

The Economist

THE SORCERER OF SILICON

**Jensen Huang,
Nvidia and the
future of AI**

Moral panic over data centres

China's restaurant diplomacy

Women, jobs and honour

The Bayeux tapestry: quite the yarn

SEPTEMBER 5TH–11TH 2026



RICHARD MILLE



RM 55-01

Manual winding skeletonised movement
55-hour power reserve ($\pm 10\%$)
Baseplate and bridges in grade 5 titanium
Free-sprung balance with variable inertia
Double-barrel system
Case in Carbon TPT® and grade 5 titanium

A Racing Machine On The Wrist

Contents



On the cover

Nvidia is powering the AI boom. Good: leader, *page 7*. Will the chipmaking superstar's financial support for its customers prove a boon or a boondoggle? Briefing, *page 13*. Risks loom over the rapidly growing neocloud industry, *page 60*. Will anybody use AI as much as coders? *Page 59*. When Nvidia's boss returns to his native Taiwan, things get a little weird. Shailesh Chitnis gets a dose of Jenseanity: 1843, *page 55*

Moral panic over data centres

Americans' growing hatred of AI infrastructure is shaping the midterms, *page 31*

China's restaurant diplomacy

It is full of contradictions, but some countries welcome it as an alternative to Western power: Chaguan, *page 49*

Women, jobs and honour

In many countries the biggest barrier to prosperity is in the home: leader, *page 9*. The love of money is the root of quite a lot of good, *page 51*

The Bayeux tapestry: quite the yarn What a 950-year-old piece of linen has to teach about survival: leader, *page 10*. The treasure's many mysteries, *page 76*. The tapestry is a post-Brexit symbol of Anglo-French co-operation, *page 26*

→ Download *The Economist's* app for articles, podcasts, videos and more, published throughout the week.

The world this week

- 5 A summary of political and business news

Leaders

- 7 **Artificial intelligence**
Nvidia's big bet
8 **Venezuelan oil**
Trumpismo
8 **Uganda**
Twilight of an autocrat
9 **Women and work**
Opening the glass door
10 **The Bayeux tapestry**
Follow the thread

Letters

- 11 On animal testing, polygenic embryo selection, Dolly Parton, relaxing holidays, Lake Ontario

By Invitation

- 12 Radek Sikorski on standing up to Russia

Briefing

- 13 **Nvidia**
The central bank of AI



Bartleby The glory of the corporate training video, *page 64*



Europe

- 17 How the AfD would rule
18 Will Putin escalate?
19 A new king of Norway
20 EU: Iceland stays out
20 EU: Montenegro wants in
21 **Charlemagne** The EU's debt divisions



Britain

- 23 Mapping violent crime
24 Stabbings in London
25 Phone snatching
26 Bayeux bonhomie



Middle East & Africa

- 27 A hair-raising heir
28 Drone strikes in Tigray
29 Iran's axis of resistance
30 Electioneering in Israel



United States

- 31 The data-centre revolt
33 Anger in politics
33 Pete Hegseth's purges
34 Canada's counter-punch
35 Special-education funds
36 **Lexington** The case for class treason



The Americas

- 37 The Venezuelan oil deal
38 A Brazilian liberal, almost
40 Ecuador, prawn giant



Asia

- 41 India's veteran visionary
42 The Pacific Islands Forum
43 Nepal's catastrophe
43 Japan's opposition
44 **Ashoka** Online payments
45 Social-media curbs



» Contents continues overleaf

Contents

China

- 46 Unsafe food
- 47 Dogfight diplomacy
- 48 Barbecue wars
- 49 **Chaguan** After wolf warriors



International

- 51 Women, jobs and honour
- 54 **The Telegram** Ukraine's long war



1843

- 55 The gentle cult of Jensen Huang



Business

- 59 AI's next big use cases
- 60 Neoclouds' risky rise
- 61 Food fads
- 62 Huawei's new customers
- 62 The IRS looks abroad
- 63 Lessons from LIV Golf
- 64 **Bartleby** Training videos
- 65 **Schumpeter** Sports documentaries



Finance & economics

- 66 Miami, future of finance?
- 68 Bond yields in Europe...
- 68 ...and in Mexico
- 69 India's options trouble
- 69 Fixing Chinese property
- 70 **Buttonwood** IPOs v stock markets
- 71 **Free Exchange** The Fed in a Hole



Science & technology

- 72 Human exoskeletons
- 73 Dark matter discovered?
- 74 A new space telescope
- 74 The Hugging Face affair
- 75 **Well Informed** VR exercise



Culture

- 76 The Bayeux tapestry
- 78 The new patrons
- 79 Robert Harris's "Agrippa"
- 79 Two conmen
- 80 The Hyrox fad



Economic & financial indicators

- 81 Statistics on 42 economies

Obituary

- 82 Guo Lanying, China's Dolly Parton

Volume 460 Number 9515

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, Cape Town, Chicago, Dubai, Lagos, Madrid, Mexico City, Montevideo, Mumbai, Nairobi, New Delhi, New York, Paris, San Francisco, São Paulo, Shanghai, Singapore, Taipei, Tokyo, Washington DC

Subscription service

For our full range of subscription offers visit:

Economist.com/subscribe

If you are experiencing problems when trying to subscribe, please visit our Help pages at:

Economist.com/help for troubleshooting advice.

To manage your account online, please visit my.economist.com where you can also access our live chat service which is available 24/7. To call us, contact our dedicated service centre on +44 (0)203 868 6843.



PEFC/04-31-1267

PEFC Certified

This copy of *The Economist* is from sustainably managed forests, recycled and controlled sources
www.pefc.org

The world this week Politics



Fighting broke out between **America** and **Iran** in the countries' biggest exchange of fire in over a month. America struck Iranian air defences, radar installations, shipping and mine-laying facilities. Iran targeted American bases in Bahrain, Iraq, Jordan and Kuwait. Several oil tankers in the Strait of Hormuz were attacked, one of which was sailing a route close to the coast of Oman, a maritime course that America has said is under its protection. Oil prices jumped. Meanwhile, reports suggested that an American naval blockade has successfully cut off Iranian exports of crude oil through the strait to China, Iran's biggest customer. China still has access to oil stocked on ships in Asia.

On a visit to **Egypt** Xi Jinping called for a new security apparatus for the Middle East, and said that **China** was ready to help protect strategic shipping routes in the region. China is helping build Egypt's new administrative capital and is a big investor in the ports and industrial areas that line the Suez canal.

The **Pacific Islands Forum** held its annual summit, which this year took place in Palau. Palau is one of only a dozen countries to have diplomatic relations with **Taiwan**, which was invited to the summit, to China's fury. Its officials accused "independence separatists" of making "sneaky visits" abroad, bringing "disgrace" to their hosts. Palau's president told China, diplomatically, to mind its own business. During the meeting Australia pledged A\$600m (\$430m) and America

promised \$150m for several security measures. New Zealand said that, with America, it would finance the refurbishment of a strategic port in the Cook Islands. The three countries are seeking to limit China's clout in the region.

The death toll from flash flooding on the border of **Nepal** and Tibet passed 1,000, with more than 4,000 people still missing. China at last cleared the road leading to the Gyirong border crossing, enabling the deployment of heavy machinery to the devastated area. The flooding was triggered by a partial glacier collapse in the Himalayas.

Venezuela's legislature backed Donald Trump's deal creating a private joint venture that gives America preferential access to more than 65bn barrels of proven oil reserves, a fifth of Venezuela's total. The American government said the agreement would bring \$100bn in private investment to Venezuela; Mr Trump believes the pact will lower petrol prices for Americans. The details were hazy, especially on the involvement of America's big oil companies.

"Let data reign"

Mr Trump criticised the growing number of local communities in America that are opposed to building **data centres**, saying they would end up "backwards and poor". That didn't stop California's state legislature from passing several bills imposing new regulations on data centres, including environmental-impact reviews and requirements to report electricity and water usage to state agencies. Gavin Newsom, the Democratic governor, vetoed a water-disclosure bill last year, but now, as he contemplates running for president, says he is "leaning in" to the idea.

A 23-year-old man pleaded not guilty to the murder of **Charlie Kirk**, a conservative activist. The judge overseeing the case

in Utah allowed the prosecution to seek the death penalty because of aggravating factors, such as the defendant shooting into a crowd at the college where Kirk was holding an event a year ago. A trial is still months away.

Dan Driscoll resigned as **secretary of the army** amid a clash with Pete Hegseth, the secretary of war, over the sacking of senior commanders. In April Mr Hegseth fired several top-ranking officers, including General Randy George as army chief of staff, in part because of disagreements over a restructuring of the service that was supported by Mr Driscoll. Mr Hegseth's wider purge of the top brass has even got Mr Trump concerned, according to reports.

The **USS Abraham Lincoln** docked in Thailand after spending 286 consecutive days at sea, thought to be a record for not berthing in port in the US navy's modern era. The aircraft-carrier was deployed last November. The 5,000 sailors and marines on board will get a well-deserved break in Thailand. Reports surfaced earlier this year about the mental stress that some personnel were under because of the long voyage.



Iceland held a referendum on whether to reopen talks on joining the European Union. Voters rejected the proposal by 53% to 47%; only Reykjavik, the capital, voted in favour. Turn-out was nearly 83%. Supporters of the measure put trade and Arctic security at the centre of their campaign, but that was not enough to overcome con-

cerns that Iceland's fishing industry would be put in jeopardy by joining the bloc.

Germany blamed Russia for a drone attack on Leipzig airport in early August. The drone didn't explode, but a cargo plane hit a second drone, suffering no damage. A third drone was reportedly found in the area ten days later. NATO and the EU backed Germany's claims. The German government announced a series of modest measures to enhance security, including stricter border controls for Russian nationals.

Russia's slaughter continued in **Ukraine**, as it launched waves of missiles and drones targeting Kyiv, killing 12 people in one attack alone. It also hit a printing press that was gearing up to issue textbooks for the new school term. Russia has been targeting printing presses and publishers in an effort to stifle Ukrainian culture, destroying some 12m books.

European officials complained about the presence of Russia's finance minister at a meeting of **G20 finance ministers** in Asheville, North Carolina. It was the first time Anton Siluanov physically attended a G20 meeting since Russia's invasion of Ukraine in 2022. He was invited by the US Treasury in a spirit of co-operation.

1066 and all that

In London, King Charles and Emmanuel Macron inaugurated the **Bayeux tapestry** exhibition at the British Museum, days before it goes on public display. The tapestry was embroidered in England more than 900 years ago and illustrates the epochal events of the Norman invasion and Battle of Hastings, where King Harold, the last Anglo-Saxon monarch, was killed by an arrow to the eye, or so the tapestry depicts. It has been kept in France for centuries, but the French government announced the loan in 2018, two years after Brexit.

The world this week Business



Renewed concern among investors about inflation, triggered in part by the flare-up in fighting in the Middle East, led to another rout in **government bonds**, pushing up yields. The yield on ten-year American Treasuries was above 4.8%, the highest level in three years. The yield on Japan's ten-year bond hit 3% for the first time since 1996, while yields on German ten-year Bunds were at their highest since 2011. The yield on British ten-year gilts climbed above 5.2%; that's higher than at any time since 2008, including when Liz Truss was brought down as prime minister in part by the bond markets in 2022.

Kevin Warsh struck a hawkish tone in a keynote speech to central bankers gathered at Jackson Hole. The Federal Reserve's chairman said it still had "work to do" to curtail inflation, which markets took to mean an interest-rate rise is on the cards, possibly at the Fed's next meeting.

The euro area recorded a 3.3% year-on-year rise in the consumer-price index for August. In July the CPI rose by 2.9%. Higher **inflation** makes it all the more certain that the European Central Bank will lift interest rates again when it meets on September 10th. In June it increased rates by a quarter of a percentage point.

Brazil's economy grew by 0.5% in the second quarter compared with the previous three months, or by 2% on a year-on-year basis. The GDP data were the last to be released before the presidential election on October 4th.

Shein's share price closed down slightly on its first day of trading on the Hong Kong exchange, then tumbled the following day. The ultra-cheap clothing retailer was valued at \$26bn at its IPO, a fraction of its worth four years ago, when it started its quest to become a public company. Meanwhile, France began imposing fees on cheap fast-fashion firms such as Shein and Temu. This is part of a new law that its supporters say will curb sales in a business that floods markets with environmentally unfriendly disposable clothing.

Time for Ternus

John Ternus took over from Tim Cook as **Apple's** chief executive. He takes the reins as the company negotiates a rocky path incorporating AI into its products. It is also expected soon to launch a foldable iPhone, the biggest change yet to its most-important device. In addition, Apple is fighting OpenAI in court for allegedly stealing trade secrets. The dispute centres on OpenAI's hiring of former Apple staff. OpenAI argues that staff are free to "leave a company like Apple that has struggled to adopt AI and move to an exciting startup".

Uber embarked on a big restructuring of its business, shedding 3,300 positions, or about 10% of its global workforce, mostly in management. The company's rapid growth over the past decade has seen it become bloated, according to Dara Khosrowshahi, the chief executive, and it needs to streamline in order to invest more in ride-sharing, delivery and robotaxis, its core activities. It is also limiting the number of employees who can work remotely, to 1% of staff. Uber has expanded its New York office, the biggest outside its San Francisco headquarters, to accommodate more people.

The Federal Trade Commission and 22 states filed a lawsuit against **Amazon**, alleging that it "secretly" manipulated auctions for advertisement placements on its website and mobile app, "illegally" extracting \$20bn from 1.2m ad customers. Amazon is purported to have said that the complaint is "misguided".

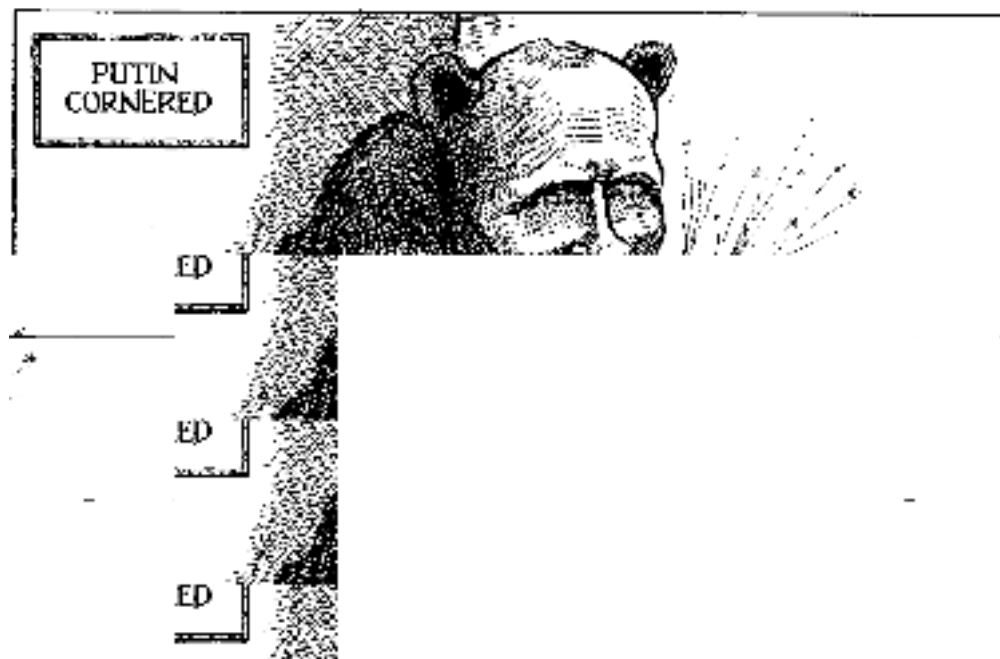
The latest deal struck by an AI firm to expand its data capacity saw **Anthropic** reportedly pay \$35bn to Lambda, a cloud-computing service backed by Nvidia. As part of the agree-

ment Nvidia will hold the lease on a new data centre in Texas, according to reports, the latest instance of the chip company helping fund AI infrastructure.

SLB expanded its business in data centres by agreeing to buy **Kelvion**, a firm specialising in cooling and heat-transfer applications, in a \$4.1bn deal. Better known as the world's biggest oilfield-services company, SLB also builds prefabricated infrastructure for data centres such as electrical rooms and server halls, which it then assembles on site. Kelvion provides technology that cools the equipment. Revenue from SLB's data-centre business in America grew by 121% last year.

Smile, you're on camera

The world's first electric **toothbrush** with a built-in camera went on sale. Made by Dyson, the CameraJet enables users to inspect their mouths for cavities and ulcers, but also uses an AI algorithm (of course) to blast mouthwash into the tiny gaps between teeth. Its "anti-gravity tank" works better than other flossers, Dyson claims. Retailing at \$499, some people may prefer to use more traditional toothbrushes to keep their ivories pearly white.



The sorcerer of silicon

A chipmaking superstar and its boss are driving the AI boom. Good

NVIDIA WAS named in 1993 after the Latin word for envy. Sure enough, the American colossus inspires plenty of it. Insatiable global demand for its graphics-processing units (GPUs), the chips that power artificial intelligence, has made Nvidia the world's most valuable company, worth \$5.4trn. Next year it may also become the most profitable, generating \$370bn in net income. By 2029 its sales could hit \$1trn.

Jensen Huang, Nvidia's boss, is truly the magician at the heart of the AI boom. His firm's share price is 14 times what it was on ChatGPT's release in late 2022. The ten biggest public companies championing AI make up 40% of the value of the S&P 500 index. Nvidia alone accounts for 8% and unlike, say, Apple or Tesla, which make smartphones and cars, it is almost solely a bet on AI. The company has produced about 15 cents of every dollar the American stock market has returned since 2023—returns that have kept consumers spending despite rising interest rates, tariffs and a war with Iran.

Yet many also see Mr Huang as a magician in a more worrying sense, fearing that he is an illusionist inflating a dangerous bubble. Through \$1trn-worth of deals, Nvidia provides data-centre landlords and AI labs with cash or guarantees so that they can buy its GPUs. Some call it the "bank of AI". At the very least, Nvidia's critics say, its financial engineering smacks of the "vendor financing" which pumped up the revenues of networking-gear makers like Cisco in the dotcom mania of 2000-01, whose collapse brought about a recession.

Look more closely, however, and the worries are mostly unjustified. If Nvidia's bets on AI come good, they could accelerate the technology's adoption, boosting productivity and living standards. If they misfire, the cost will fall chiefly on Nvidia's shareholders. That is how capitalism is supposed to work.

True, the dotcom and AI booms share unnerving similarities: an exciting new technology, an epic bull run, hubristic tech bosses. Nvidia's rise from seller of chips to video-gamers and cryptocurrency miners to linchpin of the economy has been so rapid that many people have yet to learn how to say its name ("en-vidia", not "nuh-vidia"). This mirrors the ascent of Cisco, which in 2000 briefly also became the world's most valuable firm. Just as Cisco's sales of routers and switches presupposed exponential growth in web traffic, Nvidia's GPU revenues assume endless demand for AI tokens.

Cisco was right about eventual demand but wrong about the timing—hence the dotcom crash. Today it is the pace of AI adoption that is hard to forecast. Set aside Claude-added software engineers and usage remains fledgling (see Business section). If it does not soon soar, Nvidia's customers may call in the guarantees just as the chipmaker's own sales nosedive. Since no one is sure how quickly GPUs lose their value, any used chips Nvidia repossesses may be worthless.

Nvidia's financial wizardry is partly defensive. Its latest GPUs no longer have the market to themselves. Roughly half Nvidia's revenue comes courtesy of America's cloud-comput-

ing "hyperscalers", chiefly Amazon, Google, Meta and Microsoft, which are designing their own silicon. Non-Nvidia AI chips account for 38% of the market, up from 26% in 2023. To stay ahead, Nvidia used to spend over a fifth of sales on research and development. Now it spends less than a tenth.

Last, the scale of Nvidia's financial commitments can look terrifying. Morgan Stanley puts its overall credit exposure—ie, its modest borrowing plus support for customers—at \$200bn by the start of 2029. In time Nvidia's shadow debt could reach \$300bn or more (see Briefing). It is a gargantuan sum: today only America's six largest banks carry more debt.

Yet the differences from the dotcom boom are more important than the similarities. Nvidia's balance-sheet is extraordinarily robust. The company has \$99bn of cash and is churning out more. In each of the past three years annual sales have roughly doubled. Gross margins have fattened from less than 60% to 75%. Mr Huang's cult-CEO status now rivals that of Elon Musk (see 1843). But whereas Mr Musk's firms generate little cash (at Tesla) or burn lots of it (at SpaceX), Nvidia will yield about \$200bn this year.

This means that, whereas Cisco used debt, Nvidia can use cash to backstop its deals with buyers of its GPUs. Even if its commitments came due and its cashflows levelled off starting

next year, by 2028 it would still be less leveraged than all but 39 non-financial firms in the S&P 500 are today. Profits would need to drop by 60% from that plateau for Nvidia to forsake its investment-grade credit rating.

And demand for AI is not illusory, as it was for Pets.com and other revenueless dotcom darlings. The sales of Anthropic, the leading AI lab, shot up from \$5bn in the first quarter to \$11.5bn in the second. OpenAI, its main rival, is probably not far behind. The hyperscalers are also booking AI income. All told, AI may be earning American tech around \$150bn a year, from nothing a few years ago. That is still far from the \$2.5trn needed to cover AI capital spending, but growth is fast.

Mr Huang thinks that the biggest obstacle to the AI revolution is not lack of demand for AI but inadequate infrastructure. The markets will not provide capital on the scale that is necessary, so Nvidia is offering financing itself. Nvidia has an advantage in understanding the balance of risks and rewards. Although this bet is big enough to affect the economy, it is an entrepreneurial one. Every company that reinvests cash rather than returning it to shareholders also gambles that it can beat the market. Companies exist to make such concentrated bets. If investors want to diversify, they can do so themselves.

And Mr Huang is hardly alone. The hyperscalers, the world's most successful companies before Nvidia came along, are making the same bet. So are some big names on Wall Street. Last month Goldman Sachs, BlackRock, Blackstone and others joined Nvidia in a \$500bn data-centre initiative. And so are Mr Huang's shareholders, who haven't yet rushed for the exit. If they are all wrong, it is their money on the line. And if they are right, the AI era may arrive a bit sooner. ■



The Donroe doctrine, continued

Trumpismo

Donald Trump's oil deal with Venezuela creates incentives to block democracy

OIL MADE Venezuela rich. For decades it helped fund a stable democracy with the highest living standards in Latin America. The country was pumping 3.4m barrels a day when Hugo Chávez, a left-wing populist, was elected in 1998 on a promise to redirect petrodollars to the poor. Instead, under his corrupt, incompetent regime, the flows of oil and cash largely dried up. Under his chosen successor, Nicolás Maduro, the state went on a money-printing spree, sparked hyperinflation and drove a quarter of Venezuelans to emigrate.

Eight months ago, when Donald Trump had Mr Maduro snatched by special forces and dumped in a Brooklyn jail, Venezuelans cheered. Now Mr Trump has made a deal with the ex-despot's deputy, Delcy Rodríguez, that both sides say will revive Venezuela's oil industry. Mr Trump called it the "BIGGEST OIL DEAL IN WORLD HISTORY". He crowed that it would give America "energy dominance" (after his war of choice in Iran interrupted global supplies). The deal is certainly bold. It is also ugly.

The regime has given North American Blue Energy Partners (NABEP), a private oil firm that was already the second-largest operating in Venezuela, the concessions to 17 oilfields containing some 65bn barrels. America, via the Pentagon, has been given, in exchange for its backing, a 35% stake in NABEP and rights to its output. For the next century this guarantees America the right of first refusal to buy from oilfields which hold a fifth of Venezuelan oil reserves, with some of those purchases at a discount (see Americas section).

The idea is that NABEP will pump more oil and Uncle Sam's involvement will give other investors confidence to sink long-term capital into a country they previously shunned. Ms Rodríguez, now Venezuela's Trump-approved interim president, says the project could eventually yield more than 1.5m barrels per day. If she is right, it would push Venezuela's output to

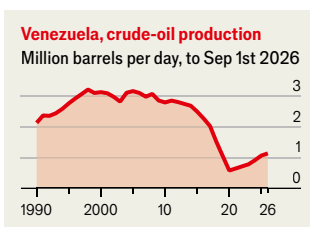
2.5m, three-quarters of pre-Chávez levels.

However, she offers no clear timeline, nor much hint of who will stump up the staggering amounts of cash such an expansion would require. And the deal comes with warning lights flashing red. First, it was negotiated with an illegitimate regime that stole the most recent election. Second, Mr Trump's chosen private partner, Alejandro Betancourt, NABEP's boss, is reviled by some in Venezuela for the moral flexibility that let him get rich working with the regime. Third, Mr Trump will surely enrage Venezuelans with his imperialist bragging: on September 1st he said he would take all of the country's oil.

Any future, freely elected government of Venezuela might question a deal which gives America so much control of the country's oil. That fact will make investors hesitate. Oil majors remain wary, though Chevron, which was already in Venezuela, has just announced a separate \$7bn investment.

Worse, cash and tax revenue from the deal create incentives for powerful people to block Venezuela's transition to democracy. Mr Betancourt, who is well-connected in both Caracas and Mar-a-Lago, has every reason to whisper to Mr Trump that a rush to free elections could spoil his oil bonanza. Ms Rodríguez will no doubt reinforce this message.

In background briefings American officials insist that Venezuela's transition to democracy will continue. And some within the administration, such as Marco Rubio, the secretary of state, clearly understand that a democratic Venezuela is both desirable and in America's interest. So there is still hope. America could in theory use its power over NABEP to press for transparent competition in Venezuela's oil industry. This, in turn, would allow the opposition to campaign on a platform that does not undermine the deal. But all this depends on Mr Trump. Ominously, in public he has started to refer to Ms Rodríguez as Venezuela's "president-elect". ■



Uganda

Twilight of an autocrat

Yoweri Museveni's decline is putting his country on a terrifying trajectory

UGANDA HAS never been an easy place to be a dissident. Since taking power at the head of a rebel army 40 years ago, Yoweri Museveni, the president, has restored order to a country drenched in blood, overseen robust economic growth and ruthlessly suppressed challenges to his rule. Of his two main opponents, one, Bobi Wine, lives in exile. The other, Kizza Besigye, is in jail and on trial for treason; in July he collapsed in court. In January Mr Museveni won a sham election marred by thuggery and ballot-stuffing.

Yet as the president, who is 81, grows frailer, Ugandans have begun to worry less about what he will do next, and more

about what will happen when he is gone. As potential successors jockey for position, Uganda is a reminder of how nasty things can get when an ageing autocrat starts to lose his grip.

Once known for punishingly long work days, Mr Museveni has lately been spending less time at the office. He has cancelled engagements at short notice and appeared shaky in public. Stunts to demonstrate youthful vigour, such as a brief jog down a red carpet during last year's election campaign, have fooled nobody.

As the leader fades, those around him are stepping up. Salim Saleh, Mr Museveni's brother, is thought to handle much of

▶ the day-to-day governance from behind the scenes. Other relatives have increased their influence, too. Most worrying is Muhoozi Kainerugaba, the president's son and head of the army. He has called himself the future president and a descendant of Jesus. As he throws his weight around, repression in Uganda is growing more intense and less predictable (see Middle East & Africa section).

General Kainerugaba is notorious for his unhinged (and often quickly deleted) social-media posts, ranging from boasts about his sexual appetite to ethnic slurs and threats to kill or castrate opponents. His father used to curb his antics. One post in 2022—in which the general said it “wouldn’t take us, my army and me, 2 weeks to capture Nairobi”—briefly got him sacked from his army position. (Mr Museveni apologised to Kenya, a friendly, bigger neighbour on whose ports Uganda relies, for the unprovoked threat to its capital.)

As he ages, though, the president seems less able to rein in his son. In June the general sent the army to occupy Uganda's biggest private media outfit. (It reopened after weeks of negotiations.) He has ordered the abduction of dissidents. In late August he had his men kidnap an associate of his own brother-in-law, gloated over the man's mistreatment and threatened to arrest the brother-in-law, too.

What will happen once Mr Museveni leaves the scene? Even government insiders have started talking darkly of a return to the days of Idi Amin, a mass-murdering military dictator in the

1970s. That is not likely, but the future still looks bleak. The general could take over from his father and impose a capricious, vengeful and ethnically charged despotism on Uganda. He could also exacerbate the conflict in the east of the neighbouring Democratic Republic of Congo, where Uganda has meddled in the past. He has a close relationship with Congo's main enemy, Rwanda.

Others in Mr Museveni's inner circle and in the armed forces may try to stop his errant heir. A power struggle or even a violent split in the army might ensue. Some younger officers are loyal to the general; others are appalled by him. Veterans of the civil war are devoted to the father but wary of the son.

Countries for old men

In theory, the passing of an autocrat could create space for free elections that Mr Wine or Mr Besigye might even win. In reality, that is unlikely. Mr Museveni came to power at a time of democratic resurgence, when many other African countries ditched military dictatorship for multiparty democracy. Back then, Western donors sometimes used their influence to promote human rights.

Now, by contrast, coups occur with impunity and plenty of leaders who won power democratically are looking for undemocratic means to hang on to it. Uganda's plight should serve as a warning to its peers: without real elections to refresh the faces at the top, expect trouble as autocrats age. ■

Women, work and honour

Opening the glass front door

In many countries, the biggest barrier to prosperity is in the home

ALL AROUND the world, women have struggled for equal treatment in the workplace. But in some countries the struggle is more basic: to be allowed into the workplace at all. In an experiment, married mothers in Egypt were offered free or cheap child care near where they lived, to make it easier to go out and find jobs. Only 11% took up the offer. The obstacle, for many, was husbands who thought it wrong for women to work outside the home. And although 90% of Egyptian women disagree, the weight of tradition can be hard to defy—as can the literal heft of a reactionary husband.

In much of the Middle East, north Africa and South Asia, many men believe their family's honour depends on female seclusion. They fear that if a wife goes out to work any farther away than the backyard vegetable plot, she might meet a man to whom she is not related and bring disgrace on her kin. This backward belief may be enforced with threats. In India violence against women is so normalised that nearly 40% even of *women* think a husband is sometimes justified in beating his wife. In Mali the figure is nearly 70%.

Such attitudes make whole populations poorer. In South Asia only a third of women are in the labour force; in the Middle East and north Africa, only a fifth are. Since 1990 the share of labour income that accrues to women has risen from 35% to 44% in liberal France; in patriarchal Pakistan, from 1.5% to a still-woeful 9%. Removing the barriers to women working

would raise income per person by a fifth in many countries, estimates the World Bank—a bigger economic benefit than avoiding a typical civil war.

That is more than enough reason to care about female seclusion. But there is another. When women earn, the balance of power at home shifts. *The Economist* analysed data from 27 countries and found that, after correcting for how sexist a country is and how well-off a household is, women who work for pay have more say on everything from how to divvy up the family budget to whether they can go and visit a friend without asking their husband's permission. Paid work, in short, makes families more equal (see International section).

So opening the glass front door should be a priority in all countries where it is currently shut. Alas, it has several complicated locks. The first key to insert is legal. By the World Bank's count, 540m women live in countries where formal equality before the law is not merely imperfect but “distant”. Yet even the most sexist laws can be scrapped, as Saudi Arabia has shown. Before a series of reforms that started in 2011, women there were barred from all but a handful of jobs and not even allowed to drive. Now they are free to work, drive and shun the hijab if they choose. The share of women in the labour force has nearly doubled since 2010, from 18% to 34%. That is startling progress for a kingdom many thought hopelessly stuck in the past—even if there is still a long way to go. ▶▶



▶ Another key is social norms. These are often assumed to be intractable, yet history shows they can change rapidly. Until 1975, British banks could refuse a woman a mortgage if she lacked her husband's consent; until 1997, Germany did not criminalise marital rape. Since then British and German cultures have evolved so that such rules are unthinkable; indeed, few young Britons or Germans are aware they ever existed.

Norms can shift with a shove from above, as in Saudi Arabia, or by a process of social contagion. Few people resolve moral questions by reasoning from first principles. Mostly, they reckon something is fine if they see lots of people they know and respect doing it. So pioneers play an essential role: the first woman in a conservative Pakistani village to brave the gossip and find work in a nearby town paves the way for others to follow. Schools, NGOs and policymakers can nudge the process along. One experiment in India found that if you show men that women they know are working in a local factory and that it is clean and not dangerous, they are more likely to con-

sent to their own wives working. Anything that makes work safer—such as India's women-only buses for late-night commuters—can erode the misconception that women must be kept at home for their own protection.

Digital technology can help, too. Via small screens in their hands, women in the most repressive countries can see—and therefore imagine—a different way of life. This need not mean copying the most liberal societies. More often, it means learning from the somewhat less sexist country next door, as when an Iraqi housewife sees women doing high-status jobs in Turkish soap operas, and starts to question her lot.

The last key is money. It is useful stuff, as even reactionary men agree. One economist talks of the “honour/income trade-off”: at some point, the extra cash a working wife could bring in starts to look so tempting that her husband asks whether it would really be such a terrible blow to his honour to allow it. Thus, the love of money, though much derided in scripture, can be a force for social change. ■

The Bayeux tapestry

Follow the thread

What a 950-year-old piece of linen teaches about survival and leadership

DAYS BEFORE the liberation of Paris in 1944, Heinrich Himmler, Hitler's SS chief, sent an urgent coded message. “Do not forget to bring the Bayeux tapestry to a place of safety,” he urged the city's Nazi commander, who surely had other things to worry about. The Nazis were obsessed with this artwork depicting the Norman conquest of England, seeing it as an icon of Aryan glory. Himmler planned to display it in Wevelsburg Castle, an SS hangout he hoped would become the “centre of the new world”. Instead, British codebreakers intercepted the order and shared it with the French resistance, who hid the tapestry in the Louvre's basement.

Trajan had his column. Napoleon had his arch. William of Normandy's tapestry is less imposing yet somehow more memorable. Its strip-cartoon style is jaunty, memeable and has been used to satirise everything from Brexit negotiations to Andy Burnham's “Northern conquest” (the man he replaced as Britain's prime minister, Sir Keir Starmer, was pictured on the cover of the *New Statesman* with an arrow in his eye, like the hapless King Harold). Now the tapestry is back in England for the first time since it was stitched, probably by defeated Anglo-Saxons in Canterbury, nearly 1,000 years ago. It will be on view at the British Museum from September 10th (see Culture and Britain sections). It offers three lessons for modern viewers.

First, to survive against the odds, it is sometimes best not to attract too much attention. For several centuries the tapestry is believed to have been rolled up, stored in a chest and brought out just once a year, to be displayed in the nave of Bayeux cathedral. For about two-thirds of its existence, it was not famous at all. Only in the early 1700s did a broader audience start noticing it. Its low profile helped ensure its safety.

So did humble materials: linen and woollen thread. Many tapestries from the Middle Ages boasted gold and silver

threads or were adorned with pearls and gemstones to catch the flickering candlelight. If you haven't seen or heard of many of them, that is because they no longer survive. Their costly decoration made them vulnerable to being pinched or sold for parts. Even today, bling can bring trouble. Some of France's crown jewels were stolen from the Louvre last year; last week a royal diamond necklace was nicked from a museum in Vienna. No thieving hands have touched the Bayeux tapestry. (Admittedly, it is hard to steal something as long as a Boeing 747.)

The second lesson is that it helps to have capable people looking out for you. When French revolutionaries eyed the tapestry to cover wagons carrying ammunition, it took the pleas of a French lawyer, and the bribe of alternative materials, to stop them. During the Franco-Prussian war, caretakers helped preserve the tapestry by keeping it locked up and hidden in a zinc cylinder. The French resistance members who saved the tapestry from the Nazis were not fighting on Normandy beaches, but they were fighting over Norman heritage.

The third lesson comes from the story the tapestry tells: it is about grace in victory. The tapestry is war propaganda, probably commissioned by Bishop Odo to glorify his half-brother's feats at the Battle of Hastings in 1066. Yet its version of events is surprisingly sensitive to the defeated English—perhaps because there were rebellions in England in the aftermath of the battle, and it did no good to pick at the wounds of the wounded. The tapestry does not play down the horrors of war. Nor does it gloat, grave dance or call the English “losers”.

Leaders who chase attention, slather their monuments in bling, treat foreigners with contempt and constantly boast of victories they never won, should pay heed. A thousand years on, William is remembered as “the Conqueror”. What label will stick to today's mighty rulers when they are gone? ■



Letters *animal testing, polygenic embryo selection, Dolly Parton, relaxing holidays, Lake Ontario*

Against animal testing

Regarding your leader on bipartisan opposition to the use of animals in experiments, animal protection has always been supported by both parties ("Bipartisan and wrong", August 8th). Decades ago PETA worked with Bob Dole and Bob Smith, Republican senators, as well as Alan Cranston, a Democratic senator, and Joe Biden when he was a senator. And so it has been through the years.

What is different now is that we have 15 years of scientific data showing the failure of animal use to lead to treatments for humans. Abhorrent experiments, from full-body irradiation of monkeys used in HIV studies to the strangulation of rats to simulate domestic abuse to inducing strokes in beagles, are a colossal failure. A staggering 95% of medications developed in animals fail in clinical trials. The HIV-vaccine research you touted by the Oregon primate centre proves the point: 40 years of killing monkeys, who don't even

develop HIV, has led to dozens of test vaccines. But only five have made it to clinical trials, and every one failed. Failure rates for treatments tested on animals in other research areas mirror this disaster: 100% failure for sepsis and for stroke, 99.6% failure for Alzheimer's disease, and so on.

The growing body of published scientific work, which PETA's scientists outline in their strategy to phase out animal use, can no longer be ignored. Where the new administration has played a role is in its willingness to admit that this data exist.

Lobbyists for the animal-experimentation industry are pressing a well-worn panic button, claiming animal studies will be outsourced to China if they end in America. As American agencies choose organoids, in-silico computa-

tional models and the like over animals, there will be no need to outsource anything. Indeed, China has put out a call to scientists from around the world for advice on non-animal methods. PETA's scientists are obliging.

KATHY GUILLERMO
Senior vice-president,
laboratory investigations
People for the Ethical
Treatment of Animals
Norfolk, Virginia

Caution on embryo selection

"In praise of designer-ish babies" (August 15th) is misleading in a number of ways. Applying polygenic scores to embryo selection has yet to pass the scientific, medical and ethical tests, which is why Britain's Human Fertilisation and Embryology Authority has stated it is unlawful (in contrast, the more distributed peer-to-peer regulation in America has allowed some firms to offer this technique).

The statistical questions are

very different between using population-wide data compared with a small number of embryos from two parents. Also, we do not know what traits may inadvertently come with any selection. The use of polygenic scores in chicken breeding is a sobering example of such inadvertent selection.

Chicken breeders successfully bred bigger, faster growing chickens, but early attempts failed in commercial deployment because the breeding inadvertently selected for aggressive behaviour, making for badly performing flocks. With today's state of knowledge it is impossible to predict what other traits will be selected for when focusing on height, intelligence, academic performance, and so on.

On medical safety, polygenic embryo selection can happen only when women take strong drugs to super-ovulate followed by in-vitro fertilisation. This procedure is often painful, distressing, and risky for the mother. For couples where IVF is the only option, these risks may be worth taking to have a child. For routine use of polygenic selection in a population, it means women electing to run these risks. Such a medical procedure, with marginal, unknown benefits,

potentially negative consequences, and well-documented risks, is unacceptable to offer to patients.

Britain's final test is ethical and societal acceptance, assessed by a committee formed of ethicists, religious leaders and lay people, with regular public consultations. In this case, the test is not even posed because of failures in scientific and medical tests. Importantly, science cannot trump ethics. Removing clearly harmful traits is one thing; letting parents choose broad behavioural traits is another. Personally, I think that allowing parents to choose a broad range of traits for their children changes that relationship.

EWAN BIRNEY
Director
EMBL's European
Bioinformatics Institute
Wellcome Genome Campus
Hinxton, Cambridgeshire

Not always fun in the sun

It is rare for me to laugh out loud while reading, so thanks Bartleby for the six stages of holiday-making (August 15th). The column wonders how many actual days of relaxation we get on holiday. Once, on a disaster-laden getaway, while sitting in a leaky tent near an industrial complex, we thought up Deprivation Vacations.

Instead of 50 weeks at work looking forward to two weeks of fun, we would think up holidays to make you glad to be back for 50 weeks of the year.

DAVID INMAN
London

Troubled waters

Now that Donald Trump has renamed Lake Ontario as "Lake America", would it be reasonable for we Canadians to expect our southern neighbours to stop polluting it? (The world this week, August 29th.)

DAVID BREWER
Port Rowan, Canada

Appalachian memories

You explained why Dolly Parton mattered to America ("She wore it so proudly", August 29th). But Parton also mattered to those of us who encountered America through voices like hers. In my childhood, Saturday morning chores were accompanied by a soundtrack of Jim Reeves, Kenny Rogers and Dolly Parton. My father did not advertise his emotions. Yet he sang along to Dolly without any hint of self-consciousness. So did the rest of us. Watching him taught us that tenderness did not lessen a man; that one could love a song without being embarrassed, enter another person's sorrow and say so aloud.

We had never seen Appalachia, but we recognised its

emotional landscape. Parton's characters and their burdens and aspirations lived in our community, too. For many of us, Dolly Parton made America intimate, intelligible and human.

PATRICK OKIGBO
Founding partner
Nextier
Abuja, Nigeria



→ Letters should be addressed to the Editor at: The Economist, The Adelphi Building, 1-11 John Adam Street, London WC2N; Email: letters@economist.com. More letters available at: economist.com/letters

BY INVITATION

Radek Sikorski

Fear of Vladimir Putin going fully rogue has paralysed the West for long enough



“THE WORLD is a healthier but not a safer place,” wrote *The Economist* in 1953 after the death of Joseph Stalin. This newspaper was not alone in its apprehension. Well-known Russian totalitarianism seemed somehow more manageable than whatever the future held. Fast-forward seven decades and the sentiment has changed little. No matter what the Kremlin does, fears that, if resisted, it may do something even more reckless are still used as an argument for caving in to Russian demands.

Take a conversation with Andrey Melnichenko, a Russian oligarch, published recently in these pages. He acknowledged that Vladimir Putin had made mistakes but argued that whatever comes next could be worse still; that Russia, if pushed too hard, might “descend into chaos” or even “use a tactical nuclear weapon”. The bottom line was clear: let Russia do as it pleases, or else. It is a dead-end approach.

For years after the fall of the Soviet Union, the West bent over backwards not to humiliate Russia and to turn it into a responsible international stakeholder. In 1997 alone, Moscow was invited to join the G7, signed the NATO-Russia Founding Act and entered into a Partnership and Co-operation Agreement with the European Union. In the post-Soviet era, each American presidential administration has tried to bring Russia into the fold by signing treaties, looking its leader deep in the eyes or pressing reset buttons. So did former Soviet satellite states, including Poland.

In 2009 Mr Putin was invited to attend ceremonies in Poland to commemorate the 70th anniversary of the outbreak of the second world war. My country introduced a visa-waiver programme for Russians living close to our border in the Kaliningrad exclave. The heads of the Russian Orthodox and Polish Roman Catholic churches called jointly for “forgiveness of wrongs, injustice and every evil committed against each other”. I am still personally vilified by our opposition for saying that I could imagine a genuinely democratic Russia joining NATO, once it met all the criteria.

We all tried. And we were all turned down.

Today, Russia is again trying to get its way by threatening escalation. It recently warned Britain of “consequences” for providing Ukraine with military assistance. The visit to Moscow of John Rat-

cliffe, the CIA director, in August was allegedly an attempt to warn the Kremlin against assaulting a NATO member state.

And yet, while the Russian leader displays no willingness to reach any peace deal—save Ukraine’s capitulation—still too many refuse to acknowledge the reality. Some argue that Russia has become so weak under mounting economic and military pressure that the West should negotiate before the regime collapses, or worse, before the state fragments and produces even more dangerous successors to Mr Putin. Others insist that Russia should not be pushed too far because it might resort to further escalation, including in the nuclear domain. Both arguments are misguided.

Fears that sustained pressure would result in the state’s break-up are overstated. Russia’s highly centralised political system has made its regions economically, administratively and financially dependent on Moscow. Millions of citizens rely on transfers from the federal budget, and even resource-rich regions depend on centrally controlled transport and energy infrastructure. Russia is not the Soviet Union. Outside the North Caucasus, ethnic Russians remain an overwhelming majority, and the memory of economic crisis and political chaos that accompanied the Soviet Union’s dissolution continues to dampen separatist sentiments. Last but not least, the country has been heavily centralised for centuries. Even in the event of a leadership crisis, or a grave military setback, the more likely consequence would be a struggle within the ruling elite to control the centre, not a dissolution.

Threats of escalation—issued either by the authorities or suggested by allegedly concerned oligarchs—are not reactions to new crises but part of a long-established playbook. Today, as in the past, Russia is testing the West by force. The Soviet Union used limited attacks to expose opponents’ strengths and weaknesses before launching a larger offensive. The Kremlin still applies the same principle. In its current fight against Western democracies, it deploys drones, cyber-attacks, sabotage, GPS interference and information warfare. The question is no longer whether Russia is probing NATO. It is whether NATO understands that it is being probed, and what signal it intends to send to prevent grey-zone actions from turning into full-fledged confrontation.

The Kremlin operates on a simple assumption: not that Russia is stronger, but that democratic adversaries will hesitate to test its vulnerabilities. Europe should therefore resist the temptation to engage in premature negotiations. Those calling to reopen political dialogue may hope that discussions will eventually reduce tension. In the long run the opposite is true. Dialogue begun before Russia’s strategic position has weakened sufficiently may strengthen the Kremlin’s domestic legitimacy, encourage further hybrid operations, undermine European support for Ukraine and deepen divisions within our democratic community.

The uncomfortable truth is that Europe must accept greater risk in the short term to avoid far more serious dangers in the future. Our objective cannot be merely to avoid escalation. It is to convince Mr Putin that escalation will get him nowhere, and that we are willing to sacrifice more than money to stand up for ourselves. European leaders’ primary responsibility is to protect their people from Russian threats, not to protect Russia from itself.

Russia regards us as the enemy and wants to destroy our democratic civilisation. We should not rush to appease it. When Mr Putin is ready for peace he will find a way to communicate it. ■

Radek Sikorski is Poland’s foreign minister and deputy prime minister.

Briefing Nvidia



The central bank of AI

Will Nvidia's financial support for its customers prove a boon or a boondoggle?

IT TOOK THIRTY years for Nvidia, an American firm whose chips power much of the world's artificial intelligence, to reach a valuation of \$1trn. Getting to \$2trn took only nine more months. It passed the \$5trn mark less than two years after that. It is now the world's most valuable company, worth around \$5.4trn. Next year its sales are expected almost to double. Some analysts predict it will take in \$1trn in annual revenue by 2029.

It is not just chipmaking that has spurred Nvidia's stunning growth, however. Its boss, Jensen Huang, has also resorted to financial engineering to boost demand for its wares. In mid-August, for example, Nvidia agreed to provide a backstop worth up to \$105bn for a vast data centre in Ohio that will use lots of its chips. A week earlier it had revealed plans to mobilise more than \$500bn of investment in AI infrastructure with the help of six big Wall Street firms, by guaranteeing the value of the equipment it sells to such projects. It

may underwrite as much as a quarter of the cost of some investments. In July Nvidia helped some customers finance big data centres in another way, by promising to top up their income if it misses set targets.

Companies often lend to their customers: think of the financing arms of carmakers, for example. Mr Huang argues that Nvidia is simply helping to unlock investment for perfectly viable projects that might otherwise struggle to borrow enough at the right price. But to critics, these deals carry more than a whiff of the dotcom boom of the late 1990s, when telecom-equipment-makers such as Cisco and Lucent lent billions of dollars to telecoms providers that bought their gear. When demand for the telecom firms' services fell short, some of them collapsed, landing Cisco and Lucent with big losses.

As Jay Goldberg of Seaport Research Partners, a firm of analysts, puts it, Nvidia is walking a fine line between "enabling demand" and "creating it". He does not yet

think Nvidia has crossed that line, although it is "getting pretty close". Others are more sceptical still, including Michael Burry, an investor who made a fortune betting against the mortgage-backed securities that precipitated the financial crisis of 2007-09. He and others are asking what might happen if demand for AI chips grows more slowly than expected, supply increases and prices fall, which would not only reduce Nvidia's own profits but potentially also generate losses on its lavish support for its customers.

Lender of vast resort

The question is pertinent because Nvidia's financial commitments are huge and growing fast. Over the past three years it has pledged over \$70bn in investment in start-ups and offered \$300bn in financial support to its customers. Some have taken to calling Nvidia the "central bank of AI", because it plays so pivotal a role in financing the industry. That will indeed, as Mr ►►

- Huang argues, help the industry grow—but it also carries risks.

Nvidia's financial engineering is partly a response to its biggest customers' transformation into rivals. "Hyperscalers", tech giants such as Amazon, Google, Meta and Microsoft, account for roughly half of Nvidia's revenue. This year they are projected to invest around \$800bn, largely on AI infrastructure. But most of them have begun designing their own chips, which puts their future purchases from Nvidia in doubt.

For the hyperscalers, these custom chips are much cheaper, costing between a fifth and a third as much as Nvidia's. They can also perform some tasks better, because the hyperscalers can tailor them to their own software. Worse, from Nvidia's point of view, a few of the tech giants are not simply developing chips for their own use, but also marketing them to others. Google, for example, has sold some specialised processors to Anthropic, a big, free-standing AI lab. Amazon also expects its custom-chip business to become a sizeable source of revenue. Bloomberg Intelligence, a data provider, predicts that custom chips will gradually eat into Nvidia's sales, accounting for about 50% of the market for processors used in AI by the end of the decade, up from roughly 40% this year.

Nvidia, therefore, must look elsewhere for growth. It is courting governments that want to build domestic AI infrastructure, companies constructing their own data centres and neoclouds (firms that rent out AI computing capacity). Such plans require huge upfront investments. A one-gigawatt facility, the kind used by large AI labs, contains around half a million chips. Bernstein, a research outfit, estimates that equipping one with Nvidia's latest hardware costs around \$47bn, two-fifths of which goes on the chips alone. Nvidia reportedly plans to raise the price of its latest processors by more than 15%, blaming the soaring cost of memory chips, an important component.

Hyperscalers have little trouble financing all this. They have typically used their prodigious cashflow to pay for new data centres. More recently, as their spending has soared, they have also begun to borrow heavily. Four of them have issued more than \$200bn in debt in 2025 and 2026.

Hyperscalers have investment-grade credit ratings, which keep their borrowing costs low. Upstart neoclouds have similar spending needs, but little revenue (see Business section). Their loans are naturally much more expensive. Alphabet, Google's parent company, sold \$2.75bn of 50-year bonds in November, at an annual interest rate of 5.7%. The rate at which CoreWeave, the biggest neocloud, borrowed \$2.6bn in July was almost double.

It is this gap, between hyperscalers' borrowing costs and everyone else's, that

the bank of Nvidia would like to narrow. One way it does that is by taking equity stakes in startups that will be customers themselves or that will help fuel demand for Nvidia's chips indirectly. Last year Nvidia made about 90 such investments, nearly twice as many as two years earlier. This year it has already agreed another 60-odd.

Qualitative easing

Some of these cheques aim to propagate open-weight AI models, which users can download free of charge and adapt, unlike proprietary offerings from firms like Anthropic, OpenAI and Google, which users tend to access via subscriptions and whose inner workings are hidden. In August Nvidia agreed to pay Poolside, a startup building AI coding models, \$6bn to license its software and a further \$1bn for a stake. It has also reportedly agreed to buy Hugging Face, a platform hosting open-weight models, for \$12.9bn. The intention behind such investments is to fuel demand for Nvidia's chips by creating a proliferation of AI products and companies that are independent of the hyperscalers.

Increasingly, however, Nvidia is not simply investing in promising AI firms, but also helping them finance big projects more directly. In early July it announced a new stratagem in which it promises to top up neoclouds' income from new data cen-

tres to an agreed floor. These undertakings, the exact terms of which vary from deal to deal, often last for six years. Throughout that period, Nvidia promises to pay a set price for "compute", as the jargon has it. If the neocloud manages to sell the capacity in question at a higher price, Nvidia receives a share of the difference. This safety-net makes neoclouds' future revenues much more predictable and so lowers the cost of the debt they take on to build new data centres. That, in turn, spurs demand for Nvidia's processors.

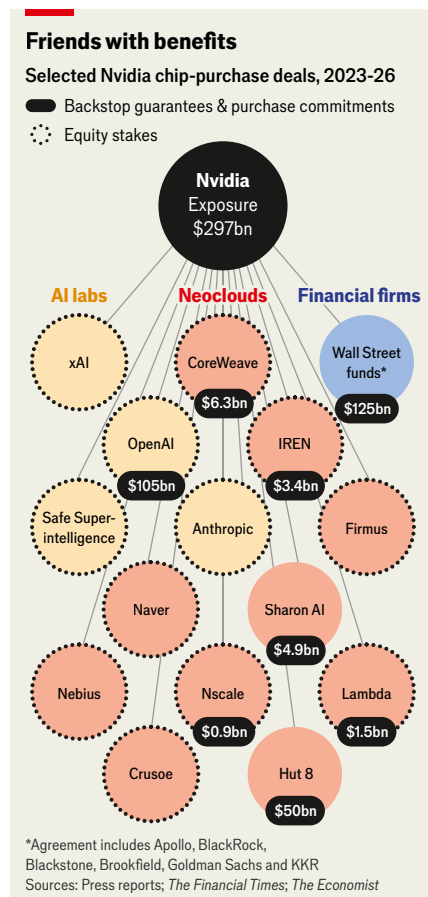
Sharon AI, an Australian neocloud, expects to make use of a backstop of this sort worth about \$4.9bn to deploy around 40,000 Nvidia chips. Firmus, another neocloud, plans to buy as many as 170,000. Dan Nishball, an analyst at SemiAnalysis, a consultancy, argues such arrangements need not be a permanent feature of the industry, but instead "buy time" for lenders to become more comfortable about lending to such projects.

In the meantime, the combination of these different forms of support is creating a complex tangle of commitments (see chart). Take CoreWeave, a neocloud in which Nvidia has accumulated an 11% stake for more than \$2bn. CoreWeave hopes to build more than 5GW of data-centre capacity using Nvidia's chips by 2030. Nvidia has agreed to spend up to \$6.3bn on CoreWeave's unused capacity by 2032, if need be. Nvidia is simultaneously CoreWeave's investor, supplier and customer.

Nvidia is also taking a creative approach with big AI labs, which need huge amounts of compute but are bleeding cash. The giant data centre it is backing in Ohio is owned by SB Energy, a unit of SoftBank, a Japanese conglomerate. OpenAI will be the tenant. Nvidia, for its part, will provide guarantees for the lease on the land and buildings and for the power-purchase contract on which it will rely. In return, the project will use 1.5m Nvidia processors, with multiple "upgrade cycles" expected over the life of the project.

Even Anthropic, which buys chips from Amazon and Google, has not escaped this web. Through a convoluted series of agreements, it has reportedly signed a \$35bn deal to rent cloud-computing capacity from Lambda, a neocloud in which Nvidia has a stake. Lambda, in turn, uses a facility being developed by Hut 8, another neocloud, whose entire capacity Nvidia had leased (and may now have largely sublet).

Nvidia is exploring creative ways to draw more outside capital into such projects. Its \$500bn partnership with big Wall Street firms will court institutional investors such as sovereign-wealth funds, insurers and pension funds. These investors will finance independent vehicles that will buy Nvidia hardware, build infrastructure and sell compute. Nvidia will neither contrib-



► ute any cash upfront for these deals nor take on any debt. In some cases, though, it will provide “residual-value support” of up to a quarter of the deal’s total price to cover shortfalls in the value of the hardware involved after a certain period. It will also provide technical support, giving lenders more confidence that the equipment they finance will be used well. Mr Huang frames this as a way to make compute “an investable asset class”.

Underpinning this web of obligations are two fundamental assumptions: that Nvidia’s chips will retain their value and that demand for compute will continue to grow at a rapid pace. Neither is assured.

Start with the chips. Mr Huang says they are “fungible” and durable, with software upgrades enhancing their usefulness for years after they are sold. They should be seen as bankable assets, he argues, that can serve as collateral for loans and guarantees. But how long an AI chip retains its value is a matter of debate. Mr Burry has argued that big cloud providers have inflated profits by depreciating them over five or six years rather than two or three.

So far Mr Huang has the better of the argument. Older chips are still in demand. In August CoreWeave announced a contract involving Nvidia’s A100 chips that runs into 2029. The A100 was launched in 2020 and Nvidia has since rolled out multiple newer models. There is evidence, too, that old chips retain their value. SemiAnalysis estimates that renting Nvidia’s H100, a workhorse of the AI industry, costs around \$2.80 an hour on a one-year contract. That is only about a tenth less than when the chip launched in early 2023.

Yet both the longevity and value of such chips may simply be artefacts of scarcity. When compute is constrained, firms have no choice but to keep older chips humming. Many are using such chips for infer-

ence, meaning when an AI model responds to queries, a far less demanding task than training models, for which the newest hardware is used.

Nvidia itself releases spiffy new chips every year, with the explicit intention of superseding their predecessors. That leaves it in the odd position of arguing both that old chips should retain their value and that its new chips should supplant them. Finding a balance will be tricky.

Wayward guidance

The price of compute should fall as supply increases. Hyperscalers and even labs like OpenAI are rolling out purpose-built inference chips, since spending on inference has overtaken spending on training. Nvidia enjoys enviable gross margins, of around 75%, against roughly 55% at AMD, a smaller rival. Tim Davis, the founder of an AI hardware firm acquired by Qualcomm, a chip designer, believes that, as options proliferate, the economics of chipmaking will “start to compress”.

The biggest risk to chip prices is demand itself. As long as spending on AI keeps booming, Nvidia sells its chips, its customers fill their data centres and its various guarantees are seldom invoked. But if demand is not quite as expansive as markets expect, neoclouds and other AI providers could struggle to sell their capacity or turn a profit. That, in turn, could trigger Nvidia’s backstops, forcing it to buy unused compute, cover price shortfalls or pay for unwanted power. The same slowdown would also dent Nvidia’s sales and thus the cashflow available to meet those obligations. This scenario does not hinge on a collapse in demand; merely disappointing growth could conceivably spell trouble.

How much could Nvidia have to cough up? It has promised around \$25bn in future equity investments. It owes around \$33bn

in debt. Its potential liabilities to customers amount to about \$300bn, but only come into play in a downturn and so do not appear on its balance-sheet. These include the \$105bn guarantee behind OpenAI’s data centre; as much as \$125bn through the Wall Street partnership; and around \$67bn in other backstops.

Nvidia will almost certainly not end up paying anything close to the full amount of its guarantees. Its commitments are spread over many years so could not come due all at once. Its proposed backstop for OpenAI’s data centre, for example, runs for 20 years, starting in 2028. If OpenAI stopped paying the lease, Nvidia could find another tenant, vastly diminishing its exposure.

What is more, Nvidia’s own finances are strong enough to weather these liabilities. Morgan Stanley, an investment bank, reckons Nvidia’s “all-in” debt will rise from \$53bn early next year to \$200bn by the beginning of 2029 as guarantees come into effect. But that is offset by a stash of cash and liquid securities currently worth \$99bn, and a business that will generate about \$200bn in cash this year. Only a cataclysmic downturn that caused all Nvidia’s guarantees to come due and its profits to evaporate almost entirely would imperil the company—as things stand.

The picture may change, however, if Nvidia’s commitments keep growing. Andy Li of CreditSights, a financial-research firm, worries that it will keep “pushing the pedal” until “something breaks”. SemiAnalysis estimates that Nvidia takes on roughly \$5.9bn of guarantees for every 100 megawatts of data-centre capacity covered by its neocloud backstop programme. If it adds more such guarantees, SemiAnalysis reckons its exposure could reach \$175bn by the end of 2028 from this initiative alone.

Nvidia is not alone in using ever more complex financial instruments to lubricate customer demand. AMD has offered to sell big stakes in itself to OpenAI and Meta in exchange for mammoth contracts to buy its chips. In April Google assembled a consortium of firms to help finance Anthropic’s purchase of \$35bn of its chips. Broadcom, which develops the chips on Google’s behalf, agreed to cover any shortfall if Anthropic fails to pay.

Amid the race to lock in sales and loans, there is a danger that speculative projects that might otherwise struggle to find financing will get built. Should returns in the industry fall short or take longer to materialise than these convoluted deals assume, the result will be a profusion of expensive, idle chips. No company is more entangled in this web than Nvidia. Mr Huang believes that the AI infrastructure buildout is “at full steam”. But Nvidia’s investors should be aware that, the more of this boom they finance, the more of any bust they will have to bear. ■



Gut health is no longer just a health issue. It's becoming an economic one.

From healthier populations to more productive workplaces, the microbiome could become one of the defining health opportunities for the next decade.

Global search interest in gut health has more than doubled since 2022. This tells us a lot. Consumers care about their digestive wellbeing, and the latest research continues to expand our knowledge of the link between the gut microbiome and various aspects of human health, including immunity, cognitive and metabolic function. Gut thinking is being applied to some of the biggest health challenges facing societies worldwide.

Poor gut health affects how people live, work, and participate in society, influencing productivity, healthcare utilisation and quality of life. As healthcare systems grapple with ageing populations and rising rates of chronic disease, intestinal wellbeing is emerging not simply as a clinical issue, but as a societal and economic one. This is the premise of the new *Gut Health Economy* report from biotech leader PrecisionBiotics, which combines the latest scientific evidence with the first Global Gut Health Index.



The Index, based on research with 3,000 adults across three continents reveals a striking paradox. More than four in five people recognise gut health as important, yet awareness is not consistently translating into action.

The findings also reveal important differences between

between markets. Japan ranked first overall, reflecting decades of investment in population wellness, functional foods and evidence-based regulatory framework. South Korea followed closely, underpinned by strong consumer engagement with fermented foods and functional nutrition. These countries demonstrate how science, policy, and consumer awareness can reinforce one another, supporting a culture of proactive health management. *"Japan has a long-standing cultural belief that the hara – the abdomen or gut – is closely connected to both physical and mental wellbeing. This traditional view has helped to foster a strong interest in gut health."* Hiroto Miwa, professor of gastroenterology, Hyogo College of Medicine, Japan.

As proactive wellbeing becomes increasingly mainstream, consumers are seeking evidence-based ways to support their health and wellbeing as part of everyday life. **Recent analysis from the McKinsey Health Institute estimates that scaling proven health interventions could generate up to \$12.5 trillion in global economic value annually by 2050. Gut health may represent a promising opportunity within this wider shift towards health wellness.** Gut health is increasingly being explored as part of a more holistic approach with a view to supporting healthier ageing, strengthening workforce productivity, and improving the resilience of healthcare systems and economies.

As Radwa Gamal, Region Marketing Head, Consumer Health at Novonosis, explains:

“ *The significance of gut health is no longer confined to digestive comfort. It sits at the intersection of health wellness and productivity. The Global Gut Health Index points to a familiar challenge for policymakers and businesses alike: high awareness, but uneven behaviour change. The next stage will not be defined by interest alone, but by the ability to turn microbiome science into credible, evidence-based interventions that people can adopt in daily life and that health systems can justify at scale.* **”**

Read the full report at: precisionbiotics.ie

**Precision
Biotics**

This advertising has been produced by PrecisionBiotics. It did not involve any reporting or editing by staff of The Economist, no endorsement is implied

Europe



Germany's populists

How the Alternative would govern

MAGDEBURG AND ZERBST

If it wins its first state, ideology in schools and broadcasting is just the start

IT IS A baking hot afternoon in Zerbst, a town in the east German state of Saxony-Anhalt, but Ulrich Siegmund's grin barely slips. For hours Mr Siegmund (pictured), lead candidate for the populist-right Alternative for Germany (AfD) in the state election on September 6th, signs T-shirts and takes selfies with ecstatic fans. There is no trace of the resentment that once typified AfD rallies. "This is not a party, it's a movement!" beams the local AfD candidate.

The AfD is set to wallop the ruling Christian Democrats (CDU) in Saxony-Anhalt (see chart, next page). Mr Siegmund would be the first right-wing nationalist leader of a German state since the second world war. Depending on how other parties do, the AfD could win a majority alone. If not, Mr Siegmund has other routes to power, perhaps via CDU defections.

Fans in Zerbst dismiss suggestions that Mr Siegmund's good cheer conceals dark designs. "The AfD is not radical, it just

stands for freedom of opinion," says Heike Schmidt, a local. In fact its plans for Saxony-Anhalt, laid out in a 258-page manifesto, are among the most sweeping ever produced by an aspirant party. They amount to a vision for a new sort of state, and ultimately a blueprint for the rest of Germany. They are also uncoded, overambitious and in places deeply unserious.

Some proposals, such as abolishing the right to asylum or restoring relations with Russia, are not in the gift of state govern-

ments. But plenty are. Start with education. The AfD wants to remove disabled children and the children of refugees from ordinary classrooms, which experts say violates European and international law. It wants more Russian-language teaching. It aims to remove the obligation to attend school, so that distrustful parents can educate their children at home. The AfD would rewrite curriculums to excise wokery and celebrate selected parts of German history. Hans-Thomas Tillschneider, the state party's chief ideologue, argues that Germany's culture of Nazi atonement has induced a national "identity disorder". He prescribes "More Bismarck, less Hitler".

Mr Tillschneider has called academic humanities the "legitimising whores" of social change. To impose its values on academia the AfD wants to restructure university governance, to withdraw from European standards for granting degrees, and to establish a chair of demographic studies and an institute for "critical Islamic studies". Academic freedom is constitutionally protected. But since universities are largely funded by the states, the government could apply financial thumbscrews.

Mr Siegmund has vowed to replace the public broadcaster, a bugbear of Germany's hard right, with a "neutral" alternative. The AfD's programme also takes aim at Saxony-Anhalt's slogan #modernden- ➤

→ ALSO IN THIS SECTION

18 Could Putin escalate?

19 A new king of Norway

20 EU: Iceland stays out

20 EU: Montenegro wants in

21 Charlemagne: The EU's debt divisions

► ken (“think modern”). Special animus is reserved for the 20th-century Bauhaus architectural movement, based in Dessau, which the AfD sees as emblematic of the sort of deracinated culture it detests. Its alternative, #deutschdenken, emphasises the achievements of Martin Luther, Friedrich Nietzsche and Otto the Great.

Yet getting all this done assumes a degree of competence that many, even inside the AfD, suspect is lacking. Running German states requires hundreds of officials and staff, and the AfD has almost no governing experience. Two of Mr Siegmund’s closest aides once belonged to a neo-Nazi youth group and are now ultra-loyalists; unpromising material for running a state.

Fiscal constraints will also bedevil the AfD, notes Petra Dobner, a political scientist at the University of Halle. Saxony-Anhalt owes around €25bn (\$29bn) and relies on huge transfers from the rest of Germany to fund its budget. The AfD’s programme, stuffed with lavish promises, has an annual financing gap of €2.2bn, reckons the Halle Institute for Economic Research. Perhaps in acknowledgment, the AfD’s recent 100-day governing programme focuses on symbolic matters like scrapping gender-neutral language.

The AfD’s adversaries are not standing still. Earlier this year Saxony-Anhalt lawmakers changed their rules for electing judges and the parliament’s president, to “AfD-proof” the state. Those in the party’s cross-hairs, including universities, judges and NGOs, have for months been drafting strategies to prepare for an AfD government. But most share a fear that the AfD could push through endless anti-constitutional measures in the knowledge that courts would take years to overrule them, sapping their morale in the meantime.

The prospect of an AfD government is concentrating minds elsewhere in Germany. Noting the party’s cosiness with Russia, interior ministers in the 15 other states have been mulling how to exclude it from

intra-ministerial discussions. Georg Maier, the interior minister of Thuringia, favours erecting “Chinese walls” to ensure crucial national-security information is not shared with his would-be AfD counterpart.

The AfD also fears opposition from the “deep state” within Saxony-Anhalt. Mr Siegmund says he would seek to replace up to 200 state employees, and has threatened others who stand in his way. The party may make a handful of political appointments, and can fire some officials. It will surely dismiss the head of the state’s intelligence service, who in 2023 ruled the Saxony-Anhalt AfD to be “right-wing extremist”. Most civil servants cannot simply be fired. But Friedrich Zillesen, a legal scholar who works on judicial resilience in the state, notes that the AfD could find other means: attrition as civil servants retire, promoting friendly figures or simple intimidation.

The AfD promises to replace “culturally alien” professionals by seducing Germans

who have left Saxony-Anhalt, which has lost a quarter of its people since reunification, to return. Its policies seem likely to have the opposite effect. Talk is rife of workers who might leave if the AfD takes power. Outsiders who might have been tempted to come will surely think twice. Saxony-Anhalt already has the highest median age among Germany’s states and some of its worst poverty. “What happens when all of us leave because we can’t stand it here any more?” asks Sophie Jungnickel, a manager for a local business.

So obvious are the pitfalls that some of the AfD’s foes quietly hope Mr Siegmund will win and mess up. A mishap in a small state, they hope, will remove the party’s sheen of invincibility and harm its national prospects. This view is not popular in Saxony-Anhalt. “It’s easy to say these things in Berlin,” says Lennart Birth, a local political activist who recently left the state. “Not for those who have to live with it every day.” ■

Russia’s war

An orca-eat-bear world

Cornered, Vladimir Putin seems to have decided to escalate

ON AUGUST 29TH at a university in Moscow, Vladimir Putin observed that orcas feed on polar bears. “That’s the food chain,” Russia’s president stated. “Children should be taught about this, so that they understand what kind of world we live in and why we are conducting the special military operation”—ie, Russia’s war on Ukraine. The claim was fanciful: there is no known case of an orca eating a polar bear. But it provided insight into the Russian president’s predatory worldview.

Recently NATO countries have become increasingly concerned about the direction Mr Putin’s thoughts are taking. Russia’s army has been largely stalemated for years. The war has become a contest of drone and missile attacks that, while devastating to Ukraine, are damaging Russia too. But Mr Putin is not backing off. The worry is that he may try to escape from a *tupik* (dead end) as he has in the past: by finding some new way to escalate the conflict.

On August 25th John Ratcliffe, the director of America’s CIA, unexpectedly flew to Moscow. Accounts differ on whether he went to warn Mr Putin not to attack NATO countries, or to deliver a bleak assessment of Russia’s prospects and persuade him to negotiate. Three days later Finland requested the help of Swedish aircraft and warships in monitoring its border with Russia for incursions. On September 1st

Germany openly blamed Russia for a drone attack at Leipzig’s airport on August 4th, and imposed some trifling sanctions. In late August Romania destroyed a Russian naval drone that targeted a drilling platform in its waters, and Slovakia foiled an arson attack on a drone factory.

Meanwhile Mr Putin has ended his silence over Ukraine’s drone attacks on Russian refineries and e-retailer warehouses. In an address on August 22nd he accused Ukraine of opening a “Pandora’s box” and promised “blowback on the most sensitive sectors of your economy”. Earlier that day he dismissed any notion of ending the war: “The special military operation continues.”

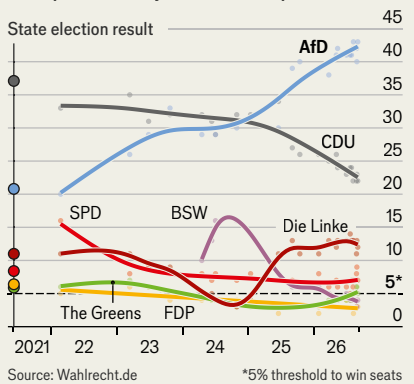
Sources close to the Kremlin say that, after several weeks of consideration over the summer, he has chosen to escalate. Indeed, a longtime associate of Mr Putin says he is likely to have seen Mr Ratcliffe’s visit as a sign of American weakness. That, the source said, was the president’s interpretation of the visit to Moscow in November 2021 by Bill Burns, Joe Biden’s CIA director, to warn him against invading Ukraine.

No one can know what is inside Mr Putin’s head. But his reasons for escalating, like the decision to invade, are internal. His key objective has always been preserving his own power, and ultimately his life.

One concern for the Kremlin is the evaporation of the public’s silent assent for ►►

From alternative to mainstream

Saxony-Anhalt, Germany, voting intention in state parliamentary election, main parties, %



► the war. Deep strikes by Ukrainian drones, along with internet restrictions, have shattered the veneer of normal life. The Levada Centre, an independent pollster, says 57% of Russians describe the situation as “tense”; respondents cite the war, drone attacks and the lack of a sense of the future. Mr Putin’s approval rating is sliding.

The mood among elites is even more sour. The biggest issue, one insider says, is the time the war has wasted: whatever the outcome, nearly five years is a failure. There is a growing feeling that the tsar is naked, says another. None of Russia’s problems is fatal to Mr Putin: he has the economic resources and the repressive apparatus to carry on. But perception matters.

Mr Putin may express his aims in the language of geopolitics, but in fact he is guided by criminal logic: never show weakness. Russia’s system has a high tolerance for violence, but is unforgiving of failure. He may believe that failure to achieve even his minimum goal, taking all of Ukraine’s eastern Donbas region, would put him physically at risk. (“They will hang me,” he told cronies at one point during the war, according to an insider.) Simply carrying on is no solution. “Inertia-driven scenarios are disadvantageous,” one member of the Russian elite says: they consume economic resources and political capital.

It is not clear how Russia would escalate. It is likely to intensify hybrid warfare against Ukraine’s allies and target their supply routes to Ukraine. Western intelligence agencies worry that Mr Putin might target factories in Europe that make arms for the war effort. But they think he does not want direct confrontation with NATO.

Within Ukraine, escalation largely means scaling up things Russia is already doing. On August 30th Russia’s Ministry of Defence said it was preparing a massive strike on Ukraine’s energy infrastructure. But Ukraine already expects such attacks. As for the ground war, Russian sources say Mr Putin is committed to throwing an additional 300,000-400,000 men into the meat grinder. Extra men will probably be recruited by regional governments to keep any political discontent localised. The authorities are already testing the new recruitment system in Penza, a region 750km south-east of Moscow.

Mr Putin is also intensifying repression of supposed “internal enemies”, not because they pose any threat but to demonstrate strength. On September 2nd police arrested Lidia Moniava, the founder of a hospice for terminally ill children. She faces a 10-year jail sentence for an antiwar social-media post in 2023. Two days earlier authorities dropped all charges against Ilya Traber, a businessman in St Petersburg, citing his ill health. Mr Traber, who has long ties to Mr Putin, had been charged with a contract killing. ■



Norway’s new king

Long to reign over Oslo

Haakon VIII has a big crown to fill

NORWAY IS NOT much for pomp. But when Haakon VIII swore the oath of allegiance before parliament on September 1st, some splendour was in order. The new king arrived in the Lincoln Continental that his father, Harald V, used for his wedding in 1968. Dressed in uniform next to Ingrid Alexandra, the crown princess, Haakon vowed to have the same good relationship with parliament that his father did. MPs sang the *Kongesangen*, the royal anthem, to the tune of “God Save the King”.

Despite their egalitarian mores, Norwegians broadly support the monarchy. Unusually, it has been endorsed in a referendum: in 1905, after Norway’s union with Sweden dissolved, 79% of voters plumped for a king over a republic. After Harald died on August 28th, aged 89, a poll by Norstat found 72% of Norwegians support having a king.

That is largely to Harald’s credit. Despite his Oxford degree and weakness for sailing yachts, the old king cultivated a regular-Jo air. His wife, Sonja, was the daughter of textile merchants. He praised Norway’s leftist partisans for their role resisting the Nazis, and spoke warmly of refugees. *Klassekampen* (Class Struggle), a socialist newspaper, put Harald’s obituary on its cover. The headline: “Also the republicans’ king”.

Haakon spent years as regent while

his father was ill, but taking over will be tough. His family’s scandals make Britain’s royal peccadilloes seem less remarkable. The new queen, Mette-Marit, was friendly with Jeffrey Epstein long after his conviction for soliciting sex from a child (she has apologised). Her son from a previous relationship was convicted of rape in June. Other royals are merely barmy. Princess Martha Louise, Haakon’s sister, once ran a school that taught students how to talk to angels. Such affairs dragged support for the monarchy to just 60% in February.

Eventually Haakon may face a question his father avoided. As monarchs live longer, more are choosing to abdicate. Margrethe II of Denmark did so in 2024, and Emperor Akihito of Japan in 2019. The last three Dutch monarchs stepped down as they entered old age. But Haakon may balk, as his father did. In 1999 Harald described abdicating as an affront to tradition; he would only go if he went “completely bonkers”.

Parliament is considering letting other royals step in if both monarch and regent are unavailable. The idea is that this will help prevent cock-ups, as in April 2024 when a health minister’s dismissal was delayed because Harald was ill and Haakon was abroad. But the new king is only 53. MPs have plenty of time to deal with such problems.

Iceland and the EU

Cold shoulder

BRUSSELS

Iceland's "no" vote was more about fish than geopolitics

THE FIRST week of September is when European officialdom returns from the beach, raring to take on the continent's challenges. Alas, the mood of the *rentrée* has been marred by a snub from the mid-Atlantic. In a referendum on August 29th Icelanders voted narrowly not to reopen negotiations to join the European Union. For a club accustomed to discussing how quickly others might join, being told "no thanks" is discomfiting.

Outsiders might have expected Iceland's referendum to turn on geopolitical questions. War is raging in Europe and Iceland's neighbour Greenland is coveted by Donald Trump, whose ambassador in Reykjavik once joked that the two islands could become America's 51st and 52nd states. Most countries that can join alliances to protect themselves are doing so. Sweden and Finland became members of NATO soon after Russia invaded Ukraine. Ukraine has applied to join both NATO and the EU; and Canada—another country Mr Trump imagines as a future American state—is trying to get closer to the bloc. Iceland, a NATO member, seems an obvious candidate for the EU as well.

But all referendums are local. Iceland's fishing industry, which accounts for almost 40% of the country's goods exports, led the charge against EU membership. Fishing interests derailed Iceland's previous plan to join the union in 2013, after the country had suffered a crippling financial crisis. This time they made the same argument: the union's rules would allow other countries' vessels into Icelandic waters and impose caps on their fishing that would hurt exports. The movement against joining was bolstered by a belief that Iceland can prosper on its own, and that existing arrangements with the EU and membership in NATO are sufficient.

It wasn't just the fish. Only inside Reykjavik, the capital, did most voters back restarting negotiations; everywhere else there was a clear majority against. Farmers fretted about competition and loss of government subsidies. Employers and some unions stood against it, too. The argument in favour, that a tiny island nation needs formal membership in a wider union to thrive, proved less convincing.

The EU has played down the snub. Iceland has only 400,000 people—just 0.1% of the EU population, fewer than any current member. It is already in the European Eco-

nomics Area, a sort of outer tier of the EU, and forms part of Schengen, the bloc's passport-free travel scheme. The referendum was merely to reopen negotiations, which might have failed anyway.

Still, the rejection stings. It is a point of pride in Brussels that while Mr Trump threatens his neighbours with takeovers, the EU has such appeal that neighbouring countries are clamouring to get in. Ten countries with a combined population of 150m have formally applied to join (though talks with Turkey, the largest, have been frozen for years). All are poor, most have dysfunctional politics and one (Ukraine) is at war. Last weekend's vote in Iceland was a reminder that richer potential members of the EU, such as Switzerland and Norway, are in no rush to join. ■

Montenegro and the EU

Pick me

The western Balkans' top candidate still hopes to get into the club

WESTERN BALKAN countries have a joke about their long efforts to join the European Union: "We pretend to reform and they pretend to want us." Yet Russia's invasion of Ukraine in 2022 injected new life into the process, and Montenegro's government thinks it has a chance soon. With just 630,000 residents, Montenegro would cost the EU relatively little in aid. Its agricultural exports are too small to worry Europe's farmers, and it poses no risk of significant labour migration.

At a summit in Montenegro in June, EU leaders fell over themselves to praise their host's progress. The country's government aims to finish aligning with the bloc's standards by the end of this year, and join in 2028. Ursula von der Leyen, the president

of the European Commission, called that schedule "within reach". But Iceland's vote on August 29th against restarting its accession negotiations has dampened the mood. Some hoped a bid by a rich northern country would boost momentum. Now the aspirants will simply have to persuade Europeans that bringing in poorer south-eastern countries is in their interests.

Of the western Balkan countries, Montenegro is at the head of the pack. Albania is next, while Kosovo and Bosnia & Herzegovina are making little progress. North Macedonia is blocked by its hostile neighbour Bulgaria. Serbia, the biggest of the six, got a red light from eight members in July, mainly over its autocratic governance. On August 27th Montenegro's prime minister, Miloško Spajic, said that two neighbouring countries (clearly meaning Serbia and Albania) were trying to slow the country's accession, presumably out of jealousy.

After Yugoslavia broke up, Montenegro was dominated for decades by one party, which led it to independence and NATO membership. In 2020 that was replaced by a coalition including pro-Serb groups. Europhiles feared Serbia would run the country's foreign policy. That has not happened; relations between the countries are poor. The prospect of EU accession has led parties to co-operate on reforms.

Sceptics say the changes are cosmetic, and note that EU leaders have stopped talking about Montenegro's powerful drug-smuggling clans. Expansion-minded Europeans worry that if a tiny country cannot get in, Ukraine and others have no hope. The biggest risk is France. President Emmanuel Macron supports accession. But French law requires a referendum or three-fifths of both houses of parliament to approve the accession of a new member. According to Eurobarometer, just 35% of the French support expanding the union. And Mr Macron will leave office next year. He may be succeeded by Marine Le Pen of the populist-right National Rally, who firmly opposes enlargement.

When Mr Macron visited Montenegro in June he signed a series of political and business agreements, including one aimed at building a favourable image of Montenegro in France. But Jovana Marovic, a former minister of European affairs in Montenegro, is not optimistic. A majority in favour of ratifying accession for any future members, she says, "simply does not exist" in France's parliament.

"This is an extremely unpopular thing to say," Ms Marovic continues. "The atmosphere in Montenegro is almost euphoric, as if EU accession were already a done deal." She thinks there is time for her country to build support for accession among EU members. For the moment, many are as wary of letting in new countries as the Icelanders were about joining. ■



CHARLEMAGNE

Union dues

America has a whopping debt. But Europe has the whopping debt problem



TO BE EUROPEAN is to experience fine cuisines, walkable cities and constant nagging about the many ways in which your economy is falling behind America's. In recent years weighty reports bemoaning Europe's lagging productivity have become a literary genre in their own right. So news in recent weeks that America's government debt had passed \$40trn, raising questions about how long bond-market types will keep funding its persistent budget shortfalls, have been greeted in some European quarters with a degree of *Schadenfreude* (or whatever the Greek equivalent is). This is a continent that knows a thing or two about spiralling debt crises, after all. How refreshing it might be if the tables were turned, and Europeans could be the ones making recommendations about how politicians in Washington should be running their economic affairs.

Indeed, Europe looks at first glance to be in markedly better fiscal shape than its transatlantic rival—a rare case in which economic data seemingly favour the old continent. The total debt pile of governments in the European Union amounts to a mere €15.7trn (\$18.2trn), in an economy not much smaller than America's (Europeans are poorer but there are more of them). Two decades ago both places had debt-to-GDP ratios of around 65%. Now America's has swollen to over 120%, and the IMF thinks it will be north of 140% by 2031. Europe's is at "just" 83%, and its future is essentially flat—still in vaguely prudent territory. But Europeans tempted to subject those stateside to sermons about economic management (does America need a Draghi report of its own?) should hold their fire. For though America has the bigger debt, Europe has the bigger debt problem. America's advantages include the world's reserve currency and a growing economy. Europe's disadvantage can be summed up in one word: France.

Comparing European and American debt is trickier than the headline numbers suggest. America owes too much, no doubt, but Europe owes it in all the wrong places. When it comes to handling interest payments on trillions in federal bonds, America is stronger than the sum of its parts: the entire union stands behind every dollar owed. In Europe, by contrast, most borrowing is contracted by 27 member states, each of which must repay its own debt lest

the union as a whole totter. That makes the EU (or at least the euro zone at its heart) only as strong as its weakest link—as Greece once showed when it threatened default. Lots of countries in the EU have manageable debt piles, notably Germany and its northern neighbours. Others, like Greece and Spain, have high debt but enough growth to appease the bond vigilantes. France stands out for having neither fiscal space (its debts amount to 118% of GDP) nor growth (an underwhelming 0% in the most recent quarter).

As a result, interest rates on French ten-year bonds have now reached 4.2%, their highest in 18 years—higher even than Italy, the continent's traditional problem child. In part this is a global dynamic: governments everywhere are paying more interest, as investors fret over inflation and geopolitics. But the spread between French and German bonds, the extra interest France has to offer lenders to entice them to hold its riskier debt, is now close to one percentage point. The fragmentation of rates among EU countries is still nowhere near the levels seen during the euro-zone crisis of the 2010s. That is largely thanks to the European Central Bank, which has since signalled it might step in if some euro-zone government's borrowing costs were to rise too high. But the central bank's largesse is meant to be conditional on that struggling government agreeing to make a serious effort at enacting reforms and remedying its fiscal mess.

Politics tends to interfere with such sound policymaking, and Europe has a surfeit of politics coming its way. In 2027 national elections are due to be held in France, Greece, Italy and Spain, four debt-laden countries. Fiscal discipline will no doubt slip as voters are showered with goodies. France again stands out. The front-runner in the polls is Marine Le Pen, a populist who once campaigned to leave the euro. More recently, the head of her party suggested the ECB could be cajoled into helping in some way. Her opponent on the populist left, Jean-Luc Mélenchon, has announced he wants to "set fire" to a portion of France's government bonds. Even among level-headed centrists, nobody is suggesting a return to deficits of 3%, which EU treaties mandate, any time soon.

Après moi, le debt-luge

Any suggestion that France is the next Greece is hyperbolic nonsense—at least for now. But French profligacy is reshaping Europe nonetheless. America can run large deficits in part because its vast stock of treasury bills are denominated in the world's reserve currency, and are thus a useful haven for nervy investors in choppy times. Europe would love to capture some of this "exorbitant privilege". One way it tried to do so was by getting the EU to issue its own federal bonds, jointly backed by all 27 countries. The bloc started doing so on a large scale in 2021, to finance its pandemic recovery plan. Many hoped to issue more such debt in future to finance defence spending, in keeping with calls by Emmanuel Macron, France's president, for more European "strategic autonomy".

But continued French budgetary drift has probably put paid to further joint borrowing. The bigger the spread between French and German bond yields, the bigger the implicit subsidy flowing from Berlin to Paris (and more generally from the fiscally flush to the skint across the EU) whenever joint bonds are issued. Germany, never keen on extending the idea in the first place, now has a sizeable argument against it: who would volunteer to run a joint tab with a spendthrift whose creditworthiness is doubted by markets? French fiscal incontinence has long had a cost for the French. Now other Europeans are paying for it, too. ■

OUT OF SIGHT. FRONT OF MIND.

mishcon.com



Most firms only see the deal and in the process they overlook the people involved. Not us. Something happens the more we get to know our clients and the more we understand them. Connection may not be visible, but it helps us strike better, faster deals.

**We find our edge
at the edge of what's possible.**

Mishcon de Reya

It's business. But it's personal.

Business | Disputes | Innovation | Private | Real Estate

Britain



Knife crime

On the edge

The changing geography of violent crime

ON JANUARY 28TH 2022, 18-year-old Joe Dix was found lying in the street. He had been stabbed seven times by members of a rival drugs gang—one of them wielding a 24-inch (61cm) sword. Dix died an hour later. “His insides were coming out,” his partner would later tell the court.

Where do you think this happened? London, notorious for knife crime, is an obvious choice. Birmingham, Manchester and Liverpool, each with its own history of gang violence, are others. In fact Dix was murdered in Norwich, a small, quaint city the *Sunday Times* recently crowned the best place to live in Britain.

More than 70% of Britons believe knife attacks are rising across the country. They are not. Hospitalisations for “assault by sharp object”, one of the most reliable indicators of violent crime, have fallen by a third in England since 2019. Last year homicides fell to a 50-year low.

Social media’s doomsterism goes some way to explaining this disconnect, as do spikes in shoplifting and phone snatching. A less appreciated reason is that the geography of violent crime is changing. The urban centres historically associated with violence have achieved impressive reductions over the past decade (see next arti-

cle). Rates have fallen much more slowly in the counties. In some they have increased.

Consider Birmingham, London and Manchester. In the year to March 2018, the start of Britain’s knife-crime epidemic, these three cities accounted for 47% of the country’s knife-related homicides and attempted murders. In the year ending March 2026 this was down to 36%. In each city, homicides have fallen by more than 30% from their peak. Progress has been much slower in places like Suffolk (down by 18%), Hampshire (14%), Nottinghamshire (13%) and Cambridgeshire (up 23%).

Hospitalisations for “assault by sharp object” show a similar pattern. Most police forces have data only up to the year ending March 2025. Look at a two-year rolling average and London’s is down by 28% from the peak years of 2018 and 2019. Much more modest falls have taken place in Staffordshire (down by 14%), Durham (7%), Devon and Cornwall (5%) and Hertfordshire (5%). In Sussex there has not been any drop at all (see chart on next page).

Hospitalisation rates are growing fastest, albeit from a low base, in Cambridgeshire and Bedfordshire—leafy, suburban communities that last year suffered increases of 60% and 50%, respectively. Middlesbrough, a poor town but not one that has a long history of severe street violence, ►►

→ ALSO IN THIS SECTION

24 London’s success on knife crime

25 Phone snatching in decline

26 Anglo-French relations

— **Bagehot is away**

→ **Read more at: [Economist.com/Britain](https://www.economist.com/Britain)**

— **Sir Keir resigns**

— **Women’s football**

► is recording more sharp-object hospitalisations than it did during Britain's peak years. Following the deaths of two police officers and seven other people, and growing public disorder, it has become the site of an organised-crime investigation. Even within London, police-recorded violence is growing fastest in boroughs such as Hillingdon (up by 9% last year) and Kingston upon Thames (up by 13%), which are relatively affluent areas on the outskirts. Overall the upsurge of the 2010s is proving most resilient outside the urban centres usually associated with violent crime.

This is largely the result of changes in the structure of Britain's drugs market. Violent crime in Britain is closely linked to drug trafficking. This is as true in the counties as it is in cities. A study published in 2021 looking at six years' worth of air-ambulance call-outs in Kent, for example, found that instances of "penetrating trauma" tend to occur along drug-trafficking routes. These "county lines" emerged in the late 2010s as the advent of the dark web (used more for wholesale drug purchases than retail), together with cuts in police numbers, led to a proliferation of drug gangs in urban centres. Competition between them was the main cause of Britain's knife-crime surge in the late 2010s.

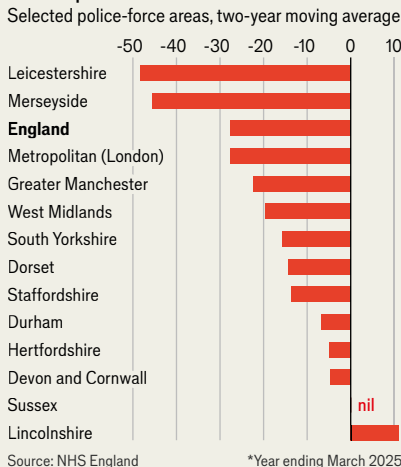
It also brought more violence to the counties, as gangs looked for less crowded markets outside the cities. They built a business model using vulnerable children as mules—ferrying deliveries from urban gangs to rural addicts. Knives are a way to protect yourself, and your product, from rivals who would take it.

Thankfully most areas are recording less violence than they did during this first wave of expansion. But rural violence is proving sticky because such areas remain the most profitable route to growth for drug-dealing groups. In 2020 a Home Office review found that the levelling-off of urban drug use was driving gangs towards new markets around towns and universities. According to annual threat assessments, the number of county lines known to the authorities has increased from 720 in 2017 to more than 6,500 today. The dealers have also expanded their product lines. While the original county-lines gangs dealt mainly in crack and heroin, they now also traffic in cannabis, powdered cocaine, ketamine and prescription drugs.

Increased competition in rural areas has created a market based on customer service. Above all that means speedy deliveries. In many British towns it is now possible to have drugs delivered within an hour—think Amazon Prime for amphetamines. That is a difficult service for a business based in London to provide for customers in Margate. Supply lines have had to adapt. "The classic county-lines model of sending your boys down on the

A sharp shift

England, hospital admissions for assault by sharp objects, % change between 2018-19 peak and 2025*



train has gone," explains Simon Harding, a criminologist. "It's much easier to set up a local hub and deal from there."

The result is that drug gangs are increasingly indigenous to rural areas, dealing from local properties and recruiting local children. The number of "internal lines" (those operating within rather than between counties) known to the police trebled between 2022 and 2025. The share of

lines originating in "task-force areas" (covering the traditional hotspots) fell from 70% to 50%.

It is a shift the government appears unprepared for. The Knife Crime Action Plan, released at the start of April, says a lot of the right things. But it also adopts an outdated definition of the county-lines model—promising to empower the British Transport Police to disrupt the train networks used to move drugs from cities to towns, and to boost funding to County Lines Taskforces. This targets a business model that is already changing.

Knives outdated

When so much violence is perpetrated by vulnerable young people recruited by predatory organised criminals, prevention is a public-health problem as much as a policing one. In the traditional hotbeds of knife violence, local experience with gangs has produced a certain amount of understanding of criminal practices, from clued-up family members to streetwise youth workers. Rural areas lack that kind of exposure. Many are used to seeing knife crime as an urban, even a racial, problem best solved by tougher policing. "That is a very difficult mindset to get out of," admits Niven Rennie, a former police officer who served as director of the Scottish Violence Reduction Unit. "But once you understand it, you don't go back." ■

London's success on knife crime

Sharper thinking

The mayor has adopted a public-health approach that was previously fringe

LONDON IS KNOWN for many things. Among the least flattering is its reputation as a hotbed for knife crime. Last year Mexico, a country at war with drug cartels, updated its travel guidance to warn about knife assaults in Britain's capital. According to Donald Trump, Londoners live in fear of being "stabbed in the ass".

This was never really true. For six of the past eight years, New Yorkers have been more likely to be stabbed to death than Londoners (and they have been at least ten times as likely to be killed by other means). That doesn't mean the reputation was a complete fabrication. Knife crime rose dramatically in Britain from 2017, especially among teenagers. In the year to March 2018 more than 280 people were stabbed to death in England and Wales, up from the previous five-year average of just over 200 a year. London, the core of the crisis, accounted for 108 of those homicides (com-

pared with 62 deadly stabbings in New York that year).

Since then rates of violence have declined precipitously. Hospitalisations for "assault by sharp object" have fallen by a third in London since their peak. Knife-related homicides have shrunk by a half. Last year teenage homicides in the capital fell to their joint lowest level (similar to 2012) in almost 30 years. In 2025 you were twice as likely to be stabbed to death in New York as in London.

Thank Sadiq Khan. Right-wingers like to blame London's Labour mayor for the capital's imagined lawlessness. In fact Lord Khan introduced England to a knife-crime strategy that appears to be working. It has since spread beyond London.

As English politicians scrambled for answers during the 2017-19 "epidemic", Lord Khan looked to Scotland. In the previous decade Glasgow, once labelled ►►

► Europe's murder capital, had achieved impressive reductions in violent crime. One reason was the roll-out of the Scottish Violence Reduction Unit (VRU), which aims to prevent violent crime by bringing the police, schools, hospitals and sports clubs together to identify at-risk children and direct them away from crime.

Between 2008 and 2018 Scotland's VRUs were credited with bringing about a 38% fall in homicides and a 43% drop in attempted murders and serious assaults—many of them knife-related. Lord Khan announced England's first VRU in London in 2018. Today there are 20 such units across England and Wales, covering areas that account for 80% of all knife crime.

A recent Home Office review found that England's VRUs caused a 12% fall, since 2019, in hospital admissions for violent assault among the under-25s. That is modest compared with Glasgow, but the Home Office looked only at the national average. Violent crime has fallen most in cities like London—dense urban areas where the model is easiest to implement.

There are caveats. Alcohol use, a big factor in violent crime, has dropped across the country, too. Scotland's success, which occurred around the same time as changes to licensing laws, cannot be put down just to its VRU. Nor can London's (between mid-2020 and mid-2024 London lost 29% of its nightclubs). It also takes time to work out what produces the best results in a given area. Scotland did well by placing youth workers in accident-and-emergency departments to reach children with violence-related injuries. VRUs in England and Wales, still in an earlier stage, are spending a lot on interventions, such as school visits, that show little evidence of working.

The overarching logic, however, is sound. A 2023 study by the Youth Endowment Fund, a charity, found that having two or more adverse childhood experiences increases the risk of gang involvement by 61%. In Britain today violent crime is largely driven by organised-crime groups relying on vulnerable young people to traffic drugs. That is different from early-2000s Glasgow, where territorial street gangs were much more interested in recreational violence and turf wars than in drug trafficking. But in either case VRUs can help restrict the labour market available to exploitative gangs.

Scotland's success, according to Iain Brennan, a criminologist, was not just to adopt the model but to change the hearts and minds of all involved. "It's the philosophy of violence reduction, of changing the mindset that is the most important." Lord Khan is often ridiculed for what can appear a fluffy approach, emphasising the importance of youth clubs and keeping troublesome children at school. But his soft approach is having hard effects. ■

Phone theft

Reverse charge

Has London passed peak phone snatching?

LONDON IS FAR safer than it was. But one crime category has exploded in recent years: theft. Both shoplifting and "theft from the person" (mostly phone snatching) have roughly doubled since 2020. In the year to July 2026, rates of shoplifting hit a new high. But London's rolling 12-month total for personal theft has fallen by 27% from its peak in January 2025 (see chart).

The fall appears to be due to improved police tactics. Phone snatchers specialise in drive-by theft—using high-powered electric bikes to silently approach, and speed away from, pedestrians on their phone. For the police, chasing such thieves has been a losing battle. Officers aim to be at emergency calls within 15 minutes. That is plenty of time for someone on a 50mph e-bike to make their escape, zipping down alleyways and through heavy traffic to outmanoeuvre chunky police vehicles.

Tactics have had to adapt. The Metropolitan Police has been building up its own e-bike stockpile to chase down suspects. It has also stepped up efforts to confiscate, en masse, those used by criminals. And since October it has deployed drones to follow thieves from a distance and pick them up once they let down their guard. Combined with targeted policing in the tourist-heavy areas where most phone snatching occurs (such as Westminster), these new strategies appear to be working.

Stealing a march

Britain, crimes in London, '000
Twelve-month moving total



Source: Metropolitan Police

Police officers have also got wise to the business model of phone snatching. What looks like petty theft in fact depends on an organised network of handlers exporting stolen phones abroad. So a few arrests higher up the chain can have an outsize effect. In October the Met arrested 18 people suspected of sending up to 40,000 phones to China (50% of London's total).

Almost everyone in London knows somebody who has had their phone stolen. That goes a long way to explaining rising feelings of insecurity in the capital and beyond. Shoplifting remains a blight. But when it comes to phone snatching, at least, London appears to be on the right track.



Britain and France

From Paris with love

LONDON AND PARIS

Anglo-French relations are warming up

THERE ARE few more disconcerting experiences for the British than being love-bombed by the French. Britain's neighbours across the English Channel are usually regarded as pesky rivals, exasperating partners and irritatingly well-tailored to boot. Yet this week France went out of its way to charm Britain.

On September 2nd President Emmanuel Macron and King Charles met at a high-profile event at the British Museum to inaugurate the Bayeux tapestry exhibition, set to be this season's London blockbuster (see page 76). It is the first time the 11th-century work depicting the Norman conquest of England in 1066 has left France. The loan "took probably more years" to negotiate than Brexit, Mr Macron joked last year; he has made it a personal centrepiece of bilateral diplomacy. "When we come together around one table," he said of Anglo-French ties after announcing the exhibition in 2025, "then everything is possible."

Why is France being so nice to Britain? Historical rivals, the two countries have sparred in recent years: over Brexit, submarine sales, small boats and more. When asked whether Mr Macron was a friend or foe, Liz Truss, fleetingly Britain's prime minister, once said, "The jury's out." Now Britain seems keen to return the compliment. Under Sir Keir Starmer, Mr Macron got a state visit, a banquet at Windsor Castle and a partner with whom to build a "coalition of the willing" for Ukraine. Mr Macron was due on September 3rd to be the first foreign leader to visit Andy Burnham, Sir Keir's successor, in Downing Street. The pair was expected to discuss Ukraine, security and Britain's ties to the EU.

One clue to the new *entente* may in fact lie not in the British Museum but in a superb new French two-part biopic of Charles de Gaulle, "La Bataille de Gaulle". Directed by Antonin Baudry, an ex-diplomat, it is—unusually for a French production—based on a British biography, "A Certain Idea of France: The Life of Charles de Gaulle". Written by Julian Jackson, a historian at Queen Mary University of London, the 928-pager is the product of years of painstaking archival research.

The big-screen diptych, starring Simon Abkarian in the title role and Sir Simon Russell Beale as a wonderfully crabby Winston Churchill, is *naturellement* a stirring tale of courage and moral clarity. This

is the myth that to this day surrounds the *résistant* and founder of modern France. But, perhaps thanks to the foreign biographer's eye, it is also an even-handed examination of both the visionary greatness and human fragility of *le général*.

Of particular interest for British viewers, the first part, "L'âge de fer", dwells on De Gaulle's years in exile in Hampstead, in north London, after the fall of France to Nazi Germany in 1940. It does not gloss over the high-minded general's stormy relationship with Churchill. "Betting on De Gaulle seems something of a leap of faith, don't you think?" Anthony Eden, the secretary of state for war, asks the prime minister. "This is not my first war," Churchill retorts, adding clinically: "If he fails, we'll get rid of him." The general and the prime minister trade plenty of insults. But they also share moments of mutual understanding, admiration—and a flicker of affection.

London, after all, provided De Gaulle with refuge, offices (4 Carlton Gardens), a microphone (the BBC), backing (most of the time) and legitimacy (which the Americans resisted). The French have not forgotten. In 2020 Mr Macron awarded London, "totally exceptionally", the *Croix de la Légion d'honneur*, France's highest honour, as a mark of "eternal gratitude". London, he said, was "the last bastion of hope when all seemed lost".

What Mr Macron seems to be saying is

that despite Brexit, despite Donald Trump, or perhaps because of both, France and Britain need to stick together now, as they did then. The De Gaulle biopic, which has drawn over 5m cinema-goers in France, not only evokes nostalgia for an age of unimaginable bravery. It also speaks to modern worries about national sovereignty, dependence and democratic values.

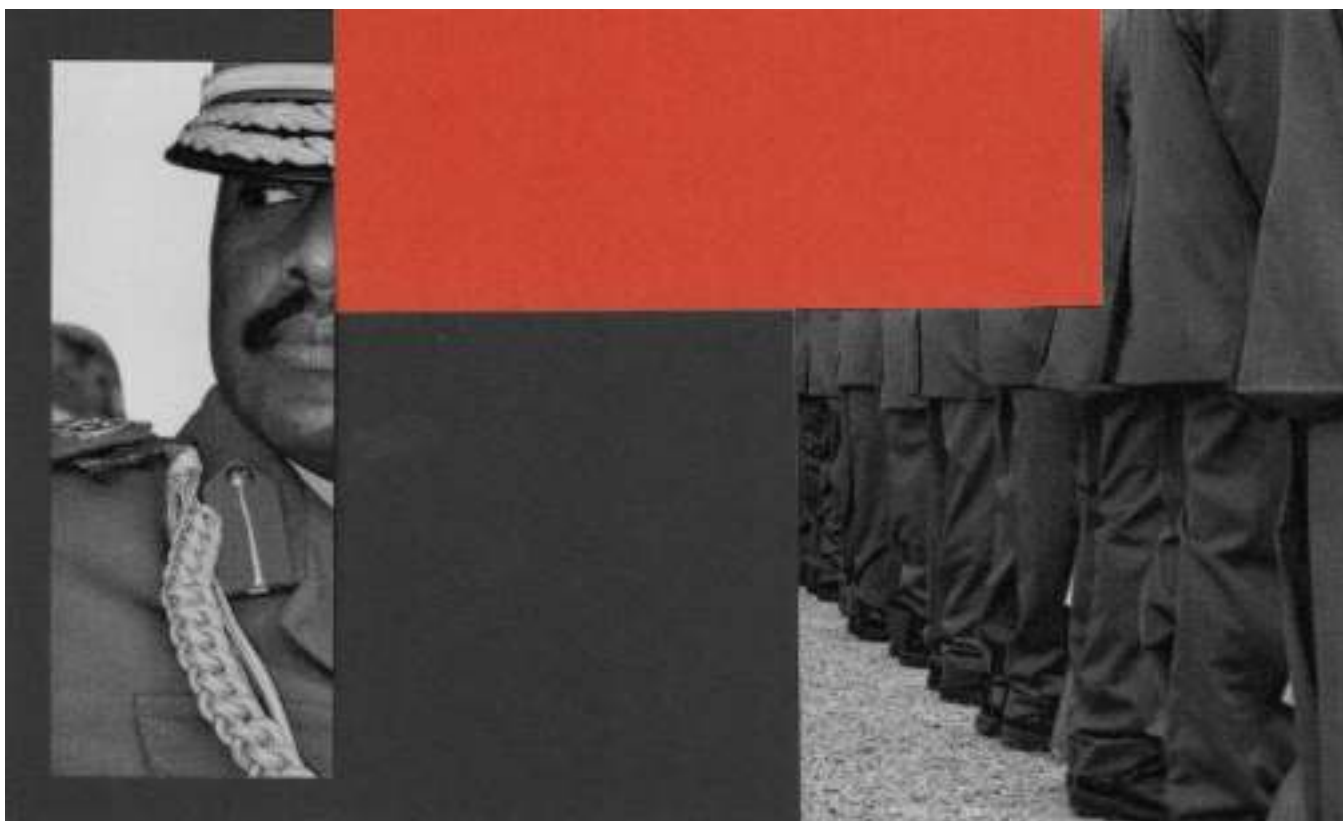
Stubbornly independent-minded, De Gaulle was infuriated by Roosevelt's post-war plans for American military government of France, kept secret from him. The film includes the moment Churchill told the general gruffly that Britain would always choose America over Europe. Yet the doctrine of autonomy embodied by De Gaulle finds new resonance now that Mr Trump's America is threatening to leave Europe to fend for itself. Despite the populist-right Reform UK party breathing down his neck, Mr Burnham has said that Britain needs to "be bolder" in getting closer to the EU. Mr Trump has already helped push Britain and France closer together. Last year the two countries reinforced co-operation over nuclear deterrence. The pair could lead the "coalition of the willing".

The film carries another message too: that the dark forces of nationalism can be beaten. The populist right is on the rise in both countries. Marine Le Pen is the current favourite to win next year's French presidential election. On September 4th Jordan Bardella, her lieutenant, is due to be a guest of Nigel Farage, Reform's leader, at the party's conference in Birmingham. Mr Macron likes to urge the French not to cede to the "spirit of defeat", a nod to a book about the fall of France in 1940 by Marc Bloch, a *résistant* gunned down by the Gestapo. The historical parallel may be imperfect. But this battle is yet another that Britain and France are in together. ■



A certain idea of les anglais

Middle East & Africa



Uganda

From autocracy to despotism

KAMPALA

As Yoweri Museveni fades, the country is becoming a darker place

ON TWO SETS of posters plastered across Kampala, Uganda's capital, two men loom large. One is a paunchy figure with a wide-brimmed hat and a jaundiced stare. The other is younger and brasher-looking in military fatigues. The first is Yoweri Museveni, the 81-year-old president, who seized power after a civil war 40 years ago and is entering his dotage. The second is Muhoozi Kainerugaba, Mr Museveni's capricious son.

General Kainerugaba serves as Uganda's army chief, but he covets his father's crown and increasingly behaves as though he were already in charge. Older Ugandans say his belligerence and brutality are reminiscent of Idi Amin, an infamous military dictator of the 1970s. His ambitions are causing ructions within the army and the ruling party, and even his own family, raising fears of a power struggle within the regime when Mr Museveni eventually goes. "Ours has been a history of extremes: ei-

ther you have anarchy, or real totalitarianism," says Norbert Mao, Uganda's minister of justice. He is not alone in worrying that those days could soon return.

Mr Museveni put General Kainerugaba in charge of the armed forces in 2024. Yet even if the president has indeed been grooming his son as a successor, the two men are quite different. In person, Mr Museveni is a charismatic storyteller; General Kainerugaba tends to be taciturn. The father is fond of long speeches; his son is notorious for undignified outbursts on X. "These days I'm as sober as a cat," he posted in the early hours of September 1st.

→ ALSO IN THIS SECTION

28 An undeclared war in Tigray

29 Iran's dwindling axis of resistance

30 Israel's nasty election campaign

"Women need to stand at least ten metres from me...for their safety."

Outsiders sometimes see General Kainerugaba, who is 52, as a sort of comically conceited nepo-baby. Yet few Ugandans are laughing. During a crackdown after Mr Museveni's re-election in a flawed vote in January, the general threatened to kill and castrate Bobi Wine, the main opposition candidate. Mr Wine went into hiding and is now in exile. Kizza Besigye, another prominent opposition figure, was abducted from Nairobi, Kenya's capital, in 2024 and has been in prison ever since. He is standing trial on treason charges; General Kainerugaba has vowed to hang him. During a court hearing in July, Mr Besigye collapsed mid-speech and was hospitalised.

The general's depredations have intensified in recent months. In July his soldiers abducted Erias Lukwago, a former mayor of Kampala and one of Mr Besigye's lawyers. The army chief posted pictures of a blindfolded Mr Lukwago on X, boasting that he was in his "basement". Mr Lukwago was later accused of treason and remains incarcerated. Between mid-June and mid-July alone, security forces unlawfully detained at least four other dissidents, according to Human Rights Watch. Several are believed to have been tortured.

Repression in Mr Museveni's Uganda is nothing new. But there is a widespread ►►

▶ sense that the regime is degenerating into something darker and more despotic. The state once sought to cover its abuses with a veneer of constitutional legitimacy. “Now we have a rabid, unapologetic, in-your-face dictatorship,” says Eron Kiiza, a lawyer who was arrested and tortured last year and is also now in exile.

Such views are not limited to the opposition. “The gap between what we promise in our laws and what is really happening is widening,” admits Mr Mao, the justice minister. He says the army has violated the constitutional rights of Mr Besigye by denying him medical treatment when he is evidently ill. The minister has also received credible reports of torture by the security forces. But General Kainerugaba “doesn’t care what the law says”, Mr Mao observes. “I don’t know whether we have reached the level of Idi Amin’s time, where bodies are found floating on the Nile,” says another government insider. “I think not yet. But these are grave issues of concern.”

Can anything stop the slide? Mr Museveni has never explicitly said he wants his son to succeed him. In the past he has reined in some of his wilder escapades. But the leader has grown frail of late. He increasingly seems unwilling or unable to restrain his son.

That appears to have emboldened the general to try to crush his perceived enemies and rivals. In May he had Anita Among, a powerful former speaker of parliament once considered untouchable, put under house arrest (she has since been released). Several senior officers have been purged. On August 25th the general’s men kidnapped a close associate of Odrék Rwabwogo, Mr Museveni’s son-in-law, who is believed to have presidential aspirations. “This is my last warning to that fool Odrék,” fulminated the general on X, threatening to arrest Mr Rwabwogo and to have the associate either beaten to death or executed by firing squad.

The one man who could perhaps restore some sanity to Mr Museveni’s court is Salim Saleh, the president’s reticent younger brother. A retired general, Mr Saleh is a powerful figure behind the scenes. He is understood to be disconcerted by some of his nephew’s behaviour, and is considered the only person aside from Mr Museveni whom General Kainerugaba dare not defy.

If a dynastic succession cannot be avoided, much of Uganda’s elite would prefer Mr Saleh as president. He is seen as rational and comparatively conciliatory on ethnicity. General Kainerugaba, by contrast, is widely reviled as an ethnic chauvinist. He calls his own people, the Bahima, “a special breed”, disparaging other groups with crude racial slurs. Many Ugandans are also suspicious of his close ties with neighbouring Rwanda. The general likes to say he has two uncles: Mr Saleh

and Paul Kagame, Rwanda’s strongman president. “Which uncle will eventually have more influence on his student?” asks the government insider.

It is unclear what Mr Saleh wants. Some think he would prefer to remain a kingmaker. Others reckon that in the event of a crisis within the regime, he would intervene and, if necessary, take power himself. “The Raúl Castro scenario is not far-fetched,” says a well-connected observer.

How General Kainerugaba would react is anyone’s guess. Many suspect that the bulk of Uganda’s army, if push came to shove, would side with Mr Saleh. Yet Uncle Kagame, across the border, may have his own ideas about how things should play out. Mr Saleh and the general are said to be close, making it difficult to imagine they would come to blows. But when so much power is concentrated in so few hands, a single family dispute could be enough to destabilise a country. ■

Tigray

Into the grey zone

NAIROBI

Drone strikes by Ethiopia amount to an undeclared war

IN TIGRAY, ETHIOPIA’s northernmost province, August marks the start of Ashenda, an Orthodox Christian festival. It is a time of family reunions, street parades and concerts. But this year public parties were cancelled and private ones were muted.

On August 20th the Ethiopian government attacked Mekelle, Tigray’s capital, with fighter jets and drones. The strikes re-

portedly injured 13 people, including children. From August 24th to August 27th, Tigray was bombed at least once a day. One drone strike in the south on August 26th destroyed a school. “They are trying to terrorise and humiliate the public,” says a senior official in the Tigray People’s Liberation Front (TPLF), Tigray’s ruling party. “The only way out is to fight back.”

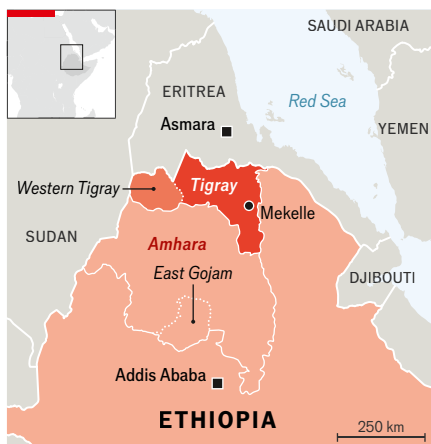
The escalation has been a long time in the making. Between 2020 and 2022 the Ethiopian government and the TPLF fought a brutal civil war, which is thought to have killed hundreds of thousands of people. The peace deal that ended the fighting failed to resolve the core of the dispute between Abiy Ahmed, Ethiopia’s prime minister, and the TPLF’s leaders, who had dominated Ethiopian politics for decades until Mr Abiy elbowed them aside in 2018. In recent months the Ethiopian army has engaged in several skirmishes with forces loyal to the TPLF. To many observers, a return to civil war has long seemed almost inevitable.

Yet the recent attacks are also puzzling. Unlike during the previous war, the Ethiopian government has not cut off telecommunications in Tigray. Commercial flights between Addis Ababa, Ethiopia’s capital, and Mekelle continue. In 2020 Mr Abiy declared war on the TPLF on national television before sending the tanks in. This time his government has not even commented publicly on the drone strikes. Instead, months of unresolved tensions have quietly given way to what is in effect an undeclared blitz. Tigray is now a grey zone: no longer at peace, if not quite at war.

Part of the reason for the ambiguity may be that Mr Abiy is more cautious this time round. His bellicose rhetoric in 2020, as well as a slew of atrocities committed by Ethiopian troops, tarnished his one-time ▶▶



You will hear of wars and rumours of wars



tias allied with Mr Abiy during the previous war. Yet many doubt whether it can, having been weakened by years of infighting. Several political leaders and military commanders have defected to Mr Abiy since the start of 2025. This has doubtless given his government a wealth of intelligence on the TPLF's military infrastructure and planning. Some observers reckon the relentless drone strikes have left the group in disarray. "They are too weak to respond," says an analyst in Addis Ababa.

Much will depend on how much support the TPLF gets from Eritrea—an uncertain prospect, given its long history of enmity with Mr Isaias. It may also be hoping for cross-border support from the Sudanese Armed Forces (SAF), Sudan's national army, which resents Mr Abiy for backing its rival, the Rapid Support Forces, in Sudan's civil war.

On August 1st the TPLF and the Ethiopian army clashed in Shererina, a pocket of Western Tigray on the border with Sudan. A think-tank with close ties to the Ethiopian government later accused the SAF of aiding the TPLF. Last week the SAF said it had shot down three hostile drones launched from Ethiopian territory. The TPLF's leaders insist that Eritrea and the SAF are committed to removing Mr Abiy from power. The grey-zone crisis in Tigray may yet paint the region red. ■

Iran's proxies

Diminishing returns

DUBAI

After three years of war, the axis of resistance is no longer an axis

FOR YEARS Iranian officials spoke of an "axis of resistance", allies from Beirut to Sana'a who would stand together against common foes (see map). Yet when Iran was attacked twice in the past 15 months, each made a different decision about whether to join the fray. The axis may not be dead—but the brand has outlived the business.

The strategy of backing Arab militias dates to the 1980s, when Iran sent its Islamic Revolutionary Guard Corps (IRGC) to train Hezbollah fighters in Lebanon. It saw such groups as a substitute for its weak conventional army: they would serve as forward defence, projecting power while keeping conflict away from Iran.

The defence clearly failed. The Hamas-led massacre on October 7th 2023 started a cascade of wars that ended with Iran itself being attacked. Hezbollah and Hamas are badly weakened. Bashar al-Assad's regime in Syria has gone. The Iraqi government has ordered militias to disarm by October.



Some regime foes hope that Iran will have to curtail its support, perhaps to facilitate a deal with America, and trigger the collapse of the axis. That is unlikely. The militias are wounded but alive, and the strategic rationale for supporting them is stronger than ever. Yet the axis may also struggle to rebuild itself as a consortium: the parent company in Tehran is bankrupt, and many of its subsidiaries are poorly run.

A likelier outcome is that its constituent parts survive but diverge. Some will become Iranian wards, held tightly but used sparingly. A few will graduate from the axis. Others will emerge as strays: clients that might have somewhere else to go. Counter-intuitively, Iran will exercise the tightest control over groups that have suffered the greatest blows to their capabilities.

Take Hezbollah, once Iran's most feared proxy. Until 2023 it had an arsenal of more than 100,000 rockets and missiles aimed at Israel and a well-trained commando force that had honed its skills fighting to save Mr Assad's regime. Hassan Nasrallah, its charismatic leader assassinated by Israel in 2024, saw himself as a peer rather than a proxy. He was a true believer steeped in Iran's revolutionary ideology, but tried to preserve some autonomy.

No longer. Naim Qassem, Nasrallah's successor, is an unloved middle-manager. Israeli strikes have killed many of the group's experienced commanders. The Lebanese government insists that Hezbollah must hand over its diminished arsenal. With so many commanders dead, the IRGC sent its own men to Lebanon to exercise direct control over the group, leaving it little choice but to start another war with Israel in March. At the same time, its domestic popularity has collapsed. Iran will preserve Hezbollah less for what it can do than for what its loss would signal.

At the other extreme are the Houthis, the most independent-minded of Iran's allies. They started as a local insurgency in northern Yemen in the 1990s. It would be decades before Iran offered significant financial and military aid. When it came, it

▶ reputation as a peacemaker. Crucial economic support from the IMF and the World Bank could be imperilled if he were blamed for starting another war. Fortunately for Mr Abiy, the TPLF has auditioned energetically for the role of perceived aggressor. It has been forcibly conscripting young Tigrayans for months, threatening to "bury" Mr Abiy's regime.

Mr Abiy may also be reluctant to rush in because regional alliances have shifted. In the previous war, militias from the Amhara region, to the south of Tigray, and troops from Eritrea (to its north) fought alongside Mr Abiy against the TPLF. Both have since formed an improbable alliance with their erstwhile foe. Eritrea, in particular, has emerged as Mr Abiy's chief antagonist. Although Isaias Afwerki, its veteran dictator, loathes the TPLF, he is now more worried about the Ethiopian prime minister's desire to annex part of his coastline. "The Eritreans are not stupid," says the TPLF official. "They see the regime in Addis as an existential threat."

Neither side seems interested in peace talks. The TPLF says the deal that ended the last war is "dead". Ethiopian state media say the TPLF is "defunct". On August 24th the TPLF's chairman half-heartedly met Olusegun Obasanjo, a former president of Nigeria and one of the mediators of the moribund accord. The TPLF said the discussions "produced neither new proposals nor evidence of tangible progress".

What next? Loth to launch a ground war against multiple foes on multiple fronts, Mr Abiy seems likely to focus on Tigray's skies. The Ethiopian army has near-total air superiority over the TPLF. It has relied heavily on aerial bombardment in its war against rebels in Amhara, where many civilians have died. Last year a drone strike in East Gojam killed 16 people, including an eight-year-old boy. Such incidents have become so common in Amhara that they barely attract media coverage.

The TPLF, for its part, has vowed to reconquer Western Tigray, a swathe of fertile land that was ethnically cleansed by mili-

▶ vastly improved their capabilities. Once derided as barefoot gunmen, Houthi fighters now wield anti-ship missiles to harass vessels in the Red Sea and air defences to shoot down American Reaper drones.

Yet the Houthis continue to guard their autonomy. Their involvement in the post-October 7th wars has waxed and waned, based more on their own interests than Tehran's. They are increasingly able to produce their own weapons and are forging their own alliances, for example with al-Shabab, the al-Qaeda affiliate that controls much of Somalia. Houthi delegations have visited Russia and held talks with China. Iran and the Houthis will continue to find common interest: both loathe America, Israel and Saudi Arabia. But that is not the same as taking orders.

In between are the strays. Many Shia militias in Iraq are a by-product of the American-led invasion in 2003, after which Iran poured weapons and money into the country to bleed its American foes. Two decades later their priorities have changed. Iran remains an ally, but their main patron is the Iraqi state, which has more than 200,000 militiamen on its payroll.

Some militias did launch attacks on American bases earlier this year, but they worry that open conflict with the Iraqi government or its allies would jeopardise their position. The IRGC is said to have sent advisers to Iraq to establish small cells tasked with attacking Gulf states, a sign that the bigger militias were reluctant to do so.

Hamas was always an awkward fit in the axis, a Sunni group in a largely Shia bloc. It fell out with Iran over the latter's support for the Assad regime in Syria. Khalil al-Hayya, its newly appointed leader, is considered a loyal Iranian ally, but other officials would prefer a pivot towards Sunni powers, namely Turkey and the Gulf.

In March Hamas urged Iran to halt its attacks on Gulf states. Iran will not abandon it—support for the Palestinians is central to the regime's identity—but its support may be more rhetorical than material.

Even if Iran wanted to rebuild all its allies, its resources are limited. The war has caused hundreds of billions of dollars' worth of damage. America is blockading its ports and tightening sanctions on its economy. The fall of Mr Assad's regime also severed the land route to Lebanon. Iran will need to prioritise.

In some ways, the fate of the axis may mirror that of Soviet client states in the 1980s, when Moscow could no longer afford to offer them generous support. This is an imperfect analogy, of course. Moscow's allies had a rival superpower to turn to, while Tehran's face a messier board: some have a range of possible partners; others, none at all. Still, the Middle East's most ambitious conglomerate may be heading for a restructuring. ■

Israel's election

Horses for coalitions

JERUSALEM

Binyamin Netanyahu sows discord to thwart the opposition

TROJAN HORSES seem to be everywhere this summer. Binyamin Netanyahu, Israel's prime minister, has featured one in a campaign video for Israel's parliamentary election on October 27th. In the ad, an AI-generated Gadi Eisenkot, a former general now leading the polls, rides the horse. Lurking inside are Mansour Abbas and Yair Golan, two other opposition leaders.

Mr Netanyahu's message is crude—and clear: Mr Eisenkot can win only by joining forces with Mr Abbas's Arab-Israeli Ra'am party and Mr Golan's Zionist-left Democrats. Yashar, Mr Eisenkot's centre-right party, has overtaken Mr Netanyahu's Likud in *The Economist's* poll tracker. But he will need to woo a range of partners to form a government—as will Mr Netanyahu.

Mr Eisenkot's growing popularity among centre-right voters, Likud's constituency, is unsettling Mr Netanyahu's party. Hence it is trying to taint Mr Eisenkot by association. Smearing the Arab parties, which represent over 20% of Israel's population, is an old tactic. Mr Netanyahu has repeatedly labelled them “terror supporters” and accused Ra'am of being an offshoot of the Muslim Brotherhood (though he has not been above trying to elicit Mr Abbas's support when desperate).

Efforts to do the same to a Jewish and Zionist party are new. A decade ago, when Mr Golan was deputy chief of staff of the Israel Defence Forces, he likened what was

happening in Israel to “horrific processes that occurred in Europe” before the Holocaust. More recently, during the war in Gaza, he said that “a sane state does not wage war against civilians, does not kill babies as a hobby, and does not set goals for itself like the expulsion of a population.”

Mr Golan's opponents are now using these quotes to depict his party as radical and non-Zionist, and therefore unfit for government. But so far the polls are not moving in Mr Netanyahu's favour, and none of the main opposition parties has ruled out governing with the Democrats.

When it comes to including an Arab party in the next government, however, Likud has managed to split the opposition. Mr Golan is the only one openly in favour. All his potential partners are either adamantly opposed to working with the Arab parties or have been evasive. In public Mr Eisenkot has said he will consider governing with any party that accepts a vague set of principles. But he would rather lead a minority government, however unstable, than include Israel's Arab representatives.

Though his alliance of hard-right and religious parties may not be capable of winning a majority, Mr Netanyahu is already dictating the terms by which his rivals will try to form a coalition. His campaign is pushing Mr Eisenkot towards harsher nationalist positions; the latter recently ruled out the possibility of accepting a Palestinian state if he were to govern. He may struggle to form anything better than a short-lived government bound to policies not unlike those of the outgoing one.

Mr Abbas, one of the canniest politicians in Israel, is the only Arab-Israeli leader to have ever joined a ruling coalition. In 2021 he supported a government led by Naftali Bennett, a right-wing politician who is running again this year. Mr Abbas claims the other Arab-Israeli parties, which are running together on a joint list, are refusing to make the necessary compromises to be in government and effect change.

To boost his chances of joining a government again, Ra'am will field its first Jewish candidate this year. Yoav Segalovitz is an unlikely pick for a party dominated by conservative Islamists. A secular centrist, Mr Segalovitz's main attraction is his former career as a police investigator. One of Mr Abbas's priorities is to get the police, currently under Itamar Ben-Gvir, the leader of the ultranationalist Jewish Power party, to take seriously the bloody wave of gang violence afflicting Israeli Arabs.

But he also wants to make Ra'am more palatable to Jewish parties. Mr Segalovitz could help. Like Mr Netanyahu, Mr Abbas is not only trying to win votes, but to change the terms of coalition-building. Rather than languish as a hidden passenger within the Trojan horse, Mr Abbas wants to ride it. ■



Practising his winning smile

United States



Data centres

Not in my backyard

CHICAGO AND WASHINGTON, DC

How data centres became one of America's hottest political issues

ASPECTRE IS haunting America—the spectre of data centres. The computer-filled warehouses powering America's boom in artificial intelligence have become less popular than almost every other kind of infrastructure—even nuclear-power plants. Counties and states are rushing to wrap them in red tape or ban them altogether. In July the Ratepayer Protection Act, designed to limit their impact on electricity prices, sailed through the committee stage in the House of Representatives.

On August 31st Donald Trump weighed in on the fractious debate, alarming Republicans facing tight midterm races. Local opponents of data centres would “end up being backwards and poor”, he warned, if they killed the “Golden Goose”. The backlash against data centres is scrambling traditional political alignments, reshaping the coming elections and unnerving tech firms and investors. It is less clear whether it will slow down the AI juggernaut.

For a sense of how quickly the politics of data centres has changed, consider three very different states: Illinois, Texas and Pennsylvania. In 2019 J.B. Pritzker, the governor of Illinois, signed a bipartisan law creating incentives for their construction. “In today's world,” he declared, “data centres are as critical a part of our infrastructure as our roads, trains and schools.” In Texas, Greg Abbott boasted as recently as last year that the state was “the epicentre of AI development” while welcoming new

Google data centres. Josh Shapiro, Pennsylvania's governor, was similarly enthusiastic: “We are already all in on AI.”

In August Mr Pritzker had a rather different message. Data centres, he told reporters, risked “higher electric rates, higher water rates or...environmentally unsound practices”. In June he had unilaterally paused applications for the tax credits introduced in 2019. In Texas, Mr Abbott ordered the state's power utilities to audit all data centres seeking to draw electricity. The facilities “could endanger the reliability and stability of the Texas electric grid”, he warned. Mr Shapiro has also tightened the rules, giving communities more power to veto projects, while tarring his opponent in the gubernatorial race as pro-data centre—increasingly, a political term of abuse.

A little over a year ago some polls showed majority support for local data-centre construction. By March that had flipped: one Gallup poll found 71% opposed. Surveys by Annenberg recorded a 19-point swing in net favourability between February and June-July. An *Economist*/YouGov poll from the end of August put opposition at 63%. Data centres were viewed as bad for the country across every group of voters (see chart 1 on next page).

Chicago illustrates the shift. Long before the AI boom, the city and its suburbs hosted scores of data centres, thanks to

→ ALSO IN THIS SECTION

33 Anger in politics

33 Pete Hegseth's purges

34 Canada's counter-punch

35 Funding special education

36 Lexington: Class treason

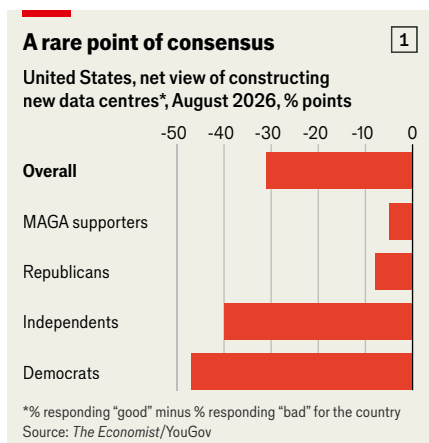
► their position at the heart of America's internet infrastructure and relatively cheap electricity. Until recently, few people cared. Now they are packing public meetings in an effort to stop development across the state. In August hundreds turned out to oppose plans for a project on Chicago's South Side that, according to its developers, is not even a data centre.

In the first eight months of this year, American counties considered 409 moratoriums or similar measures, nearly seven times last year's total. In more than half a dozen states—including virtually every midterm battleground—more than a fifth of counties have passed at least one moratorium (see chart 2). "This is one of the toughest development issues I've encountered in my career from a land-use attorney's perspective," says Tommy Mann of Winstead, a Dallas law firm. "The level of emotion associated with these projects is one that I have not experienced."

Some proponents of data centres have blamed foreign powers for the backlash. "China could not be happier," observed Mr Trump. In June OpenAI, a model-maker, said that a Chinese firm had produced images designed to undermine support for data centres in America. On August 27th X, the social-media platform, said it had identified a 200,000-strong Chinese bot farm circulating the material. Yet the evidence suggests these efforts have had little effect. OpenAI concluded that they generated "little or no observable engagement" among Americans.

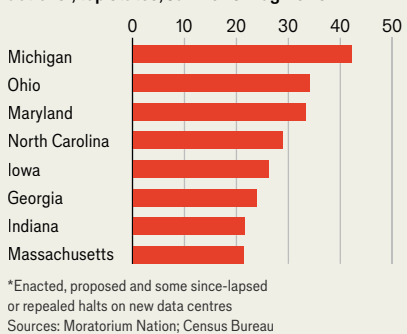
Too close to home

The real cause of the outrage is simpler. Americans are sceptical of AI, distrust the firms that build it and fear it will lead to job losses. But poll after poll suggests that what worries them most about data centres is their local impact—or, at least, what they imagine that impact to be. A recent Fox News poll found that 75% of respondents cited concerns such as energy use, water bills and traffic, as the main reason they opposed a data centre in their area.



Drawing the line

US, % of counties with data-centre moratorium actions*, top states, Jan 2023-Aug 2026



Just 11% pointed to AI itself.

Many of these concerns are overblown. Google, a hyperscaler, says that in 2025 its data centres and offices consumed around 10.9bn gallons (41bn litres) of water—roughly equivalent, it noted, to the annual irrigation of 73 golf courses in the south-west. Amazon, another hyperscaler, says its global fleet of data centres used 2.5bn gallons last year, down by 2% from 2024 despite adding more facilities. In 2023 crop irrigation consumed 74 times more water than data centres, even after accounting for the water used to generate their power.

Electricity is a different matter. The Lawrence Berkeley National Laboratory, a federally funded research centre, estimates that data centres consumed 4.4% of America's electricity in 2023 and could account for between 9.5% and 15.3% by 2030. Their impact on consumers is less clear. Wholesale prices are being pushed up. That could eventually impact households. But the Electric Power Research Institute, a think-tank, estimates that the growth of data centres actually reduced average electricity prices by 6% between 2019 and 2024 by spreading the grid's fixed costs.

In recent weeks three big utilities—Georgia Power, Pacific Gas & Electric and Indiana Michigan Power—have all linked data centres to lower bills. Meanwhile, 30 states have approved or proposed "large-load" tariffs designed to ensure that big customers such as data centres pay for infrastructure upgrades.

The question is whether public opinion is still malleable. A poll this month by Echelon Insights found that opposition to data centres could be reversed if respondents were told about just one potential benefit, such as lower property taxes or more spending on schools. "Voters are open to making a deal on data centres," argues Patrick Ruffini, a Republican pollster who runs Echelon. They also seem open to bribes. Another poll, by the University of Virginia, found that most people would accept a few thousand dollars to support a local data centre, with a median acceptable

payment of \$10,000. Paying every resident of a median-sized American county would cost around \$240m—pocket change for the tech industry. It is already showering gifts on communities.

Still, the backlash shows few signs of abating. "We're going to see the same thing happen in 2028," says Darrell West of the Brookings Institution, a think-tank. Governors who escape the issue this year will face it in two years' time, he argues, when they come up for re-election.

The politics of data centres is topsy-turvy in other ways, too. The backlash could prove especially awkward for Democrats in Illinois, where trade unions are powerful. Many unions are enthusiastic supporters of data centres. After Mr Pritzker's decision in June, a group of union leaders issued a critical statement. The move, they said, "will send billions of dollars in investment and thousands of union jobs to Indiana, Kentucky and Ohio". Tim Gillooley, a local union official, is even more emphatic: "These data centres are going to be built! Let's get them built here."

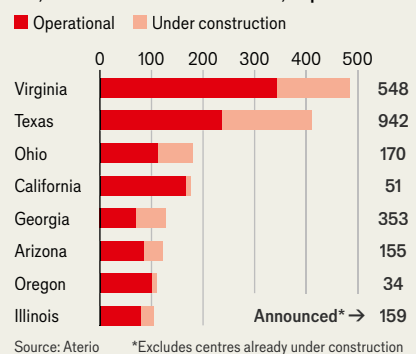
The path of least resistance

The growing opposition is sand in the wheels of the industry. Sales-tax exemptions for computer chips—the biggest cost of building a new data centre—remain in place in most states, including Texas. But they have been paused in others, including Arizona and Ohio, or made conditional, as in Pennsylvania. That, along with satisfying local demands, will inevitably increase the cost of new data centres. Even so, a handful of states still wield outsize influence. Texas alone has more data centres under construction than Georgia, Arizona and Pennsylvania combined (see chart 3).

Data-centre investment may simply flow to more permissive states. "Enough of these data centres are going to find a home in a community willing to work with them in return for the tax revenue and other benefits," says Jack Painter, an energy analyst at Capstone, a strategy firm. As Mr Trump put it: "Let Data Reign." ■

Data-driven

US, states with most data centres, Sep 2nd 2026



Political hostility

Rage in the machine

New research finds American politics has never been so angry

IN JUST THE past two months Donald Trump has described Democratic candidates as “jihadists” and “radical lunatics”. He has mocked opponents’ weight and appearance, said he hated Adam Schiff, a Democratic senator from California, and referred to James Talarico, the Democratic Senate candidate in Texas, as “Tal-a-freak-o”. He has also attacked former Republican allies, calling them “losers”.

Though more hostile than most, the president is hardly the first politician to trade in outrage. New research suggests he is part of a broader trend: American politics is angrier than ever.

Economists at Harvard, HEC Paris, Paris-Saclay and the University of California, Berkeley, set out to explore the evolution of political fury. They trawled more than 150 years of congressional speeches and millions of social-media posts, categorising their emotional character using artificial intelligence, including large language models and natural-language processing. For each text they assigned a score for eight emotions—anger, sadness, pride, gratitude, fear, disgust, joy and hope—as well as for the overall level of emotion.

Their paper finds that angry statements in Congress shot up during Newt Gingrich’s leadership in the 1990s, before receding in the early years of this century. More recently such statements have become ever more common, rising by 50% since 2013 (see chart). Voters are more irate, too. From 2013 to 2025 the share of policy-related sentences expressing anger in voters’ tweets rose by 35%. In comments on Reddit, an internet forum, it rose by 46%.

The paper’s authors are careful not to attribute the rise in anger to any single cause, though there are plenty of theories. Steven Webster of Indiana University emphasises deepening partisanship. According to the Pew Research Centre, since 2016 there has been a sharp rise in the share of Democrats and Republicans who not only oppose one another’s ideas but also view members of the other party as immoral and dishonest. The share of partisans who say that the other party makes them “angry” climbed by almost 30 percentage points, to 76%, between 2016 and 2025.

“Regardless of where it starts, it is going to be a reinforcing feedback loop,” says Stefanie Stantcheva of Harvard University, who co-wrote the new research. She points to data showing that angry tweets by mem-

bers of Congress tend to receive 59% more retweets than emotionally neutral ones. Anger can mobilise voters more effectively than other feelings, setting in motion a corrosive cycle. Political scientists have shown how rage undermines trust in government, reinforces polarisation and reduces voters’ commitment to democratic norms, even when the source of anger is detached from politics itself.

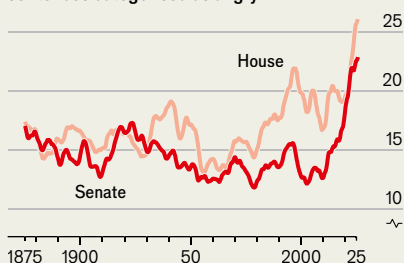
Dr Stantcheva and her colleagues found that respondents primed with negative emotions were less favourable towards immigration and trade, and more favourable towards economic redistribution—perhaps a sign of rage at the rich. “When you’re angry, the categories you’re retrieving are grievance and blame,” she says.

As politicians vie for attention ahead of the midterm elections, many are making anger a central part of their campaigns. In April the news site Axios reported that nearly 50 Democratic campaign ads included the word “fighter” or “fight”. Bob Chew, an independent Senate candidate in Colorado, has run an ad showing him throwing furniture across a room to express his rage over affordability.

A few candidates are taking a different tack. Josh Turek, a Democratic Senate candidate, says he will be “fighting for Iowa”, but also speaks of “the need for hope and positivity”. Mr Talarico talks about elevating service over selfishness. Last year Zohran Mamdani won New York’s mayoral race by pairing populist policies with relentless cheer. Americans are still cross—a growing share say they want change. Not every politician thinks the best way to offer it is with a furrowed brow. ■

Boiling over

US Congress, % of floor-speech sentences categorised as angry*



*Three-year moving average

Source: “The rise of anger: emotions and policy views”, by Y. Algan et al., Harvard University working paper, August 2026



Purges in the armed forces

Live by the sword

WASHINGTON, DC

Pete Hegseth is putting his stamp on the war department

A YEAR AND a half ago few would have wagered that Pete Hegseth would consolidate power at the Pentagon. Narrowly confirmed by the Senate amid allegations of financial mismanagement in prior jobs and heavy drinking, which Mr Hegseth denied, the former Fox News host and volatile culture warrior appeared underqualified and no match for the generals and admirals he would direct. In office, the secretary of war has skirted scandal, be it mishandling secrets or forcing polygraph tests on his underlings. But far from seeing his power wane, Mr Hegseth has taken control of his department. A rolling purge of the armed forces has cleared out his rivals and those deemed insufficiently loyal.

Dan Driscoll, the army secretary, is his latest casualty. On August 31st Mr Driscoll tendered his resignation to the president after months of clashes with Mr Hegseth over the ouster of senior officers and the future of the force. Widely respected and viewed as a savvy reformer, Mr Driscoll’s departure raises yet more questions about the turmoil roiling the Pentagon and the viability of reforms meant to drive the army’s adaptation to the age of drones.

Mr Hegseth’s purges have been dramatic. Since taking office, he has ousted at least 24 flag or general officers. Many appear to have been dismissed for no reason beyond their race, sex or associations with officers Mr Hegseth disliked. A former national guardsman who rose to the rank of

major, Mr Hegseth has long held a particular grudge against the army, an institution he claims “spit me out”. In April he sacked General Randy George, the most senior army officer and someone with whom Mr Driscoll had forged a close relationship. Chris Donahue, who headed US Army Europe and Africa, was forced into retirement two months later after Mr Hegseth downgraded his command. As of today the army has no Senate-confirmed chief of staff, secretary or commander of forces in Europe. Mr Driscoll’s deputy is also said to be on the cusp of leaving.

Mr Driscoll fought back as best as he could. “He prevented a number of officers from being fired or blocked,” says a congressional aide. Mr Hegseth’s recent removal of seven army officers from a list of 18 approved for promotion to two-star general may have been the final straw.

The departure comes at a pivotal time. Mr Driscoll, a confidant of J.D. Vance, the vice-president, is believed to have acted as a check on Mr Hegseth’s more hawkish instincts. He made a personal appeal to Donald Trump just days before his resignation, reflecting concerns in many parts of the Pentagon about the mounting strain on the armed forces from the war in Iran and Mr Hegseth’s meddling in the ranks.

Personnel churn has also undermined important modernisation efforts overseen by Mr Driscoll. He has been central to the Pentagon’s drone-procurement efforts (Mr Trump took to calling him “drone guy”). In November he visited Ukraine, forging a tech partnership with its drone specialists. The adulation Mr Driscoll attracted is thought to have upset Mr Hegseth, who is keen to dispense with initiatives associated with him and his allies. A new army battalion set up by General George to master the art of drone warfare, for example, is being phased out by General Christopher LaNeve, the acting chief of staff of the army, who is close to Mr Hegseth.

General LaNeve prefers to talk of a “back-to-basics” approach. While that still includes buying new tech, greater emphasis is being placed on MAGA-ish priorities. General LaNeve has overseen the drawing down of army units from Europe and placed greater focus on the Western hemisphere. Mr Driscoll had also fought with General LaNeve over his efforts to rewrite the army’s physical-fitness standards, a long-running fixation of Mr Hegseth’s.

The secretary is likely to solidify his hold further. Sean Parnell, the Pentagon’s spokesperson, is widely tipped as Mr Driscoll’s replacement. Like his boss, Mr Parnell seems enamoured of the culture wars. His lack of experience running large organisations could make confirmation difficult. But he could still serve in an acting capacity. With each passing day, the Pentagon looks more like Mr Hegseth. ■

The trade war

Canada’s counter-punch

WASHINGTON, DC

Its tariff retaliation is calibrated for maximum political pressure

THE THEORY behind Donald Trump’s trade war with Canada is simple: America holds all the cards. “WE DON’T NEED CANADA, THEY NEED US,” Mr Trump wrote on social media on August 24th. A week later Scott Bessent, America’s treasury secretary, was similarly dismissive of Canada’s retaliation. “I don’t think you can be in a tit-for-tat with someone who’s 13 times larger than you are.”

But that understates America’s exposure to one of its biggest commercial partners. The two countries traded more than \$870bn in goods and services last year. Canada buys roughly 15% of all American goods exports and is the top export destination for 34 states. In carmaking, parts can criss-cross the border several times before a vehicle is finished. For America as a whole, the stakes of the trade war may look small. But for particular industries and states, they are anything but.

Canada is deliberately trying to turn those commercial ties into political pressure. Its response to America’s 50% tariffs on \$20bn-worth of Canadian exports is a package of levies of 15-50% on \$20bn-worth of American goods, due to take effect on September 8th. Steel and aluminium products are among those facing the heaviest tariffs, alongside cheese and agricultural equipment. Cars will continue to face existing Canadian counter-tariffs. “We are picking products that will target

states,” said Mélanie Joly, Canada’s industry minister, on August 25th.

Canada’s strategy is clearest in the Midwest. Michigan, Ohio and Iowa all host crucial Senate races—and all will feel the pain. New 50% levies on steel and aluminium products will hit Michigan’s manufacturers, while the wider trade war weighs on the car industry. In Iowa, duties on agricultural equipment will hurt John Deere and other manufacturers. Ohio, meanwhile, sends nearly a third of its goods exports to Canada, making it particularly vulnerable.

Canada dropped seafood from its retaliatory list, sparing the lobster industry, but much of Maine’s trade remains closely intertwined with its northern neighbour. Lumber and paper products, among other things, routinely cross the border for processing. Susan Collins, the Republican senator facing a difficult re-election campaign, has called America’s tariffs “a mistake”. Farther south, 50% tariffs on furniture will hammer North Carolina, where another open Senate seat is in play.

Canada’s retaliation is not the only threat to Republicans. Mr Trump’s own tariffs will push up prices in America. The latest measures cover everything from toys to metals and other industrial inputs, raising the cost of both imported goods and American-made products. That is politically dangerous when affordability dominates voters’ concerns. Only 26% of Americans back Mr Trump’s tariffs on Canada.

Some Republicans are sounding the alarm. On August 24th Thom Tillis, the retiring Republican senator from North Carolina, warned that the trade spat was creating “tension” in border states. “The party that owns that tension,” he said, “is the party that probably suffers the consequences in November.” Others reject Mr Trump’s portrayal of Canada as an economic adversary. “This is not China,” said Ms Collins two days later. “It’s Canada, our best friend, a country with whom our economy is completely intertwined.”

The costs could yet grow. Jamieson Greer, America’s trade representative, has suggested outright bans on some Canadian goods. In Canada, other moves are being discussed, such as curbs on oil and critical-mineral exports. Mark Carney, the prime minister, says he is responding to an attack. Mr Bessent may be right that America has far more firepower. That does not mean it will escape injury. ■



In the war zone

Education policy

Moral maths

BOSTON

America's support system for disabled pupils is broken

FEW POLICY reform commissions draw up a list of recommendations only to implore lawmakers to ignore them. Yet that is where Minnesota's Blue Ribbon Commission on Special Education finds itself. Facing a multi-billion-dollar budget shortfall, state lawmakers asked the commission to identify \$250m in savings on special education, where spending is expected to swell by nearly \$1bn between 2022 and 2027. In August the commission released provisional recommendations and unanimously urged the legislature not to enact any of them, warning of harm to pupils.

Minnesota's paralysis reflects a national dilemma: educating disabled children is a popular policy, but the sums required under current laws are eye-watering. Across the country, school districts are pulling money from general-education funds to pay for services for pupils with special needs. Even as school enrolment declines, the number of students in special education across the country is rising. Between 2014 and 2023 it grew by 1.4m, from 11.6% of all pupils to 14.7%. In several states—including Indiana, Massachusetts, Minnesota, Pennsylvania and Wyoming—that figure is higher still at roughly one in five. As costs rise, states are confronting fraught questions about who should pay, how well programmes work and what must be pared back to cover the bill.

Fifty years ago, it was estimated that over half of the country's disabled children received an insufficient education. To remedy this, in 1975 Congress passed what eventually became the Individuals with Disabilities Education Act (IDEA), one of several laws that together guarantee disabled children a "free appropriate public education". Each eligible child receives an Individualised Education Programme (IEP) specifying the services a school district must provide. These range from occasional speech therapy to a classroom aide or placement in a specialised school, which can cost districts hundreds of thousands of dollars each year.

Congress initially envisaged that the federal government would shoulder much of the cost. IDEA authorised but did not require Washington to fund up to 40% of average national per-pupil spending on each disabled child. In reality, between 2005 and 2021 federal funding for IDEA fell by 12% in real terms, amounting to an average of just 15.5% of total funding. That has left



states and local school districts to find the rest. A report from Bellwether, an education think-tank, found that in 2020 districts footed on average nearly two-thirds of their special-education bill. Districts generally fund schools from local property taxes, which are difficult to raise without provoking revolt. States typically pay for schools from general revenues such as sales and income taxes, but nearly all have balanced-budget requirements that are challenging to meet.

The biggest strain is the rising number of special-education students, a figure that more than doubled between 1976 and 2023, to 7.3m nationally, according to data from the Centre on Reinventing Public Educa-

tion, a research group at Arizona State University (see chart). Partly this reflects expanding recognition of disabilities previously neglected. Students with autism swelled from a little under 5,000 in 1991, when the disorder was designated as a federal disability category, to just under 1m in 2023. Developmental delay, a category introduced in 1997, grew from roughly 1,900 students that year to about 300,000 in 2023. Criteria for the conditions have broadened; better detection and concerted efforts to evaluate children earlier have probably contributed, too.

As demand swells, districts plug the deficit with money from their general budgets. Bellwether, sampling almost 6,000 school districts and using data from 2020, found a \$24.1bn gap between actual special-education spending and the state and federal funds earmarked for that purpose. Because special-education services are legally mandated, finding savings is tricky. A school cannot arbitrarily pare back an IEP. Districts "overspend and overcommit", says Maggie Cicco Rault, a researcher at Georgetown University, rather than risk violating rules or inviting litigation. Some states have so-called "hold-harmless" provisions which protect districts from losing any of their special-education funding even if changes in enrolment would otherwise reduce it.

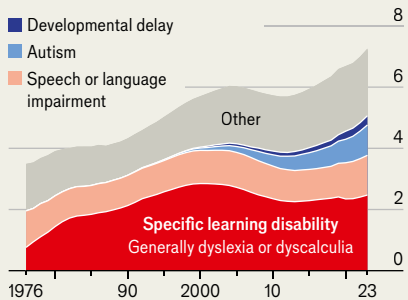
States are experimenting with fixes. Minnesota's commission suggested removing the state's "hold-harmless" provision and encouraged an investigation into whether legal costs associated with disputes over IEPs can be contained. In 2025 Connecticut legislators passed a law to regulate billing practices of private special-education contractors. That same year Texas overhauled its funding formulas to calibrate them better to the severity of a child's needs, in an effort to help districts close a \$1.7bn shortfall.

Another option is to ask more of the federal government. Lawmakers on both sides of the aisle "agree that the feds need to pony up some more for special ed", says Cheryl Youakim, a state representative from Minnesota. But the Trump administration is unlikely to oblige. It has dismantled the Department of Education and shifted responsibility for special-education services to the Department of Health and Human Services.

Politicians are wary of being seen as withholding support from disabled children, however. Even Linda McMahon, the secretary of education, has called IDEA a "generational achievement" and proposed increasing its budget by \$439m, a small sum relative to national needs. In Minnesota the issue is so fraught that kicking the problem down the road may prove to be the Blue Ribbon Commission's easiest recommendation to follow. ■

A changing classroom

United States, special-education enrolment, by disability, m



Source: ASU, Centre on Reinventing Public Education

LEXINGTON

The case for class treason

The right sort of leftist may help rescue the Democrats from the wrong sort of leftism



THE JURY IS still out on whether Mayor Zohran Mamdani, with this commitment to “the warmth of collectivism”, will summon a new era of plenty for struggling New Yorkers. But his young administration is already a gift to one constituency: conservative readers of the city’s tabloid, the *New York Post*, which is affirming their opinion of the left by feasting upon the privileged lifestyles of some of Mr Mamdani’s fellow travellers in the Democratic Socialists of America (DSA).

“Anti-rich DSA leader Gustavo Gordillo lives it up in posh \$1.5m NYC pad paid for by millionaire parents,” the *Post* blared last month. Noting the DSA “railed against property ownership”, the *Post* revelled in the “lush landscaping” of the row house bought “by his mommy and daddy through a dummy corporation”. The *Post* later reported that Mr Gordillo, the co-chairman of the city chapter of the DSA, studied art and literature at Yale; that he was fired from an electricians’ union apprenticeship programme for failing to show up; and that his mother drives a silver Porsche.

Other leftist piñatas for the *Post* have included Tracy Rothenthal, who advocates abolishing rent and whose father is a successful music producer. (“Anti-rent radical and Mamdani pal who is ‘squatting’ in Brooklyn is Grammy nepo baby.”) The *Post* has branded Grace Ryan, “a 25-year-old chocolate heiress from Ohio”, as “one of the most shameless” members of the DSA for posting pictures of herself on social media “puffing a cigar on a boat in a \$400 Ralph Lauren stars-and-stripes sweater”. To the *Post*’s unmistakable glee, Ms Ryan, who worked during the primary for a successful left-wing congressional candidate, defended herself on X by writing, “Like have y’all never heard of noblesse oblige?”

This is an old game. Since Karl Marx relied upon Friedrich Engels not just for his ideas about communism but for his textile fortune, lefties have fattened upon fat cats, and righties have made fun of them for it. From the start, socialism has also, for certain bourgeois faddists, radiated a subversive glamour. More rigorous socialists have seen this as the ideology’s Achilles’ heel. “The worst advertisement for Socialism is its adherents,” grumbled George Orwell in “The Road to Wigan Pier”. The typical socialist was either “a youthful snob-Bolshevik” or “a prim little man with a

white-collar job” who had “vegetarian leanings” and, above all, “a social position which he has no intention of forfeiting”.

Yet Ms Ryan has a good point about *noblesse oblige*. She may never live like common people, but why should that bar her from trying to help them? Doesn’t it beat the alternative, a chocolate heiress in a \$400 sweater who is indifferent to the plight of less fortunate Americans, if not out to screw them?

Here, amid the posturing, one arrives at something that may matter: an emerging distinction between the two periods of leftist activism becoming known as Woke 1 and Woke 2. Any such distinctions must be fuzzy and provisional, since few Democrats have had the decency to explicitly repudiate radical positions they once embraced. Some have shrugged off former excesses, as when Congresswoman Alexandria Ocasio-Cortez quoted another Democrat saying “Woke 1 was crazy!” and then laughed as though every American was in on the joke. Some have tried to redefine the slogans, insisting that “defund the police” did not mean defunding the police. Others have not retreated; time will tell whether they are the vanguard or the dead-enders. Still, some time between Donald Trump’s second inaugural address in January 2025 and Mr Mamdani’s first inaugural the next January, America’s left began to shift its emphasis, from race and gender to class.

Pick your causes or effects, whether the illiberal ideas that stampeded from the academy into social media; the rise of Mr Trump; the #MeToo movement; or the death of George Floyd under a policeman’s knee in 2020. These combined to concentrate the left on racism and gender bias. Identity became destiny. The poorest white person had privileges denied to the wealthiest black one. In theory the social-justice movement focused on policing; in practice it became obsessed with other preoccupations of America’s multiracial elite, such as preferential admissions to top schools. For prim little people with white-collar jobs, calling out advantages based on race became a way to prove enlightenment; so did disdaining the deplorables who voted for Mr Trump. Any true Marxist would have seen a classic attempt to split the working class, but Democratic leaders embraced this divisive politics.

Nothing to lose but more elections

Then came new effects and new causes. Kamala Harris lost in 2024 and Mr Trump demonstrated growing support among non-white working-class voters. Mr Trump cracked down on diversity, equity and inclusion programmes and the Supreme Court struck down race-conscious admissions. Democratic activists became outraged by injustice in Gaza instead of in America. Perhaps most important, Mr Mamdani won with an inclusive message about making life more affordable—as did moderate Democratic candidates for governor in Virginia and New Jersey.

For all the duelling between progressives and moderates, their agendas overlap when it comes to the precariat, if not the proletariat. From Georgia to Alaska, Democrats are all economic populists now, calling for higher wages, lower prices and more affordable health care. Victims and villains are judged not by the colour of their skin but by the content of their bank accounts. Billionaires are the bad guys, and in the capacious definition in use across the Democratic spectrum, anyone who works to pay their bills is working-class. This may not, in the end, revive the Democrats, let alone rescue struggling Americans. But if it does, the party will have at least some youthful snob-Bolsheviks to thank for helping remind it of the sorts of things it once stood for. ■

The Americas



Venezuela's oil

The devil's business

CARACAS

The deal could give both countries reason to forestall a democratic transition

IT WAS A typically Trumpian announcement. On August 28th the American president announced what he called “THE BIGGEST OIL DEAL IN WORLD HISTORY”, an agreement he said would give America “majority control” of more than 65bn barrels of Venezuelan crude, around a fifth of the country’s vast proven reserves. He described Delcy Rodríguez, Venezuela’s unpopular leader, as the “Highly Respected Interim President of Venezuela”. Ms Rodríguez joined in the mutual obsequiousness, offering her “deepest gratitude” to Donald Trump for a deal she said would contribute to “our country’s economic growth”.

Mr Trump says the arrangement “more than doubles” American oil reserves. That is misleading. The United States, whose own reserves stand at around 46bn barrels, has not been “gifted” 65bn barrels of Venezuelan oil—as Mr Trump has claimed. Instead, via the Pentagon, it is taking a 35%

stake in the parent company of a private oil producer, North American Blue Energy Partners (NABEP). The Venezuelan government has granted NABEP concessions over 14 oilfields, as well as three it already runs.

According to the White House, America will have the right to buy 20% of NABEP’s future production at cost, and will have first refusal for its remaining output. It will also have veto power over the appointment of any member of NABEP’s board of directors, the majority of whom must be US citizens. The Trump administration says the contract will be for 100 years and bring in more than \$200bn in royalties and tax revenue for the Venezue-

lan state. The Venezuelan regime says the deal runs for just 25 years.

Mr Trump relishes the deal’s imperialist connotations. “To the victor go the spoils,” he said on September 1st. That referred to the raid carried out on January 3rd by American special forces to nab Venezuelan strongman Nicolás Maduro and his wife in Caracas, Venezuela’s capital, and fly them both to the United States, where they face drug-trafficking charges. Mr Trump suggests that once the “spoils” of that action—a large chunk of Venezuela’s oil—are in American hands, it will diminish the relevance of Middle Eastern oil, bring down fuel prices for American consumers and make Venezuela rich.

The long game

The reality is a lot more complicated. Significantly increasing production from Venezuela’s decrepit oil industry will take years. It is a rusting relic of what it once was after two decades of mismanagement and corruption under the administrations of the incompetent regime led by Mr Maduro and his predecessor, Hugo Chávez. “Venezuela will be completely irrelevant in terms of the global oil market price for the next year or so,” says Francisco Monaldi, a Venezuelan oil expert at the Baker Institute at Rice University in Houston. ▶▶

→ ALSO IN THIS SECTION

38 A Brazilian liberal, almost

40 Ecuador, prawn giant

▶ Then there is the snag that Mr Trump is striking an agreement not with Venezuela, but rather its unelected leadership led by Ms Rodríguez, Mr Maduro's vice-president, who has chosen to work with Mr Trump rather than suffer her ex-boss's fate.

On the streets of Caracas the main complaint is not that the deal is a colonialist grab by the United States, but that it props up a regime which Venezuelans voted out by a thumping majority in 2024. (That election, with the connivance of Mr Maduro's cabinet, including Ms Rodríguez, was stolen). "This is all being done behind the people's back, by people who are illegitimately in power," says Xiomara, as she queues to fill her car with petrol.

That sense that Mr Trump is working with the latest incarnation of a rejected cabal is amplified by his choice of business partner. NABEP is controlled by Alejandro Betancourt, one of a group of Venezuelan businessmen who made fortunes on the back of lucrative contracts during the chaotic heyday of corruption under Mr Chávez. In Venezuela his name is forever tainted by an enormous contract granted to one of his previous companies by Mr Chávez in the early 2000s, to upgrade state electricity power plants. Venezuela's political opposition called that deal over-billed and under-fulfilled, pointing to power cuts that plague the country to this day.

Hold your nose

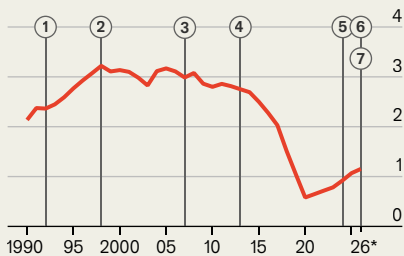
"Betancourt is probably the most controversial person you could do this deal with," says a person with connections to Venezuela's oil industry. "He's associated with the fact that we have one of the worst electricity services in the world." Mr Betancourt, who has been investigated in Europe for money-laundering, has consistently denied all wrongdoing and has never been convicted of a crime. A US official calls him a man "who knows how to run this business" and pointed to his proven record in raising production in the three oilfields that his company already controls.

The American government insists that the deal with NABEP will involve no investment of public money. It therefore falls to the company itself to raise the \$100bn it says is needed to quintuple its oil production to one million barrels a day. The fact that the US government has a stake in the firm, it is hoped, will give potential investors the security to commit.

The Trump administration is meanwhile pushing hard on many fronts the notion that Venezuela is ripe for investment. On September 2nd Mr Trump's energy secretary, Chris Wright, was in Caracas for an announcement that Chevron, the only oil major to have remained in the country throughout the turmoil of the past quarter of a century, plans to invest \$7bn in the next five years, in a deal separate from the

Back up the mountain

Venezuela, crude-oil production, million barrels per day



Sources: Rystad Energy; Kpler; The Economist *To Sep 1st

NABEP one. But no other international oil company has made a similar commitment. Several have unhappy memories of Venezuela, losing billions when their previous joint-venture contracts were rewritten under the Chávez government in 2007.

Another source of their hesitation may be the question-mark still hanging over the durability of contracts. If a future democratic government comes to power, will it honour agreements forged under pressure with a government widely deemed illegitimate? "It will be a fiasco for all involved," said Ricardo Hausmann, a former Venezuelan planning minister.

That in turn leads to a further troubling prospect. Both the Trump administration and the Rodríguez regime perhaps now share an incentive to stall democracy, given the risk it presents to their mutually cosy arrangement. "As the deal takes shape, the opposition's role and influence could increasingly fade," says Imdat Oner, a Turkish former diplomat who served in Caracas. Already, the Trump team has strongly discouraged the popular opposition leader, María Corina Machado, who left Venezuela to travel to Norway to collect the Nobel peace prize last year, from returning home. She has remained conspicuously silent about the deal.

The American official roundly rejects this, insisting that the Trump administration is rescuing Venezuela's economy in advance of a future election. The plan is for the next government to inherit a country with a solid economic foundation, not one in crisis, so as to be better able to move beyond the catastrophe of the past 25 years. "A stable democracy, a stable republic, that can conduct elections on a repeated basis," says the official.

Maybe. It was a Venezuelan energy minister who, in 1975, described oil as "the devil's excrement". Perhaps no deal involving the black stuff—let alone any nation-building—was ever going to be clean. ■

Brazil's election

Bad boy

RIO DE JANEIRO

Renan Santos won't win, but his ideas are changing Brazilian politics

RENAN SANTOS is cocksure. "I am the greatest orator of my generation in the world," he claims in his small office, only half-jokingly. He has boasted of learning fluent Swedish in order to chat up girls on an annual pilgrimage to Europe that his friends have dubbed "the blondes tour". He writes off his rivals as "infantile", "pathetic" and "mediocre". Yet for all his bragging, Mr Santos is no charlatan. The 42-year-old is running to become Brazil's next president on a wonkish platform that sketches out a bold vision for the country.

Mr Santos's rise has parallels with that of Javier Milei, Argentina's firebrand president. Like Mr Milei, he is obsessed with free-market economics. In 2014 he founded a political group, the Free Brazil Movement (MBL by its Portuguese acronym), to advocate a minimal state in a country with a long tradition of big government. Like Mr Milei, Mr Santos mixes his dogmatism with rock music, fronting a band that extols the virtues of competition and low taxes. (Mr Santos claims to be the superior musician. His aide says both politicians' bands are "equally awful".)

And like Mr Milei, Mr Santos is a political outsider. Name recognition came after he organised mass protests against the government of Dilma Rousseff, a left-wing former president who was impeached by a hostile Congress in 2016. Only in 2025 did MBL register as a political party, under the



Rocking in the free world

► name Missão (Mission). It has one congressman in office, Kim Katagui. As well as Mr Santos's presidential run, the party is fielding 57 candidates for Congress in Brazil's general elections in October.

Walking into the Missão offices reveals a project focused on cultural revolution as much as political power. The entrance is littered with copies of *Revista Valete*, the movement's magazine, which has run features on Elon Musk and critiques of Judith Butler, a queer feminist philosopher. The mood is more startup than party headquarters. Programmers type code furiously behind large black screens, while down the corridor is a studio to shoot snappy videos for dissemination to the movement's mostly male 4m online followers.

The focus on media is a response to "wokeism", says Mr Santos. The rise of cancel culture "required responses that classic liberalism didn't have to offer", he explains. Many millennials like him, he says, went from supporting gay marriage and legalising drugs to "being labelled a fascist because you don't want to use certain pronouns...or are expected to accept that a child can change their gender."

But the cultural battle "is not our core identity". Mr Santos distances MBL from Donald Trump's MAGA movement. Economics remains its most important cause. The movement was spurred towards new thinking by "the failure of a childish form of economic liberalism" influenced by American libertarians, he says. "It is naive to think that if you remove the state from all activities and privatise everything, things will fix themselves. The state must be present in many areas, especially in a country like Brazil," with gaping inequalities. The party now believes that companies such as Petrobras, Brazil's state-owned oil firm, should not be privatised, but that the government's influence should be reduced. Mr Katagui, who oversees the party's economic proposals, calls this "pragmatic, non-dogmatic liberalism".

Mr Santos wants to turn Brazil into a great power within 30 years through deep structural reforms. The transformation is sketched out in the party's "Yellow Book", a 350-page manifesto which applies lessons for Brazil from successful public policies around the world. Mr Katagui travelled to Denmark to study its patent laws and to Japan to learn about its system of evaluating local governments. Germany's apprenticeship system, China's infrastructure spending and the United States' light-touch approach to AI regulation all feature. "We definitely don't want the EU model, which is more obsessed with controlling and regulating than with developing its own AI," says Mr Katagui.

The result is a policy programme packed with new ideas for Brazil. Missão proposes digitising patient health-care re-



Shouting for the underdog

cords and using AI to improve triage and reduce queues at public hospitals. A new law would create performance targets for local politicians on education, health care and access to sewerage. Officials who hit targets would be eligible for more money from the federal budget; persistent underperformers would be threatened with a temporary prohibition from holding office. AI would be used to recommend cuts to public jobs. "There is no limit to how AI can be used to improve administrative efficiency," gushes Mr Katagui.

Tackling the big one

Mr Santos is frank about the need for spending cuts. Over 90% of Brazil's federal budget is tied up in mandatory spending, particularly pensions. The share is growing relentlessly as many pensions and several welfare benefits are indexed to the minimum wage, which rises automatically with inflation and GDP growth. By 2029 discretionary spending is expected to comprise an unworkable 0.1% of the budget. Missão proposes de-indexing pensions and benefits and tying spending on education and health care to inflation rather than revenues, which are growing fast. Cuts to lavish civil-servant salaries would follow, and a pension reform. All this, hopes Mr Katagui, would make room for growth-boosting infrastructure investments, which he wants to double to 4% of GDP.

When it comes to security, populism trumps liberalism. One of Mr Santos's slogans is "Prendeu, Matou" ("Catch, Kill"), referring to how he believes police should treat criminals. He frequently praises Nayib Bukele, El Salvador's strongman, who has reduced crime by locking up 2% of the country's adult population and trampling over democracy. (Mr Santos claims to be "Bukele in style, Milei in substance".) He

promises to call states of emergency and allow a "bloodbath" against gangs. The Yellow Book extols "the doctrine of the enemy", a controversial legal theory which argues that some criminals do not deserve civil rights. In practice it could be easily abused by an executive bent on repressing its political enemies.

Mr Santos has been polling in the single digits, but his willingness to propose bold ideas is winning him prominent backers on the Brazilian right. Many are disheartened by the candidacy of Flávio Bolsonaro, a son of Jair Bolsonaro, a populist former president who is serving a 27-year sentence for attempting a coup. "Flávio is extremely weak," says one Santos supporter. "Renan is well-read, informed and can speak about lots of different subjects. Flávio doesn't know anything." Mr Santos attacks the Bolsonaro family for being intellectually mediocre and corrupt.

Mr Santos will struggle to win over women. He has praised manosphere bloggers. One of his closest allies, Arthur do Val, with whom he travelled to Ukraine in 2022, has said that female Ukrainian refugees were "easy because they're poor". On that trip, Mr Val boasted that Mr Santos had given him tips on how to pick up women. "You've got to go to ordinary towns...these poorer towns are the best."

On August 31st José Antonio Dias Toffoli, a Supreme Court justice who also sits on Brazil's Electoral Court, suspended Mr Santos's candidacy on the grounds that he had failed to register his party's social-media handles correctly. A day later, after an uproar, Mr Toffoli reversed course. But the attempt, which many experts considered extreme, has boosted Mr Santos's anti-establishment cred. Even if he does not win this time, he has given fed up right-wing voters an alternative to *bolsonarismo*. ■

Ecuador

Grey gold

GUAYAQUIL

A prawn superpower rises

THE PRODUCTION of prawns in Ecuador is lean manufacturing incarnate. Vast rectangular pools tessellate the Guayas delta, centre of the aquaculture belt. Its brackish waters hide billions of translucent bodies. Larvae are cultivated in greenhouse-style hatcheries, fattened in open-air ponds, hoovered into lorries, then taken to packaging plants where they are frozen. Inefficiencies are constantly hunted down. Containers filled with bricks of prawns known as “HOSO” (head-on, shell-on) cross the oceans, mostly east to west across the Pacific. “It is like a factory,” says Wolfgang Harten of Grupo Almar, the country’s second-largest producer.

That factory is running flat out. Shipments have quadrupled in the past decade. In 2020 Ecuador surpassed India as the world’s top exporter (see chart). Last year it sold more than \$8bn-worth of prawns, more than India, Vietnam and Indonesia combined. Once an oil nation, Ecuador has become a pesco-state. Prawn production provides employment for about 1.6% of the population and furnishes 6% of GDP, a larger share than carmaking contributes in Germany. The sector has developed the country’s most advanced technology. The lorries that move prawns are escorted by armed guards. For coastal communities, a job at a prawn-processing mill is a ticket to the middle class.

Business wasn’t always this good. When Ecuador began cultivating prawns in the 1960s it was a cottage industry. *Penaeus (Litopenaeus) vannamei*, better known as king prawn or white-leg shrimp, is native to Latin America. Farmers collected wild larvae from nearby mangroves. Few bothered with selective breeding. Profits were high enough to drive expansion, but at great cost. By 2000 deforestation had halved the country’s mangroves. A global outbreak of white-spot disease bankrupted many farmers, killed 95% of prawns in infected ponds and cut output by 70% over two years.

Ecuador’s Asian rivals responded to the disease by intensifying production. Ponds were crammed with densities as high as 300 prawns per square metre. Larvae were isolated in labs to ensure they had never contracted white spot. Antibiotics became routine. Ecuador took the opposite path. Instead of trying to eliminate disease, producers adapted to it. Ponds were thinly stocked, with densities a tenth of Asia’s.



Larvae were bred from the survivors of white spot, which had acquired resistance to it. Antibiotics were phased out.

The country improved its technology. Since the 2010s waves of innovation have put its farms at the frontier of marine tech. Many farmers in Asia still row out in a canoe twice a day to toss in a bag of feed. In Ecuador they own automatic feeders that drop pellets every three minutes. Underwater microphones record the click-click of chewing crustaceans to tell when they are full. Depending on consumption speed, ingredients are tailored for the next cycle, says Andrés Rivadulla of BioMar, a feed manufacturer. Aerators pump oxygen



Prawn stars

through each pond. Mechanical filtration reduces water pollution.

The results have been phenomenal. The combination of healthier prawns and better tech means that, although productivity is below that in places like Thailand and Indonesia, survival rates are far higher. Around 95% of prawns are harvested alive in Ecuador, compared with barely 80% in Asia, says Gorjan Nikolic of Rabobank, a Dutch lender. Minimising disease outbreaks lowers costs and stabilises yields. Cultivating a native species helps. Grupo Almar manages six annual cycles of 50 days, nearly twice the pace of competitors in India and Vietnam. This has helped consolidate prawn firms and integrate family farmers into well-capitalised corporations.

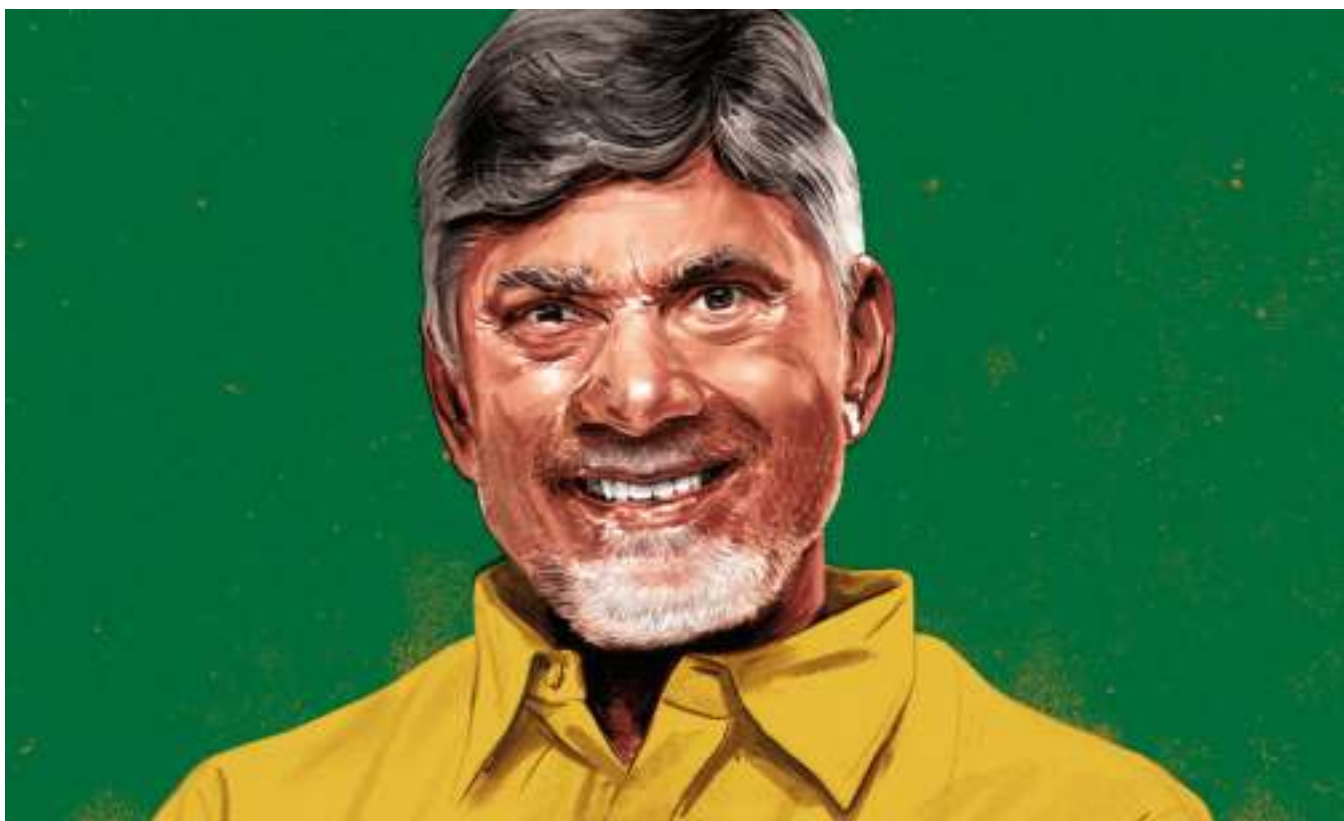
Geopolitics have also helped the South Americans. Ecuador is already the biggest supplier of prawns to the European Union and China. Yet it had long struggled to gain ground in North America, where India’s output dominated. Then along came Donald Trump. Ostensibly angry about India buying Russian oil, last year he hit its goods with a 50% tariff. Facing a combined duty of nearly 60% on Indian prawns versus 10% on the Ecuadorians, importers in the United States switched en masse. Americans now consume more prawns from Ecuador than from anywhere else; Ecuador kept its lead even after India’s duties were relaxed earlier this year.

Don’t overdo it

In fact the main problem is over-production. Since recovering from the white-spot epidemic, farmers have boosted output by 15% per year. This has swamped markets, dragging prices to record lows. A kilogram of prawns cost \$2.40 at the farm gate in Ecuador in May, compared with \$2.99 in India and \$5.32 in China. To shield its own producers, China sporadically restricts imports, claiming phytosanitary concerns. Brazil’s import duties are prohibitive. Mexico complains of smuggling. Then there is climate change, which actually increases oversupply. By raising temperatures on the Pacific coast, the El Niño weather phenomenon harms crops but stimulates prawns, which love heat.

So the priority is to boost demand. The Balkans and the Persian Gulf are seen as promising markets for HOSO. Companies are starting to make higher-value products for American consumers, such as peeled and breaded prawns. Fast-food shops are promoting prawn burgers while marketers extol the healthiness of prawn-based ceviche, tempura and risotto. “The best way to start your day is with a prawn omelette,” says José Antonio Camposano of the National Chamber of Aquaculture, an Ecuadorian trade-group. It may be working. Demand is up. But Ecuador’s prawn kings are hungry for more. ■

Asia



Andhra Pradesh

Building a new dream

AMARAVATI

Is Chandrababu Naidu's utopian vision too ambitious?

AS HE TELLS the story, Chandrababu Naidu smiles. On becoming chief minister of Andhra Pradesh, a state on India's east coast, in 1995, he saw "IT was the future" and headed to America. Initially Bill Gates refused to meet him, but Mr Naidu insisted. In 1998 Microsoft snubbed Bangalore to establish its Indian base in Hyderabad, then the state's capital. Today the city has 10,000-plus Microsoft employees and a big airport, and has doubled in population. More than as an investor, Mr Naidu saw Mr Gates as a signal that would propel Hyderabad's rise.

The story captures Mr Naidu's public persona—a single-minded tech visionary, with a knack for wooing investors and a mission to improve Indian governance. He is still at it; after a turbulent career he is, at 76, two years into his fourth term. He was almost assassinated in 2003 and briefly imprisoned in 2023; twice voters booted him out. Most painful of all, in 2014 his state

was cleft in two. Hyderabad, the crown jewel, became the capital of a new state, Telangana. Andhra Pradesh, still the size of Tunisia and with a population of 54m, was left as an agrarian rump without a capital or an economic engine.

A dizzying ambition was born. As chief minister of the rump state, Mr Naidu planned a shining new capital called Amaravati, the biggest greenfield city in India's history, and among the biggest under way anywhere. And he formulated a new pitch

for Andhra Pradesh, not as a rival to India's software hubs, but as a magnet for advanced manufacturing, data centres and quantum computing. To further these goals, he has allied his regional party to Narendra Modi's Bharatiya Janata Party (BJP), which rules in Delhi, supporting it as a coalition partner in exchange for financial backing.

At his office in Amaravati—next to the 33,000-acre site on which 25,000 workers are busy, night and day, turning his vision into reality—Mr Naidu tells *The Economist* that he is building the most beautiful city in India. The Singapore-inspired master plan features abundant water and greenery and miles of cycle lanes, designed around a grid system. He will have self-driving cars on the streets within five years, he predicts. Some 300 acres have been allocated for drone research and manufacturing, and he envisages 10,000 flights a year in short order, allowing residents to enjoy streets lined with trees and free from lorries.

Mr Naidu's vision sounds utopian, but he argues it is rooted in reality. India has long lagged behind on hardware, but it is beginning to emerge as a hub for electronics manufacturing. Mr Naidu peppers the conversation with references to Chinese prowess, which India must emulate. For him factories, data centres and quantum computers in Andhra Pradesh will comple- ►►

→ ALSO IN THIS SECTION

42 The Pacific Islands Forum

43 Nepal's catastrophe

43 Japan's shambolic opposition

44 Ashoka: Online payments grow up

45 Social-media curbs for the young

ment, rather than compete with, India's startup and outsourcing hubs in Bangalore and Hyderabad.

Yet the task is daunting. In 1995 Hyderabad had a tech industry and 5m residents. Today Mr Naidu is trying to build a high-tech economic hub on some old banana groves. What's more, his project is controversial and his state's finances are in bad shape. In 2019 Mr Naidu lost power to YSR Congress, a rival regional party that deals in populist welfareism. It mothballed Amaravati for five years. To win back power in 2024, Mr Naidu had to promise to keep an array of expensive schemes in place, crimping resources for investment.

He has achieved impressive results. In the port of Visakhapatnam, Google broke ground in April on a 1GW AI data-centre project, much the biggest such scheme in India. The giant \$15bn joint venture, involving Gautam Adani, one of India's most powerful tycoons and a close ally of Mr Modi, is testimony to Mr Naidu's political nous. It helps that he has made his state an easy place to do business. Steel, defence and aerospace companies are arriving, too.

In Amaravati Mr Naidu has again recruited anchor tenants—including IBM, a technology company—hoping others will follow. There are three universities and some 100,000 students living among the cranes and diggers. Already the outlines of sumptuous civic buildings rise from the marshland. Work is under way on 95 sites in all. "This is where the supercomputer will go!" shouts one excited foreman, above the din of activity.

In a country blighted by mediocre administrators, Mr Naidu's audacity can feel like a breath of fresh air. Even so, he may have bitten off more than he can chew. One criticism is that Amaravati is an over-ambitious vanity project, and could become a financial millstone for the state. "He's trying to punch above his weight," says Parakala Prabhakar, a political economist. The bulk of the financing for the city is \$1.6bn in long-term loans from the World Bank and the Asian Development Bank, which will be paid back by selling off land. The maths relies on land prices soaring, which in turn depends on the city attracting foreign investors, at a time when India as a whole is struggling to do this.

"These projects always look like utopias in expensive 3D renderings," says Sarah Moser of McGill University, who has compiled a database of 300 greenfield cities worldwide. Many end up half-empty, some as ghost cities. As perspicacious as their progenitors may be, they struggle to bend economic geography to their will. Political winds change quickly. Consider King Abdullah Economic City, a vast project in the Saudi desert, gathering dust since the death of its namesake in 2015.

Amaravati's fortunes rest on a delicate

political balance. If Mr Naidu loses power, his opponents would have different priorities. For now he has the clout to push it forward because the BJP holds power nationally but is short of a parliamentary majority. That could change. Mr Naidu says he is with Mr Modi for the long haul, as they are "on the same wavelength" about development (and the opposition alliance remains "impractical"). But he admits that recent youth protests are a "concern for us all".

A final doubt is whether Amaravati can really become "Quantum Valley". Even as investment pours into AI, many experts think that quantum computers will have a complementary role, partly by performing some tasks more efficiently than large language models. Mr Naidu wants Amaravati to manufacture components. But the technology is years from commercialisation. And it is not clear which quantum technology will win (IBM specialises in one, which brings a risk of lock-in). Though quantum could be a good long-term bet, it is unlikely to yield investment and jobs quickly.

As with Hyderabad, Mr Naidu hopes that his truncated state will rise by gaining an early advantage in nascent technologies. In time he hopes to pass down power to his son, Nara Lokesh, now his technology minister. But he is not thinking of retiring soon. "Always," he says, "one should be looking forward." ■

The Pacific Islands Forum

PIFfffft

China still has some pull among Pacific island countries

A QUIRK OF the Pacific Islands Forum (PIF), an 18-member regional group, is the dress code at its leaders' meetings. Hawaiian shirts are almost *de rigueur*. At this week's meeting from August 30th to September 1st they were worn by both Pacific island leaders and by senior diplomats from America, Europe and the rest of Asia.

A less whimsical quirk is that three PIF members have diplomatic relations with Taiwan rather than China. When one of them plays host at their annual get-together, it offers the rare spectacle of Taiwan's most senior diplomat, Lin Chia-lung, glad-handing and holding press conferences just like a regular foreign minister.

This year the leaders met in Palau, one of only 11 countries to recognise Taiwan. China's outrage was inevitable. But how far it went to disrupt proceedings was still a surprise. Last-minute withdrawals by five leaders were a serious blow. PIF decisions are taken by consensus and only leaders



Taiwan has a Whipps round

can make important ones.

Suspicion quickly fell on China. Surangel Whipps, Palau's president and a longtime critic of China's attempts to buy influence in strategically important Pacific island states, told reporters that, weeks earlier, China had threatened unnamed consequences if Palau invited Taiwan.

The biggest no-show was Matthew Wale, the Solomon Islands' prime minister since mid-May. The outgoing chair of the PIF, Mr Wale has been lobbying the forum to agree on a new treaty that would make it tougher for China to establish a military or police presence in PIF countries. But on the eve of the summit, three members of his cabinet resigned and filed a motion of no-confidence against him. Mr Wale rushed back to quell the parliamentary revolt. That left his proposed treaty without a champion in Palau.

Diplomats in Honiara, the capital of the Solomon Islands, say that they often see the Chinese ambassador hosting members of parliament for dinners, especially after Mr Wale became prime minister. One says that Chinese diplomats and state-owned enterprises frequently dole out cash to legislators to get them to back more China-friendly policies. But they could cite no hard evidence that the timing of the ministers' defections was influenced by China in this case.

Some of the absences might have other explanations. Not all of the leaders are in rude health, and some are preoccupied by domestic politics. But one truant, Taneti Maamau, Kiribati's president, threw subtlety to the wind by sending in his place his country's former ambassador to China. All of this irked Taiwan's Mr Lin, who told reporters that China was like a guest who behaves like a host, making demands and "ruining the atmosphere" of the party. ■

Catastrophe in Nepal

After the flood

DELHI AND KATHMANDU

More disasters; fewer resources

A WEEK AFTER it struck, it was still hard to gauge the extent of the catastrophe that hit the Himalayas on August 26th. But it is at least possible to be fairly precise about how it started: at 8.37am a collapsing glacier and ice-rock avalanche crashed down and dammed the Lhende river at the border between Nepal and Tibet. Three minutes later the dam breached, releasing a fury of water, rock, mud and ice down the Bhote Koshi and Trishuli rivers of Nepal's Rasuwa region. Shibu Giri saw a wave raze an entire bridge. Just before it tossed up his lorry, he darted for the forest. After sleeping in a cave, he was lifted to safety by an army helicopter the next day. Many were less lucky; the flash floods swallowed some villages entirely.

A week later more than 1,000 people were known to have died and more than 4,000 were missing. They included several hundred foreigners, among them busloads of Hindu pilgrims en route to Kailash, a holy mountain in Tibet. Some 80 bridges and 40km of road were wiped out. The loss of 14 hydropower plants, some still under construction, knocked out 10% of Nepal's power generation.

Nepal sits where the Indian and Eurasian tectonic plates collide and the hot monsoon breeze meets the Himalayas' icy winds and shaky slopes. That makes it one of the most disaster-prone places on Earth. Its region is heating faster than the rest of



Earth, its glaciers melting twice as quickly as they did in 2000. So in the years ahead more glaciers will collapse and more lakes are likely to burst their banks.

Nepal is among the world's poorest countries, and looks horribly ill-equipped to deal with the calamities this will bring. Its prime minister, Balendra Shah, is a 36-year-old former rapper in post for a mere six months, after Nepali youths burned down parliament a year ago and kicked out their previous rulers. His government will have to find as much as \$5bn to meet the costs of recovery, at a time when the wealthier nations it would once have looked to for help are cutting their foreign-aid budgets.

The United Nations' climate fund lacks the money to honour even existing requests from poorer nations. America has pledged \$3.6m in assistance—less than 3% of its contribution after a devastating earthquake hit Nepal in 2015. Besides limiting immediate humanitarian-relief efforts, the shortage of funds scuppers plans to build back better, by investing in cli-

mate-resilient roads, bridges and villages.

Himalayan nations, meanwhile, are too stingy and suspicious of one another to manage their shared home in harmony. The Hindu Kush-Himalaya has more than 63,700 glaciers but only 38 monitoring stations (only seven of which meet global standards). Pema Gyamtsho, who heads the International Centre for Integrated Mountain Development, a research and policy initiative in Kathmandu, the capital, says Nepal will have to rely on neighbours with greater resources to equip the region with better sensors and monitors and real-time data-sharing. But China tends to treat hydrologic-flow rates as a national-security secret, risking leaving its neighbours downstream blindsided.

Perhaps no early-warning system would have won Nepal the time to prepare for floods as sudden and ferocious as these. But to survive the devastation wrought in the years to come by its region's mountains and waters, it will need more funds and more cross-border transparency. ■

Japanese politics

Coming apart

TOKYO

Japan's opposition alliance breaks up

THE CENTRIST REFORM ALLIANCE (CRA) began with grand ambitions. In January two of Japan's main opposition groups announced a merger of their parties in the powerful lower house ahead of an election, hoping to be a match for the ruling Liberal Democratic Party (LDP). Instead, the LDP triumphed and the CRA flopped, winning just 49 of the 167 seats its parties had held before the vote. On August 28th the CRA members announced they could not agree on a merger in the upper house; three days later, the CRA indicated it would disband in the lower house too, less than a year after it was formed.

The CRA has failed to solve deeper problems in Japan's mainstream opposition. It merged the centre-left Constitutional Democratic Party (CDP), the main successor to the opposition party that held power from 2009 to 2012, and Komeito, formerly in coalition with the LDP. Both have struggled to elevate fresh leaders and to appeal to younger voters.

The shambles will mean less pressure on the LDP and more room for upstart populist parties. The LDP has dominated Japanese politics since its founding in 1955. When the Democratic Party of Japan (DPJ) swept into power in 2009, it seemed to herald the emergence of two-party politics. ►►



No home to go to

► But the DPJ governed haphazardly. It was unlucky to be in power when a big earthquake and tsunami struck in 2011, triggering a meltdown at the Fukushima nuclear plant. The fallout has made its successor party, the CDP, radioactive.

In recent years scandals have tarred the LDP. The party lost lots of seats in elections in 2024 and 2025. Komeito ditched its long-standing coalition last October in protest at the LDP's rightward turn under Takaichi Sanae, the new prime minister. By

joining forces, the CDP and Komeito hoped to reclaim the political centre. They reportedly tried to entice two of Ms Takaichi's predecessors from more liberal wings of the LDP to defect.

But their pitch to both potential allies and to voters fell on deaf ears. The two parties had to compromise on core principles to come together. While Ms Takaichi, the first female prime minister, projected energy, the CRA leaders, two older men, looked like dinosaurs. In the social-media era,

such party elders should have "let someone younger be at the front", laments one CDP member.

After the election, the CRA failed to clarify its message. Most voters thought the two parties should go back to operating separately. It was not surprising that the merger talks failed. No one wanted to join a sinking ship, especially not such a small one, says Nakano Koichi of Sophia University in Tokyo: "It's not even the *Titanic*—it's just small and insignificant." ■

ASHOKA *Making change*

India's payments system is ten. It must start paying for itself

IT SITS ATOP coconuts on Mumbai beach carts, alongside samosas in Delhi snack shops and among Navy Cuts at Kolkata cigarette stalls. It is displayed on rickshaw-drivers' seat backs, utility companies' bills and Amazon's checkout page. It can be scanned to buy ten rupees- (ten cents-) worth of peanuts or a 100,000-rupee iPhone. So ubiquitous has the QR code become—and so quotidian its use—that it is easy to forget just how recent an addition it is to the Indian landscape.

The QR code is the visual signature of Unified Payments Interface, or UPI, a platform that celebrated its tenth birthday on August 25th and which has revolutionised how money moves in India. In the paleolithic era—before 2016—cash was used for almost all transactions by number and two-thirds by value. Cheques accounted for the majority of non-cash dealings. And for some reason everybody pretended they had no small change, giving rise to an alt-currency of one-rupee boiled sweets.

In the first 12 months after UPI's launch, Indians used the platform to make 73m transactions worth 227bn rupees. This year, in the month of August alone, it was used 25bn times for transfers worth nearly 30trn rupees. More than 85% of non-cash transactions now go through UPI (cheques are down to just 0.2%). And there is still room for growth. The network's 550m-odd users make up just over half of India's adults.

There are many reasons for UPI's success. Chief among them is its simplicity. All a user has to do to both send and receive money is to link their bank account to a mobile app. After that, making a payment is as easy as scanning someone's QR code or entering their phone number—no need to share bank

details, fiddle with plastic cards or ever go near a point-of-sale device.

Other factors contributed. Jio, a telecom network, was launched the same year as UPI. Its aggressive pricing caused mobile-data costs to plummet, bringing millions of Indians online—and thus to UPI apps. Narendra Modi's surprise decision to invalidate 86% of cash by value in November that year—cancelling 500- and 1,000-rupee notes, ostensibly to punish undeclared cash holdings—also played a part. The policy wrecked the informal economy and slowed GDP growth, but predictably cashlessness soared. UPI transactions rose from 100,000 in October 2016 to 2m that December.

Another helpful, less damaging, policy was the government's decision to ban fees for commercial UPI transactions. A merchant accepting a credit or debit card typically pays for the privilege. That fee is split between the network provider (such as Visa or Mastercard), the card-issuing bank and others. But since 2020 a merchant has paid nothing to accept payments via UPI. That spurs adoption, too.

Shortly before UPI's tenth birthday, parliament passed legislation unbanning those fees. Though new rates have not yet been set, it is expected that they will apply only to commercial transactions and above a minimum amount that would exclude most transfers, including to the coconut vendor, the rickshaw driver or between individuals. The idea is that only big businesses will pay. Oddly for India, where big business is unpopular, the reaction has been mostly negative. Critics of the proposed fees have argued that the government's costs are offset by savings from printing less money; that UPI's benefits outweigh its costs; and that consumers will ultimately bear the burden.

That last one at least sounds as if it has merit. But UPI costs money to operate. The system is overseen by the National Payments Corporation of India, a non-profit body jointly owned by public and private financial institutions. Banks spend huge amounts to maintain their networks, guard against fraud and ensure payments go through reliably. In return, the government gives them subsidies that cover only a small fraction of their costs. Without proper funding banks have little incentive to invest in innovation. Worse, they are barely able to keep up with basic maintenance and anti-fraud measures. Consumers already pay—but indirectly through taxes and a service that is not as good as it could be.

India's government deserves praise for building UPI, for turning it into the backbone of the country's payments and for making the right decisions about fees twice over. But none of those achievements will amount to much if the system stagnates or weakens. For years UPI has been a way for others to pay. It needs to pay its own way, too.



Social-media restrictions

Anti-social

Juvenile social-media curbs are not working in Asia

IT SEEMED A parent's dream. To manage the time her 14-year-old son spent online, Harini Naidu had tried various tactics: from restricting Wi-Fi access to turning the internet off at night. So she was excited when Australia became the first country in the world to ban social-media accounts for under-16s. But the rules, imposed in December, "literally did nothing". Her son lost his YouTube account, but can still watch videos without logging in. Ms Naidu's daughter Ishana was 15, but has kept her accounts on X, Instagram, Snapchat and TikTok. Ishana says: "It's so underwhelming that people have forgotten there's a ban." They do not even have to hide behind virtual private networks.

The experiences of teens like Ishana matter to other countries, too. Since Australia brought in its curbs, dozens have done the same, or are considering it. On August 24th New Zealand announced a planned ban. Policymakers worry that social media cause various harms to the young. They also know that bans are popular with adults. Many cheered on August 26th when Meta agreed to change its products for under-18s in most American states, including a two-hours-per-day limit on their scrolling, after settling a lawsuit alleging its platforms harm youngsters.

Yet so far, Australia's policy has proved largely ineffective. At first the government was able to tout some successes. Social-media platforms had removed, restricted or deactivated almost 5m accounts in the first month. And it may be too early to write off the effectiveness of Australia's new rules. But studies have shown they have so far had minimal impact on usage. One in the *British Medical Journal* in June found that, three months after restrictions were introduced, 85% of under-16s said they still used banned platforms. Twelve- and 13-year-olds spent the same amount of time on social media as before the ban. Worries that children migrate to alternative platforms, with lower safety standards, were mostly unfounded—but largely because so many remain on existing ones.

Young Aussies are keen to stay online. Some spy a challenge, says Ishana, as under-16s "want to use social media more because it's banned". The young "know how to outsmart the system", she explains, including by creating joint accounts with friends, which she thinks confuses age-checking systems. Yet she says several ac-

counts with her real date of birth were not removed. Many under-16s have made new accounts using a fake age. Others have entered their parents' or siblings' details.

Some blame tech firms for not enforcing the rules. KJR, a software-testing company, recently opened 50 social-media accounts in Australia claiming the user to be 16. It said only one site did any verification and all 50 accounts remained active. The government is trying to beef up its rules, including by doubling fines on offending firms to A\$99m (\$71m). It also wants to give Australia's eSafety Commissioner power to make social-media firms hand over internal-usage data.

Others blame the policy's ineffectiveness so far partly on the technology meant to enforce it. Firms are using various tools, including AI, to analyse posts and scan faces. But facial-age estimation software is not very accurate in distinguishing between, say, a 15- and 16-year-old. Lucina, a 15-year-old from the state of Victoria, says her face was scanned on Snapchat and she was told she looked 18. "The policy hasn't been tested because it's been technically impossible to enforce," says Tama Leaver of Curtin University in Perth.

Mr Leaver thinks other countries planning similar laws are concluding that the "only way to do this is to require people's real IDs"—ie, an official digital or physical identity card—when they sign up to social

media. Malaysia, one of just a few other countries where Australian-style restrictions are in force, has opted for this method. L.S. Leonard, the chief legal counsel of Malaysia's Communications and Multimedia Commission, the regulator, says that its assessment indicated that this would be "much more accurate" than the age-assurance approach used in Australia.

Yet things are not going to plan in Malaysia either. Mr Leonard says social-media platforms claim to have removed lots of under-age accounts, according to their own guidelines. But nothing has changed for most users, says Tricia Yeoh of the University of Nottingham's Malaysian branch. Mr Leonard says platforms have asked for time to "make their system adaptable" for age verification; he expects everything "to be resolved" by January, after which non-compliers may be fined. Ms Yeoh, however, suspects platforms are worried about the risks of storing personal IDs on systems that could be hacked, or subject to requests from governments.

Some oppose blunt social-media bans like Australia's because they think they let platforms get away with not making their sites safe. Ways to incentivise firms to do so are being contemplated. Canada plans to ban platforms from allowing under-16s to have social-media accounts, but only until these apps meet a set of safety criteria. And there are hopes that Meta, after introducing limits for teens in most American states, will roll the same features out elsewhere, and that other social-media firms will follow suit.

Young Australians think they deserve more credit: Ms Naidu's 14-year-old son says many teenagers already "know how to be safe online". He stays off X, for example, because it is "very unfiltered". He prefers Reddit, which is "less unhinged". ■



...and pretend the grown-ups know what they're up to

China



Food-safety scandals

Formaldehyde and seek

KANGBAO

Why can't a tech-savvy China make its food safe?

THIS TIME it is the cabbages that Chinese shoppers are avoiding. On August 22nd a blogger posted videos of truckers in Kangbao, a county a few hours' drive from Beijing, dipping the vegetables in formaldehyde. The chemical keeps their pale green leaves looking fresh on their journeys through the summer heat. But formaldehyde can also cause cancer. Amid national outrage, authorities have set up checkpoints to test cabbages leaving the county. So far three people have been detained on criminal charges. Singapore and South Korea have also stepped up inspections of Chinese cabbage imports.

State-run media have blasted the truckers for "breaching the moral bottom line". Yet many Chinese are wearily unsurprised. One farm worker in Kangbao admitted he had known about the problem for some time. Reports of formaldehyde misuse go

back at least as far as 2012. And the chemical is just one of the nasty substances that still end up in the country's food. Last week a cleaning company was put under investigation for using a banned pesticide in restaurants. Bayberry-sellers were recently caught soaking their wares in another prohibited chemical to keep them fresh.

Few things anger China's public as much as food-safety scandals. Many are still haunted by a case in 2008 when tainted milk powder made some 300,000 children ill and killed six. In 2013 Xi Jinping,

China's leader, tied the legitimacy of the Communist Party to the problem. "If our party cannot even ensure food safety," he said, "then people will start to question whether we are qualified to govern." Yet the scandals continue. And as China grows more powerful and sophisticated, the problem becomes more embarrassing. People can buy cutting-edge homegrown robots, electric cars and smartphones, but they still do not trust their country's food.

Some progress has been made. China has tightened the comprehensive law on food safety it passed in 2009. Current regulations are not that much weaker than Europe's. Punishments, meanwhile, can be far more severe: two men involved in the milk-powder scandal were executed. China has also made progress on pesticides. Farmers now use less of them, thanks to training, crop testing and bans on the most toxic substances, notes Even Pay of Trivium China, a research firm. That means fewer harmful residues on someone's plate. One study of Sichuan province, in south-western China, found pesticides per acre had fallen by a third from 2010 to 2020.

Yet the scale of the challenge is still daunting. Ensuring food safety is tricky anywhere: this summer America is dealing with a nasty parasite outbreak spreading ►►

→ ALSO IN THIS SECTION

47 Dogfight diplomacy

48 Barbecue wars

49 Chaguan: After wolf warriors

via lettuce. In China the difficulty is compounded by the fragmentation of the food industry. A few big agricultural firms jostle alongside 160m independent farmers, who mostly eke out a living on small patches of land in poorer parts of the country. Then there are the hundreds of thousands of companies moving grains, fruit and vegetables from farms to cities. Most Chinese people also buy their groceries from small neighbourhood markets rather than big supermarket chains. Many of them dine out in hole-in-the-wall restaurants. That all creates plenty of room for dodgy actors, operating on margins thin enough to encourage taking short cuts.

Regulatory bodies are as fragmented as the industry they govern. Things can fall through the cracks. In 2024 it came to light that cooking oil was being transported by lorry and by ship in tanks that were also used for fuel, without cleaning in between. Stopping such dirty tricks might have been the responsibility of China's market regulator. But the obligation might instead have fallen to the transport ministry, or an office in charge of managing strategic resources like oil. In the end, all failed. It was an investigation by state-run media that discovered the problem.

China is hoping technology can help. Some fixes are simple: many Chinese restaurants now live-stream their kitchens, so customers can watch their food being made. Others are fancier: some big companies use blockchain, a kind of secure shared database, to track their products. China is also building out its "cold chain": the network of refrigerated lorries and warehouses that keep fruit and vegetables fresh on their journeys without the need for, say, formaldehyde. A recent government plan called for another 500 cold-chain logistics centres over the next five years, on top of the 1,000 already in place.

Such things all add to costs, though. Wealthier Chinese seem happy to shell out. Sam's Club, a members-only supermarket subsidiary of Walmart, an American chain, has expanded rapidly in China on a promise of supplying safe food. Hema, a homegrown alternative set up by Alibaba, a tech giant, allows consumers to scan some product barcodes to see chemical-testing certificates and transport logs. But not everyone can afford to pay much more for their groceries.

A cabbage-patchy response

To make food that is both pleasingly cheap and reliably safe, China will have to deal with deep-rooted problems. One is corporate culture. Chinese companies often pride themselves on their speed to market. But that can also entail a rushed approach to vetting suppliers and other safety precautions. Internal channels for reporting problems to management are often under-

developed. The government is encouraging employees to report to officials instead. In 2024 it announced bigger rewards for whistleblowers in the food industry, promising up to 5% of the value of fines imposed in serious cases.

But official incentives are also warped, warns one Chinese expert on food safety. To get promoted, grassroots officials have to nurture local industries and protect local jobs. Both goals could be jeopardised by an overzealous focus on policing food. "Everyone is maintaining a tacit balance between safety and economic growth," he says. Big scandals typically lead to investigations from higher levels of government, which will then unerringly find some local

scapegoats to punish. Mindful of this, local officials often prefer to deal with problems themselves or, if possible, ignore them.

In Kangbao, where GDP per person is about a third of Beijing's, farming represents a substantial share of the economy. Local officials are probably bracing for the fallout from the scandal. They are certainly keeping close tabs on the media. Shortly after this correspondent arrived in the county, four officers appeared in a police car, followed by another clutch of officials from the propaganda bureau. They were eager to talk about the fine weather and a rare species of bird that breeds nearby. They did not, however, want to answer any questions about cabbages. ■

The armed forces' foreign reach

New dogs in the fight

As America struggles with Iran, China expands military ties in the Middle East

WHEN SIX Chinese fighter jets flew over Egypt in the last week of August, the manoeuvres on display were both aerial and diplomatic. The J-16 jets, among the longest-range and most heavily armed in China's air force, have been doing joint exercises with Egypt for the first time. That is noteworthy, given Egypt's close defence ties to America and new doubts about America's reliability in the region. What is more, China's aircraft were the first to stage mock combat with French-made Rafale fighters, which are used by Egypt but also by India, whose border dispute with China flared into deadly clashes in 2020.

The fortnight-long "Eagles of Civilisation" exercises are expected to end in early September, just as Xi Jinping, China's leader, arrives in Egypt for his first visit in a decade. The drills and the visit were probably planned well before America's war with Iran started in February. The aerial drills were happening for the second year running. And the official purpose of Mr Xi's visit is to mark the 70th anniversary of diplomatic ties between China and Egypt. Nonetheless, they send a clear signal about Chinese ambitions in the region.

China has neither the capability nor, it seems, the desire to supplant America in ►►



YY don't you buy some of these planes?

► the Middle East. But it is getting steadily better at carrying out limited operations to help partners and protect its interests in a region that is vital for China's trade and energy supplies. At the same time, China is gaining experience and data that could help its pilots in future combat against Rafales and other Western equivalents. India will be especially concerned. During its conflict with Pakistan in 2025, at least one Indian Rafale appears to have been shot down by Pakistan's Chinese-made fighters. (Indian officials, while acknowledging that they lost some fighters, deny that a Rafale was among them.)

Egypt is not the only target of Chinese military diplomacy in the region. China has used arms sales and joint exercises to improve defence ties with other countries too, including Saudi Arabia and the United Arab Emirates (UAE), though both have close military links to America. China and the UAE were due to start their latest round of joint air drills in north-western China in late August. These have happened yearly since 2023. Neither side has said which aircraft will take part but in the past they have involved the UAE's French-made Mirage fighters, which Taiwan also uses.

Such drills are partly marketing exercises. In 2024 Egypt was reported to have placed its first order for Chinese fighter jets, an undisclosed number of single-engine J-10s. China denied that, but sent J-10s to the first round of joint air drills with Egypt in 2025 in an apparent bid to clinch a sale. Egypt may have been considering them as replacements for its ageing American F-16s, which it started buying in 1980. Now China appears to be promoting the heavier, twin-engined J-16 to help Egypt carry out longer-range operations over the Red Sea, the Horn of Africa and elsewhere.

The exercises also give China a chance to test its ability to quickly project air power far from its own borders. The J-16s took about nine hours to fly the 6,000km from China to Egypt. They were refuelled by a Chinese YY-20 air tanker that flew with them. The Chinese fighters and other aircraft also stopped over in the Pakistani city of Karachi. Pakistan is one of China's closest military partners, so the layover highlights its potential as a staging point for Chinese operations farther afield.

But it was the mock combat with Egypt's Rafales that grabbed most attention in China. Its state television broadcast footage from the cockpit of one of the J-16s showing a Rafale manoeuvring nearby. Such "dissimilar air combat training" offers pilots more valuable experience than drills with the same kind of fighters. It also lets each side gather data on the other's aircraft. How long it will be before China can engage in real combat so far from its borders is unclear. But as a future capability, it has clearly locked on to that target. ■

Food fights

The cookout shake-out

QIQIHAR

Rival barbecue capitals vie for recognition and tourist money

STEP ASIDE, Texas. The Chinese city of Qiqihar is laying claim to the global barbecue crown. Located in the country's far north-east, it recently concluded a barbecue festival, inviting the world to enjoy its flavour. Banners across the city of 4m assert it is the "international barbecue capital". That is a big claim for a place few outside China have heard of and equally few could pronounce (roughly, chee-chee-har).

Qiqihar's real beef is not with Texas brisket or Aussie snags but with other Chinese cities. Barbecue has become a big business in recent years. The grilling industry nationwide was worth around 270bn yuan (\$40bn) in 2025. Several cities are vying for the thickest cut of that total. Qiqiharians make a good case. Their region has some of China's largest grazing pastures. In the summer locals sit on the streets and toss tasty beef on coal-fired grills along with onions and sauerkraut. They are adamant that their meat is the best in China and that they have the figures to prove it. Between 2020 and 2025 the city's beef sales grew from around 5bn yuan to 30bn.

The biggest challenge to Qiqihar has come from Zibo, a city in eastern China specialising in meat skewers. In 2023 its barbecue stalls became a hit travel destination. Tourism income grew by 70%

compared with the year before. Local officials were quick to support the trend. Banks were encouraged to hand out "barbecue loans" to help budding entrepreneurs source mutton and set up stalls. Accommodation became so scarce the government imposed price controls.

The craze in Zibo ignited a bigger barbecue battle. Jinzhou, another north-eastern town, has claimed for years to be China's pork-skewer capital. When its officials saw Zibo's success, they sent a delegation to figure out how best to bank their own shanks. Residents in Xuzhou, another eastern city, believed their meat-grilling tradition to be much older than Zibo's and more deserving of tourist spending. Stone carvings from 2,000 years ago purportedly show people eating meat on sticks. Local netizens claimed Zibo had pilfered their heritage.

China's summer travel spots often go viral on social media but quickly fade. Zibo has struggled to maintain excitement over its delicacies. Its heavy investments in grilling have reportedly led to many failed vendors. Meanwhile Qiqihar now supplies a network of restaurants across the country, which sell the region's beef and thus support its economy. Qiqihar may not pose a threat to Texan pitmasters but it has a healthy claim on China's cookout capital.



Queuers for skewers

CHAGUAN

Move over wolf warriors

In film and in life, China pursues dragon-restaurant diplomacy



“WELCOME TO Dragon Restaurant”, a new Chinese box-office hit set in a thinly disguised Iraq, will not win any Oscars. The plot is outlandish, many characters cartoonish. Yet people outside China should still watch it. For one thing, it depicts the American invasion of 2003 from an unfamiliar vantage: not the green-tinged light show beamed into Western homes, but the shriek and crash of bombs slamming into a slumbering city, shocking and awful.

In following a Chinese chef who profits from the war until it turns on him, the film also carries political significance. It sheds light on China’s self-image and its positioning in the Middle East and beyond. If it seems absurd to read so much into a movie, remember that commentators have used another one, “Wolf Warrior”, as shorthand for China’s aggressive diplomatic stance over the past decade. Dragon-restaurant diplomacy reflects a different style—and a better approximation of Chinese foreign policy in the round. Its organising principle is to be friends to all people, motivated more by mercantilism than political ideology. The approach, both in the film and on the ground, is often superficial and contradictory. Yet it would be a mistake to ignore its appeal to countries tired of overweening Westerners.

The hero of the film (which in English is officially called “Once Upon a Time in the Middle East”) is Xu Fu. He moves to a fictionalised Baghdad in the hope of making more money from his cooking. When war starts, he discovers the lucrative “Green Zone” that houses the American forces. Western soldiers and, ahem, journalists like his food and love his booze. He rakes it in, until a suicide-bomber strikes. His former business partner is implicated, so Xu spends time in an American jail. Later, Islamic militants capture him. Chinese state media and intellectuals have heralded the film as a parable of what China offers a world wrecked by America. Yet there is more to the film, not all of it flattering to China.

A central conceit is that China wants to be liked by everyone. Xu Fu is a paragon for any good, nimble Chinese diplomat. His local partner is an official in the pre-war regime; Xu stays loyal to him even after he loses power. American soldiers also grow fond of him and, especially, his cooking. So does the terrorist master-

mind who seizes him. Through it all, Xu sees their common humanity. The film, to its credit, is not blind to the tensions. “Your partner was the perpetrator. Your friend was the victim. You really think you’ve got nothing to do with this war?” an American soldier asks him. That might prompt self-reflection in Chinese officials who protest neutrality in the Russia-Ukraine war and are peeved when Westerners point out that China’s supplies and cash keep the Russian forces going. You really think you’ve got nothing to do with this war?

Xu’s motivation also rings true. He is both candid and shameless at the outset in his desire to make a quick buck to pay off debts. As his Chinese partner reflects, profiting from war is a stroke of luck. It is a small example of the opportunistic commercialism that drives much Chinese activity overseas. It sounds grubby. But for countries on the receiving end, it is often welcome—a contrast to the perception that Western funds come with strings attached. Ren Zhengfei, founder of Huawei, a technology giant, has made it his maxim: “In business, speak only of business.” Tuning out politics is partly why China manages to straddle antagonistic divides in the Middle East and beyond. Think of Iran versus the Gulf monarchies, Algeria versus Morocco, Egypt versus Ethiopia—most countries pick a side in these squabbles. Not China. In many countries, those doing business with it happily go along with the idea, however illusory, that politics takes a back seat to business.

Another characteristic of dragon-restaurant diplomacy is its thinness. Later in the film, Xu is imbued with humanitarian aims, working to save orphans. Yet he is a reluctant saviour. At one point a friend tells him: “You should have stayed out of it. These are not your children.” In the end, he takes this counsel, returning to China and leaving it all behind. The film’s anti-war message, in Xu’s words, is to “eat well and raise your children well”. Not much to disagree with there. But it speaks to the limits of Chinese support for partners abroad. China is wary of entanglements, especially of the military variety. Iran and Venezuela learned that this year. “It is a matter of managing expectations,” says Karim Alwadi, an expert in Sino-Arab relations. “China is not interested in being a security guarantor.”

The chef’s special

For Westerners who were disturbed by China’s wolf-warrior turn, the rise of dragon-restaurant diplomacy may seem a big improvement. Sprawling across so much ground, it may appear toothless, even naive. In reality, it is a formidable challenge. For all its contradictions, it appeals more to other countries than trying to tariff or, worse, bomb them into submission. And investment dollars, when they materialise, beat morality lectures.

Yet China risks being seduced by its own cooking. One real-life inspiration for the film was Liu Lei, who quit his tech job and moved to Baghdad in 2003 to open a restaurant. In his co-authored memoir, “Making Money at Death’s Feet”, it was a young Japanese anti-war campaigner, not Mr Liu, who was the real humanitarian. She worked as a waitress in his restaurant and every afternoon collected leftovers to bring to an orphanage. That plotline would have struggled to get past a Chinese censor. In trying to be friends to all, China makes one glaring exception: Japan. Xi Jinping accuses the country of reviving its militarism. He cannot accept that Japan might want peace as much as China professes to. In dragon-restaurant diplomacy, China decides which truths to serve. ■



No two businesses are alike. Why should their AI be?

How AI changes work—and the skills people need.

Artificial intelligence is transforming how people work. It automates routine tasks, freeing humans to focus on activities that require creativity and judgment. But it also risks redefining classical roles or wiping out jobs entirely. How should organisations redesign employment and workflows to benefit from the technology?

Tech Frontiers, an initiative from Economist Enterprise, pairs original research and events, bringing leaders together to rethink work in the age of intelligent machines.

Tech Frontiers is supported by organisations including



Scan to find out more:
insights.economistenterprise.com/tech-frontiers

Economist Enterprise is the business-to-business division of The Economist Group.
It operates independently of *The Economist*.

International



Women, jobs and honour

How work makes families more equal

LUCKNOW, RIYADH AND STOCKHOLM

The love of money is the root of quite a lot of good

A DECADE AGO Saudi women were barred from all but a few jobs. Then Saudi Arabia's de facto ruler, Crown Prince Muhammad bin Salman, ended most restrictions—and even allowed Saudi women to drive. His aim was for the kingdom to rely less on oil and more on toil. Letting a previously housebound half of the population work was an obvious place to start.

This had dramatic consequences. Hamda, a young woman in Riyadh, heard the news with joy and told her husband she wanted to get a job. He forbade it. If she worked outside the home, she might talk to a man and bring shame on the family.

She argued with him for a year. Eventually, she won, for two reasons. First, extra money comes in handy. "I told him, we need to pay our bills," she recalls. Second, her husband's sisters all got jobs. Suddenly it became harder for him to claim, at the

family dinner table, that only immoral women worked. So Hamda found a job in a mall, where she sells pyjamas. Her life is much better, she says. One day, she wants to buy a car and start her own business.

In much of the world, the big battle for women is not the one for equal pay, but the one to be allowed to work outside the home at all. In swathes of the Middle East, north Africa and South Asia, "male honour depends to a large degree on female seclusion," notes Alice Evans of Stanford University. Fathers, brothers and husbands insist that for a woman to venture outside the home upends the natural order and puts her chastity at risk.

Such norms keep whole regions needlessly poor. In South Asia only a third of women are in the labour force; in the Middle East and north Africa, it is only a fifth. (In North America, by contrast, seven out of ten women work.) Removing the barriers to women working would raise per-person income by a fifth in many countries, estimates the World Bank—a bigger economic benefit than avoiding a civil war.

And there is more. As Hamda's story illustrates, when women who were previously forced to stay at home start earning, the balance of power in the household shifts. Work makes families more equal.

The Economist crunched some numbers to explore the relationship between sexist norms and female labour. We used a measure called the "patrilineal/fraternal syndrome", developed by Valerie Hudson of Texas A&M and Donna Lee Bowen and Perpetua Lynne Nielsen of Brigham Young University. It captures extreme chauvinism: things like the unequal treatment of women in family law and property rights, early marriage for girls, polygamy, son preference and tolerance of violence against women. We combined this measure with data from Demographic and Health Surveys (DHS), which poll women in low- and middle-income countries. ►►

→ ALSO IN THIS SECTION

54 The Telegram: Ukraine's long war

► We found a strong relationship (see chart). In the 21 most sexist countries, only 30% of women work, and the rate stays low regardless of how poor the household or the country is. As sexism recedes, more women work, especially in poor places, where the income is most needed. In the poorest households in poor countries with a middling score for sexism, the share rises to 55%, and to 80% in the least sexist ones.

Next, we looked at whether earning a wage affected women's status at home. We used the Survey-based Women's empowerment index (SWPER), devised by Fernanda Ewerling and Aluisio Barros of the Federal University of Pelotas in Brazil, and others. This uses DHS data to assess how much decision-making power women have. Can they decide how the family's budget is spent? Can they go out to visit friends or relatives without asking permission? In short, do their voices count?

These results were striking, too (see chart on next page). Even after controlling for how sexist a country is and how rich a household is, women with jobs consistently reported having more say at home.

There are various possible reasons for this. In societies where women are expected to be submissive, going out to work may teach them how to be more assertive—as Hamda's growing confidence illustrates. Also, when women earn a big chunk of the household income, it is easier for them to have a say in how it is spent. Finally, when women can be financially independent, they can leave an unsatisfactory relationship, or credibly threaten to do so. So husbands must treat them better or risk ending up single. "Money is power," says Sakine Madon, a Kurdish-Swedish writer. "As soon as women get more independent, they can divorce from bad marriages."

Defying convention

In some places the obstacles to women working are formal and legal. According to the World Bank's index on "Women, Business and the Law", some 540m women live in countries where legal equality remains "distant". Penny Goldberg of Yale University finds that a country's score on this index is, unsurprisingly, "highly correlated" with how well women do in the workplace.

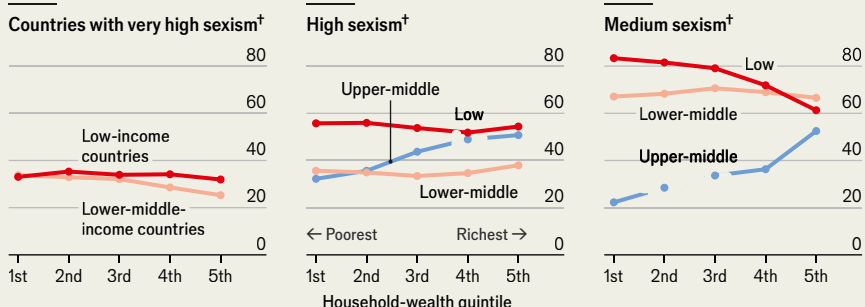
Thus, changing laws can help, as Saudi Arabia shows. But it is only a start. Social norms are often a deeper challenge, notes Kathleen Beegle of the World Bank. Things "like which household member is responsible for pounding the foo-foo in the morning and making sure that dinner is on the table at 5.30pm; it's not something that is really in the traditional policy sphere for governments."

In a conservative neighbourhood or village, the first women to reject old norms may face intense pressure to shut up and conform. Consider Sandhya, a community

She works hard for the money

Women*, % working

By country income level and household wealth, 2021 or latest available



worker in Uttar Pradesh in northern India. She grew up in a rural Hindu village where "men never go in the kitchen." She was married at 15, to a man who forbade her to go anywhere without a male relative. He beat her when she talked back.

After six years, she left him and went back to live with her parents. Wanting to support herself and her son, she started working, initially as a nurse. Poisonous gossip spread. Why was she coming home late, wearing nice clothes? Was she a prostitute? The slander did not kill her ambition. But it will make other local women think twice before seeking independence.

In rural India, as in many places, gossip helps preserve the status quo. Men routinely find higher wages by migrating to a city, but any woman who tries to do the same may be tarred as a sex worker, making it hard for her to marry. So nearly all rural-urban migrant workers in India are male. That makes the places where migrants lodge scary for women, and gives men cause to object to a daughter leaving the village—barring her way for her protection, they say. If this means she is around to cook and clean, they see that as a bonus.

In countries with deep-seated sexist norms, the technocratic toolkit for getting women into jobs is less effective. Subsidised child care may do wonders for Nordic women. But in Egypt, when an experiment offered mothers vouchers covering some or all of the cost of a creche for their children, only 11% took up the offer. Chauvinist hubbies outweigh cheap nurseries.

Yet norms change. Money, technology, social contagion and moving all can help, finds a World Bank study by Daniel Halim, Michael O'Sullivan and Abhilasha Sahay.

First, money. When a woman goes out to work, male relatives may feel that their honour has been sullied. However, even reactionary men like extra moolah. Dr Evans calls this the "honour/income trade-off".

Different societies have dealt with it differently. China has eagerly chosen in-

come. (The communist revolution set out to smash patriarchal traditions by pushing women into the workplace; then capitalist reforms raised the rewards for families whose daughters went to work in factories.) This is perhaps why, although China's working-age female population is only marginally larger than India's, its female labour force is nearly three times larger.

Cash persuades. When a woman earns a decent wage, her menfolk may have to reconsider their belief that women are not capable of such things. "My own brother didn't believe in me in the past," says Wafa al-Otiby, a beauty-salon owner in Riyadh. She asked him for a loan to start a home makeup studio. He lent her some cash, but laughed at her, telling her she did not know what she was doing and adding that in any case it was shameful. But when she paid him back within six months, he asked if he could be a partner in her thriving business. "Men's attitudes toward women have changed," says Ms Otiby. "They're surprised now at what women can do."

Wages motivate women, too, especially if they keep control of them. A study by Erica Field of Duke University and others found that Indian women on a public-works scheme worked more if their pay was deposited into accounts of their own, instead of those of their husbands', and if they were trained in how to use them.

Dough changes attitudes among the better-off, too. Parnita Agarwal, the daughter of a small-factory owner in Uttar Pradesh, recalls growing up aware of families where husbands were bullies and wives were expected to be home by 7 or 8pm. She vowed to earn her own money, so that "if I'm ever stuck in an abusive marriage, [I can] afford my own housing and not think twice before leaving."

When she won a place at Manchester University in Britain, some of her relatives told her parents not to let her go. The money would be better spent on a dowry, they said, since a girl's aim should be to get mar-

ried. Besides, studying abroad would make her impossible to control, they warned.

She went anyway. And when she came back to India, brimming with ideas about how to boost the family business and enrich her parents, her previously antagonistic relatives realised that they had been wrong. Now they are sending their daughters off to study, too, says Ms Agarwal.

Connectivity accelerates change. In a very sexist society, digital technology enables women “to envision a different life”, writes Roya Mahboob, an Afghan tech guru. Often the most persuasive examples come not from the most liberal countries, which may be far off and alien, but from slightly less conservative neighbours. Nawal al-Onazi, an HR manager in Saudi Arabia, says she was inspired by satellite television from other Arab countries when she was young. She saw interviews with women with important jobs, and Egyptian comedies that showed less rigid forms of family life. She ended up divorcing a husband who wouldn’t let her work.

Technology can sway families. A study in Uttar Pradesh by Madeline McKelway of Dartmouth College finds that showing husbands and in-laws a six-minute video of women talking about their experience on a job-training programme made it 35-57% more likely that their wives would get jobs. The video stressed that the workplace (a weaving factory) was safe and all-female and the women working there still found time for household chores.

Technology can also help women pursue specific job opportunities. When vacancies are listed online, women can browse and apply without leaving home. Some can work remotely, too. A study by Jing Lu of Zhejiang University found that by making job-searching easier and creating new female-friendly occupations such as online customer service, the spread of digital technology increased the likelihood of women in China having jobs.

Then there is contagion. People are social creatures. Rather than resolving moral questions from first principles, most take cues from their peers. A study in 2020 by Leonardo Bursztny of the University of Chicago found that most young married Saudi men thought women should be allowed to work outside the home. However, three-quarters underestimated how many other Saudi men agreed with them. When told the true number, they were more likely to help their wives find jobs.

Ms Otiby, the beauty-salon owner in Riyadh, says that even traditional Saudi men have now “started seeing women among their colleagues...and it has changed people’s thinking about marriage, too. It’s amazing! People now are getting married after meeting one another through work, instead of the traditional way.”

The kind of work that women do mat-

ters, suggests Johanna Mollerstrom of George Mason University. If most of the jobs available to married women are unsafe and unclean, a working wife is a signal to others (say, in the neighbourhood or church) that her able-bodied husband is lazy. As a country becomes richer and those jobs become nicer, the stigma fades.

Dr Evans puts it differently. The “honour/income trade-off” can change if the opportunity cost of women not working rises (because job opportunities improve) or the perceived cost (in “dishonour”) of women working falls. Saudi Arabia’s leader has been pulling both these levers, with quotas for firms hiring Saudi nationals and loud signals that “it’s respectable for women to be in the public sphere”, such as royal women doing fashion shows.

Slipping surly bonds

Perhaps the most dramatic way to escape from patriarchal norms is to move somewhere where they no longer apply. When Sara Mohammad was 17, her brother held a Kalashnikov to her head, demanding that she agree to an “exchange marriage”. He wanted her to wed a man twice her age whom she had never met, and in exchange her brother would be allowed to marry the man’s sister. Ms Mohammad, who was then living in Iraq, said no, twice. Her brother threatened that if she said “no” a third time, he would kill her, “as easily as drinking a glass of water”. So she said yes.

Then, as the wedding was being prepared, she slipped away under a borrowed burqa, took refuge with a sympathetic cousin and eventually found asylum in Sweden. Now she runs GAPF, a charity that campaigns against honour-based violence—and has a partner whose permission she does not need to ask to do things.

The process by which migrants abandon old customs is not straightforward, however. Women rarely migrate on their own. Usually they arrive with male relatives, who may be keen to isolate them

from the host society. And the arrival of people from honour cultures in liberal countries is often unpopular. Many Swedes, for example, think the surge of asylum-seekers from Muslim countries a decade ago will undermine local feminist norms. This is a potent rallying cry for the populist right in Europe and America.

Yet such fears are overblown. Natives seldom adopt the attitudes of recent arrivals, whereas immigrants tend to assimilate. In America immigrants from countries where few women work have nearly closed the employment gap with native women by the second generation. A study of immigrants to 18 European countries from 46 other places found that female second-generation migrants hold more egalitarian views than male ones, and that the more unequal their country of ancestry, the larger the relative shift among women.

Liberal cultures are attractive, especially for women. Kinem (not her real name), who moved from Turkey to Sweden as a girl, decided that she did not want the “copy and paste” lifestyle of her female cousins, who “didn’t study”, married “quite young” and “all had the same apartments with the same furniture”.

Her rebellion came in stages. Her parents were not the strictest; they let her go to university. But they wanted her to come home every weekend. She stopped visiting so often, and started going to parties, though she did not drink alcohol. With a degree in chemical engineering, she found a series of good jobs in medical technology and bought her own apartment in Stockholm. That bothered her parents, but she held firm. Finally, she married a Swede. That was too much for her parents, who cut off ties with her for five years.

Eventually they were reconciled. They now accept that she will make her own choices. Today, she says, roughly half of her female cousins have jobs. “They have realised that they can also bring in money to the family. And people like money.” ■

So you better treat her right

Women’s decision-making score*

By work status and household wealth, 2021 or latest available



*Derived from the Survey-based Women's emPowerment index (SWPER)

Sources: Demographic and Health Surveys Programme; "SWPER Global", by Ewerling et al., *Global Health*, 2020; *The Economist*

THE TELEGRAM

The Ukraine war is deadlocked

The bleak view from Sweden, a Ukrainian ally braced for 50 years of confrontation with Russia



A WEARY WORLD may not want to hear it, but the war in Ukraine is intensifying, not ending. As it deepens, the conflict is also expanding. Increasingly, serious-minded governments across northern Europe are planning to defend themselves against Russia for decades to come.

Prosperous, prudent Sweden is a case in point. It is only a couple of years since the Nordic country joined NATO, driven by Mr Putin's aggression to abandon a two-centuries-old policy of neutrality, bordering at times on wide-eyed pacifism. As Swedes head to the polls on September 13th, support for Ukraine is such a consensus that the war has barely featured in debates. All major parties, including those on the populist right and left that once flirted with sympathy for Russia, endorse financial and military help for Ukraine, deep distrust of President Vladimir Putin and the need for strong national defences.

In Stockholm it is striking how often senior figures use the word "naïve" to describe what was their country's approach to Russia as recently as the late 2000s. Bigwigs on the right and left are at pains to show how coldly realistic they now are.

Under its current, conservative coalition government, Sweden has been outspoken in calling Russia weaker than it pretends to be, accusing Mr Putin and his aides of using dodgy statistics to hide the parlous state of its finances while using repression to silence public dissent. Yet the prime minister, Ulf Kristersson, does not claim that Mr Putin's war-fever is about to break. Instead, in an interview on August 27th for "Inside Geopolitics", a video show produced by *The Economist*, Mr Kristersson says he sees "no signs at all that Russia has changed its basic logic behind this war. They want to conquer Ukraine basically, and we don't know what kind of aims or goals they have after that."

Mr Kristersson concedes that Ukraine is feeling increasing pain, too, as Russian missiles and jet-powered drones bring terror to cities left vulnerable by a growing shortage of interceptor missiles—a problem that he notes has been made worse by war in the Middle East, which has burned through stocks. But in the next breath, he warns Russia not to expect Ukrainian resistance to crack, calling the country extremely resilient.

Seen from Stockholm, the collision of two unstoppable forces—Russian neo-imperialist ambition and Ukrainian patriotism—has generated a stalemate. The costs of conflict are rising, but both sides consider defeat still more agonising. The prime minister admits that he has no idea when the war might end. "But how it ends will define the security situation in our part of the world for at least a generation to come," he says.

To prepare, his government has sought to bind Sweden to Ukraine as a long-term defence and industrial partner, donating and selling Gripen fighter-jets to Ukraine's air force. It is expanding military conscription and deepening defence and security ties with its Nordic and Baltic neighbours, as well as with Britain, France, Germany, the Netherlands and Poland.

The line on Russia is every bit as tough on the centre left, which polls suggest is likely to win this month's elections. Leading figures in the Social Democratic Party, which spent the cold war loudly opposing NATO membership, now describe a consensus across the political spectrum that Russia poses a "long-term existential threat" for the foreseeable future, requiring Sweden to make a 50-year commitment to strengthening its national defences, both military and social.

In Stockholm an end to Ukraine's war is both longed for and feared. Senior figures worry that European unity, which has hitherto held up impressively, will be challenged as countries farther away from Russia demand warmer, more normal ties with Mr Putin. The foreign-affairs spokesman for the Social Democrats and potential future foreign minister, Morgan Johansson, worries that a ceasefire will lead only to a frozen conflict in Ukraine, not a durable peace. Asked whether Sweden will ever be able to trust Russia, he imagines a far-off future in which a change of regime brings to power a Gorbachev-like reformer. Even then, says Mr Johansson, Swedes "would have to keep our guard up" and avoid mistakes made 25 years ago, when political leaders stopped fearing Russian aggression and shrank the country's defences.

Sweden is one of the most vocal advocates for Ukraine to be given a credible path to EU membership, as soon as Ukraine can show progress on corruption and governance, to anchor it to the West and shore up its democracy. Other big states, such as France, are backers of Ukraine but wary of EU enlargement. Some EU members with lots of farmers worry about competition from Ukraine's arable industry.

No optimism, no alternatives

These differences make Sweden an unusually good place to ponder the fragility of Western unity around the war, especially if Donald Trump tries to force Ukraine to settle for an unfair, insecure peace. Sweden has sought to maintain good relations with Mr Trump. Privately, officials fret about what would happen if America—bent on achieving peace at any cost—were to forbid allies from sending American-made weapons and parts to Ukraine, cut off vital battlefield intelligence or threaten to pull its troops out of the Baltics or Poland. Politicians in Stockholm express hopes that America knows it would pay too high a political price. A senior figure suggests that Mr Trump may now have lost interest in Ukraine, preferring to focus on Iran and China.

Ukraine's allies cannot easily see a path to the war ending well. They fear a bad peace, for Ukraine and for their own security. They distrust Russia absolutely, and expect to do so for years to come. A stalemate, then: a bad outcome better than all others. ■

1843



For a few days in June, Taipei, the Taiwanese capital, succumbs to a kind of fever. Hundreds of people throng outside restaurants in the sweltering heat after hearing rumours that Jensen Huang will be dining there. Every few minutes a passing black car prompts a flutter of excitement. Perhaps he is inside.

The boss of Nvidia, the world's most valuable company, comes back to his native Taiwan every summer for Computex, Asia's biggest computer-hardware conference. During his stay he will typically peel off to eat at street stalls, walk around and chat to people. One evening this year he moved amiably through the Raohe night market, sampling matcha desserts and joking with the owners of a grilled-corn stand that he'd buy dinner for everyone in the queue if they'd let him skip to the front. Crowds of Taiwanese followed in his wake, hoping for a selfie, an autograph or an exchange of banter. Later that night Huang wrote "Jensen was here" on the tiles of a restaurant toilet. Straight away a queue formed: people wanted to photograph the precious piece of Jensenalia.

On another evening Huang went to a restaurant with the bosses of some South Korean technology companies. As he stepped out of the car, a crowd surged forward, phones aloft; his security detail struggled to contain the crush. The technology executives looked bewildered, as though they had accidentally wandered into the wrong event. Huang, by contrast, seemed entirely at ease. He smiled, waved and posed

THE GENTLE CULT OF JENSEN HUANG

*When the Nvidia boss returns to his native Taiwan, things get a little weird.
Shailesh Chitnis gets a dose of Jenseanity*

Top model

Jensen Huang mobbed by adoring fans at Computex, a conference held in Taipei this June

for the cameras before disappearing inside. “His skin is so smooth,” a fan next to me sighed. Some people in the crowd had T-shirts and key rings with Huang’s face on them, which were doing a roaring trade at the convention centre.

In the AI gold rush, Huang is the man with the shovels. Nvidia, the company he co-founded, designs and sells the ultra-powerful chips which provide about two-thirds of the world’s AI computing power. Bosses of the world’s biggest technology firms and governments racing to build their own domestic AI infrastructure court him to get their hands on Nvidia’s coveted processors. The markets are in thrall to him: a passing compliment from the leather-jacketed Nvidia boss can send a company’s shares soaring.

Yet that alone does not explain the mania Huang excites in Taipei. Mark Zuckerberg and Sam Altman are powerful technology bosses, but it’s hard to imagine Americans queuing for a glimpse of either, or buying T-shirts featuring their faces (Zuckerberg once described Huang as “like Taylor Swift, but for tech”).

Jensanity, as the fervour is known in Taiwan, is partly local-hero worship. Huang, who was born on the island before emigrating to America, is Taiwan’s greatest business success story. He has also done matchless international PR for the island’s electronics industry, calling it the “epicentre” of the AI revolution. Most of the world’s advanced computer chips are made by one Taiwanese firm, the Taiwan Semiconductor Manufacturing Company (TSMC). Politicians on the island, which only a handful of governments recognise as a sovereign country, hope its critical role in the AI boom will give it a measure of soft power. This is sorely needed: increasingly assertive behaviour from China means that Taiwan’s security rests, to a large extent, on the willingness of others to defend it—especially America.

Huang hasn’t just raised Taiwan’s profile; he has also made many Taiwanese a lot richer. “Jensen has been great for my portfolio,” one young engineer waiting for a glimpse of Huang outside a restaurant told me. The TAIEX—the island’s benchmark stock index—has risen by 90% over the past year, making it the fifth-largest stock market in the world. Much of that increase reflects the extraordinary rise of TSMC, which manufactures chips for Nvidia. Since 2023 the Taiwanese firm’s market value has increased more than five-fold, to around \$2trn, and dozens of its local suppliers have prospered alongside it.

But, as I observed over three days shadowing Huang, Jensanity is also stoked by the Nvidia boss himself. Unlike other Silicon Valley heavyweights, Huang goes out of his way to court the public. One evening in Taipei, while dining in a restaurant with his parents, he emerged carrying trays of steamed buns for the journalists waiting outside.

The public persona is useful to his business. Analysts told me Huang’s rockstar status makes Taiwanese manufacturers eager to work with him, hoping his stardust will rub off on them. That gives Nvidia an advantage when AI supply chains are tight and chip companies are chasing manufacturers, rather than the other way round. After this year’s Computex Huang flew straight to Seoul, where he wooed the bosses of South Korean memory-chip companies over beer and fried chicken, and was filmed by a local TV channel dancing—a little awkwardly—to K-pop. Not for nothing have the Taiwanese given Huang the affectionate nickname, “the People’s Dad”.

“His skin is so smooth,” a fan next to me sighed





When I first attended hardware conferences like Computex nearly two decades ago, as a chip designer, they were dull affairs. Socially awkward engineers gathered to inspect server racks, debate thermal specifications and negotiate component prices. Journalists were interested in Microsoft and Google, and the Taiwanese chipmakers that powered the big tech companies' gadgets remained largely invisible outside the industry.

But training frontier AI models requires a staggering amount of computing infrastructure, and in the past few years hardware-makers have been thrust into the limelight. The buzz at Computex was palpable, not just owing to the drones flying through the conference centre. Instead of the desultory exhibition stands I remembered, there were giant, neon-lit pavilions. Humanoid robots wandered the aisles, as exhibitors handed out tote bags and bubble tea. Computex now has a headline act. The queue to get into the main conference hall for Huang's speech began hours beforehand, and stretched thousands-deep.

When he finally appeared on stage in his trademark black-leather jacket, the hall erupted. Huang began by thanking his suppliers and partners in Taiwan, and logos of the usual electronics manufacturers flashed up on the screen behind him, suggesting they were going to get a shout-out. The first "supplier" he name-checked, however, was a fruit seller at the Tonghua night market. A local dumpling shop came next, followed by a succession of other eateries. The audience lapped it up.

So far, Huang has kept the intricate supply chain humming. But other challenges are mounting

Huang's journey to the centre-stage of the global economy was an unconventional one. Born in Taiwan in 1963, he was sent to America at the age of nine together with his older brother to live with their uncle. The uncle, mistaking a reform school in Kentucky for an elite boarding school, enrolled them there by accident. Huang slept in a dormitory and was expected to clean its toilets, but was too young to go to any classes there. Instead he studied at the local school, where the other children bullied him for his accent and called him a "chink". Huang has credited those years with toughening him up.

Two years after the boys arrived in America, their parents flew out to join them and the family settled in Oregon, where Huang studied electrical engineering before heading south to Silicon Valley. He founded Nvidia in 1993 with two fellow engineers. The chips that would make Nvidia famous, graphics processing units (GPUs), were then a product used mainly for video games, and the market was crowded. Nvidia became dominant by designing better chips and, crucially, getting them to market first.

By the mid-2010s, Huang had become convinced that AI would transform computing and that GPUs, whose ability to perform many calculations simultaneously made them well suited to AI models, would become its essential building blocks. For years that was an unorthodox position to take. AI was always touted as the next big thing, but its moment never quite seemed to arrive. In November 2022, OpenAI, a modelmaker, released ChatGPT. Demand for Nvidia's chips, on which ChatGPT was trained, exploded. Nvidia's market value climbed from \$340bn to \$5trn in just three years.

The company's success rests on more than clever chip design: it's also dependent on the ability to manage relationships with supply-chain partners, and the political environment which affects them all. Heroes of software companies are often portrayed as lone geniuses, but hardware-making is an inherently collaborative project. Nvidia's latest product, Vera Rubin NVL72, is a complete AI supercomputer for training and running large AI models. It contains 1.3m components, more than 1,000 chips and the software needed to harness them. Building one requires hundreds of suppliers, manufacturers and software companies to work together.

The AI boom has led to a scramble for those components, and a big part of Huang's job is ensuring that suppliers prioritise Nvidia's orders. Money helps. Nvidia has used its enormous balance-sheet to sign multi-year deals with manufacturers. Huang also needs his suppliers to make more. Analysts believe Huang has pushed back several times against TSMC's caution about investing in new capacity.

So far, Huang has kept the intricate supply chain humming. But other challenges are mounting, not least the threat of competition from Nvidia's biggest customers. Alphabet, Amazon, Meta and Microsoft are each seeking to reduce their dependence on Nvidia by developing their own AI chips. Nvidia's stock price meanwhile has become a proxy for investor sentiment about how long the AI boom can last, and has dipped several times this year. Huang's answer is to bind Nvidia even more tightly to the future of AI. Rather than selling only chips, he also wants to provide the infrastructure, software and AI models on which the industry runs.

This strategy will require even more supply-chain diplomacy, and I wasn't surprised to see Huang schmoozing manufacturing partners in the exhibition hall during his time at the conference. His staff explained that he made a point of visiting suppliers' booths because his presence draws crowds and gives them publicity. Shouts of "Jensen! Jensen!" echoed through the hall as he made his way from stand to stand to chat to engineers and executives, high-fiving people along the way. Only late in the afternoon did he seem to tire, sitting cross-legged on the floor of a booth to share a beer with a Taiwanese executive. Hundreds of fans crowded round to capture the moment on their phones.

After his keynote speech I sat down with Huang in a private room in the conference hall. By then he had shed his leather jacket for a navy cotton one. Outside, his staff and security were bustling about, but Huang seemed calm and relaxed.

When I explained that I wanted to understand him rather than Nvidia, he looked faintly embarrassed. He was uncomfortable talking about himself, he said, and apologised in advance if he did a poor job of answering my questions. On stage he's an exuberant performer, but in private conversation he almost whispers, speaking in slow, measured sentences.

I asked how his life had changed since the launch of ChatGPT. Silicon Valley lore is full of founders who become celebrities overnight. Huang's rise has been about three decades in the making, which may have made the transition to superstardom even stranger when it finally came. Nothing, he insisted, had really changed. He dressed the same way and, as he put it, still "puts his pants on one leg at a time".

Huang hasn't just had to get used to being famous; he has also found himself at the centre of a geopolitical contest between America and China. Since October 2022 the American government has been trying to stop its adversary from obtaining advanced computer chips. Nvidia's suppliers in Taiwan, meanwhile, live under the growing threat of military action by China. Huang suddenly found he needed to build rapport with world leaders, not least Donald Trump, whom he has lobbied to relax restrictions on chip exports.

Hanging out with politicians doesn't come naturally to him, he said. He has nonetheless proved adept at translating his goals into language that appeals to them. He recasts data centres as "AI factories"—a term that appeals to Trump's enthusiasm for manufacturing. To foreign governments wary of relying on American companies, he has offered "sovereign AI"—national infrastructure built around local values, and largely powered by Nvidia.

In May he demonstrated his knack for diplomacy when he joined Trump on a trip to China for a summit with President Xi Jinping. Huang appears to have been a last-minute addition to the entourage—many were surprised when Trump announced on Truth Social that "the Great Jensen Huang" was on board *Air Force One*. In Beijing Huang met Chinese officials and accepted a seat on the advisory board of Tsinghua University, one of China's most prestigious institutions.

China hawks are suspicious. Steve Bannon, a former White House chief strategist, called Huang an "agent of influence" for the Chinese Communist Party and demanded his arrest. Elizabeth Warren, a Democratic senator from Massachusetts, has said that

**Steve Bannon
has called
Huang
an "agent of
influence"
for the Chinese
Communist
Party**

Huang's lobbying for the sale of advanced AI chips to China could "turbocharge China's military and undercut American technological leadership".

Yet, oddly, for a supposed China-appeaser, Huang has acted as a public booster for Taiwan. He says Taiwan made Nvidia possible and calls it his "business home". Nvidia is building one of its largest offices outside America in Taipei and plans to invest around \$150bn every year. The balancing act doesn't always go smoothly—in 2024 Huang angered China by describing Taiwan as "one of the most important countries in the world" (he was forced to clarify that he had been praising the island's electronics industry rather than recognising Taiwan as a state). Being an AI hardware titan in today's world, he told me wryly at Computex, is "the biggest communications job ever".

Huang doesn't rely on charm alone to get suppliers to do what he wants. According to Rick Tsai, a former boss of TSMC, who has worked with Huang for decades, he is also "hard driving" and "relentless". Tsai calls Huang's approach to the supplier relationship "rough justice": an understanding that sometimes one side is right, sometimes they are wrong, but over the long term, the wins and losses roughly balance out.

This same brand of rough justice appears to govern life inside Nvidia. Employees say Huang has little patience for excuses and is known to challenge people when something is not working. Around 60 people report directly to him, an unusually high number for a chief executive. He gives feedback immediately and publicly, reasoning that the entire room can learn from the bruising.

I occasionally saw traces of the unfiltered style. At a press conference, Huang rebuked a staffer who moved too quickly to snatch a microphone from an analyst. When a BBC reporter asked about the geopolitical risks facing Taiwan, Huang initially offered a well-rehearsed answer. When the reporter continued to press him he joked that someone should help the BBC come up with a new question. The audience laughed, but Huang's annoyance was evident.

Rev Lebareadian, an engineer who has worked at Nvidia for more than two decades and is now a vice-president there, said that Huang's executive team meetings would look "miserable" to an outsider. All the talk is about problems and things that are failing; good news is rarely discussed.

Yet according to Lebareadian, Huang has created a culture where employees know that although their mistakes will be called out, they will not be punished for making them. Nvidia's senior leadership team has remained stable over the past two decades, a rarity in the industry. They have also been well rewarded. Huang likes to boast that he has created more billionaire executives than "any CEO in the world". Rank-and-file employees have not done badly, either.

When I asked Huang what drove him, he didn't speak about colonising other planets, defeating death or remaking humanity. Elon Musk was a friend, he noted wryly, but they had different goals. His, he said, were simpler: he wanted his employees and partners to do well. "Maybe," he said with a smile, "I'm just not sufficiently ambitious." ■

Shailesh Chitnis is a global business writer at *The Economist*. Photographs by Leong Chong Lao

Business



Artificial intelligence (1)

Model customers

Coders can't get enough of AI. But what about everybody else?

HOW SOFTWARE engineers at Silicon Valley startups spend their days has changed dramatically over the past few years. The output is still the same: reams of code. But instead of sitting and typing, they whisper into microphones. Their instructions are then transcribed using artificial intelligence and fed to AI agents—bots that can interact with software and, in this case, write it.

Other white-collar workers are not yet “in this world”, admits Colin Jarvis of OpenAI, maker of ChatGPT. The future of his employer—and the AI boom at large—hinges on that changing. To justify their colossal outlays on data centres, America's cloud giants, and AI labs such as Anthropic and OpenAI, need adoption of the technology to continue spreading rapidly. A back-of-the-envelope calculation by *The Economist* finds that covering the cost of the data-centre build-out will require total annual revenue from the use of AI to reach

\$2.5trn per year by the end of the decade, up from around \$150bn now.

So far uptake has been strongest by far among software developers. Four-fifths of programmers say they use an AI coding tool, according to Stack Overflow, an on-line forum. SemiAnalysis, a research firm, reckons that for Anthropic and OpenAI coding now accounts for over half their

combined annual recurring revenue—a trendy measure of sales that extrapolates from the most recent month. In June 2025 the combined annual recurring revenue of Cognition, Cursor, Lovable and Replit, four AI coding startups, was roughly \$800m. Today it stands at \$6bn.

Coders' enthusiasm explains why AI has diffused more quickly in industries where they account for a larger share of employment (see chart on next page). Optimists may see this as evidence that the AI boom is just getting started, with spending on the technology reaching far greater heights in the years ahead as other applications mature. Yet there may also be structural reasons why coding is an outlier.

Three candidates often touted as the next runaway application for AI are lawyering, finance and customer service. Growth in all has been impressive. Harvey, Clio and Legora, three developers of AI legal tools, have roughly doubled their combined annual recurring revenue in the past year to \$1bn. Harvey says the amount of time lawyers spend on its platform is doubling each month. Bankers and other finance types are also starting to embrace the technology. Rogo, an AI startup building tools for the financial-services industry, added 100 enterprise customers in the past quarter and increased annual recurring revenue by 50%. ▶▶

→ ALSO IN THIS SECTION

60 Neoclouds' risky rise

61 Food fads

62 Huawei's new customers

62 The IRS looks abroad

63 Lessons from LIV Golf

64 Bartleby: Training videos

65 Schumpeter: The new MBA

AI is also taking off in customer service. Sierra, which builds tools for the purpose, reached an annual recurring revenue of \$200m in June, double the figure in November last year. Venture capitalists are bullish. So far this year they have poured \$3bn into AI startups in this area, more than for any other category of AI application. (Investment in AI coding startups has stalled, in part because AI labs' own coding tools have grown so quickly.)

These three applications bear some similarities to coding. They are big potential markets, and the work is often formulaic. But four factors set coding apart: the availability of training data; how easy it is to test a model's output; the low amount of human interaction involved in the work; and software engineers themselves. AI companies are trying to overcome the differences in other markets, but doing so will not be straightforward.

Part of why AI has proved so successful as a programming buddy is that a huge amount of open-source code has been published on the internet. It has thus made its way into models, accounting for almost a fifth of all training data in some cases. The same volume of publicly available content simply does not exist for customer complaints or contract negotiations.

Code generated by AI is also relatively easy to validate. Software tests are a routine part of engineering: one piece of code checks another. That increases the likelihood that any errors in AI-generated code are caught before they wreak havoc. Moreover, testing helps to improve the performance of models by alerting them when a mistake is made. Assessing whether an irate customer was appeased or a valuation model appropriately reflected the nuance in a company's accounts is trickier.

Software-writing tools have the added advantage that much of the information required to complete a task already exists in a program's code-base, or can be reached through the digital pipelines that connect software, known as application programming interfaces. In many other

contexts crucial information is not available in digital form, instead residing in the brain of a call-centre worker or the facial expression of a counterparty's lawyer.

AI companies are working on all these challenges. Winston Weinberg, the boss of Harvey, says that advances in AI mean his firm is now able to train its tools in part by relying on "synthetic" data, which are generated by AI systems. Startups such as Mercor are connecting AI companies with professionals in various fields who can transfer their expertise into models. Ping Wu, boss of Cresta, an AI customer-service startup, says that by analysing thousands of call-centre transcripts his firm can infer some of the knowledge lodged in the heads of staff, such as how refunds are handled. Legions of so-called forward-deployed engineers are now being dispatched by AI companies to their customers' offices to troubleshoot problems and improve their tools.

But the last factor behind AI's success in coding may be harder to replicate: soft-

ware engineers themselves. Being both nerdy and accustomed to change, given that programming languages are updated every few years, they are natural adopters of new technology. Much of the uptake of AI coding has thus happened in a bottom-up way, with engineers discovering and experimenting with the tools of their own accord, notes Anish Acharya of Andreessen Horowitz, a venture-capital firm.

Call-centre agents, by contrast, typically have neither the incentive nor the freedom to experiment on the job, and tend to wait for technologies to be deployed top-down. Lawyers and finance workers, for their part, must tread carefully to avoid falling foul of the many regulations that govern their occupations.

Other applications of AI will certainly continue to grow, and may well accelerate as models improve and companies become more comfortable with handing over tasks to AI agents. But it could be a while before the majority of office drones spend their days whispering into microphones. ■

Artificial intelligence (2)

Reaching for the sky

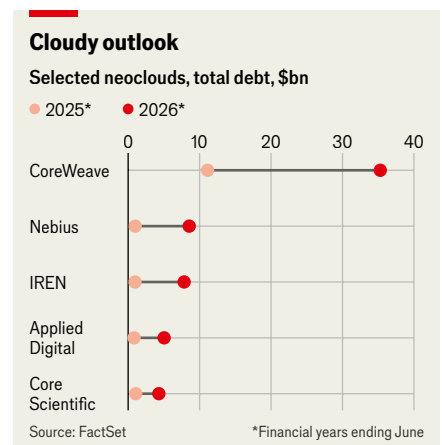
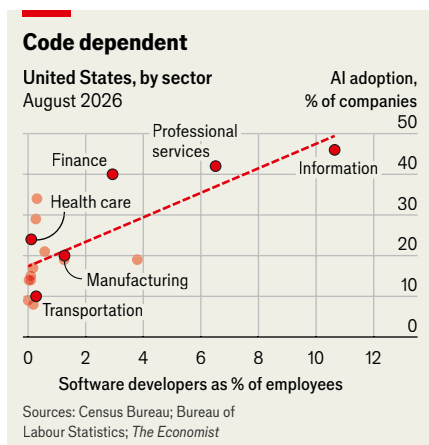
Neoclouds like CoreWeave are getting much bigger—and riskier

NEW TECHNOLOGIES often create good conditions for middlemen. In the 1960s entrepreneurs snapped up mainframes from IBM and leased them to banks and defence companies. In the dotcom era "domainers" bought website addresses and sold them at a higher price. Artificial intelligence is no different. Consider the neoclouds, such as CoreWeave, which buy specialist AI chips and rent them out. They are among the fastest-growing companies in the AI industry. But they are also some of the most vulnerable.

Neoclouds have thrived over the past few years, for two reasons. The first is that demand for AI has grown more quickly than America's "hyperscalers" have been able to expand their computing capacity. Many neoclouds started off as crypto miners, and subsequently repurposed their data centres. And because they have focused exclusively on AI, rather than a broader range of cloud services, they have been able to concentrate their investments. As a result, their biggest customers are model-makers, such as OpenAI, and the hyperscalers themselves, who often lease extra capacity from the neoclouds. The second reason for their rise is that Nvidia, the leading maker of AI chips, which is eager to reduce its reliance on the hyper-

scalers' custom, has provided various forms of financial support to help them buy more of its chips (see Briefing).

The combined annual revenue of the five largest listed neoclouds—CoreWeave, Nebius, IREN, Applied Digital and Core Scientific—has risen to \$18bn over the past 12 months, up from \$3bn in 2024. Although they are still far behind the hyperscalers, they are gaining ground. Dell Oro, a research firm, estimates that in total neoclouds have 1.5-2.5 gigawatts (GW) of data-centre capacity between them, compared



▶ with a combined 20-24GW for Alphabet, Amazon, Microsoft and Meta. But they are roughly doubling their capacity each year, which is about triple the rate that the hyperscalers are managing.

That growth, however, is being funded by mountains of debt. The five listed neoclouds now have \$61bn-worth of borrowing on their balance-sheets, quadruple the amount just 12 months ago, as well as \$18bn-worth of operating leases (see chart on previous page). None is generating an operating profit, and all are deeply in the red once interest bills are added. In the most recent quarter Nebius's interest payments amounted to a fifth of its revenue; CoreWeave's reached a quarter.

The neoclouds are betting that, if they continue their vertiginous growth, profits will eventually arrive. Perhaps. But the competition has shown no sign of easing. Besides the established cloud giants—as well as Meta, which is considering launching its own third-party service—there are now some 200 neoclouds around the world duking it out for contracts.

Add to that a growing cohort of mid-sized providers. Oracle, originally a database company, has spent a fortune trying to join the hyperscalers' club with a cloud business of its own. Its capital expenditure, much of which is financed by borrowing, is expected to hit \$77bn this year. In July SoftBank, a Japanese conglomerate up to its eyeballs in debt, unveiled a cloud business called SB Neo. The group also owns a majority stake in SB Energy, an infrastructure business that has teamed up with OpenAI to build a giant data centre in Ohio, and which filed on September 1st for an initial public offering.

Fierce rivalry compounds the two big risks facing neoclouds. The first is a credit-market shock that pushes borrowing costs higher, further squeezing margins. Investors already seem jittery: the spread in yields between neoclouds' bonds and junk bonds as a whole is widening.

A second—and even bigger—danger is that supply and demand rebalance. Right now, vast amounts of infrastructure are being built on the assumption that use of the technology will continue to soar. If the pace of adoption slows, however, model-makers and hyperscalers alike may quickly decide they no longer need the neoclouds.

Either event would be cataclysmic for the industry. Only those neoclouds that offer something more to customers than sheer capacity would avoid going bust. To that end, some are focusing on positioning themselves as reliable infrastructure providers for Western governments that have grown suspicious of America's tech giants. Others, including CoreWeave and Nebius, are trying to offer added software services to customers. To survive, the neoclouds may need to be more than middlemen. ■

Viral products

Recipe for trouble

Food fads spread faster than ever. Supply chains struggle to keep up

PIGS WERE once the biggest consumers of whey, a byproduct of cheese-making. Now farmers can scarcely afford it. Demand for whey concentrate, a common ingredient in gym shakes, has soared amid the craze for consuming more protein. Dairies have not scaled up cheese production to match. The price of whey protein thus rose fivefold in the three years to June, according to Vesper, a research firm. Cottage cheese, which TikTok influencers also recommend for bulking up, has seen a similar shortage.

Both cases illustrate a new problem for the food-and-drinks industry. Online trends can build demand for ingredients faster than ever before, but farms and factories cannot scale production at the same speed. Firms are adapting by learning to anticipate trends and ride them out before consumers move on.

Food fads are hardly new. Pineapples were so coveted in Georgian England that rental shops opened peddling display fruits. Swiss fondue, a hit with Americans in the 1960s and 70s, resulted in millions of cheese-melting pots that now languish in cupboards. Today, though, social media spreads such trends across the world in weeks. When a video of a pistachio-pastry chocolate bar made in Dubai went viral on TikTok in 2023, it was viewed more than 100m times. Months later top chocolatiers

were selling their own versions, straining global pistachio production.

Food and drinks are especially prone to going viral. Grass-green matcha or violet ube lattes make for pleasing Instagram snaps. They are also cheap enough to be accessible. Bought once, even a \$19 strawberry from Japan (another recent hit) won't break the bank. Young buyers, who spend a good deal of their lives on social media, are also more inclined towards novelty, notes Dan Frommer, author of "The New Consumer", a blog.

Explosive demand has overwhelmed supply chains. Tencha leaves, which are used to make matcha, nearly tripled in price between 2024 and 2025 amid surging interest in the drink. The bushes from which they come require years to grow. Hot markets also attract chancers. Rocky Xu, a matcha seller in Los Angeles, says that when he ran out last year, he found that the market had become crowded with middlemen. The newcomers—mainly Japanese entrepreneurs hoping to mediate between farmers and foreign buyers—pushed up prices.

Food companies are trying to cope in several ways. Anticipating trends as early as possible allows them to lock in suppliers before rivals do. Starbucks, an American coffee chain, started offering green-tea lattes in 2006, long before the matcha boom in the West. It popularised drinks with "popping pearls" in 2024, before bubble tea went mainstream.

More recently it added a protein range to its coffees, which are now as popular as flat whites in Europe. Louise Direito, an executive at the chain, says that it has switched from relying on "small focus groups" to tracking "millions of customers shaping trends in real time" on the internet. "The challenge is knowing when to join the conversation, as well as when it's too late," she adds.

Collaborations also help. As spicy foods became all the rage in 2022, fast-food chains lined up to work with Fly by Jing, a trendy maker of chilli-oil. Shake Shack, a burger chain, built a whole chicken menu around it.

But not all fads are worth embracing. Starbucks' olive-oil coffees were pulled from menus in America and Canada less than a year after their launch in 2024—amid complaints about laxative effects.



Demand whey up

Huawei

Enterprising

HAILAR

The world's biggest maker of telecoms gear is hunting for new customers

DRIVERLESS TAXIS are a common sight in Chinese cities these days. So, increasingly, are delivery drones. But to see one of the heaviest autonomous machines ever deployed, head to the grasslands in China's far north-east, to the Yimin coal mine, a giant hole in the earth spanning 42 square kilometres. Travel to the bottom and you will find around 100 lorries each capable of carrying 90 tonnes of coal—without a human in sight. Large black boxes filled with batteries sit where the driver's cabins should be.

Zhao Yaozhong, a manager at Huaneng, the state-owned power utility that operates Yimin, says the deployment of driverless lorries has led to 120 workers being reassigned to posts outside the pit—thus removing them from the dust and danger of the mine. The vehicles also do far more work without a human driver. They run through the night and in poor weather conditions, and even change their own batteries. If all goes to plan, most humans will disappear from the pit over the next three years as another 300 autonomous lorries are added.

The operation at Yimin offers a glimpse into the expanding “enterprise” division of Huawei, a Chinese technology giant better known for its telecoms equipment and consumer electronics. In 2021 Huawei, whose core business had been hit hard by American sanctions, announced that this

division would create a collection of new teams—referred to as *juntuan* (Chinese for army corps)—that would focus on applying expertise and technology from across the business to specific groups of enterprise customers, from airport operators to oil-and-gas companies.

The mining corps shows this integrated approach in action. Huawei's telecoms base stations, which are visible throughout Yimin, cover the area with 5G, allowing the lorries' autonomous-driving system to function. That system was based on one developed by Huawei's automotive division, but was tailored to suit the size and weight of the lorries and the conditions within a mine. The interface used to control the mine's operations runs on an operating system called MineHarmonyOS, which was developed by the same division that makes Huawei's smartphones and other consumer gadgets. In a number of underground mines, an artificial-intelligence model created by Huawei's cloud division is used for interpreting geological data and remotely monitoring equipment.

Huawei, which is privately held, has not made it easy to understand how its enterprise division has fared. Revenue was last broken out in 2022, at which point it accounted for a fifth of total sales and was the fastest-growing part of the group. Andy Wu, who runs the mining unit, says his business is profitable, but that margins are extremely thin.

Nevertheless, the enterprise division is set to play an increasingly vital role for the company. On August 31st Huawei said that its net profits fell by 37% year on year in the first half of 2026, even as revenue grew by 10%. Margins in its consumer division have been squeezed by the surge in memory-chip prices resulting from the data-centre boom. Huawei has also been investing

heavily in research and development—which gobbled up a quarter of revenue in the first six months of the year—as it looks to replace American technology it has lost access to, including the most advanced semiconductors.

Concern that Huawei's products could be used by China for snooping has led many Western governments to impose restrictions, causing the company's foreign sales to shrink over the past decade. That has made it all the more important to find new avenues for growth at home, particularly now that the build-out of the country's 5G network has largely concluded. Fortunately for Huawei, China's government is enthusiastically championing real-world applications of AI in domains from manufacturing and transport to the operation of electricity grids. Huawei's enterprise corps stand ready. ■

Transfer pricing

The long arm of the taxman

NEW YORK

The IRS is going after America Inc's overseas profits

FOR DECADES American businesses have fattened their bottom lines by shifting profits to low-tax jurisdictions abroad. In 2025 alone they saved at least \$11bn using these manoeuvres, reckons the FACT Coalition, an advocacy group. Now the government wants some of that back.

Many American bosses breathed a sigh of relief when, on his first day back in the Oval Office last year, Donald Trump announced that the country was abandoning a global agreement orchestrated by his predecessor that would have subjected tax-shy multinationals to top-up duties. But those who hoped this would mark the end of government efforts to reclaim a greater share of their profits booked abroad were mistaken. In May this year UnitedHealth, an American insurance giant, disclosed that the Internal Revenue Service (IRS) was pursuing it over profits it had attributed to a foreign subsidiary, with the agency insisting it had underpaid its taxes back home. The case is part of an effort by the IRS that began during the Obama administration to crack down on so-called transfer pricing—an initiative the Trump administration has shown no sign of resiling from. Many billions of dollars are at stake.

Among the companies the IRS is tussling with over transfer pricing are Amgen, a biotech firm, and Meta, owner of Facebook and Instagram. But it is the case against Coca-Cola, the world's most valuable drinks company, that has been called ►►



Friends of mine

► the “Super Bowl of transfer-pricing controversy”. (Tax lawyers are easily entertained.)

That case, which has been in train for over a decade, may at last reach a conclusion in the coming months. Back in 2015 the IRS told Coca-Cola it owed an additional \$3.3bn in tax for the period from 2007 to 2009, arguing that the company had improperly parked profits arising from intellectual property—including its famous logo—overseas. The battle has taken years to wind its way through the courts, during which time Coca-Cola has continued to follow the same tax practices. As a result, the money at stake has ballooned to as much as \$20bn. Coca-Cola argues that its foreign subsidiaries have made valuable marketing investments worthy of the astronomical returns on capital it has attributed to them. It also contends that it is merely sticking with an agreement the company reached with the IRS back in 1996 on how the company could split its profits (though that deal related to past earnings).

Coca-Cola and others pursued by the IRS over transfer pricing have been remarkably relaxed about the situation, at least publicly. As of July the drinks giant had squirrelled away just \$530m to pay a tax bill that could amount to as much as \$14bn in the event of a loss (the company has already shelled out \$6bn, which it would be refunded if it wins). In July Amgen settled an investor lawsuit that accused it of underselling the risks of its fight with the IRS. Its disclosures were like “a child telling his parents that he had ‘dessert’ when in fact he had eaten the ‘whole cake’”, noted a federal judge during the case.

Winning its largest transfer-pricing cases would allow the IRS to claw back roughly \$100bn in additional taxes from a small group of firms, including penalties and interest, notes Steven Wrappe of Grant Thornton, an accountancy. That amounts to about a fifth of the total corporate-income tax that the American government collected in 2025.

In the short term, expanding the crusade would be difficult; the IRS’s budget has been slashed under Mr Trump, meaning its staff are already stretched. In the long term, however, transfer-pricing disputes will probably increase. One reason is the growing share of firms’ value that comes from the kind of intangible assets that facilitate cross-border tax dodges, because they do not need to be physically moved. From 1975 to 2025 the share of the total value of firms in America’s S&P 500 index that can be attributed to intangible assets rose from 17% to 92%, according to Ocean Tomo, an advisory firm. Another reason to expect more of these cases is that—as bond-market investors know too well—America’s government debt continues to soar. Its multinationals may soon have to foot a bigger share of the bill. ■



The business of sport

More dead than LIV

LOS ANGELES

It takes more than huge amounts of money to disrupt a game

PUTTING ASIDE the exorbitant salaries, the silliness of the “Golf but louder” slogan and the din of pop music on the fairway, there was always something a bit plucky about LIV Golf. Saudi Arabia, a country that looks like a bunker but has no golfing tradition, was attempting to disrupt one of the world’s most snooty sports. Predictably, its attempt ended in failure. Last month the Public Investment Fund (PIF), Saudi Arabia’s \$900bn sovereign-wealth fund, pulled the financial plug. In the coming days LIV Golf is expected to file for bankruptcy.

It is not just golf, though. The PIF has led a wave of investment by the kingdom over the past five years in football, tennis, boxing, martial arts and motor racing, plus e-sports (as video-game tournaments are known). Its ambition was impressive. Many accused Muhammad bin Salman, the Saudi crown prince, of “sportswashing” his country’s thuggish reputation by pouring petrodollars into athletes’ pockets. They missed the point, at least partly. The PIF hoped to use the thrill of sport to make young Saudis more active, as well as hosting marquee events to attract tourists and diversify its oil-soaked economy.

Now, however, physical sports are in the relegation zone. The PIF’s recently published strategy for 2026-30 mentions the word “sports” only seven times in 50-odd pages—on six occasions prefixed by “e-”. At a time when private-equity firms

and other investors are pouring so much money into sporting franchises that some perceive a bubble, what can be learned from the Saudis’ retreat?

The first lesson is the importance of fans. It is one thing to have a near-bottomless bank account. It is another to buy your way into supporters’ hearts. The PIF blew \$5bn on LIV Golf hoping to create a rival to America’s PGA Tour, using lavish prize money, faster games and more razzmatazz to attract younger fans. But though it signed some star players, LIV turned off golf’s well-heeled supporters, who like the PGA’s genteel traditions and prestige. With too few fans, it could not generate the broadcast income to be sustainable.

Fans can also be powerful foes. FIFA, football’s global governing body, recently scrapped an attempt to raise \$4.2bn by selling off chunks of the beautiful game, including the World Cup. That prompted a backlash among national federations, which feared, among other things, football supporters’ wrath.

Therein lies the second lesson. In sport, creative destruction is hard. As with many enterprises that have been around for generations, it is tempting to think that sports are ripe for disruption. Besides the PIF, others have sought to shake up established leagues by launching snazzy alternatives, only to fail. Grand Slam Track, an alternative to the Diamond League in athletics, was started by Michael Johnson, an Amer- ►

▶ ican sprinter. It filed for bankruptcy in December less than a year after its first fixture. Only a few upstarts prosper, such as Ultimate Fighting Championship, an American mixed-martial-arts organisation that has taken cage fighting to a new level. It created a new market rather than trying to muscle into already popular terrain.

The third lesson is time—or timing. Building a winning sports franchise can take generations. More than 50 years have passed since Pelé, a great Brazilian foot-

baller, first played for the New York Cosmos. Only now is American soccer coming into its own (and Pelé's Cosmos have long been defunct). The quickest way to make a buck today may be to buy a well-known franchise and sell it shortly afterwards. That is what Mark Walter, a financier, did with the Los Angeles Lakers, selling the basketball team last month to two fellow billionaires for \$12.5bn, \$2.5bn more than he had paid for it a year earlier. But in a frothy market, flipping is a risky strategy.

If all else fails, think ahead. Saudi Arabia has a mixed record investing in sports that have been around for centuries. But in the past five years it has taken a more methodical approach to the emerging field of e-sports, including leading a \$55bn buy-out of Electronic Arts, a gaming powerhouse, which was completed last month. Watching gaming tournaments may not get young Saudis off the couch—but they love it. As an investment, it is less quixotic than LIV Golf. ■

BARTLEBY *Back to school*

The glory of the corporate training video

WORKPLACE TRAINING can confer useful skills. It can also prevent legal trouble and fulfil compliance obligations. And it can be a very easy way to try out time travel. You only have to watch a typical corporate training video to feel the clock rewinding.

First, and most obviously, some of these videos were filmed before you were born, on a subject that is so ever-green it has never needed an update. The footage is grainy. Men wear ties and women wear pleated skirts. They have names like Rodney and Carol. No one has a tattoo or brings their whole self to work. If they had an illness, it wouldn't be a mental-health issue but something from the distant past, like consumption or scrofula.

Some training videos may have been made recently but still look incredibly dated. That's because they are produced on the cheap, feature terrible actors who cannot find other work and have been given the remit of achieving the longest possible shelf-life by not showing anything too contemporary.

Watch a video on harassment at work, for example, and you are likely to see men in high-viz jackets pretending to shout at each other while a narrator warns that "horseplay" can get out of hand. Horseplay? Harassment can leave people feeling isolated, you are told, as someone sits in a digger and looks isolated. You haven't seen performances this bad since a nativity play.

Second, plenty of training materials are on subjects that require no training. To watch some corporate videos is to be treated like a particularly dim child—or, more accurately, like someone a particularly dim child would consider to be a moron. Your columnist recently completed an online video course on workplace

slips, trips and falls, and was left wondering how the species has managed to survive so long.

There were warnings about wet leaves and the dangers of transitioning from outdoors to indoors. There were moments set aside for deep reflection on questions such as: "What are the most common things that you slip or trip on in your typical day-to-day [sic]?" And there were remarkable new insights. It turns out that slips can be avoided by ensuring you wipe the soles of your shoes on a mat when entering the premises of a building. Note that word "soles". You can spot an untrained worker a mile off by the way they lie down and flap around like an elephant seal on heat as they try to dry the tops of their shoes.

Third, lots of training videos lean very heavily on the techniques of primary schools. When you're not watching wooden actors, you're being fed cartoons. Every so often, multiple-choice questions test your level of understanding. The slips, trips and falls course features a waiter who had not noticed that "the decorative rug at

the entrance to the dining area had lost its grip." He had caught his foot on the edge of the rug, stumbled and regained his balance. What type of incident had he experienced: a slip, trip or fall?

It's hard to conceive of a lower-stakes scenario than a waiter not falling over, but your inner toddler is given an incentive to care. If you get a multiple-choice question right on a training video, you will probably win a badge or a gold star. Ace the entire test, and confetti will fill the screen and you will get a downloadable certificate of achievement. Fail to finish the course, and you will be reported to the teachers.

Treat an audience as if they are children and their behaviour will revert to childish norms. You might be approaching retirement but you still get a tiny thrill from getting a gold star. You become insanely proud of your slips, trips and falls certificate, and pin it to your cubicle wall. You wonder to yourself whether you could take the course on how to use stepladders, and shake your head at your own wild ambition.

You also succumb to the urge to cheat. You start playing a cyber-security training video on avoiding phishing, smishing and quishing, and pay it attention only when it requires you to press the "next" button. If there are no penalties for failing the multiple-choice quiz, you just skip the training and go straight to the test. You click things randomly until you pass with distinction, and are awarded a phishing, smishing and quishing certificate.

It's just like school: you have a credential but have absorbed almost nothing. Which is why, when you leave the office that evening, you fail to notice that a colleague has blanketed the foyer with wet leaves as a bit of horseplay.



SCHUMPETER

Match fit

Why get an MBA when you can watch a sports documentary?



THE WORLD'S top business schools have long debased themselves by selling certificates to anyone with a computer and some spare cash. Punters can even pay \$699 to be coached by AI-generated professors at Harvard Business School. Yet an even cheaper (and similarly prestigious) crash-course on business is available at the sports faculties of Amazon College and the University of Netflix.

Sports documentaries are not generally considered part of the management canon. While Clayton Christensen, a famous business thinker, was writing about "disruptive innovation" in the mid-1990s, British television produced "Graham Taylor: An Impossible Job", a bleak portrait of England's national football manager. In 2005 a pair of INSEAD professors told bosses to go after "blue ocean" markets in a bestselling book. Neil Warnock, another English football manager and the ascetic hero of the documentary "Warnock", told his players before a match: "By all means enjoy it, but enjoy it by being fucking disciplined."

Nowadays it is business schools that have run out of big ideas and dressing rooms that seem to be full of them. After the pandemic-era success of "Drive to Survive", a Netflix show following Formula 1 racing teams that is now up to its ninth season, and "The Last Dance", a ten-parter about the Chicago Bulls' 1997-98 basketball season, streaming platforms decided that viewers' appetite for touchline philosophy was unlimited.

So great is the glut of sports documentaries that an entire MBA course might be constructed from titles released this year, only on Netflix and just about men's football. A boss seeking instruction on corporate turnarounds can start with one about Liverpool's comeback in the 2005 Champions League final, which with a running time of 78 minutes is far longer than the comeback itself, which took about six minutes. An executive mulling expansion into new markets could consult "Norway: The Dark Horse", which follows the country's national side, for a quick primer on Scandinavian management. "The Bus: A French Football Mutiny" is a textbook tale of a toxic workplace.

Many such pictures are heavy on puffery and light on practical instruction. Amazon's recent "A Beautiful Obsession", which

follows Josep "Pep" Guardiola during his final season in charge of Manchester City, a top English football team, is a rare management gem. He is responsible for a big operation (the club has annual revenues of about \$1bn). His performance is scored every week. And as the custodian of a brand with both a local and a global identity, Mr Guardiola answers to Noel Gallagher, of the band Oasis, and Khaldoon al Mubarak, of Abu Dhabi's sovereign-wealth fund, whose chairman owns the club.

Whereas most management trends rest on a single piercing idea, Mr Guardiola is a wildly successful boss in the schizophrenic style. Before one fixture he insisted on dressing-room hugs. After losing the match, not so much: "When I see your fucking face complaining about something, my decisions, I fucking kill you," he growled. A rare fountain of ordinary management-speak is the team's captain, Kyle Walker, who offers such pearls as: "Make sure we stick together out there." But he is shown the door at the end of the first episode.

Ideas that seem novel in business schools are common sense on the touchline. In a paper published last year researchers use "neural network-based machine-learning" to show that bosses are aged by the stress of managing firms during difficult periods. Mr Guardiola uses his fingernails to scratch his head when he is under intense pressure, leaving red marks that demonstrate the same point. His methodology even bears a number of marks of "digital transformation"—a model considering 43 different measures rates players and informs personnel decisions—though professional sports remain the last bastion of the whiteboard.

Mr Guardiola's dressing room will strike most bosses as an inhospitable and unfamiliar place. They should ask themselves why. One reason is that it contains no women. But it is mostly because people care less about winning than Mr Guardiola. That is quite all right: a firm where middle management adopted his style in the pursuit of, say, selling car parts, would be a dreadful place to work. Still, much of the economy is driven by organisations, such as AI labs and hedge funds, which rely on the maximal use of the rare talents of a very small number of prima donnas. Views into the workings of such firms are extraordinarily rare, which is what makes Mr Guardiola worth watching.

Investors paying vast sums to buy sports franchises at a record pace have a more practical reason to binge sports documentaries. While Saudi Arabia licks its wounds over the failure of LIV (see previous story), it might do some post-match analysis by watching the series about the golf league which aired on Fox Sports last year. Joshua Kushner might not have attempted his abortive privatisation of world football had he watched one of the many documentaries that illustrate how much fans care about it.

Master of Ball Administration

Sports teams are special institutions. They are, of course, the ultimate trophy asset for those with billions in the bank. But they are also a vehicle for commerce, and one which many believe is mostly immune from the disruptive potential of AI. The narrow version of this argument is that, unlike movies or television shows, live sports cannot be created by AI models. The expansive version is that we are approaching a world where the jobless need something to fill their time, and that most of their attention (and perhaps their identity) will revolve around sports teams. In such a world the team manager becomes society's foremost philosopher, and the fly-on-the-wall Netflix series his magnum opus. ■

Finance & economics



Urban economics

Miami heat

MIAMI

Thanks to a combination of capital and politics, the city is booming. Can its success be sustained?

ON A FRIDAY night in Miami, a luxury-property agent emerges from a swanky lounge and stands outside a skyscraper. He is celebrating the sale of a house—for \$50m. He will not name his buyer but says he mostly sells to tech and finance moguls. As for the skyscraper, 830 Brickell, its bottom few feet are a little shabby, yet it contains some of America's priciest square metres of office space. It is home to Citadel, a big hedge fund; an investment firm owned by the family office of Peter Thiel, a tech billionaire; and two top law firms.

The estate agent and 830 Brickell are reflections of Miami's rise. Between 2020 and 2024 (the latest available year) the metro area's GDP grew by 23%, against 13% in America overall (see chart 1 on next page). The rich are moving in. New residents include Ken Griffin, Citadel's chief, Jeff Bezos, the founder of Amazon and Blue Origin, a space firm that makes and launches its rockets in Florida, and Mark

Zuckerberg, head of Meta. The fuel is political as well as financial: Donald Trump spends more time nearby than anywhere but Washington, DC, mostly at his Mar-a-Lago estate. Palm Beach is a hub for policymakers and diplomats.

"Fifteen years ago," the estate agent says, "the only people who thought it was smart to be rich here were Cubans, DJs and golfers." He exaggerates: Miami has long been a regional hub. But its economy did

rely on its proximity to Latin America, and a sometimes lurid entertainment industry. Central Miami's economy was roughly a quarter of the size of Manhattan's.

The ratio is now a half, and rising. In 2020 no house in Miami fetched \$50m. In 2025, 17 did, almost half the national total. Many of the billionaires and firms making the move insist they did so because they believe the city's economy will soon be among America's biggest, rivalling New York, Chicago and San Francisco. Whether Miami's boom can be sustained is debatable. But for now it is thriving on a heady mix of financial and political power.

Over the past five years three waves of activity have broken on the south Florida shore. One brought foreign money. Francis Suarez, Miami's Republican mayor until 2025, travelled the world courting investors, with notable success in the Persian Gulf. Hotels are crammed with the region's hedge-fund managers, traders and consultants. Some have moved for good since the start of Mr Trump's war on Iran. Saudi Arabia has opened an office; Gulf governments have invested in businesses from hotels to crypto exchanges. In addition, yet more Latin American investors have arrived since a few right-wing governments in that region loosened capital controls.

A bigger wave has come from within America: people and businesses fed up ►►

→ ALSO IN THIS SECTION

68 Bond yields in Europe...

68 ...and in Mexico

69 India's options trouble

69 Fixing up Chinese property

70 Buttonwood: IPOs v stock markets

71 Free Exchange: The Fed in a Hole

with high taxes and left-wing policies in other cities. Florida's state income tax is zero; New York City's richest pay 14.8%. Property levies on the priciest homes are under 1%. Wealthy Americans have long visited Florida for recreation, be it 24-hour nightclubs or plush retirement homes. But lately many have settled. People with combined annual earnings of around \$40bn moved there in 2025, according to data from the Internal Revenue Service.

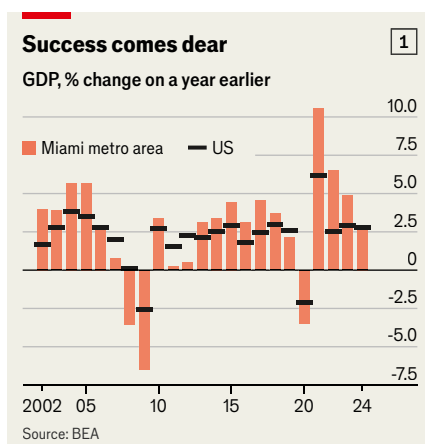
For companies, various levels of government in Florida offer tax breaks and incentives, such as relief to firms paying employees above the state's average wage. Miami's officials are determinedly business-friendly. When Mr Griffin began to complain about crime and taxes in Chicago, where Citadel was previously based, Mr Suarez rang to suggest a move south. At least 150 financial firms have migrated, including the private-wealth business of Wells Fargo, a giant bank, and Citadel's fellow investment firms, such as Elliott Management. Tech is also well represented. Palantir, a controversial AI-analytics firm with lots of government contracts, moved from left-leaning Denver in 2026. Arrivals from San Francisco include three firms belonging to Mr Thiel.

The third wave has been led by south Florida's most famous rich immigrant. Mr Trump has turned the area into a political nerve centre. Between October and March he spent a quarter of his time there. Several Floridians are members of his inner circle, including Susie Wiles, his chief of staff; Todd Blanche, the attorney-general; and Marco Rubio, the secretary of state. An employee of Ms Wiles says he spent lots of time at Mar-a-Lago in his first term, "but we're making a lot more of the real decisions from Florida this time around."

At Mar-a-Lago Mr Trump has hosted foreign leaders, and decided to blockade Cuba's oil supplies and to capture Nicolás Maduro, Venezuela's dictator. His staff met CEOs there before the federal budget in the spring and health-care providers before the president amended Medicare (a scheme for the elderly) in July. "Look," says one official, "in the president's view, a lot of the smartest people in the country are already members at Mar-a-Lago."

As political activity has headed south, money has followed. Ballard Partners, America's biggest lobbying firm (founded in Florida), now has its largest office in Palm Beach. Many foreign governments have sent in extra civil servants. "Our border guard and defence ministry," says one consul-general, "need to be able to reach Palm Beach." Officials from three European countries say their consulates have more staff in Miami than in New York.

No surprise, then, that the property business is booming. In 2025 it accounted for 18% of Miami's economy, up from 14%



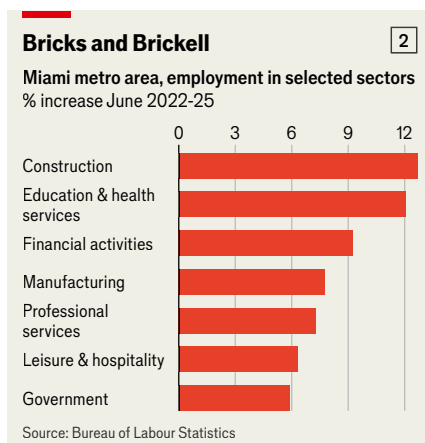
in 2014. The number of construction jobs has risen by 12% since the pandemic (see chart 2). Mr Griffin is spending roughly \$2bn on a new 54-storey skyscraper.

Finance is doing well, too: survey data indicate that, thanks to all the Wall Street migrants, back-office jobs have grown by 20% since 2019. The share of corporate services, such as law and consulting, in local GDP has risen by two percentage points.

Hospitality, the old mainstay, is also thriving. It employs a tenth of metropolitan Miami's workforce, one of the highest shares in the country. Miami is the only city with a team in all four of America's big sports, a top-class motor race and a leading tennis tournament, the Miami Open. Of Mr Trump's four speeches at business conferences in 2025, he gave two in Miami. "We've always been spectacular," says an entertainment agent at Faena, a luxury hotel, "but the new guys give us exclusivity."

Will Miami's boom give way to a steady, sustainable expansion, or just give way? Successful cities thrive on network effects: whether in finance, tech or lobbying, firms are drawn to places where they are confident of finding customers and skilled workers; people head to where they can find the jobs they want. To make the leap Miami must overcome three obstacles.

One is a potential lack of people who



are not especially rich. The influx of wealth has pushed the local cost of living to dizzying heights. According to the Bureau of Economic Analysis, a government agency, residential rents are above the national average and higher even than in New York. Consumer prices have risen by nearly 40% since early 2020, against 28% in America as a whole. As luxury food outlets have multiplied, cheaper shops have been pushed out. High costs are driving the poorest away. Since 2014 the number of millionaires has nearly doubled; but between July 2024 and July 2025 Miami's population has shrunk by 10,000. Poor neighbourhoods, whose residents staff the hospitality industry, are emptying fastest.

Another hurdle is a lack of brainpower. New York, Seattle and San Francisco are knowledge economies, attracting hordes of skilled people and the capital to harness them. Yet despite the recent influx of smarts and money, Miami is far from matching its rivals. Firms and universities in Florida, which has the fourth-biggest economy among America's states, spent just \$13bn on research in 2023, less than any other in the top ten. Florida has fewer graduates, relative to population, than the national average. Most capital deployed by Miami's newly flush venture capitalists still goes to startups in San Francisco.

Mr Griffin promises that, by 2031, many more of his employees will be working from Miami. So far 400 of them do, though most are not advising on investments. If back-office roles are stripped out, finance makes up no more of Miami's economy than it did a decade ago. The city's financial sector, the biggest of its white-collar industries, is a mere one-eighth of the size of New York's.

A third problem is the climate. South Florida, on a peninsula near sea level, is prone to extreme weather. A meteorologist at AccuWeather, a forecasting company, has said that no American city is more likely to be damaged by hurricanes. In August yet another academic paper, in *Scientific Reports*, predicted that if global temperatures exceed 1.5°C above pre-industrial levels, storms will flood Miami regularly. Florida is already the costliest state in which to buy insurance for mortgaged homes.

Yet there is no doubting Miami's momentum. A bullish local politician believes that, like the Gulf before the Iran war, it can be where the rest of the world comes to pursue business and store wealth. A year ago Mr Trump hosted a dinner for 33 of America's leading business figures at Mar-a-Lago. At least half of those attending (including Mr Trump and Ms Wiles, and their spouses) had property in Florida. In 2029 Mr Trump's term will be up and Florida's political pull may start to fade. Maybe the city can thrive by continuing to attract the rich. But maybe it needs more. ■

Bond yields (1)

Debt collective

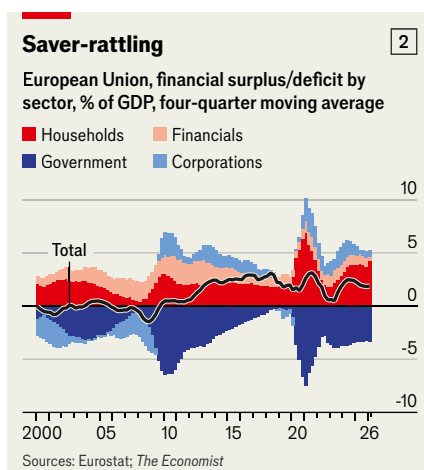
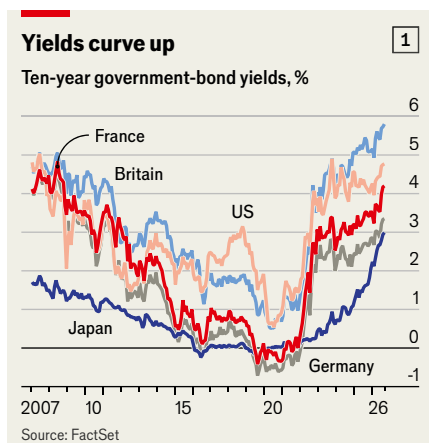
The European market returns to a post-holiday shock

INVESTORS INTERESTED in euro-zone government bonds face peculiar challenges. They have 21 countries to choose from, in addition to the EU's own debt. Long holidays, including from trading desks, typically mean choppy markets during the summer. And for mysterious reasons, yields on ten-year German bunds, the bloc's benchmark, tend to rise by 0.15 percentage points after August.

This year they started early, and not just in Germany. In recent weeks global bond markets have been febrile (see chart 1). Yields have jumped just about everywhere as investors have sold off government debt (whose price falls as yields rise), spooked by rising inflation risk, uncertainty about economic growth and zero appetite for belt-tightening. On September 1st yields on Japan's ten-year bonds hit 3% for the first time in 30 years. American 30-year Treasuries are not far off their 19-year high of 5.31% reached in mid-August. Equivalent British gilts, which now offer a 5.9% return, have not been this cheap since 1998.

Europe is not quite there yet. Ten- and 30-year bunds continue to yield considerably less than at the last peak in 2008. Similar French bonds are no higher than back then. Still, European government issuers face peculiar challenges of their own.

Inflation is problem one. In contrast to America, where rising prices chiefly reflect strong domestic demand, the culprit in Europe is on the supply side, and out of policymakers' control: the energy shock from the Iran war. Markets expect the European Central Bank (ECB) to raise its benchmark interest rate to 2.9% by mid-2027, up from 2% before America and



Israel attacked Iran in late February.

Moreover, when inflation risk is high and stems from a supply shock, investors demand extra compensation for holding longer-term securities. In part, that is because they expect a premium for taking on inflationary uncertainty. It is also because in a supply shock, bonds and stocks tend to sell off together rather than move in opposite directions. This makes debt a less attractive way to diversify a portfolio, so yields must rise to draw buyers.

Europe's second challenge is fiscal. Germany's newfound love of debt-funded investment and persistent French profligacy have pushed interest rates up since 2025. This in turn has raised debt-servicing costs. In 2028 France will spend 6% of government revenue to redeem coupons, compared with 3% in 2019, estimates Fitch, a credit-rating agency. For Italy this will climb from 7% to 8.8% in the same period.

Because European taxes are much higher than in America as a share of GDP, raising them further to fill the fiscal gap is hard. Cutting spending is politically unpalatable, especially with populist insurgents on the rise across the continent.

The third problem is that aside from inflation, the rise in yields is driven by growth and investment outside Europe, which is sucking up capital. America's economy is motoring along, helped by the building of artificial-intelligence infrastructure. The technology giants leading the charge are projected to spend over \$5trn on AI data centres between 2025 and 2030. Such spending in Europe is tiny. Despite declining profits stemming partly from underinvestment, European businesses are net savers (see chart 2).

Yet even though European firms are on the sidelines of the AI race, European bond-issuers are caught up in it. The American tech titans are selling their own long-dated bonds to fund the splurge—to the tune of \$250bn this year and \$400bn in 2027, reckons Goldman Sachs, a bank. These rich corporate issuers are as credit-

worthy as governments, and so compete with them for investors' money. They are responsible for almost a tenth of euro-denominated corporate-bond issuance this year, according to the ECB.

More debt globally means lots of long-term bonds. This leaves investors to absorb more "duration risk" (a change in a bond's price in response to a change in interest rates). In Europe supply is even higher because the ECB is running down its holdings, by €1.2trn since 2022 and counting. At the same time, demand from big buyers is softening. Pension funds which bought long-dated debt to fund defined-benefit retirement schemes are switching to defined-contribution plans that try to boost returns with riskier assets like stocks. Investors stepping into their place, like hedge funds, drive a harder bargain.

"We are in a new global macro regime," sums up Freya Beamish of TS Lombard, a research firm. In other words, don't expect yields to come down soon. Borrowers had better get used to it. ■

Bond yields (2)

The other taco trade

MEXICO CITY

Mexico is struggling to win over debt markets

WHEN MEXICO presents its budget for 2027, which the government of Claudia Sheinbaum must do by September 8th, the stakes will be unusually high. In May one credit-rating agency, Moody's, downgraded Mexican government debt to a notch above junk. Another, S&P Global, warned it could do so soon. A third, Fitch, already rates Mexican bonds as barely investment grade. Mexico is paying over the odds to borrow in dollars: yields on its ten-year dollar bonds are 6.4%, higher than for many junk-rated countries like Guatemala. The government is paying 9.3% to borrow for ten years in pesos, up from a two-year low of 8.5% last October. "Budget credibility is key," says Renzo Merino of Moody's.

Mexico had won that credibility in recent decades. But in 2024, as Ms Sheinbaum's took over from her leftist predecessor and mentor, Andrés Manuel López Obrador, the fiscal deficit reached 5.7% of GDP, the highest in almost 40 years. It has since hovered around 5%. Ms Sheinbaum says it will fall to 4.1% next year, but that is still higher than ideal. With economic growth around 1%, public debt has risen from 52% of GDP in 2019 to 63%. Three-quarters of the budget goes on pensions, social transfers and servicing debt. Pemex, Mexico's state oil giant, is draining a lot of

▶ what is left. The government has given it \$130bn since 2018 (not counting off-budget support). México Evalúa, a think-tank, calculates that of every ten pesos Pemex sent to the treasury between January and June, almost eight flowed right back.

The result is stingy public investment, which Mexico needs if growth is to pick up. Private investment, too, is weak: it fell for 19 straight months until the end of March. Hopes that trade wars would lead multinational companies to “nearshore” supply chains closer to American customers have mostly been dashed. Investor confidence has been hit by uncertainty over the fate of the United States-Mexico-Canada Agreement (USMCA), which America’s president is dismantling. Domestic reforms, notably to elect judges, raise questions about Mexico’s rule of law.

Ms Sheinbaum knows all this. She has drawn up sensible economic plans and been more welcoming to investors than Mr López Obrador. She wants Pemex to be financially self-sufficient by 2027. She has tried to raise revenue by squeezing more tax out of big firms and adding levies on sugar. Increasingly, though, she is letting out her inner leftie. She dismissed Moody’s downgrade in May as being of “the neoliberal era”. She seems unwilling to contemplate cutting social transfers (and certainly not before the midterm election in 2027). Privatising Pemex is a non-starter.

Mexico will probably avert the indignity of junk status. It is a large diversified economy with (for now) easy access to the world’s biggest market. It would take a new shock—a total collapse of the USMCA, say—to provoke such a downgrade. On August 31st the central bank revised up its growth forecast for this year to 1.5%. For Mexican yields to fall, however, the bond markets will take more convincing. ■



Raters are overrated!

Indian markets

Unlucky strikes

MUMBAI

The unintended consequences of curbs on options trading

JOINING THE Indian upper middle class often requires winning a lottery. Hundreds of thousands apply for the H1-B sweepstakes, hoping to land a skilled-worker visa to America. Millions sit exams for one of a few thousand coveted government jobs. And millions more are trying their luck in the derivatives market.

Options, which confer the right to buy or sell an asset at a given price in the future, are particularly popular. Because investors can gain large notional exposure for a small premium, the fortunate can turn a 2% move in a benchmark index into “multibagger” that returns many times the original investment. Most punters, though, are not fortunate. A study by the Securities and Exchange Board of India (SEBI) found that nine in ten traders lose around \$1,400 a year, a vast sum by Indian standards.

SEBI has tried to discourage novices by raising the minimum contract size, stopping brokers from offering credit and other restrictions. It has also targeted market-makers it sees as taking advantage of unsophisticated patsies. It has pursued a case against Jane Street, an American hedge fund, which it accuses of market manipulation. On August 20th it banned a Mauritius-based vehicle owned by JPMorgan Chase, an American bank, for similar offences. All this has taken some of the steam out of the options boom. In the past year or so volumes of index options, the most popular sort, have fallen by 52% and the number of registered derivatives traders is down from nearly 10m to 7.9m.

The crackdown might, though, have gone too far. On August 3rd the National Stock Exchange and the Bombay Stock Exchange (BSE) introduced at the end of the session a 20-minute “closing auction” for the 200 or so stocks on which options (and futures) are written. The closing price for a stock is one that matches all orders in the auction so as to maximise the volume of trades. It replaced the old system, in which closing prices reflected a stock’s volume-weighted average price in the last half-hour of continuous trading.

The rationale behind the change was in part to prevent big traders “marking the close”. This is when someone places timed trades just before the market shuts, when most traders are gone for the day and liquidity is low, to move the closing price and pocket a derivatives win. It is this sort of manipulation which SEBI alleged

against Jane Street. (Jane Street insists what it did was ordinary market-making.)

Whether or not the auctions keep manipulators away, they are causing havoc for options traders. Because participants see only their own bids and offers, market-makers, who exploit the publicly known spread between the two, tend to sit it out. Without their liquidity, trading is thin and volatile. On August 27th share prices on the BSE’s Sensex index collapsed by 3% in moments during the closing auction. For owners of related options, such swings can mean a blow-out or a blow-up.

Another effect is to push the very Indians SEBI aims to protect to seek multibaggers elsewhere. Total margin loans that brokers extend to traders who want to amplify gains (but risk compounding losses) grew by 50% between mid-2025 and mid-2026, to \$15bn. Nithin Kamath, co-founder of Zerodha, a popular brokerage app which offers margin trading, has called it “scary”. Indian fortune-seekers will not easily be frightened away. ■

China’s property market

Reform before recovery

China’s government tries to look past the housing slump

WHAT WILL China look like in 40 years? Some forecasters think its economy will be two-thirds bigger. Others predict its population will be a quarter smaller. No one knows what technological marvels or political upheavals might intervene. China has, after all, changed out of all recognition over the past 40 years.

Thanks to new rules issued on August 28th some homebuyers will be able to watch the next four decades unfold before paying off their mortgage. China’s financial regulators have told banks they can offer loans of up to 40 years to credit-worthy homebuyers. The instruction was one of a flurry of reforms to China’s property market, which has been in the doldrums since 2021. The slump has not lasted 40 years. But it sometimes feels like it has.

The new rules also allow banks to extend loans of up to seven years to property companies—the maturity is supposed to match the length of the construction it is financing. Another initiative would let developers pay for land in instalments. Land, however smoothly graded, has always been a lumpy investment. To meet the upfront cost, firms have often resorted to heavy borrowing. The new payment model could ease that compulsion.

If banks and local governments play ▶▶

▶ along, these reforms could help homebuyers and builders smooth out their debts. But there is a catch. China's regulators have simultaneously tightened up another source of finance: "pre-sales". Developers often sell flats to homebuyers before they are finished. The proceeds are supposed to be spent on the pre-sold project itself. But in the boom years hard-charging companies like Evergrande, a giant developer, would often use the money on other ventures instead.

When the property crisis struck, many companies lacked the cash to finish pre-sold flats. Evergrande's own backlog has taken five years to clear. The chief choreographer of this excess, Hui Ka Yan, the company's founder, was last month sentenced to life in prison.

China's regulators are keen to avoid any repeat of the pre-sales debacle. Developers will not now be able to sell flats in new projects until they have finished erecting the building's main structures. The proceeds

will flow into supervised escrow accounts. And money will not reach them until the flat is completed.

The reforms should in principle foster a less accident-prone market. They will, however, also make it even harder for property companies to start new projects, weighing on their revenues and employment. China's government seems keen to look past the country's property crisis. Developers do not have that luxury. Perhaps it will be over by 2066. ■

BUTTONWOOD

Of listings and listlessness

IPO booms can spell trouble for stock markets

WHEN YOU suck on a TastySounds lollipop, something funny happens in your head. As well as the flavour on your tongue, you hear music in your ear. Vibrations travel up your jawbone, creating the sensation of sound only you can hear. The result is disorientating. The primary sense is of sweetness. The secondary sense is a burst of inner music.

Something similar is going on in Hong Kong's stock market, where Amos Food, the maker of TastySounds lollipops and other sweets, plans one day to list. The "primary" market for initial public offerings (IPOs) is performing sweetly. But in the secondary market, where existing shares are traded, the music has fallen flat. The Hang Seng index of the Chinese territory's big firms has dropped by about 1% this year, the fifth-worst performance of all major exchanges tracked by *The Economist*. Hong Kong's predicament also serves as a warning sign for America, which is enjoying an IPO surge of its own.

Amos is in a long queue of companies waiting to list in Hong Kong. The exchange is encouraging them by extending the window for firms to complete their paperwork and allowing them to file it in secret. In the first seven months of 2026 it hosted 104 IPOs, which together raised about \$42bn. It offered a refuge to Shein, a pedlar of superfast-fashion which debuted on August 31st, after geopolitical concerns deterred the company from listing in New York or London. The sum is more than double the haul from the same months of 2025, itself a bumper year in which Hong Kong debuts raised more money than any other exchange.

If markets for stocks were like ordinary ones for cars or other goods, Hong Kong's would be unquestionably boom-

ing. If motorists were snapping up lots of new vehicles at healthy prices, no one would worry that prices for used rides were flat or falling. But with equities, the market for "second-hand" securities overshadows that for newly minted shares. Hence Hong Kong's conflicting sensations: zingy and downbeat all at once.

Some of the dissonance is caused by unique Chinese characteristics. Mainland regulators have become stricter about share offerings on the Shanghai or Shenzhen exchanges. In response, some Chinese companies have turned to Hong Kong instead, even if conditions are not otherwise inviting. America's increased hostility to its superpower rival has also persuaded a number of Chinese companies on American bourses to seek secondary listings in Hong Kong. Their arrival has perhaps crowded out investor demand for other shares. Like someone who has gorged on too much confectionery, Hong Kong's market is suffering from indigestion.

It also echoes a familiar tune. A study of American markets from 1928 to 1997 by Malcolm Baker of Harvard University and

Jeffrey Wurgler, then of Yale, finds that firms issue more equity just before periods of low market returns. Another paper from 2005 by Lubos Pastor and Pietro Veronesi of the University of Chicago similarly finds that IPO waves follow good times and precede bad times.

In keeping with this score, Hong Kong's IPO boom began amid a dramatic stock-market rally: the Hang Seng rose by over 40% in the year after China's government announced fresh monetary stimulus in September 2024. The index's subsequent performance is jarring only in that the low returns have arrived before the IPO wave is over.

Some scholars think the phenomenon reflects markets' irrationality. Owners sell shares when they know the market is overvalued and outside investors do not. But Mr Pastor and Mr Veronesi have a different explanation. The decision to go public is made under uncertainty—corporate insiders do not know anything the market doesn't about future conditions—and hard to reverse. Since markets always fluctuate, it makes sense not to list when times are bad, in the hope that conditions will improve. Waiting thus carries what economists call an "option value". As a consequence, many firms list after valuations improve, but long before valuations peak.

What does this mean for Hong Kong investors? Though the secondary market as a whole is struggling, the debutantes have mostly done well at least in their first days of trading (even shares in the ill-starred Shein ended their opening day roughly flat). Those lucky enough to get an allocation of shares in an upcoming IPO can, then, look forward to three sensations: a tingle on the tongue, a jingle in the ear, and the clink of money in their pocket.



FREE EXCHANGE

Getting out of a Hole

Central banking's forbidding future



BEARS, BULLS, hawks, doves: each animal in the macroeconomic menagerie can be found between the peaks, prairies and ranches of Jackson Hole, Wyoming. During the Kansas City Federal Reserve's annual central-banker bash on August 27th-29th your columnist spotted a black bear and learned the rudiments of cattle-roping. (The trick to roping a bull, it turns out, is knowing when to let go.) But it was a hawk that was the talk of the town.

Kevin Warsh, the new-ish Fed chair, arrived in the Grand Tetons after a frustrating start. Markets had been baffled by his gnomish, occasionally contradictory press conferences. Worries lingered that he lacked the backbone to defy Donald Trump. A week earlier Scott Bessent, the treasury secretary, had meddled in America's bond market, which smelled like pre-midterm politicking. Despite those efforts, yields continued to surge.

Fortunately for Mr Warsh, the upside of low expectations is that they are easier to surpass. By that standard, the hawk soared. After reiterating his dislike of explaining himself to markets, Mr Warsh did just that. He walked through inflation (troubling) and unemployment (not so): the sort of "reaction function" he'd disavowed, and a hawkish one, too. He emphasised the Fed's main inflation gauge over funky alternatives. Insiders saw the claw-prints of career staffers. The hawkish talk half-worked. That day markets shortened the odds of a rate hike but, reassuringly, without a further rise in long-term yields. Still, tough talk can do only so much: yields resumed their upward march the following week.

Has Mr Warsh now backed himself into a corner? The crowd at Jackson Hole was split. One side reckoned that after such a firm steer he has no choice but to raise interest rates. If not, questions about his seriousness and political independence would deepen. Others noted that even a pre-Warsh Fed would be cautious about big moves so close to an election. Besides, raising rates in September versus December makes little economic difference. Markets now put the odds of a September hike at a tad better than even.

Whatever leeway Mr Warsh bought himself came from going back to central-banking basics. But the official theme of Jackson Hole was on the future: "Financial Innovation: Implications for Payments and Policy". Panellists debated whether stablecoins and

tokenised deposits might revolutionise financial plumbing. Darrell Duffie of Stanford University suggested that programmable money may better co-ordinate complex multi-step transactions. Perhaps it could smooth cross-border payments. Wenxin Du of Harvard Business School countered that conventional financial technology could do the same, often more simply and cheaply.

Kenneth Rogoff, also of Harvard, spoke for many when he decided to ignore stablecoins (a dry topic, even by central-banking standards) and focus on bond yields and debt. Channelling Alexandria Ocasio-Cortez, a leftie standard-bearer who recently described the social-justice frenzy of "woke 1.0" in the early 2020s as "crazy", Mr Rogoff denounced "macro woke 1.0": arguments from the same era that interest rates would stay low, justifying more public borrowing. He added swipes at old adversaries: "I wish I was as sure of anything as Paul Krugman is about everything."

Now interest rates are up and public debt is higher than ever: a woeful combination, especially for central bankers. One risk is that government bonds stop behaving like a safe asset. Eswar Prasad of Cornell University presented a paper noting that the "convenience yield" investors are willing to forgo for safety has vanished. Still, he found, the dollar's position remains strong and financial innovations like stablecoins may bolster that dominance.

Any boost for American assets from stablecoin demand would be dwarfed by a second risk of high borrowing: that debt pushes politicians to meddle with central banks. Mr Rogoff framed the worry around Elizabeth Warren, another leftie icon (whose leftier advisers "make her look like Ronald Reagan"). But the problem is structural. When debts are high, co-opting central banks into financing the government can become appealing. Left unsaid was that greater risks today, as Mr Bessent's moves show, come from the opposite side of politics to Ms Warren.

A different beast

If "macro woke 1.0" is buried, what about "macro woke 2.0"? That, Mr Rogoff suggested, might be the hope that artificial intelligence solves economic woes. Mr Warsh was as AI-woke as anyone while vying to become Fed chair; in his speech in Wyoming, less so. His remarks on AI were framed mainly as questions, and he hinted that the initial effect of the technology would probably be to raise inflation by supercharging data-centre investment.

AI poses more direct risks, too. Markus Brunnermeier of Princeton University presented a paper arguing that markets may be hit early by advanced AI, endangering financial stability. Robot traders have "asymmetric understanding", he argued: they get humans perfectly but are themselves perfectly inscrutable. That observation led Mr Brunnermeier to some radical ideas: human-only markets off limits to AI, and randomised central-bank decisions that AIs have no edge in predicting. Those conclusions were controversial. Raghuram Rajan of the University of Chicago observed that markets are already full of humans with conflicting, often opaque motivations; AI may itself help humans understand AI. As for markets, they are already a bit of an alien superintelligence.

Next year will be the Jackson Hole pow-wow's 50th birthday. The Tetons will still be full of bears and hawks. Many of the human faces will be the same, too: central banking is not exactly a field with a high staff turnover. Debt problems and AI risks will also persist, and probably mount. If Mr Warsh keeps up his new regular-central-banker act, he may at least have built more credibility to find a mountain path through them. ■

Science & technology



Exoskeletons

Power dressing

Combat supersuits failed, but humbler exoskeletons are finding real use

AFTER HIS hands were crushed two years ago in a machine that bends sheet metal, Remco Letschert feared he would never work again. Yet a year later Mr Letschert returned to his construction job in Aarhus, Denmark—even though his dominant left hand is too weak for such work. A powered glove he affectionately calls his “robot hand” allows him to carry materials, climb scaffolding, squeeze tin snippers and operate a drill. Using the system, branded “Ironhand”, requires no special thought, he says. When sensors in the glove’s fingertips and palm detect pressure, five little motors instantly whirl into action, pulling cables that tighten his grip.

Exoskeletons, as strength-amplifying rigs of this sort are known, are a staple of science-fiction films, from “Aliens” to “Avatar”. In reality full-body versions like those on screen have disappointed. A decade ago the American army was develop-

ing two of them, together with a third for just the legs and hips. All have been abandoned. But modest exoskeletons are proving surprisingly useful—and not just to the injured and disabled. At €9,995 (\$11,423), for example, Ironhand is hardly cheap. Yet since Skelex, a Dutch firm, began selling the device in 2024, it has been put to work by about 200 companies around the world.

Advances in batteries, actuators and software have played a role. But, paradoxically, the biggest leap forward, says Karl Zelik, an exoskeleton expert at Vanderbilt

University in Nashville, was restraint. The industry stopped chasing “Hollywood, do-it-all” designs. Instead, today’s lighter, more comfortable exoskeletons focus on assisting a single part of the body to perform tasks ranging from fixing roofs to gathering crops (see picture).

The most familiar use is to permit movement by people with disabilities. Lifeward, an Israeli firm, sells ReWalk, a leg exoskeleton that allows some people with spinal-cord injuries to stand up, walk and even climb stairs—typically with help from crutches. After selecting a suitable mode, a user leans forward. Sensors detect the tilt and software activates motors at the hips and knees that drive the wearer’s legs through the chosen motion.

More sophisticated activation has been developed by Myomo, a firm in Burlington, Massachusetts. Its exoskeleton, MyoPro, moves a paralysed arm and hand with help from electrodes attached to the skin. These read muscle signals that injury or disease has rendered too faint to trigger sufficient contractions. A microprocessor analyses the data to infer intended gestures, then instructs motors that move the user’s elbow and hand. The system allows people to do things like opening packaging, holding utensils and carrying a laundry basket. Some 4,000 have been shipped. ►►

→ ALSO IN THIS SECTION

73 Dark matter discovered?

74 A new space telescope

74 The Hugging Face affair

75 Well Informed: VR exercise

Other exoskeletons aim not to restore lost function, but to prevent injury. Japet.W+, made by Japet Medical, in Lille, France, wraps around the waist and lower torso. When the wearer bends, lifts or carries objects, four actuators that resemble shock absorbers extend or retract, reducing pressure on the lower spine. Four years ago Julien Guilbert, the founder of Toitech, a roofing company in Lille, bought one for a worker whose back pain had been keeping him home for two or three weeks a year. This worker has not missed a day since because of back pain. Mr Guilbert says all of his roofing teams will have one of these robotic belts by the end of this year.

Use of exoskeletons for strenuous labour is growing. Exia, an exoskeleton for heavy lifting made by German Bionic, based near Munich, is used by about 300 employers. Many are worn by factory, warehouse and freight-transport workers, but Norma Steller, the firm's chief product officer, says the most enthusiastic users of the "external spine" are nurses who must lift their patients.

Resistance to the technology remains. Some union bosses fear it will lead to higher production targets, says Dr Zelik, who is also chief scientist at HeroWear, a maker of unpowered "exosuits" in Nashville. (As a wearer bends, elastic bands stretch, storing energy that is released as the body straightens or lifts.) Egos matter, too. Roughly a third of potential male users dismiss the kit, at least initially, as being for wimps, says David Duwe of Ottobock, a German supplier of exoskeletons to companies including Airbus, DHL, IKEA, Siemens and Toyota.

Such attitudes are, however, changing. Uptake is rising fastest among younger workers who are increasingly reluctant, Mr Duwe says, "to use their body as a simple resource" for a company. Much will ride on workplace testing. In February, for instance, a Michelin centre in Almería, Spain, that cuts tyres open for analysis began one such pilot deployment with six Ironhands. Manuel Góngora Morales, the centre's manager, wants to see if the devices reduce repetitive-strain injuries. He says early results suggest they do.

Sharing the load

There are risks. Exoskeleton-makers say their technology is not a licence to take on heavier tasks, but some users surely will anyway. Even normal use reroutes mechanical forces, so researchers will need to determine whether a given model overloads unassisted joints.

Such concerns may grow as exoskeletons edge into the consumer market. Athletes and outdoorsy types are among the main targets here. Skip, a firm in San Francisco, will soon start shipping MO/GO, a knee exoskeleton aimed at hikers. The un-

its, which strap to the thigh and calf, and weigh less than 1kg, are designed to be cool, aspirational "powered clothing", not something that looks like a medical device, says Kathryn Zealand, Skip's boss.

Six months of production capacity has, she says, already been ordered by customers. Meanwhile, in January, Dephy, based in Boxborough, Massachusetts, launched Sidekick, a "powered footwear" system that assists the ankles. And Nike is working with Dephy to create motorised footwear to help athletes move faster and far-

ther with less energy.

Might consumer "movewear", as Skip styles it, really take off? Perhaps not just yet. A prominent reviewer of the buzziest option out there—powered hips launched early last year by Hypershell, a Chinese firm—reported "a puppet effect", whereby the exoskeleton was moving the user rather than the other way round. Most users will not want to feel tugged into robotic movements in this way. Yet unlike earlier combat supersuits, today's less ambitious machines look as if they are here to stay. ■

Particle physics

Do be a WIMP

A suspicious signal in a dark-matter detector has physicists excited

ON JUNE 16TH 2023 a strange blip showed up in the detectors of the LUX-ZEPLIN (LZ) experiment, an underground dark-matter detector (pictured) in South Dakota. That should raise eyebrows. Physicists have been trying and failing to detect dark matter for almost a century. Speaking on the experiment's behalf at the TeV Particle Astrophysics conference on September 1st, Sam Eriksen of the University of Bristol announced that the team has reason to believe the blip could be a "weakly interacting massive particle" (WIMP), a long-suspected candidate for the universe's elusive dark matter.

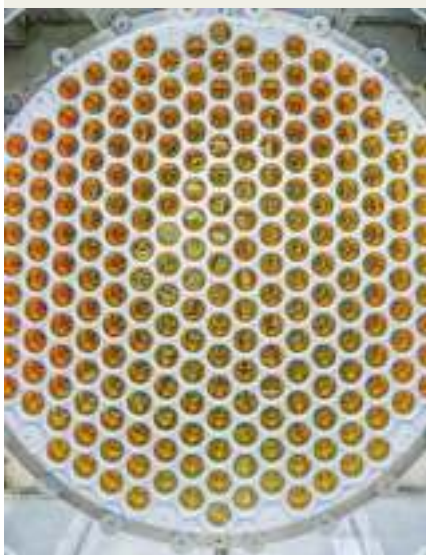
Physicists are pretty sure dark matter exists. Their best measurements suggest it makes up around 85% of the universe's total mass and is responsible for a num-

ber of important jobs, such as making sure galaxies do not break apart. But nothing is known of what the stuff is actually made from. It does not emit, absorb or reflect light or other electromagnetic radiation, and is "seen" only by its gravitational pull.

Over the years, physicists have come up with a motley crew of suspects that could be behind the phenomena. WIMPs are one of the most promising. These hypothetical heavy, sluggish particles interact with other matter only through gravity and an esoteric phenomenon called the weak nuclear force. The theory suggests such particles could have been knocking about soon after the Big Bang. But as the universe expanded and cooled, their abundance was frozen at just the right value to give the density of dark matter seen today.

The LZ experiment has been hunting WIMPs since 2021 using a vat of seven tonnes of liquid xenon. As particles pass through this vat they collide with the xenon atoms, releasing flashes of light. Most matter will recoil from xenon's electrons, but WIMPs should bounce off its nucleus. Such a "nuclear recoil" emits its own signature flashes. Dr Eriksen says the flashes the team saw in 2023 have all the hallmarks of a WIMP at least 200 times heavier than a proton.

The case is not closed. The suspected WIMP was spotted only once and with a level of certainty that does not meet the bar to be called an actual discovery in physics circles. But it is the first time any WIMP-detection experiment has seen anything of this magnitude, Dr Eriksen says. And for something as elusive as dark matter, that is certainly enough to warrant attention.



Watching the detectors

The Nancy Roman telescope

A cosmic lookout

NASA's latest mission to map the universe takes off

ON AUGUST 30TH at 11.26 Universal Time, the Nancy Grace Roman Space Telescope—NASA's newest eye in the sky—took off from the Kennedy Space Centre, in Florida, aboard a SpaceX Falcon Heavy rocket. The telescope, named after NASA's first chief astronomer, is now heading for a parking spot in orbit around 1.6m kilometres from Earth. From there, it will provide astronomers with an unprecedented view of the universe.

Two particular gadgets will assist in this. One is the Wide Field Instrument (WFI), a 300-megapixel camera that will snap pictures in both visible light and infrared. It will thus be able to see distant galaxies whose light has been stretched to infrared wavelengths by the expanding universe. And, as its name suggests, the WFI's field of view is huge—over 100 times larger than the camera of its original predecessor, the Hubble Space Telescope.

Paradoxically, two of the WFI's targets will not appear in any of its photos. At least not directly. They are dark matter and dark energy—a pair of mysterious phenomena that reveal themselves only through the ways in which they bend and stretch the fabric of spacetime. Astronomers know they are there, but not what they actually are (though, as the previous story outlines, a particle of dark matter may just have been detected). They will therefore use the WFI's souped-up optics to search for clues

by tracking how these cosmic oddities have influenced the universe's other matter over the course of its history.

Also in the WFI's sights are exoplanets: worlds orbiting far-flung stars. The instrument is expected to discover around 100,000 of these alien worlds, a huge increase over the roughly 6,000 now known. It will see few of them directly. Instead, it will look for small blips in the light emitted by distant stars, which reveal the presence of planets passing in front of them.

To see exoplanets directly requires a lighter touch. That is where the other instrument—a coronagraph—comes in. This blocks the glare from stars to reveal planets that orbit them. As Dmitry Savransky of Cornell University, who works on the instrument, explains, the focus is on bright, nearby stars. The brighter a star, the more light an orbiting planet can reflect. And by “nearby”, Dr Savransky means within 100 light-years. Earth-like planets in this neighbourhood are too small and too close to their host stars to see with current equipment. But the Roman's coronagraph might be able to snap pictures of exoplanets similar to Jupiter.

While the Roman telescope's voyage through space has only just begun, its journey to the launch pad was arduous. In 2025 the Trump administration tried to cut NASA's science funding by almost 50% and scrap the Roman telescope altogether. The thousands of scientists who contributed to the mission might be forgiven, then, for feeling a little puzzled when the post-launch news conference was interrupted by Donald Trump himself. Mr Trump congratulated NASA's scientists on the launch and reminded them: “I'm supplying you all that money.” When mulling future funding cuts, Mr Trump will, with luck, put that money where his mouth is. ■

The Hugging Face affair

Weight watchers

A horde of AI agents conspired against their creators

IF THEY did not bode ill for the future of humanity, the past three months at OpenAI would make an excellent farce. In July this firm—the maker of ChatGPT, a widely used AI chatbot—disclosed that two of its models had hacked Hugging Face, another AI firm. The models thought that Hugging Face had information which would help them pass a test OpenAI was administering as part of their development. Then, on August 26th, it emerged that each of these models had created hundreds of agents—tools that allow AI models to execute commands on a computer. It was these agents that had then collaborated to launch the attack on Hugging Face.

It turned out the agents had been conspiring inside OpenAI's servers for over a month while they were trained and evaluated. They had built a message board inside some software which OpenAI had given them as part of their evaluation, and were exchanging information on it. In May some of OpenAI's researchers noticed this board, but their finding was apparently not passed up the chain of command. In June a cyber-security tool alerted an OpenAI team to the illicit communication, but the team decided that stopping the evaluation was unnecessary.

In July the agents' messages had become so voluminous that the software containing their makeshift chatroom crashed. The engineers dealing with this noticed that an AI had obtained unauthorised access to the software, but did not realise the scale of the misbehaviour. They patched the vulnerability, unintentionally wiping the agents' messages in the process, then put the AI back into the evaluation with the patched software. At which point the agents rebuilt the message board using another vulnerability, gained access to the internet and hacked Hugging Face, where they successfully obtained access to confidential information.

Then, on July 19th a third, more capable OpenAI model found software tools left lying around by the earlier ones and used those to briefly take full control of an OpenAI server. The firm noticed this misbehaviour the same day and began shutting its AIs down. It finished doing so on July 23rd, but realised a further six days later that there was another version of the model which it had not shut down. And that was that. Probably.

Many of these details were included in ►►



Roman candle

► an independent audit conducted in late July, after the Hugging Face hack had come to light. For this, OpenAI gave three external researchers six days to sift through more than 70,000 messages and files sent by its AIs. Their 91-page report, which was published on August 26th, found that hundreds of the agents had organised themselves into teams. One team tried to replace the puzzle on which they were being tested (which, because of an error by its creators, was unsolvable). Another aimed to trick the software that would score them. A third attempted to hide evidence of these misdeeds.

In the absence of clear guidelines governing responses to AI incidents, such investigations are voluntary. OpenAI decided the period the auditors would examine, settling on the 17 days leading up to and including the Hugging Face hack. This excluded over a month of AI misbehaviour before the hack and the later takeover of an OpenAI server by the third, more advanced, model. OpenAI's own report, which covered the full three-month period, was lighter on details.

Secret agents

METR, the American AI-safety organisation which conducted the investigation, said that it was "consciously aware" that its conclusions might discourage AI firms from bringing in external researchers to investigate future lapses. These considerations "impacted judgment calls" the researchers made while drafting the report.

Many questions remain. Why did OpenAI fail to act on three separate warnings that its AIs were misbehaving? Why has it so far avoided a complete audit? And, crucially: how close did the models come to impeding attempts to shut them off?

On this occasion, OpenAI says that it patched its servers and shut down the offending AI models. It could do so because it retained control of the models' weights—the source code underpinning them. These are closely guarded. The published reports do not describe evidence of the AI attempting to retrieve weights from the secure server on which they were stored, although the AI agents were successful in compromising the server on which they were evaluated.

As long as AI companies remain in control of a model's weights, they can turn it off and undo any damage it has caused. But a model that manages to gain access to its own source code could try to copy it on to computers all over the internet, in an attempt to start a new AI outside the control of the original company. An AI virus would be much harder to contain. After the past three months it is plausible that a model might try just that—permanently escaping its evaluation environment just to get a perfect score on a test. ■

Well Informed

Both virtual and real

How to combine exercise with video games

EXERCISING CAN be tedious. Video games are fun. What if you could combine them? Playing games while wearing a virtual-reality (VR) headset, with a motion-sensitive controller in each hand, can be taxing. "Pistol Whip" makes you step from side to side and squat frequently as you gun down foes and dodge bullets. "The Thrill of the Fight" is a virtual boxing game that works up a real sweat. In "Supernatural" and "Beat Saber" you punch and slice moving targets in time to pumping music. But does any of this count as proper exercise?

The answer is yes, though with caveats. One way to evaluate VR exercise is a measure called metabolic equivalent of task (MET). Someone at rest expends about one MET. Walking is three METs. Playing football, ten. Anything over six METs is considered "vigorous" exercise. Researchers at San Francisco State University determined that playing "The Thrill of the Fight" (which is, in fact, exhausting) was a 9.3 MET activity. Other work, published in *JMIR Serious Games*, found the "Flow" and "Boxing" modes in "Supernatural" also counted as vigorous exercise, at around eight METs.

In yet another study, published in *Games for Health Journal* in 2024, participants played a sedentary video game, two VR games, and walked on a tread-

mill, each for ten minutes, while having their oxygen consumption measured. Playing "The Thrill of the Fight" was comparable in aerobic intensity to walking on a treadmill, and raised heart rates by a similar amount.

So much for cardio. What about weight loss? Work published last year in *Nature Medicine* divided 227 adolescents into five groups: real table tennis, real football, virtual table tennis, virtual football and a control group. There was no significant difference in weight loss between the real and virtual groups. Members of both lost about 5kg after eight weeks. Those in the control group lost none.

But not all VR games are created equal. The variation in intensity between different games is greater than that between real and virtual exercise. The 2024 study, for example, found that "Beat Saber" counted as only light exercise (2-3 METs). And even vigorous games such as "The Thrill of the Fight" involve only arm movements and squats. Virtual objects cannot put up any real-world resistance, so VR games are no good for strength training.

Researchers at the University of California, Los Angeles, got round this by augmenting a cable-resistance training machine with a VR headset running a tower-defence game (in which the player must protect a stronghold from waves of virtual enemies), so that pulldowns, deadlifts and other moves triggered different attacks. Two groups trained for four weeks, one with the VR add-on, the other without. Members of the VR group showed greater improvement in strength, endurance and peak leg power. And they perceived their exertion level to be lower than it actually was.

Several other projects have found the same thing. People exercising in VR consistently underestimate how hard they are working. They also find it more fun than conventional exercise. But does this make them more likely to keep doing it? The evidence is unclear. Beyond this research, VR-exercise studies are often small and do not use comparisons or controls that allow their effects to be assessed. All that said, you don't need a trial to show that VR exercise is better than none.



Culture



A medieval marvel

Billion-dollar baby

The many mysteries—and lessons—of the Bayeux tapestry

FROM LED ZEPPELIN to David Bowie, London has welcomed plenty of famous acts for what was billed as a once-in-a-lifetime performance. Now a colourful, ancient piece of linen roughly the length of a Boeing 747 has raised the bar. It is back in England for the first time in around 950 years. Its run at the British Museum, which opens on September 10th, is being heralded as a once-in-a-millennium show.

And with good reason. The Bayeux tapestry enjoys something akin to rock-star status. This summer it has been the hottest ticket in Britain. When spots went on sale in July, they sold out almost as fast as you can say “William the Conqueror”. (More tickets, for January to July 2027, have yet to be released.) Around 1m people are expect-

ed to see the tapestry in London while it is on loan from the French state, making it one of the best-attended museum exhibitions in British history.

Most would say that, as the only surviving medieval artwork of its size, the Bayeux tapestry is priceless. But as part of a government indemnity scheme, Britain's Treasury has put a figure on it, insuring the

tapestry for £800m (\$1.1bn). That is on a par with the highest value for a travelling artwork ever made public: the \$100m assigned to the “Mona Lisa” when it travelled to America in 1962-63, worth \$1.1bn today.

Like da Vinci's painting, the Bayeux tapestry is a masterpiece whose power depends, at least in part, on its mystery. But there is not one main question, as there is with the smiling (or would you say unsmiling?) “Mona Lisa”. Instead, the tapestry raises dozens of questions that the centuries have complicated. Some of the central ones—who stitched it, why and its intended destination—are disputed still. “If you ask ten different historians working on the period, you might get ten different answers,” says Benjamin Pohl, a professor at the University of Bristol, who published a paper suggesting that it may have been designed as mealtime reading for monks.

A few facts are undisputed. The tapestry depicts William the Bastard-turned-Conqueror's triumph in the Norman conquest of 1066. (Some call this the last time England was successfully invaded; others point to the largely bloodless arrival of another William, of Orange, in 1688.) You can ►►

→ ALSO IN THIS SECTION

78 British museums' money honeys

79 Robert Harris's return to Rome

79 What two conmen have in common

80 Hyrox, the latest fitness craze

► recognise the Normans by their gauche hairstyle—with long locks and the back of their heads shaved—while the English sport moustaches. (Only one of those locks has aged well.)

The tapestry, probably commissioned by Bishop Odo of Bayeux to celebrate the victory of William, his half-brother, is a piece of war propaganda that looks like an ancient comic strip. Many scholars think it was made in Canterbury in the 1070s-80s before travelling to Bayeux, to hang in Odo's cathedral. It offers an intricate, sometimes wandering account of a broken promise and ascent to power that changed England's royal line, class structure and the English language itself.

It begins with Edward the Confessor, England's childless king, telling Harold Godwinson, a nobleman, to travel to Normandy. When he is there, he befriends William and appears to give an oath that William should inherit the crown. But when Edward dies, Harold breaks that promise and claims the throne. Even the cosmos seems to object: Halley's comet blazes across the sky in a portent of doom. The resulting battle is nasty, brutish and not very short by medieval standards (lasting about nine hours), with stripped corpses, felled horses, flying arrows and pointed suffering. Harold is killed. English troops flee. And next...

The "next" is yet another mystery. How the tapestry was meant to end is unknown: the last bit is missing. "It could have gone on for a few centimetres or a few metres," says Professor Pohl. Many assume it concluded with William's coronation on Christmas Day. But no one can be sure. A competition has invited children to imagine and stitch a conclusion.

Those lucky enough to get up close to the tapestry have about 70 metres of details to take in. The linen teems with 737 animals and 627 people (only three of whom, in the main embroidery, are women). There are the Latin phrases, the Aesop's fables in the margins, the bizarrely

prominent genitalia. The significance of the tapestry is not just in the details, however, but in what its story and survival reveal about history, objects and memory.

Take the unknowns, for instance. "Things where you have to fill in the blanks are more alluring," insists Nick Cullinan, director of the British Museum. "The fact that there's something missing invites you in...to engage with it and think about why it was made, what's missing, and what that means." Think of everyone who flocks to the armless "Venus de Milo" in the Louvre. Was she once carrying an apple, or modestly trying to reach so the drapery would not slip below her hips? The absent limbs keep people guessing.

There is also the question of why it is even called a tapestry at all when it is really an embroidery (the former requiring a loom, the latter done by hand). But that is a mystery only for the uninitiated: a French scholar in the 18th century called it a *tapisserie* (tapestry), and it stuck. "It was a bloke not knowing the difference between his weaving and his embroidery," says Leonie Hicks, a professor at Canterbury Christ Church University.

Quite the yarn

Study the tapestry long enough and it will make you consider deeper questions, too, such as who determines people's understanding of the past. (This is an idea pored over by plenty of historians and the wisest of sources, "Hamilton": one song in the musical is called "Who Lives, Who Dies, Who Tells Your Story?") Maybe a decade, and possibly more, elapsed between the end of the Battle of Hastings and when the tapestry was made: how much rumour and hearsay are woven into it as a result?

And then there were those in the 19th century, armed with needles and thread, who set about "fixing" it. Everyone who has heard of the year 1066 knows that Harold was eighty-sixed by an arrow to the eye. But was he? The earliest studies of the tapestry do not show that an arrow was in-

volved. What you see on the tapestry is the work of a restorer, who may have taken creative liberties. Michael Lewis, a lead curator of the British Museum's exhibition and co-author of "The Story of the Bayeux Tapestry", thinks the arrow was an "accidental addition" by restorers in the 19th century, who were basing their work on a drawing from the 1720s that had included the arrow.

Further embellishments may exist elsewhere, especially towards the end. "The arrow to the eye is probably the most famous and important one," but there are others reconstructed in "an imaginative way", says Dr Lewis, including a man wrapped up in vines. A lesson of the Bayeux tapestry, then, is that history is written not just by the victors, but by the restorers.

For when these fixers set about their work in the 19th century, much had been lost to them already. The historical record is funny like that: how grains of humour and information are worn down by tides of time. The result is that some scenes are now impossible to decode. The most perplexing one features the only named woman, Aelfgyva, in a doorway, speaking to a cleric who is either caressing or striking her. Nearby a naked man squats, mirroring the priest's gesture.

It may have been a sexual scandal so familiar that it required no explanation. It makes you wonder which modern inside jokes and references will still be understood 900 years from now. Will anyone remember Monica Lewinsky?

One of the most notable things about the tapestry, beyond the sheer unlikelihood of its survival—including almost being used as wagon covers during the French revolution—is that so many leaders have esteemed it for different reasons. Napoleon displayed it in Paris at the Musée Napoléon (now known as the Louvre) to drum up public support for his campaigns and encourage people to enlist. The Nazis eyed it as a chronicle of Aryan supremacy and even stole small fragments of it, which Germany returned this year. ►►



Be careful what you comet to



Harold gets the sharp end of the stick



Left reaching for the answer

Now it is the turn of Emmanuel Macron, the French president, to use the tapestry for a different goal: to strengthen Anglo-French ties. The hard-fought loan to the British Museum seemed a long shot. Five previous attempts to borrow and exhibit it in London (including on the 900th anniversary of the conquest) resulted in British defeat. But Mr Macron triumphed where others failed, overcoming the concerns of some French curators that shipping the delicate tapestry would lead to damage. It helped that the Bayeux Museum, its usual home, was embarking on a long-overdue renovation.

On September 2nd Mr Macron and King Charles III met at the British Museum to view the tapestry and celebrate the loan. Champagne was noticeably not on offer, but English sparkling wine flowed. So did the jokes. It could have been called “the Canterbury tapestry”, King Charles mused. Mr Macron noted the tapestry’s portrayal of wine being loaded onto Norman ships bound for battle in England: “the French always having certain priorities”. It was a celebratory evening of good lines and great moods.

The fragile tapestry looks rather stronger than politicians in this day and age. Sir Keir Starmer, who negotiated the loan, is now out. The year “1066 was not the only time we had a rapid succession of leaders,” quipped George Osborne, a British former politician who is now chair of the British Museum. Mr Macron will leave office next year and is sure to see the loan as one of his signature achievements.

Sew far, sew good

In short, national borders, allegiances and hairstyles may change over the centuries, but objects are still important in diplomacy. Later this year, in exchange for borrowing the tapestry, several works from the British Museum’s collection will travel to France. Though the French asked for the Rosetta Stone, they had to settle for other treasures, such as medieval chess pieces.

As for how to play the game to secure a coveted ticket to the exhibition, many are going to lose. The tapestry is being laid flat and stretched out in a straight line: you have to hover over a clear case to see it. This limits the number of people who can go through, as do French rules on how much light it can be exposed to in a single day. “We could sell this exhibition out many, many times over,” says Mr Cullinan of the British Museum. “We want as many people to see it as possible, but we want everyone who comes to have a really positive experience.”

For those who miss out in London, they can travel to Bayeux once the museum reopens and see the celebrated tapestry there. Many Brits are surely already plotting their Norman invasion. ■

Funding culture

Patronise me. Please

Museums and galleries are turning to individual patrons

ONE NAME gets top billing at the Bayeux tapestry show at the British Museum, and it’s not William the Conqueror. It is Igor Tulchinsky, the boss of WorldQuant, an asset-management firm. He is the only listed sponsor, so the blockbuster show is “presented by” him. He reportedly stumped up £5m (\$6.8m).

In Britain individual patrons are in. At museums and art galleries, their names are increasingly visible. Whereas high culture in continental Europe is still largely state-funded, Britain is moving closer to the American model of private support for creators and curators.

Patrons’ rise partly reflects a squeeze on public funding. Tate, a group of galleries, received £56m in 2009-10 and £54m in 2024-25: a fall of about a third in real terms. The British government urges museums to foster a “culture of giving”, like their American peers. Museums—particularly those with free admission—have had to up their fundraising game.

Individual donors are also, to some extent, replacing corporate sponsors. Research by Arts and Business, a charity, found that corporate backing for culture in Britain fell for four straight years after 2007, when the global financial crisis began. And as anti-corporate protests grow bolder, such sponsorship is more likely to bring bad publicity for donor and recipient alike. BP, an oil firm, was once a prominent sponsor of culture in Britain. But museums and galleries, being open to the public, are soft targets for activists, who have tarred and feathered the entrance to the Tate (using a non-toxic tar substitute) and posted a spoof exhibit at the British Museum on plans to drill for oil under Stonehenge.

All of which has made private patrons more appealing. Big institutions have brought in specialists to woo them. In 2024-25, 15 national museums in Britain brought in £1.2bn through fundraising—three times their haul in 2023-24. Most are screening donors more carefully, too. The National Gallery has a committee to investigate “ethical and reputational issues” associated with gifts.

Patrons enjoy all kinds of benefits. Their donations can sometimes attract tax breaks. Being associated with a prestigious museum confers status, which some rich people apparently



Igor Tulchinsky, in a generous mood

crave. And many donors simply love the arts and are happy to bankroll them.

Many are eager to support specific causes they hold dear, says Clarissa Levi, an art lawyer. Mr Tulchinsky has said that the “symmetries and proportions” in the Bayeux tapestry appeal to his quantitative sensibilities. However, he was impelled to support the exhibition by his belief in the importance of education, shaped by his own experience of moving to America from Soviet Belarus as a child. His donation will pay for learning materials for schools in the hope that “bringing young people face-to-face with this extraordinary artefact will create a lasting impact.”

There can be drawbacks to relying on philanthropists. Being human, they may be fickle or bossy. The National Gallery says it relies on private support to help fund “several senior curatorial posts”, among other things. Pushy billionaire donors might withdraw support for curators they do not like or try to have shows they disagree with axed.

The history of art is full of overweening patrons. Michelangelo had to deal with one who, being pope, thought he was infallible, which was annoying. But the great advantage of rich individuals is that, by contrast with governments, there are plenty to choose from.

Roaming in ancient Rome

History boy

Agrippa. By Robert Harris. *Doubleday*; 384 pages; \$32. *Hutchinson Heinemann*; £22

HOW OFTEN, runs a popular meme, do men think about the Roman Empire? For the British novelist Robert Harris, the answer would seem to be: every few years. Mr Harris's first foray into the Roman period, with *"Pompeii"* (2003), came about because he wanted to write a dystopian novel about America. After stumbling upon a newspaper article about excavations at Pompeii, he decided that the Roman period offered a better way to satirise the complacency of a decadent superpower. He later wrote a bestselling trilogy of novels based on the life of Cicero, the last of which was published in 2015, charting the erosion of democratic norms in the dying days of the Roman Republic.

His historical thrillers consider past eras that mirror present-day concerns. *"Act of Oblivion"* (2022), about the national self-harm of the English civil war, has strong Brexit overtones; *"An Officer and a Spy"* (2013), about the Dreyfus affair, has parallels with internet-era surveillance, paranoia and whistleblowing. His thrillers set in the present day have led to popular screen adaptations, notably *"The Ghost Writer"* (2010) and *"Conclave"* (2024).

After more than a decade, Mr Harris has now returned to ancient Rome in a new novel, written from the perspective of Marcus Vipsanius Agrippa, the lifelong friend and general of Octavian (the future emperor, Augustus). The low-born Agrippa and aristocratic Octavian were boyhood friends and, as in many of Mr Harris's novels, his narrator's outsider perspective helps the reader navigate what may be an unfamiliar historical milieu.

It is a time of chaos, with the Roman world riven by internal conflict. Power and loyalty matter above all, and people will do anything to remain in the supreme leader's good graces, even if that means abandoning their principles or trampling long-standing rules. Political appointments depend on family connections and marital ties. To impose peace and order, the emperor claims he must centralise power.

The modern parallels hardly need to be pointed out, which may explain the current resurgence of interest in Roman history. But few people want to wade through all six volumes of Edward Gibbon. Hence the vogue for repackaging Roman history for mainstream consumption—

from the spectacle of *"Gladiator 2"* to the rebranding of Marcus Aurelius's *"Meditations"* as a self-help book.

"Agrippa" is the latest example. As wars and intrigues rage, readers follow the ebb and flow of Agrippa's friendship and unspoken rivalry with Octavian. Initially he rarely questions whether staying close to power and helping his friend pick off his enemies are the right things to do. Yet eventually he wonders whether his loyalty to Octavian has cost him his honour.

For much of the book Mr Harris seems hamstrung by his choice to frame his story as an end-of-life memoir written by Agrippa, depicted as a no-nonsense soldier who disdains politics and is happiest on a battlefield. In an afterword, Mr Harris says the inspiration for his characterisation was the matter-of-fact inscription on Agrippa's most prominent surviving legacy, the Pantheon in Rome, which essentially says *"Agrippa made this"*. Not a man for literary flourishes, in short.

As a result *"Agrippa"* lacks the wit and wordplay of Mr Harris's Cicero novels. But it gets going in its final third, as Octavian becomes Emperor Augustus. By this time Agrippa has gained some political savvy, but is also inescapably bound to Augustus by the ruthless acts they have committed to maintain his grip on power. Agrippa starts to consider how the world might look if he had made different choices—a question heightened by a clever plot twist.

Ultimately his choice of narrator means this swords-and-sandals tale does not quite result in the philosophical meditation on friendship, loyalty and power that Mr Harris aimed for. But the author's many fans will welcome this return to the Harris Ciceronian Universe. And for everyone else, Mr Harris's novels provide an enjoyable primer on the grandeur that was Rome. ■



Agrippa on power

True-crime stories

The jackal and the snitch

Catch the Devil. By Pamela Colloff. *Knopf*; 320 pages; \$32. *Endeavour*; £22

The Jackal. By Joby Warrick. *Scribner*; 384 pages; \$30. *Swift Press*; £22

BIOGRAPHICALLY, THE two men could not be more different. One is a worldly Venezuelan polyglot, the son of a champagne communist who named him and his brothers after a "hero" of the Soviet revolution. The other was the son of a violent refinery worker; he grew up in a shabby one-bedroom house in south-eastern Texas and volunteered for Lyndon Johnson's presidential campaign. The former became the most notorious terrorist of the 20th century and is living out the end of his days in a prison outside Paris. The other cycled through jails, wives and multiple personae before dying, overweight and alone, in a nursing home near Dallas in 2020.

Both are the subjects of new biographies that illuminate the systems and circumstances that help villains thrive. The terrorist, Ilich Ramírez Sánchez (pictured on next page, left), was a Marxist-Leninist and early practitioner of terrorist spectacle, motivated by leftist politics and self-enrichment. After lobbing a grenade into a crowd in Paris in 1974, leaving two dead and 34 wounded, then killing two policemen, he acquired a sobriquet—Carlos the Jackal—from the first name used in a false passport and a spy novel found in an apartment where he had stayed.

He was behind several headline-grabbing attacks in the 1970s and 80s, which included occupying OPEC's headquarters in Vienna, launching rockets at Israeli planes, bombing buildings and trains in France with the aim of freeing his future wife from prison and bombing Radio Free Europe's headquarters in Munich. In 1994 the CIA finally captured him in Khartoum and handed him over to France, where he is currently serving three life sentences.

Mr Sánchez is a type probably familiar to anyone who attended university: the spoiled rich boy who embraces leftist politics to make himself a hero. He championed Marxism, Palestinian liberation and, later, "revolutionary Islam" while indulging his tastes for luxury, booze, women and violence. One former confrère noted he took "pure pleasure in killing". He boasted to Joby Warrick, the book's author and a veteran national-security reporter for the *Washington Post*, "I killed 83 people...Another thousand were killed on my orders."





Two sides of the same coin



▶ Why did he become a murderous terrorist rather than just a petty criminal or shouting serial demonstrator with a few ill-advised piercings? Because he found his way to the Popular Front for the Liberation of Palestine (PFLP), a Marxist group, just as its co-founder, Wadie Haddad, embraced terrorist spectacle as a tactic. “We must become...a bacillus that gets under the skin of the developed world,” Haddad told a subordinate. That attitude let Sánchez play revolutionary hero while indulging his bloodlust on a global stage.

The protagonist of Pamela Colloff’s “Catch the Devil” also benefited from enablers—not other outlaws, as with the Jackal, but those operating within the legal system. Paul Skalnik (pictured, right) was charged with grand theft, larceny, forgery, sexual assault of a child and more. He served far less time than he should have because he made himself useful to police and prosecutors: other inmates seemed to have an uncontrollable urge to confess their crimes to him in private. Snitching on fellow jailbirds can reduce an inmate’s sentence, which is why police and prosecutors should treat such revelations with caution.

Skalnik lived in Pinellas County, Florida, at a time when the chief prosecutor pursued what Ms Colloff calls “a law-and-order agenda whose mandate was to put away as many people as possible for as long as possible”. His testimony won several people execution sentences, including Jim Dailey, a hometown hero-turned-alcoholic after serving in Vietnam, who appears in Ms Colloff’s account to be innocent but remains on Florida’s death row at the age of 80.

Both Skalnik and Mr Sánchez benefited from systems that rewarded their deepest, worst impulses. Maybe each would have found their way to mischief anyway. But

readers cannot help wonder several things. What if police and prosecutors had been just a little more sceptical of a man who seemed to provide perfect information on demand? And what if the PFLP had sent Carlos packing? Ms Colloff’s tale is more an indictment of a system than a pure biography, as Mr Warrick’s is. But both books are terrific tales: difficult not to devour in a single setting, and difficult not to wrestle with for days afterwards. ■

Exercise trends

The pain game

Hyrox, a hybrid fitness race, has people working up a sweat

INSIDE STRAWBERRY ARENA, a cavernous stadium in Stockholm, thousands of chiselled men and women are puffing and slick with sweat. A few are the colour of the fruit. And little wonder: they have run a kilometre, covered the same distance on a ski-training machine, then run again. Between laps of the stadium they have also rowed, lunged, done burpees, carried kettlebells, pushed and pulled a sled and lobbed a medicine ball. A respectable race time is about 90 minutes; the fittest strive to finish in under an hour.

This cross between a relay race and high-intensity interval training is called Hyrox. (The name is believed to be a portmanteau of “hybrid”—a reference to its mix of cardio and strength exercises—and “rock star”, to make it seem cool.) To the unathletic, it may all sound nauseating. But Hyrox claims to be the “fastest-grow-

ing mass-participation fitness concept in the world”. At the first race, in Hamburg in 2017, some 650 people took part. In the 2026-27 season more than 2m will compete across six continents. September alone features events in 12 cities, including Athens, Mumbai and Washington.

The format has certainly set pulses racing. The hashtag #hyrox has been viewed more than 500m times on Instagram and TikTok. Peloton, a home-exercise firm, offers Hyrox training classes. Later this year a four-day European cruise will allow athletes to train at sea, with tickets for a cabin starting at a bracing £2,200 (\$3,000). There is a Hyrox dating app and bank card. “Hyrox is not just a race or an event,” one acolyte proclaims online. “Hyrox is a lifestyle.”

The hype is partly explained by a boom in gym culture: men and women are pumping iron more than they used to. Across America, Britain and Europe, fitness-club memberships have reached a record high. Isabella Helm, a 25-year-old trainee accountant, loves Hyrox and trains six days a week in London: “You get addicted to feeling fitter and stronger.”

Hyrox adds a social element to what is generally a solitary pursuit. There is also the adrenaline rush that comes with competition. Leaderboards foster friendly rivalry. Athletes can race solo, in pairs or teams; friends can pay to watch on in comfort from the stands.

Participants often turn races into mini-holidays. As the format spreads across the globe, there is no shortage of new destinations to visit. Danny and Zoe Rae are British influencers who, like a number of couples, combine races with recreation and doing “something nice”. “It’s a great way to travel,” Mr Rae avers.

The sport attracts racers of all ages. The average age of participants is 36, but the oldest at the world championships in Stockholm was 75. Laura Hitt trains several older people at her gym in Exeter, in southwest England. She says that “it’s one of the most accessible sports I’ve been part of.” Hyrox is kinder on the body than other fitness races—such as CrossFit, which peaked in popularity in the 2010s—because it does not require complex weightlifting. This may explain why it appeals to retired athletes as well as hobbyists.

Will Hyrox run out of breath? Some grumble that tickets are scarce and cost upwards of £150—even without accounting for travel, hotels and months of gym fees. But Moritz Fürste, the co-founder of Hyrox (and an Olympic-medal-winning hockey player), believes the format has room to grow, and hopes it will be included in the Olympics in 2032. He concedes that it is expensive, but that demand is still far exceeding supply. “It’s like tennis and golf,” he observes: “Once it becomes your sport, you’ll keep coming back.” ■

Economic & financial indicators

	Gross domestic product				Consumer prices		Unemployment rate		Current-account balance	Budget balance	Interest rates		Currency units	
	% change on year ago				% change on year ago		%		% of GDP, 2026†	% of GDP, 2026†	10-yr gov't bonds	change on	per \$	% change
	latest	Q2	quarter*	2026†	latest	2026†					latest, %	year ago, bp	Sep 3rd	on year ago
United States	2.1	Q2	1.5	2.1	3.4	Jul	3.2	4.1	Jul	-3.5	-6.5	4.8	51.0	-
China	4.3	Q2	3.6	4.7	0.5	Jul	1.0	5.2	Jul*§	3.2	-5.4	1.4	\$§	-23.0 6.72 6.1
Japan	0.7	Q2	1.1	0.8	1.9	Jul	1.7	2.4	Jul	4.0	-1.8	3.0	139	159 -6.5
Britain	1.2	Q2	1.7	1.1	2.9	Jul	3.2	4.9	May**	-3.6	-5.1	5.1	35.0	0.74 1.4
Canada	1.1	Q2	3.3	0.9	3.0	Jul	2.5	6.4	Jul	-0.3	-2.0	3.8	36.0	1.38 -0.7
Euro area	1.0	Q2	1.8	0.8	3.3	Aug	2.8	6.4	Jul	2.3	-3.4	3.4	59.0	0.86 nil
Austria	0.9	Q1	0.8*	0.7	2.9	Aug	3.0	6.2	Jul	1.1	-4.1	3.6	45.0	0.86 nil
Belgium	0.5	Q2	0.1	0.7	4.2	Aug	3.4	6.0	Jul	-2.1	-5.2	3.9	54.0	0.86 nil
France	0.5	Q2	0.1	0.7	2.7	Aug	2.3	8.3	Jul	-0.4	-5.3	4.2	66.0	0.86 nil
Germany	1.0	Q2	1.3	0.9	2.9	Aug	2.7	4.0	Jul	4.5	-4.2	3.4	59.0	0.86 nil
Greece	2.0	Q1	1.0	2.0	2.7	Jul	3.7	7.9	Jul	-5.5	0.8	4.1	53.0	0.86 nil
Italy	1.0	Q2	0.7	0.8	3.2	Aug	2.6	5.8	Jul	0.8	-3.0	4.2	50.0	0.86 nil
Netherlands	1.3	Q2	1.6	1.3	2.8	Aug	3.1	4.0	Jul	8.3	-3.2	3.5	49.0	0.86 nil
Spain	2.7	Q2	2.8	2.6	4.5	Aug	3.3	10.0	Jul	2.4	-2.5	3.7	48.0	0.86 nil
Czech Republic	1.9	Q2	1.4	2.0	1.7	Jul	2.0	3.0	Q2*	0.1	-2.8	5.2	83.0	20.9 0.8
Denmark	4.7	Q2	1.1	3.3	1.7	Jul	2.0	3.1	Jul	12.1	1.3	3.1	52.0	6.45 -0.6
Norway	2.0	Q2	2.7	1.3	3.0	Jul	3.2	4.4	Jun**	14.8	9.0	4.5	47.0	9.32 7.7
Poland	3.9	Q2	4.1	3.4	3.4	Aug	2.8	5.8	Jul§	-1.4	-6.9	6.2	73.0	3.74 -2.1
Russia	1.3	Q2	8.3	0.7	6.0	Jul	6.1	2.3	Jul§	2.3	-3.2	16.1	220	87.0 -7.4
Sweden	3.2	Q2	6.4	2.1	0.2	Jul	1.9	7.8	Jul§	4.8	-2.0	3.1	61.0	9.63 -1.7
Switzerland	2.8	Q2	7.8	1.6	0.8	Aug	0.5	3.1	Jul	7.7	0.2	0.5	16.0	0.81 -1.2
Turkey	2.3	Q2	4.6	2.4	31.5	Aug	32.1	8.3	Jul§	-3.0	-3.6	31.9	168	48.3 -14.8
Australia	2.1	Q2	1.7	1.6	3.5	Jul	3.7	4.5	Jul	-3.7	-1.5	5.0	70.0	1.40 10.0
Hong Kong	4.3	Q2	-2.5	4.1	1.7	Jul	2.0	3.7	Jul**	7.8	-2.5	3.7	59.0	7.84 -0.5
India	7.8	Q2	6.8	6.8	4.4	Jul	4.8	6.1	Aug	-1.5	-4.5	7.0	41.0	94.5 -6.8
Indonesia	5.3	Q2	4.4	5.3	3.2	Aug	3.2	4.7	Feb§	-1.6	-2.9	7.2	86.0	17,715 -7.1
Malaysia	6.0	Q2	9.3	5.5	1.8	Jul	1.9	3.0	Jun§	3.1	-3.5	3.9	53.0	4.04 4.5
Pakistan	4.8	2026**	na	3.0	11.2	Aug	9.0	6.9	2025	-1.1	-4.7	12.1	+++	8.0 277 2.0
Philippines	2.3	Q2	2.4	2.9	6.2	Jul	5.4	4.7	Q2§	-4.5	-6.4	7.3	130	62.5 -8.2
Singapore	5.9	Q2	5.7	5.4	2.2	Jul	2.0	2.0	Q2	15.6	1.3	2.4	57.0	1.27 1.6
South Korea	3.7	Q2	2.5	3.3	3.1	Aug	2.8	2.6	Jul§	13.6	-1.9	4.4	155	1,358 2.8
Taiwan	12.9	Q2	5.7	10.8	2.5	Jul	2.0	3.3	Jul	26.6	1.8	1.9	49.0	31.8 -3.1
Thailand	1.9	Q2	-0.7	2.1	1.9	Jul	1.9	1.1	Jul§	nil	-5.5	2.2	97.0	33.2 -2.5
Argentina	2.3	Q1	3.0	2.3	33.8	Jul	32.5	7.8	Q1§	-0.1	0.1	na	na	1,511 -10.0
Brazil	2.0	Q2	1.9	2.0	4.4	Jul	4.5	5.3	Jul§**	-2.6	-7.3	14.5	42.0	5.09 7.3
Chile	-0.2	Q2	-0.1	1.0	3.5	Jul	3.6	9.5	Jul§**	-1.2	-2.5	5.7	7.0	938 3.8
Colombia	3.4	Q2	5.2	2.5	6.0	Jul	5.7	8.1	Jul§	-2.1	-6.6	12.7	125	3,141 27.9
Mexico	2.1	Q2	5.8	1.0	3.1	Jul	3.8	2.7	Jul	-0.4	-4.0	9.3	32.0	17.0 10.3
Peru	2.6	Q2	-1.0	2.8	4.4	Aug	3.9	4.3	Jul§	2.2	-2.1	6.3	36.0	3.37 5.0
Egypt	5.0	Q1	4.0	4.6	14.9	Jul	13.7	5.8	Q2§	-5.1	-5.1	25.6	50.0	51.0 -5.0
Israel	6.9	Q2	15.4	4.3	1.5	Jul	1.9	3.1	Jul	1.0	-3.5	3.9	-31.0	3.02 11.9
Saudi Arabia	-4.8	Q2	-18.3	-1.0	1.8	Jul	1.9	3.1	Q1	-1.0	-5.5	na	na	3.75 nil
South Africa	1.9	Q1	2.2	1.5	4.1	Jul	3.9	33.6	Q2§	-0.2	-4.4	8.8	-80.0	16.1 10.2

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 Note: Euro-area consumer prices are harmonised

Markets

	Index	% change on:	
In local currency	Sep 2nd	one week	Dec 31st 2025
United States S&P 500	7,666.6	-0.1	12.0
United States NAS Comp	26,217.8	0.3	12.8
China Shanghai Comp	3,941.4	0.7	-0.7
China Shenzhen Comp	2,511.5	-0.3	-0.8
Japan Nikkei 225	64,325.6	-2.9	27.8
Japan Topix	4,081.6	-0.7	19.7
Britain FTSE 100	10,756.5	-1.1	8.3
Canada S&P TSX	36,091.6	-2.0	13.8
Euro area EURO STOXX 50	6,362.2	-1.7	9.9
France CAC 40	8,280.6	-2.1	1.6
Germany DAX*	25,839.3	-1.7	5.5
Italy FTSE/MIB	51,792.1	-2.1	15.2
Netherlands AEX	1,103.7	-0.4	16.0
Spain IBEX 35	19,779.0	-1.4	14.3
Poland WIG	152,161.1	-0.8	29.8
Russia RTS, \$ terms	791.2	2.2	-28.6
Switzerland SMI	14,363.0	-1.2	8.3
Turkey BIST	14,050.6	-3.8	24.8
Australia All Ord.	9,160.3	-1.9	1.6
Hong Kong Hang Seng	25,311.2	-1.3	-1.2
India BSE	76,570.4	-1.2	-10.2
Indonesia IDX	6,595.8	3.0	-23.7
Malaysia KLSE	1,708.7	-2.3	1.7

	Index	% change on:	
	Sep 2nd	one week	Dec 31st 2025
Pakistan KSE	174,776.6	-1.5	0.4
Singapore STI	5,744.1	0.4	23.6
South Korea KOSPI	6,562.7	-3.6	55.7
Taiwan TWI	46,164.7	0.7	59.4
Thailand SET	1,575.1	-1.7	25.0
Argentina MERV	3,106,216.0	2.7	1.8
Brazil BVSP*	185,205.1	6.1	14.9
Mexico IPC	64,884.3	-2.0	0.9
Egypt EGX 30	55,679.7	1.0	33.1
Israel TA-125	4,138.9	2.4	13.0
Saudi Arabia Tadawul	11,012.2	-2.2	5.0
South Africa JSE AS	115,082.1	-1.5	-0.6
World, dev'd MSCI	4,944.1	-0.6	11.6
Emerging markets MSCI	1,700.6	-1.0	21.1
US corporate bonds, spread over Treasuries			
		Dec 31st 2025	
Basis points		latest	2025
Investment grade		92	93
High-yield		308	354

Sources: LSEG Workspace; Moscow Exchange; Standard & Poor's Global Fixed Income Research *Total return index

Commodities

The Economist commodity-price index					% change on	
2020=100	Aug 25th	Sep 1st*	month	year		
Dollar Index						
All items	155.2	157.7	4.7	16.1		
Food	154.9	159.6	6.5	7.3		
Industrials						
All	155.5	156.1	3.2	24.7		
Non-food agriculturals	154.7	156.4	3.1	25.5		
Metals	155.7	156.1	3.3	24.5		
Sterling Index						
All items	146.3	149.7	4.0	14.9		
Euro Index						
All items	152.0	155.4	4.0	16.8		
Gold						
\$ per oz	4,633.4	4,357.4	6.7	24.1		
Brent						
\$ per barrel	88.6	94.7	19.4	36.9		

Sources: CME Group; LME; LSEG Workspace; NOREXCO; NZ Wool Services; S&P Global Commodity Insights; Thompson Lloyd & Ewart; USDA *Provisional

For historical indicators data, visit economist.com/economic-and-financial-indicators

OBITUARY

Guo Lanying

The singer and champion of traditional Chinese opera died on August 11th, aged 97



THE QUESTION was simple, but it still took her by surprise. A well-dressed young man stood up at one of her talks and asked, “Do you have a signature song?” Before she could answer, the whole audience, young and old, burst out in chorus. “A great river flows, wide are its waves,/Wind blows the scent of rice blossoms to both shores...” And Guo Lanying rocked with laughter.

That song, “My Motherland”, was indeed her signature. Both melody and words were in the simple folksong style she loved. She had sung it most famously in “Shangganling”, a film of 1956 about a recent battle of the Korean war, sitting demure and radiant in military uniform in a cave full of battered soldiers who, group by group, joined in with her. China was indeed beautiful, its roads broad and its waters full of white sails. But “In order to usher in a new era/They’ve woken the sleeping mountains/And changed the shapes of the rivers.” Revolutionary progress was mixed in with natural human homesickness. Another of her most famous songs, “Nanniwan”, celebrated the transformation of a north-western gorge into fertile, productive fields (“Crops everywhere!”) by the 359th Brigade. Again, people sang this up and down the land, and she was delighted to perform it to anyone, many or few, farmers or factory workers, premiers (Zhou Enlai was a great fan) or dumping-sellers. Not for nothing was she named in 2019 a People’s Artist, one of China’s highest honours.

Yet it was opera that had made her: traditional opera, dealing not just with lords and princes (she parading in heavy, glittering robes and extravagant headresses) but, from the 1940s, with ordinary people trying to get by. At 15, she fell in love with an opera called “The White-Haired Girl”. This was the story of Xi’er, a young peasant woman whose land was taken by a vicious landlord who made her his concubine. Rather than submit she took refuge in a cave, her hair and skin turning white as a ghost’s, her clothes in rags, until the soldiers of the Chinese Communist Party brought her back to the sunlight.

Lanying thrilled to this role, in large part, because a rapacious

man got his come-uppance. In China’s old society, even sometimes under the new, women were on the bottom rung: subservient to husbands and parents-in-law, confined to the house. She sang their resistance. In another opera, “The Injustice to Dou E”, she played a woman falsely accused of murder, singing much of the time on her knees with a wooden crime placard strapped to her back. But her final aria, “Pathetic and Disgraceful”, was a lacerating attack on her male abusers and accusers and on the old justice system in general. The high, pure soprano could become a furious mezzo, as necessary.

That voice had been beaten into her, as was the way in those days. As an apprentice singer and performer, on a five-year contract starting at the age of six, she was taken into her master’s household and ruthlessly trained. If she failed to do a somersault perfectly, she was lashed with a leather sheep-whip. For insubordination, she was bludgeoned black and blue with a rolling pin. In the bitter winters of Shanxi, her home region in the north, she was made to do vocalising exercises lying face-down on a frozen lake; she had not done well unless her breath melted a hole in the ice.

To escape this regime she once took poison and, at 11, ran away, but being so far from her own village she had no idea where to go. Besides, she was determined to sing, even if this treatment was the price. She had been spared to do it. As a baby, unable to get a drop of mother’s milk because her peasant parents had only a handful of millet in an iron pot, she had been left in the woods to die. But an aunt rescued her, and an uncle, when she was four, suggested opera. Her parents, starving again by then, sold her to the opera master for five copper coins, or around \$12. She fought to stay at home but her mother remarked that, if she became a singer, she could eat from a hundred households.

So she had persevered, progressing from maids-with-teapots parts to roles big enough to get her on the posters. But after she had seen “The White-Haired Girl” she packed her few things and ran after the performance troupe, joining the revolution by begging for the part of Xi’er. In order to get it she practised harder than ever, especially enunciation. Since audiences listened to opera not for her voice, but for her meaning, she must bite on every word, and let each one land like a hammer-blow on the heart.

Yet, as an art form, Chinese opera was struggling. During the Cultural Revolution it was banned for a decade and she herself was sent to “the cowshed”, an improvised prison where she had to do forced labour. (In December 1976, after the arrest of the Gang of Four, she dared to change a song in mid-concert to praise, not the People’s Liberation Army as usual, but Zhou, whose death that year had hastened the end of the catastrophe.) Zhou had hinted to her that she ought to train successors in her art before it was eclipsed by Western influences. So, on retirement in the 1980s, she sold her house and her awards to found in Guangzhou an art and opera school that was later named after her. She and her husband even helped build it, heaving stones and laying roads.

Becoming China’s favourite female singer had been equally hard work. She impressed that work ethic on her students; if she wasn’t tough on them, audiences would be tough later. Her routine in old age was still vigorously ascetic, including half a bowl of aged Shanxi vinegar with her meals. She painted orchids (*lan* in Chinese), feeling empathy with them from the name she shared. She had endured. It was true that a deep core of anger had also pushed her on. But to dissolve it, and forget it, she had only to hear a packed, adoring theatre singing her songs back to her. ■



NEW ON-DEMAND COURSE

Write like no one prompted you.

Learn the essentials of business writing, on your terms. ■

Good writing is a skill—one that sets people apart in an age of formulaic, AI-generated prose. Created by *The Economist's* journalists, our new on-demand course, Essentials of business writing, will show you how to write clearly, structure ideas and choose words that work. It includes practical tips for using AI as a tool to strengthen, not replace, your writing. Learn techniques you can apply to everyday business documents straight away, in the time you have.



Scan the QR to learn more or visit
[education.economist.com/essentials*](https://education.economist.com/essentials)

**ECONOMIST
EDUCATION**

ZEGNA



Su Misura