% last year, outperforming not just the Shanghai bourse but the MSCI emerging-markets index, and indices in many rich countries, too. As we wrote this, the Sensex was up so far this year, compared with declines elsewhere.

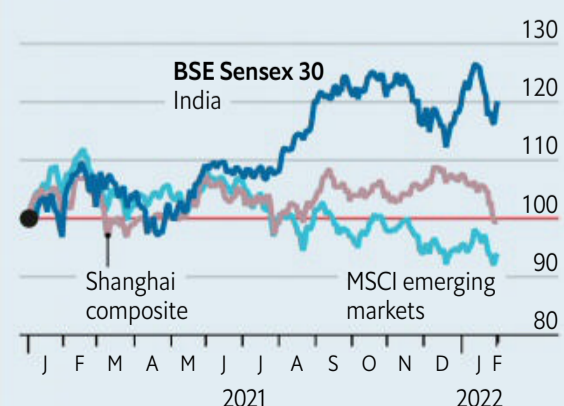
The healthy showing has been enough to lure Indian retail punters to the market. According to *Mint*, a newspaper, bank accounts opened by customers with the intention of investing in stocks and bonds rose above 77m last year, compared with 39m in 2019. What lies behind the market's extraordinary performance?

After a desultory decade, profits are roaring back. Company earnings were lacklustre even before the pandemic, as firms coped with high inflation, patchy access to bank loans and obstructive regulation. The spread of covid-19 in 2020, and the strict lockdowns of that year, dealt another blow. But the economy is now on the mend. The IMF expects GDP to grow by 9% this year and 7.1% in 2023, more than any other big economy.

Plenty about regulation in India is still forbidding, from the complexity of its tax system to the sheer number of its import tariffs. Yet some modest tweaks over the past three or so years may be beginning to ▶▶

India shining

Stockmarket indices, January 1st 2021=100
\$ terms



Source: Refinitiv Datastream

► bear fruit. That includes a cut to the corporate-tax rate and a promise, at last, to end the government's practice of whacking companies with retroactive tax bills. Financial incentives for manufacturers may also have buoyed small firms in particular, which have benefited from the bullish mood as much as large ones. Overall, reckons Ridham Desai of Morgan Stanley, a bank, a new earnings cycle has begun. He predicts annual profit growth of 24% over the next three years.

Big information-technology consultancies, such as Tata Consultancy Services and

Infosys, have fared well in the boom. Investors had been cooling on their growth prospects in the years before the pandemic. Covid-induced digitisation, however, rekindled their interest. The share prices of the two firms more than doubled between March 2020 and December last year (although they have since fallen a little from their peaks).

The striking thing, however, is that the recent pickup in the Sensex has been broad-based, says Neelkanth Mishra of Credit Suisse, a bank, as he rattles through one industry after another showing strong

returns. Homebuilders, for instance, have been boosted by increasing demand from buyers and accelerating credit growth. That has in turn buoyed the share prices of cement and equipment makers.

The share prices of clothing firms, together with cotton and yarn producers, have done well, as have chemical companies. The hunch is that these might have benefited not just from general optimism about the domestic economy, but also from manufacturing tilting away from its higher-cost, and increasingly geopolitical-ly divisive, neighbour to the east. ■

Buttonwood Sting in the tail

Why high-yield-bond investors should worry

WRITING IN JULY 2007, the fund manager and bubble spotter Jeremy Grantham likened the stockmarket to a brontosaurus. Although credit markets were collapsing around him, share prices remained stubbornly high. It was as if the great sauropod had been bitten on the tail, but the message was still "proceeding up the long backbone, one vertebra at a time" towards its tiny brain. It took its time arriving: America's S&P 500 index did not reach its nadir for another 20 months.

The story so far this year has been different. Equities, particularly the more speculative ones, have had a brutal start to 2022. The tech-heavy Nasdaq Composite index fell by about 16% in January, before rallying a little. The ARK Innovation fund, a vehicle devoted to young, high-risk tech stocks, declined by 20% last month, and is 53% below its peak in early 2021. Yet even the wilder parts of the credit markets remain comparatively serene. Bank of America's US high-yield index, a popular barometer for the price of "junk" bonds issued by the least creditworthy borrowers, has fallen by just 2.4% since late December.

The contrast is less surprising than you might think. The value of a stock stems from a stream of potential earnings extending far into the future. By contrast, the value of a bond depends on the issuer's ability to pay interest until the security matures, and then to find the cash to repay the principal (probably by issuing another bond). That makes bondholders less starry-eyed than shareholders. If a firm wants to change the world, great—but avoiding going broke for a few years is fine, too. So bond markets tend to be less susceptible to swings in sentiment and price. In other words, 2007 was the exception, not the rule.

Moreover, the creditworthiness of junk bonds as a category improved during the pandemic. The difficulties of 2020 hastened the descent of "fallen angels": companies, such as Kraft Heinz, that were previously rated investment-grade but were then downgraded. Such issuers tend to sit at the safest end of the junk market.

Nonetheless, there are good reasons for investors to be watchful. One is that the shock of monetary-policy tightening could be yet to feed through. The record amount of junk bonds that were issued over the past two years will eventually need refinancing. For American firms such issuance amounted to \$869bn, or around half of the outstanding stock of junk bonds, according to Refinitiv, a data provider. Ensuring that firms did not flounder for lack of credit was a key aim of the Federal Reserve's pandemic-prompted bond-buying. But its asset purchases are soon to end. Borrowers will have to either repay the debt or refinance it in a market that is no longer flooded with liquidity.

More fundamentally, the investment case for high-yield debt has changed as

interest rates have declined. Michael Milken, an American investment banker, pioneered the use of junk bonds in the 1980s by arguing that their yields were high enough to compensate investors for the odd default. In that decade, he was right: junk yields averaged 14.5% and just 2.2% of issuers defaulted each year. But the phrase "high-yield" has since lost its meaning. Although central-bank rate rises are on the cards, yields are still anaemic. In America and Europe, average junk-bond yields, of 5.1% and 3.3%, respectively, are well below inflation. The credit market's resilience amounts to a belief that few of even the riskiest borrowers are likely to go bankrupt. Yet when the yield is in the low single figures, it takes only a handful of defaults to break the investment case.

And borrowers that do default are likely to be in worse financial health, leaving creditors nursing heavier losses. Lender protections have weakened over the past decade, as yield-starved investors chased returns at any cost. Maintenance covenants, which allow lenders to seize the wheel if the borrower's financial position deteriorates, have long been absent from bonds (and have largely disappeared from private loans, too). Incurrence covenants, which limit borrowers' ability to issue new debt or pay dividends, have lost their teeth.

Its proponents might point out that bond investors have few attractive alternatives to junk debt. Yields on Treasuries are still low; financial markets expect the Fed's benchmark rate to peak no higher than 1.8%. But credit markets are priced for a world in which nasty surprises don't happen and liquidity flows eternal. Those assumptions increasingly look like they belong with the brontosaurus.



Free exchange | The high kingdom

This year may be China's last as a middle-income country

CHINA IS HAUNTED by the spectre of the “middle-income trap”, the notion that emerging economies grow quickly out of poverty only to get stuck before they get rich. “During the next five years, we must take particular care to avoid falling into the middle-income trap,” said Li Keqiang, China’s prime minister, in 2016. Lou Jiwei, then China’s finance minister, once put the odds of China becoming ensnared at 50%.

The trap was named by Homi Kharas and Indermit Gill, two economists, in 2006, when they were both at the World Bank. It raises an obvious question: what counts as middle income and what would qualify as surpassing it? Mr Kharas and Mr Gill adopted the bank’s own income classifications. These were established in 1989 when the bank drew a line separating high-income countries from the rest. The line had to accommodate all of the countries that were then considered “industrial market economies”. It was drawn at a national income per person of \$6,000 in the prices prevailing in 1987, just low enough to include Ireland and Spain. That line is now \$12,695. It rises in step with a weighted average of prices and exchange rates in five big economies: America, Britain, China, the euro area and Japan. Eighty countries met that threshold in 2020, three fewer than the year before. The pandemic relegated Mauritius, Panama and Romania to the middle division.

Despite its leaders’ fears, or perhaps because of them, China is now on the cusp of becoming a high-income country by this definition (see chart). Based on the latest available forecasts from Goldman Sachs, we calculate that China could cross the line next year, helped in part by its strong currency. (The transition would not be officially announced until mid-2024, when the World Bank updates its classifications based on the previous year’s data.) If we are right, then 2022, the year of the tiger, could be China’s last as a middle-income country. It will be a fatter cat thereafter.

The threshold, of course, is arbitrary. Several countries (including Argentina, Russia and even Venezuela) have surpassed it only to flounder or fail in subsequent years. A lasting escape from the middle-income trap requires a more fundamental transition. Countries at this intermediate stage of development can encounter a variety of pitfalls. They may face diminishing returns to capital. They typically run out of workers to move out of agriculture. And they must invest heavily in education, beyond the basic schooling a factory hand needs to follow instructions. The truer test of a high-income country is how well it copes with such threats to its growth. How is China faring on these three counts?

China is still accumulating capital at a furious pace. It invested 43% of its GDP in the five years before the pandemic. The high-income countries averaged only half that percentage. But China’s high investment rate is perhaps not as fruitless as is often assumed. Just as its investment remains high by the standards of rich countries, so does its GDP growth rate. Indeed, the ratio between its investment share in output and its growth rate (sometimes called the incremental capital-output ratio, or ICOR) still looks favourable in comparison with high-income countries.

What about other sources of growth? In its annual check-up of China’s economy, released on January 28th, the IMF noted with concern that China’s “total factor productivity” growth, which measures changes in output that cannot be attributed to more capital or labour, fell in the past decade, compared with the ten years before. It attributed this slackening to “a stalling” of structural reforms, especially of state-owned enterprises. “Market dynamism has been losing steam recently,” it argued. But this kind of productivity is notoriously hard to measure. And according to one

gauge from the Conference Board, a business group, it is rising notably faster in China than in high-income countries (see chart).

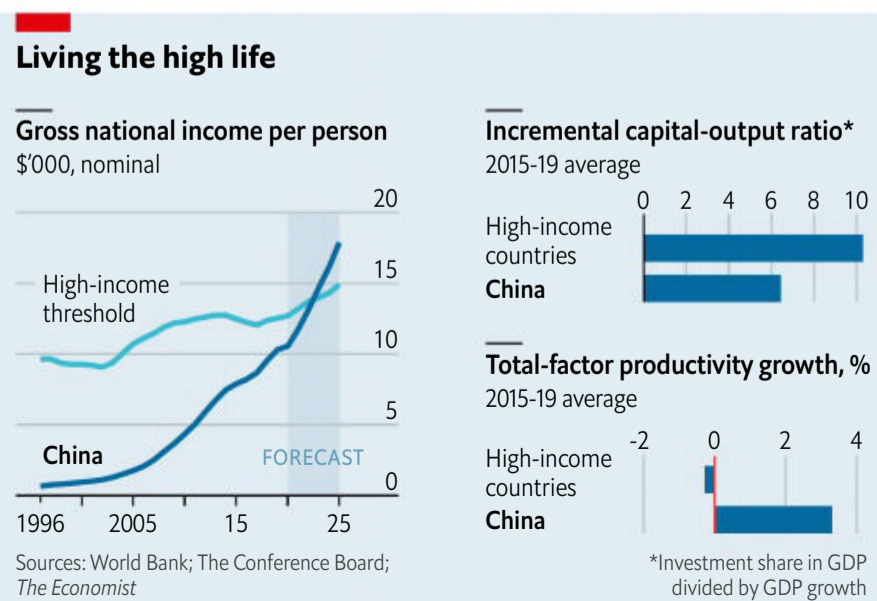
China’s employment patterns still differ markedly from those of more prosperous countries. Surprisingly, perhaps, the share of its workforce in construction is lower than the high-income average. The percentage in manufacturing is higher (19% compared with an average of 13%) and the share still in agriculture is far higher—about 25% compared with a high-income average of 3%. From one perspective, this residual rural workforce is a reason for optimism. If China can achieve high-income levels with a quarter of its workers marooned in agriculture, imagine what it will do as they escape into more productive employment? The worry, however, is that these workers have not left the farms because they cannot. Perhaps they do not want to forfeit their claims on communal land. Or perhaps they are too old or poorly educated to take advantage of better opportunities in cities.

China’s stock of human capital is indeed a cause for concern. According to its latest census, its adult population had an average of 9.9 years of schooling in 2020. That would put it near the bottom of the heap of high-income countries, which have 11.5 years on average, according to Robert Barro of Harvard and Jong-Wha Lee of Korea University.

The high-income trap

This problem can only be fixed one cohort at a time. China’s older citizens grew up in a much poorer country and were educated accordingly. A child now entering China’s school system could expect to receive 13.1 years of education, according to the World Bank. The quality does not yet match the quantity: based on how well children score on standardised tests, 13 years of school in China is equivalent to less than ten years in a country like Singapore, the bank calculates. Nevertheless, things have improved.

The “stock” of human capital reflects China’s impoverished past, then, but the “flow” of investment in new human capital is more befitting of a high-income future. The problem is that this costly investment of money and time is deterring parents from having children, a demographic deadlock that is sadly characteristic of many rich parts of the world. China’s population increased last year by only 0.03%. Judging by Japan’s experience, an ageing, declining population can contribute to depressed spending, low growth and low interest rates. China’s policymakers must now worry about a different kind of trap. ■





Heavenly power

Faster, higher, stronger

Space is about to enter its nuclear age—fission-powered engines will make satellites speedier and more versatile

IN NOVEMBER LAST year Russia blew up a defunct satellite, creating shrapnel that will orbit the Earth for decades. The “direct ascent” missile test was a first for Russia and echoed a similar weapons test carried out by China in 2007, which also created an enduring cloud of debris. India and America have shot at inoperative satellites, too, although fortunately without creating as much associated long-lasting space junk.

All this target-practice concerns American defence chiefs, who would struggle to fight a war if critical satellites were knocked out. The Pentagon, therefore, wants its next generation of satellites to have enough power to be capable of evading attacks. It thinks the answer lies with nuclear-powered propulsion.

Two initiatives will investigate the concept. The first, led by the Defence Advanced Research Projects Agency (DARPA), will test a technology known as “nuclear thermal propulsion”. Working with American firms, including Blue Origin, General Atomics and Lockheed Martin, DARPA spacecraft will carry a small nuclear reactor. Inside, uranium atoms will be split to

generate tremendous heat. That heat will be absorbed by liquid hydrogen sucked from a tank on board the spacecraft. The hydrogen, which will start at a storage temperature colder than -253°C , will rapidly expand as it warms. As that hot gas shoots out of a nozzle at the back of the spacecraft, it will produce thrust.

Such a spacecraft could climb to a geostationary orbit above the Earth, nearly 36,000km up, in mere hours. Satellites that burn normal rocket fuel need several days for the same trip. Nuclear-powered satellites with abundant power would also be hard to destroy—their trajectories could be changed often enough to become unpredictable. DARPA wants to test its spacecraft, dubbed DRACO (Demonstration Rocket for Agile Cislunar Operations), in orbit in

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73 Methane “ultra-emitters”

2025. This is an ambitious timetable, given that nuclear thermal propulsion has never been tried out in space.

The Pentagon’s Defence Innovation Unit (DIU) runs the second nuclear initiative. In September 2021 it solicited proposals for nuclear systems for satellite propulsion or, alternatively, to power onboard electronics. Companies pitching ideas need to meet a few conditions: they should steer clear of the nuclear-thermal-propulsion technology that DARPA is already working on; they should be able to build a prototype within three to five years; and they need a credible plan for testing in space. Out of the dozens of proposals received by the DIU, the first two winners are set to be announced later this month.

Beyond the dragon

Ryan Weed, a captain in the United States Air Force (USAF) who leads the DIU programme, says the submitted proposals fall into distinct categories. Some incorporate nuclear reactors, but not to heat liquid hydrogen. Instead, the heat will be used to generate electricity that will then be applied to a propellant gas such as xenon. This will ionise the gas which, thanks to an electric or magnetic field, will zip out of a nozzle to produce thrust.

Ion thrusters are not a new idea but a nuclear reactor could produce far more electricity to power them than even a large solar array. Satellites without solar panels would, usefully for military purposes, also be harder for enemies to track and disable. ▶▶

▶ Many of the designs for nuclear electric propulsion call for the same process of splitting atoms used in terrestrial nuclear-power plants. The kit for space would weigh at least a tonne, so it would only power big satellites.

Other proposals are for radioisotope thermoelectric generators (RTGs). These kinds of “nuclear batteries” have long been used to power probes sent into deep space, where solar power is especially feeble. Instead of building a nuclear reactor, an RTG uses devices called thermocouples to produce a modest wattage from heat released by the decay of radioactive isotopes. Plutonium-238, which is a by-product of weapons development, has been used by NASA to power both the *Voyager* probes, launched in the 1970s and still functioning, as well as the *Curiosity* rover currently trundling around Mars.

Plutonium-238, however, is heavily regulated and in short supply. And with a half-life of 87.7 years, the heat it produces from radioactive decay is spread over a long time. The DIU is therefore looking for alternatives with a shorter half-life and a “much higher thermal power density”, says Captain Weed. Cobalt-60, with a half-life of 5.3 years, is a promising alternative and available commercially. He would like RTGs to provide electricity for thrust and also the onboard electronics for satellites that are the size of a washing machine.

First, do no harm

How safe is it, however, to send nuclear devices, especially reactors, into space? Nathan Greiner, a major in the USAF who leads DARPA’s programme, says that one concern he often hears is about the potential explosion of a DRACO spacecraft on the launchpad. He says that such an event would not present any more danger than the explosion of a conventional spacecraft—because the reactor would not have been switched on at that point, its uranium fuel would pose no radiological hazard.

A bigger problem would be if the nuclear reactor crashed into the sea. Water can encourage the start of a nuclear chain reaction in which uranium atoms split and release neutrons that can go on to split further uranium atoms. If uncontrolled, this chain reaction can lead to a meltdown. DRACO is therefore configured so that even if submerged in water, “poison wires” made from boron will remain in place. Boron is used in nuclear reactors to moderate—or even stop—nuclear fission.

Another danger is accidental atmospheric re-entry. The Soviet Union flew at least 33 spy satellites with nuclear reactors for onboard power (but not propulsion). In one accident, the reactor in a satellite named *Kosmos 954* failed to ascend into a high-enough “disposal orbit” at the end of its mission. In 1978 it ended up spraying ra-

dioactive debris over a swathe of Canada’s Northwest Territories. To avoid a similar accident, DARPA’s nuclear reactor will not be flown in low orbits, says Tabitha Dodson, DRACO’s top engineer.

The recent swell in interest in nuclear power for space can be directly traced to improvements in engineers’ ability to use computers to model their reactor designs. For a long time, scientists believed that, for a nuclear reactor to be able to fit on a rocket, it would need to run on fuel that was highly enriched with uranium-235, an isotope of uranium that easily splits apart. The fuel for the Soviet *Kosmos 954*, for example, was 90% uranium-235, similar to the material used in the atom bomb detonated over Hiroshima in 1945.

Given the fuel’s worrying potential for dual use, therefore, scientists have had to deal with thick bureaucracy, long delays and huge costs when building nuclear reactors. And, even if all went well, “a lot of guards and guns”, says Michael Eades, head of engineering for USNC Advanced Technologies, a Seattle subcontractor involved in DRACO. But better computer modelling has, in recent years, allowed scientists to design reactors in which the fuel is enriched to less than 20% uranium-235. That is below weapons grade, so government restrictions will be less onerous.

America is not alone in its nuclear quest. China and Russia are also developing nuclear power for space. China’s wish list includes a fleet of nuclear-powered space shuttles. Russia is designing an electric-propulsion cargo spacecraft called *Zeus*, which will be powered by a nuclear reactor. Roscosmos, Russia’s space agency, hopes to launch it in 2030.

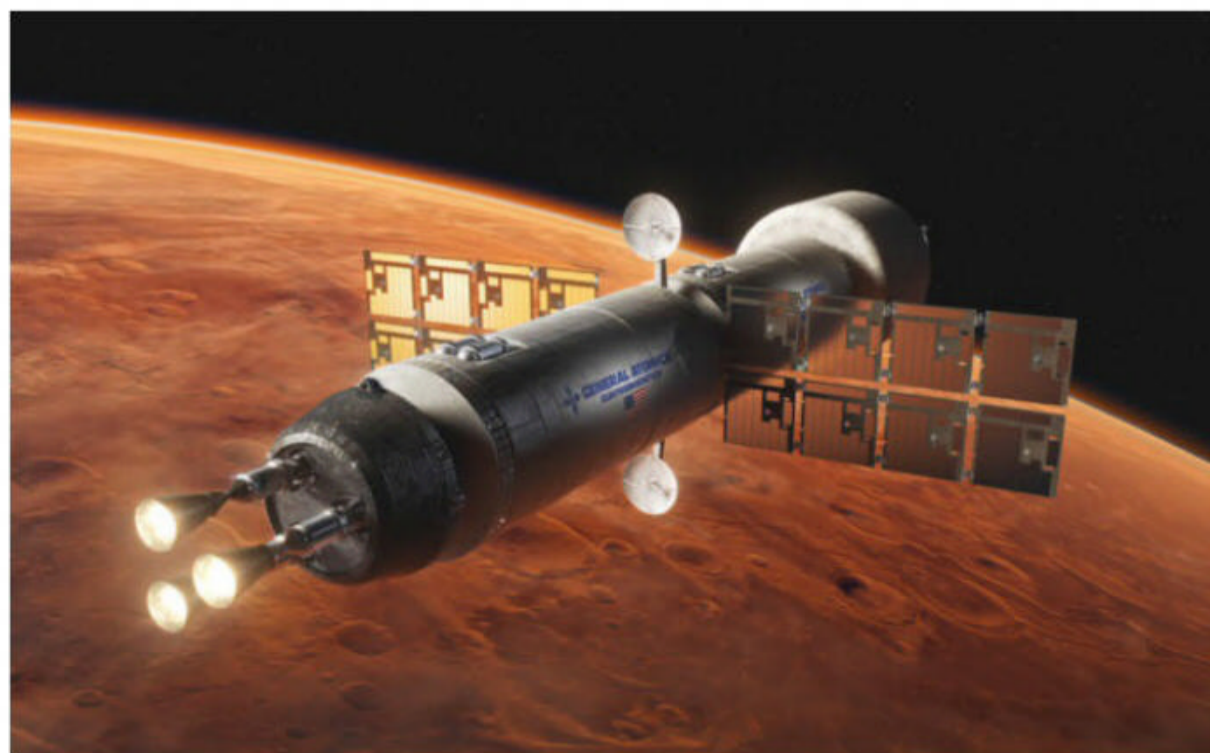
The prospect of more capable satellites will, no doubt, raise suspicions among spacefaring nations. Nuclear spacecraft with abundant electrical energy could be

used to jam satellite communications. Documents from KB Arsenal, a St Petersburg firm at work on *Zeus* and, reportedly, another nuclear spacecraft called *Ekipazh*, refer to the possibility of using large antennae to flood an area with lots of electromagnetic radiation—this could overwhelm the relatively weak radio signals normally sent and received by communications satellites. Such stirrings may have focused minds. In 2019 the then president, Donald Trump, issued a memorandum declaring that nuclear-powered space systems were “vital” to America’s dominance in space. In that and subsequent presidential actions, Mr Trump simplified regulations. His successor, Joe Biden, has not changed course, fuelling subsequent research and development in both government and the private sector.

To boldly go

And not all of the interest in nuclear power comes from the armed forces. NASA, keen to put astronauts on Mars one day, is studying reactor-powered electric propulsion and is also working on a project to develop nuclear thermal propulsion. The second system is named PADME—Power-Adjusted Demonstration Mars Engine—and its prototype is slated for testing in 2026.

PADME will weigh about 3.5 tonnes and, once in orbit, will be able to accelerate a large spacecraft to 12km a second in around 15 minutes. Such a craft could reach Mars in under six months, three less than with chemical propulsion. NASA wants to test it on a possible cargo mission to Mars in the 2030s. By the end of this decade, NASA also wants a nuclear plant to power a base on the Moon. Proposals for a ten kilowatt “fission surface power” facility are due in to the space agency by the middle of February. All this means that one way or another, space is entering its nuclear age. ■



Want to reach Mars faster? First, split some atoms

Scientific publishing

Handsome prints

Preprints on the coronavirus have been impressively reliable

SCIENTIFIC PUBLISHING moves slowly. Depending on the academic field, it can take years for a single paper to get published in a well-regarded journal. In that time, a paper might undergo several rounds of peer-review by academic volunteers, followed by corrections—and possibly rejections—before a new scientific result sees the light of day.

This rigmarole is meant to ensure that the research that enters the scientific record is reputable, rigorous and trustworthy. That is admirable—and the system generally works well—but it also introduces a bottleneck, delaying the circulation of new scientific results. To get around this, scientists can release a “preprint”: a manuscript of a paper posted to a public server online before it has completed a formal peer-review process.

Preprints are commonplace in physics and mathematics. During the covid-19 pandemic, these publications took off in biology, genomics and medicine too, reflecting the urgency of communicating coronavirus-related findings to other scientists, government officials, and the public.

Some have expressed concerns over the quality of preprints, however, arguing that publishing research prematurely risks undermining the integrity of science if conclusions may later need to be revised, after comments from peer-reviewers, say. Fortunately, a study published in the journal *PLOS Biology* this week suggests that they have little to worry about.

A team of researchers led by Jonathon Coates, a biologist at Queen Mary University in London, decided to analyse how reliable preprints were early in the covid-19 pandemic. They compiled a set of 184 research papers in the life sciences that had initially been posted as preprints on bioRxiv and medRxiv—two large preprint servers—and later published in one of 23 major scientific journals in the first four months of the pandemic.

They compared each preprint with its more polished version that had later appeared in a journal. They looked for content that had been added or removed from the body of the manuscript, tables or figures that had been rearranged, and when key wording had been changed.

Dr Coates’s analysis found that 82.8% of coronavirus-related preprints and 92.8% of non-coronavirus-related preprints saw no material change to their conclusions



Clouds of suspicion

upon journal publication. Of the changes that were made, most involved only strengthening or weakening of conclusions. Only one paper out of 184 saw one of its conclusions reversed. “This is a welcome finding,” says Dr Coates. “Ultimately, scientists share preprints because they think the work is ready, not simply to rush it out—the results of our study reflect that.”

That more coronavirus-related papers saw changes upon publication than non-coronavirus papers could reflect two factors, suggests Dr Coates. The first is that scientists were moving as quickly as possible to make coronavirus-related results public to aid the early pandemic response, meaning that the language in early covid-19 preprints was more likely to require a final edit. Dr Coates adds that, in his experience, journal editors were also being more rigorous in their treatment of early covid-19 research, precisely because the stakes were so high.

These findings support arguments made by advocates of “open science”, who say that new scientific results should be made available to other researchers and the public freely and quickly. Dr Coates’s work suggests that the usual gatekeepers of the research, scientific journals, may add little scientific value to the original research manuscripts. Their large subscription fees, therefore, look increasingly at odds with the value they provide.

Dr Coates also discovered an annoying wrinkle in the publishing and sharing of data in the life sciences. Whenever his team tried to gain access to the supplementary data for a journal-published version of an article, all too often the links were dead or did not lead to the data they were looking for. That seems troubling, not least during a public-health crisis in which access to timely data has been critical in working out what to do and when. ■

Drug delivery

Trypanophobics rejoice!

A new way to deliver delicate drugs, no jabbing required

PLENTY OF PEOPLE hate needles. Indeed, it is probably the case that a portion of those refusing to be vaccinated against SARS-COV-2 might be doing so simply because they do not want the discomfort of being jabbed. A new invention could help—for those who are needle-shy, how about taking a pill instead?

Two of the most successful covid-19 vaccines, from Pfizer-BioNTech and Moderna, need to be administered via injections because their active ingredients are fragile molecules of mRNA. These vaccines cannot be administered orally, since the mRNA would be quickly destroyed by acids in the stomach.

Aware of these challenges, Robert Langer and Giovanni Traverso, engineers at the Massachusetts Institute of Technology (MIT), wondered if it might be possible instead to smuggle mRNA into the stomach inside a protective capsule that is engineered to jab patients from the inside, where they would feel nothing.

This is not new ground for the researchers. Several years ago they collaborated to create a star-shaped structure that could be folded up inside a capsule and then released when the capsule dissolved in the stomach. Once free, the structure remained in the stomach for a month, slowly releasing contraceptives, malaria drugs or HIV treatments as needed by a patient.

With this in mind, Dr Langer and Dr Traverso wondered whether they could design something that could linger in the stomach and then inject its medication there.

The device they invented is the size of a large pill, encased in gelatine and shaped like the shell of a tortoise. It carries a needle that is engineered to penetrate the lining of the stomach only when the device’s flat section sits flush against it. So aligned, the needle can then inject its payload painlessly into the stomach wall.

The researchers knew, however, that this trick alone would not be enough for safe passage of the delicate molecules. Naked mRNA is not readily taken up by cells, but needs to be encased inside a protective envelope to gain entry.

The mRNA molecules of covid-19 vaccines are delivered into cells inside tiny bubbles of fat. But the sort of delivery mechanism needed for Dr Langer’s and Dr Traverso’s device was not immediately clear. To investigate further, the engineers worked with colleagues at MIT to test sev-

eral hundred specially shaped polymers that they thought might be able to protect their mRNA molecules as they transferred into stomach cells. They found three polymers that could carry the mRNA payloads successfully and also support a transfer into living cells.

The engineers loaded these polymer-encased mRNA molecules into their turtle-shell pills, which were then swallowed by six mice. As expected, they subsequently found evidence that the mRNA had transferred successfully into the stomach tissue of all the mice.

The researchers then went on to test their technology on pigs, which have stomachs that are very similar to those found in

humans. They introduced their turtle-shell pills into three animals and studied their stomachs a day later. Two showed clear evidence of the mRNA having entered their cells. One did not.

Dr Traverso and Dr Langer published details of their work this week in the journal *Matter*. Their device shows the potential to get mRNA into the body without the need for an uncomfortable jab in the arm.

More work is needed, however, both to understand why one trial in the pigs failed to yield results and also to work out if the mRNA molecules like those found in covid-19 vaccines can also be successfully delivered via something like Dr Langer's and Dr Traverso's turtle-shell pills. ■

Space Agency. The researchers found more than 1,800 single "ultra-emitting" events, defined as producing 25 tonnes or more of methane each hour. Some events released several hundred tonnes of the greenhouse gas per hour, generating plumes that spanned hundreds of kilometres.

Two-thirds of the ultra-emitting events were co-located with oil and gas production sites and pipelines; the rest came from coal production, agricultural or waste-management facilities. Accounting for 1.3m tonnes of methane per year, Turkmenistan was home to some of the largest sources. Dr Lauvaux and his colleagues noted that the events they documented were not included in national emissions inventories and suggest that official numbers may underestimate total emissions by half. After Turkmenistan, the largest emissions were found over Russia, America, Iran, Kazakhstan and Algeria.

The 8m tonnes of methane picked up in the latest study have the same warming effect as the carbon footprint of 18m Americans. Eliminating all these emissions would avoid between 0.003°C to 0.007°C of warming over the next one to three decades, according to Dr Lauvaux.

Improving monitoring and patching up leaky infrastructure would also be in the interests of fossil-fuel producers in places including Algeria, America, Kazakhstan, Russia, Turkmenistan. The researchers calculated that companies forgo revenue of between \$100 and \$400 per tonne of methane that leaks out.

At the United Nations COP26 climate negotiations, held last November in Glasgow, leaders of more than 100 countries made a pact to reduce global emissions of methane by 30% by 2030. The cheapest, most cost-effective way of doing this will be to patch up oil-and-gas infrastructure, starting with the ultra-emitters identified by Dr Lauvaux. Inventories like his, and further data from a new generation of satellites capable of detecting point sources of methane, are important steps in meeting those global ambitions. ■

Climate change

Methane mission

Targeting "ultra-emitters" of a potent greenhouse gas would be a cheap way to reduce the oil-and-gas industry's climate impact

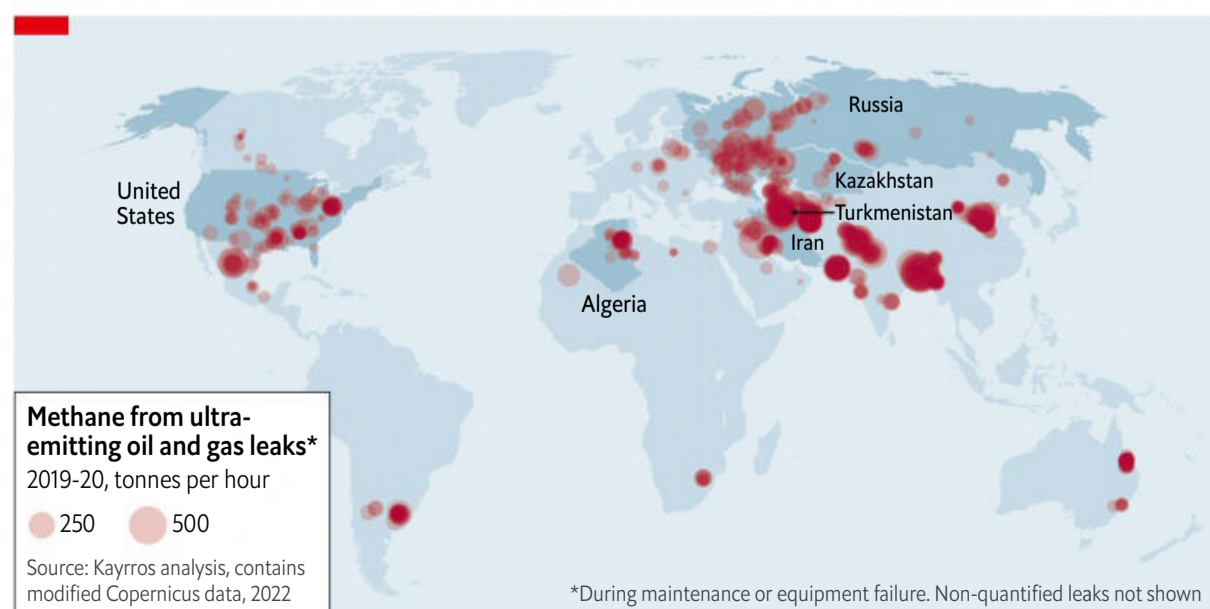
ON FEBRUARY 15TH 2018 a gas well blew up in Ohio's Belmont county. Flying overhead shortly before 1pm, a state highway-patrol helicopter captured images of a column of flames and a billowing plume of soot and gases rising high into the sky from the rolling hills. Although the flames were soon put out, the bust wellhead was not patched up for 20 days. A subsequent study using satellite data calculated that during that time, some 58,000 tonnes of methane was released, equivalent to one-quarter of what Ohio's entire oil-and-gas infrastructure reportedly produces every year and more than the annual methane emissions of similar fossil-fuel infrastructure in most European countries.

Methane is a colourless, odourless greenhouse gas that makes up the bulk of the natural gas burned to heat homes, cook food and generate electricity. It is also the second largest driver of global warming after carbon dioxide, responsible for at least one-quarter of the rise in global average temperatures since the Industrial Revolution. Once emitted, methane molecules degrade in around a decade so they do not pile up in the atmosphere in the same way as carbon dioxide, which can persist for hundreds of years.

Slashing methane emissions, therefore, could help reduce the overall atmospheric volume of greenhouse gases and slow the pace of global warming in the near term. Patching up leaky oil-and-gas infrastructure, responsible for 22% of all man-made methane emissions, would help meet those goals. This has led to efforts to quantify methane leaks.

According to a new study published this week in the journal *Science*, lengthy blow-ups on pipelines and at wellheads—as happened in the Belmont county explosion—are behind the release of roughly 8m tonnes of methane every year. That is equivalent to between 8% and 12% of the estimated total released from the global oil-and-gas infrastructure each year. By identifying and mapping the leaks in such detail, the study offers an opportunity: focus on tackling these big leaks and a significant chunk of the world's greenhouse-gas emissions could be removed.

Thomas Lauvaux, an atmospheric scientist at the University of Saclay in France, and his colleagues used imagery and data collected in 2019 and 2020 by the Tropospheric Monitoring Instrument (TROPOMI) which is flying aboard an Earth-monitoring satellite launched by the European





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Fundamental rights

The megaphone and the muzzle

A history of free expression charts a pattern of crackdowns and advances

A GLOBAL FIRESTORM erupted in 2005 after the publication in a Danish newspaper of 12 provocative cartoons of the Prophet Muhammad. Jacob Mchangama, a Dane and then a young lawyer, was dismayed. In the Muslim world he watched states that rarely allowed protest of any kind encourage violent demonstrations. Those governments also redoubled their diplomatic efforts to define “defamation of religions” as a human-rights violation that should be banned everywhere.

He found the response elsewhere even more alarming. Respectable people across the Western world blamed the cartoonist and his editors, not the repressive forces that drove the newspaper staff into hiding. This was not what Mr Mchangama, the product of a confidently secular Nordic democracy, had expected.

As his new book recalls, free expression was suffering setbacks on other fronts, too. In the late 1990s, when he was a student, the internet presaged a glorious era of liberty for people who otherwise lacked money or power to speak and organise. The vic-

Free Speech. By Jacob Mchangama.
Basic Books; 528 pages; \$32 and £25

tory in 2008 of Barack Obama, an erstwhile outsider, marked a high point of those expectations. Even then, though, digital freedom was already in retreat. Authoritarian regimes proved adept at exploiting and policing social media for their own malignant ends. Western governments were often heavy-handed in their regulation of extremist discourse. And the gigantic power wielded by a few tech companies was troubling, regardless of how they used it.

All this led Mr Mchangama (whose paternal forebears came from the Comoro Islands) to apply his legal mind to supporting intellectual liberty: by podcasting and founding a think-tank, and by studying free expression's fluctuating fortunes over the past 25 centuries. His conclusions, presented in a crisp and confident march through Western history, are sobering.

His view that freedom of speech is under threat from many directions—and,

politically, from both right and left—is not original. More distinctive is his determination to show the ebb and flow of liberty as a dynamic process, under way at least since the era of ancient Greece. Accordingly, stringent repression of thought and speech becomes self-defeating and stimulates brave opponents. But great bursts of freedom also prove finite.

For example, the intellectual energy unleashed by the printing press and the Protestant Reformation was dissipated in waves of sectarian wars and mutual persecution. After the shock of the American and French revolutions, and the rise of Napoleon Bonaparte, Britain's establishment became severely repressive in the early 19th century. But a countervailing movement of liberal thought and debate, carried along by technological and social change, proved more powerful.

Yet that trend, too, had its limits and its hypocrisies. John Stuart Mill was a brilliant Victorian advocate of intellectual freedom, but he participated in, and defended, the colonial administration of India. And as Britain became more open and tolerant at home, it curbed liberty of expression in its overseas possessions, especially amid the rise of independence movements.

The effects of colonial repression continued to be felt long after colonialism ended, as the book shows. Laws dating from the British Empire have been used to stifle dissent in modern India, and recently in Hong Kong. Measures that strangle ▶▶

▶ freedom can easily outlive the conditions that engendered them—as, luckily, can laws and constitutions that entrench liberty. In America, where the possibility of frank, productive debate seems threatened by cultural warfare, the constitution's First Amendment sets a limit on any faction's ability to muzzle its opponents.

The important thing, Mr Mchangama argues, is to read history correctly. For instance, in his view modern Germany has erred on the side of draconian regulations for “hate speech” on digital platforms, in part out of a well-meaning belief that the Weimar Republic was too complacent in allowing the poisonous ideology of Nazism to be aired. But that analysis of Hitler's rise is not borne out by the facts: in reality, the book maintains, the Weimar authorities did try, rather haplessly, to rein in the Nazis through curbs on freedom of expression. By contrast, they failed to act when Hitler's thugs committed acts of violence that should have led to prosecution.

Keep it in the family

The historical lessons closest to the author's heart come from the classical era. He contrasts the robust free-speech culture of Periclean Athens with the mannered exchanges of ancient Romans, which were confined to a small elite. Central to the Athenian system, he says, were the concepts of *isegoria*—an equal entitlement to speak, for all classes of men—and *parrhesia*, the right to express even the most outrageous thoughts. He thinks these laudable notions, absent in ancient Rome, provide a yardstick to judge modern societies. (He might have added that the decline of Athenian democracy is as telling as its zenith: the city's internal affairs were manipulated by outsiders who exploited its openness—just as trolls, spies and lobbyists for autocrats do in democracies today.)

These parallels are instructive, but they raise a wider question about the circumstances in which virtually unbridled speech can flourish and be tolerated. Many groups, including families and friends, remain intact—and can absorb the noisiest of arguments—because of unspoken and often unconscious limits on the sayable, even the thinkable. That kind of informal system works best in smallish communities, such as the citizenry of ancient Athens or the political class of modern democracies. In a digital universe of billions, incorporating many religions and ideologies, no such commonality exists.

The result is that a cartoon which seems fair game to a Scandinavian intellectual can look, on the streets of Islamabad or Cairo, like an invitation to riot or even kill. Keeping legal restrictions on free expression to a minimum is a vital principle that ought to be sacrosanct. But it will not close that yawning gap. ■

The undiscovered country

A thousand natural shocks

Death cannot be defeated. Stalling it is another matter, says an upbeat history

This Mortal Coil. By Andrew Doig.
Bloomsbury; 384 pages; £25

FOR OVER 200 years, France has diligently recorded the lifespans of its citizens. Since 1816 their average life expectancy has more than doubled: long skewed by high infant mortality, it jumped from 41.1 years to 85.3 for French women, and from 39.1 years to 79.3 for men. In other words, it “has increased on average by five hours per day”, writes Andrew Doig in “This Mortal Coil”, a study of how people die. “So, every day, the date of a French person's death gets closer by 24 hours due to the passing of time, but recedes by five hours, thanks to medicine, nutrition, sanitation, good government, trade, peace and so on.”

You might expect a book on this morbid theme to be forbidding or sombre. This one is neither. Instead Mr Doig, a biochemist at the University of Manchester, tells an empowering story of human ingenuity.

For most of human history, life expectancy hovered around 30. The oldest anatomically modern humans, who lived around 200,000 years ago, often died in accidents—in falls, say, or by drowning—or were killed by large animals during hunts or by other people. About 10,000 years ago humans discovered agriculture, and previously nomadic populations settled to grow fields of wheat, barley and maize. Farmers could suddenly produce a lot more food than people had before; but, counter-intuitively, that did not translate

into an explosion in the species. The world's human population increased only from 4m in 10,000BC to 5m in 5000BC.

Farming, it turned out, had some big downsides. Not only did it involve back-breaking labour; it brought new diseases to people. Most of the infections that plague humans today come from bugs that once lived in animals and crossed the species barrier. Measles derives from the rinderpest virus in cattle and influenza from poultry. Living in close quarters with animals meant a higher chance of catching their lurgies. Dense settlements and cities let new ailments spread quickly. Their appearance repeatedly obliterated human communities; it took generations for natural resistance to evolve and spread.

The fight against infectious diseases made a step-change around 250 years ago in Europe and North America. Mr Doig devotes chapters to some of the major infections of the medieval era, including bubonic plague, smallpox, typhoid and cholera. His gut-wrenching descriptions of disease and death—stinking, weeping boils, diarrhoea and worse—serve as background to the larger story of how people began to apply reason to their understanding of illnesses. In the process, they invented the seeds of modern medicine.

In 1747 James Lind, a Scottish doctor, designed a systematic experiment to show that citrus fruits could cure scurvy. Fifty years later, Edward Jenner, an Englishman, discovered that people could be protected from smallpox if they were inoculated ▶▶



What dreams may come

▶ with pus from the blisters of milkmaids who had contracted a related disease, cowpox. In 1854 John Snow, a doctor in London, was studying cholera, the “most terrifying disease of the 19th century”, which could plunge a person from good health to death in only 12 hours. He gathered data on where cholera-affected households in Soho had been getting their water. Around the same time in Vienna, Ignaz Semmelweis, a Hungarian, showed that cleanliness in maternity hospitals could save the lives of new mothers.

Such were the respective origins of clinical trials, vaccination, epidemiology and good hygiene. At last, humans were acquiring decisive weapons against infections and, from the mid-19th century, life expectancy began to rise. Death, however, remained inevitable. As some versions of it fade, others take their place.

The early 21st century might be the healthiest time ever to be alive; modern medicine has given people in developed countries tremendous lifespans. But all bodies fail eventually. The top causes of death today are coronary heart disease, stroke and lung diseases including asthma, emphysema and pneumonia. Cancers are now known to comprise several types of disease, but, if grouped together, they kill almost as many people as heart troubles. Human behaviour has exacerbated some of these afflictions: processed junk food, smoking, alcohol and lack of exercise all damage human bodies.

The whips and scorns of time

A looming spectre is dementia. The numbers of elderly people are rising so fast that the incidence of debilitating, costly conditions such as Alzheimer’s and Parkinson’s is growing rapidly. Here science is still stumped: in contrast to the arsenals available to fend off other causes of death, there are no drugs to slow or halt these terrifying brain diseases. Mr Doig’s conclusion is grim but realistic: “We seem to be heading for a world of elderly people with functioning bodies, but demented minds.”

Nevertheless, he is an optimist. He points to medical marvels that may lie ahead—such as 3D-printed organs that could make it routine to go into hospital at 60 to “freshen up” with new lungs, kidneys, liver or pancreas, grown from stem cells and optimised by genetic editing. “We could then have hearts like Usain Bolt and lungs like Serena Williams,” he writes. “Many more of us would only die when our brains can no longer function.” The “years of living with chronic disability”, which now blight old age, would be over.

These are remarkable prospects. But, as Mr Doig knows, ultimately they are distractions from the immutable fact that, however ingenious medicine becomes, one day, it will all end. ■



GameStop revisited

The house always wins

The Revolution That Wasn't.

By Spencer Jakab. *Portfolio*; 300 pages; \$28. *Penguin Business*; £20

A YEAR AGO, on January 28th 2021, the price of a single share in GameStop, a struggling purveyor of video games, climbed to an all-time high of \$483. That was nearly 200 times the low it had hit ten months previously, and almost 30 times its price at the start of the year. GameStop was the most-traded stock in America on one of its busiest-ever trading days. The surge in activity left retail brokers unable to meet capital calls from the settlement system, forcing them to suspend buying in a handful of stocks. A congressional hearing was held to investigate. How did this happen?

Spencer Jakab, a columnist at the *Wall Street Journal*, unknots the threads of this complex financial tale. His is a pacy and comprehensive account that takes in the structural changes in finance and the media that made the turmoil possible. The ingredients included the prominence of a chatboard on the Reddit website called r/wallstreetbets; the rise of Keith Gill (pictured), a buccaneering investor; a “Gamestonk!!” tweet by Elon Musk; and the political outrage of both Alexandria Ocasio-Cortez and Ted Cruz. Produced at impressively high speed, the book ends with some sage advice for retail investors: stick to low-cost diversified funds, and sit on them.

Its thrust is that a widespread interpretation of the GameStop episode—as a triumph of Davids (retail investors) over the Goliath of Wall Street—is mistaken. The narrative of little guys taking on the establishment was indeed widely

peddled at the time, with some reason. Mr Gill, better known by his YouTube alias “Roaring Kitty”, or his Reddit handle “DeepFuckingValue”, was a long-term booster of GameStop, and posted screenshots of his account balance soaring into the tens of millions of dollars. Meanwhile some professional hedge-fund managers who had short-sold the company lost billions.

Even at the time, though, it was obvious that other hedge funds and financiers had piled into the trade. And it was clear that outfits like Citadel and Goldman Sachs, which generally make meaty returns from high trading volumes, would do well. The idea that these bits of Wall Street profited is not quite the counter-intuitive insight Mr Jakab implies.

He faces another obstacle. The best books on financial dramas take readers behind closed doors—using hitherto undisclosed details to shed light on, say, the decisions to initiate quantitative easing or let Lehman Brothers sink. But the GameStop saga unfolded very publicly. The critical events were posts on a public forum, tweets and a congressional hearing. Those who followed them closely will find little to surprise them here.

Still, Mr Jakab’s knowledge of Wall Street shines in the historical context he provides and the industry aphorisms he relays (the retail investors who can lose out when hedge funds prosper are type-cast as “a lot of dentists”). Despite the density of the subject matter, which includes “rehypothecation” and “gamma squeezes”, the story is deftly told. If the first draft of history was not quite on the money, as Mr Jakab contends, his second go has set the record straight.

World in a dish

More fish in the sea

Lucky new-year foods embody a benign view of good fortune

“WHY STEAM fish”, asked Andy Ricker, an author and restaurateur who ran several acclaimed Thai restaurants in America, “when you can batter chunks and immerse them in hot oil? When you can grill it over charcoal?” As he discovered while travelling around Thailand, one answer is that steamed fish can be delicious. A recipe Mr Ricker developed includes ginger, spring onions, celery leaves and oyster mushrooms, which bolster the pure marine sweetness of the fish without contamination by the taste of oil or smoke. Another reason is that, in the right context, steamed fish can be lucky.

The Chinese words for “fish” and “plenty” are homonyms; a whole fish, eaten on the eve of the lunar new year—which this year fell on February 1st—represents a wish for abundance to come. It can be braised, deep-fried or roasted in a pan, but if you live on a coast, or have access to first-rate fish, steaming is the way to go. These new-year meals are suffused with symbolism. Enough fish should be cooked to ensure leftovers, which signify hopes for a surplus in the year ahead. Spring rolls, with their fanciful resemblance to gold bars, represent hopes for wealth. Uncut noodles symbolise longevity; sweet rice cakes anticipate a better future.

Such customs are not unique to the Sinic world. On the Jewish new year, Rosh Hashanah, Jews bake their *challah*, a traditional enriched bread, in a round shape to signify the cycle of life and creation. The bread, and often apples too, are smeared with honey, symbolising the wish for a

sweet year. Pomegranates, with their many seeds, embody a desire to do many *mitzvot*—literally “commandments”, but more commonly understood as “good deeds”—in the coming year.

On New Year’s Day in America, black southerners have long eaten Hoppin’ John, a delicious dish of rice and black-eyed peas or cowpeas, cooked with salt pork or smoked ham hock (interest in African-American culture has made the recipe popular elsewhere). The peas symbolise coins, and the greens that are usually served as well stand for dollar bills. Some people put a clean dime in the pot; whoever gets it on their plate will enjoy a glut of good luck.

Whether anyone actually believes in a causal relationship between eating these foods and receiving the promised benefits is unclear. Mainly, these culinary traditions continue for the same reason that other traditions do: people have fond memories of observing them with their parents, and want to pass them down to their own offspring.

Diverse as these dishes are, they all imply an optimistic and democratic view of good fortune. Fish and noodles, bread and apples, beans and greens appear regularly on Chinese, Jewish and southern tables. They are neither costly nor exotic, suggesting that luck is not something bought expensively or sought with difficulty. Rather these foods are ordinary, yet suffused with benevolent meaning when eaten at the right time and in the right frame of mind. Good fortune, they suggest, lies all around, and is always within reach. ■



Playground lore

Jabbed you

The pandemic has given children new words to play with

“AT SCHOOL, I’VE invented a game with my friends,” says Griffin, a nine-year-old Australian boy. The rules of Corona Tip are simple. One child chases the others, touching as many as he can. Anyone caught is “in corona”. They join the chaser in pursuit of those remaining, as do all the children they tag in turn—a neat demonstration of exponential growth. The game ends when everybody has been caught.

Griffin’s account was collected by the Pandemic Play Project, one of several groups researching children’s behaviour in the covid-19 era. Children in many countries were kept apart for long spells in 2020 and 2021. When they returned to school, they were often banned from touching. Playgrounds have been segregated by year group and some equipment removed. How have these changes affected play?

It is partly an anthropological question. Some of the researchers are inspired by Iona and Peter Opie, who wrote a series of books about children’s games, songs, rhymes and jokes beginning in the late 1940s. The Opies argued that primary-school children had a distinct oral culture, which they transmitted to each other under the noses of adults. Much of their lore was decades, even centuries old. Children’s culture, they wrote, is as special as that of “some dwindling aboriginal tribe”.

Today’s researchers have spotted many examples of covid-19 permeating play. Australian children invented a game in which they chase each other with stones, which stand in for vaccines. Thomas Enemark Lundtofte of the University of Southern



Denmark has heard children singing about covid—sometimes echoing pop songs, sometimes making up their own. The British-based Play Observatory has collected accounts of children playing covid-themed games at home. In one video a young girl swabs the nose of her toy horse with a plastic screwdriver.

In some ways the pandemic seems to have made children's play more modern. More of it takes place online: during lockdowns children spent more time playing video games like "Animal Crossing" and "Roblox" than was allowed before. That

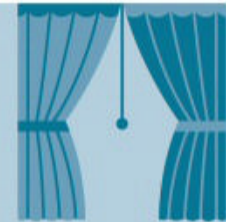
helped them keep in touch with each other, and also coloured their offline play. When one group of Australian children saw each other again, they tried to re-enact "Among Us", a multiplayer video game in which some characters attempt to kill the others.

But in other ways play became more old-fashioned. Alison Stenning of Newcastle University found that in 2020, during England's first lockdown, children recolourised streets that they had ceded to cars over the years. They drew pavement games in chalk, just as their grandparents had done. When balls were banned in school play-

grounds, children adopted a venerable dodge and used rolled-up gloves instead.

Julia Bishop of the University of Sheffield suspects that references to covid and "corona" will linger in children's lore, although they might become detached from the disease itself. "They like weird words," she says. A killjoy would point out that Griffin's game is almost identical to others (such as Infection) that were played before covid-19. But one characteristic of children's lore, which the Opies noticed, is that its practitioners often claim to have just invented things that are in fact very old. ■

Back Story The parable of Taras Bulba



As Gogol shows, literature offers a better way to think about Russia and Ukraine

HE IS DAUNTLESS in battle, defiant in adversity and loyal to his comrades. With his last words, he foresees the coming of an invincible tsar. Taras Bulba, hero of Nikolai Gogol's novella of the same name, is an avowed Russian patriot. Yet something in the picture is askew. Taras wears trousers "wide as the Black Sea"; he carries the gunpowder for his Turkish pistol in a dangling horn. This ideal Russian is actually a Ukrainian Cossack. His story, and Gogol's own, are a reminder of the nuances of identity in their tense region—and of lost possibilities in Russia's relations with Ukraine.

All modern Russian literature, Dostoyevsky reputedly said, came out of Gogol's "Overcoat", a mesmerising short story about a clerk in St Petersburg and a coat with a cat-fur collar. But Gogol himself came out of Ukraine. Born there in 1809, he moved to St Petersburg, the imperial capital, and wrote in Russian. "Taras Bulba", the tale of a Cossack warlord bent on fighting the Poles, was one of the fables of the steppe with which he first beguiled his Russian readership.

As his reputation grew, Gogol revised the narrative to emphasise its Russian-ness. The Cossacks live to fight—no one dies of old age—and, when they are not fighting, they "drink and carouse as only a Russian can". Slain in battle, one exclaims, "May Russia flourish for ever!" Taras's son, Andriy, falls in love with a Polish princess; as bad luck has it, she winds up trapped in a city that the Cossacks besiege. Andriy saves her and betrays his father. Taras duly kills him.

Like his protagonist's, Gogol's politics grew more nationalistic over time. In "Dead Souls" he famously portrayed Russia as a horse-drawn *troika* barrelling through history. He became fanatical, went mad, and died in 1852.

Yet neither Gogol nor "Taras Bulba" quite pull off their nationalist shtick. Some critics said the writer had a "double soul", both Russian and Ukrainian. Gogol, an outsider even in his pomp, sometimes agreed. "I myself don't know what soul I have," he told a friend. Some bibliophiles in Kyiv claim Mykola Hohol (the Ukrainian version of his name) as their own.

As for Taras and the Cossacks, they make pretty delinquent poster boys. Their boozing proves ruinous, and they rampage around the countryside like a barbaric mob; their grotesque anti-Semitism taints the whole story. In any case, Gogol's emphasis on their freedom undercuts their fealty to Russia. And then there is Andriy. From a certain point of view, his fate is a timely warning of the dangers of betraying the Slavic brotherhood and turning West. But for most modern readers, and doubtless many earlier ones, Andriy's compassion and self-determination make him a hero rather than a traitor.

Gogol's novella, and his life, suggest a way of thinking about Russia and Ukraine rooted in the ironies and contradictions of

art, rather than the deathly binaries of autocracy. The same goes for other writers buffeted around the tsarist and Soviet empires by force, opportunity or caprice. The house in which Mikhail Bulgakov lived during the Russian civil war—and where he set "The White Guard"—is a museum on Kyiv's prettiest street. Vasily Grossman, author of the second-world-war epic "Life and Fate", was born in Ukraine. Taras Shevchenko is revered as the father of Ukrainian literature (and was exiled to Siberia for his efforts). But he sometimes wrote in Russian and spent years in St Petersburg.

Together their work offers an approach to relations in which Ukrainian and Russian identities are linked but distinct. More than that, they form an overlapping canon that transmutes a dark shared past into a golden joint inheritance. Through literature if not in politics, the entwined histories of the two countries can engender both mutual respect and a benign cultural affinity. With his tantrums and tanks, Vladimir Putin has violated not just peace and borders, but the humane bonds that art can forge. To many in the region, he has made the idea of a shared culture seem tragically improper.

Hollywood made a film of "Taras Bulba" in 1962. Compared with the original, there are more orgies and fewer pogroms. As Andriy, Tony Curtis is a suave sort of Cossack. Most importantly, they changed the ending: Taras (Yul Brynner) is triumphant and merciful, whereas in the book he is vengeful and burned alive. Read it closely, in fact, and you see that all the talk of national pride and interests is a cynical cover for his bloodlust and ambition. War, Gogol knew, can be sparked by the ego and scheming of a single man.



Economic data

	Gross domestic product				Consumer prices			Unemployment rate			Current-account balance		Budget balance		Interest rates		Currency units	
	% change on year ago latest		quarter* 2022†		% change on year ago latest		2022†	%		% of GDP, 2022†		% of GDP, 2022†		10-yr gov't bonds latest,%	change on year ago, bp	per \$ Feb 2nd	% change on year ago	
United States	5.5	Q4	6.9	3.4	7.0	Dec	4.9	3.9	Dec	-3.5		-7.7	1.8	66.0	-			
China	4.0	Q4	6.6	5.3	1.5	Dec	2.3	5.1	Dec [§]	2.3		-4.7	2.4	§§	-60.0	6.37	1.4	
Japan	1.2	Q3	-3.6	3.2	0.8	Dec	1.3	2.7	Dec	3.1		-7.0	nil	-8.0	114	-8.1		
Britain	6.8	Q3	4.3	4.3	5.4	Dec	3.7	4.1	Oct ^{††}	-2.6		-6.5	1.3	91.0	0.74	-1.4		
Canada	4.0	Q3	5.4	3.7	4.8	Dec	3.3	6.0	Dec	0.1		-7.5	1.8	85.0	1.27	0.8		
Euro area	4.6	Q4	1.2	3.9	5.1	Jan	3.0	7.0	Dec	3.2		-4.0	nil	53.0	0.89	-6.7		
Austria	5.7	Q3	14.6	4.1	5.1	Jan	2.4	4.9	Dec	1.8		-3.1	0.3	65.0	0.89	-6.7		
Belgium	5.6	Q4	2.0	3.3	7.6	Jan	2.2	5.7	Dec	0.6		-4.3	0.4	65.0	0.89	-6.7		
France	5.4	Q4	2.9	3.9	2.9	Jan	2.2	7.4	Dec	-1.3		-4.9	0.4	69.0	0.89	-6.7		
Germany	1.4	Q4	-2.9	3.3	4.9	Jan	3.5	3.2	Dec	6.5		-2.7	nil	53.0	0.89	-6.7		
Greece	13.7	Q3	11.3	4.5	5.1	Dec	3.2	12.7	Dec	-4.0		-4.3	1.8	109	0.89	-6.7		
Italy	6.4	Q4	2.5	4.3	4.8	Jan	2.7	9.0	Dec	3.5		-5.5	1.4	78.0	0.89	-6.7		
Netherlands	5.2	Q3	8.7	2.8	5.7	Dec	3.8	3.8	Dec	9.0		-4.1	-0.2	36.0	0.89	-6.7		
Spain	5.2	Q4	8.3	5.5	6.0	Jan	3.2	13.0	Dec	1.3		-5.4	0.8	63.0	0.89	-6.7		
Czech Republic	3.0	Q3	3.6	4.3	6.6	Dec	4.6	2.2	Dec [†]	2.1		-5.1	3.3	194	21.4	0.5		
Denmark	3.7	Q3	4.3	3.0	3.1	Dec	1.6	2.5	Dec	8.5		-0.2	0.3	63.0	6.58	-6.1		
Norway	5.1	Q3	16.1	3.4	5.3	Dec	3.0	3.5	Nov ^{††}	8.5		0.2	1.4	76.0	8.80	-1.9		
Poland	5.5	Q3	9.5	4.9	8.6	Dec	6.2	5.4	Dec [§]	0.5		-3.1	4.0	282	4.03	-7.4		
Russia	4.3	Q3	na	2.4	8.4	Dec	5.0	4.3	Nov [§]	7.1		0.7	9.3	271	76.3	-0.8		
Sweden	5.7	Q4	5.7	3.0	3.9	Dec	2.4	7.3	Dec [§]	3.7		-0.3	0.4	31.0	9.20	-8.5		
Switzerland	4.1	Q3	6.8	3.0	1.5	Dec	1.1	2.4	Dec	5.0		0.5	0.1	54.0	0.92	-2.2		
Turkey	7.4	Q3	11.3	3.4	36.1	Dec	31.4	10.9	Nov [§]	-1.7		-3.6	22.0	939	13.6	-46.9		
Australia	3.9	Q3	-7.5	3.3	3.5	Q4	2.6	4.2	Dec	1.6		-4.6	1.9	78.0	1.40	-5.7		
Hong Kong	5.4	Q3	0.5	2.9	2.4	Dec	2.2	3.9	Dec ^{††}	1.3		-1.5	1.6	72.0	7.79	-0.5		
India	8.4	Q3	54.1	7.0	5.6	Dec	4.6	6.6	Jan	-1.6		-5.9	6.9	75.0	74.8	-2.5		
Indonesia	3.5	Q3	na	5.3	2.2	Jan	3.5	6.5	Q3 [§]	-0.5		-4.9	6.4	30.0	14,358	-2.3		
Malaysia	-4.5	Q3	na	4.5	3.2	Dec	2.8	4.3	Nov [§]	3.2		-6.1	3.7	102	4.19	-3.6		
Pakistan	6.0	2021 ^{**}	na	3.4	13.0	Jan	8.0	6.9	2019	-5.6		-6.4	10.9	†††	104	176	-9.1	
Philippines	7.7	Q4	13.0	5.3	3.6	Dec	3.9	7.4	Q4 [§]	-2.9		-7.2	4.8	184	51.0	-5.9		
Singapore	5.9	Q4	10.7	3.8	4.0	Dec	2.8	2.4	Q4	17.3		-1.8	1.8	77.0	1.35	-1.5		
South Korea	4.0	Q4	4.5	2.9	3.7	Dec	2.3	3.5	Dec [§]	4.1		-2.9	2.6	83.0	1,206	-7.3		
Taiwan	4.9	Q4	11.1	3.2	2.6	Dec	2.4	3.7	Dec	14.6		-0.7	0.7	38.0	27.8	0.6		
Thailand	-0.3	Q3	-4.2	2.8	2.2	Dec	1.8	1.5	Dec [§]	1.8		-6.9	1.9	64.0	33.2	-9.7		
Argentina	11.9	Q3	17.3	2.3	50.9	Dec	51.6	8.2	Q3 [§]	0.9		-3.2	na	na	105	-16.6		
Brazil	4.0	Q3	-0.4	0.3	10.1	Dec	7.6	11.6	Nov ^{§††}	-0.7		-7.3	11.0	355	5.30	1.1		
Chile	17.2	Q3	21.0	3.0	7.2	Dec	6.9	7.2	Dec ^{§††}	-2.4		-3.5	5.6	302	810	-9.7		
Colombia	12.9	Q3	24.9	5.0	5.6	Dec	4.2	11.0	Dec [§]	-4.9		-6.5	8.7	380	3,934	-10.3		
Mexico	1.0	Q4	-0.4	2.6	7.4	Dec	5.3	4.0	Dec	-1.4		-3.5	7.6	243	20.6	-2.1		
Peru	11.4	Q3	15.0	2.8	5.7	Jan	5.7	6.4	Dec [§]	-2.7		-2.6	6.2	244	3.86	-5.7		
Egypt	9.8	Q3	na	5.4	5.9	Dec	6.3	7.5	Q3 [§]	-3.9		-6.9	na	na	15.7	0.1		
Israel	4.5	Q3	2.7	4.3	2.8	Dec	2.8	4.3	Dec	4.8		-3.2	1.6	76.0	3.17	4.1		
Saudi Arabia	-4.1	2020	na	5.0	1.2	Dec	1.8	6.6	Q3	6.3		2.0	na	na	3.75	nil		
South Africa	2.9	Q3	-5.8	2.1	5.9	Dec	4.8	34.9	Q3 [§]	-0.7		-6.3	9.3	74.0	15.4	-2.4		

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 Feb 2nd	% change on:	
		one week	Dec 31st 2020
United States S&P 500	4,589.4	5.5	22.2
United States NAScomp	14,417.6	6.5	11.9
China Shanghai Comp	3,361.4	-2.7	-3.2
China Shenzhen Comp	2,262.4	-2.9	-2.9
Japan Nikkei 225	27,533.6	1.9	0.3
Japan Topix	1,936.6	2.4	7.3
Britain FTSE 100	7,583.0	1.5	17.4
Canada S&P TSX	21,362.4	3.7	22.5
Euro area EURO STOXX 50	4,222.0	1.4	18.8
France CAC 40	7,115.3	1.9	28.2
Germany DAX*	15,613.8	1.0	13.8
Italy FTSE/MIB	27,388.7	2.9	23.2
Netherlands AEX	765.6	1.7	22.6
Spain IBEX 35	8,713.2	1.1	7.9
Poland WIG	68,875.7	1.2	20.8
Russia RTS, \$ terms	1,463.9	10.5	5.5
Switzerland SMI	12,360.4	2.2	15.5
Turkey BIST	2,002.2	2.6	35.6
Australia All Ord.	7,399.6	2.1	8.0
Hong Kong Hang Seng	23,802.3	-2.0	-12.6
India BSE	59,558.3	2.9	24.7
Indonesia IDX	6,707.6	1.6	12.2
Malaysia KLSE	1,512.3	-0.2	-7.1

	index Feb 2nd	% change on:	
		one week	Dec 31st 2020
Pakistan KSE	46,119.2	2.6	5.4
Singapore STI	3,249.6	-0.7	14.3
South Korea KOSPI	2,663.3	-1.7	-7.3
Taiwan TWI	17,674.4	nil	20.0
Thailand SET	1,667.8	1.5	15.1
Argentina MERV	89,662.7	4.5	75.0
Brazil BVSP	111,894.4	0.5	-6.0
Mexico IPC	51,766.2	1.4	17.5
Egypt EGX 30	11,691.8	1.7	7.8
Israel TA-125	2,057.1	1.2	31.2
Saudi Arabia Tadawul	12,192.6	0.1	40.3
South Africa JSE AS	75,190.8	1.9	26.6
World, dev'd MSCI	3,113.8	4.5	15.8
Emerging markets MSCI	1,213.2	0.1	-6.0

US corporate bonds, spread over Treasuries

Basis points	Dec 31st 2020	
	latest	
Investment grade	132	136
High-yield	369	429

Sources: Refinitiv Datastream; Standard & Poor's Global Fixed Income Research. *Total return index.

Commodities

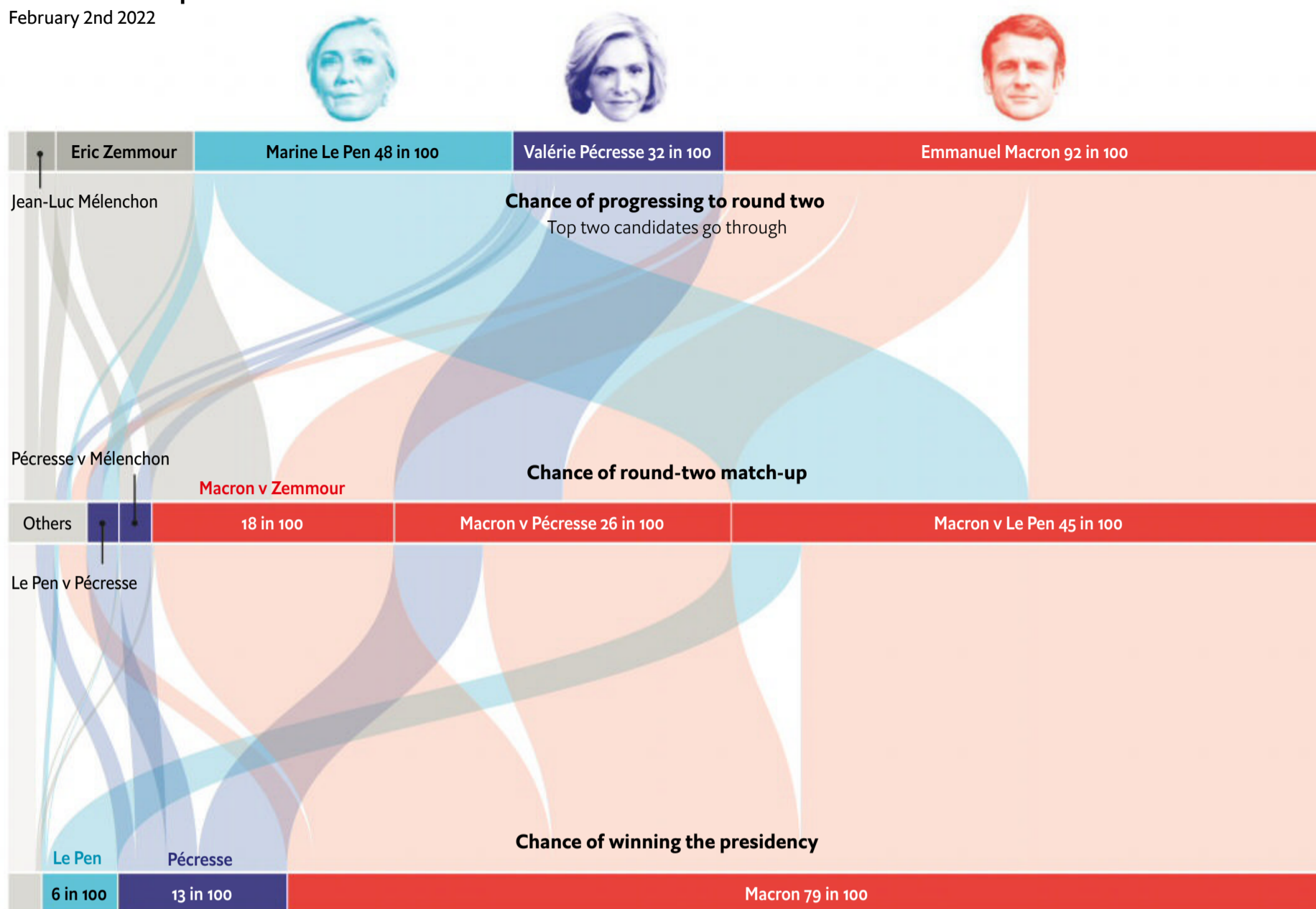
The Economist commodity-price index 2015=100	% change on			
	Jan 25th	Feb 1st*	month	year
Dollar Index				
All Items	171.4	175.8	7.2	14.9
Food	142.6	146.9	4.4	18.2
Industrials				
All	198.3	202.7	9.1	12.7
Non-food agriculturals	165.8	164.6	0.3	25.0
Metals	207.9	213.9	11.4	10.3
Sterling Index				
All items	194.0	198.6	7.5	15.9
Euro Index				
All items	168.6	173.3	7.8	22.8
Gold				
\$ per oz	1,847.3	1,806.4	-0.4	-1.8
Brent				
\$ per barrel	88.3	89.2	11.4	55.1

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.

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Share of model's predicted outcomes

February 2nd 2022



Elysian stakes

Our French presidential election model augurs well for the incumbent

EMMANUEL MACRON once longed for a more “Jupiterian” presidency. This April he may realise his dream by securing a rare second term in the Elysée. At the launch of *The Economist’s* statistical model for the French election, Mr Macron’s lead in the polls suggests that he has a 79% chance to come away victorious. In political terms, there is still an aeon until April 10th, when the first round among a dozen candidates takes place, let alone the two-candidate run-off to be held on April 24th. Updated daily, our model will keep track of his and his rivals’ fortunes until the votes are cast. If Mr Macron were to succeed, he would be the first president to win re-election since Jacques Chirac achieved the feat two decades ago.

Although there are many rich traditions in France, sophisticated modelling of elections, common in America and Britain, is

not yet one of them. That is not because it is impossible. The essential input—reputable polls—have existed there for decades. Since 1965, when our historical data begins, polls taken in the final week of the presidential campaign for either round have deviated from the actual vote shares achieved by candidates by an average of just 2.5 percentage points. Our efforts rest on this rich record of polling, both past and present.

As several recent elections have shown, polls cannot eliminate uncertainty. Neither can our model. We try to take the fullest account possible of the error in French election polling, but our model offers no



Our interactive election model is updated daily. To see it, scan this QR code on a mobile device, or go to economist.com/France2022

guarantees. It uses statistics to put candidates’ positions in the polls today in the context of the evolution of past campaigns and the errors of past polling—no more and no less. Our assessment of Mr Macron, for example, does not assure him victory. It simply observes that, four times out of five, presidential candidates with a lead of this magnitude ten weeks from election day have gone on to win. That is roughly the chance that a professional footballer successfully scores a penalty kick.

For many people, election modelling is a black box, and its statistical methods a dark art. Ours is not, in a literal sense, since we are releasing the underlying code powering our predictions. The thinking behind our methods is readily intelligible, too. The underlying approach can be summarised simply: we combine the current polls with historical error to create probabilities. The rest of this walk-through fills in the details.

We start by aggregating all current polls for the presidential campaign. We then construct a polling average for every candidate, which is more accurate than any individual poll. We use a modestly fancy statistical tool to do this by employing a curve of best fit called a “spline”, which resembles ▶▶

▶ the linear regressions familiar to statistics students. So that we do not put too much weight on the past and build overconfident models, we use a machine-learning technique called cross-validation.

The next step is to calculate the historical error of the polls. We use a “timeline” method popularised by the political scientists Will Jennings and Christopher Wlezien, whose remarkable polling database we also rely on. As one gets nearer and nearer to an election day, the difference between the polling estimate and the final result narrows. Six months before the election date, for example, French presidential polls deviate an average of five percentage points from the final result. We can compute this average “absolute error” for every point in the campaign: three months from the election, say, up to the day before.

This is a different sort of measure from the “margin of error” that is sometimes reported by pollsters, which reflects the chance that the people surveyed are unrepresentative of the French electorate. The margin of error also does not account for equally worrisome potential pitfalls, such as the chance that certain kinds of voters are systematically shying away from pollsters, that questions are poorly worded or that pollsters’ methods for correcting for known biases are faulty. The historically rooted “absolute error” method therefore gives a better sense of overall accuracy.

Like manufacturing paint or whisky, the art of blending is the all-important fi-

nal step for election models. With a starting point (the candidate’s position in the polls on a given day) and a guide (the amount of uncertainty that history implies) we are able to make conjectures about the destination. Our preferred method when the maths get complicated, as it does here, is to employ simulation and let a computer answer our questions by brute force. Where the simulations ought to start is provided by today’s polls. How widely spread apart they ought to be is provided by the historical error.

There is one final quirk—the large number of candidates—to straighten out. When elections only feature two candidates, statisticians can conveniently simulate error by taking votes from one candidate and transferring them directly to the other (such is the nature of a zero-sum system). But in a race with many candidates, this process is not so simple. One candidate’s lost supporters are not equally distributed among the other options. For example, Mr Macron’s standing in the polls has tended to fall as support for Valérie Pécresse, the centre-right Republican candidate, has risen. We solve this by observing the trade-offs in polling averages over the campaign and estimating a covariance matrix—a table that stipulates how each candidate’s votes move in relation to everyone else’s.

At last, we are able to quantify these relationships between all pairs of candidates and simulate 10,000 potential first-round outcomes based on these critical factors:

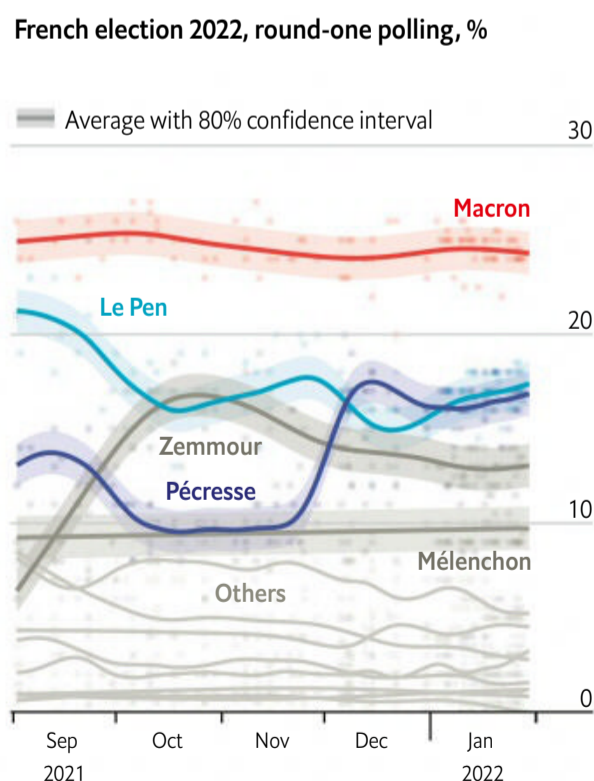
candidates’ current estimated standing, the observed fluctuations between pairs of candidates and the historical uncertainty in the polls. With these simulations in hand for the first round, we repeat the process for the (much simpler) second round. For every single first-round simulation, we generate 1,000 second-round simulations using the patterns in second-round polling for the top two vote-getters. Together, we get 10m total simulations for the French election—refreshed each day.

Bonne chance

As we launched our model, Emmanuel Macron won in about 7.9m of those simulated elections—giving him the commanding (but by no means certain) probability of being re-elected of close to 79%. Mrs Pécresse is the second likeliest to win, albeit with a relatively slender chance of 13%. Marine Le Pen, a far-right candidate, trails in third with a chance closer to 6%. According to the polls today, the other candidates are extreme longshots, splitting the remaining 2% among themselves.

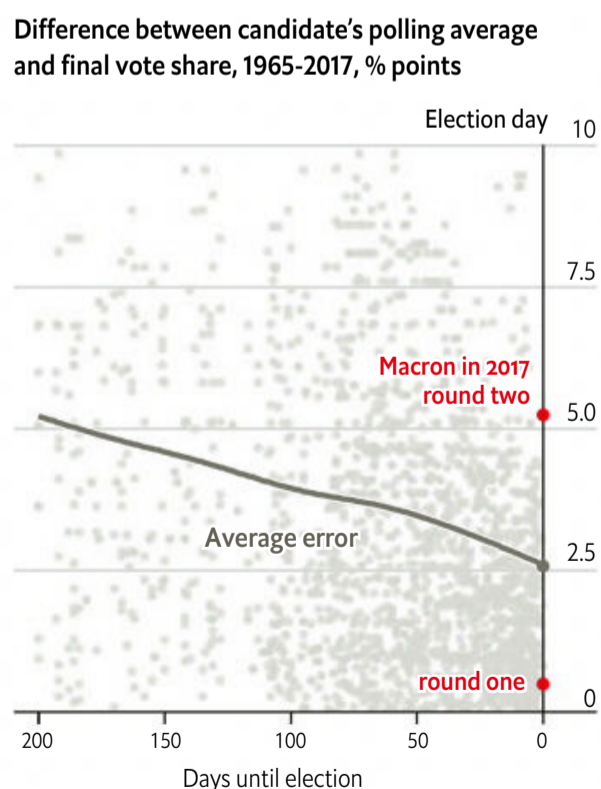
George Box, an eminent statistician, once quipped that “All models are wrong but some are useful”. For an exercise as complicated as an election, a model like ours must necessarily be simplified. But it will prove useful if it correctly measures uncertainty. Mr Macron may like his starting chances, but he should not take false confidence. Who hasn’t seen a professional footballer miss a penalty kick? ■

→ **Step one: current polling**



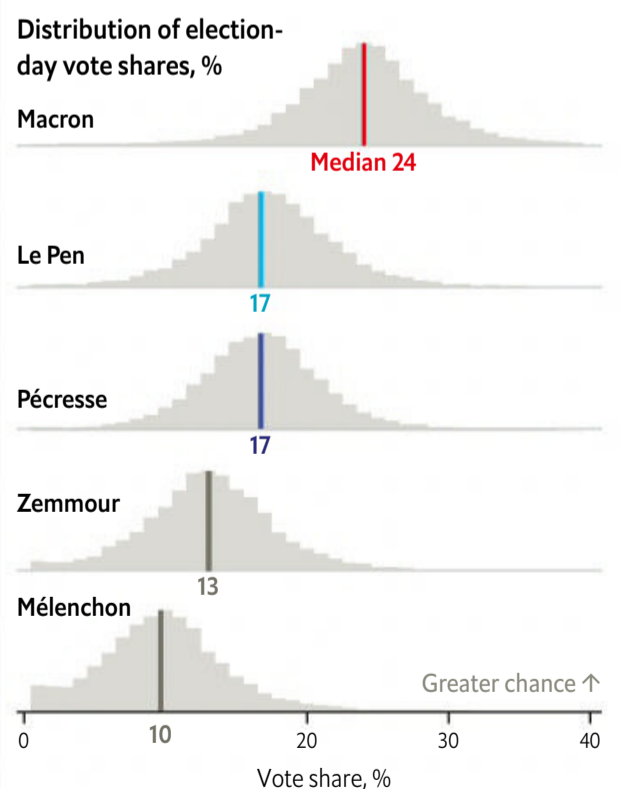
We aggregate this year’s polling data to estimate the vote share for each candidate. The polling aggregate is tuned with machine-learning techniques to neither overreact to outlier polls nor be too conservative when the polls do change.

→ **Step two: historical polling**



Then, we analyse historical data to quantify how reliable French pre-election surveys are. We measure the average difference between candidates’ polling and actual election results in the ten elections going back to 1965.

→ **Step three: modelling vote shares**



Our model then simulates 10,000 different paths for the first-round election. These faux elections yield predictions—assuming polls are as accurate as they have been historically. Repeating this process for round two gives our final probabilities.

Sources: “Election polling errors across time and space”, by Will Jennings and Christopher Wlezien, *Nature and Human Behaviour*, 2018; Alexandre Léchenet, NSPPolls; *The Economist*



To sea in a barrel

The intrepid adventurer died on January 21st while rowing solo across the Atlantic, aged 75

EDWARD LEAR'S Jumblies, seeking the hills of the Chankly Bore, went to sea in a sieve. They had a beautiful pea-green sail tied with a ribbon to a tobacco-pipe mast, and slept in a crockery jar. In 2018-19 Jean-Jacques Savin, aiming for the Caribbean from the Canaries, crossed the Atlantic in a Bordeaux *tonneau* made of plywood and painted a gaudy orange. It had no sail or engine, but flew the flag of France. Inside, in a space scarcely bigger than a crockery jar, he installed a bunk, a sink, a captain's chair, a card-table and a porthole in the floor through which to watch the fish. His barrel-baby, as he thought of it, was baptised on the beach after mass in Arès, his home town in the Gironde, and named *Audacieux*, because it was. It would drift to America in the arms of the ocean, with no man-made power at all.

The Jumblies, after landfall over the Western Sea, stocked up with an owl, a useful cart, a pound of rice, a cranberry tart and "no end of Stilton Cheese". Mr Savin was equipped with two solar panels, a desalinator, GPS, a Globalstar spotlight to make him trackable on the internet, gel batteries and a floating anchor and no end of nylon rope. He also carried his favourite adventure books, a mandolin, a bottle of Saint-Emilion, another of champagne, a bottle of Sauternes and a tin of foie gras, to celebrate the new year and his birthday at sea.

The birthday, on January 14th, was his 72nd. At an age when many men take to gardening, he was setting out on a voyage where he almost collided with two ships, was knocked off his barrel in a storm (swinging like a yo-yo on his rope, underwater and out again), spent days lashed to his bunk and lost four kilograms, "Quite risky", he confessed. But it earned him worldwide celebrity and thousands of Facebook followers, as the tiny orange craft floated its way west on ocean currents and the trade winds.

His father had been a prosperous oyster-farmer in Arès, which was famous for them. Outside town lay the Bay of Arcachon, mile

after mile of muddy sand and huge shifting dunes, where the young Jean-Jacques larked about rather than bother with school. Beyond stretched the immense Atlantic, beckoning to be crossed. He tried other adventures first, though. As a teenager he scaled the bell-tower of the church in Arès by way of the lightning conductor. He did military service as a paratrooper in elite units, prospected for gold in Africa and became a near-champion in triathlon. Back home he threw himself into whatever needed doing, whether diving to fix boats, repairing roads with oyster shells or harvesting the cordgrass that covered the dunes. With his jaunty cap and gap-toothed grin he never looked his age, or felt it. Late in his 60s he climbed Mont Blanc and swam four times across the local bay, combining the feat with mud-skating. But his greatest *défi* to age and a boring life was to set out on that blue, open ocean.

Four times he sailed across. What he really wanted, though, was to do it as a man adrift after a shipwreck, at the mercy of the sea. His favourite boyhood book was "The Voluntary Castaway" by Alain Bombard, a French doctor who had crossed the Atlantic in an inflatable dinghy, with a sail and oars, in 1952. (He was a mere 28, and took Shakespeare and Rabelais with him.) "Docteur Fou", as his countrymen mostly called him, set out to prove that castaways could live for several weeks on what the ocean provided: water, plankton and fish. Plankton, filtered through a special net, was full of vitamin C to ward off scurvy. Sea water was fine to drink if taken in small doses. As for fish, Bombard had learned from Polynesians that big fish, tuna and sharks, had a liquid just beneath the skin that could be drawn off and mixed with sea water, making a drink at least as pleasant as Vichy water. All these became Captain Savin's diet. But the part of Bombard's book that most seized him was a single sentence: "A *barrique* [225 litres, half the size of his *tonneau*] launched in the Canaries will take three months to reach the Caribbean." He took 127 days.

The voyage was not just a boy's dream but also, he stressed, scientific. He recorded his observations daily and minutely. Doctors were going to measure his vital signs. Even the Sauternes would be subtly compared with a bottle left on shore. He also noted his morale, since Bombard had said it was the key to survival, and his was resoundingly good. He was free on the ocean, completely free. Out there, in a bobbing barrel, there were no rules beyond instinct and common sense. In his paratrooper days he had struggled with taking orders: where to go, what to do. But if you chose to put yourself through tough times and solitude, it changed everything. His voyage became a holiday.

That was why, three years later, he decided to cross the Atlantic in an 8-metre rowing boat shaped like a canoe. This too was called *Audacieux*, because he still was. There was more space on board, and the IT had improved. The main drawback was that the sea was no longer gently carrying him over, but had to be rowed through for eight hours a day. And he was older—if he made it, the oldest person ever to row across. On the barrel voyage, *à la cool*, he had played a lot of bluegrass on his mandolin and written large chunks of his book, "127 Days Adrift: The Atlantic in a Barrel". Now, with the sea between Portugal and the Azores bucking and plunging like a rollercoaster, there was no time for music or books, only the Three Rs: *ramer, ravitailler, ronfler*, row, stoke up, snore. On his 75th birthday the champagne and foie gras came out again. On January 19th his solar panel stopped working, but his message ended on a merry note: his morale was fine, and he was absolutely not giving up. On the 21st he triggered two distress flares.

Had he failed? Not necessarily. The voyage had hardly begun, and he had more or less decided to get repairs done in the Azores and start again. It had been his choice to build the canoe, his choice to set out alone, his choice to flick away old age like a nothing. He had notched up all those successes in any case, revelling in freedom. But freedom also meant, as on his barrel voyage, that he chose to entrust himself to the ocean in which his craft now floated without power towards the west, and in which he was lost. ■



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TOWARDS A DREAM

LOUIS VUITTON